ITI LIMITED
(A Govt. of India Undertaking)

Expression of Interest
For
Upgradation of Security and Fire Fighting Infrastructure in 16 X Ammunition Depots

Tender Notice No: ITI/MSPDelhi/2k22/MoD Date: 12.05.2022

Deputy General Manager
ITI Limited, MSP-Delhi
201-202 Rohit House
3, Tolstoy Marg, New Delhi-110001
Phone: (011)-23317195
Website: www.itiltd.in

ITI LIMITED
(A Govt. of India Undertaking
Deputy General Manager ITI Limited,
MSP-Delhi 201-202 Rohit House 3,
Tolstoy Marg, New Delhi-110001
Phone: (011)-23317195

TENDER NOTICE

Tender Notice to: **ITI/MSPDelhi/2k22/MoD**

Date: 12.05.2022

ITI Limited invites ONLINE bid in ONE COVER SYSTEM (Technical & Budgetary) from eligible bidders which must be valid for a minimum period of 18 Months from date of bid opening for following items:

Scope of Work	Upgradation of Security and Fire Fighting Infrastructure in 16 X Ammunition Depots

Interested parties may view and download the tender document containing the detailed terms & conditions at free of cost from the websites CPP Portal OR http://itiltd.in

The ONLINE bid is to be submitted over the tender wizard portal super scribing "Upgradation of Security and Fire Fighting Infrastructure in 16 X Ammunition Depots"

Any queries may please be sent to etenderiti_mspdli@itiltd.co.in or you can contact below mentioned officers.

The helpdesk nos. **for bidding:**

a) **Shri Prashant Kumar: +91-99100-48364**
b) **Shri Abhay Sharma: +91-78274-50462**

M/s ITI Limited
DGM MSP Delhi

*****Special Note*****
SI can participate in this tender who are willing to deliver full solution back to back.
OEM can also participate with their part mentioned in the EOI directly with ITI
Optical Fiber Cable and HDPE Pipe supply scope will be with ITI Only

Subject: EOI for Upgradation of Security and Fire Fighting Infrastructure in 16 X Ammunition Depots

We as a Govt. of India Undertaking organization under the Ministry of Communication & IT engaged in ICT business along with other diversifying business areas.

This EOI/RFP/Tender is aimed at identifying suitable Commercial Organization as a 'System Integrator' / OEM having adequate strength in the above field.

The 'System Integrator' (SI)/ OEM shall execute the project in India. All mission critical activities would be managed and supervised by ITI through its experienced Managers and qualified Professionals in the respective areas.

With this vision and commercial objective, sealed bid is invited for the above mentioned work. The Sealed Technical and Financial proposal under Two Cover-System may be submitted by the Bidder(s). It is must for the bidders to meet the Eligibility Criteria as mentioned in the EoI/RFP/Tender document.

Few important points & timelines are being furnished hereunder.

Sl. No.	Important Points / Timelines	Details
1	**EoI/RFP/Tender Enquiry Authority**	Depy. General Manager 201, 202 Rohit House, 3 Tolstoy Marg New Delhi- 110001 Ph: (011)- 23317195
2	**Contact Person for the clarification of EoI/RFP/Tender Document**	Shri Prashant Kumar, Chief Manager Contact: +91-99100-48364 Shri Abhay Sharma, Marketing Executive Contact: +91-78274-50462
3	**Tender Type** **(Open/Limited)**	Open Ended EOI
4	**No. of Cover/Packet**	One Cover System
5	**Tender Category (Goods/Services/Works)**	Works
6	**Payment Mode (Online/Offline)**	Online RTGS/ NEFT Bank: Bank of Baroda, KG Marg MICR: 110012021 IFSC: BARB0CURZON Acc. No.: 06230500000010
7	**EoI/RFP/Tender Document Cost (inclusive of GST)**	xxxxxxxxxxxxx
8	**EMD Amount**	xxxxxxxxxxxxx
9	**Estimated Value of Enquiry**	-------
10	**Due Date, Time & Place for Sale of EoI/RFP/Tender Document**	19.05.2022; 12:00 p.m.
11	**Due Date, Time & Place for Submission of Bid**	19.05.2022; 02:00 p.m.

12	**Due Date, Time & Place for Opening of Technical Bid**	19.05.2022; 03:00 p.m.
13	**Due Date, Time & Place for Opening of Financial Bid**	Will be intimated later
14	**Performance Security**	5%

In order to get the clarity of the scope of work / terms & conditions, the bidders are requested to go through the whole EoI/RFP/Tender document and other project related requirements carefully. An explicit understanding of the requirement is rather essential for arriving at commercial assessment by the prospective bidders.

The selected bidder who is to play the role of a 'System Integration Associate (SIA)' has to enter in to a Contract with ITI Limited to forge a case-specific business alliance (under sole investment business modal) for arranging the requisite bidding inputs.

This EoI/RFP/Tender is being issued with no financial commitment and the response to this EoI/RFP/Tender shall not be assumed as mandatory for short listing of the vendor for giving the work.

Depy. General Manager
MSP-Delhi

Project Background:

ITI Limited (ITI) is a Public Sector Undertaking which functions under the aegis of The Ministry of Communications and IT, Government of India.

We at MSP-Delhi (which is part of the Corporate Marketing Department located at Bangalore) are engaged in the business of Telecom / ICT and e-Governance projects implementation, Supply of Hardware and Software and the services related with these items.

ITI is interested in addressing some of the prospected business opportunities where it is strongly positioned by virtue of its 'PSU Status', proven 'Project Management Capabilities' and rich Relevant- Experience. ITI is looking for business association from reputed System Integrators/ OEMs who can assist ITI to win the business and ultimately help ITI in the execution of the project.

The objective of this Invitation for submission of bid is to identify a System Integration Associate **(SIA)** to address a particular 'Business Opportunity' / a kind of 'Business Opportunity' which has emerged or under process to emerge from a client for the implementation of a project in Government Domain. The prospective customer has already published/disclosed its broad requirement through an Invitation for EoI/RFP/Tender/e-Mail/Discussions which is to be responded with the submission of Techno-commercial Proposal / Bid in due course of time.

The selected bidder who is to play the role of a 'System Integrator' has to enter in to a contract with ITI Limited to forge a case-specific business alliance for addressing the opportunity.

During the bidding process, the vendor is supposed to provide the requisite Techno-commercial inputs to ITI as per the Requirements/Specifications/Expectations/Scope of Work of the prospective customer to win a commercial-favour in terms of award of order to ITI. The name of the end-customer and other finer details of the Projects would be shared with the selected bidder prior to the actual bidding to be done by ITI.

In the event of the award of an order to ITI, the selected business associate would act as a SI/ Vendor to implement the project for which a separate 'Purchase Order' would be placed on the selected SI.

Eligibility Criteria of the Bidders:

The bidders are to fulfill the following eligibility criteria **and submit documentary proof in this regard:**

	Eligibility Criteria of Applicants	**Required Documents**
A	**Company Profile:** 1. The Bidder/ Consortium Partner shall be in operations for a period of at least three years prior to the date of bid submission. 2. The Bidder/ Consortium Partner should be a company registered in India for a period of at least three years prior to the date of bid submission.	Copy of certificate of Incorporation/Registration under Indian Companies Act1956/ 2013with roles & responsibilities of lead bidder and consortium partner.
B	Bidder's Undertaking for willingness to work with ITI as per customer tender terms and conditions.	Undertaking for the same.
C	Minimum two years' experience in broad areas like manufacturing/integration of electronic systems etc. as applicable in the instant procurement/ upgradation case. If not, then cumulative experience of at least three years in above areas, resulting in gaining of competence for manufacturing the proposed product.	Copy of PO, Completion
D	Where product involves integration, previous experience of not less than one year/ one project in integration of systems/ equipment shall be required.	Copy of PO, Completion

E	Experience of successful completion of one Turnkey project of Security upgradation and modernization where supply, commissioningand installation of varied machines/equipment is involved within last five years or currently executing a contract. In case of no experience in Turnkey projects, the Vendor for main component of such Turnkey projects may be selected if it has experience of installation or integration of equipment/system or system for security and fire fighting systems upgradation.	Copy of PO, Completion
F	ISO 9001/ CMMi 3	Certifications copy
G	(Average Annual Turnover. Minimum average annual turnover for last three financial years, ending 31st March of the previous financial year, should be 50 Crs	CA Certificate
H	**Company standings:** As on date of submission of the proposal, the Bidder as applicable shall not be blacklisted by any State / Central Government Department or Central/State PSUs.	Undertaking for non-blacklisted
I	Net worth of bidder should be positive	CA Certificate
	The company needs to specify the previous experience/expertise in Modernization and Upgradation of Security and Fire Fighting System or any of its sub-components like Intrusion Detection and Surveillance System, Access Control System (Locking System), Quick Reaction Capability, Fire Fighting System for Ammunition sheds/similar flammable stores, Fire Detection System, Communication System, Integrated Command & Control Centre System, Power Backup and Video Management System (VMS) project undertaken in MoD/other ministries. The details of the same needs to be provided.	Relevent Documents

General Terms and Conditions of EoI/RFP/Tender:

The prospective bidders are advised to study the EoI/RFP/Tender document carefully. Submission of your offer/bid shall be deemed to have been done after careful study and examination of the EoI/RFP/Tender with full understanding of its implications. Failure to furnish all information required in the EoI/RFP/Tender Document or submission of an offer/bid not substantially responsive to EoI/RFP/Tender in every respect will be at the Bidder's risk and may result in its outright rejection.

The Bidder shall bear all costs associated with the preparation and submission of its Bid, including cost of presentation for the purposes of clarification of the Bid, if so desired by ITI Limited. In no case, ITI would be responsible or liable for those costs, regardless of the conduct or outcome of the Tendering Process. ITI reserves the right, not an obligation, to carry out the capability assessment of the Bidder(s). This right inter alia includes seeking Technical-Demonstrations, Presentations, Proof of Concept and Live-site visits etc.

1	**Empaneled Vendor of ITI**	Open ended EOI
2	**Non-transferable Offer**	This EoI/RFP/Tender document is not transferable. Only those, who have purchased this offer document, are entitled to quote.
3	**Only one Proposal**	The Bidder should submit only one Bid/Offer/Proposal. If the Bidder submits or participates in more than one proposal, such proposals shall be disqualified.
4	**Language of the Bid**	All information in the Bid, correspondence and supporting documents, printed literature related to the Bid shall be in English. Failure to comply with this may disqualify a Bid. In the event of any discrepancy in meaning, the English language copy of all documents shall govern.
5	**Clarification and Amendment in Tender**	At any time before the submission of Proposals, ITI may amend the EoI/RFP/Tender document by issuing an addendum / corrigendum in writing or by standard electronic means. The addendum / corrigendum shall be sent to all contenders and will be binding on them. The Bidders shall acknowledge receipt of all amendments. To give bidders reasonable time in which to take an amendment into account in their Proposals ITI may, if the amendment is substantial, extend the deadline for the submission of Proposals.
6	**Amendment to Bid**	At any time prior to the deadline for submission of bids, the bidder may, for any reason, whether at its own initiative, or in response to a clarification requested by a prospective Bidder, submit the Revised Financial Bid.
7	**Modification and Withdrawal of Bid**	No bid may be withdrawn or modified in the interval between the bid submission deadline and the expiration of the bid validity period specified in Bid documents. Modification or Withdrawal of a bid during this interval will result in the forfeiture of its bid security.
8	**Validity of Offer**	The offer should be valid for a minimum period of **18 Months** from the date of submission. The Bids valid for a period shorter than specified period Shall be rejected.
9	**Prices**	The prices quoted by the Bidder shall be FIRM during the performance of the contract and not subject to variation on any account. A bid submitted with an adjustable price quotation will be treated as non-responsive and

		rejected.
10	**Deviation Clause**	No Deviation from Specifications, Terms & Conditions of the tender is allowed. Quotations having deviation from our specifications, standard terms & conditions would be liable to be rejected.
11	**Taxes and duties**	The taxes and duties are to be clearly mentioned, if any.
12	**Payment Terms**	a) Payment shall be released to the vendor on back-to-back basis and on pro rata basis after ITI has received its payment after the submission of necessary document like Vendor Invoice, receipt acknowledgement of goods by end user etc. b) Other Direct Expenses will be deducted from the payment of the vendor. Expenses like cost incurred by ITI towards EMD/PBG/BG/SD processing. c) The payment shall be done on the basis of actual supply/installation of requirements as certified by the end customer. d) No advance payment will be made during the execution of the project. In case ITI receives any advance payment, the same may be released to the vendor after submission of equivalent amount of Additional BG valid till the completion of obligation for which payment has been released by the end customer.
13	**Warranty**	**1.** Warranty will be three years **2.** Five years of CMC post warranty
14	**Liquidated Damages (LD)**	Liquidated Damages shall be levied on back- to-back basis i.e. ITI shall deduct from the payment on amount equal to the LD levied on ITI by the end customer.
15	**Training**	Training of customer officers/representatives will be the responsibility of the selected Bidders.
16	**Acceptance Test Procedure (ATP)**	a) Vendor will conduct the Acceptance Test (AT) before handing over of the project(s) to ITI project executing division. .
17	**Damage to Properties**	In case of any accident/damage to customer/end user properties by the vendor, full responsibility will be attributed to the vendor.
18	**Contractual Period**	ITI's Delivery date provided to ITI by customer. Delivery extension will be on back-to-back basis. The successful Bidder shall so organize his resources and perform his work as to complete it not later than the date agreed to.

19	**Extension of Contract**	On back-to-back basis.
20	**Inspection Authority**	All supplies will be subject to customer & ITI inspection.
21	**Tender Award Criteria**	Single Mode Tendering
22	**Tender Document Cost** and **Earnest Money Deposit (EMD)**	**In case of bid submission:** Tender Document Cost and Earnest Money Deposit (EMD) (If applicable) must be remitted through NEFT/RTGS/Net Banking. No interest shall be payable on the EMD. **The Bank Details of ITI Limited for NEFT/RTGS/Net Banking is as below:** Online RTGS/ NEFT Bank: Bank of Baroda, KG Marg MICR: 110012021 IFSC: BARB0CURZON Acc. No.: 06230500000010 Note: Tender Document Fee will be non refundable
23	**Performance Security Deposit**	The value of performance security shall be 5 % of Contract Value (issued to Business Associate/SIA by ITI) or end-customer's performance security (as per order to ITI)
24	**Consortium Bidding**	Consortium Bidding is allowed
25	**Signing of the Bids**	The Bid must contain the name, residence and place of business of the person or persons making the Bid and having Power of Attorney and must be signed & submitted by the Bidder with his usual signatures. Satisfactory evidence of authority of the person signing the bid on behalf of the Bidder shall be furnished on non-judicial stamp paper of an appropriate value with the Bid in the form of a **Power of Attorney**, **duly notarized by a Notary Public**, indicating that the person(s) signing the bid have the authority to sign the bid and that the bid is binding upon the Bidder during the full period of its validity. All the pages of Bid document and supporting documents must be signed and stamped by the authorized signatory having Power of Attorney. Any interlineations, erasures or overwriting shall only be valid if they are initialed by the signatory (ies) to the bid.

26	**Submission of Tender**	The '**Technical Bid**' consisting all technical documents and budgetary commercial shall be uploaded "Budgetary Commercial shall be on letter head"
27	**Opening of Tender**	Technical bid will be opened on due date of tender opening.
28	**Rejection of Bid**	ITI reserves the right to reject any or all tenders/quotations/bids received or accept any or all tenders/quotation/bids wholly or in part. Further, ITI reserves the right to order a lesser quantity without assigning any reason(s) thereof. ITIalso reserves the right to cancel any order placed on basis of this tender in case of strike, accident or any other unforeseen contingencies causing stoppage of production at ITI or to modify the order without liability for any compensation.
29	**Termination For Default**	ITI may terminate the contract in whole or in part for the following reasons: • If the bidder fails to deliver any or all of the goods/services within the period(s) specified in the contract/purchase order, or within the extension time granted by ITI. • If the bidder fails to perform any other obligation(s) under the contract/purchase order. • If the bidder has engaged in corrupt/fraudulent practices in completing/executing the work assigned to him.

		ITI may, without prejudice to any other right or remedy available to it, by a three days notice in writing, can terminate the contract as a whole or in part in default of the contract. ITI shall have the right to carry out the incomplete work by anymeans at the risk and cost of the bidder. In addition to rights to forfeiture of PBG and application of LD charges, on the cancellation of the contract in full or in part, ITI shall determine what amount, if any, is recoverable from the contractor for completion of the work or part of the works or in case the works or part of works is not to be completed, the loss or damage suffered by ITI. In determining the amount, credit shall be given to the contractor for the value of the work executed by him up to the time of cancellation, the value of contractor's material taken over and incorporated in work assigned as per the purchase order. "Corrupt practices" means the offering, giving, receiving or soliciting of anything of value to influence the action of public official in the procurement process or in contract execution. "Fraudulent practices" a misinterpretation of facts in order to influence the action of a public official in the procurement process or in contract execution and includes collusive bidding among bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels to hamper free and open competition.
30	**Force Majeure**	Neither party shall bear responsibility for the complete or partial non-performance of any of its obligations, if the non-performance results from such Force Majeure circumstances i.e. Flood, Fire, Earth Quake, Epidemic and other acts of God as well as War, Military Operation, Blockade, Act or Actions of State Authorities that have arisen after signing of the present contract. Party invoking this clause shall serve notice of seven days along with the proof of occurrence of the force majeure event to the opposite party. At the time of cessation of such force majeure event a notice of the same shall also be served to the opposite party. In such circumstances, upon a written approval of ITI, the time stipulated for the performance of an obligation under the present contract will stand extended correspondingly for the period of time of action of these circumstances and their consequences. However, any such extension shall be given only if extension is granted by the ultimate buyer/ user. Parties at all times take reasonable steps within their respective powers and consistent with good operation practices (but without incurring unreasonable additional costs) to: a) Prevent Force Majeure Events affecting the performance of the Company's obligations under this agreement; b) Mitigate the effect of any Force Majeure Event; and c) Comply with its obligations under this agreement.

		Further if the period of Force Majeure event extends beyond three months* the parties may consider the fore closure of the agreement. * Period of three months may vary at the discretion of ITI as per the validity period of the contract.
31	**Arbitration**	All disputes arising out of this contract shall be referred to the sole arbitration of MSP Head, ITI Limited, Delhi or his nominee as per the Provisions of Indian Arbitration and Reconciliation Act 1996. Decision of arbitrator shall be final and binding on both the parties.
32	**Jurisdiction**	This contract between the supplier and buyer shall be governed by the laws of India and this contract shall be taken up by the parties for Settlement and orders only in Delhi jurisdiction.
33	**Other Terms and Conditions**	
a		The Bidder(s) are required not to impose their own terms and conditions to the bid and if submitted, it will not be considered as forming part of their bids. The decision of ITI shall be final, conclusive and binding on the Bidder(s).In a nutshell, the Conditional Bid or Bid with deviations will be Summarily rejected.
b		The Bids/Offers of the Qualified bidders (who qualify the eligibility conditions) only would be subjected to the technical-evaluation.
c		The bidder is expected to go through the Scope of work and Specifications. The bidders are to quote only fully compliant solution.
d		The bidder may be required to study the existing system being used by the end-client to assess the exact requirements and the Quantum of work on "No-commitment" basis (no commercial compensation would be given to The bidder either by ITI or the end-client for doing this exercise).
f		The bidder is required to extend the requisite support during the Evaluation by giving Technical Presentation /Demonstration /Arranging site visits (if required) on "No-Cost No-commitment" basis.
g		Any clarification issued by ITI in response to query raised by prospective bidders shall form an integral part of bid documents and it shall amount to An amendment of relevant clauses of the bid documents.
h		A clause-by-clause compliance statement to all Sections of the EoI/RFP/Tender document is to be submitted in the Technical Bid, demonstrating substantial responsiveness. A bid without clause-by-clause compliance statement to Eligibility Criteria of the EoI/RFP/Tender document, shall not be considered for evaluation and shall be summarily Rejected.
i		The bidder should study carefully the document to assess the work and Risk factors associated with such type of Business opportunities.
j		The bidder has to consider the following major Cost Factors while arriving at a commercial decision: • Direct Cost (requisite IT Hardware and Application Software) • Taxes/ Duties • Services and Administrative Cost • Training and Documentation Cost

		• Contingencies
k		The bidder should enclose the documents in their '**Technical**' as specified in the tender documents.
l		Please note that if any document/authorization letter/testimonies are found fabricated /false/ fake, the bid will be declared as disqualified and EMD will be forfeited. This may also lead to the black-listing of the bidder.
m		All the required documents to establish the bidder's eligibility criteria should be enclosed with the original bid/offer (Technical-Bid) itself. The EoI/RFP/Tender will be evaluated on the basis of the documents enclosed with the original bid/offer only. ITI will not enter into any correspondence with the bidder to get these certificates/ document subsequently. However, it reserves its right to get them validated/verified at its own.
n		Due to any breach of any condition by the bidder, the Bid Security (EMD) submitted by the bidder may be forfeited at any stage whenever it is noticed and ITI will not pay any damage to the bidder or the concerned person. The bidder or/and the person will also be debarred for further participation in future EoI/RFP/Tenders.
o		All suppliers (including small scale units who are registered with the National Small Scale Industries Corporation under Single point registration scheme) shall furnish Bid Security to the purchaser as per the requirement. As such no bidder is exempted to furnish the EMD.
q		Suitable 'Training' would have to be imparted to ITI personnel at Bidder's cost in the areas of Installation, day to day Maintenance and Operation of entire system (in the event of placement of order by ITI). The training of the personnel shall be to ensure trouble free operations of the System/Equipment by the end customer.
r		The bidder is required to enclose Notarized Copy of the Power of Attorney from its Directors/Top management which should indicate clearly the name of the signatory and title. The Bidders must ensure that all the Documents are sealed and signed by authorized signatory.
s		The Power of Attorney given to the Authorized Signatory should be submitted and executed on the non-judicial stamp paper of appropriate value as prevailing in the respective states(s) and the same be attested by a Notary public or registered before Sub-Registrar of the states(s) concerned.
t		"DISCOUNT, if any, offered by the bidders shall not be considered unless specifically indicated in the price schedule.
u		Sealed offer/bid prepared in accordance with the procedures enumerated above should be submitted to the Tenderer not later than the date and time laid down, at the specified address.
v		ITI shall not be responsible for any postal delay about non-receipt / non- delivery of the bid/documents. This EoI/RFP/Tender Document is absolutely not transferable.
w		The bid submitted may be withdrawn or resubmitted before the expiry of

		the last date of submission by making a request in writing to ITI to this effect. No Bidder shall be allowed to withdraw the bid after the deadline for submission of the EoI/RFP/Tender.
x		It is further stressed that synergies between ITI's competitors with the bidder or cartel Formation with other bidders would result in Disqualification of the Bidder.

Special Terms and Conditions of RFP/EoI/Tender:

1. The requirement is meant for addressing a business opportunity which has emerged from some Govt. body against their already published Tender-Notification / Invitation for the submission of Bids which envisages Implementation of Project.

2. The broad 'Scope of Work' would be as per the EoI/RFP/Tender Document. However, the exact Scope of Work will be intimated to the selected SI/Vendor in due course of time (once bidder is short-listed) for addressing the opportunity.

3. The bidder (in the capacity of a System Integrator) is supposed to address the business opportunity jointly with ITI under "Sole Investment Business Model". This may include arranging Bid Security and Performance Bank guarantee etc. All 'Terms and Conditions' as per ITI's customer with regard to Payment / Reward / Delivery/Penalty shall be applicable on the selected Business Associate /SI also (in the event of the award of the business to ITI by the end-customer).It may please be noted that ITI shall not open any 'Escrow Bank Account' with the consortium member/SI (in the event of the award of the order to ITI).

4. The bidder must be prepared to work with ITI limited on exclusive basis and will neither submit any direct proposal (to the end-client) nor submit any business proposal (to the end-client) through other business partner/PSU. In case of violation of the same, the EMD shall be forfeited and the bidder will be black-listed.

5. ITI reserves the right to quote & supply ITI manufacturing products if BOM of EoI/RFP/Tender Document contains ITI manufacturing products.

6. All activities like Proof of concept on "No Cost No Commitment" (NCNC) basis wherever applicable will be the responsibility of agencies.

