NTPC LTD VEC, USSC		
1	**CEG No.**	**IT-02**
2	**Brief description of CEG**	**Supply, Installation, Testing & Commissioning (SITC) of CCTV System at NTPC Plant / Sites / Offices**
3	**Responsibility Centre**	VEC, USSC
4	**Enlistment Category**	Category-I
5	**Brief scope of work**	Supply/ SITC of CCTV System as per detailed Tech Specs and Scope of Works (Tentative) as per "***Annexure-SOW***"
6.	**Technical Qualifying requirements**	**6.1** The applicant should have Supplied, Erected / Supervised erection and commissioned / supervised commissioning of the "combination of IP based camera and Video Management Software/ NVR (Network Video Recorder)" for CCTV system having installation of minimum Ten (10) nos. CCTV cameras in a single contract during the preceding 05 (five) years from the last date of submission of application. **AND** **6.2** The supplied CCTV system (referred to at 6.1 above) should have been in successful operation for at least one year prior to last date of submission of application.

	Document to be submitted by Applicant in support to meeting QR	(i) Relevant PO copy and Client's Completion Certificate / RA bill / GST Invoices / Final Deviation Statement in support of execution of works. (ii) Successful operation certificate of CCTV system for one year from the client concerned.
7.	**Additional Documents to be submitted**	In addition to the documents required in support of meeting technical requirements as stated above, following documents are required to be submitted by the Applicants applying for enlistment: - 1. Three POs with BOQs of the highest executed values of similar work during previous five years from the last date of submission of application and Copy of Completion Certificate from the concerned client /RA Bill/ GST Invoices in support of successful execution of works against each of the POs to be submitted. 2. Audited balance sheet including Profit & Loss statement for the previous three completed financial years reckoned from the last date of submission of application. In case the audited balance sheet(s) are not ready / available / applicable, then a certificate would be required from the CEO/CFO as per the format available in the portal, stating that the Financial results of the Company are under audit as on the date of Techno-commercial bid opening and the Certificate from the practicing Chartered Accountant certifying the financial parameters is not available. 3. Udyam / NSIC certificate, if applicable. 4. PF and Service Tax registration certificate. 5. Any other documents in addition to the above which the applicant wants to submit.

8.	**NOTES:**	1. **Similar Works:** "Similar Works" means. 'Supply and/or erection / erection supervision and/or commissioning / commissioning supervision' of the 'combination of IP based camera and Video Management Software/ NVR (Network Video Recorder)' for CCTV system. Maximum Three Credential Order(s) / Similar Work(s) shall be considered for calculation of the Execution Capability (EC). 2. The executed value means Basic value of quantity of similar works executed/ supplied against the reference PO (also applicable to partly executed POs as on date of application). Where PO value is composite (i.e., including Taxes etc.), the applicant should give item-wise breakup of Composite PO value mentioning Basic Value, Taxes etc. 3. The work "executed" means the applicant should have achieved the criterion specified in the QR, even if the total contract is not completed/closed. In the case of contracts under execution as on the last date of submission of application for enlistment, the value of work executed till the last date of submission of application will be considered provided the same is certified by the employer. 4. In case, has executed reference works under two orders -- one for supply and one for services separately for the same installation, combined value of both the orders shall be considered as a single order for the purpose of evaluation. 5. Reference work executed by the applicant as a sub-contractor may also be considered provided the certificate issued by main contractor is duly certified by owner specifying the scope of work executed by the sub-contractor in support of qualifying requirements.

Annexure - SOW

Scope of Work & Technical Specification

Section-V of Bidding Document

For

"SECURITY SURVEILLANCE SYSTEM AT NTPC XXXX"

(This document is meant for the exclusive purpose of bidding against this Bidding Document/Specification and shall not be transferred, reproduced or otherwise used for purposes other than that for which it is specifically issued).

CLAUSE	PARTICULARS
1.0	**AREA OF EXECUTION OF WORK** XXXX Super Thermal Power Project (NTPC XXTPP), NTPC Limited, located at XXXX of district XXX. Through this contract, XXXXXX envisages to setup Security Surveillance System at XXXX.
2.0	**SCOPE OF WORK** This part covers scope of work, technical requirements and other terms & conditions pursuant to the contract and will form an integral part of the contract. The following provisions shall supplement all the detailed technical specifications and requirements brought out in accompanying technical specifications. The vendor's proposal shall be complying fully with the requirements specified herein. The scope of the proposal shall be based on SINGLE POINT RESPONSIBILITY, completely covering the following activities and services in respect of all the Supply, Installation-Commissioning of Security Surveillance System at NTPC XXXX as specified and covered under the specifications. The broad scope of works includes but not limited to the following. The bidder's scope of work as per the conditions of contract and technical specifications includes, but not restricted to, packing and forwarding, transportation, insurance and carrying out other required activities at sites viz. unloading, inspection, storage, handling, laying, erection and laying of OFC, Poles and commissioning of the system along with its associated peripherals etc., testing and any other service explicitly specified or not, to complete this project. The bidder shall be responsible for providing all required materials, equipments for setting up of Security Surveillance System at NTPC XXXX, which are required to fulfil the intent of this project ensuring operability, maintainability, and reliability of all the equipment. This work shall follow all applicable standards, statutory regulations and safety requirements in force of the date of award of this contract. Bidder is liable to penalty if found violating any of these during complete tenure of execution of project. Equipment furnished shall be complete in every respect, unless included in the list of exclusions, with all mountings, fittings, fixtures and standard accessories normally provided or not with such equipment but are needed for erection, completion and safe operation of the equipment, though these may not have been specifically detailed in the technical specification. At Bidder's own cost, the bidder should inspect and examine the site proposed for installation of CCTV Cameras and its surrounding and shall satisfy as to the nature of the work and quantities, materials necessary for completion of the work and their availability, means of access to site and in general to obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect his offer. Bidder shall understand the specifications, seek clarifications, if require any and ensure that they understood the specification. Such clarifications should be sought before submission of the bid documents. No extra claim consequent on any misunderstanding (or) otherwise shall be allowed. This work shall be consistent with modern Security System practices and shall be following all applicable codes, standards, guides, statutory regulations and safety requirements in force. Any component/hardware/parts/assembly/software including firmware used in the offered solution (hardware/software) must not support any protocol which enables

unauthorized access or unauthorized remote control. CCTV CAMERA ,VMS OEM shall certify (at the time of system handing over) that the Offered Hardware & Software shall be free of any known Security vulnerability (excluding Zero Day vulnerabilities). The intent is that CCTV OEM shall certify that the Video Management software/NVR & it'sfirmware (excluding third party software e.g. Video Analytics) does not contain any malicious code or otherwise is not operating contrary to its stated purpose. There shall be no option in the camera web page/settings to activate or deactivate such protocols/standards any of their version(s) or any such protocol which allow certain organizations to bypass all security parameters and investigate the devices directly.

The bidder shall submit the detailed block schematic, network & power wiring diagram, describing the connections between the network switch/camera server Systems and various cameras, wireless components for owners' approval. Vendor must take approval of all drawing from M/s NTPC before supply of material & start of execution of job.

NTPC, XXXXXX is planning to procure XXXX (TOTAL CCTV …….) no. of CCTV for Main plant, AHP and CHP. Breakup of CCTV and their type in these areas are as follows:

Area	Fixed Camera	PTZ Camera	Dome Camera	Other Type of camera
Main Plant				
AHP				
CHP				

NOTE:xx cameras are to be installed in Main Plant along with NAS, xx cameras to be installed in AHP along with NAS and cameras to be installed in CHP along with NAS separately for all the areas. All servers should be interconnected. All servers shall be redundant with auto change over.

3.0 TECHNICAL REQUIREMENT/TERMS & CONDITIONS

3.1 ITEM WISE TECHNICAL REQUIREMENT

Technical specification cum data compliance sheets enclosed at-

(a) **ANNEXURE-A** (TECH SPECIFICATIONS-COMPLINACE SHEET).
(b) **ANNEXURE-B** (BILL OF QUANTITY as per requirement of respective site).

3.2 BID EVALUATION CRITERIA-

3.2.1 The bid will be evaluated in totality including Supply, Installation. **SPLITTING OF TENDER IS NOT ALLOWED.** The bidder must furnish complete information asked for in these specifications including completed technical specification compliance sheets. Incomplete information may lead to the rejection of the bid.

3.2.2 The bidders shall carefully examine and understand the technical specifications (**Annexure-A**) and seek clarifications, if required, to ensure that they have understood the specifications. The bidders' offer should not carry any sections like clarifications, interpretations and assumptions. Being a **ZERO DEVIATION BID**, any deviation from specified technical specifications, terms & conditions may lead to rejection of the bid. However, if the bidder feels that certain features/parameters offered are superior to what has been specified by NTPC XXX, it shall be highlighted separately.

3.2.3 The bidder must submit the OEM's undertaking and relevant documents with the bid to demonstrate compliance with the General Technical Requirements (**Annexure-D**) for **CCTV Cameras, SERVER, VMS, NAS, WORKSTATION and Switches at the time of material supply**.

3.2.4 Bidder also should submit undertaking in support to ensure that the components offered are not discontinued products on the date of bid submission. Bidder must make sure that any of the active components shall not be discontinued at the time of handover to NTPC XXXX. In case of obsolesce during period mentioned, an equivalent/better product to the satisfaction of NTPC XXXX shall be supplied with no extra cost implication.

3.3 OTHER TEHNICAL REQUIREMENTS

3.3.1 All the items supplied will be inspected at site (NTPC XXTPP) jointly by vendor representative, Engineer in Charge and acceptance will be subjected to items confirming to Technical Specifications.

3.3.2 NTPC will finalize the exact location of CCTV camera to be installed along with pole to be erected, cable route for power supply, Fiber cable, locations of Racks/JBs etc. Post finalization, vendor shall submit detailed network diagram along with time schedule for executing the work.

(a) Installation, commissioning and configuration of Server, Displays, Storage and Video Management Software is to be done as per the requirement.
(b) Installation and configuration of client software at desired locations is to be done by vendor.
(c) The following drawings shall be submitted to NTPC XXXTPP for review and approval of NTPC, two weeks before starting of erection work: -
- Total CCTV Network Diagram (Power Supply & Network Drawing).

- Pole Foundation Drawing

3.3.3 The completion of the project and satisfactory demonstration of its functioning is in the scope of the bidder. For this, the bidder's responsibility shall specifically include, but not limited, to the following.

(a) The complete system as agreed upon must operate at or above the guaranteed values with regard to availability.

(b) All tools & tackles as required during project for completing the scope of work as per these specifications are be provided by the bidder at no extra cost implication to NTPC XXTPP. The bidder shall undertake all activities for the project commissioning and shall provide further assistance during inspection and testing of the systems' functionality by NTPC XXTPP.

(c) The bidder shall also provide all required equipment/services which may not be specifically stated herein but are required to meet the intent of project, ensuring completeness, maintainability and reliability of the total system covered under this specification, these materials, however, will be under the scope of bidder and shall have no cost implication on the NTPC Ltd.

(d) The system proposed by the supplier should be scalable for future expansion with-out any performance constraints.

(e) Cables shall be neatly & properly tied and dressed using cable hangers and Velcro bands. All the cables, connectors, sockets, panels etc. shall be labelled for identification purpose. Detailed labelling scheme of all equipment and cables etc. should be provided to NTPC XXTPP at the time of system hand over.

(f) All Licenses/Subscriptions/Authorization to use, on all the devices/ equipment/ system software/OS and application quoted by the bidder in this tender must be perpetual and in name of NTPC Limited, XXTPP. The offered hardware & software (**CCTV Cameras, SERVER, VMS, NAS, WORK STATION and Switches**) should be guaranteed by OEM for availability of spares for a period of not less than 5 years from the date of system handing over.

(g) Bidder shall make a provision of, and maintain, a stock register for the items pertaining to this project. The stock register shall be complete in all aspects with respect to items received, issued, used and balance. This stock register shall be submitted to EIC on handing over or whenever asked.

(h) The entire system with 01 years warranty for the server/client PCs (as per the detailed technical specifications) from the date of system acceptance by NTPC i.e. issue of completion certificate by competent authority. Any Software updates/ enhancements released during the defect liability of the system shall be supplied, installed and commissioned free of cost by the Bidder along with corresponding documentation. Any failure or defect of hardware (camera/networking system / servers/ storage/ workstations etc.) during defect liability period is to be rectified/ replaced by the bidder free of cost. VENDOR'S SERVICE ENGINEER SHALL REPORT AT SITE WITHIN 24 HOURS OF REPORTING OF SYSTEM FAILURE DURING Defect liability /WARRANTY PERIOD

(i) Other requirements

(i) Bidder shall read together NTPC XXTPP's BOQ (Annex.-B), technical specification and compliance sheet shall propose a complete workable solution.
(ii) All active components indicated in the vendor's bid should be supported with technical documents from OEM.
(iii) Information regarding any modification required in the system configuration to meet the intent of the specifications shall be provided. Provision for effective up-gradation shall also be detailed.
(iv) Wherever applicable, the bidder shall submit the relevant test certificate/guarantee certificate along with the supplies.

3.3.5 Site Preparation-

Raw power supply will be provided by NTPC. It shall be the responsibility of the bidder to supervise and ensure that the site is well prepared as per the requirements such as environmental conditions, cabling, power requirements; etc. The bidder shall ensure that the offered system operates properly under these conditions.

3.3.6 Erection Work-

a. Pole Erection: Erection of pole shall be done in consideration of providing proper required strength & durability. After having mutual agreement b/w vendor and EIC, vendor shall submit pole erection drawing, work of pole erection shall start after approval of drawing by EIC. Grounding to earth of each pole shall be ensured by vendor by preparing earthing point/pit as per the Indian standards, required material to prepare the earth pit shall be in vendor scope.

b. The camera should be wall/ pole mounted as per the finalised CCTV network and all the accessories like lens, mount, outdoor housing, power supply required for installation of same shall be in scope of bidder. All the cables, cable trays, power packs, erection hardware (viz. junction boxes, brackets glands, nut-bolts, conduits etc.), poles are also included in Contractor's scope. Earthing (existing earth pit) of control room equipment is in Bidders scope.

c. Junction Box Erection: Junction box is to be fixed by the vendor on a separate concrete foundation or pole as mutually decided by EIC and vendor. Earthing to JB shall be ensured by the vendor by connecting to the nearest available earthing point or by preparing earthing point/pit as per the Indian standards (in case of non-availability), required material to prepare the earth pit shall be in vendor scope. The provision for mounting the JB on the pole shall be made available in the junction box. The junction box shall be protected from direct sunlight by canopy. All the cables shall be clamped with suitable clamps to avoid the damage of the core/conductors due to cables weight. Each junction box should be double

grounded to earth with suitable copper cable. Each Junction box should be uniquely labelled for proper identification.

d. The Camera Erection: The camera should be mounted on top of the pole and all the accessories required for installation of same shall be in scope of bidder. Cameras are to be installed in such a way that the dome bottom surface is parallel to the ground surface. The top hole of pole should be aligned to cable entry points of camera dome. The power and ethernet cable from camera to junction box shall be done as per requirement.

e. Laying of the Cables: All the civil work required for laying of OFC and power cable is in vendor's scope. The cable laying will be through existing trenches/ trusses/cable trays and underground (thru HDD/Manual), etc in HDPE pipes, etc. In case of buried cable underground laying in manual digging, the minimum size of trenches shall be 75 cms deep. Necessary loop chambers are to be made for buried cables as per standard practice. Where hard soil/rocks are encountered, in consultation with the EIC, the depth may be varied from 1.5 to 2.5 feet. Cable Route Markers are to be installed at an interval of 50 meter and at all bending points, minimum arm length of route marker above the ground would 300 mm.

f. Laying of power cable from nearest power source to junction box including termination accessories as well as requisite protection shall be in vendor's scope.

g. The CCTV System along with all its system components (In AHP control room, CHP control room and Main plant control room) i.e. network switches, storage devices, servers, LAN switches, media converters etc. shall be powered from existing UPS system (230 VAC, 1 Phase, 50 Hz). UPS Supply will be provided by NTPC and required cabling & termination from source point will be in Contractor's scope.

h. For cameras & local equipment like FOC converter/Ethernet switch etc. shall be powered from AC supply (AC 230 V~ (+/- 10 %), 50 Hz (+/- 5 %)). AC supply (AC 230 V~ (+/- 10 %), 50 Hz(+/- 5 %)) will be provided by Customer and required cabling & termination from source point to all local equipments will be in Contractor's scope. Wherever possible NTPC will provide UPS power supply for cameras and accessories. The power supply may be extended from nearby switchgear rooms, laying of power cables from nearby switchgear room is in vendor's scope. The source identification will be done by EIC.

i. Where Road crossing is involved, the bidder shall cut the road and lay one or more runs of MS/GI Pipes. The size of the road cutting shall be as per the site requirement. After laying pipes the road cutting is to be filled with cement concrete.

j. Cable Terminations: All the power cables coming from the control room/work group switch and from camera should be terminated in terminating strip in junction box. The cable termination procedure and type of connections is to be made should be discussed with engineer-in-charge before starting of erection work. PVC Copper Cable, Single Mode OFC or Ethernet cables are to be used for connections as per requirements. The Ethernet cable to be used shall be CAT6 cable and supply of all the required cables including power supply cables shall be in the scope of the bidder. If any cable tray & conduit pipe is required, the same shall be supplied by the bidder as part of erection consumables.

k. Erection of Control Room Equipment: All cables coming to this control room shall be terminated on patch panel. All equipment shall be powered with centralized UPS power supply.

l. Erection of Network Racks/Power Supplies: The power through UPS shall be extended to the switches through Network panel. The Network panel consists of on/off switches along with indication lamp and MCBs. Through these panels the AC power supply shall also be fed. Entire power distribution shall be the bidder's responsibility. If any additional Power Supply Panels are required, the same shall be supplied by the vendor at no extra cost. Any cables and consumables required for such power supply distribution which are not included in BOQ must be supplied by the bidder without any cost to NTPC.

3.4 Deployment of Onsite Manpower (If required) -

Bidder is required to post one (01) Resident Engineer (RE) and one (01) Resident Assistant (RA) during the entire support period (from the date of handing over until completion of Defect liability) at NTPC XXTPP on all working days from 08.30AM to 5:30 PM or/and as per the directions of Engineer in Charge (EIC) and should not leave site without permission of EIC.

(a) Minimum qualifications of the resident engineer should be B-Tech or BCA or Degree/Diploma in CS/IT/EC/Equivalent and having certificate or completed course in networking along with minimum 03 years of experience in maintenance of LAN-WAN/CCTV Surveillance System or equivalent. Also Specialized knowledge of LAN/WAN Network, Optical Fibre Splicing, IP based CCTV, Network Switch Configuration and maintenance is required.
The Resident Engineer shall be deployed post assessment by EIC. During the deployment period contractor shall ensure payment of minimum wages at least 1.5 times of high skilled worker (HSW) plus allowances like mobile, conveyance, HRA etc. to the deployed resident engineer. Time to time wages shall be escalated on the escalation in minimum wages as per NTPC guidelines without any additional cost to the NTPC, therefore, bidder may quote their bids accordingly.

(b) Minimum qualifications of the resident assistant should be BCA/Diploma in CS/IT/EC/Equivalent with minimum 1 years of experience/ITI/01-year relevant certification course with minimum 02 years of experience, in maintenance of LAN-WAN/CCTV Surveillance System or equivalent.
The Resident assistant shall be deployed post assessment by EIC. During the deployment period contractor shall ensure payment of minimum wages of skilled worker (SW) plus allowances like mobile, conveyance etc. to the deployed resident engineer. Time to time wages shall be escalated on the escalation in minimum wages by Govt. of Uttar Pradesh/Central Govt. and same shall be paid to the deployed RE without any additional cost to the NTPC, therefore, bidder may quote their bids accordingly.

	Bidder shall ensure that, the resident engineer and resident assistant should have his own mobile with valid mobile number and at-least a two-wheeler for local transportation. RE and RA should be equipped with required PPEs. Minimum PPEs during the execution of the work shall be - Safety Helmet, full body harness, safety shoes and others as per the prevailing safety requirements, provision of PPEs shall be in bidder's scope. Compliances of all statutory requirement in force/come in effect during the contract period shall be in the scope of the bidders. Recurring payments shall be released after due certification of EIC for all relevant compliances. **Accommodation to Resident Engineer/Resident Assistant-** To make the contract more effective, for efficient service and to facilitate timely maintenance of the CCTV camera network, NTPC may consider providing suitable accommodation to the resident engineer in its township on request from the contractor on chargeable basis as per NTPC rates, terms & conditions, subject to availability of accommodation in NTPC Township.