7. Agencies should be willing to impart required training to ITI engineers for undertaking services & execution of project.

8. Agencies will be responsible for any short coming in the BOM and the same should be rectified free of cost.

9. Agencies should be willing to provide TOT for manufacturing of offered products in ITI if the bidder is an OEM.

10. Agencies should be willing to sign an exclusive agreement with ITI for smooth execution of the

project.

11. Earnest Money Deposit (EMD) / Bid security required for submitting the bid will be borne by the selected agency.

12. All CVC circulars/ Statutory guidelines as applicable needs to be followed.

13. Margin to ITI would be payable on Supply, I&C and AMC services undertaken by the selected agency for the project.

14. At least one of the consortium partner should be empaneled with ITI.

EoI/RFP/Tender Rejection Criteria:

The EoI/RFP/Tender/Bid will be rejected in case any one or more of the following conditions are observed**:**

1. Bids received without Proof of Purchase of EoI/RFP/Tender Document and EMD as per requirement.
2. Bids which are not substantially responsive to the Invitation for EoI/RFP/Tender.
3. Incomplete or conditional EoI/RFP/Tender that does not fulfill all or any of the conditions as specified in this document.
4. Inconsistencies in the information submitted.
5. Misrepresentations in the bid proposal or any supporting documentation.
6. Bid proposal received after the last date and time specified in this document.
7. Unsigned bids, bids signed by unauthorized person (without a valid Power of Attorney.
8. Bids containing erasures or overwriting except as necessary to correct errors made by the Bidder, in which case such corrections shall be authenticated by the person(s) signing the bid.
9. Bid shall remain valid for the specified period from the date of opening of EoI/RFP/Tender prescribed by the purchaser. A bid valid for a shorter period shall be rejected by the purchaser being non-responsive.
10. If Bidder will not submit any relevant documents as per documents to be submitted and Eligibility Criteria.

Special Note:

SI can participate in this tender who are willing to deliver full solution back to back.
OEM can also participate with their part mentioned in the EOI directly with ITI
Optical Fiber Cable and HDPE Pipe supply scope will be with ITI Only

Please Note

The business associate submitting the bid against this EoI/RFP/Tender must not have an alliance with other bidders / competitors of ITI for the same business opportunity. The bidder if selected as vendor/SI will not be allowed to address the opportunity directly/ extend the help to any other competitor of ITI Limited for the subject project.

Evaluation Methodology:

1. This EoI/RFP/Tender would be subjected to a Single Stage (Technical "including budgetary commercial") Evaluation Process. All the Bidders are requested to note the entire evaluation process carefully.

2. Prior to the detailed evaluation, ITI will determine the substantial responsiveness of each Bid to the EoI/RFP/Tender Document. For the purpose of ascertaining the eligibility,

3. A substantially responsive bid is one which confirms to all the terms and conditions of the EoI/RFP/Tender Document without deviations.

4. The purchaser's determination of bid's responsiveness shall be based on the contents of the bid itself without recourse to extrinsic evidence.

5. ITI may waive any minor infirmity or non-conformity or irregularity in the bid which doesn't constitute a material deviation, provided such waiver doesn't prejudice or effect the relative ranking of any bidder. The bids submitted by the Bidders would be subjected to a well-defined and transparent evaluation process.

6. The Bids would be evaluated by a duly constituted Committee of ITI Limited, whose decision would be generally taken as final, unless the aggrieved party establishes any Prima facie errors in the findings of the Committee. In such a situation, he may file a representation within 3 working days of receipt of decision from ITI Limited, duly listing the reasons / grounds. Such a representation would be considered at Senior Management Level of the Tendering Authority, whose decision would be final and binding on all the bidders.

Documents to be submitted along with the "Technical Bid":

The Bidder/System Integrator (SI) must submit the following documents along with their Technical Bid:

1. Bid covering Letter on the Letter-Head of the Bidder Company indicating Name and Address of the Authorized Signatory (with Contact telephone numbers and email ID) as per Annexure-A.
2. Bidder's Profile as per Annexure-B.
3. Proof of Empanelment (If empaneled) with ITI.
4. Power of Attorney authorizing the bidder to submit the Bid/EoI on behalf of the Bidder/Consortium.
5. Tender-Document Cost of required amount.
6. Bid Security (EMD) of required amount.
7. Copy of PAN Card.
8. GST Registration Certificate.
9. Turnover Certificate(s)/Audited Balance-sheet(s) & Profit-Loss Account(s) of the Bidder /All consortium members for last three years.
10. Declaration on the Letter-Head of the Bidder Company for Non-Black Listing as per Annexure-C.
11. Declaration / Undertaking on the Letter-Head of the Bidder Company as per Annexure-D.
12. Compliance Statement of '**Eligibility Criteria of the Bidder'** along with supporting documents (credentials, experience certificates, declarations & others)
13. Integrity Pact /Non-Disclosure Agreement as per
14. Tender Documents duly signed & accepted by the bidder
15. All MAF and other technical documents should be submitted by vendor along with technical bid
16. Annexure K

In case, the bidders do not submit any of the above mentioned papers/information along with Expression of Interest, his bid will be rejected and bid will not be considered for further evaluation.

Documents to be submitted along with the "Budgetary Commercial Bid":

The Bidder/System Integrator (SI) must submit the following documents along with their budgetary Commercial Bid:

1. Price Bid as per EoI/RFP/Tender Document should be uploaded along with technical bid. No other separate commercial will be accepted.

Brief Scope of Work:

Important Parameters.

Operational Requirements. Considering the prevalent security environment and the sensitivity as well as cost and importance of ammunition held at Ammunition Depots, there is an inescapable requirement to modernise Security and FF Systems on priority at 20 locations.

Locations. The locations where the Upgradation of Security and Fire Fighting Infrastructure is proposed will be communicated by the user (MoD/ DGOS) during the RFP Stage. The places where the Security and Fire Fighting Infrastructure is proposed to be upgraded occupy varying area which is enumerated below:-

Location	Approx Area (In acres)
Place-1	686
Place-2	620
Place-3	491
Place-4	1407
Place-5	502
Place-6	560
Place-7	522
Place-8	879
Place-9	856
Place-10	1500
Place-11	2016
Place-12	2211
Place-13	62.39
Place-14	45
Place-15	1728
Place-16	1235
Place-17	1466.162
Place-18	1340
Place-19	2196.28
Place-20	70
Total	20392.832

Technical Requirements. The technical specifications of the proposed equipment/systems reqd for upgradation is attached at Appendix 'C'. Eqpt which is reqd to be installed and offered by the vendor must be of same or higher technical specifications as suggested in Appendix 'C'. The eqpt offered with lower technical specifications will not be accepted. A summary of equipment required to be installed for the project is as under: -

(a) Scope of the Work.

(i) **Intrusion Detection and Surveillance System.** Thermal cameras of different specification are proposed to be installed along the perimeter on poles to capture the presence of intruder. The cameras should be connected through buried cable sensor which is to be connected to display at central location. The thermal cameras on intrusion should trigger the alarms in central location and focus the PTZ Cameras and perimeter lighting on the intrusion site.

(ii) **Access Control System (Locking System).** Each location should have a workstation to keep record of the guard/patrolling parties patrolling the perimeter to record their presence at each designated check point. The data collected should be fed to the workstation. It should record the time of reaching the check point and also the interval between the check points. Check points may consists of magnetic strips, RFIDs, NFC or

optical barcodes. Its main features should be as under:-

(aa) Secure login via a control key and a PIN code.

(ab) Supports remote programming device management.(ac)

Manages and creates:-

(ai) Access permissions.

(aii) Audit trails — including activities from remote devices.(aiii)

Time-based authorization.

(aiv) Recurring validation.(av)

Reports.

(ad) Enables system grouping into manageable domains.

(ae) Allows remote key programming.(af)

Key and personnel management.

(iii) Quick Reaction Capability. A Safety and security vehicle that increases the response capabilities as a mobile operational unit is proposed. This Vehfitted with GPS, Portable Video camera, Siren with PA system, Radio communication and fog light & flash light will provide a "look-up and see" capability to cover wide area of security operation. The flexible modular architecture of the system installed will enable progressive system growth with connectivity to command & control center. The Quick Reaction vehicle will be a fully customizable all-terrain vehicle unit with rapid deployment capability in all weather conditions**.**

(iv) **Fire Fighting System (Remote Control Monitor).** Main objective ofRemote Water Cannon spraying system is to fight fire with water and foam application by remote cannons, handheld nozzles in case of fires in shed areas, surrounding areas including grass fires etc. The water cannon needs to be connected with existing Static Water Tank (SWT) through Fire Water Hydrant Line. Remote Control Monitor system should consist of Water Cannon, Monitor assy with motor, proximity sensors, junction box and panel for it to be operated remotely.

(v) **Fire Detection System for WP Shed**. Flame detectors (IR and UV type of detectors) ammunition is proposed. They are required to detectthe fire in early stage and should trigger alarm in time which

be suppressed by Remote Control Monitors installed near by the ammunition sheds.

(vi) **Communication System.** The broad purpose for providing Communication System is to upgrade existing communication facility and propose an efficient communication system with redundancy in terms of line communication to effectively control the suggested Security and Fire Safety system. The system is proposed to include the following:-

(aa) Radio sets for all guard posts.

(ab) Line communication for all guard posts.(ac) IP based PA System.

(ad) Line Exchange 200 Line.

(ae) Radio Interoperability System.

(vii) **Integrated Command & Control Centre.** The Integrated Command andControl Center is required to receive input from different sources (field devices like ultra HD fixed camera, outdoor PTZ cameras, perimeter thermal cameras, internal thermal PTZ cameras, RCM etc.) installed in the Ammunition Depot. Feeds from these sources needs to be assimilated, analyzed and visualized over single platform resulting in aggregated depot level information, thus providing integrated single view to operators and stakeholders. This aggregated depot level information needs also to be transmitted to relevant stakeholders for appropriate responses and information.

(viii) **Power Backup for Depot.** DG set are required to be installed in the depots for catering the emergency power, as for the security related requirements alternate power backup system is required. Adequate rating UPS power system and DG Set is required in each depot for power backup.

(ix) **Video Management System (VMS).** The system brings together physical security infrastructure and operations by using the IP network as theplatform for managing the entire surveillance system. End users need to be provided with rapid access to relevant information for analysis.

(b) **Indigenization**. The Vendor is required to state whether the equipmentis available in Indian market and the level of Indigenization. If the equipment isproduced Indigenously the method of verification of indigenous content is alsorequired to be specified. The Firms ability to design, develop, manufacture andintegrate should also be specified. Holding of Industrial License for the production of the equipment and the Indian origin of sub parts is mandatoryrequirement.Vendors are also requested to give comments with respect to effortsmade for indigenization of the equipment asked for in Para 1 of Annexure I toAppendix 'B' of the EoI.

(c) **Proof of Concept (PoC)**. Proof of Concept (PoC) as part of Technical Evaluation will be carried out in 01 X location. Commercial Bids of only those

Vendors will be opened who qualify during the PoC. During the PoC, the evaluation committee reserves the right to verify any technical/functional compliance requested in the tender.

(d) **Functionality of equipment in all Terrain.** The Vendor is also required to confirm the suitability of equipment in various types of terrain i.e. deserts, plains,mountainous and high altitude areas. The equipment is also required to be certified by accredited laboratory.

(e) Alternative Equipment. The best available equipment must be installed at each location as per the technical specifications attached at Appendix 'C'. The Vendor is required to provide approximate cost of each equipment being recommended for installation. The Vendor will ensure that all working components are fully compliant with the technical specifications and contract conditions. If any equipment or component is not available as per Technical Specifications given in Appx C, then alternative equipment with better Technical Specifications must be provided. The eqpt offered with lower Technical Specifications will not be accepted.

(k) Manpower Deployment Plan.

(i) Manpower During Implementation Phase.

S.No	Position	Quantity/ Nos	Location	Minimum Qualification
(aa)	Project Director	1	Central location	As Specified in DPR
(ab)	Project Manager	1	Central location	-do-
(ac)	Solution Architect	1	Central location	-do-
(ad)	Technical Lead	2	For two critical locations (one at each site)	-do-
(ae)	Master Trainer	1	Central location	-do-
(af)	Project Engineer	20	One at each site	-do-

(ii) Manpower During Warranty & AMC phase.

S.No	Position	Quantity/ Nos	Location	Minimum Qualification
(aa)	Project Director	1	Central location	As Specified in DPR
(ab)	Project Manager	1	Central location	-do-
(ac)	Surveillance and			

Security Expert	1	Central location	-do-	
(ad)	Datacenter Expert	1	Central location	-do-
(ae)	Master Trainer	2	For two critical locations (one at each site)	-do-
(af)	Resident Engineer	20	One at each site	-do-

(l) Temperature Range. The equipment must be able to operate in the environment conditions as specified below without any deterioration in reliability or condition of the equipment:-

(i) Operating Temperature.

(aa) Minimum Range. Minus 15 to minus 5 (ab) Maximum Range. Between 40 to 45 Temparature is in Degree Centrigrate

(a) Vendors would be bound to provide product support for time period specifiedin the RFP, which includes spares and maintenance tools/ jigs/ fixtures for field and component level repairs.

(Bid Covering Letter / Annexure-A)

To
ITI Limited, MSP-
Delhi
Rohit House, 3
Tolstoy Marg New
Delhi- 110001

Subject: Bid Covering Letter against Expression of Interest (EoI) for Upgradation of Security and Fire Fighting Infrastructure in 16 X Ammunition Depots

Ref: Tender no. …… dated …….

Dear Sir,

Having examined the EoI/RFP/Tender document, we hereby submit our bid for the subject requirement which has emerged from some Government body to implement the above captioned project.

We confirm that the information contained in this response or any part thereof, including its exhibits, and other documents and instruments delivered or to be delivered to ITI Limited is true, accurate, verifiable and complete. This response includes all information necessary to ensure that the statements therein do not in whole or in part mislead the Buyer in its short-listing process.

We fully understand and agree to comply that on verification, if any of the information provided here is found to be misleading the short-listing process, we are liable to be dismissed from the selection process or termination of the agreement during the project, if selected to do so.

We agree for unconditional acceptance of all the terms and conditions set out in the EoI/RFP/Tender document including annexures and corrigendum if any and also agree to abide by this tender response for a period of 6 months from the date fixed for bid opening.

We hereby declare that in case the agreement is awarded to us, we shall submit the Performance Guarantee in the form of bank guarantee in the format to be provided by ITI Limited.

We agree that ITI Limited is not bound to accept any tender response that they may receive. We also agree that ITI Limited reserves the right in absolute sense to reject all or any of the services specified in the tender response.

It is hereby confirmed that I/We are entitled to act on behalf of our company/ corporation/ firm/ organization and empowered to sign this document as well as such other documents, which may be required in this connection.

We understand that it will be the responsibility of our organization to keep ITI Limited informed of any changes in respect of authorized person and we fully understand that ITI Limited shall not be responsible for non-receipt or non-delivery of any communication and/or any missing communication in the event reasonable prior notice of any change in the authorized person of the company is not provided to ITI Limited.

Dated this Day of **2021**

Authorized Signatory

Name:
Designation:
(Company Seal)
Note: To be submitted in Company Letterhead

(Annexure-B)

Bidder's Profile

1.	Name and address of the company			
2.	Contact Details of the Bidder (Contact person name with Designation, Telephone Number, FAX, E- mail and Web site)			
3.	Area of Business			
4.	Annual Turnover in last 3 financial years (Rs in Crore)	2018-19	2019-20	2020-21
5.	IT Turnover in last 3 financial years (Rs in Crore)	2018-19	2019-20	2020-21
6.	Profit / Loss in last 3 financial years (Rs in Crore)	2018-19	2019-20	2020-21
7.	Net-worth in last 3 financial years (Rs in Crore)	2018-19	2019-20	2020-21
8.	Date of Incorporation			
9.	GST Registration number			
10.	PAN Number			
11.	CIN Number, if applicable			
12.	Number of technical manpower in company's rolls			

Dated this Day of **2021**

Authorized Signatory

Name:
Designation:
(Company Seal)
Note: To be submitted in Company Letterhead

(Annexure-C)

To
ITI Limited, MSP-
Delhi
Rohit House, 3
Tolstoy Marg New
Delhi- 110001

Subject: Undertaking towards Non-Black Listing of our firm by any Govt. Body

Dear Sir,

We hereby declare that we have not been BLACK LISTED by any Govt. department/ PSU (State or Central)/ Autonomous Institution against our performance obligation in India and there has been no litigation with any government department on account of similar services for the last 5 years.

This declaration is being submitted as per the requirement of your EoI/RFP/Tender.

Dated this Day of **2021**

Authorized Signatory

Name:
Designation:
(Company Seal)
Note: To be submitted in+ Company Letterhead

(Declarations / Annexure-D)

To
ITI Limited, MSP-
Delhi
Rohit House, 3
Tolstoy Marg New
Delhi- 110001

Subject: Declarations against Expression of Interest (EoI) for Upgradation of Security and Fire Fighting Infrastructure in 16 X Ammunition Depots
Tender no. ……... dated ……

Dear Sir,

We hereby declare / undertake the following.

We hereby declare that we will work with ITI as per EOI/RFP/Tender terms and conditions of ITI as well as end customer including warranty & post-warranty services and implementation of the project in the event of ITI winning the contract on back-to-back basis.

We hereby declare that we will submit the Tender Fee & EMD (while submitting the bid to the end customer in the form of Bank Guarantee / Demand Draft / Online Payment from any Nationalized / Scheduled Bank) & Performance Bank Guarantee to end customer or ITI (as decided by ITI) as per EoI/RFP/Tender terms & conditions. We also undertake that we will provide EMD & PBG to ITI as per the end-customer's EoI/RFP/Tender terms even if ITI is exempted to submit the same to end- customer because of its PSU status.

We hereby declare that we have 'No Objection/ No Claim/ No Compensation' from ITI Limited if this EoI/RFP/Tender is cancelled at any stage of evaluation process by ITI or the main EoI/RFP/Tender is cancelled by the end customer.

We hereby undertake that we will be equipped with the required manpower with qualifications, certifications and experience as required in the end customer's EoI/RFP/Tender.

We hereby undertake that we will be able to give the proposed solution as required in the end customer's EoI/RFP/Tender.

We hereby undertake that we will arrange required certificate & support (warranty & post-warranty/maintenance) in the name of ITI Limited from the OEM as per end customer's requirement.

We hereby undertake that we will obtain relevant statutory licenses for operational activities.

We hereby undertake that we will sign Consortium Agreement /Teaming Agreement / Integrity Pact with ITI for addressing the end customer's EoI/RFP/Tender if required.

We indemnify ITI Limited from any claims / penalties / statuary charges / liquidated damages / legal expenses if any etc. as charged by the end customer.

We hereby undertake to make arrangement for signing of agreement between OEM and ITI as per end customer's EoI/RFP/Tender requirements.

We hereby undertake that the OEMs who meet the eligibility and other conditions as per end customer's EoI/RFP/Tender requirement will be finalized by us and produce the required eligibility documents and other related documents of the OEM for final bid submission.

We hereby agree to take the responsibilities covered in the agreement (on back-to-back basis) to be signed between ITI & OEM (if required) as per end customer's EoI/RFP/Tender terms&conditions.

We hereby declare to supply equipment/components which are brand new, first hand and contain no previously used, recycled or refurbished components.

We hereby declare not to partner with any other organization for addressing this EoI/RFP/Tender.

We hereby declare to accept payment terms on back-to-back basis. Penalties, if any, will be borne by us.

We hereby declare to provide Bank Guarantee (110% of value for the period till the advance is settled) for getting the advance payment if any on back-to-back basis.

We hereby agree that ITI may take any punitive action as deemed fit, including forfeiture of EMD / Security submitted by us, if it is found that any of the documents / information provided by us (to meet the tender requirement including eligibility) is wrong/ forged/ misleading at any stage of tender processing / evaluation. The decision of ITI regarding forfeiture of the EMD shall be final and shall not be called upon question under any circumstances

Dated this Day of **2021**

Authorized Signatory

Name:
Designation:
(Company Seal)
Note: To be submitted in Company Letterhead

(Annexure-E)

Compliance Statement of Eligibility Criteria

Ref: Tender no. ……..……. dated ……..

Sl. No.	Clause No.	Clause	Compliance (Complied/Not Complied)	Remarks with Documentary Reference

Dated this Day of **2021**

Authorized Signatory

Name:
Designation:
(Company Seal)

(Annexure-G)

INTEGRITY PACT

PURCHASE ORDER No.

THIS Integrity Pact is made on……day of …….21 .

BETWEEN:

ITI Limited having its Registered & Corporate Office at ITI Bhavan, Dooravaninagar, Bangalore – 560 016 and established under the Ministry of Communications, Government of India (hereinafter called the Principal), which term shall unless excluded by or is repugnant to the context, be deemed to include its Chairman & Managing Director, Directors, Officers or any of them specified by the Chairman & Managing Director in this behalf and shall also include its successors and assigns) ON THE ONE PART

AND:

…….. represented by .....Chief Executive Officer (hereinafter called the Contractor(s), which term shall unless excluded by or is repugnant to the context be deemed to include its heirs, representatives, successors and assigns of the contractor ON THE SECOND PART.

Preamble

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

In order to achieve these goals, the Principal has appointed an Independent External Monitor (IEM), who will **monitor** the tender process and the execution of the contract for compliance with the principles as mentioned herein this agreement.

WHEREAS, to meet the purpose aforesaid, both the parties have agreed to enter into this Integrity Pact the terms and conditions of which shall also be read as integral part and parcel of the Tender Documents and contract between the parties.

NOW THEREFORE, IN CONSIDERATION OF MUTUAL COVENANTS STIPULATED IN THIS PACT THE PARTIES HEREBY AGREE AS FOLLOWS AND THIS PACT WITHNESSETH AS UNDER:

SECTION 1 – COMMITMENTS OF THE PRINCIPAL

1.1 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 the contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the personal 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 tender process or the contract execution.

c. The Principal will exclude from the process all known prejudiced persons.

1.2 If the Principal obtains information on the conduct of any of its employee, which is a criminal offence under IPC/PC Actor if there be a substantive suspicion in this regard, the Principal will inform the Chief Vigilance Officer and in addition can initiate disciplinary action as per its internal laid down Rules/ Regulations.

SECTION 2 – COMMITMENTS OF THE BIDDER/CONTRACTOR

2.1 The Contractor(s) commits himself to take all measures necessary to prevent corruption. He commits himself observe the following principles during the participation in the tender process and during the execution of the contract.

a. The contractor(s) will not, directly or through any other person 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 of any kind whatsoever during the tender process or during the execution of the contract.

b. The contractor(s) will not enter with other contractors 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 contractor(s) will not commit any offence under IPC/PC Act, further the contractor(s) will not use improperly, for purposes of competition of personal

gain, or pass onto 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 Contractor(s) of foreign original 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.

e. The Contractor(s) will, when presenting the bid, disclose any and all payments made, are committed to or intend to make to agents, brokers or any other intermediaries in connection with the award of the contract.

f. The Contractor(s) will not bring any outside influence and Govt bodies directly or indirectly on the bidding process in furtherance to his bid.

g. The Contractor(s) will not instigate third persons to commit offences outlined above or to be an accessory to such offences.

SECTION 3 – DISQUALIFICATION FROM TENDER PROCESS & EXCLUSION FROM FUTURE CONTRACTS

3.1 If the Contractor(s), during tender process or before the award of the contract or during execution has committed a transgression in 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 Contractor(s) from the tender process.

3.2 If the Contractor(s), has committed a transgression through a violation of Section 2 of the above, such as to put his reliability or credibility into question, the Principal shall be entitled exclude including blacklisting for future contract award process. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the Principal taking into consideration the full facts and circumstances of each case, particularly taking into account the number of transgression, the position of the transgressor within the company hierarchy of the Contractor(s) and the amount of the damage. The exclusion will be imposed for a period of minimum one year.

3.3 The Contractor(s) with its free consent and without any influence agrees and undertakes to respect and uphold the Principal's absolute right to resort to and impose such exclusion and further accepts and undertakes not to challenge or question such exclusion on any ground including the lack of any hearing before the decision to resort to such exclusion is taken. The undertaking is given freely and after obtaining independent legal advice.

3.4 A transgression is considered to have occurred if the Principal after due consideration of the available evidence concludes that on the basis of facts available there are no material doubts.