<table>
<tr><td>4.0</td><td>BILL OF QUANTITY/SCHEDULE OF QUANTITY/BOQ ITEM WISE DESCRIPTION.
- ANNEXURE-B (BOQ)-Tentative</td></tr>
<tr><td>5.0</td><td>QUANTITY VARIATION
- As per GCC</td></tr>
<tr><td>6.0</td><td>EXCLUSIONS (MATERIALS AND FACILITIES TO BE PROVIDED BY CONTRACTOR)
POWER & WATER SUPPLY AND BOARDING AND LODGING OF EMPLOYEES/LABOUR/STAFF
Exclusions - Boarding and lodging of contractor's employees/labour/staff be in Contractor's scope.</td></tr>
<tr><td>7.0</td><td>LIST OF MINIMUM TOOLS, SPARES-Tentative(vary from Site to site)
(a) During the commissioning as well as onsite support period, agency is required to maintain a pool of requisite tools and tackles.
(b) During the entire support period, following minimum spares needs to be maintained at site- PTZ Camera-02 Nos; Fixed Camera- 05 Nos; 08 Port Switches- 02 Nos; Mini-UPS-01 Nos.
(c) All required tools & tackles during the execution of the package shall be in agency scope.</td></tr>
<tr><td>8.0</td><td>OWNER'S ISSUE MATERIAL (MATERIALS AND FACILITIES TO BE PROVIDED BY NTPC)
Raw power supply for required tools & tackle shall be provided by NTPC</td></tr>
<tr><td>9.0</td><td>SAFETY
Successful bidder must adopt proper safety measures as per NTPC XXTPP and other industrial norms and ensure safety of equipment and his personnel during complete tenure of the contract. The bidder shall be solely responsible for any mishap due to non-compliance of any safety procedure.
During the execution of the work, agency shall strictly ensure & provide the following-
- Agency shall ensure compliance to NTPC Work Permit System
- Agency shall ensure that, all workers should be equipped with required PPEs. Minimum PPEs during the execution of the work shall be- Safety Helmet, Safety Shoes, Safety harness belt (during work at height) and others as per the safety requirement, provision of PPEs shall be in agency scope.
- Provision of First Aid Amenities/kit with the deployed team.
- Agency shall ensure Safety pep talk before starting the work.
- Insurance of the deployed workers will be in the scope of the agency.
Bidders are advised to price their bids in such a manner that the component for 'Amount linked to Safety Aspects/compliance to Safety Rules' should be as follows-
<table><tr><th>S/N</th><th>Line Item</th><th>Remark</th></tr><tr><td>1</td><td>Amount Linked to Safety Aspects for Installation, Erection & Commissioning</td><td>Not less than 5% of total amount quoted for installation, erection & commissioning</td></tr></table>Release of Amount Linked to Safety Aspects-</td></tr>
</table>

	(a) For Installation, Erection & commissioning- Amount linked to safety aspects/compliance shall be released in part or full based on safety compliance duly certified by EIC after completion of installation & commissioning work.
10.0	**QUALITY** The successful bidder shall submit Quality Plan (QP) for installation, commissioning and testing of all the equipments. This QP shall set out practices, procedures, relevant standards and acceptance levels for all equipment. The QP shall be submitted with detailed drawings on finalization after mutual discussion and approval by EIC/NTPC XXTPP.
11.0	**DEFECT LIABILITY PERIOD** NIL
12.0	**PRICE BASIS (FIRM/VARIABLE)** Prices are Firm.
13.0	**COST COMPENSATION CLAUSE FOR NON-COMPLIANCE OF SPECIFICATIONS/SCOPE** Liquidated Damage & Penalty Clause- **(a) For not meeting specifications-** If the specifications of the system are not met by the bidder during various tests, the bidder shall rectify the system to comply with the specifications, failing which NTPC XXTPP has the sole right either to reject the system. **(b) For delay in completion-** If the bidder fails to complete the supply, installation, testing, commissioning as per schedule. NTPC will deduct a sum of one half of one percent (0.5%) of the total contract price as liquidated damages for each calendar week of delay or part thereof in completion of different activities. The total amount of liquidated damages for delay shall how-ever be limited to 5% of the contract price. The Details of LD Applicable for various Unattended Defects during the warranty period and other service deficiencies are enumerated below:

S/N	Description of Deficiency of Service	LD (Penalty Amount)
1.1	Server/Storage Failure shall be Attended & Resolved within 48 Hours in case of Routine Failure like OS Crash, VM Software Crash etc. where No Hardware Failure is identified during initial diagnosis. [*Complaint Start Time: Complaint Start Time Starts immediately after registration complaint if the complaint is between 9.00 AM & 6.00 PM during working days) (Monday to Saturday). For after 6.00 PM Complaints, start time will be counted from next day 9.00 AM. (Sunday will be excluded)]*	After 48 Hours Rs 1000/Per Day till restoration of the server/storage.
1.2	Server/Storage Hardware Failure shall be attended & resolved within 96 Hours. (*Complaint Start time Calculation as Stated at 1.1*)	After 96 Hours Rs 2000/Per Day up to next 3 days & beyond 3 days Rs 5000/per day till restoration of the server/storage.

	1.3	Camera Routine Failure shall be Attended & Resolved within 48 Hours in case of Routine Failure like Network Problem, OR VM Software Crash etc. where no Camera Hardware Failure is identified during initial diagnosis. (*Complaint Start time Calculation as Stated at 1.1*)	After 48 Hours Rs 500/Per Day/Per Camera till restoration of the Camera. (Non-Functioning of the Camera due to Power failure will not be in Vendors Account. However, if Failure of Power is due to Failure of UPS etc the same will be to Vendors account).
	1.4	Camera Hardware Failure shall be Attended & Resolved within 96 Hours. (*Complaint Start time Calculation as Stated at 1.1*). In case the Spare Camera is available the same can be Installed by the vendor within 96 Hours. If the Spare Camera is made operational within 96 Hours, then no Penalty will be applied. However, if No Spare camera is Available vendor may bring additional camera on his own and install the same.	After 96 Hours Rs 500/Per Day/Per Camera till restoration of the Camera.
	1.5	If any Camera Not Available due to Network Failure OR any Other Problem	Clause 1.3 will be applied.
	1.6	In case of Faulty Network Items like Switch/Fiber Module etc OR any other Item of CCTV System Not Covered elsewhere; the Vendor is Required to Replace the Item with the spare available. However, the defective item shall be repaired/replaced within 30 days from the date of Fault.	Rs 200/Per day per Device beyond 30 Days. However, if Camera is down due to failure of any device where no spare is available then Clause 1.03 will be applicable in addition to this clause.
	1.7	Failure of Display Device shall be Repaired within 7 Days of reporting. Reporting Date is Excluded	Rs 300 per day after 7 days up to next 7 days. Beyond which Rs 500 per day till Repair/Re-placement.

14.0 ITEMS NOT COVERED IN BOQ – N/A

15.0 WORK SCHEDULE

Activity detail	Required time
Site Survey.	2 weeks from date of PO.
Submission of detailed engineering drawing/Scheme.	3 weeks from date of PO.
Supply of Material.	12 weeks from date of PO.
Installation, commissioning & handing over of complete System to owner with Documentation including Performance/Availability test.	40 weeks from date of PO.

Contract period: -

(a) For supply and installations: **40 weeks**
(b) For Defect liability: **01 year** *(shall start after handing over the complete system to NTPC).*

16.0 PAYMENT SCHEDULE

Payment Schedule, Terms, and Conditions-

Bidders are advised to quote their bids in such a manner that Erection and commissioning charges should not be less than 25%(twenty Five percent) of total charges of supply and installation & commissioning of all the equipment.

In case the quoted Erection and commissioning charges are below the minimum percentage specified above, the amount by which it is lower shall be retained from the payable under PR line item-10: "CCTV Surveillance System Materials" and the retained amount shall be released on completion and final handing over.

Line Item 10 i.e. Supply of Materials

(a) **80%** of the supply portion payment will be paid on receipt, inspection and acceptance of material at NTPC site.
(b) **20%** of the supply portion payment will be paid upon:
- Successful installation, testing, and commissioning of the equipment at the site.
- Successful completion of a 30-day trial operation and final acceptance and handover of the system to NTPC XXTPP.
- Receipt of applicable warranty certificates.
- Receipt and acceptance of the Contract Performance Guarantee (CPG) as per clause 17.0.
- Submission and acceptance of all relevant drawings and documents.
- Completion of onsite users training etc.

Line Item 20 i.e. Erection & Commissioning

(a) **80%** will be paid through RA Bills as per executed jobs.
(b) **20%** of the supply portion payment will be paid upon:

	- Successful installation, testing, and commissioning of the equipment at the site. - Successful completion of a 30-day trial operation and final acceptance and handover of the system to NTPC XXTPP. - Receipt of applicable warranty certificates. - Receipt and acceptance of the Contract Performance Guarantee (CPG) as per clause 17.0. - Submission and acceptance of all relevant drawings and documents. - Completion of onsite users training etc.
17.0	**CONTRACT PERFORMANCE GUARANTEE/SECURITY DEPOSIT** The bidder is required to submit CPG for an amount equivalent to **10% of Supply + Installation value**. This CPG shall be valid for a period of three months beyond the expiry of warranty (01 years), *(note: If the CPG is not submitted, an amount equivalent to the applicable CPG value will be withheld as Security Deposit (SD) for three months beyond the warranty period's expiry).*

18.0 ANY OTHER REQUIREMENT/CONDITION MAY BE MENTIONED HERE

18.1 Documentation:

Before handover, the bidder shall furnish following in hard copy as well as soft copy:
The complete comprehensive documentation of all items should be in original (Hardcopy or softcopy as applicable). After completion of work bidder is to make complete installation report with whole network diagram, OFC route map etc. All final system documentation as delivered to NTPC XXTPP shall be complete, accurate and fully representative of the supplied & installed system and its elements.

18.2 Training/Workshop

The bidder shall arrange training for NTPC personnel on installation, operation and maintenance of the equipment's to the extent that the personnel can fully maintain and troubleshoot the system.

18.3 Insurance Charges

(a) The successful bidder contracted shall arrange to take insurance in the name of NTPC XXTPP for full value of the system to protect from risks such as loss or damage in transit, theft, pilferage, riot, civil commotion, weather conditions of all kinds, fire, etc.
(b) Any loss or damage to the equipment and materials during handling, transportation, storage, installation or otherwise at any stage, till the system is 'Taken Over' by NTPC XXTPP after successful Performance and Guarantee test, shall be the responsibility of the contracted bidder. The bidder shall be liable to replace the lost or damaged system/subsystem without any extra cost. No additional payment shall be made to contractor towards insurance premium, Insurance charges shall be inclusive in overall package cost.

18.4 Force Majeure

Force majeure is herein defined as any cause which is beyond the control of the bidder or NTPC XXTPP., as the case may be, which either of them could not foresee or could not have foreseen with a reasonable amount of diligence, such as:
(a) Natural phenomena, including but not limited to floods, droughts, earthquakes, epidemics.
(b) Acts of any Government, including but not limited to war, declared or not-declared, priorities, quarantines, and embargoes.

Any such event shall be notified to NTPC XXTPP in writing within fifteen (15) days from its occurrence. NTPC XXTPP or the bidder shall not be liable for delays in performing his obligations resulting from any force majeure causes as defined above.

18.5 Sub-Contractor Deployment-

The successful bidder may engage a subcontractor for executing specific tasks such as installation, commissioning, and onsite support etc., subject to the approval of the EIC/competent authority. However, in the event of subcontractor deployment, the main

	contractor's site in-charge will retain the core responsibility for overseeing and ensuring the proper installation and commissioning of the entire setup.
19	**ENCLOSURES** 1. ANNEXURE-A (TECH SPECS-COMPLINACE SHEET-SECURITY) 2. ANNEXURE-B (BOQ) 3. ANNEXURE-C (MANDATORY SPARE LIST) 4. ANNEXURE-D (GENERAL TECHNICAL REQUIREMENT)
20	In the event of conflict between requirements of any two clauses of specification documents, Contractor shall seek written clarification from NTPC. NTPC 's decision in this regard will be final and binding.