3.5 The decision of the Principal to the effect that breach of the provisions of this Integrity Pact has been committed by the Bidder(s)/ Contractor(s) shall be final and binding on the Bidder(s)/ Contractor(s), however the Bidder(s)/ Contractor(s) can approach IEM(s) appointed for the purpose of this Pact.

3.6 On occurrence of any sanctions/ disqualifications etc arising out from violation of integrity pact Bidder(s)/ Contractor(s) shall not entitled for any compensation on this account.

3.7 subject to full satisfaction of the Principal, the exclusion of the Contractor(s) could be revoked by the Principal if the Contractor(s) can prove that he has restored/ recouped the damage caused by him and has installed a suitable corruption preventative system in his organization.

SECTION 4 – PREVIOUS TRANSGRESSION

4.1 The Contractor(s) declares that no previous transgression occurred in the last 3 years immediately before signing of this Integrity Pact with any other company in any country conforming to the anti-corruption/ transparency International (TI) approach or with any other Public Sector Enterprises/ Undertaking in India of any Government Department in India that could justify his exclusion from the tender process.

4.2 If the Contractor(s) makes incorrect statement on this subject, he can be disqualified from the tender process or action for his exclusion can be taken as mentioned under Section-3 of the above for transgressions of Section-2 of the above and shall be liable for compensation for damages as per Section- 5 of this Pact.

SECTION 5 – COMPENSATION FOR DAMAGE

5.1 If the Principal has disqualified the Bidder(s)/Contractor(s) from the tender process prior to the award according to Section 3 the Principal is entitled to forfeit the Earnest Money Deposit/Bid Security/ or demand and recover the damages equitant to Earnest Money Deposit/Bid Security apart from any other legal that may have accrued to the Principal.

5.2 In addition to 5.1 above the Principal shall be entitled to take recourse to the relevant provision of the contract related to termination of Contract due to Contractor default. In such case, the Principal shall be entitled to forfeit the Performance Bank Guarantee of the Contractor or demand and recover liquidate and all damages as per the provisions of the contract agreement against termination.

SECTION 6 – EQUAL TREATMENT OF ALL BIDDERS/CONTRACTORS

6.1 The Principal will enter into Integrity Pact on all identical terms with all bidders and contractors for identical cases.

6.2 The Bidder(s)/Contractor(s) undertakes to get this Pact signed by its sub- contractor(s)/sub-vendor(s)/associate(s), if any, and to submit the same to the Principal along with the tender document/contract before signing the contract. The Bidder(s)/Contractor(s) shall be responsible for any violation(s) of the provisions laid down in the Integrity Pact Agreement by any of its sub-contractors/sub- vendors/associates.

6.3 The Principal will disqualify from the tender process all bidders who do not sign this Integrity Pact or violate its provisions.

SECTION 7 – CRIMINAL CHARGES AGAINST VIOLATING BIDDER(S)/ CONTRACTOR(S)

7.1 If the Principal receives any information of conduct of a Contractor(s) or sub- contractor/sub-vendor/associates of the Contractor(s) which constitutes corruption or if the Principal has substantive suspicion in this regard, the Principal will inform the same to the Chief Vigilance Officer of the Principal for appropriate action.

SECTION 8 – INDEPENDENT EXTERNAL MONITOR(S)

8.1 The Principal appoints competent and credible Independent External Monitor(s) for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extend the parties comply with the obligations under this pact.

8.2 The Monitor is not subject to any instructions by the representatives of the parties and performs his functions neutrally and independently. He will report to the Chairman and Managing Director of the Principal.

8.3 The Contractor(s) accepts that the Monitor has the right to access without restriction to all product documentation of the Principal including that provided by the Contractor(s). The Bidder(s)/Contractor(s) will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The Monitor is under contractual obligation to treat the information and documents Contractor(s) with confidentiality.

8 .4 The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the project provided such meeting could have an impact on the contractual relations between the Principal and the Contractor(s). 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 specific manner, refrain from action or tolerate action.

8.5 The Monitor will submit a written report to the Chairman & Managing Director of the Principal within a reasonable time from the date of reference or intimation to him by the principal and, should the occasion arise, submit proposals for correcting problematic situations.

8.6 If the Monitor has reported to the Chairman & Managing Director of the Principal a substantiated suspicion of an offence under relevant IPC/PC Act, and the Chairman & Managing Director of the Principal 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.

8.7 The word **'Monitor'** would include both singular and plural.

Any changes to the same as required / desired by statutory authorities is applicable.

SECTION 9 – FACILITATION OF INVESTIGATION

9.1 In case of any allegation of violation of any provisions of this Pact or payment of commission, the Principal or its agencies shall be entitled to examine all the documents including the Books of Accounts of the Bidder(s)/Contractor(s) and the Bidder(s)/Contractor(s) shall provide necessary information and documents in English and shall extend all help to the Principal for the purpose of verification of the documents.

SECTION 10 – LAW AND JURISDICTION

10.1 The Pact is subject to the Law as applicable in Indian Territory. The place of performance and jurisdiction shall the seat of the Principal.

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

SECTION 11 – PACT DURATION

11.1 This Pact begins when both the parties have legally signed it. It expires after 12 months on completion of the warranty/guarantee period of the project / work awarded, to the fullest satisfaction of the Principal.

11.2 If the Contractor(s) is unsuccessful, the Pact will automatically become invalid after three months on evidence of failure on the part of the Contractor(s).

11.3 If any claim is lodged/made during the validity of the Pact, the same shall be binding and continue to be valid despite the lapse of the Pact unless it is discharged/determined by the Chairman and Managing Director of the Principal.

SECTION 12 – OTHER PROVISIONS

12.1 This pact is subject to Indian Law, place of performance and jurisdiction is the Registered & Corporate Office of the Principal at Bengaluru.

12.2 Changes and supplements as well as termination notices need to be made in writing by both the parties. Side agreements have not been made.

12.3 If the Contractor(s) or a partnership, the pact must be signed by all consortium members and partners.

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

12.5 Any disputes/ difference arising between the parties with regard to term of this Pact, any action taken by the Principal in accordance with this Pact or interpretation thereof shall not be subject to any Arbitration.

12.5 The action stipulates in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

In witness whereof the parties have signed and executed this Pact at the place and date first done mentioned in the presence of the witnesses:

For PRINCIPAL For CONTRACTOR(S)

…… ……

(Name & Designation) (Name & Designation)

Witness Witness

1) ……1)……

1.	**Indigenous Content/ Production**. (a) Are the equipments (as per appendix 'C' of this EoI) available in Indian market? What is the level of indigenization, maintenance support and life time support? (b) Can the equipment /platform be produced indigenously by the Indian Industry? If yes, what will be the Indigenous Content provided & verification process? Is the equipment indigenously designed and developed (IDDM)? (c) What are the critical technologies which the industry has taken from theirglobal partners or Joint Venture, if any? Or what are the essential critical technologies which are required to be obtained? (d) If you have a startup/Joint venture, then how much time will the startup / Joint Venture take to start production? (e) Does the Indian Industry have the capability to design, develop, manufacture, test and integrate the system including the critical technology? (f) If there is no Joint venture, does the OEM/Vendor/Integrator (Buy Global) plans to have any Indian Manufacturer as its Partner? If No, is the OEM willing to enter into Joint Venture with Indian Defence Industry/ DPSU? (g) Is the OEM willing to offer licensed production in India? (h) What are the enhanced parameters/specifications that can be provided? (j) Do you have Industrial Licences for the production of the equipment? If not, have you applied for the same and when (date) and by which it is likely to be granted? (k) How many sub Vendors are involved in the manufacturing of product? Isproduct support from all sub Vendors also assured for the same period, as committed by you? (l) Can you provide Indian origin batteries, tyres & tubes, bulbs and other such items/accessories with your equipment, where applicable? (m) What is your firm's annual production capacity? Is it likely to increase? (n) How much time is reqd to deliver the eqpt post contract for operational use with the stipulated indigenous content? (o) What is the suitability of platform for dply in various types of terrain in India? Specify separately for deserts, plains, mountains, High Altitude Area. (p) What is the minimum time period for the Vendor to deposit the eqpt for Proof of Concept post submission of Bids? (q) Which US Military Standards are being conformed to by the eqpt produced by the OEM/Vendor/Integrator? Or which standards does your equipment conform to?	

S No	**Specification/Parameter**	**Reply**

(r) Which Joint Service Specifications (JSS)/ Joint Service Guidelines (JSG) are being conformed to by the eqpt produced by the OEM/Vendor/Integrator?

(s) Which accredited laboratory (Indian/ International) has certified your equipment?

(t) Will your firm be able to offer sectionised/ Cut Models, 3D model CDs for training?

(u) What is your preferred mode of shipment of goods _ rail, road, sea or air or a combination?

(v) Is the Applicant Entity an Indian Company as defined under the Companies Act 2013?

(w) Has the Applicant Entity or any of its allied entities ever been banned or suspended by MoD/SHQ or any Government Department or Organization?Details of vigilance action viz ongoing investigations by any Department/ agency of Central Government may be provided.

(x) Is the Applicant Entity a Manufacturing Entity or System Integrator or a Trading Company?

(y) Does the Company has any previous experience/ expertise in this field? Specify the field of expertise/ experience of your company and duration of experience in years.

Product Support.

Will your firm be able to provide a Service Life of 08 years for allequipment and services? If not, then provide the Service Life of each equipmentseparately.

Will your firm be able to provide Comprehensive Maintenance Contract for 05 years post 03 years Warranty. If not, then what kind of 'Product Support' will you ensure? What will be the 'Time Period'?

What is the period for which you commit the product support for sustenance of equipment in terms of supply of spares / CMC etc?

What is the expected life of your equipment and main sub-assemblies in terms of usage?

Have you supplied the equipment to any other company? If yes, furnish details of quantity supplied to the country and year of supply?

Does the company have major repair and overhaul facility for major assemblies and component level repair?

What kind of 'Engineering Support Package' will you be offering?

Will your firm be able to provide 03 years Warranty? If not, then what is the warranty period offered for each equipment?

What life time support can be provided by the Vendor?

Does the equipment have capability of backing up data? What allredundancies are provided for the same?

Will your firm provide Interactive Electronic Training manuals (IETMs) aspart of technical literature? If yes which class?

Will the engineering support package be provided exclusively by yourfirm or will it

	be outsourced through sub Vendors? What are the facilities available at OEM/ Vendor/ Integrator premises toconduct training? How will you assist in carrying out training for user? Will your firm provide soft copies of the 'User Hand book' and othermanuals including Technical Manuals along with the CBT for training? Which INCOTERMS 2010 are suitable/ preferred by your company andfor what reasons?	
3.	**Budgetary Estimate**. (Exclusive of all taxes) (a) Approx basic cost of the all equipments as per appendix 'C'of this EoI? (b) Complete cost of project implementation. (c) Rate/Cost (Per year) at which CMC will be provided on completion of warranty period. (d) Estimated Cost per equipment including cost of Product Support Package and training cost? (e) Details of Taxes as applicable to be provided.	
4.	**Vendor Certification**. Vendor needs to provide Vendor Certification for all parameters which have not been validated during Proof of Concept (PoC)/ Trials. If not, Vendor needs to satisfy giving reasons for it.	
5.	**Company Profile**. (a) Specify the turnover and net worth of Company in the last three (03)years. (b) Is the company under insolvency resolution as per Indian BankruptcyCode? (c) What is the Credit Rating of the Company equivalent to CRISIL rating? (d) Does the Company qualify under Start up or MSME Category?	

2.	**<u>Product Support</u>**. (a) Will your firm be able to provide a Service Life of 08 years for allequipment and services? If not, then provide the Service Life of each equipmentseparately. (b) Will your firm be able to provide Comprehensive Maintenance Contract for 05 years post 03 years Warranty. If not, then what kind of 'Product Support' will you ensure? What will be the 'Time Period'? (c) What is the period for which you commit the product support for sustenance of equipment in terms of supply of spares / CMC etc? (d) What is the expected life of your equipment and main sub-assemblies in terms of usage? (e) Have you supplied the equipment to any other company? If yes, furnish details of quantity supplied to the country and year of supply? (f) Does the company have major repair and overhaul facility for major assemblies and component level repair? (g) What kind of 'Engineering Support Package' will you be offering? (h) Will your firm be able to provide 03 years Warranty? If not, then what is the warranty period offered for each equipment? (j) What life time support can be provided by the Vendor?	

(Needs to be uploaded with technical bid on letter head) Annexure I (Financial Bid)

LIST Of EQUIPMENT PROPOSED FOR INSTALLATION

Ser No	Equipment Description	A/U	Total Qty	Unit Cost	GST Rate	Total Basic Cost	Total GST	Total Cost including Taxes
1	**Surveillance IP System**							
	13MM Thermal Camera	Nos	592					
	19MM Thermal Camera	Nos	294					
	35MM Thermal Camera	Nos	134					
	60MM Thermal Camera	Nos	292					
	IP ultra HD Camera with IP 66 outdoor Housing	Nos	604					
	IP Outdoor PTZ Camera 1080 P(CCD/ CMOS, 30x, IP 66)	Nos	875					
	Supply installation, testing and commissioning of Joystick for PTZ controlling	Nos	61					
	Supply, installation, testing and commissioning of Operator Workstation	Nos	82					
	Supply, installation, testing and commissioning 65" Industrial Grade LED Screens with Controller & Software	Nos	115					
	Supply, installation, testing and commissioning of Video Management Solution (VMS) with all licenses	Nos	20					

	required to support the cameras							
	Recording and management Servers	Lot	20					
	6m pole with bracket for mounting outdoor cameras (and associated civil and cabling/conduiting work) with IP 66 Junction Box	Nos	2,414					
2	**Lighting System**							
	Pole	Nos	2,817					
	LED Unit with communication Unit	Nos	6,144					
	Central Control Unit	set	20					
3	**PA System**							
	Speakers with Amp	Nos	1,031					
	Command & Control Software	Nos	20					
4	**Cabling (Measure and Pay)**							
	Cat 6 cable @ 75 m/camera	mtrs	2,31,900					
	Fiber Cable	mtrs	3,97,300					
	Junction Box	Nos	5,331					
	PA System Cable	mtrs	1,00,000					
	Power Cable 25 Sqmm	mtrs	3,07,300					
	Power Distribution Cable 2 sq mm	mtrs	3,68,760					
	HDPE Conduit	mtrs	6,76,060					
	MS Conduit 20/25 mm	mtrs	2,31,900					
5	**Security Network**							
	Chassis Layer 3 Core fiber switch as per specification	Nos	40					
	Firewall	Nos.	40					
	8 (10/100) port industrial Distribution switch with Jack Panel	Nos	3,517					

	24 (10/100) Port with 2 SFP Switch with Jack Panel	Nos	40					
	SFP Modules SFP+ transceiver module for multimode fiber, commercial operating , temperature range, 32°F to 158°F (10°C to 50°C)	Nos	14,111					
	Supply, installation, testing and commissioning of Other network equipment (Server racks, Connectors etc)	Lot	20					
	CAT-6 I/O Outlet with SMB	Nos	12,369					
	Cat-6 Patch Cords 3 mtrs	Nos	4,023					
	Racks (42u)	Nos	40					
6	**Power**							
	UPS 30+30 KVA dual hot standby	Nos	20					
	UPS 30 KVA for field	Nos	120					
	DG set for power back for all security equipment 200 KVA	Nos	20					
7	**Fire**							
	Fire alarm system for WP shed	Set	20					
	Thermal Camera for depot	Nos	325					
	Remote Control Monitor for Fire Fighting	Nos	645					
8	**Locking System**							
	Guard Tour Management	Nos	456					
	Key	Nos	3880					
	Guard Locks	Nos	5920					
	IP Programmer	Nos	40					
	Transfer key	Nos	100					
	Software	Nos	20					

	Work station for locking system	Nos	20					
9	**Command & Control Centre – C4I**							
	Integration of all sensors for IDS, Access Control, Surveillance, Gate Control, Communication, Fire & Alarm Management etc	set	20					
	QRT Veh with focus light, radio, night vision device	Nos	38					
10	**Communication System with Voice logger**							
	200 Line exchange (Incl exchange & line)	Set	20					
	Radio Interoperability System (Incl radios, phones, computers & video assets	Set	20					
	Radio sets	Nos	1376					
11	**Civil Infrastructure & Allied Services**							
	Gate – redesign and construction to be done	Nos	20					
	C4I control room design & construction design	Nos	20					
12	**Barriers**							
	Crash Barrier	Set	128					
	Gate automation	Set	40					
	Boom barrier	Set	128					

Annexure- J (Check List)

DESCRIPTION	Page No.
Offer Letter	
Vendor Information Proforma	
Company profile	
Request for Information- Questionnaire	
Certificate of Incorporation	
Audited financial statements of last three financial years(2020-21, 2019-20, 2018-19)	
Audited financial statements (2020-21)	
Audited financial statements (2019-20)	
Audited financial statements (2018-19)	
Net worth as on 31st March 2022	
A certificate from CA/CS indicating the financial parameters for the last three years	
Credit Rating (Desirable Financial Parameter).	
Shareholding pattern	
Quality Certificates	
Experince of - Copy of work order and completion certificate	
Compliance to RFI document	
Declaration for Not banned	
Declaration for Not Insolvent	
Declaration - Not wilful Defaulter	
Valid Defence Industrial License	
OEM Technical Proposal & Data Sheet	
Signed RFI document	
Registration Certificate	
Details of any such project implemented with any of the Government agency/establishment	
Compliance with IEEE/ ITU standards depending upon nature/type of project or solution required	
Budgetary Quote	

Annexure- K

1. **Name of the Vendor/Company/Firm**.

_____.

_____.

(Company profile including Share Holding pattern, in brief, to be attached)

2. **Type (Tick the Relevant Category)**. The list to be prepared in tabulated manner forall major equipment. The list of which is placed at Appx 'D'.

(a) Original Equipment Manufacturer (OEM)/Integrator Yes ☐ No ☐

(b) Authorised Vendor/ Integrator of Foreign Firm (attach details, if yes) Yes ☐ No ☐

(c) Other (give specific details)

- -

3. **Contact Details**.

Postal Address :

City :_____. Province :_____.
Country :_____. Pin/Zip Code :_____.
Tele :_____. Fax :_____.
URL/Website :_____.

4. Local Branch/Liaision Office/Authorised Representatives in Delhi (if any).

Name and Address :
City :_____. Province :_____.
Pin/Zip Code :_____.
Tele :_____. Fax :_____.

5. Financial Details.

(a) Category of Industry (Large/Medium/Small scale):_____.
(b) Annual turn over :_____(In INR).
(c) Number of employees in firm_____.
(d) Details of manufacturing infrastructure available:_____.
(e) Earlier Contracts with Indian Ministry of Defence / Government Agencies.

Contract No	Equipment	Quantity	Cost (In Rs)

6. Certification by Quality Assurance Organisation.

Type of Equipment	Name of Agency/ Integrators (Certification obtained from)	Certification	Applicable From (Date & Year)	Valid Till (Date & Year)

7. **Details of Registration**.

Agency	Certificate	Applicable From (Date & Year)	Valid Till (Date & Year)
GeM			
DGQA/DGAQA/DGNAI			
OFB			
DRDO			
Any other Govt Agency			

8. **Membership of FICCI/ASOCHAM/CII or other Industrial Associations**.

Name of Organisation:_____. Membership Number:_____.

9. **Equipment/Product Profile (to be submitted for each product separately)**. The listof equipments being used in the project is at Appx 'D'.

(a) Name of the Product :_____.(IDDM Capability be indicated against the product)
(Should be given category wise for e.g. all products under Night Vision Devices to bementioned together)

(b) Description (attach technical literature):
.

(c) Whether OEM or Integrator:
.

(d) Name and address of Foreign collaborator (if any):
.

(e) Industrial License Number:
.

(f) Indigenous component of the product (in percentage):
.

(g) Status (in service / Design development state):
.

(h) Production capacity per annum:

.

(j) Countries/ agencies where equipment supplied earlier (give details of quantity supplied):

_____.

(k) Estimated price of the equipment:

.

10. Details of any such project implemented with any of the Governmentagency/establishment.

11. Alternatives for meeting the objectives of the equipment set forth in the EoI.

12. Any other Relevant Information :

.

13. **Declaration.** It is certified that the above information is true and any change will beintimated at the earliest.

भारतीय सेना

Table of Contents

Note: Bidder has to propose each product/system meeting all minimum technical/functional requirement given in RFP whereas bidder can also propose the product/system with better technical/functional specifications

INTRUSION DETECTION AND SURVEILLANCE SYSTEM

1. Surveillance IP System

(a) 13mm Thermal Camera

Item	Minimum Requirement Description
Make	
Model	
Sensor Format	Uncooled
Detector Type	VOx Microbolometer
Lens & Angle of view	Lens (>=13&<=18MM) providing <= 36 Degree
Thermal Resolution	640 x 480, 25 Hz
Spectral Band	8-13µ
Frame rate Hz/FPS	Full Frame – 25/30 Hz
Zoom	Up to 4X Digital zoom
Thermal Sensitivity	<50mK f/1.0
Modes	White-Hot & Black-Hot user selectable
Analytics	Built-in or server based analytics & IQ based processing for Human and Vehicle or other classification
Analytics Range	Shall reliably trigger intrusion detections analytics alarm for human at 150m or higher
Output	Analogue BNC and IP RJ45
Streaming	Dual Stream, ONVIF Profile S
Rating	IP-66 and MIL-STD-810F
Power	PoE and 24VAC/DC
Operating temp.	Temp: -20° C to 55°C , Humidity: 90%
Standard	BIS Standard 13252 (Part 1):2010

(b) 19mm Thermal Camera

Item	Minimum Requirement Description
Make	
Model	
Sensor Format	Uncooled
Detector Type	VOx Microbolometer

Lens & Angle of view	Lens (>=19&<=25MM) providing <= 27 Degree
Thermal Resolution	640 x 480, 25 Hz
Zoom	Up to 4X Digital zoom
Spectral Band	8-13μ
Frame rate Hz/FPS	Full Frame – 25/30 Hz
Thermal Sensitivity	<50mK f/1.0
Modes	White-Hot & Black-Hot user selectable
Analytics	Built-in or server based analytics & IQ based processing for Human and Vehicle or other classification
Analytics Range	Shall reliably trigger intrusion detections analytics alarm for human at 250m or higher
Output	Analogue BNC and IP RJ45
Streaming	Dual Stream, ONVIF Profile S
Rating	IP-66 and MIL-STD-810F
Power	PoE and 24VAC/DC
Operating temp.	Temp: -20° C to 55°C , Humidity: 90%
Standard	BIS Standard 13252 (Part 1):2010

(c) 35mm Thermal Camera

Item	Minimum Requirement Description
Make	
Model	
Sensor Format	Uncooled
Detector Type	VOx Microbolometer
Lens & Angle of view	Lens (>=35&<=50 MM) providing <= 18 Degree
Thermal Resolution	640 x 480, 25 Hz
Zoom	Up to 4X Digital zoom
Spectral Band	8-13μ
Frame rate Hz/FPS	Full Frame – 25/30 Hz
Thermal Sensitivity	<50mK f/1.0
Modes	White-Hot & Black-Hot user selectable
Analytics	Built-in or server based analytics & IQ based processing for Human and Vehicle or other classification
Analytics Range	Shall reliably trigger intrusion detections analytics alarm for human at 300m or higher
Output	Analogue BNC and IP RJ45
Streaming	Dual Stream, ONVIF Profile S
Rating	IP-66 and MIL-STD-810F
Power	PoE and 24VAC/DC
Operating temp.	Temp: -20° C to 55°C , Humidity: 90%
Standard	BIS Standard 13252 (Part 1):2010

(d) 60mm Thermal Camera

Item	Minimum Requirement Description
Make	
Model	
Sensor Format	Uncooled
Detector Type	VOx Microbolometer
Lens & Angle of view	Lens (>=60&<=75MM)providing <= 10 Degree
Thermal Resolution	640 x 480, 25 Hz
Zoom	Up to 4X Digital zoom
Spectral Band	8-13µ
Frame rate Hz/FPS	Full Frame – 25/30 Hz
Thermal Sensitivity	<50mK f/1.0
Modes	White-Hot & Black-Hot user selectable
Analytics	Built-in or server based analytics & IQ based processing for Human and Vehicle or other classification
Analytics Range	Shall reliably trigger intrusion detections analytics alarm for human at 550m or higher
Output	Analogue BNC and IP RJ45(Both required)
Streaming	Dual Stream, ONVIF Profile S
Rating	IP-66 with sunshield and MIL-STD-810F
Power	PoE and 24VAC/DC
Operating temp.	Temp: -20° C to 55°C , Humidity: 90%
Standard	BIS Standard 13252 (Part 1):2010

(e) IP Ultra HD Camera with IP 66 Outdoor Housing

Item	Minimum Requirement Description
Make	
Model	
Sensor	1/2.5" or bigger Progressive CMOS Sensor
WDR	High/Low/Medium user configurable
Minimum Illumination	Day 0.5 lux / Night 0.05 lux
Lens	9-50mm varifocal, Auto Iris, Full HD, D/N lens providing 15-40 degree adjustable FOV and detect human at 150m or higher
IR sensitivity	Between 680 to 1100nm IR cut filter
3D Noise reduction	User configurable ON/Off
Tamper Detection	User configurable On/Off
Compression	Dual H.264 streams
Compression Performance	Resolution & FPS Maximum Performance: Stream 1: 3840 x 2160 @ 25FPS and Stream 2: 720 x 576 @ 25FPS on two streams respectively at the same time
Bandwidth	64Kbps to 20Mbps

Motion Detection	Built-In Multi-zone motion detection
Protocols	Unicast, Multicast, RTP, TCP, UDP, HTTP, IGMP, ICMP, DHCP, ONVIF etc. or as per solution requirement to fulfill functional requirement
Connectivity	10/100 Base-T Auto sensing, Half/Full Duplex (RJ45)
Audio	Audio IN and Audio out for two way audio communication using suitable external microphones and speakers
SD Card Support	Built in Micro SD card slot to support up to 32GB storage for local recording. SD Card will be supplied by system Integrator
Alarm I/O	At least one potential free Alarm IN and one Alarm out
Power	Power : 802.3af class 3 PoE and 12VDC/24VAC auto sensing
Enclosure	Vandal resistant enclosure with IP66 rated, built in Heater and Blower, Sun shield.
Mounting	Wall, Pole as required
Operating conditions	Temp: -20° C to 50°C , Humidity: 90%
Standard	BIS Standard 13252 (Part 1):2010

(f) IP outdoor PTZ Camera 1080P (CCD/CMOS, 30x IP 66)

Item	Minimum Requirement Description
Make	
Model	
Sensor	1/3" CCD/CMOS Progressive Sensor
Minimum Illumination	Minimum Illumination : Color 0.5 lux & B/W 0.05 lux
Lens	Auto iris, Auto focus, Motorized 4.3mm-129mm or better zoom lens (30X) providing adjustable 3-65 degree or better FOV and detect human at 400m or higher
Compression	H.264
Compression Performance	Resolution & FPS Maximum Performance: Stream 1: 1920 x 1080 @ 25FPS and Stream 2: 720 x 576 @ 25FPS on two streams respectively at the same time
Bandwidth	Bandwidth : 64Kbps to 16Mbps
Protocols	Unicast, Multicast, RTP, TCP, UDP, HTTP, IGMP, ICMP, DHCP, ONVIF etc. or as per solution requirement to fulfil functional requirement
Connectivity	10/100 Base-T Auto sensing, Half/Full Duplex (RJ45)
Pan-Tilt	Endless 360° pan and -10° to 90° tilt movement
Speed	Manual Pan/tilt speed up to 90 deg per second and preset speed up to 200 deg per second
Mode	200 or more preset positions and 8 tour
Audio	External audio Input and output: Required
SD Card Support	Built in Micro SD card slot to support up to 64GB storage for local recording
Alarm I/O	At least one potential free Alarm IN and one Alarm out
IR	Built-in or external IR with minimum 150m range
Power	Power input: 24VAC or POE++ as per manufacturer standard
Rating	IP66 rated, Built in heater
Operating conditions	Temp: -20° C to 50°C , Humidity: 90%

Stereo Playback	Yes
Number of Speakers	2
Youtube	Yes
Web Browser	Yes
HDMI Input	2
USB Port	2
VGA Input	1
Composite Input	1
Component Input	1
Ethernet	1
DLNA Support	Yes
Dimensions (W x D x H) (mm)	Approx 1230mm x 210mm x 753mm
Approximate Net Weight (Kgs)	20
Remote Control	Yes
Brand	Should be from Sony/Samsung/LG/Panasonic
Digital Audio Output(Optical)	1 (rear)
Included Accessory	TV Remote
Power Supply	AC Auto 110 - 240 V, 50/60 Hz
Visible Screen Size (diagonal)	106 cm , 42 inches
Rated Power Consumption	97 W
Standby Power Consumption	0.20 W
Screen Resolution	1,920 (W) x 1,080 (H)
Dimensions (W x H x D) (w / o stand)	963 x 566 x 69 mm
Dimensions (W x H x D) (with stand)	963 x 610 x 247 mm
Stand	Mount wall stand with rotation facility
Brand	Should be from Sony/Samsung/LG/Panasonic
Item	Minimum Requirement Description
Certification	BIS, Energy Star
Video Wall Controller with Software (3x2)	
Make:	
Model:	

Mounting	Mount: Wall or pole or pendant
Standard	BIS Standard 13252 (Part 1):2010

(g) Joystick for PTZ Controlling

Item	Minimum Requirement Description
Make	
Model	
Keyboard	Electromechanical
Joystick	3-axis, vector-solving, twisting, return to-center
Connector	RS232
Display	LCD, 75.2mm x 33.85mm
Max User Accounts	1 Admin, 10 User
User Account Type	Admin, User
Power Supply	Input 100V ~240V 50Hz / 60Hz, Output 12V DC 1000mA
Power Consumption	Max 5W
Operating Temperature	Temp: 0° C to 40°C
Operating Humidity	<90%RH

(h) 65" Industrial Grade LED Screen with Controller

Item	Minimum Requirement Description
65" LED TV & Video Wall Controller with Software	
Make	
Model	
Screen Size (Inches)	Minimum 65
Type of Television	LED
Backlight	Yes
Resolution (Pixels)	1920 x 1080
Picture Processor	Yes
Aspect Ratio	16:09
Number of Selectable Picture Modes	Vivid, Standard, Custom, Cinema Pro, Cinema Home, Sports,
Picture In Picture	Yes
Selectable Sound Modes	Standard, Cinema, Live Sports, Music
Audio Output (PMPO) (Watts)	20W

General	Display Controller should be scalable to control video wall in a matrix of M x N (any combination of Row & Column) up to total of 6 screens. It should also be capable of taking universal inputs for video as well as data along with necessary wall management software's
Networking	Dual-port Gigabit Ethernet Controller Inbuilt Support for Add on Network adapters
Wall Configuration	6 DVI-D/ HDMI Outputs
Resolution Output support:	Minimum 1920x1080 or higher
Universal Ports	6 Universal Inputs (Should be able to accept at least 3 kinds of signals i.e. DVI/RGB/HDMI)
Redundancy Support:	System should have the redundancy support for following: - Controller Hard Disk Data - Power Supply - LAN
Matrix Combination	The video wall of any matrix combination (CR) should be capable of displaying multiple type of outputs as desired in CCC facility
Software Certification	Compatible Video Wall Management software to meet the required functionality BIS

(i) Video Management Solution (VMS)

(i) The VMS software shall consist of an MS-SQL 2012 or better based Main Directory Database, Failover directory, Recording Server licenses, Failover recording, Redundant recording, Incident Reports, Alarm and Management. All the related software licenses should be the part of the offered system.

(ii) Vendor should consider additional server for maintaining system administration database if required by the offered system configuration apart from recording servers.

(iii) The VMS system should be accessible from at least 15 computers from the network for system administration and video monitoring with minimum 5 simultaneous users. System administration and monitoring can be distributed depending on the sub division of the surveillance areas/zones. Even though system should allow to create unlimited user ID's in the system.

(iv) The VMS Server shall maintain a catalogue of settings for all the client, servers and IP cameras in the system.

(v) The VMS shall support up to 250 camera connections.

(vi) The VMS Archive Server, for video and audio, shall be capable to support and manage cameras @ 1920x1080 @ 25FPS, camera @ 1280x720. But considering the future intention to zonalise the recording not more than 120 cameras be loaded on any server during initial design of the system.

(vii) The VMS shall be able to set each camera frame rate, bit rate and resolution independently from other cameras in the system, and altering these settings shall not affect the recording and display settings of other cameras. This should be applicable even if vendor propose to use multi-channel encoders.

(a) The VMS shall utilize multicast network communication for video monitoring.

(b) Unicast based equipment will not be considered as an approved equal for alternate system.

(viii) The VMS shall have Digital Video Matrix Switcher.

(a) The Virtual Matrix Switch shall provide a full matrix operation of IP video to digital (computer) screens.

(b) The Virtual Matrix Switch shall have the capability of creating at least 20 sequences including: I) Multiple cameras with independent dwell time for each camera ii) PTZ camera presets iii) Sequence of multiple pre-loaded pre-configured tile layout.

(ix) The VMS shall support thicl clients/web basedclients connecting to the VMS system.

(x) The VMS shall be based on a true open architecture that allow for use of non-proprietary PC and storage hardware that shall not limit the storage capacity and shall allow for gradual upgrades of recording capacity.

(xi) The VMS Server shall be of the most recent computer technology and shall cover the VMS requirements. To provide an advanced and reliable system the operating system shall be Linux/Windows 2012 server or higher.

(xii) The VMS shall allow use of latest Windows 10 OS or higher for client machines as we intend to access the video from existing machines which has these operating systems and cannot be changed.

(xiii) The VMS shall provide support for industry standard SNMP V2.0 and V3.0 and should provide the compatibility with any SNMP application to report the status of various component of VMS system. Required interface license shall be included in the offer.

(xiv) The VMS shall provide alarm dry contact interfaces to allow for any alarm input initiating any action in the VMS system. All the cameras should be provided with easily panic button accessible near each camera. If anyone press this switch, relevant camera should popup automatically on the client work station.

(i) The VMS client shall consist of Monitoring application, an Archive Player application, alarm handling, virtual matrix capability, and all other user related features. Each VMS system videos and administration should be possible from all unit workstations.

(ii) The VMS client shall perform the following applications simultaneously without interfering with any of the Archive Server operations (Recording, Alarms, etc.)

- Live display of cameras.
- Play Live audio.
- Broadcast audio to remote locations.
- Live display of camera sequences.
- Live display of panoramic camera views.
- Control of PTZ cameras.
- Playback of archived video and audio
- Playback of panoramic camera clips.
- Retrieval of archived video and audio.
- Instant Replay of live video and audio.
- Instant Replay of panoramic camera clips.
- Use of graphical controls (maps).
- Configuration of system settings

(iii) The VMS client applications shall support any form of IP network connectivity, including: LAN, WAN, VPN, Internet.

(iv) The VMS client applications shall support IP Multicast (UDP) and Unicast (UDP) video and audio streaming.

(v) The VMS client applications shall automatically adapt to the network topology and use the best available method to receive streaming video.

(vi) The VMS client applications shall provide an authentication mechanism, which verifies the validity of the user.

(vii) The Client application shall allow for live monitoring of video and audio.

- The Monitor shall enable view of up to 25 video tiles simultaneously on a single monitor.
- The IP Based VMS Shall provide more than 15 tile layouts on each of the VGA monitors independently including below formats.
- Full screen, Quad, 3x3, 4x4, 5x5 etc.

(viii) The VMS Monitor application shall allow operators to view an instant replay of any camera or audio input (microphone).

(ix) operator shall be able to define the amount of time he wishes to go back from a predefine list or through a custom setup period.

(xv) The VMS Shall support full duplex audio communication and transmission signals over the IP Digital Transmission Network without the need of any additional license.

(xvi) The VMS shall support the group functionalities to facilitate the administrator to change the setting of all the cameras in single go. i.e. Changing resolution/FPS of all the cameras in single command, Changing user privileges of all the users etc.

(xvii) The VMS shall provide a reporting utility for tracking but not limited to the following options. Video and Images shall be stored with reports for documenting events.

(a) Alarms, Incidents, Operator logs, Service requests.

(b) The Email Alert should be generated in responds to alarms triggered in VMS software and sends out email alerts to a preconfigured list of recipients.

(c) It should be possible to export the settings of various entities within the VMS i.e. Archiver, Directory, cameras etc. it should be possible to print these reports.

(xviii) The VMS should allow to mask a specific area within the picture of any cameras in order to maintain privacy of sensitive areas without compromising the security. Any privileged user should be able to unmask the view during playback or live in case of specific situational requirements.

(xix) The VMS should allow to configure automatic scheduled backup of videos from user selected cameras to specified network drive. It should also allow to configure specific timings of the day whose video need to be backed up.

(xx) The VMS shall provide module to allow access of system through iPad, iPhone, Android phones. At least one license for the same shall be supplied.

(xxi) The VMS shall provide the facility so as any Android OS smart phone can capture the video using its in-built camera and stream it to the VMS server through 3G, 4G, LTE or Wi-Fi network. VMS shall have the capability to automatically popup this video and also indicate the GPS location of the smart phone.

(xxii) The VMS shall provide alarm management module without the need of any additional license.

(a) The alarm management shall be able to set any monitor or groups of monitors to automatically display cameras in response to alarm inputs.

(b) The alarm management shall be able to reset automatically or manually alarmed video.

(c) The alarm management shall allow for multiple modes of alarm handling capability, these modes to be programmed within the same system.

VMS Client

(x) The operator shall be able to control the playback with play, pause, forward, and speed buttons.

(xi) The VMS Monitor application shall allow operators to add bookmarks to recorded clips of video or audio.

(xii) The operator shall be able to choose and trigger an action from a list of available actions included but are not limited to: -

- View camera in a video tile.
- View Map or procedure in a video tile.
- Starting/stopping PTZ pattern.
- Go to PTZ Preset.
- Sending alert messages.

(xiii) VMS Monitor application shall display all cameras attached to the system regardless of their physical location on the network.

(xiv) The VMS Monitor application shall display all camera sequences created in the system.

(xv) The VMS Monitor application shall allow for unlimited cameras sequences, which can be run independently of each other on either digital monitor tiles or analog CCTV monitors.

(xvi) The VMS Monitor application shall allow operators to control (Pause/Play, skip forwards, skip backwards) Camera Sequences, without affecting other operators' ability to view and control the same sequence.

(xvii) The VMS Monitor application shall display all cameras, sequences and analogue monitors in a logical tree.

(xviii) The VMS Monitor application operator shall be able to drag and drop a camera from a tree of available cameras into any video tile or an analogue monitor icon for live viewing.

(xix) The VMS Monitor application operator shall be able to drag and drop a camera sequence from a tree of cameras into any video tile or an analogue monitor icon for live viewing. The VMS Monitor application shall support Graphical Site Representation (Maps) functionality, where digital maps are used to represent the physical location of cameras and other devices throughout facility.

(xx) The VMS Maps shall be able to import maps from any graphical software supporting BMP, JPEG and/or GIF image formats.

(xxi) The VMS Monitor application operator shall be able to drag and drop a camera from a map into a video tile for live viewing.

(xxii) The operator shall be able to click on an icon in a map to initiate PTZ camera preset, run PTZ pattern, view camera in an analog monitor or send an I/O stream.

(xxiii) The VMS Monitor application shall support the procedure functionality, where procedures can be triggered to appear during a certain event and can be used to provide detail written or verbal instructions to the operator as to the actions to be taken.

(xxiv) The VMS Monitor application shall support digital zoom on a fixed camera's live and recorded video streams.

(xxv) The VMS Monitor application shall support digital zoom on a PTZ camera's live and recorded video streams.

(xxvi) The VMS Monitor application shall provide management and control over the system using Joystick controller of any compatible make. Each client workstation should be provided with joystick controller.

(xxvii) The VMS software must support PTZ cameras with complete PTZ functionality from any client workstation GUI.

(xxviii) The VMS should provide the application which should be integrated to the offered VMS and provide the below mentioned Incident Reporting and backup mechanism. Offered prices should include the price of this application.

(xxix) This application should provide the facility to create the incident reports for specific incidents.

(xxx) It should be possible to access recorded video within the VMS system for play back and export from this application.

(xxxi) It should also allow the operator to write the text, attach the snapshots, video clip, audio clip or any other type of attachment which can be used in conjunction with this incident and form the entire incident report.

(xxxii) It should be possible to send these reports by email or archived on offline media.

(xxxiii) Software shall have the facility to monitor the desktop of any networked computer in camera tiles. We intend to use this facility to create the central monitoring display of all the systems (BMS, FAS, ACS, PIDS etc.) on same monitor simultaneously.

Alarm Management

(i) The IP based VMS shall provide alarm management module.

(ii) The IP based VMS shall notify a user on any alarm set in the system.

(iii) The VMS user shall be able to support multiple alarms.

(iv) The VMS system administrator shall be able to set for each user the maximum alarms to be viewed at one time.

(v) It should be possible to populate the alarm on the maps indicating their actual location and current status.

(vi) It should be possible to drag the alarm related video on tile.

(vii) It should also be configurable to popup the procedural URL/standard operating procedure for alarm handling specific to the active alarm.

(viii) Alarms should be prioritized and displayed in different color for easy understanding of operators.

(ix) The VMS user shall be able to forward alarms to other users.

Integration Interface

(i) VMS shall provide SDK/API's interface for possibility to integrate it with third party security systems. Any required license shall be supplied.

(j) 6m Pole with Junction Box

Item	Minimum Requirement Description
Make	
Model	
General Requirement	Shall be minimum 6.5m height as per NHAI norms
General Requirement	Hot dip galvanized pole with silver coating of 86 micron as per IS:2629 min 10 cm diameter pole and suitable bottom and top thick HT plate along with base plate size 30x30x15 cms suitable for wind speed 50 m/sec with suitable arm bracket and with J type foundation bolts. Fabrication in accordance with IS 2713 (1980)
Foundation	Pole would be fixed on an adequate and strong foundation to withstand city weather conditions and wind speed of 150 km/hr
Foundation	Casting of civil foundation with foundation bolts to ensure vibration free (video feed quality should not be impacted due to wind in different climatic conditions) Expected foundation depth of minimum 100 cms or better
Sign Board with number plate	Sign board depicting the area under surveillance and with serial number of pole
Height	Height of the pole shall be as per requirement of the location varying from 6 m to 12/15 m.
Electrical Connection	Electrical power requirement for the systems/devices installed on the pole should be available with metering and protection equipment
Lightning Protection	Lighting arrestors with proper grounding

Earthing	Pole should have proper earthing system
Network Communication	All communication passive & active devices should be housed in enclosure of adequate standards and protection
Certification	ISI, BIS

2 Lighting System

(a) Pole for Lights

Item	Minimum Requirement Description
Make	
Model	
General Requirement	Shall be minimum 6.5m height as per NHAI norms
General Requirement	Hot dip galvanized pole with silver coating of 86 micron as per IS:2629 min 10 cm diameter pole and suitable bottom and top thick HT plate along with base plate size 30x30x15 cms suitable for wind speed 50 m/sec with suitable arm bracket and with J type foundation bolts. Fabrication in accordance with IS 2713 (1980)
Foundation	Pole would be fixed on an adequate and strong foundation to withstand city weather conditions and wind speed of 150 km/hr
Foundation	Casting of civil foundation with foundation bolts to ensure vibration free (video feed quality should not be impacted due to wind in different climatic conditions) Expected foundation depth of minimum 100 cms or better
Sign Board with number plate	Sign board depicting the area under surveillance and with serial number of pole
Height	Height of the pole shall be as per requirement of the location varying from 6 m to 12/15 m.
Electrical Connection	Electrical power requirement for the systems/devices installed on the pole should be available with metering and protection equipment
Lightning Protection	Lighting arrestors with proper grounding
Earthing	Pole should have proper earthing system
Network Communication	All communication passive & active devices should be housed in enclosure of adequate standards and protection
Certification	ISI, BIS

(b) LED Unit with Communication Unit

Feature	Minimum Requirement Description
Operating Voltage	100 - 277vAC
LED Power	150W
Colour Temp	Neutral White (3700-5000k)
Brightness	Neutral White 18,275LM
CRI	Neutral White >70
Spot Type	Polarized Oval
Adjustable Angle	15°
Lifespan	>50,000 hours

Communication Unit	Should be able to integrate with PIDS & CCC (RS232/485/422/TCP/IP or equivalent)
Power Factor	0.95
Efficiency	90%
Protections	Short Circuit/Over Load/Over Voltage/ Over Temperature/Lightning Protection
Surge Protection	4 KV
Working Temperature	-40to +55 °C
IP Rating	IP66
Certifications	CE, RoHS, UL

(c) Central Control Unit

(i) The Graphical user interface to interact with the system, which is divided into two subsystems: the first is the visualization model to monitor the state of the lighting systems, and also includes the management system; the second is the display model associated with intelligent management that allows for automatic system control.

(ii) Lighting System will be integrating with PIDS system and Lights will be ON/OFF based on the inputs from the PIDS system.

(iii) System should be able to segregate the area into zones and Software should be able to control individual Zone/Lighting devise from Control room.

(iv) Software services: they are the processes responsible for implementing new algorithms for intelligent system behavior. These Software services receive instructions from the intelligent control and monitor the environment to act intelligently. These processes use the web services layer to obtain the missing information from the upper layers.

(v) Web services: The Web services layer includes a security module that is responsible for filtering information to prevent attacks that attempt to access in-formation. Services will use the hardware layer interface to access the data from the devices. The hardware abstraction layer will define the access inter-face for each device.

(vi) Data source: the software component will implement the mechanisms to access the information defined by the hardware abstraction layer. Each data source can be from a different manufacturer on the condition that the hardware abstraction layer and interfaces remain constant.

3. PA System

(a) Speakers with Amp

Item	Minimum Requirement Description

Make	
Model	
Max sound pressure level	> 121 dB
Frequency response	280 Hz -12.5 kHz
Amplifier	Built in or integrated amplifier
Wattage Capacity	Minimum 20 W
Coverage pattern	70° horizontal by 100° vertical (at 2 kHz)
Power	Power over Ethernet (PoE) /220 VAC
Connectors	RJ45 10BASE-T/100BASE-TX
Operating conditions	20°C to 50°C (-4°F to 122°F) Humidity 10–100% RH(condensing)
Casing	Impact-resistant aluminium, IP66/IP67 rated. Tap: 119 dB
Range Certification	should cover minimum 150 meter in open environment EN 54-16 and ISO 7240-16

(b) Central Control Software

Item	Minimum Requirement Description
Make	
Model	
General Requirement	Should have the capability to control individual PAS i.e. to make announcement at select location (1:1) and all locations (1: many) simultaneously.
	The PAS should also support both Live and Recorded inputs.
	Should be able to configure min. 15 zones
	Shall support min. 5 users simultaneously
	Should be client-server architecture
	audio/visual representation of alarms
	should be able to play pre-recorded messages based on different alarms from different systems
	Able to generate reports in different format (word/excel/pdf)
Connectivity	IP Based
Integration	PIDS & Command and Control Centre or any other component if required
Central Server/Software	Redundant central application server/software

4. Cabling.

(a) Cat 6 cable (Indoor)

(i) Type: Unshielded Twisted Pair, Category 6, TIA / EIA 568-C.2 & ISO/IEC 11801.

(ii) Conductors: solid bare copper.

(iii) Insulation: High Density Polyethylene.

(iv) Jacket: Low Smoke Zero Halogen (LSZH)/ Polyethylene.

(v) Pair Separator: Cross-member (+) fluted Spline.

(vi) Operating temperature: -20 °C to +60 °C Storage Temperature -20 °C to +80 °C.

(vii) Frequency: tested up to Minimum 250 MHz.

(viii) Packing Box of 305 meters.

(ix) Cable Outer Diameter: 6.3 +/- 0.4 mm.

(x) Bend Radius: 4 * Cable Diameter.

(xi) Impedance: 100 Ohms + / - 15 ohms, 1 to 250 MHz.

(xii) Fire Rating: IEC 60332-1, IEC 60754, IEC 61034.

(xiii) Conductor Resistance: 73 Ohms Max / KM nominal.

(xiv) Max. Tensile strength: 110N.

(xv) Performance characteristics to be provided along with bid Attenuation, Pair-to-pair and PS NEXT, ELFEXT and PSELFEXT, Return Loss, ACR and PS ACR

(xvi) Standard Compliance: ANSI/TIA-568 C.2 category 6, ISO/IEC-11801, Class E/ IEC 61156-5: category 6.