ANNEXURES

ANNEXURE-A (TECH SPECS-COMPLINACE SHEET-Tentative

(10.10) PTZ IP Camera- Technical Specification & Compliance Sheet			
S/N	**Parameter**	**Requirements**	**Offered product parameters**
1	**Make & Model**	**to be provided by the bidder**	
2	Form Factor	DAY/Night PTZ (HD IP) Outdoor Dome Camera	
3	General technical requirement	Camera shall comply with the general technical requirement as mentioned in Annexure D	
4	Image Sensor	1/2.8" CMOS or better.	
5	Focal Length	4.25 to 7mm – 127.5 to 210mm or better Motorized zoom/focus	
6	Optical Zoom	30X or better	
7	Digital Zoom	12X or better	
8	WDR	120DB OR BETTER	
9	Defog	Camera should have Defog feature	
10	Video Encoding	The camera shall support the following encoding standards:	
		(1) H.264 , H.265	
		(2) Motion JPEG/MPEG-4	
11	Multiple Streams	The camera shall provide at least three simultaneous video streams.	
		Stream compression should be as following:	
		(1) Primary Stream: H.264, H.265 @50/60 FPS	
		(2) Secondary Stream: HEVC H.265, H.264 or Motion-JPEG/MPEG-4 @25/30 FPS	
		(3) Third Stream: HEVC H.265 or H.264@ 25/30 FPS	
12	Effective resolution/Number of Pixels	2 MP (1920 x 1080 Full HD) or better at 50/60 frame per second for primary stream. 1920x 1080 (2MP) at 25/30 frame per second for secondary or 3rd stream.	
13	Light Sensitivity	Colour mode: 0.07 lux or better	
		B/W mode: 0.01 lux or better, 0 Lux at IR on	
14	IR Range	150 mtr or better	
15	Focus	Auto Focus	
16	Iris Control	Auto IRIS Control	
17	White Balance	Automatic	
18	Electronic Shutter	1/10000 to 1/10 sec	
19	Wide Dynamic Range	120 dB or better	
20	Memory Card Slot	Up to 256GB (128 GB card to be supplied)	
21	Day/Night selection	Automatic, Colour, Mono and should automatically switch to night vision by sensing illumination level	
22	Interface Type	10/100-Base T, autosensing, half/full duplex, RJ45	
23	Protocols	IPv4, IPv6, UDP, TCP, HTTP, HTTPS, RTP/RTCP, IGMP	

		V2/V3, ICMP, ICMPv6, RTSP, ARP, DHCP, NTP (SNTP), SNMP (V1, V3, MIB-II),802.1x, DNS, DNSv6, SMTP, UPnP (SSDP), digest authentication	
24	Other functions	Sharpness, Backlight compensation, Contrast enhancement, Display stamping (Name/logo/Time).	
25	Encryption	TLS 1.2, AES128, AES256	
26	Network connectivity	Camera shall be directly connected to network without use of an external encoder	
27	Data Security Features	Secured connections supported (HTTPS) Password enforcement at initial set up Execution of 3rd party software is disabled Firmware updates via OEM digitally signed firmware files only. Detect changes in a configuration support of customer specific certificates. Regular updates via security patches	
28	Hardware for data security	Inbuilt TPM /TEE as per STQC ER	
29	Pan	360 Deg Continuous	
20	Tilt	-3 to 90 deg	
31	Preset Positions	Minimum 256	
32	Pan & Tilt Speed	240°/s Pan Speed and 160°/s Tilt Speed	
33	Guard Tour/ Patrol	2 (Minimum duration of 15 minutes for each Tour) Tour and 2 Pre-position tour	
34	Auto Resume after Power Failure	Required	
35	Operating Temperature	0°C to 55°C	
36	Humidity	Up to 90% RH, non-condensing	
37	IK Rating	IK10	
38	Audio communication	Two-way, full duplex	
39	Camera Housing & Mount	The camera housing should be parapet or pole mount type (as per the site requirement) and should be of the same make as that of camera.	
40	Audio Line In/Out	1 In / 1 Out	
41	1 In / 1 Out	1 In / 1 Out	
42	Ingress protection	IP 66	
43	Power Supply	IEEE 802.3af/at compliant or better PoE power supply as per manufacturer's standard to be provided	
44	ONVIF compliant	The camera shall conform to ONVIF Profile S, G, T or latest	
45	Camera certification	STQC ER (Essential requirements)	
46	Visual Dashboard	Camera should have inbuilt browser-based dashboard to show details on Camera Bandwidth, Port utilization, services use, Camera Temperature	

(10.20) Fixed IP Camera - Long Range- Technical Specification & Compliance Sheet			
S/N	**Parameter**	**Requirements**	**Offered product parameters**
1	**Make & Model**	**to be provided by the bidder**	
2	Form Factor	High-Definition Fixed IP Long range outdoor camera.	
3	General technical requirement	Camera shall comply with general technical requirement as mentioned in Annexure-D	
4	Image Sensor	1/2.8" CMOS or better	
5	Field of View	Horizontal - 91°–32° Vertical - 49°–18°	
6	Video compression	H.265 MP, H.264 MP; M-JPEG	
7	Number of Pixels/Effective resolution	2592X1520 (4 MP) at 25/30 frame per second for primary stream. 1920x 1080 (2MP) at 25/30 frame per second for secondary or 3rd stream.	
8	Light Sensitivity	Colour mode: 0.14 lux or better B/W mode: 0.03 lux or better, 0 lux with IR illumination on	
9	IR Range	50 mtr or more	
10	Lens type	Fixed focal 3 - 10 mm Lens (+- 1 mm)	
11	Focus	Auto Focus	
12	Audio communication	Two-way, full duplex	
13	Iris Control	Auto IRIS Control	
14	WDR	120 dB or better	
15	White Balance	Automatic with mode selection options	
16	Electronic Shutter	1/10000 to 1/10 sec	
17	Wide Dynamic Range	Minimum 120 dB	
18	Day/Night selection	Auto, Color, Monochrome	
19	Encryption	TLS 1.2, AES128/AES256	
20	Memory card slot	Up to 256GB (128 GB card to be supplied)	
21	Interface Type	10/100-Base T, auto-sensing, half/full duplex, RJ45	
22	Typical Protocols	IPv4, IPv6, UDP, TCP, HTTP, HTTPS, RTP/RTCP, IGMP V2/V3, ICMP, ICMPv6, RTSP, ARP, DHCP, NTP (SNTP), SNMP (V1, V3, MIB-II),802.1x, DNS, DNSv6, SMTP, UPnP (SSDP), digest authentication	
23	Other functions	Sharpness, Backlight compensation, Contrast enhancement, Display stamping (Name/logo/Time), Defog	
24	Network connectivity	Camera shall be directly connected to network without use of an external encoder	
25	Data Security Features	Secured connections supported (HTTPS) Password enforcement at initial set up Execution of 3rd party software is disabled Firmware updates via OEM digitally signed firmware files only. Detect changes in a configuration Support of customer specific certificates. Regular updates via security patches Organization under MEITY) for mitigating cyber security risk.	
26	Hardware for data security	Inbuilt TPM /TEE as per STQC ER (Essential requirements)	

27	Auto Resume after Power Failure	Required	
28	Power supply	IEEE 802.3af/at compliant or better PoE power supply as per manufacturer's standard to be provided	
29	Operating Temperature	0°C to 55°C	
30	Humidity	Up to 90% RH, non-condensing	
31	IK &IP Rating	IK10,IP66	
32	ONVIF compliant	The camera shall conform to ONVIF Profile S, G, T or latest .	
33	Camera certification	STQC ER	
34	Visual Dashboard	Camera should have inbuilt browser-based dashboard to show details on Camera Bandwidth, Port utilization, services uses, Camera Temperature	

(10.30) VMS With 200 Licenses - Technical Specification & Compliance Sheet		
S/N	**Parameter Requirements**	**Offered product parameters**
1	Function The Video Management System (VMS) specified shall be an IP video security solution that provides seamless management of digital video, audio and Metadata across an IP network for Viewing, Recording, Auto changeover of VMS server ,control and Playback of IP CCTV system. It shall have all required Lifetime Licenses for use of the entire system. The video management software should support minimum 300 cameras and 14 nos. Clients.	
2	No. of Licenses :200 cameras, 14 client stations	
	General Features The proposed solution shall not require proprietary computer, server, and storage hardware and shall provide seamless integration with third party devices, subsystems, wherever possible. Software shall be Open platform network video compliant with API/SDKs available for integration with 3rd party systems	
3	Software shall be suitable for a complete CCTV system, with remote web interface, Synoptic maps with active icons representing cameras.	
4	The VMS should support storage of RAID-5/6 Configuration. The VMS should support iSCSI protocol.	
5	The VMS should have Option to do recordings on NAS, SAN, Cloud Storage, DAS, local or network drive. Defining different drive for each individual camera	
6	The VMS should support MJPEG, MPEG -4, H.264, H.265 video compressions. It should be able to support minimum two individually configurable H.265 streams.	
7	In case of Network Failover/failure, the video should be stored in camera SD card /edge local storage, once the Connectivity is re-established the Videos that Recorded on the SD Card during the Disconnection Period shall be Replenished & Synchronized with the Central Storage.	
8	Offered VMS should support 64 bits OS	
9	Offered VMS shall have capability to multicast videos to clients	
10	Controls a) Provide access to live, playback, audio, PTZ control, preset control, and auxiliary commands be programmable on an individual camera basis. b) Simultaneous viewing and recording of live videos from multiple cameras. c) Full PTZ Priority Queues – Prioritize PTZ control from events, tours, local and remote users.	

	d) Provide access rights to specific cameras, priority for pan/tilt/zoom control, rights for exporting video, and access rights to system log files.	
11	Recording/Playback a) Simultaneous recording & playback video streams from network cameras. d) Software remote interface provide Playback with all the options of the local playback facility, video multicasting and should have capability that most of Console's configuration can be adjusted through remote administration. e) Instant playback video streams with instant date & time stamp. f) For playback it should support pause, play forward, play reverse, single step forward, single step reverse, fast- forward, and fast-reverse.	
12	Time Synchronization: Provide Network Time Server function to ensure the synchronization of all cameras with servers for recordings.	
13	Configuration: The system administrator shall have rights to add/delete/assign/configure etc. With users' rights. Also possible to add/delete, configure cameras, Configure Alarm monitors.	
14	Multiple Live videos on single monitor: Play back recorded video at different speeds i.e. 1/4X to 16X. The system should support multiple live videos on single monitor in different configurations like 1, 2, 4 etc.	
15	Video Retrieval a) Retrieve recorded video without much delay for any date/time. Provision should be given to take video data backup in compressed form in other storage device and if needed, the same can be retrieved back at any client end. b) Archive searching should be based on any combination of time/date and device(s). c) Should have a weekly scheduler to program regular recording and support the recording on event functionality.	
16	Configuration Database User friendly spreadsheet/equivalent format providing the ability to enter camera titles, operator name, timely events, change system parameters, program camera sequences and lockouts.	
17	System Status Software shall also provide the ability to monitor system status events. Systems alarms, switching functions, sequence events, keyboard actions, and video loss information. The system shall be able to provide complete system Diagnostics.	
18	System Alarms The software shall support video loss, network loss and recording failure alarm logging.	
19	Automatic sequencing The video management system shall support automatic sequencing.	
20	Video Analytics Video Motion Detection.	
21	Cyber Security VMS Software as well the Web & Desktop Client Application should have undergone Audit as per OWASP top 10 Guidelines from STQC or MEITY empaneled agency in accordance with Gazette Notification Public Procurement (Preference to Make in India) Order 2017-Notifying CCTV/ Video Surveillance System for Security in furtherance of the Order dated 6th March 2024 or its latest amendments.	
22	Certificates The VMS OEM should have Certifications ISO 27001 and CMMI v2.0 Maturity Level - 3 Appraisal Certificate	
23	VMS	

	OEM and Version to be specified		
24	The VMS shall support the Open Network Video Interface Forum (ONVIF - S, G, M & T Profile) compliant Cameras and devices at the time bid submission.		
25	The offered video management system should have integration with Video Wall		
26	The management server shall be able to intelligently scan an IP network for new devices (cameras or servers etc.) simultaneously		
27	Should be capable of native Fail over of N+N configuration in future for all video recording management and storage.		
28	VMS shall support Lightweight Directory Access Protocol (LDAP) that allows integration with enterprise user management systems such as Microsoft Active Directory		
29	Client applications shall support any form of IP network connectivity including LAN, WAN, VPN, Internet, and Wireless		
30	The video management software client application shall support the display of the live stream of multiple ultra-HD cameras in without the impact on the smoothness of the displayed video by using Nvidia-based or Intel-based GPU decoding		
31	The video management system is listed as an ONVIF Profile-S, G, M, T conformant product on the ONVIF website. The Profile Conformant Details should be available on ONVIF Official Website www.onvif.org at the time of bidding		
32	Video Management Software Web Client should have a Reporting functionality in the form Camera Uptime, Downtime		
33	Video Management Software Web Client should support for H.265 Codec Live & Playback Streaming.		
34	Offered Software details		

10.40: Technical Specifications for NAS (Network Attached Storage)			
S.NO.	**Parameter**	**Specifications**	**Offered product parameters**
1	**Make & Model**	**to be provided by the bidder**	
2	Processor	Intel Xeon CPU Silver 4314 / AMD EPYC 7313 - Dual Processor – 16 Cores each Processor or better	
3	Cache	25 MB	
4	Memory	32 GB DDR4 ECC or Better	
5	Graphics Cards	Inbuilt/dedicated for Emergency Playback Support	
6	Inbuilt Video Port	2 x HDMI 2.0, 4K (3840 x 2160) /60 Hz for Emergency Playback Support on 2 Display	
7	HDD Bays	Min 16 Bays, Minimum 18 TB per Bay Enterprise Grade Hard disk support	
8	Minimum Storage	100 TB of usable disk space.	
9	SSD for OS	2x SATA3 2.5' 480 GB Enterprise SSD, RAID1 configuration	
10	RAID	Hardware RAID controller to be supplied. Hard Disk for Data should support Hot Swappable and minimum 01 HDD to be configured as Hot Spare	
11	RAID Level Support	1, 5, 6	

12	No of RAID controller ports	16	
13	Speed of RAID controller ports (Gbps)	12	
14	Protocol Support	CIFS, NFS, SMB, SMB 3.0, FTP, iSCSI latest versions	
15	OS	Licensed - Microsoft Windows Server IoT 2022 for Storage Standard /Embedded OS	
16	Network	2x10GbE or better	
17	Power Supply	Redundant, hot-swappable, 80 Plus Titanium Grade or Better	
18	Power Input	AC 230 V~ (+/- 10 %), 50 Hz (+/- 5 %).	
19	USB Ports	Front / Rear: 2 x2 USB 3.2 ports or better	
20	Data Security	Discrete TPM 2.0	
21	OEM Warranty	3 years	

(10.50) 24 Port L3 Ethernet Switch- Technical Specification & Compliance Sheet			
S/N	**Parameter**	**Requirements**	**Offered product parameters**
1	**Make & Model**	**To be specified by the bidder**	
2	Form Factor	19" Rack Mountable. 24 Nos. 10/100/1000 Base-T ports and additional 4 no 1G/10G SFP Ports. All Ports should be populated with 1G Trans receivers.	
3	Scope of work	Compliance for the scope of work	
4	Warranty/Onsite Support	As specified in the scope of work	
5	Form Factor	19 Inch Rack mountable	
6	IPV6 Compliance	All Functionalities of Switch shall be IPv6 compliant, and it should work on IPv6 Platform without any additional hardware/ software	
7	Common Criteria certification (ISO/IEC 15408).	The offered product series or its operating system series must have achieved Common Criteria Certification of EAL2+/ NDPP or higher in the Common Criteria certification.	
8	Port Standards	IEEE 802.3 10BASE-T Ethernet, IEEE 802.3u 100BASE-TX Fast Ethernet, IEEE 802.3ab 1000BASE-T Gigabit Ethernet, 802.3ae 10 GbE, Auto-negotiation.	
9	Switching capacity	Switching Capacity should be 76 Gbps or more.	
10	MAC address	MAC Address Table: Up to 10k or more	
11	VLANs (802.1q tagged VLAN)	512 or more	
12	Packet Throughput	68 MBPS or more switching throughput	
13	Trans receivers	All the Transceivers/Modules used to connect the Switches should be from the same OEM/make of the switches OR OR All Transceivers / Modules should be MSA Compliance duly certified and warranted by Switch OEM for Full functionality.	
14	L2 Loop Protection	IEEE 802.1d Spanning tree protocol	
		802.1s MSTP (Multiple instances of STP)	

		802.1w RSTP (Rapid spanning tree)	
15	Link Aggregation	802.3ad Link Aggregation	
16	QOS Support	Switch should support QOS.	
17	IP Multicast	IGMP Snooping	
18	Port Mirroring/ Span port	Port mirroring must be available.	
19	Router redundancy	Shall have VRRP/HSRP and enabled	
20	Network Login	MAC and 802.1 X based Login must be available	
21	Port Security	MAC Address based Lockdown and Limited Learning	
22	Access Control Lists	L2/L3/L4 access lists - IP based, Source/ destination ports, MAC based shall be available	
23	AAA (authentication, authorization and accounting)	AAA using RADIUS must be available. Should support RADIUS Change of Authorization (CoA) feature to change the attributes of an authentication, authorization, and accounting (AAA) session after it is authenticated.	
24	In-band Management	Following in-band management methods shall be available:	
		¨ Web based management (On http or https)	
		- SSH based management (SSH v2).	
25	Out-of-band management	- Console port	
26	Role based Administration	The switch shall support multiple administrator accounts. Each administrator account shall be configurable with the desired level of management privileges.	
27	Remote Monitoring	RMON Support	
28	Network Management	The switch should support SNMP V2c and V3.	
29	Time synchronization	Time synchronization using Network time protocol must be available.	
30	Configuration backup & restore	The switch shall have feature of backing up the configuration & restoring a backedup configuration. Multiple Configuration files must be supported. Switch shall have 1 x USB / MicroUSB port	
31	Interface cables and connectors (to be supplied with each switch)	Console cable and power cable (As per Indian standards) to be provided. All Cables shall be factoryterminated.	
32	Licensing	All the licenses required to implement the features specified in this document shall be provided	
33	Safety certification	The switch shall conform to IEC-60950/CSA-60950/EN-60950/UL-60950 standard for safety requirements of information technology equipment.	
34	Power supply	AC 230 V~ (+/- 10 %), 50 Hz (+/- 5 %)	
35	Operation Humidity	0% to 90% non-condensing	
36	Operating temperature	0°C to 40°C	
37	Latest OS version	The switch shall be supplied with the latest OS version.	

38	Port status display	Each port must have a dedicated LED for status display	
39	OEM Warranty	3 years	

(10.60) Server For VMS- Technical Specification & Compliance Sheet			
S/N	**Parameter**	**Requirements**	**Offered product parameters**
1	Make & Model	To be specified by the bidder.	
2	Processors make	Intel/AMD	
3	Processor Description and Number	Intel Xeon Silver 4509Y /AMD EPYC 7252 or better	
4	Number of processors	2 (i.e. Dual processor)	
5	No of cores per processor	8	
6	Form factor	RACK	
7	Size (RU)	1	
8	Chipset compatible with processor	Intel chipset compatible with processor Intel Xeon silver 4509Y /AMD SP3 platform chipset	
9	Expansion slot Gen 3 (PCIe x16)	1	
10	Max no of sockets available on server	2	
11	Maximum number of Sockets populated with Processors available on Server	2	
12	Type of RAM	DDR5 SDRAM with ECC	
13	Total No of DIMM slots available	16	
14	No of DIMM slots populated with DDR SDRAM	4	
15	DDR SDRAM size (GB)	128	
16	Type of Interface for SSD storage	SATA	
17	SATA SSD Hot swappable	YES	
18	Total Number of slots available for SATA SSD	2	
19	Number of Slot Populated with SATA SSD	2	
20	Capacity offered per SATA SSD (GB)	480	
21	Total Capacity Offered with SATA SSD (GB)	960	
22	Type of interface for Hard disk drive	SAS	
23	Total Number of Slots available for SAS drive	6	
24	Number of Slot Populated with SAS drive	6	

25	Capacity Offered per SAS Drive (GB)	1200	
26	SAS drive Speed (Hot plug or better) (RPM)	10K	
27	Total storage Capacity Offered with SAS drive (GB)	7200	
28	RAID Level	1, 5, 6	
29	No of RAID controller ports	8	
30	Speed of RAID controller ports (Gbps)	12	
31	RAID controller cache (GB)	4	
32	Network card supported	1G, 10G	
33	No of networking interface cards (LAN)	2	
34	Total no of Ethernet ports required in server	4x1G, 2x10G with SFP+	
35	Video controller (supported VGA or above resolution)	Yes	
36	Optical Drive	8X or higher DVD ROM- Internal/external. (If external it should be USB powered)	
37	USB ports (Ver 2.0/3.0)	3	
38	Other ports	One no of DP, mini-DP or HDMI port (as per solution provided)	
39	Certifications/compliance (OS)	Windows, Red hat Linux, SUSE Linux, Ubuntu	
40	Certifications /Compliance (Virtualization/Cloud platform	VM ware, Hyper V, Red hat virtualization	
41	Security Features	Secure Boot (Firmware and Bios Level Security), Provision to lock the system on breach, Hardware root of trust/Dual Root of Trust, Server should provide policy-based security, Server should provide server intrusion detection, "Malicious Code Free design" (to be certified by OEM). B) Hardware TPM 2.0	
42	Management Features	Remote power On/Shutdown of server, Remote Management of Server over LAN & WAN with SSL encryption through gigabit management port, Should have virtual Media support with all required licenses. Remote KVM, Server Health Logging, Out of Band Management. Server OEM's Management software to be provided. Real-time power meter, temperature monitoring, Monitoring of fans, power supply, memory, CPU, RAID, NIC for failures.	
43	Hot Swappable Redundant Power supply	Yes	
44	Redundant Fan	Yes	
45	Power supply efficiency	Platinum	
46	BIS registration under CRS of MeitY and its validity	To be provided by the bidder	