(xvii) Application: IEEE 802.af and IEEE 802.3at for PoE Cat 6 Cable.

(b) Cat 6 cable (Outdoor)

(i) Type: Unshielded Twisted Pair, Category 6, TIA / EIA 568-C.2 &ISO/IEC 11801.

(ii) Conductors: AWG solid bare copper.

(iii) Insulation Material: Foam PE.

(iv) Inner Sheath Material: LSZH.

(v) Screening Material: AL/Mylar.

(vi) Armouring: > 65 % coverage steel wiring.

(v) Outer Sheath Material: LSZH.

(vi) Outer Sheath External O.D:11.2+-1.0mm.

(vii) Operating temperature: -20 °C to +70 °C Storage Temperature -20 °C to +80 °C.

(viii) Frequency: tested up to Minimum 250 MHz.

(ix) Packing Box of 305 meters.

(x) Cable Outer Diameter: 6.3 +/- 0.4 mm.

(xi) Min Bend Radius: 8 * Cable Diameter.

(xii) Impedance: 100 Ohms + / - 15 ohms, 1 to 250 MHz.

(xiii) Fire Rating: IEC 60332-1, IEC 60754, IEC 61034.

(xiv) Conductor Resistance: 73 Ohms Max / KM nominal.

(xv) Performance characteristics to be provided along with bid Attenuation, Pair-to-pair and PS NEXT, ELFEXT and PSELFEXT, Return Loss, ACR and PS ACR.

(xvi) Standard Compliance: ANSI/TIA-568 C.2 category 6, ISO/IEC-11801, Class E/ IEC 61156-5: category 6.

(xvii) Application: IEEE 802.af and IEEE 802.3at for PoE.

(c) 6/12 Core Fiber Optic Cable Indoor/Outdoor (Multi Mode)

(i) Type – 6/12 core OM4 (50/125 micron) Multi mode Loose Tube jelly filled, Uni-tube design, Indoor/outdoor optical Fiber cable.

(ii) Outer Jacket: LSZH/ FR PVC, UL OFNR rated.

(iii) Strength Members: E-glass.

(iv) Can be used for both indoor and outdoor application.

(v) Crush Load: 1000N/100mm (Short term), 300N/100mm (Long term) as per IEC 60794-1-2-E3.

(vi) Colour Code: ANSI/TIA/EIA-598-B.

(vii) Max attenuation: <=2.3 dB per km@850 nm,<= 0.6 dB per km@ 1300nm.

(viii) Operating temperature - 20°C to 60°C.

(ix) Standard Compliance: ITU-T G.651.1 Fiber, ISO/IEC 11801, ISO/IEC 24702, ANSIANSI/TIA/EIA 568C.3, IEEE 802.3z Gigabit Ethernet, ROHS compliant Directive 2002/95/EC.

(d) 6/12 Core Fiber Optic Cable Indoor/Outdoor (Single Mode)

(i) Type – 6/12 core OS2 (9/125 micron) Single mode Loose Tube jelly filled, Uni-tube design, indoor/outdoor optical Fiber cable.

(ii) Outer Jacket: LSZH/ FR PVC, UL OFNR rated .

(iii) Strength Members: E-glass.

(iv) Can be used for both indoor and outdoor application.

(v) Crush Load: 1000N/100mm (Short term), 300N/100mm (Long term) as per IEC 60794-1-2-E3.

(vi) Colour Code: ANSI/TIA/EIA-598-B.

(vii) Max attenuation: 0.34 dB per km@1310 nm 0.24 dB per km@ 1550nm.

(viii) Operating temperature - 20°C to 60°C.

(ix) Standard Compliance: ITU-T G.652.D Fiber, ISO/IEC 11801, ISO/IEC 24702, ANSIANSI/TIA/EIA 568C.3, IEEE 802.3z Gigabit Ethernet, ROHS compliant Directive 2002/95/EC

(e) Pole Junction Box

Suitable Junction Box shall be specified by the bidder.

(f) PA System Cable

Suitable cable shall be specified by the bidder and the cable shall be of relevant IS standards.

(g) Power Cable 25 Sq mm

Suitable cable shall be specified by the bidder and the cable shall be of relevant IS standards.

(h) Power Distribution Cable 2 Sq mm

Suitable cable shall be specified by the bidder and the cable shall be of relevant IS standards.

(i) HDPE Conduit

Suitable HDPE Conduit shall be specified by the bidder.

(j) MS Conduit 20/25 Sqmm

Suitable MS Conduit 20/25 mm shall be specified by the bidder.

ACCESS CONTROL SYSTEM

1. Locking System

(a) Guard and Tour Management

(i) The guard tour Management logger is a simple device that can be installed anywhere, doesn't require power or wiring and serves as Patrol logger.

(ii) The guard tour Management Often security guards need to have access to premises as well as log their presence on those premises which means they need to have keys and a logging device.

(iii) The guard tour Management Patrol guard solution combines the controlled access of the premises and at the same time includes the logging solution.

(iv) All events created by the guard (by opening/locking the locks and by inserting his key in logger) are stored on the key and the logger.

(v) When the key downloads all the access logs to the software, a clear report can be issued to verify that the user has done his rounds when required.

(vi) On-line Guard Tour Management system is an automated record keeping system that

records tours and inspections performed by security officer at specific locations in a real time basis.

(vii) It allows for one or more card readers to be checked during routine tours to verify that predefined routes are completed. Security officers use their credentials at card readers in a Sequential order that is conducive to their watch path.

(viii) Each tour delivers events to Alarm Monitoring, allowing operators to know if checkpoints are reached on time, early, overdue, or late. Each guard tour station is equipped with a card reader that is attached to a guard tour control panel.

(ix) The security management software will update the latest guard tour transaction record via TCP/IP/ USB or any other protocol onto Guard tour management system. Each security guard as he or she makes rounds from one assigned guard tour station to the next. All entries are date and time stamped stored into system database.

(x) User configurable tour route definition, the Guard tour system come with interface for system supervisor to program the touring point sequence, the system user can have a flexible touring point vary from time to time, instead of having a constant tour route.

(xi) Comprehensive activities report can easily generate from the recorded transaction event. And best of all, the information is logged as it is happening in real time.

(xii) A conventional security guard tour system must wait until the security guard returns to the central office and downloads the security guard tour information from a system reader or scanner but with this real time scanning Guard Tour System, a supervisor can monitor the tour movement efficiently via computer workstation and do not need to wait until the completion of touring.

(b) Key

Item	Minimum Requirement Description
Make	
Model	
Number of Accessible Locks	1,00,000
Number of Access Logs	Last 1,000 Access (First-In/First-Out)
Battery Type	2 x LR1 batterie
Battery Life	25,000 opening or up to 2 years
Encryption	AES 128bit
LED	1 x Tri-color (Green, Red & Orange)
Locks	All Acsys Lock Types
Operating Temperature	-20 to 55 o C
Dimensions	40.7 x 72.7 x 17.8 mm
Material	BLADE SUS 316L / TOP COVER PC+25% GF / LED LENS / LCD 6 CHARACTERS / KEYPAD 7 BUTTONS PET/ SWIVEL SUS 304
Quality Certification	CE, FCC, ROHS

Water Protection	Splash Water resistance
LED Status	4 statuses LED (Access / No Access / Restricted Access / Low Battery)
LCD	LCD screen allows the user to see what digits are being entered before pressing OK
Certification	ISI

(c) Guard Locks

Item	Minimum Requirement Description
Make	
Model	
Dimensions	Type 1: 130 x 120 x 55 mm
	Type 2: 109 x 89 x 40.5 mm
Material	Hardened Steel
Locks	PL5 Padlock (shackle removable)
Security	Can be bolted and/or welded on gates
Usages	Easy to use (4 easy steps)
Protection	Casing serves as a robust barrier to entry on any doors, gates, by re-enforcing their fastening.
	Protects against cutting / grinding / drilling
Certification	ISI

(c) IP Programmer

Item	Minimum Requirement Description
Make	
Model	
Dimensions	98.5 x 92 x 28 mm
Material	TOP COVER PLASTIC / RAIN CAP ALUMINUM / LED
LED	3, blue color; On / Ready / Busy
IP Rating	IP55
Life Expectancy	10 years
Operating Temperature	-20 to 65 o C
Operating Humidity	0 to 97 R.H.
Power Supply	DC Power Supply (5V, 100mA)
Connectivity	Wired RJ-45
Encryption Algorithm	AES 128bit
Keys	All Key Types

Quality Certification	CE, FCC, ROHS

(e) Transfer Key

Item	Minimum Requirement Description
Make	
Model	
Dimensions	Type 1: 130 x 120 x 55 mm
	Type 2: 109 x 89 x 40.5 mm
Material	Hardened Steel
Locks	PL5 Padlock (shackle removable)
Security	Can be bolted and/or welded on gates
Usages	Easy to use (4 easy steps)
Protection	Casing serves as a robust barrier to entry on any doors, gates, by re-enforcing their fastening.
	Protects against cutting / grinding / drilling
Certification	ISI

(f) Software Features

Function: A web based software program, CILQ Web Manager is used to manage the CLIQ Remote System. User friendly and intuitive, system administrators use it to remotely manage the day to day functionality of the CILQ Remote System.

Applications: As a web-based solution, the CLIQ Web Manager provides access to the System's database from any computer with an internet connection and has been specifically designed to handle large, decentralized system.

Features:

(i) Secure login via a control key and a PIN code

(ii) Advanced search options

(iii) Manages and creates: -

(a) Access permissions

(b) Audit trails - including activities from remote devices

(c) Time – based authorization

(d) Recurring validation

(e) Reports

(iv) Supports remote programming device management

(v) Enables system grouping into manageable domains

(vi) Allows remote key programming

(vii) Key and personnel management

Specifications

(i) Web browser: Internet Explorer 7 and up

(ii) 128 bit Highly secured connection (SSL)

(iii) Available in multi-language versions

2. Barriers

(a) Crash Barriers

Item	Minimum Requirement Description
Make	
Model	
Crash Barrier	Hydraulic based with Minimum K12 rating
Blocking Width	3 Meter, Blocking Height 1000 MM or more.
Underground Housing	Width: Blocking segment + 0.36 or less
	Length: 2.2 m or less
	Depth: 0.4 m or less
Impact Rate Load	Minimum 1800 KJ.
Construction	All materials of high grade steel ST 355 & AISI stainless steel
Maximum Vehicle Penetration after impact	1 Meter from barrier.
Blocking Segment	Framework of RSJ type HEA160 or similar beam of 30.4kg/meter & intermediate reinforcement structure of RSJ type IPE 120 beam of 11.6kg/m with durbar chequer plate top 12mm thick providing a wheel load support of 100kN (10,000 kg) according to SLW60-DIN1072.
	Due to the modular design of the blocking part: after impact it should be swapped out immediately.
Underground casing	Outer framework from RSJ type IPE 400 beam of 62.1kg/m with 100 or more stub pieces 8 x 200mm welded externally to tie in with concrete pour for stability. Minimum 2 nos. hinge points, with 25mm diameter or more stainless steel shafts & bearing bushes.
Product Certifications	Certified according to DOS K12 (USA) or PAS 68 K12 (UK) (Documents of certifications to be attached from any of two authority)

Warning plate	Warning plate incorporating red round warning lights with LED illumination
Possibility to perform 500 complete cycles per hour under normal operating conditions.	Normal raise time – 3.5 secs
Operating Times	Normal lower time – 2 secs
	Normal use: Raising approx. 3.5 sec,
	Lowering approx. 2 sec to road surface
Electro Hydraulic Drive Cabinet	The EHDC shall be remotely located at a maximum distance of 25 meters from the barrier.
	Hoses are rated up to 250 Bar or more and have a burst pressure of at least 850 bar.
	Hoses shall have Plastic non braided reinforcement sleeves.
	The connectors are Quick lock connectors, and prevent a wrong connection, as male and female connectors are provided. These have an inner diameter of 30 mm.
	Flat Rubber O-rings will be used to reduce the possibility of leakage.
	Hydraulic Fluid shall be mineral oil HLP 22 or biodegradable hydraulic fluid Plantohyd 22, to be chosen by buyer
	The standard reservoir is a design conforming to hydraulic industry standards. (harmonized in the CE norm)
	The EHDC hall use standard industrial components, which conform to hydraulic industry standards, and have interchangeable mounting dimensions.
	The majority of hydraulic components shall be manifold mounted to minimize connection points, hydraulic leakage and permit component replacement without requiring the removal of other hydraulic components. The use of in-line valves alone shall not be used.
	The electrical motor shall be capable of being removed from the hydraulic pump, without disturbing the hydraulic lines.
	The EHDC will have a standard outdoor cabinet preventing environmental exposure of the aggregate
	All connections will be industry standard, sealed DIN connectors, on flexible cable assemblies.
Working Life	Average use:
	Per day: 150 cycles
	Cycles length: 8 sec
Cycles between service	50.000 Or every Year, what comes first
Product lifetime	1 million cycles
Emergency Use	By hand pump
Installation Unit	Wedge barrier is to be delivered as a complete installation unit to make sure that there is no assembling work on site necessary. The hydraulic drive unit is delivered in a separate drive unit cabinet.

Hydraulic Drive Unit	Compact hydraulic drive unit with aggregate, high pressure pump, high pressure cylinder and hand pump in a separate drive cabinet. Power 400 V 4.0 kW
Control	Control unit. Raise – Stop – Lower
	Control unit in drive cabinet, prewired in factory.
Protection Against Corrosion	Long term protection against corrosion by zinc based multi-layer plastic coating. Certificate according to ISOE N7253/ ISO9227 should be submitted. OEM should have certificate for salt testing period of minimum 2000 hrs or more with no significant corrosion on product.
Distance	Distance to road blocker with 25m hydraulic hose length
Power	4.0 kW, 400V/50 Hz AC, 3 - phases
Control Cabinet Voltage	24 V
Standard	BIS Standard or ISO Certification

(b) Gate Automation

(i) Sliding Gate Control Unit

Parameter	
Power supply(Vac+6%-10%50-60Hz)	230
Absorbed power(W)	650 or Better to sustain the 1000 KG gate
Reduction ratio	1 : 30
Type of pinion	Z16 - Z20
Rack	Module4-step12.566
Use frequency	70% (see graph)
Oil quantity(l)	1,8
Operative ambient temperature(°C)	-20 ÷ +55
Protection class	IP 44
Gatemax.weight(Kg)	1800 to 1000
Gate speed(m/min)	9,5 - 12
Gate max .length(m)(time-out)	40 - 50
Protective treatment	cataphoresis
Electric motor technical specifications	
RPM	1400 or better
Power (W)	650 or better
Absorbed current (A)	3,5 or better
Starting capacitor (µF)	35 or better
Standard	BIS 2008 Standard or ISO Certification

(ii) Swing Gate Control Unit

Parameter	
Duty type	Apartment, subdivision, industrial, and commercial applications
Duty cycle	80 Cycles/ Hour
Maximum leaf length5, ft (m)	18 (5.4)
Maximum leaf weight, lb (kg)	1300 (600)
Maximum leaf swing, deg	115
Thrust and traction, lb (kg)	0-1760 (0-800)
90 deg opening time, sec.6	15 or Better
Operating temperature range, deg C	-36 to 75
Thermal cut out, deg C	100
Hydraulic locking	Opened and/or closed
Power voltage required, VAC7	230 VAC
Standard	BIS 2008 Standard or ISO Certification

(c) Boom Barrier

Item	Minimum Requirement Description
Make	
Model	
Product Description:	Automatic vehicle boom barriers provide positive, dependable access control for all vehicle entry/exit scenarios. The boom pole will be lifted in response to any legitimate input signal. The barrier can be operated by means of coded cards, tokens, remote push button, keys, ticket machines, computer or loop detector.
Timing:	1.9 Sec or less
Blocking Width:	4 - 6 meter
Drive:	Torque Motor
Materials	Housing: Mild Steel Powder Coated
	Boom pole Aluminium and taped with red reflective tape
Technical Features	Engineered for long term reliability, fast on-site maintenance and durability
	Fully recessed removable access door
	Removable Lid for easy access to motor and linkage assembly
Power Failure	In the event of an emergency or isolation of power supply, the Barrier will remain in the locked position
Interface	Boom barrier is controlled by means of a control panel with following features:

	1 One (0V) Input for opening/closing signal (pulse N/O)
	2 One (0V) Dry Input for Remote Latching Open/close
	3 One (220V) Output for Motor
	4 One (0V) Input for beam
	5 One (0V) Barrier PVC Loop
Technical Data	Power Supply: 220 V DC
	Power Rating: 220/250V 50Hz 400W for 3 meter & 300 W for 6 Meter
	Logic Voltage: 220 V
	Operating Temperature: 0 - 55°C
	IP rating: IP54.
	Per Day Cycle: Up to 10000 for 3 meter fast operation & 2000 for 6 meter boom barrier.
Standard	BIS 2008 Standard or ISO Certification

3. Quick Reaction Capability

The successful bidder has to consider specification of in service 800 kg Lt. Vehicle 4*4 and provide additional accessories as listed below:

1	Other Accessories	Siren with integrated PA system
		Multi-charger to charge mobile phone, camera, laptop etc. from vehicle
		First-Aid kit

INTERNAL SURVEILLANCE FOR DEPOTS

1. Thermal Camera for Depot

Item	Minimum Requirement Description
Make	
Model	
Sensor Format	Uncooled
Detector Type	VOx Micro bolometer
Camera Type	Multi Sensor
Thermal Resolution	640 x 480, 25 Hz
Streaming	Dual Stream, ONVIF Profile S
Spectral Band	8-13µ
Frame rate Hz/FPS	Full Frame – 25/30 Hz
Thermal Lens	Between 30(+/-5)mm (Wide) and 120(+/-20)mm (Tele) Continuous Optical 4X Zoom Lens providing wide 20(+/-4) to Tele 5(+/-1) Degree adjustable (HFOV)
Thermal Sensitivity	<=50 mK or better
Thermal Detection Range	Should detect an object of size 2.5m X 2.5m for minimum 5Km and Human for minimum 2Km
Visible Sensor Resolution	1/2.8" Full HD CMOS/CCD
Visual Sensor Lens	4.3mm to 129mm 30X optical zoom
Output Type	IP (ONVIF Compliant) and Analogue
Pan and Tilt	Pan: 360°; 0.2° to 60°/s or better, Tilt: +90° to -90° range; Minimum 30°/s
Preset Positions	64 Presets or more
Casing	IP-66, Heater and MIL-STD-810F
Operating conditions	Temp: -20° C to 55°C , Humidity: 90%
Standard	BIS Standard 13252 (Part 1):2010

FIRE FIGHTING SYSTEM FOR 1.1 TYPE ESH

1. Fire Hydrant System

The objective of remote water cannon spraying system is to fight fires with water and foam application by remote cannons, hand held nozzles in case of fires in Shed areas, surrounding areas including grass fires etc.

The system broadly consist of Fire water Hydrant line, Fire Water Storage of approx. 225 Kilolitre, AC motor driven Main pump set (End Suction Type, Capacity – 2000 GPM), Jockey pump set for pressurization with all required accessories including valves, special fittings, instrumentation, control panels, water hydrant pipeline network, remote water cannon of 500-1000-1500 gpm capacity, fire hydrant valves, hose cabinets, hoses, nozzles etc. and other components required to complete the system in all respects.

The System shall be semi-automatic in action and shall be laid by piping covering the entire area. The Hydrant System shall be kept pressurized at all times. The proposed Jockey Pump shall take care of the leakages of the system, pipe lines and valve glands.

The pressure in the hydrant pipe work shall be kept constant at 9 Kg/cm2. In the event of fire when any of the hydrant valve in the network is opened, the resultant fall in header pressure shall start the AC motor driven fire pump through pressure switches automatically.

However, shutting down of the pump set shall be manual except for the Jockey Pump which shall start and stop automatically through pressure switches. In addition to auto start arrangements, the main pump shall also have an over-riding manual starting facility by push bottom arrangement.

The piping for the hydrant system in the area shall be laid underground in soil 1 Metre deep or above ground. The pipe laid in soil shall be protected as specified.

The Fire hydrants shall be placed at a regular spacing of 30 m in the hydrant line. The following accessories are to be provided in each arm of the hydrant line.

2 No. Hydrant valves of 900 LPM with Stand Post.
2 Nos. RRL Hoses of size 63mm dia x15m long with ISI Mark Std as per IS:636 Type – B and standard 63mm Male and Female Instantaneous coupling at the end of Flexible Fire hose with ISI Marked
1 Nos. of Solid Jet Nozzle ISI Marked
1 No. of Spray Nozzle

Other than Hydrant valves, all the other accessories shall be kept inside an external mounted Fire Hose Box

2. Remote Control Monitor

The water cannon assembly along with motors, proximity sensors, Junction boxes, panel etc. shall be suitably installed at ground level in safe area on the fire hydrant line. The remote water cannon shall be operated remotely by a control panel. The cannon assembly is connected to pipeline through a motorized operated valve. Motorized operated valve can be operated through control panel. Motors connected to monitor shall control monitor

movements – Vertical, Horizontal, Nozzle and variable flow movements. End position Feedback signals for each movement is obtained on control panel.

The scope covers the requirements regarding design, engineering, procurement, manufacturing, fabrication, assembly, testing, supply, erection, installation, commissioning of electric operated water cannon system to be used for firefighting. The scope shall include supply of UL listed or FM approved foam monitor along with electric operated remote mechanism (remote operated mechanism may or may not be UL listed or FM approved) to facilitate remote movement of the monitor, flameproof control panel, gate valve, fire hydrant line etc. Electric operated cannon is required of the following online variable discharge capacities:

(a) 1500 GPM (5700 LPM) adjustable to 1000 GPM (3800 LPM) & 500 GPM (1900 LPM) with the same single nozzle

The Electric operated Cannon shall be designed for mounting on stand posts or elevated platform /tower at fixed locations. The water cannon shall be capable to give discharge in the form of hollow jet and spray arrangement.

All the operation of the water cannon viz Horizontal movement, Vertical Movement, Jet/spray adjustment, variable discharge flow should be possible from Electric FLP Control panel, manually from Monitor (without use of power) and also from Central Command Centre (CCC) through CCTV system.

(b) Cannon Foam Induction

- Foam Induction System: Foam feeding shall be by a separate & single aqua powered foam controller. The induction system shall be UL listed or FM approved. The Foam controller should be capable of feeding foam concentrate from a horizontal distance of up-to 50 meters from the Monitor Nozzle. The inlet and outlet of foam controller shall be provided with standard 63-mm male and female instantaneous couplings as per IS: 903.

  The length of the foam pick up tube shall be 3-4 Meters. It should be possible to induct 3% foam for all the three flows, however, variation of +20% of the induction rate is permissible. Manual valve shall be provided at foam inductor to set foam induction as per 1500 GPM, 1000 GPM or 500 GPM water flows.

- Cannon: The cannon shall be able to discharge 1500 GPM, 1000 GPM and 500 GPM (depending upon adjustment at the Nozzle) at a pressure of 10.0Kg/CM2 (g) at the mating/mounting flange. The foam compound shall be AFFF/AR-AFFF.

  The nozzle shall produce foam with minimum foam expansion ratio 1:4. The pattern of the Water/foam jet nozzle shall be adjustable from straight to 140 degrees wide spray.

  The monitor shall have traversing mechanism to give 340 deg. In either direction in horizontal plane and +80 deg. & -15 deg. in vertical plane

through swivel joints operated by worm and worm wheel operated geared unit. There shall be separate hand wheels for horizontal and vertical movement of the monitor. The arrangement shall be such that monitor movements can be done by a single person. All the gear mechanisms shall be sealed by proper enclosure to avoid accumulation of dust on lubricated parts. Both the traversing mechanisms shall be self-locking type. The Swivel Joints shall have SS ball bearing with efficient sealing.

The monitor shall be online variable flow adjustment type and it should be possible to set either of the three flow rates easily and quickly at site by the operator online without stopping of the water / foam flow. The changeover of discharge flow shall be online and should be possible to be from FLP control panel from CCC and manually also.