47	Server Main supply	230+/- 10% V- AC	
48	Maximum power consumption of the system (Watts	800W	
49	Operating system (To be provided	Windows Server 2022 or latest Standard Edition licensed for all processors cores and full physical server. (Perpetual license to be provided	
50	RAID Configuration	OS to be loaded on 2 disks (SSD) configured disk mirror. Five disks (SAS) to be configured in RAID -5 with remaining one disk (SAS) as Hot spare.	
51	Graphics card description	Integrated or Discrete or Dedicated	
52	Graphics card size	8 GB or better.	
53	KVM Switch	01 KVM Switch is to be supplied under the subject package.	
54	Optical Drive	SATA DVD+/- RW Optical Drive Standard	
55	Monitor	32" latest state of art LED monitor	
56	Software	OEM approved Antivirus software with minimum 3 years validity after installation for optimal performance of the system. If licence renewal during these 3 years is required, it will be done by the bidder free of cost before validity expiry. Regular updates & the latest virus definitions will be supplied by the bidder free of cost during this period.	
57	OEM warranty	3 years	

(10.70) WorkStation- Technical Specification & Compliance Sheet			
S/N	**Sub Feature**	**Detailed Specification**	**Offered product parameters**
1	**Make & Model**	**To be specified by the bidder**	
2	Scope of work	Compliance with the scope of work	
3	Warranty/Onsite Support	As specified in the scope of work	
4	Processors make, description and Number	Intel Core i5-12500/Hexa-Core AMD Ryzen™ 5 5500U or better	
5	No of cores per processor	6 or better	
6	Out of Band management	Intel vPro/AMD DASH	
7	Chip set	Intel Q670/AMD System on chip (SOC)	
8	Installed memory (RAM)	16 GB or better	
9	RAM Type	DDR4, 3200 MHZ or higher	
10	Memory (DIMM) slots	At least two	
11	No of DIMM slots populated	ONE	
12	RAM Expandability	Expandability Up to 64GB (using spare DIMM slots)	
13	USB version 3.0/3.1 Gen 1/Gen 2	At least 4 ports	
14	USB Type C Port	One port	

15	Form Factor	Tower/Mini Tower	
16	Audio	Headphone and microphone ports or Headphone/microphone combo jack (Universal Audio jack).	
17	Other Ports	At least one Display Port or one HDMI Port	
18	Ethernet port	10/100/1000 integrated gigabit port-2NOS	
19	Graphics Type	Integrated or Discrete or Dedicated	
20	Graphics card description	Intel integrated UHD 770 or AMD Radeon or discrete or dedicated graphics card	
21	Size of memory in case of dedicated graphics card	At least 2 GB	
22	Display Size, Type and Resolution	32 inch or higher Size, non-touch, IPS or WVA panel technology, Resolution: 1920x1080.	
23	Storage Type of drives used to populate internal bays	SSD	
24	Total Capacity of SSD (GB)	1 TB	
25	SSD interface	NVMe	
26	Power Supply Rating	120 W or better	
27	Keyboard and Pointing Device	Wired standard Keyboard or and Wired OPTICAL scroll Mouse with mouse pad	
28	Operating System	Latest Windows Professional version 64 bit or Equivalent or higher	
29	OS Type	64 bit and Licensed	
30	Recovery image media	USB from the OEM	
31	Certification Types	OS Certification: WINDOWS	
32	Webcam Resolution	Full HD	
33	Mic	Inbuilt	
34	Speakers	Speakers integrated with display/CPU	
35	Stand	Height adjustable	
36	Software	Symantec or any other OEM approved Antivirus software with minimum 3 years validity after installation. If licence renewal during these 3 years is required, it will be done by the bidder free of cost before validity expiry. Regular updates & the latest virus definitions will be supplied by the bidder free of cost during this period.	
37	Security	Hardware Trusted Platform Module (TPM) 2.0	
39	OEM warranty	3 years	

(10.80) Display Screen- Technical Specification & Compliance Sheet			
S/N	**Features**	**Specifications**	**Offered product parameters**
1	**Make & Model**	**to be provided by the bidder**	
2	Scope of work	Compliance with the scope of work	

3	Warranty/Onsite Support	As specified in the scope of work	
4	Display Size	55 inches or above	
5	Native Resolution	3840 x 2160 (UHD) 4K	
6	Brightness	Minimum 400 cd/m2 or above	
7	Contrast Ratio (Static/Dynamic)	Minimum 1200:1/1000000:1 or better as panel type	
8	Viewing Angle	178 * 178	
9	Input Ports	HDMI, DP or mini DP. (as per solution provided)	
13	HDR Support	HDR Pro/10/Plus	
16	Audio	20W (10W * 2).	
17	Power Supply	100-240V~, 50/60Hz.	
20	Accessories	Heavy duty Floor stand kit in addition to standard wall mount kit, Quick Setup Guide, warranty card, application CD, power cord and Other accessories.	

(10.90) 8 Port Ethernet Switch-POE			
S/N	**Parameter**	**Requirements**	**Offered product parameters**
1	Ports	8 No 10/100/1000 Base-T ports and additional 2 no 1G SFP Ports POPULATED WITH TRANSRECEIVERS	
2	Switching Capacity	Switching Capacity should be 16 Gbps or more.	
3	Packet Throughput	6.5 MbPS or more switching throughput	
4	MAC Address	MAC Address Table: Up to 4K or more	
5	Layer 2 features	IGMP Snooping IGMP v1/v2 Snooping, 802.1Q Virtual LAN (VLAN) bridges, Protocol-based VLAN	
6	Security	802.1X Port and MAC-based Authentication, SSH, IP Source Check, ARP Detection, DHCP Snooping	
7	Quality of Service (QoS)	802.1p Quality of Service, QoS based on VLAN/port/MAC	
8	Power supply	AC 230 V~ (+/- 10 %), 50 Hz (+/- 5 %)	
9	Operation Humidity	0% to 90% non-condensing	
10	Operating Temperature	0°C to 70°C	
11	Power Budget	120 W	
12	**Make & Model**	**to be provided by the bidder**	

(10.100) 4 Port Ethernet Switch PoE			
S/N	**Parameter**	**Requirements**	**Offered product parameters**
1	Ports	4 No 10/100 Base-T ports and additional 2 no 1G SFP Ports POPULATED WITH TRANSRECEIVERS	
2	Switching Capacity	Switching Capacity should be 16 Gbps or more.	
3	Packet Throughput	6.5 MbPS or more switching throughput	
4	MAC Address	MAC Address Table: Up to 4K or more	

5	Layer 2 features	IGMP Snooping IGMP v1/v2 Snooping, 802.1Q Virtual LAN (VLAN) bridges, Protocol-based VLAN	
6	Security	802.1X Port and MAC-based Authentication, SSH, IP Source Check, ARP Detection, DHCP Snooping	
7	Quality of Service (QoS)	802.1p Quality of Service, QoS based on VLAN/port/MAC	
8	Power supply	AC 230 V~ (+/- 10 %), 50 Hz (+/- 5 %)	
9	Operation Humidity	0% to 90% non-condensing	
10	Operating Temperature	0°C to 70°C	
11	Power Budget	60 W	
12	**Make & Model**	**to be provided by the bidder**	

(10.110) Media Converter			
S/N	**Parameter**	**Requirements**	**Offered product parameters**
1	Architecture	10/100/1000 BASE-T to 10/100/1000 BASE-FX media conversion	
2	Port	1 RJ-45 port and 1 fiber port	
3	Auto Negotiation	Auto negotiation of Duplex Mode	
4	Working Environment	0-65 deg C	
5	Relative Humidity	10%–90%, non-condensing	
6	Range	5km or more	
7	OFC type	SM	
8	**Make & Model**	**to be provided by the bidder**	

(10.120) Server Panel Specification			
S/N	**Parameter**	**Requirements**	**Compliance (Yes/No)**
1	Size	42 U racks, Suitable for mounting Switches, Storage, servers	
2	Dimension	Minimum 800 x 1000 mm	
3	Front	Lockable Vented steel door	
4	Fan	4 Fans At Top of the Rack	
5	Power	Suitable number of Electrical power outputs with minimum 20% spare capacity to take care of LAN devices connected inside the rack with spike buster.	
6	Sealing	All opening and cable entry points shouhave proper cap/sealing to prevent rodent.	
7	Side Panels	Removable Side Panels.	
8	Earthing kit	Solid Copper Earthing Bar and Cables etc for earthing of total rack must be provided.	
9	Operation Humidity	Powder Coated Steel or Aluminium.	
10	**Make & Model**	**to be provided by the bidder**	

(10.130) Joystick/Keyboard Specifications			
S/N	**Parameter**	**Requirements**	**Offered product parameters**
1	General Specifications	Joystick or keyboard	
2	Communication	USB/ RS232/RS485	
3	Operating System	Suitable With Server, Workstation	
4	Working Environment	Indoor, 0-45 deg C	
5	Relative Humidity	10%–90%, Non-Condensing	
6	**Make & Model**	**to be provided by the bidder**	

(10.140, 10.150, 10.160) LIU (6/12/24 PORT)-Technical Specification & Compliance Sheet			
S/N	**Parameter**	**Requirements**	**Compliance (Yes/No)**
1	General	The Fiber Rackmount LIU loaded having Adapter panel fixed on drawer base frame, with Adapters and with Pigtails and assembled with splice tray as per the Loaded fiber port requirement and their applicable accessories.	
2		Suitable to mount at different positions (depth wise) on standard 1U 19-inch racks. Drawer type to pull out for easy maintenance when assembled in racks.	
3		Cold Rolled Steel material with black powder coating	
4		Three types of cable entry holes for different size cables through cable glands, covered with rubber cable grommets/covers.	
5		Splicing of 6/12/24 fibers in each plastic fiber splicing trays with integrated cable spool design.	
6		Non removable top cover and no rear cover. Drawer type to pull out for better access of interior.	
7		As per the Loaded fiber port requirement, Loaded 6/12/24 (SC Simplex) adapters with SC SIMPLEX Pigtails on rackmount ports.	
8		As per the Loaded fiber port requirement Accessories kit consists of Cable management rings/Cable saddles, Cable glands (PG13.5, 2 nos), Splice rods, Blanking clips, Velcro ties, Cable ties, Cable inlet/outlet hole covers (2 types, 2 nos each)	
9		Cable management rings/Cable saddles can be mounted inside the rackmount, no provision to mount outside in front of the adapter panel.	
10		Suitable for storing up to 3 meters of 900 µm tight buffered fiber pigtail per adapter.	
11		Panel Dimensions: 482 x 220 x 44.3 mm (Length x Width x Height)	
12		Splice Tray Dimensions: 220 x 90 x 15 mm (Length x Width x Height)	
13		Port identification numbers printed on the Adapter panel	
14		Standards: Comply as per ANSI/TIA-568-C.3, ISO/IEC 11801	
15		Operating Temperature: -10 °C to +70° C Installation Temperature: -10 °C to +70° C	