There shall not be any flanged joint on the monitor body, except one at base flange. Other Joint between monitor body & nozzle shall be threaded type-A pressure gauge shall be fitted in the monitor body near inlet of nozzle. Pressure drop across the monitor should be less than 10 PSI.A drain connection with valve shall be provided near the base flange. The monitor shall be so designed as to resist the nozzle reaction forces during operation and shall be capable of being handled by one person. It should be possible to operate the monitor at 12 Kg/cm2 inlet pressure.

- Remote Control Mechanism. The electrically operated remote mechanism comprises of Geared motor assembly for horizontal, vertical, nozzle movements and variable flow arrangement. The remote accessory also comprises of two junction boxes (i.e. Control & Signal). One for controlling the electrical supply to the motors & other for connection to proximity sensors for obtaining the end position feedback signals. Main cables from control panel are terminated to the junction boxes (Control & Signal) & there on to the respective motors & proximity sensors with unarmored cables.

Remote operated water cannon with variable nozzle, is having following modes of operation: -

Remote Mode: Through electrical geared mechanism from the remotely installed control panel.

Remote Mode: Through Panel at Central Command Centre

Manual Mode: Through Hand wheels

- Integration with Central Command Centre: Through CCTV surveillance system, the water cannon shall be able to be operated from the CCC. All the required software for fire detection and remote operation from CCC shall be provided. Graphic Console with Pop–Up arrangement shall be

provided. Video Analytics for detection of FIRE and subsequent messages by Email / SMS shall be provided.

- Cannon Assembly Comprises of the following parts

Inlet base flange	:	Facilitates Installation on Hydrant line
Monitor Body	:	Facilitates water path
Swivel Bearings	:	Facilitates Horizontal & Vertical Rotation of monitor
Hand wheels	:	Facilitates Movement of Monitor in desired directions
Worm Shaft	:	Facilitates Motion Transmission
Nozzle	:	For discharge of desired flow rate
Pressure Gauge	:	Indicates pressure at nozzle inlet
Drain Valve	:	Draining of Residue Water from Monitor body
Springs	:	For Counter Balancing the eccentric load
Mounting Brackets & Hardware	:	Installation of Monitor and its accessories

- Material of Construction

Item/Part	Material of Construction
Nozzle	SS-304
Cannon / Monitor Body	SS-304
Flange	SS-304 (150LBS, ANSI B16.5 rating size 100 mm
Swivel Joints	SS-304
Worm	SS-304
Gear	SS-304
Spindle for worm	SS-304
Hand-wheel for Nozzle, horizontal/vertical movement	SS-304
Pick up tube	PVC tube reinforced with high tensile steel wire helix as per ASTM D1785 sch.80 (3-4 meter length)
Drain connection	SS-304
Drain valve	SS-304
Foam strainer	SS-304 (removable type)
Foam Inductor	SS-304

Foam Inductor Couplings	SS-304 (63 mm)
Nuts/bolts at Monitor	SS-304

- Approval

The Monitor, Foam Nozzle and Foam Induction device shall be UL listed or FM approved with following features:

(i)	Nozzle	: Non-Aspirating Nozzle
(ii)	Monitor Solution Flow	: Online variable flow of 1500 GPM, 1000 GPM & 500 GPM in single nozzle
(iii)	Operating Pressure	: 10 Bar
(iv)	Induction	: Foam Induction tube with three flow settings

- Remote Control System

Electric Panel: Remote Control System shall be provided for horizontal and vertical rotation of the cannon, Jet and spray movement of the monitor nozzle and changing of the variable flow of the monitor from flameproof control panel to be supplied along with the monitor. The remote control system shall be electrical.

Control Panel shall have minimum following indication and control functions for each monitor.

Push Button Control with indication	-	Up/down, right / left movements
Push button control with indication	-	Spray / jet
Push button control with indication	-	Variable flow (i.e. 500, 1000) 500 GPM
Push Button with indication on/off valve	-	Open /Close Isolation
Power On / Off	-	Indication Lamps

Control Panel shall be complete with motor starters consisting of required rating AC-3 motor duty switch, fuse, contactor and bimetal overload relay to suit motor rating, motor start / stop push button, selector switch, voltmeter etc. and suitable structural frame for mounting of the panel. The control panel shall be minimum Ex-n / Ex-e / Ex-d type in flameproof enclosure suitable for Zone -2, Gas group – IIA / IIB with GI sheet canopy. Weather protection for motor enclosure shall be minimum IP55.

Motor shall be minimum Ex-n / Ex-e / Ex-d type suitable for Zone – 2, Gas group IIA / IIB, temperature class: T3. Weather protection for motor enclosure shall be minimum IP55. All the motors shall comply with requirements described below.

Minimum conductor size for power cable for Control panel shall be 4 mm2 copper and all cables shall be 1100 V grade PVC insulated, PVC sheathed, armoured fire retardant type.

Power and Signal cable of 150 meters length for each motor shall be provided along with the supplies for connection between the monitor motors and control panel. Flameproof Junction Box, Signal cable of 150 meters length for motor operated isolation valve and common cable tray for above cables shall be supplied along with each monitor.

- Central Control Centre (CCC): In addition to the above FLP Control Panel the monitor shall be able to be operated from the Central Control Centre (CCC). The movement of the monitor shall be viewed by the help of CCTV system.

- Performance: With pressure of 10 Kg/cm^2 (g) at base flange and Nozzle at 30 to 35 deg. from horizontal the Monitor shall be capable of giving following performance:

(i)	Flow: 1500 GPM -	Horizontal Foam Throw -70 meters (minimum); Horizontal Water Throw 75 meters(minimum).
(ii)	Flow: 1000 GPM -	Horizontal Foam Throw - 64 meters (minimum); Horizontal Water Throw-70 meters (minimum).
(iii)	Flow: 500 GPM -	Horizontal Foam Throw-45 meters (minimum); Horizontal Water Throw 50 meters (minimum).

Throw to be calculated on the basis of arithmetic average of throws (measured from monitor base flange to approximate centre of the footprint) in downwind & upwind directions at prevailing wind speed at the time of performance test.

- Workmanship and Finish: All the parts shall have good workmanship and finish. All burrs and sharp edges shall be removed. Passages for foam/water shall have smooth finish.

- Painting and Marking.: All external surfaces shall be properly shot blasted & provided with two coats of primer followed by two coats of final paint finish of 50 micron.

The water cannon shall be kept near to the sheds and hence special blast proof treatment should be provided on the cannon such that in case of any explosive the same is able to withstand the impact. The said painting shall also be corrosion proof and leak proof, thus enhancing the life cycle of the water cannon. Vendors / Bidders to submit technical details of the said painting / coating.

- Site Work: Erection, installation and commissioning of the monitor at site shall be in the scope of the contractor.

- Information/Documents required from bidder

(i) During bid submission:

- Details and drawings of the offered foam cum water monitor with bill of material of monitor & accessories. Details & Drawings shall be in line with UL listing or FM approval document of the vendor.

- Performance details like.

  - Projectile curves of both water and foam streams showing horizontal & vertical throw for foam and water at Nozzle angle of 30 degree from horizontal plane.

  - Foot print (shape, size, area) of both streams at landing zone.

- K-factor of the nozzle with supporting calculations.

- Pressure drop across the monitor.

- Vendor to give details of the proposed foam induction system and schematic sketch of the monitor with Foam induction and foam source along with the technical bid.

- Valid certificates of UL Listing or FM approval of offered manually operated foam-cum water monitor, foam nozzle and foam induction mechanism.

- CMRI/DGMS/CCOE approval for flame proof enclosures for motors & panel.

- Proven Track Record of the offered or higher capacity variable flow (minimum two flow) monitor as per tender specification along with site activities.

- General arrangement Plan (GAP) incorporating the stipulated inspection and testing requirements.

(ii) At the Time of delivery:

- As built drawings of monitor assembly.
- Electrical circuit diagrams for junction boxes & remote panel. Cable termination details & cable schedule.
- Installation procedure.
- All inspection and testing records.
- Operating and instruction manual.
- Testing and maintenance procedure/manual.

(c) Specification for Motor

- Codes and Standards: The Motor and their components shall comply with the latest editions of relevant standard issued by BIS (Bureau of Indian Standards). In case of imported motors standards of the country of origin shall be applicable, if these standards are equivalent or stringent than the applicable Indian Standards. The motor shall also conform to the provisions of Indian Electricity Rules and other regulation currently in force in the country. In case, Indian standards are not applicable or not covering any part, the standards issued by IEC /BS /VED/IEEE /NEMA or equivalent agency shall be applicable. In case of any contradiction between various referred standards/ specifications / Data sheets and statutory regulations the following order shall be govern.
  - Statutory Regulation
  - Data Sheet
  - Job specification
  - This specification
  - Code and standards
- Operating Conditions
  - Ambient Conditions: Motor shall be suitable for operating satisfactorily in humid and corrosive atmosphere found in refineries, petrochemical plants. Service condition shall be as specified in the motor data sheet. If not specifically mentioned therein, a design ambient temperature of 45º C and an altitude not exceeding 1000M above mean sea level shall be taken in to consideration.
  - Frequency and Voltage: Unless otherwise agreed motor shall be designed for operation at rated output under the following conditions:

- The terminal voltage differing from its rated value by not more than ± 6 % or
- The frequency differing from its rated value by not more than ± 3 % or

➢ Starting

- Unless otherwise specified, motor shall be designed for on-line starting with suitable protection.
- Motor shall be designed for reacceleration under full load after a momentary loss of voltage with residual voltage being 100 % and is in phase opposition to the applied voltage.
- Unless otherwise specified, all motors shall be suitable for starting under specified load conditions with 75% of the rated voltage at the motor terminals.

➢ Performance

- Motor shall be rated for intermittent duty cycle (S3), unless otherwise specified.
- Unless otherwise specified, the starting current (as % rated current) shall not exceed 600% subject to tolerance.
- In particular cases, when the starting with reduced voltage is specified, care shall be taken such that the design values of torque meet the load requirement while at the same time complying to starting conditions mentioned above in S.No.4.

➢ Construction

- Insulation: Unless otherwise specified the motor shall be with Class 'B' insulation as a minimum. In case of motor with class 'F' insulation the permissible temperature rise above the specified ambient temperature shall be limited to those specified in the applicable Indian Standard for class 'B' insulation.

  In case of motors driving equipment with pulsating loads, special care shall be taken for the joints of rotor bars and end rings to avoid premature failure due to induced fatigue stress.

- Terminal Box and Cable entries. The terminal box shall be suitable enough to facilitate easy connection of the cables. The terminal box shall be with necessary clearances, creepage distances between live parts and between live parts to earth considering air insulation and without any compound filling.

  The terminal box shall be provided with cable lugs and entries for suitable cable glands corresponding to the size of the specified cable. Nickel plated brass (or aluminium if specifically required),

double compression type cable glands/ flame proof cable gland shall be supplied along with the motors for the specific cable size.
Equipment and accessories shall conform to the hazardous area classification and the environmental conditions as specified.
The terminal box shall be capable to withstand internal short circuit conditions without danger to personnel or plant.
Appropriate phase markings as per IS shall be provided inside the terminal box. The marking shall be non-removable and indelible.

FIRE DETECTION SYSTEM FOR WP SHED

1. Fire Alarm System

Item	Minimum Requirement Description
Make	
Model	
Loop	1 expandable to 10
Detectors	159 per loop
Addressable monitor/control modules	160 per loop

Primary Input Power:	AMPS-24: 110-120 VAC, 50/60 Hz, 4.5 A maximum. AMPS-24E: 240 VAC, 50/60 Hz, 2.25 A maximum
DC Output:	Main 24 VDC: Up to 5.0 A Aux 24 VDC: Up to 5.0 A 5 VDC: Up to 0.15 A.
Temperature and humidity ranges	0 – 49°C/32 – 120°F and at a relative humidity 93% ± 2% RH (noncondensing) at 32°C ± 2°C (90°F ± 3°F).
Approvals	UL Listed: S635. ULC Listed: S635. MEA: 232-06-E. Fire Dept. of New York: COA#6114. CSFM: 7165-0028:0224 (Commercial). FM Approved. FM6320 Approved. Class 6320 for Gas Detection.
Standards	UL 864 (Fire). UL 1076 (Burglary). UL 2572 (Mass Notification Systems). (NFS2-3030 version 20 or higher) LOCAL (Automatic, Manual, Waterflow and Sprinkler Supervisory). AUXILIARY (Automatic, Manual and Waterflow) (requires TM-4) BIS 2008 or ISO Certification
Weight	0.16kg
Operating Temperature	-20 °C to +60 °C
Relative Humidity (non-condensing)	0% to 95%
IP Rating	IP24D
Operating Voltage	17-28V DC
Environmental Specifications	IP65

IR-UV Fire sensor	
Spectral Response	3600-L-LB: UV: 0.185 - 0.260 micron IR: 2.5 - 3.0 micron 3600-L4-L4B: UV:0.185 - 0.260 micron IR: 4.4 - 4.6 micron
Response Time	Typically 5 seconds. High speed 150 msec response to saturated signal

Sensitive Range	1 sq. ft. (0.1 sq. m) n-heptane pan fire from 50 ft. (15 m)
Field of View	100o Horizontal, 95o Vertical
Temperature Range	Operating: -67oF to 167oF (-55oC to 75oC) Operating Option: -67oF to 185oF (-55oC to 85oC) Storage: -67oF to 187oF (-55oC to 85oC)
Humidity	Up to 95% non-condensing (withstands up to 100% RH for short periods)
Heated Options	To eliminate condensation and icing on the window
Electrical Specifications	Operating Voltage: 24 VDC nominal (18-32 VDC) Power Consumption: Standby: Max. 90 mA (110 mA with heated window) Alarm: Max. 130 mA (160 mA with heated window) Cable Entries: 2 x ¾" - 14 NPT conduits or 2 x M25 x 1.5 mm ISO Wiring: 12 - 22 AWG (2.5 mm2 - 0.3mm 2) Electrical Input Protection: According to MIL-STD-1275B Electromagnetic Compatibility: EMI/RFI protected to EN61326-3 and EN61000-6-3 Electrical Interface: The detector includes twelve (12) terminals with five (5) wiring options (factory set)

Outputs	Relays: • Alarm, Fault, and Auxiliary • SPST volt-free contacts rated 5A at 30 VDC or 250 VAC 4-20 mA (stepped) • Sink (source opton) configuration • Fault: 0 + 1 mA • Warning: 16 mA +/- 5% • BIT Fault: 2 mA +/- 10% • Alarm: 20 mA +/- 5% • Normal: 4 mA +/- 10% • Resistance Loop: 100-600 ohms HART Protocol: Optional HART communication on the 0-20 mA analog current (FSK) – used for maintenance, configuration changes and asset management, available in mA source output wiring options RS-485: RS-485 MODBUS compatible communication link that can be used in computer control installations
Approvals	Hazardous Area • ATEX &IECEx Ex II 2 GD Ex de IIB + H2 T5 (-55o to 75oC) Ex de IIB + H2 T4 (-55o to 85oC) Ex tD A21 IP66/X7 T 95oC Ex tD A21 IP66/X7 T 105oC • FM/CSA Class I Div. 1, Groups, B, C & D Class II/III Div. 1, Groups E, F & G Performance • EN54-10 (LPCB) • FM-3260 (FM) • • DNV Marine Approval Reliability • IEC61508 – SIL-2 (TUV) • PDO Approval: Petroleum Development Oman Certificate of Registration • ISO 9001:2008: Registered Quality System

COMMUNICATION SYSTEM

1. Line Exchange 200 Line

Item	Minimum Requirement Description
General Requirement	IPPBX (Hardware & Software) shall be provided in high availability configuration.
Technology	The system should support IP or SIP as well as TDM. The TDM can be supported through an external Gateway.
Interface	Should be compatible with all telecom interfaces or Telecom Service providers
Type Of Interfaces	It should compatible with ISDN PRI, Analogy trunks, H.323 trunk, SIP trunk. It should also provide facility to integrate with GSM, Radio devices.
Type of Extension Support	Analogy, Digital, IP, SIP (3rd party SIP phone), IP Phone
Expansion of Extensions	IP Telephone extensions should be expanded based on quantities of data switch ports available.
System Design	The IP PBX should be modular, expandable, embedded IP server-gateway/server based architecture, having Unix or Linux or equivalent operating system software based platform. The system shall have hot standby/Active-Active arrangement so that it should continue to operate in case of failure or maintenance of main processor or power supply or interfacing card or CPU etc. The system should support IP or SIP as well as TDM. The TDM can be supported through an external Gateway.
Conferencing	Conference bridge that can manage multiple calls (min 5) simultaneous conferees.
ACD And CTI Support	Support for ACD Call Centre with CTI and advance call routing
Call Center Communication Support	Support Standard SIP based IP Platform, Session Initiation Protocol over an MPLS or Multiple Label Switching Protocol for connectivity of call center to other call center communications,
Outbound Calling Support	The system shall allow outbound calling from the IP Phones.
General Requirement	The system shall support local announcements and music on hold.

General Requirement	The system shall be able to provide interface to ISDN PRI
Features	The system shall be able to provide following features like Basic Call Setup, Name and Number Support, Transit Counter, called or Calling or Busy or Connected Name and Number, Name Identification, Diversion (Call forwarding), Diversion (Call forwarding) with Reroute, Call transfer.
General Requirement	The system shall have inbuilt web-based software for administration and maintenance of the system. It shall provide the following features:
	▶ The software shall provide GUI based interface for configuration and management of the system.
	▶ The Software shall provide real-time information or alerts and reports regarding health status e.g. up or down status, performance & resource utilization statistics etc. of the system and its components.
	▶ The system shall maintain the accounting and authorization logs of the users accessing the components of the telephony system. The logs shall include information about users who have login into the system.
	▶ It shall be possible to schedule tasks. The tasks could be one or more operations that the user can specify to run at a predetermined date and time.
	▶ It shall provide reports about station alarms, trunk analysis, processor occupancy, system capacity etc.
	The system shall have inbuilt web-based software for administration and maintenance of the system. It shall provide the following features:
	▶ The software shall provide GUI based interface for configuration and management of the system.
	▶ The Software shall provide real-time information or alerts and reports regarding health status e.g. up or down status, performance & resource utilization statistics etc. of the system and its components.
General Requirement	▶ The system shall maintain the accounting and authorization logs of the users accessing the components of the telephony system. The logs shall include information about users who have login into the system.
	▶ It shall be possible to schedule tasks. The tasks could be one or more operations that the user can specify to run at a predetermined date and time.
	▶ It shall provide reports about station alarms, trunk analysis, processor occupancy, system capacity etc.
	The IP PBX system should provide complete inbuilt encryption capabilities or features without any external firewall, with the ability to encrypt all traffic (media and call control signaling) between IP

	phones, soft phones, call controllers and all other associated endpoints via a strong encryption algorithm like IPSec or SRTP etc.
	The system shall provide features viz. silence suppression, comfort noise and voice activity detection.
	It shall provide some features as give below but not limited to these this list. It can be expand further based on requirement
	▶ Call forward all, Call forward while busy, Call forward if no answer
	▶ Call hold, Call Drop and retrieve
	▶ Call Waiting and Retrieve (with configurable audible alerting)
	▶ Call Join
	▶ Call status (state, duration, number)
	▶ Conference for atleast 5 parties
	▶ Missed call information on IP phone
	▶ Directory dial from phone
	▶ Hands-free, speakerphone
	▶ Last number redial
	▶ Malicious Call ID and Trace
	▶ Abbreviated Dial, Speed Dial
	The system should have IP address and connected to the network

	The system must support log services for both Internal and External commands and configuration history for at least 30 days

2. Radio Interoperability System

a. The interoperability gateway should offer multiples input channels for radio entry points.

b. The interoperability gateway should have ability to interface radios, computers, IP video feeds and smart phones within a common multi-user interface.

c. The interoperability gateway should be an independent node replication and does not require a centralized server or services to make, break or manage multi-node connections.

d. The interoperability gateway should have ability to break patches even when the systems are disconnected or loses network connection.

e. The interoperability gateway shall be assigned a unique server identification number.

f. The interoperability gateway shall support 26-pin voice and data interface ports for radio connections while offering remote radio control for select mobile radio models.

g. The interoperability gateway should have unlimited gateway scalability. The base system should have ability to add any number of input channels or IP connections.

h. The interoperability gateway should support an activity log with the ability to double-click on a transmission for instant recall.

i. The interoperability gateway shall support an unlimited number of simultaneous communications, cross connects, or patches based on the number of assets connected.

j. The interoperability gateway shall support the ability to create pre-set groups and radio configurations. When selected by the user, the gateway recreates the groups and radio configurations.

k. The interoperability gateway shall support the ability to interface to remote communications radios at towers using standard tone remote control ones with tone control hardware options.

l. The interoperability gateway shall support the ability to offer remote control tones that are user selectable. Controls will be user selectable by audio frequency, tone(s) duration, sequence of multi tones and tone level output. Remote control tones will be capable of outputting audio levels that will key the remote transmitter.

m. The interoperability gateway shall support the ability to support all conventional radios, HF, VHF, UHF, 700/800 MHz trunking, conventional and military radios.

n. The interoperability gateway shall support a simple to learn GUI with touch screen design.

o. The interoperability gateway shall support the ability to configure patches with simple to use cluster groups.

p. The interoperability gateway allows the user to create patches by selection of repeater tower locations or radio gateways.

q. The interoperability gateway offers the ability to configure a port via predefined software profiles.

r. The interoperability gateway shall support the ability to save all settings channel-by channel basis.

s. The interoperability gateway shall support the ability to configure channels on the fly with no impact to any other channels.

t. The system offers the ability to set up major user types including (1) System Administrator, (2) Dispatcher and (3) User. Users may be assigned rights and privileges regarding which functions maybe performed by the user.

u. The interoperability gateway shall support the ability to store and forward audio to account for delays within a trunking radio system.

v. The interoperability gateway shall support the ability to allow all channels (radio select chassis) to interface with the "ready" and "transmit" handshakes with trunking radios.

w. The interoperability gateway shall support the ability to interface with Nextel PTT radios. Remote users with Nextel PTT phones can communicate seamlessly with any gateway channel set up to network with the radio system.

x. The interoperability gateway offers full control from a remote client station with the ability to perform all system administrator or dispatcher functions from client stations.

y. The interoperability gateway shall support the ability to log-in multiple users within a shared workspace (optional computer ports). All users see elements created and affected by users within the system

z. The interoperability gateway shall support the ability to communicate via TCP/IP protocols.

aa. The interoperability gateway offers the ability for remote client stations to control all radio functions available from the connected radio front panel, e.g. frequency, power levels, channels, zones, scan, talk-around, etc. This capability is available assuming the radio has a computer control capability.

bb. The interoperability gateway shall support the ability to create "Dispatch Groups". The dispatcher can communicate with all radios, phones or computer terminals connected through the gateways by PTT a single on-screen element whereas all assets within the group remain operationally independent and do not hear cross connects. The members of the dispatch group may transmit to the dispatcher directly. Other members of the dispatch group may not listen to communications between the dispatcher and the individual members. The dispatcher function shall allow for frequency and transmit control of the radios.

cc. The interoperability gateway shall support the ability to establish "Private" connections between any gateway channels. Private connections act as nested groups and allow communications only between the gateway channels connected in private.

dd. The interoperability gateway shall support the ability to place radio entry points in both "Talk Groups" and "Private". When the gateway is connected in both modes, the operator may listen to both the normal Talk Group and the Private connection.

ee. The interoperability gateway shall support the ability for remote users to control or communicate with the radio subsystem server via TCP/IP wired network using RIOS client software. Remote users can perform all functions (i.e., make/break connections, start recording, etc.) as if they were physically located at the server.

ff. The interoperability gateway shall support the ability to select the priority of the "listen to" radio entry point. The priority may be changed in real time by the dispatcher with no impact on switch operations.

gg. The interoperability gateway shall support the ability to be connected using a remote IP connection, e.g., VPN using the Internet (with optional VPN set up and router).

hh. The interoperability gateway shall support the ability to be connected using an IP network to form a Radio Wide Area Network (RWAN). The RWAN will allow the user to select which gateways are allowed to participate in the radio wide area network. Selection of the gateways servers will be done simply by adding from a drop down list. Upon selecting the gateway assets to participate in the RWAN, the selected servers will appear in the shared RWAN "workspace".

ii. The interoperability gateway shall support the ability to display to RWAN sites in selectable colors indicating a RWAN gateway. Assets from that location will be color-coded once connected in the shared workspace.

jj. The interoperability gateway shall support the ability to control RWAN connections using site permission individual to each asset. Site permission shall include the ability to protect (1) patching right and (2) monitoring right from the remote gateway.

kk. The interoperability gateway shall support the ability to create "chat groups" by the selection of the computer station icon. Chat groups are defined as multiuser capable text messages with the gateway interface.

ll. The interoperability gateway shall support the ability to allow for the connection of a router (802.11x).

mm. The interoperability gateway shall support client software that can monitor in mono and stereo mode.

nn. The interoperability gateway shall support audio channels with individual volume controls.

oo. The interoperability gateway shall support the ability to communicate with P25 compliant radios.

3. Radio Set

The successful bidder has to consider specification and functionalities of in service radio sets.

INTEGRATED COMMAND & CONTROL CENTRE

1. Command & Control Platform/Application

(i) The Integrated security systems software shall support the following systems on a single platform with a feasibility to create/modify the reports as per client's requirement. The software shall support multiple web clients and desktop clients on client server architecture.

(ii) The software shall be an integrated software platform to monitor and manage the below system modules enabling the end user to have the comfort and convenience of establishing a single point responsibility for the monitoring, management and upkeep of their facilities.

- IP based CCTV monitoring and recording system
- IP based thermal camera monitoring and recording system
- Perimeter Intrusion detection system
- Fire Alarm system
- Communication system
- Contraband detection system

(iii) Access control system and CCTV System with Digital video transmission and recording including event (access and alarms) linked recording shall be supported.

(iv) The software shall support industry standard communication protocols.

(a) System Architecture

(i) The application shall be modular and must have a highly scalable architecture that can suit a single site and scale up to manage multiple sites across varied geographies if need be.

(ii) The application shall support single / multiple / clustered servers to meet the requirements of the implementation if required.

(iii) In its basic form the application, database, communications and user interface may be installed on a single Server / PC. As the system expands in terms of complexity, functionality or volume of data processed it shall be possible to install the different application server components in multiple machines and support full client server architecture for the user workstations.

(iv) The responder shall be able to provide load testing reports for defined scenarios covering a defined number of events / alarms / concurrent users on client workstations and defined number of hits to the database. This shall be available both in a LAN and WAN environments. The responder shall be required to establish a proof of concept under the defined load conditions and provide detailed load testing reports and allow inspection of the simulation in the responder's own facilities if need be.

(iv) The application shall support communication drivers for various real time systems / hardware platforms that need to be brought under the command and control infrastructure. The application shall support the ability to include custom developed communication drivers and provide an open architecture in interfacing multiple third party systems that may need to be brought under this infrastructure.

(v) The application shall be designed for high availability. The solution architecture shall optionally support dual redundancy in the servers and back up servers. It shall also support remote replication of data for disaster recovery. The application shall support remote desktop client workstations that shall be able to work as independent servers managing a local site / set of sites in case of connectivity loss with main / standby servers. Responder shall be able to provide detailed system architecture and a white paper on how the proposed application meets these requirements.

(b) General Requirements

(i) The application software shall be an integrated application for the management of various services within a building, campus or an enterprise across multiple global locations.

(ii) The services / disciplines managed by the software shall include Access control, Perimeter intrusion detection system, Fire, lighting, CCTV Systems etc.

(iii) The software shall have a single integrated back end database for all these disciplines and shall provide an integrated GUI (Graphical User Interface) for monitoring, managing and reporting across these disciplines.

(iv) The application shall be based on latest technology such as Microsoft.NET

(v) The application shall not require administrator privileges on the Operating system.

(vi) The application shall comply with a distributed 3 tier architecture. There shall be a common Business Logic layer and a single Data Access Layer that shall control access to the database.

(vii) The application should support MS SQL Server at the minimum. It is desirable that the application also support SQL Lite and MySQL.

(viii) The application shall provide an option of using a desktop based GUI as well as a web based UI.

(ix) The web based UI shall provide all functionality as the desktop GUI. Web UI restricted to alarm monitoring or only partial configuration shall not be acceptable.

(x) The desktop UI shall be designed to allow multiple screens to be opened at the same time. The user shall be able to fix windows (dock) or keep them floating.

(xi) Floating windows shall be dragged to another monitor in the case of a PC supporting multiple monitors. This shall facilitate graphics views on one monitor and list views or video on another.

(xii) The application shall provide a familiar Windows point and click environment. It shall also facilitate easy learning by providing quick access menus like toolbars.

(xiii) The application shall display all configurations in at least 2 formats:

(a) Hierarchical tree views for displaying all hierarchical data.

(b) List views that list all configured items based on user rights.

(xiv) It shall have the following Tree Views as minimum.

(a) Site Tree – Objects shall be linked under the respective sites. Hierarchical view based on site.

(b) Object browser – Objects shall be grouped under the Communication Gateways.

(c) Quick View – Objects shall be grouped like a windows explorer folder view (System wise). Operator configuration actions such as add/edit or delete shall be possible from either the tree view or the list view.

(xv) All operations on the application should be asynchronous and shall not hold up any other operation, for e.g., bulk data change should not hold up receipt of alarms.

(xvi) Communication across layers shall be encrypted. AES with 128 BIT key for symmetric shall be acceptable. Native encryption shall not be acceptable.

(xvii) Data transfer across layers shall be compressed to provide optimum utilization of bandwidth.

(xviii) Communication across layer shall preferable be over HTTP with suitable authentication. Responder to specify communication technology, port used and authentication mechanism.

(xix) Login from the Web UI shall be using MD5 or SSL.

(xx) The application shall not store any form of passwords in clear text. All such passwords either in configuration files or in the database shall be encrypted. AES with 128 BIT key. Native encryption shall not be acceptable.

(xxi) The access to database shall not be based on the default user; the application shall use a specified or pre-defined login.

(xxii) It shall be possible to designate a desktop as a specific workstation that exposes only a defined functionality like a specific Video Workstation irrespective of the logged in operator excluding the Master User or Administrator.

(xxiii) Application shall provide for the ability to copy existing configuration across hierarchies.

(xxiv) Application shall also provide the ability to clone (create multiple instances) of a configured entity. A minimum of 50 clones should be possible in one user action.

(c) Events & Alarms

(i) It shall be possible to define messages as normal events or as alarm globally for the system.

(ii) It shall be possible to define some alarms to require re-entry of operator password before process.

(iii) The system shall support up to 255 alarm priorities. Each alarm priority shall be associated with a color for easy identification of the alarm's criticality.

(iv) It shall be possible to define Operator instructions for each alarm from each site.

(v) System shall support alarm escalation where unacknowledged alarms shall be escalated and reported to supervisory workstations. Time out for each alarm for escalation shall be definable.

(vi) The application shall display alarms and events in separate windows. Alarm window shall pop up (or become window on top) in case it is minimized and an alarm is received.

(vii) The alarm window shall group alarms by priority. The group header shall display the total live alarms and acknowledged alarms in each priority.

(viii) It shall be possible to regroup the alarms by location (sites) or application type on the fly.

(ix) Alarms messages shall provide the following minimum data:

(a) Date & Time of occurrence. Alarm Description (in case of perimeter Intrusion/Access control/CCTV).

(b) Location.

(c) Device Description.

(d) Card holder name (in case of access control system card based alarm).

(e) Priority (in case of grouping other than priority).

(x) It shall be possible to double click on every alarm and get additional data that shall consist of the following:

(a) Alarm Instruction for the operator.

(b) Alarm Action capture. This shall record free flowing text entered by the operator. This information shall be stored with the operator id and date time stamp.

(c) History of last 10 alarms from that Site / device.

(d) Last Card Entered in case of an alarm from Access Controllers.

(e) Link to play video in case event is linked to a video clip.

(xi) The application shall provide for a 2-stage alarm management. Operators shall acknowledge the alarm on receipt and after investigation and closure shall be able to process the alarm.

(xii) Alarms shall be visible till it is processed. It shall be possible to visually differentiate between a live alarm and an acknowledged alarm.

(xiii) It shall be possible to process a group of alarms. In such cases the application shall prompt for the logged in operator's password.

(xiv) Existing alarms (live alarms prior to login) shall be displayed separately as History Alarms. History alarms shall be grouped as:

(a) Today

(b) Yesterday

(c) Two Weeks

(d) Last Month

(e) Older

(d) Operator Definitions

(i) It shall be possible to create Operator Group profiles. Unlimited number of groups shall be possible.

(ii) Group Profiles shall define the operator menu rights, access rights and action rights.

(iii) Group profiles shall also define the events and alarm routing. Group Profiles shall also define the rights to acknowledge and/or process the alarms routed.

(iv) Individual operators may be created and assigned to the group profiles. The following minimum definition shall be possible:

(a) Password Change on next logon.

(b) Password change not allowed.
(c) Password Disabled.
(d) Auto Log Out period.
(e) Validity days.
(f) Partitions (Sites) allowed for access.
(g) Application disciplines (Access / Video / Intrusion) allowed for access.

(v) Operator password must be at least a combination of 6 alphanumeric characters long, containing at least 1 numeric character and at least one character in caps.

(vi) The application shall not allow last 6 passwords to be repeated.

(vii) The application shall notify expiry of the password if the validity is less than 15 days.

(viii) Application shall allow for an operator to have Menu and edit rights for an object say a card holder, but is shall be possible to restrict the view to avoid any personal data like address, mobile number etc.

(ix) It shall be possible to restrict operator access to limited workstations in case of desktop UI.

(e) Reporting

(i) The application shall provide a comprehensive reporting engine.

(ii) Normal day to day reports shall be predefined and shall consist of but not limited to the following:

(a) Listing of all master configurations
(b) Listing of all Group Profiles and the rights
(c) Listing of all operators and their associated group profiles
(d) Listing of Card Holders/point lists with respect to each plant
(e) List of all alarms based on date and time
(f) List of all normal events based on date and time.

(iii) These reports shall be available in Crystal Reports or equivalent reporting tool.

(iv) The application shall provide an additional report option where by the user shall customize the view based on:

(a) Groups
(b) Sort order
(c) Column Selection (based on predetermined sub set)

(v) The application shall also provide for a customizable report generator whereby report formats shall be created at site. The options shall be the following:

(a) Report title
(b) Group Headers and titles
(c) Column Selections (all fields in the database)
(d) Sort order
(e) Filter criteria based on SQL like statements. The operations shall be logical (<,>, =, <>, in, not in, like) and aggregate (count, sum, avg) functions.
(f) Font size, fore color and back color

(vi) It shall be possible to save report formats created and reused.

(vii) All reports shall provide an ability to export to the following:

(a) CSV
(b) Text

(f) Trending

(i) The application shall provide for creating a data log.

(ii) It shall be possible to define unlimited points and their frequency for data logging.

(iii) Frequency shall be selectable:

(a) Quarter Hourly
(b) Hourly
(c) Daily
(d) Weekly
(e) Monthly

(iii) Notwithstanding the frequency specified, the data log shall also include all state changes.

(iv) It shall be possible to define a point in more than one data log with different frequencies.

(v) The application shall provide for unlimited points from within the data log to be displayed as a trend chart.

(vi) It shall be possible to select a period on the trend chart and zoom into it.

(viii) Trend data shall also be represented as a summary consisting of:

(a) Max value.
(b) Min value.
(c) Average for the plotted duration.

(x) It shall be possible to select the color of each point charted on the trend.

(x) It shall be possible to save the trend graph as an image.

(g) Graphics

(i) The application shall provide a fully functional graphics module.

(ii) It shall be possible to import images into the graphics module to create a graphical representation of the facility.

(iii) The images can be linked by using a link button.

(iv) It shall be possible to define generic device properties for each type of physical hardware like doors, inputs etc.

(v) It shall be possible to create more than one generic device for each hardware type with unique properties like icons, actions and states.

(vi) It shall be possible to position these devices into the images to indicate actual location within the installation.

(vii) It shall be possible to associate a group of images and create an animation.

(vii) Generic devices shall accept animation files for various states.

(viii) Generic devices shall be associated with a specific instance of hardware to create association. For example, Main Entry Door shall be associated with one generic door device.

(ix) It shall be possible to define a specific instance of hardware in to more than one generic device.

(x) It shall be possible to display analog values as a horizontal bar, vertical bar or as plain text. Measurement unit like Celsius shall be definable and visible in the graphics.

(xi) It shall be possible to define which image must be popped up in case the device goes into alarm.

(xii) It shall be possible to perform actions from the device icon on the graphics.

(xiii) It shall be possible to view up to 5 live alarms from each device on the graphics.

(xiv) It shall be possible to view the device configuration from the graphics.

(xv) The system shall allow graphic pages to have devices across multiple disciplines. It shall be possible to define on the same graphics page any system device including cameras, access doors and intrusion alarm sensors.

(h) Interfaces

(i) The application shall be able to provide multiple interface options.

(ii) To interact with third party applications. It shall be possible to access and retrieve a list of alarms and events from external applications using web services.

(iii) It shall be possible to manually import cardholder data from an excel sheet. The interface shall import from a pre-defined excel template as well as provide the ability to map the excel columns to the required database fields.

(iv) It shall also be possible to programmatically import cardholder data from an XML or a CSV file. Any external application shall be able to push an XML or CSV file based on a schemer. The interface shall process the file and add, modify or delete cardholder's records.

(a) It shall be possible to export events or alarm to a text file. The following definitions shall be possible.
(b) Frequency.
(c) File name.
(d) File extension.
(e) Fields required.
(f) Separator

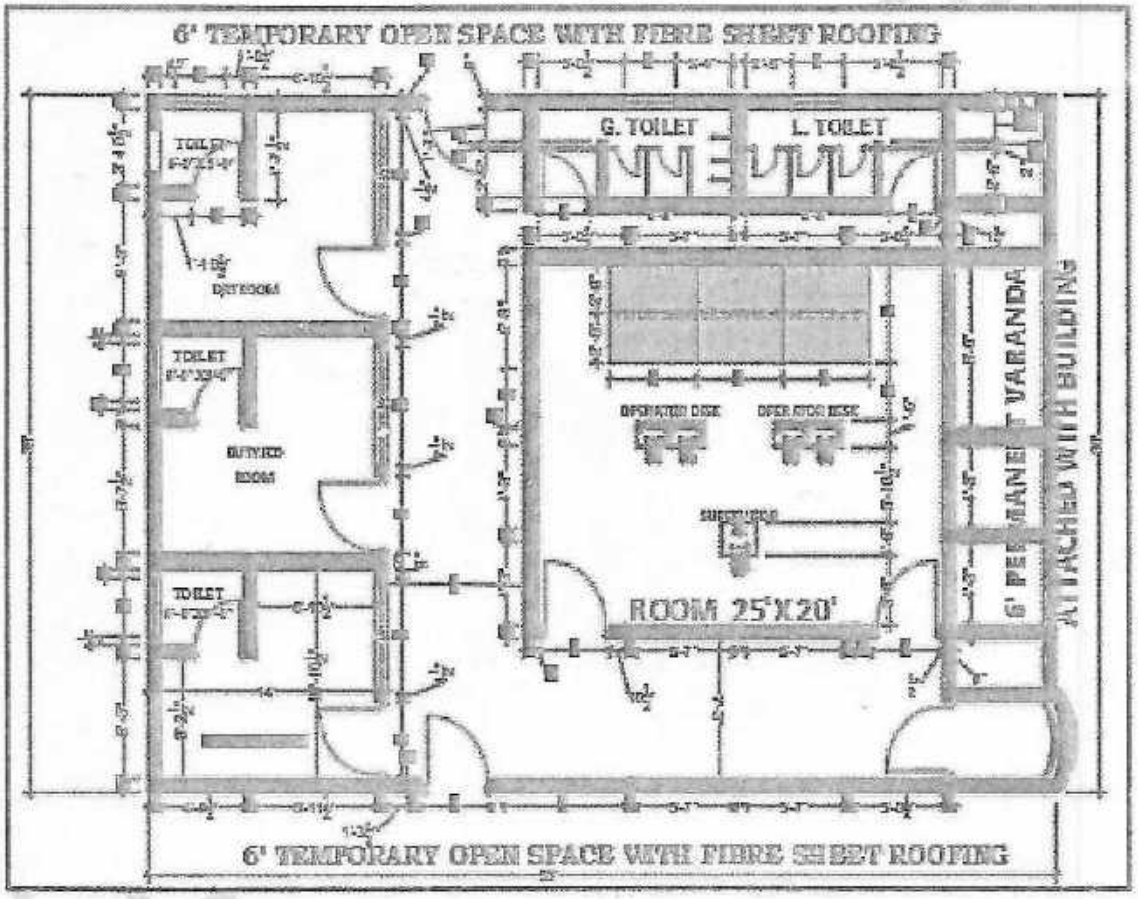
(v) It shall be possible to export cardholder data to text or XML file.

(vi) The application shall be a comprehensive solution that supports the following plug in modules.

(a) Time & Attendance with workflow.
(b) Visitor management.
(c) Notification.

3. Command and Control Room

The ICCC building will have Command and Control Room (CCR) where the operators would be sitting. Below is an indicative & suggestive layout of the proposed CCR. The exact floor dimensions and interiors of the building would be finalized by architects & the civil engineering experts who will be designing the ICCC layout, structural designs and interior planning & designing. The plan indicated in this section is indicative & suggestive in nature. The final architectural plan and relevant details shall be submitted separately.



ICCC building will also house the Datacenter, electrical & battery/UPS room. The details of the following are as below:

- Datacenter: This area will house all the core IT infrastructure which includes the server farm, storage, security and other datacenter assets in a controlled environment. The datacenter-controlled environment would provide clean power, adequate cooling, fire & hazard protection and physical security for the datacenter assets. The architects & civil engineering experts will design the interiors of the datacenter where in the cabling (both power & network)

would be provisioned under the floor. The datacenter area would be protected under 24x7 surveillance and would have biometric (finger print) based access control.

- Electric Room/battery/UPS room
- Officer's cabin
- Support Staff rooms

(a) Standards for construction and interior works in CCR

The scope of the project includes construction of control room, designing, engineering, supply & installation of ICCC Interiors with air-conditioners for adequate cooling of entire control room space. As the Control room is a significant place, it is imperative that it is designed properly in terms of Aesthetics, Ergonomics and Functionality. Various aspects should be considered while designing Control Room area to create ideal work place, considering physiological aspects such as line of sight and field of vision and cognitive factors such as concentration and perceptivity as per ISO 11064/ or equivalent.

The Architects & civil engineering experts would undertake the designing of the interior of the ICCC in such a fashion so that they shall reflect human factors requirements including the following:

- Satisfactory environmental conditions for operator personnel. Including noise, airflow, temperature and humidity, and precautionary measure under uncontrolled conditions (like fire) beyond acceptable limits.
- Adequate space for personnel and equipment for the movements and activities they are required to perform during operation and maintenance, under both normal and emergency conditions.
- Adequate visual / auditory status information and other communication links between personnel and equipment under normal and emergency conditions.
- Adequate illumination for the performance of operation, control, maintenance and training.
- The control room shall be built as per the criteria of "Human Factor Engineering" to improvise the efficiency utilization of the operators and provide them Fatigue free working environment.
- The interiors should be designed to
  - Ensure maximum standard of safety.

- Allow Flexibility
- Minimize maintenance
- Improve operator's efficiency & alertness.

- Selection of fire retardant/rated material is must.
- Implementation agency is responsible for setting up and O&M of entire ICCC including all the, hardware and software, interior work for setting-up of ICCC at physical space provided by authority, Network Cabling, Electrical Works, Video Wall, Furniture's and Fixtures, CCTV Surveillance system of the ICCC, Access Control System etc. as per the scope of work.
- The Implementation agency will have to provide all necessary Hardware, Network Infrastructure, Active and Passive Connectivity, Power Backup including all IT infrastructures that may be required for the ICCC for the entire contract duration.
- Video Wall: A state of art 65" LED TV facility should be installed at CCC. Followings are the functional requirement of video wall: -

- The video wall shall use multi-monitor (e.g., different monitor can display different input source) and split screen (e.g., several intersections can be displayed on one monitor) display technology to provide the flexibility to accept audio and video inputs Camera system, TV signal, recorded video, and Laptop computer.
- Should have provision for live monitoring and control of various application & Smart solution modules

- Each operator shall be provided with one workstation with three monitors for system monitoring along with one intercom line.
- Implementation agencies scope of work and supply of the control room only in the ICCC and its components including Ergonomic Study, Desk, Ceiling, Flooring, Panelling, Partition, Illumination defined in this document shall be on turnkey basis. The expected size of the control would be 2000 Sq. ft.
- Design, Engineering, Manufacturing, supply of all related goods and providing all related services including installation, testing, integration, commissioning etc. all complete, preparation of related drawings, documentations etc. of the control room.
- Quality assurance and commissioning of the complete system at site to the complete satisfaction of the owner/consultant.

- The control room solution provider must be ISO 9001, ISO 14001, OHSAS 18001 and ISO 27001 certified.
- Wall paneling, ceiling & desk system shall be seismic zone 5 tested and certified from government approved test laboratory.

(b) Minimum Required Specifications for CCR components

- Control Desk: -
  - Structure: - Every desk shall be standing on aluminum pole-based system, the pole shall have 200 mm diameter and minimum 10 mm wall thickness at circumference. Both the load carrying poles shall be visible as design elements on the extreme sides of the desk; work top & floating CPU Cabinets shall be installed on these poles. The CPU cabinet shall be raised by 150mm from floor and shall be firmly mounted between extreme end poles. The CPU cabinet shall have curved extruded aluminum shutters. Straight shapes/profiles of desk like under structure, slat wall, front edge, table tops etc. shall be deemed unacceptable.
  - The standard frame width shall be 1160-1250mm with an overall height of 711-762 mm to correlate to standard seated height applications.
  - Conventional bulky, boxy type desk of metal and aluminum structure shall be deemed unacceptable.
  - Wire shall be routed into the cabinet through the pole. Proper maintenance access points to be provided via suitable snap fit plastic /metal covers.
  - Table Top: - The table top core shall be made up of aluminum and shall have 2 mm thick acoustic laminate finish on the top. Desk top shall have a feature of tilting by 2 to 5 degrees with help of noise free mechanisms.
  - Front Edge: - High-density Poly Urethane Foam molded on industrial grade aluminum core to form 50mm deep tapered edge to be installed on worktop. The Edge shall be mechanically replaceable within 30 minutes in case of damage or wear without opening or removing the worktop.
  - Cable Managers and Rear Edge: - All the cable manager openings and rear edge of worktop shall be protected from no spill molded PU edge, 5

mm high above worktop surface to prevent liquid from spilling inside the CPU/Equipment Cabinet.

- Slat Wall: - 60 mm thick Curvilinear Slat wall shall have radius matching to the CPU cabinet shutter. Slat wall shall have inbuilt mechanism for tool less & effortless sliding of the monitor arm across the length of the console without removing the monitor pole.
- Monitor Arm Assembly shall have auto-lock, push & add/remove die-cast aluminum extendible arms of 150mm each with tool less addition/deletion feature to cater future requirements. Tool less addition / deletion in less than a minute. UL certificate to be enclosed along with the bid.
- Electricals: - The exhaust fans shall be provided with thermostats. Fans will automatically shut down in case the shutters are opened.
- Cable Trays: - The desks must be designed with vertical and horizontal cable trays to allow for continuous cable management between the cabinets.

- **Panelling/Partition and Celling System:**
  - Look and feel of the control room shall be ultra-modern & unique. To solve monotony in control room in future, the panelling shall have inbuilt design in 20% tiles of panelling to change the colour without ordering new.
  - Conventional Gypsum, wood, Fabric and painting work shall be deemed unacceptable in the control room area.
  - Ceiling and panelling system shall be a combination of hexagonal and rectangular designs defined below: -
  - Hexagonal design: - Hexagonal ceiling and panelling shall be made up of extruded aluminum periphery rigid enough to pass seismic test mentioned above.
  - Rectangular design: - 25mm deep tray type panelling tiles with rounded corners shall be snap fitted to the main structure and firmly hold in place by die-cast aluminium corner locks. The die-cast locks shall be attached to the main MS structure or min 1.6 mm.
  - Tiles: - Tiles shall have minimum 10,000 micro-perforations per square meter to achieve NRC of 0.6 Sound Absorption Coefficient by diffuse field

method; IS: 8225-1987 "Measurement of Sound Absorption Coefficient in Reverberation Room" (Equivalent to ISO: 354- 1985 and ASTM 423-90).