(10.170) SC-LC Duplex Fiber Patch Cord SM-Technical Specification & Compliance Sheet			
S/N	**Parameter**	**Requirements**	**Compliance (Yes/No)**
1	General	Fiber optic patch cord with two core (Duplex) fiber cable terminated with LC connector at one end and SC connector at another end	
2		The terminated connectors in assemblies are designed and are compatible with industry standards (ANSI/TIA-568-C.3, ISO/IEC 11801).	
3		100% factory terminated and tested for optical characteristics & fiber end face finish.	
4		Fiber type G. 652D standard. OS2 (9/125 µm),	
5		Buffer Diameter: 0.9 ± 0.05 mm, Jacket Thickness: 0.35 ± 0.05 mm, Strength Member as Aramid yarn	
6		Cable Diameter: 2.0 x 3.8 ± 0.2 (Duplex)	
7		Jacket color: Yellow, Jacket Material: LSZH, Length: 3 Mtr	
8		Connector Ferrule: Ceramic, Apex Offset should be <50um, Fiber height should be ±100nm	
9		Connector Repeatability ≤ 0.2dB with 1,000 times mating cycles.	
10		Connector cable retention: 50 N (11.24 lbs), Crush resistance: 100N/100mm, Bend Radius: 20xDiameter of cable	
11		Attenuation: ≤ 0.36 dB/km (@1310 nm), ≤ 0.25 dB/km (@1550 nm)	
12		Chromatic Dispersion: ≤ 3.5 ps/nm.km (@1285 - 1330 nm), ≤ 18 ps/nm.km (@1550 nm)	
13		Zero Dispersion Wavelength: 1300 - 1324 nm	
14		Cut-off Wavelength: ≤ 1260 nm	
15		Mode Field Diameter: 9.2 ± 0.4 µm (@1310 nm) , 10.4 ± 0.5 µm (@1550 nm)	
16		Insertion Loss (@1310 &1550nm): SM (UPC/PC) Type: SC/LC/ST/FC: ≤ 0.3 dB Return Loss (@1310 &1550nm): SM (UPC/PC) Type: SC/LC/ST/FC: ≥ 50 dB	
17		Insertion Loss (@1310 &1550nm): SM (APC) Type: SC/LC/ST/FC: ≤ 0.3 dB Return Loss (@1310 &1550nm): SM (APC) Type: SC/LC/ST/FC: ≥ 60 dB	
18		Standards: IEC 60332-1, ANSI/TIA-568-C.3, ISO/IEC 11801	
19		Installation Temperature: -10 °C to +70° C, Operating Temperature: -10 °C to +70° C	

(10.180) CAT 6 SFTP Cable & Accessories-Technical Specification & Compliance Sheet			
S/N	**Parameter**	**Requirements**	**Compliance (Yes/No)**
1	General	Cat 6 SFTP Cable (Operational bandwidth up to 250 Mhz).	
2		This cable well exceeds the requirements of TIA/EIA-568-C.2 and ISO/IEC 11801	
3		Conductor 23 AWG Solid bare Copper and Outer jacket sheath FRPVC and CM rated cable. Jacket color: Grey, Cable Type: SF/UTP Insulation: High Density Polyethylene Solid Conductor Diameter: 0.55 mm (23 AWG) Wrapping: Overall Polyester tape HF-Screening: Overall AL-PET (Mylar) tape Braiding: Tinned copper conductor Jacket Average Thickness: 0.44 ± 0.01 mm Jacket Diameter: 7.5 ± 0.5 mm, Rip Cord: 1 no Drain Wire: 1 no (0.39 ± 0.01 mm)	
4		Construction: 4 twisted pairs separated by internal PE Cross Separator. Full separator. Half shall not be accepted. Rip Cord is must.	
5		Dielectric Strength of cable should be 2.5 KVDC for 2 SECS	
6		Bending Radius: < 8X Cable Diameter at -20°C +/- 1°C Pulling Force: 25.35 LBS	
8		Insertion Loss of 32.8 db/100m at 250 MHz	
9		Cable should support operating Temperature from -10° to +70°C	
10		Cable support Conductor Resistance < 9.38 Ω/100m	
15		Printed sequential Length Counter of each meter on Outer Jacket	
16	Others	Casing/Capping/Connecting accessories shall be in bidder's scope.	

(10.190) 24U Smart Rack - Technical Specification & Compliance Sheet			
S/N	**Parameter**	**Requirements**	**Compliance (Yes/No)**
1	Product details	Please mention Make, Model No. and Part Code	
2		Cabinet shall be rigid welded construction with steel frame architecture to bear at least 1200 kg load should be made of 1.2mmthick CRCA steel	
3		Cabinet shall Minimum width of 800mm depth of 1000mm & 24 U Usable height	
4		IP 54/55 Approved design.	
5		Vandal proof design. Inside of the Cabinet should not get an access without opening the Door lock with key.	

6		Double skin construction [As an option] with air gap/In case of thermal Insulation material (min 20 mm thick) shall be cross filled polyolefin with factory applied reinforced 9micron Aluminum foil and acrylic adhesive backing with thermal conductivity of 0.032 W/mK		
7		Front and rear steel door, provided with 3point handle security lock with unique/common key		
8		L type Pad lock arrangement for secondary locking arrangement		
9		Depth wise reversible 19" angles with U marking screen printed in Black colour provided for equipment mounting.		
10		10 Nos. of Metallic cable loops shall be provided for routing the cables		
11		Should have Power distribution box with PDU 1U 6 X 5/15Amp Octagonal angular Socket with 16Amp MCB, 10k breaking capacity. The rack should have dual power source input provisioning.		
12		Slanted/Flat Roof Canopy shall be provided to with stand to provide the		
13		PU Molded non removable gasket arrangement provided at door on sealing of dust & water		
14		Cabinet shall be provided with split type yellow/green earthing leads for earth continuity		
15		Finish: -RAL 7035 - 80 microns Pure Polyester Nano Ceramic Powder coating.		
16	Mounting	Side/Door mounting		
17	Cooling capacity	1000 Watts		
18	Refrigerant	R 134a, R152a, R290, R600a or latest permitted		
19	Operating Ambient Temperature	10°C ± 50°C		
20	Maximum Ambient Temperature	50°C		
21	Compressor type	Hermetically sealed, Reciprocating		
22	Condenser Coil	Aluminum coil with copper tubes		
23	Condenser Fan	Backward curved		

24	Evaporator Coil	Aluminum coil with copper tubes		
25	Evaporator Fan	Backward curved		
26	Body Material	MS Body Power Coated		
27	Color	RAL 7035		
28	Power Input Supply	230V +/- 10%, 50 Hz, 1 Phase. Should have provisioning for dual source power input with auto failover mechanism.		
29	Operating Voltage	230V		
30	Temperature controller	Digital type with LCD display		

(10.200) Junction Box- Technical Specification & Compliance Sheet			
S/N	**Parameter**	**Requirements**	**Compliance (Yes/No)**
1	General	Robust steel sheet construction made from1.25mm or1.5mm steel sheet, folded and welded from a single piece, with protection channel around the door opening, rear panel with outer sunk holes for wall mounting brackets. Enclosure base fitted with sheet steel gland plates. Size-9U.	
2		The JB shall have an on/off switch to switch the power supply from UPS. For terminating all cables, the junction box should have suitable terminating block or connections.	
3		The provision form outing the JB on the pole shall be made available in the junction box	
4		Suitable for housing of mini-UPS, LIU, din rail mount switch, Power supply/all the equipment required at the camera site. It shall be weatherproof to withstand the outdoor dust and high temperature climate of the plant.	
5		Lock inserts, wall mounting brackets, plastic gland plate, earthing straps, wiring plan pockets, door stay, panels, electronic accessories (for600 mm wide enclosures only),180°hinge Enclosure and door: Dip coat primed, powder-coated on the outside, textured paint RAL7035, Mounting plate: Zinc-plated.	
6		Suitable for Outdoor installation, protected against weather influences.	
7		Required for housing CVT, LIU, Switch, Media Converter and Power Supply.	

(10.210) UPS - Technical Specification & Compliance Sheet			
S/N	**Item**	**Required Parameters**	**Compliance (Yes/No)**
1	**Make & Model**	**To be specified by the bidder**	
2	Warranty/Onsite Support	As specified within the scope of work outlined in Annex A (Clause 3.4)	
3	Ratings	3 KVA	
4	Input	160VAC-260VAC	
5	Output Frequency (sync to mains)	47.5-52Hz	
6	As per guide	Single Phase 3 wire	
7	Efficiency at Full Load	Efficiency at Ful Load - 90 %	
8	Output	230+/- 5%	
9	Output Frequency	50+/-1%	
10	Battery Type	SMF	
11	Backup Time	30 Minutes per one server.	
12	Battery Recharge	8 Hours to 90 % after complete discharge	
13	Transfer Time	10 ms maximum, Bump less transfer	
14	Indicator	LED Indicator	
15	Audible Alarm	Alarm when on battery backup mode, Low battery, overload.	