- Hexagonal system shall extend possibility to integrate various raw materials like Solid surface, Fabric, Glass, Metal (perforated and non-perforated), illumination in the tiles to form multiple design combinations.
- Structure: - The structure shall be made up of 1.6mm thick powder coated steel structure.
- Cut-outs for LVS:- Panelling shall have provisions to accommodate Video wall in an aesthetically appealing manner.
- Wall Panelling System - Lockable & Replaceable: Modular wall panelling tile having secure locking arrangement for equidistant mounting. Locking arrangement enables easy replacement without using any tool within 20 seconds. The feature shall provide easy flexibility of locking all tiles in one column through gravity.

- Doors
  - Metallic Door:- With door spring and locking arrangements and both way handle. Prepare with rigid thermo fused film metal panels. Specification: 0.6mm thick Metal panel sheets, cavity filled with glass wool insulation of density 24kg/cum in roll form of make inside adequate quantity. Material of the partition and that of metal door will remain the same.
  - Metal door with Toughened Glass Vision Panel: - The door shall have 100mm frame (made of same material as that of wall Panelling /partition) and shall have 12mm thick glass pane in between. Glass Properties: Safety (tempered): when broken, must split into tiny harmless pieces.

- Illumination: - Control Room illumination shall be designed as per ISO 11064.

3. Workstation/Desktop

S. No.	Component	Minimum Requirement
1	Processors	Latest generation X86 Processor
		3.2 Ghz or Higher
		Min 8 MB
2	Mother Board	Latest series 64 bit chipset
		Either on the Display system or on chassis or external OEM speaker
		Intel/OEM
		16 GB DDR-IV (2400 MHz) or higher expandable up to 64 GB
		Graphics Card – 2 GB
		1x PCIe x16 and 1 PCIe x4 (total minimum 2 PCI Slots)
3	Display	21.5" or higher
		Active Matrix TFT LCD (Backlit LED); 3nos. monitor with each workstation/desktop
		1920x1080 or higher
4	Miscellaneous	Minimum 6 USB Ports (minimum two USB 3.0 ports and minimum 2 USB port 2.0 or higher in front) 10/100/1000 Ethernet Card, VGA/HDMI, Display Port/HDMI/DVI, Microphone & Stereo Head Phone/Combo port and other standard ports, tool less cabinet, TPM 2.0
		External/Internal 180 W or higher Power supply (>=85% efficient), Active PFC
		Tower
5	Mouse Optical Drive Keyboard	Optical/Laser USB
		Internal 8x or higher Standard USB
6	OS & Other Software	Preloaded Windows 10 Prof 64 bit Windows/Linux Ubuntu, MS Office, Adobe acrobat reader, Anti-virus etc.
7	HDD	1 TB SATA (7200 RPM) or higher capacity

DATA CENTRE COMPONENTS

1. Chassis Layer 3 Core fiber switch

S. No.	Detailed Technical Specifications
	Architecture
1.	Switch capacity - 1.4 Tbps or higher
2.	Switch forwarding rates – 1Bpps or higher
3.	10G/Gigabit - 24 ports scalable to 40 x 1/10G fiber ports
	40 Gig interface for uplink – 4 scalable to 12 x 40G Ports
4.	Non-blocking switch architecture and modular operating system
	Switching features
5.	802.3ad based standard port/link aggregation, Jumbo frames, storm control
6.	Support at least 4000 VLAN and 200,000 MAC Address
7.	FIP snooping, Datacentre bridging exchange (DCBX) and IEEE 802.1Qbb (PFC) from day1
	Security
8.	802.1X Network Security and Radius/TACACS AAA authentication
9.	MAC Address filtering based on source and destination address
10.	support for various ACLs like port based, vlan based and L2- L4 ACL's
11.	Should have Control plane (DoS) protection
12.	The switch should support MACsec, SSH v1 & v2 and Dynamic ARP inspection
	Network Protocols
13.	Layer3 routing protocols like Static, RIP, OSPF, OSPFv3 from day 1 for the solution.
14.	The switch should support MPLS, L2 and L3 VPN and IPv6 Tunneling
	Quality of Service
15.	8 number of hardware queues per port
16.	DSCP, 802.1p and FCoE
	Multicast
17.	IGMP v1,v2,v3, IGMP snooping, PIM SM and MSDP
	High Availability
18.	The switch should support ISSU and BFD

	Management
19.	SNMP v1, v2, v3, RMON/RMON-II enabled, SSH, telnet, GUI, Web management and should have dedicated Management port
20.	The switch should support CLI via console, telnet, or SSH and should have image rollback option.
21.	Switch should support port mirroring feature for monitoring network traffic of a particular port/VLAN.
22.	Switch should support Link Aggregation on two different switches
23.	Built-in real-time performance monitoring capabilities
24.	Power Supply: Switch should have internal Hot Swappable Redundant Power supply
25.	Cooling Fans: Should have redundant cooling FANS
26.	The switch should support NEBS
27.	Switch should be stackable/VPC/Equivalent (All accessories to be provided from day 1)
28.	The Switch should be EAL3/ NDPP certified
29.	Certification - CE, FCC, UL EN 60950-1

2. Firewall

S. No.	Detailed Technical Specifications
	Architecture:
1	The appliance based security platform shall be capable of providing firewall, IPS and VPN (IPSec) functionality simultaneously.
2	The Firewall should support Application visibility and control, Antivirus and Antispam in future.
3	The Firewall should support Advanced Threat Protection like malware and zero-day threats
4	The platform should be based on real time, secure, embedded operating system.
5	Capability to detect hardware failure during power up and before going online
6	Should provide Stateful failover.
7	HA configuration that uses dedicated HA-control interfaces apart from the mentioned traffic interfaces
8	Should provide active/active and active/standby failover
	Sessions
9	Should support upto 2Million Concurrent sessions and at least 50,000 sessions per second
	System Throughput

10	Should provide 9 Gbps Firewall Throughput
11	Should have 4 Gbps IPsec throughput
12	IPS throughput of 3Gbps
13	Memory - atleast 16GB or higher and 100GB storage
14	Support: - IKEv1 and v2, IPsec VPN standards, 56-bit DES, 168-bit 3DES, OSPF routing, x.509, Up to 256-bit AES data encryption
15	Authentication, Authorization and Accounting (AAA) support: RADIUS, TACACS or TACACS+
16	Support for: Network and application level attacks ranging from malformed packet attacks to DoS attacks, Support RSA and Diffie-Hellman, MD-5, SHA-1, SHA-128, SHA-256
	DHCP relay: -
17	Forwards DHCP requests from internal devices to an administrator-specified DHCP server, enabling centralized distribution, tracking, and maintenance of IP addresses.
	Provides:
18	Rich dynamic NAT and PAT services ; Bidirectional NAT and Transparency; Static NAT and PAT services; Stateful and stateless and Zone-based firewall; Denial of service (DDoS) protection; Traffic anomaly protection; MPLS (RSVP, LDP) , MPLS VPN; Virtual private LAN service (VPLS)
	Management
19	Web based management to support for remote monitoring
20	Accessible through variety of methods including: Telnet, Console Port, SSH
21	Dedicated Out-of-Management interface
22	Support SNMPv1, v2, v3 & Support for syslog
23	Should have the ability to create customizable administrative roles/profiles (monitoring only, read-only access to configuration).
	Software features
24	support for IPv4, RIPv2, OSPF, BGP, VLAN, DHCP. Support for IPv6 RIPng, OSPFv3.
	Power Supply
25	Internal Redundant Power supply
26	Minimum Interfaces Required
	4 No's 10Gig ports and 8 No's of 1Gig Ports

3. 8 port (10/100/1000) Industrial Field Switch

S. No.	Parameters	Description
1	Switch Architecture and performance	The switch should provide 8 ports 10/100/1000 Mbps T POE+ ports, (with minimum power budget of 240W) and switch should additionally have 4 GE SFP uplinks.
		Switch should have wire rate switching capacity of minimum 24 Gbps or more
2	Layer 2 features	802.1Q VLAN on all ports with supply of minimum 256 VLANs and minimum 1K Mac addresses or higher

		Spanning tree protocol as per IEEE 801.1d, 802.1s and 802.1w
		Should support improved resiliency with support of ERPS or equivalent for ring topology
		Link Aggregation control protocol (LACP) as per IEEE 802.3ad
		Switch should support IGMP v1/v2/v3 as well as IGMP snooping and minimum 255 IGMP Multicast Groups
3	Quality of service (QoS)	Switch should support classification and scheduling as per IEEE 802.1P on all ports ad four egress queues per port. Switch should support mechanism of applying Automatic QoS or equivalent mechanism
		Switch should support eight hardware based priority queuing or equivalent to guarantee that the highest priority packets are serviced ahead of all other traffic
4	Security Features	Switch should support ACL's, TACACS+, RADIUS, ARP Spoofing, DHCP snooping, DHCP option 82, Dynamic ARP Inspection (DAI), IP source guard and BDU Guard or equivalent
5	Management, Easy-to-use Deployment and Control Features	Switch should have console port, support for SNMP version 1,2 and 3, TELNET, SSHv2, 4 groups of embedded RMON, DHCP server
6	Standards	IPv4/IPv6, IEEE1588v2 PTP, IEEE 802.3af, 802.3at,802.3az, NTP, PTP
7	Industry Standards	RoHS and IP30
8	Certifications	CE, FCC, UL EN 60950-1
9	Mount	DIN rail mount
10	EMC Compliance	FCC, IEC/ EN 61000-(3-2, 3-3, 4-2 to 4-6, 4-8, 4-11), RoHS
11	Operating Temperature	(-)10° C to +70° C
12	Shock Vibration	IEC 60068-2-27 IEC 60068-2-64 IEC 60068-2-32
13	Relative Humidity	Relative Humidity of 5% or 95% Non-considering
14	stability and credibility	OEM should have supplied minimum 1500+ switches in any surveillance project/multi-location project in Government.
		To ensure stability and credibility of OEM , Company should not have any history of merger / acquisition in last 10 years.

4. 24(10/100/1000) Port Managed Switch

S. No.	Parameter	Minimum Technical Requirement

1	Switch Architecture and Performance	Switch should have 24 Nos. 10/100/1000 Base-TX auto-sensing plus with minimum 2x10G SFP+ uplinks.
		Should support stacking using dedicated stacking ports with minimum 40 Gbps upto throughput
		Switch should support link aggregation across multiple switches in a stack.
		Should support stacking of minimum of eight switches
		Switch should have non-blocking wire-speed architecture.
		Switch should support IPv4 and IPv6 from day One
		Switch should have non-blocking switching fabric of minimum 128 Gbps or more
		Switch should have Forwarding rate of minimum 60 and above Mpps.
2	Features	IEEE 802.1Q VLAN tagging.
		802. 1Q VLAN on all ports with support for minimum 255 active VLANs and 4k VLAN ids
		Support for minimum 8 k MAC addresses
		Spanning Tree Protocol as per IEEE 802.1d
		Multiple Spanning-Tree Protocol as per IEEE 802.1s
		Rapid Spanning-Tree Protocol as per IEEE 802.1w
		Self-learning of unicast & multicast MAC addresses and associated VLANs
		Jumbo frames up to 9000 bytes
		Link Aggregation Control Protocol (LACP) as per IEEE 802.3ad.
		Port mirroring functionality for measurements using a network analyzer.
		Switch should support IGMP v1 / v2 / v3 as well as IGMP v1 / v2 / v3 snooping.
3	Quality of Service (QoS) Features	Switch should support classification and scheduling as per IEEE 802.1P on all ports.
		Switch should support DiffServ as per RFC 2474 / RFC 2475.
		Switch should support minimum 4 (four) queues per port.
		Switch should support QoS configuration on per switch port basis.
		Switch should support classification and marking based on IP Type of Service (TOS) and DSCP.
		Switch should provide traffic shaping and rate limiting features (for egress as well as ingress traffic) for specified Host, network.
		Strict priority queuing guarantees that the highest-priority packets are serviced ahead of all other traffic.

4	Security Features	Switch should support MAC address based filters/ access control lists (ACLs) on all switch ports.
		Switch should support Port as well as VLAN based Filters/ ACLs.
		Switch should support RADIUS and TACACS+ for access restriction and authentication.
		Secure Shell (SSH) Protocol, HTTP and DoS protection
		IP Route Filtering, ARP spoofing, DHCP snooping etc.
		Should support DHCP snooping, DHCP Option 82, Dynamic ARP Inspection (DAI)
		Should support a mechanism to shut down Spanning Tree Protocol Port Fast-enabled interfaces when BPDUs are received to avoid accidental topology loops.
		Should support a mechanism to prevent edge devices not in the network administrator's control from becoming Spanning Tree Protocol root nodes.
		Switch should support static ARP, Proxy ARP, UDP forwarding and IP source guard.
		The Switch should support IPv6 features from day-1.
5	Management, Easy-to-Use Deployment and Control Features	Switch should have a console port with RS-232 /RJ-45 Interface for configuration and diagnostic purposes.
		Switch should be SNMP manageable with support for SNMP Version 1,2 and 3.
		Switch should support all the standard MIBs (MIB-I & II).
		Switch should support TELNET and SSH Version-2 for Command Line Management.
		Switch should support 4 groups of embedded RMON (history, statistics, alarm and events).
		Switch should support system and event logging functions as well as forwarding of these logs to multiple syslog servers.
		Switch should support on-line software reconfiguration to implement changes without rebooting. Any changes in the configuration of switches related to Layer-2 & 3 functions, VLAN, STP, Security, QoS should not require rebooting of the switch.
		Support for Automatic Quality of Service for easy configuration of QoS features for critical applications.

		Support to detect unidirectional links caused by incorrect fiber-optic wiring or port faults and disable on fiber-optic interfaces
		Switch should have comprehensive debugging features required for software & hardware fault diagnosis.
		Should support DHCP Server feature to enable a convenient deployment option for the assignment of IP addresses in networks that do
		DHCP servers configured on servers and integrated with Directory Services.
		Switch should support Multiple privilege levels to provide different levels of access.
		Switch should support NTP (Network Time Protocol)
		Switch should support FTP / TFTP
6	Standards	RoHS Compliant.
		IEEE 802.1x support.
		IEEE 802.3x full duplex on 10BASE-T and 100BASE-TX ports.
		IEEE 802.1 D Spanning-Tree Protocol.
		IEEE 802.1p class-of-service (CoS) prioritization.
		IEEE 802.1Q VLAN.
		IEEE 802.3u 10 BaseT /100 Base Tx /1000 Base Tx.
7	Compliance	The switch should be IPV6 logo ready or Certified
		Switch should be tested and certified for EAL2/EAL3 / NDPP or above under Common Criteria Certification

5. Server/Network Rack

S. No.	Item	Minimum Requirement Description
1	Rack Height	42U
2	Rack Width	19"
3	Max Height	2000mm
4	Max Width	800mm
5	Max Depth	1200mm
6	Color	Black / standard color
7	Front Door	Glass with unique lock
8	Rear Door	Steel
9	Load bearing capacity	1400 kg

6. Server

S. No.	Parameter	Description
1	Chipset	Latest Intel Chipset
2	Form Factor	Max. 2U rack mounted with sliding rails
3	Configured CPU	should be populated with 2nos. of latest series CPU each should be min. 16 core & min. 2.0Ghz or better
4	Memory slots	24 DDR4 DIMM slots supporting speeds up to 2666MT/s.
5	Memory configured	Server should be configured with 256Gb memory
6	RAID Controller	12Gbps PCIe 3.0 with RAID 1, 5, 6
7	Internal Storage	2nos. of 300Gb 10K RPM HDD
8	DVD writer	DVD RW
9	I/O slots	Up to 8x PCIe Gen3 Slots
10	GPU	Server should support upto 2 GPU Cards (SI has to consider GPU cards as per their solution requirement)
11	Network Interface	2 x 1G RJ45, 2 x 10 GbE LAN ports for providing Ethernet connectivity, 2 x Dual-port 16Gbps FC HBA for providing FC connectivity
12	OS Support	Latest version of Microsoft Windows Server / Linux / Unix and Anti Virus
13	Power Supply	Platinum rated redundant Power Supply
14	SD Modules slots	Dual SD Module slots supporting redundant configuration
15	Management Integration	Support for integration with Microsoft System Center, VMware vCenter etc.
16	Power & temperature	Real-time power meter, graphing, thresholds, alerts & capping with historical power counters. Temperature monitoring & graphing
17	Pre-failure alert	Should provide predictive failure monitoring & proactive alerts of actual or impending component failure for memory, CPU, HDD etc.
18	Configuration & management	• Real-time out-of-band hardware performance monitoring & alerting • Agent-free monitoring, driver updates & configuration, power monitoring & capping, RAID management, external storage management, monitoring of FC, HBA & CNA & system health • Out-of-band hardware & firmware inventory • Zero-touch auto configuration to auto deploy a baseline server configuration profile • Automated hardware configuration and Operating System deployment to multiple servers • Zero-touch repository manager and self-updating firmware system • Virtual IO management / stateless computing • Support for Redfish API for simple and secure management of scalable platform hardware

19	LCD/LED panel	Should display system ID, status information and system error code followed by descriptive text. LCD/LED background should light up in different colours during normal system operation & error conditions.

7. Storage

S. No.	Parameter	Minimum Requirements
1	Converge/ Unified Storage	Storage solution with NSPoF (No single point of failure) Architecture. The Storage solution shall support NAS or SAN as an integrated offering with high availability at each level. The architecture shall allow upgrades of hardware and software for investment protection.
2	Protocols	Solution shall be configured with required protocols for the solution CIFS/SMB 3/ NFS 4/iSCSI/FCoE/FC. All required protocols required for the solution to be enabled.
3	Controllers	System to have minimum Two controllers with NSPoF Architecture (NO single point of failure architecture). Storage shall support non-disruptive online firmware upgrade for both Controllers and disk drives.
4	Operating System	The storage array should support Operating System Platforms & Clustering including: Linux/Windows
5	Cache Memory	Cache Memory: Each controller/node should be provided with minimum 64 GB RAM h usable protected data cache for disk IO Operations. If NAS controllers with separate controllers additional RAM cache to be provided. The storage array shall have complete cache protection mechanism either by de-staging data to disk/flash or protecting with NVRAM.
6	Host	The storage system shall be capable of providing host connectivity as per solution offered (Unified/SAN/NAS/Scale out NAS).
7	Connectivity	Minimum 2 ports per controller to be provided for host connectivity.
8	RAID Supports	RAID levels Supported: 0, 1, 5, 6, 10 or equivalent
9	Redundancy	Fans and power supplies: Dual redundant, hot-swappable.
10	Disk Drive Support	Storage subsystem shall support 8TB/10TB dual ported or higher NL-SAS/SAS/equivalent 7.2K drives in the same device array.

11	Global Hot Spare	System shall have the capability to designate global hot spares that can automatically be used to replace a failed drive. Storage system shall be configured with required Global Hot-spares for every thirty drives for the different type and no. of disks configured.
12	Capacity	The capacity should be configured to meet the performance requirement of solution.
13	Snapshots	Shall be able to take "snapshots" of the stored data. Offered Storage shall have support to make the snapshot in scheduled or auto snaps. Snapshot shall support block or file as applicable for solution.
14	Replication	The storage array shall have the capability to do remote replication using IP technology.
15	Software Licenses	All necessary software required for the solution needs to be provided.
16	Monitoring	Shall support the functionality of proactive monitoring of Disk drive and Storage system for all possible hard or soft failure.

POWER BACKUP FOR DEPOT

1. UPS 30+30 KVA for Control Room and 30 KVA for Field

Sr. No	Parameter	Minimum Requirement Description
1	Capacity	30 KVA
2	Technology	True ON-LINE (Double Conversion) with IGBT based inverter and PWM Technology
3	Connector	RS 232 port for software interface
4	Electrical Input	3 phase 4 wire and ground
		Voltage Range - 330 V - 480V
		Frequency Range - 47 to 53 Hz
		Efficiency AC to AC: > 85% (AC to AC)
		220V AC / 230V AC / 240V AC (Selectable)
		Frequency: 50 Hz + /- 0.1% (free running)
		Voltage Regulation: + / - 1% (or better)
		Overload Capacity: 125% for 1 sec, 110% for 10 secs
		Waveform: Pure Sine wave
5	Protection	Electronic Overload Sensing, and circuit breaker protection Over heating, short circuit, low battery, input over / under voltage
6	Galvanic Isolation	Through Inbuilt Transformer
7	Battery Type	Sealed Maintenance Free Battery, Mains & Battery with necessary indicators, alarms and protection with proper battery rack
8	Backup Time	Minimum 120 minutes backup on full load
9	DC Voltage	MIN. : 240 V DC
		Adjusted to about 10% of battery capacity for fast charging.
10	Charging Features	1. Boost / trickle charging facility
		2. Uncontrolled rectifier with high efficiency and reliability.
		3. Low battery protection to avoid deep discharging of batteries.
		4. Self test diagnostic feature
11	Other Features	UPS Bypass Automatic
		Monitoring panel with LCD display to provide following information:-
		1. Input / output voltage
		2. Input / output frequency

		3. Load current
		4. Charging current
		LED display for:- UPS on, battery operation, bypass, battery charge
		level, etc. Alarms for :- Mains failure, low battery, overload etc.
12	Environmental	Temperature 0-45°C
		Humidity 0 – 95% RH non-condensing
		Audible noise < 50 dB (A) at 1 meter distance
13	Certification	CE & RoHS Certification with make & model number mentioned on it
		ISO 9001:2000 and ISO 14001 certified.
14	Compliance	Dimension Light Weight / Smaller Footprint

2. Diesel Generator Set

Sr. No.	Item	Minimum Requirement Description
1	General	(KVA as per Depot requirement) at 1500 RPM, four stroke, electric start, six cylinder engine conforming to BS: 5514 Or ISO 3046 with capacity of 10% over loading for one hour in twelve hours operation
2	Air Intake System	Air intake manifold.
		Dry type air cleaner
3	Exhaust System	Turbocharger.
		Companion flanges for silencer & bellow.
		Residential silencer.
4	Coolant System	Engine water pump.
		Radiator.
		Coolant additive concentrate
5	Lubricating System	Oil pan.
		Engine mounted lube oil pump
		Full flow spin-on lube oil filter.
6	Fuel System	In line fuel pump with Mechanical
		Governor.
		Spin-on fuel filter
7	Starting system	12V DC electric starter.
		12V DC battery charging alternator
8	Power start Control	Yes

	Microprocessor based.	
9	LED including lamps	The control includes LED lamp indication for the following functions Genset Running
		Remote Start Shutdown Warning
		Manual, Auto and Stop
10	Data Logs	Includes Engine run time and controller on time
11	Alternator Data	Yes
12	Engine Data	Yes
13	Control	Engine Metering, Alternator metering, Battle switch function, Delay Start
		/Stop, Configurable Cranking cycle, Sleep mode time
14	Protection	Low lube oil pressure warning Or shutdown
		High engine temperature warning Or shutdown
		Low coolant temperature warning Sensor failure indication
		Low and High battery voltage warning
		Weak battery warning Fail to start shutdown Cranking lockout
		High Or Low AC voltage shutdown Under Or Over Frequency shutdown Loss of sensing voltage shutdown.
15	Alternator	Synchronous alternator, single bearing, suitable for continuous operation at 1500 RPM generating 415 volts at 0.8 p.f.(lag), 50 Hz, 3 phase, 4 wire system. The alternator shall be Brushless type, self-excited & self-regulated through an AVR. The alternator will be suitable for tropical climate The salient features of the alternator are: + 1.5% voltage regulation (max) in static conditions. IP: 23 protection with insulation. Permanent lubricating bearing. Permissible overload of 10% for one hour in 12 hours of operation
16	Control Panel	The standard Control Panel is alternator mounted & fabricated from 14 Or 16 SWG sheet and Powder Coated after seven tank treatment process. The panel is equipped with:- 200A TP MCCB 10KA (Fixed O /C, & S/C) Thermal Magnetic Release With Spreader Link PS-500 (DG Auto start Or stop, Alt. Mtg., Protection and Engine Protection) Relay Module with 2 relay,12V DC
17	Base Frame	Engine and alternator are mounted, coupled and aligned on a common channel iron fabricated Base Frame with pre-drilled holes
13	Certification	CE & RoHS Certification with make & model number mentioned on it
		ISO 9001:2000 and ISO 14001 certified.