(10.220) OFC (Armored) 12 Core-Technical Specification & Compliance Sheet			
S/N	**Parameter**	**Requirements**	**Compliance (Yes/No)**
1	General	12-Core, Single mode 9/125 micron primary coated buffers, 10G Ethernet OS2, Armoured Loose Tube, ECCS (Electrolytic Chrome Coated Steel) Tape, Jelly Filled Loose Tube.	
2		Two Steel Wires/Rods embedded in outer periphery of the jacket as strength members. UV Stabilized jacket and protected from Rodent attacks	
3		Complying to ANSI/TIA-568-C.3, ISO/IEC 11801, Telecordia GR-20 Core, ITU-T REC G.652D, IEC 60793-1/60794-1, EN 50173,	
4		Suitable for use in indoor/outdoor ducts, direct burial and backbone cabling	
5		Loose tube material: Polybutylene Terephthalate (PBT) with Natural/White Colour having Inner Diameter/Outer Diameter 1.7/2.5 ± 0.1 mm	
6		Peripheral strength as two steel wires/rods having dimensions as 0.6 ± 0.05 mm	
7		Moisture Barrier as Water Swellable Tape, Armouring ≥ 0.150 mm (ECCS Tape), Number of Ripcords as 01 no polyester-based yarns.	
8		Outer sheath material as HDPE/LSZH with diameter as 7.5/8.5 ± 0.5 mm having thickness of 1.5mm nominal	
9		Weight of the cable for 04/06/08/12 core (HDPE/LSZH): 65.0/75.0 ± 10 kg/km, for 24 cores (HDPE/LSZH): 75.0/95.0 ± 5 kg/km	
10		Fiber colour and Loose tube colour as per ANSI/TIA standards.	
11		Tensile Strength: 1000 N, Crush Resistance: 4000 N/100mm	

12		Minimum bend radius: 20 x Diameter (during installation), Minimum bend radius: 10 x Diameter (during full load)	
13		Fiber Type: G. 652D (OS2)	
14		Attenuation: ≤ 0.38 dB/km (@1310 nm), ≤ 0.25 dB/km (@1550 nm)	
15		Chromatic Dispersion: ≤ 3.5 ps/nm.km (@1285 - 1330 nm), ≤ 18 ps/nm.km (@1550 nm)	
16		Zero Dispersion Wavelength: 1300 - 1324 nm	
17		Zero Dispersion Slope: ≤ 0.092 ps/nm².km	
18		Polarization Mode Dispersion: ≤ 0.2 ps/√km	
19		Cut-off Wavelength: ≤ 1260 nm	
20		Mode Field Diameter: 9.2 ± 0.4 µm (@1310 nm) , 10.4 ± 0.4 µm (@1550 nm)	
21		Core Cladding Concentricity Error: ≤ 0.8 µm	
22		Cladding Diameter: 125 ± 1 µm , Coating Diameter: 245 ± 10 µm	
23		Cladding Non-circularity: ≤ 1 %	
24		Installation Temperature: -20 °C to +70° C, Operating Temperature: -20 °C to +60° C	
25	**Make & Model**	**to be provided by the bidder**	

(10.230) Power Cable with Termination Accessories- Technical Specification & Compliance Sheet			
S/N	**Parameter**	**Requirements**	**Compliance (Yes/No)**
1	**Type**	4 core X 2.5 sqmm armoured power cable	
2	**Voltage Rating**	Up to and including 1100 volts	
3	**Conductor**	STRARNDED ANNEALED BARE CU (CLASS-2 OF IS: 8130)	
4	**Strands**	7 nos. with each strand of at least 0.67 mm diameter	
5	**Primary insulation**	Extruded PVC compound as per IS 5831 type C	
6	**Inner Sheath**	Extruded PVC compound type ST2 Conforming to IS:5831/84	
7	**Outer Sheath**	Extruded PVC compound, type ST2 conforming to IS:5831/84	
8	**Armour over inner sheath**	Galvanised steel wire, conforming to IS:3975 thickness>1.4mm	
9	**Make & Model**	**to be provided by the bidder**	

(10.240) HDPE Pipe- Technical Specification & Compliance Sheet

S/N	**Parameter**	**Requirements**	**Compliance (Yes/No)**
1	Make	To be provided by the bidder	
2	Type	32 mm diameter HDPE Pipe	
3	PN rating	PN 6 or more	
4	Make	Standard (ISI Mark)	

(10.250, 10.260) Pole - 3 & 6 Meter- Technical Specification & Compliance Sheet			
S/N	**Parameter**	**Requirements**	**Compliance (Yes/No)**
1	Scope of work	Compliance for the scope of work outlined in Annex A	
2	Warranty/Onsite Support	As specified within the scope of work outlined in Annex A (Clause 3.4)	
3	Form Factor	FRP Poles with tiltable type base plate and foundation bolts, with suitable arrangement for mounting of PTZ camera at top of the pole, 2 more cameras at 5-7 Mtr height and mounting of outdoor rack(loaded) at suitable height.	
	Pole Height above ground level	03 Mtr; 06 Mtr	
	Depth of Pole Foundation	As per approval.	
	Pole Dia. & Thickness	Dia. 200 mm or higher; Thickness 2.5 mm or higher	
4	Manufacturing Process	Pultrusion	
5	MOC	U.V. Resistant, Fire Retardant, Non-Corrosive, Light Weight FRP, with special P.U. Paint	
6	Non-Corrosive	Special Polymer Resin with resistance to Saline Water, Air & Acidic fumes	
7	U.V. Resistant	Test Report for weathering as per ASTM G154 for 2000 Hours minimum (equivalent to 20 years outdoor life) with testing tensile strength test & flexural strength which shall not reduce by more than 15% after UV exposure.	
8	Di electrical	As per ASTM D149 Min. 6kV/mm	
9	Toxicity Index & Zero Halogen	As per NES 713 Toxicity Index ≤ 1.0 & Halogen - NIL	
10	Flexural Strength (LW)	Min 350 N/mm2 as per ASTM D790	
11	Tensile Strength (LW)	Min 350 N/mm2 as per ASTM D638	
12	Temperature Cycle	-20° C to +70°C as per IEC 60068-2-14:2009	
13	Coefficient of Thermal Expansion	Not more than 13x10−6m/m° C	
14	Design with Wind Speed	Suitable for Wind Speed of 47 mtr/sec as per ANSIC-136.20 with maximum deflection of 10% of Height of Pole.	
15	Glass Content	Min. 60%	
16	Colour	Grey/White/Black/Yellow	
18	Type Test Reports	Type Test Reports Required . All type test reports must be from Govt. Institutions & international lab, or NABL approved third party labs.	

10.270: PVC conduit- **Technical Specification & Compliance Sheet**			
S/N	**Parameter**	**Requirements**	**Offered/ Compliance (Yes/No)**
1	Nonmetallic PVC material, which is corrosion, rust & sunlight resistant.		
2	Rated for use with 90-degree C conductors.		
3	ISI marked		

10.280: Flexible Pipe- **Technical Specification & Compliance Sheet**			
S/N	**Parameter**	**Requirements**	**Offered/ Compliance (Yes/No)**
1	Suitable for high temperature applications		
2	Nonmetallic PVC material, which is corrosion, rust & sunlight resistant.		

10.290: Cable Tray 50 mm- **Technical Specification & Compliance Sheet**			
S/N	**Parameter**	**Requirements**	**Offered/ Compliance (Yes/No)**
1	Material shall be galvanised sheet steel as per IS 2629.		

IMPORTANT Note:

1. **The bidder should must fill for the compliance against each parameters as " Yes/NO" . The partial/incomplete filled data shall not be considered for technical evaluation. The specifications for BOQ Item No……shall be dully endorsed/certified by respective OEM's.**
2. **The alteration/modification/change in chronology of the parameters of the technical sheet is not permitted and If found so, then BID will not be considered for technical evaluation/vetting.**
3. **The Manufacturing Authorization Form / OEM Authorization is required for the offered products.**

ANNEXURE- B

Tentative BILL OF QUANTITIES (BOQ) - SETUP OF SECURITY SURVEILLANCE SYSTEM					
LINE ITEM	**ITEM/SERVICE DESCRIPTION**	**UOM**	**QTY**	**Compliance**	**Remarks**
00010	**MATERIAL SUPPLY (A)**				
10.10	PTZ IP Camera	NO			
10.20	Fixed IP Camera - Long Range	NO			
10.30	VMS (with auto change over)	NO			
10.40	NAS	NO			
10.50	24 Port L3 Ethernet Switch	NO			
10.60	Server For VMS	NO			
10.70	WorkStation	NO			
10.80	55" or Larger LED DISPLAY	NO			
10.90	08 Port Ethernet Switch (IE)	NO			
10.100	04 Port Ethernet Switch (IE)	NO			
10.110	Media Converter	NO			
10.120	Server Panel	NO			
10.130	Joystick for PTZ operation of cameras	NO			
10.140	6 Port LIU fully loaded	NO			
10.150	12 Port LIU fully loaded	NO			
10.160	24 Port LIU fully loaded	NO			
10.170	SC-LC Duplex Fibre Patch Cord SM	NO			
10.180	CAT6 SFTP Cable	M			
10.190	24U Smart Rack	NO			
10.200	Junction Box with Power Strip	NO			
10.210	UPS	No			
10.220	OFC(Armoured) 12 Core	M			
10.230	Power Cable With Termination Accessories	M			
10.240	HDPE Pipe	M			
10.250	Pole - 3 Mtr	NO			
10.260	Pole - 6 Mtr	NO			
10.270	PVC Conduit	M			
10.280	Flexible Pipe	M			
10.290	Cable Tray 50 mm	M			

00020	**ERECTION, INSTALLATION & COMMISSIONING**				
20.10	Installation, Erection & Commissioning	SET			
20.20	Cable Laying by Excavation, Trenching	M			
20.30	Laying of Cable on Existing Cable Tray	M			

ANNEXURE- C

Mandatory Spare List Supply

ANNEXURE-D

General Technical Requirement-

1. CCTV Camera/VMS/SERVER/NAS/SWITCH OEM shall certify that the offered hardware and software shall be free of any known security vulnerability (*excluding zero-day vulnerabilities*).

2. The intent is that CCTV Camera/VMS/SERVER/NAS/SWITCH OEM shall certify that the HARDWARE, Software and firmware (*excluding third party software e.g. video analytics*) does not contain any malicious code or otherwise is not operating contrary to its stated purpose.

3. Respective OEMs shall certify that, any component/hardware/parts/assembly/software including firmware used in the CCTV Camera/SERVER/NAS/VMS/SWITCH must not support any protocol, which enables unauthorized access or unauthorized remote control.

4. CCTV Camera/VMS/SERVER/NAS/SWITCH shall also be required to certify that no backdoor has been engineered.

5. Further, CCTV Camera OEM shall certify that MAC ID (identity of camera) of camera is registered with OEM and has not been altered.

6. CCTV Camera OEMs shall certify that, the offered CCTV Camera should not have HiSilicon chipset.

7. Respective OEMs shall certify that, the offered makes of CCTV Camera and VMS system are not banned in any PSU/Govt. organization as on first date of bid opening.

Note: - *For sl no 1-7, undertaking from respective OEM to be submitted along with the material supply.*

List of the documents(minimum) to be submitted along with bid (at the time of bidding) for technical evaluation

S.NO	Documents to be submitted along with BiD	Document submitted
1	Acceptance to scope work as per tender documents format by bidder	
2	Filled technical specifications compliance sheet by Bidder	
3	Undertaking by bidder for clause 3.2.3(i)	
4	MAF as per clause 3.2.4 by respective OEMs	
5	OEM endorsement to technical specifications as per clause 3.2.4	
6	EAL2+/NDPP certification details of network switch	
7	STQC ER/BIS certifications details	
8	ONVIF certification details	
9	NIL deviation to technical specifications	
10	Product Data sheets/ OEM endorsement for Technical Parameters for requisite items.	

NOTE: The above BOQ Item's along with specifications, Scope of Work is tentative in nature and just for illustration purposes and the same vary site to site as per requirements of respective sites/location.

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