

MORMUGAO PORT AUTHORITY
MECHANICAL ENGINEERING DEPARTMENT
NOTICE INVITING BUDGETORY OFFERS

Name of Work	NAME OF WORK “Replacement of existing CCTV system at Port’s Operational Areas with new advanced CCTV Surveillance system”.
Date of submission of budgetary quotation	On or Before 30.09.2024 .
Address for communication:	Executive Engineer (E-HL), Mechanical Engineering Department, Mormugao Port Authority, Electrical Section, 1st Floor, Admin. Building, Headland Sada, Goa – 403804.
Contact Details	Phone : (0832) 2594241/15/45 Email : xene.mgpt@gmail.com
Website	www.mptgoa.gov.in

EXECUTIVE ENGINEER (E-HL)
MORMUGAO PORT AUTHORITY

MORMUGAO PORT AUTHORITY
MECHANICAL ENGINEERING DEPARTMENT

CME/XEN(E-HL)/M-22/2024/

.09.2024

Sub: “Replacement of existing CCTV system at Port’s Operational Areas with new advanced CCTV Surveillance system”.

Ref: Budgetary Quotation No. CME/XEN(E-HL)/M-22/2024/02

Mormugao Port Authority intends to carry out “Replacement of existing CCTV system at Port’s Operational Areas with new advanced CCTV Surveillance system”

As such, kindly furnish the budgetary quotation for the same. Scope of work enclosed as Schedule - 'A' and Price Schedule enclosed as Schedule - 'A1'.

Your budgetary quotation should reach to this office on 30.09.2024.

Thanking you,

Yours sincerely,

EXECUTIVE ENGINEER (E-HL)

Technical specifications

1.0. GENERAL :

Mormugao Port Authority intends to take up the work of “Replacement of existing CCTV Surveillance system at Port’s Operational Areas with a warranty period of 03 years”.

EXISTING SYSTEM:

The existing CCTV surveillance system comprises of 41 IP Cameras, 03 Nos. NVRs, wireless units and wired connectivity at some areas. All these cameras were installed primarily to focus on surveillance of strategic areas and waterfront of the Port. The existing system is old and has out lived its useful life. In the recent assessment of the requirements under the new CCTV Surveillance system, several locations have changed and also the total requirement of Cameras.

2.0 SCOPE OF WORK:

2.1 PART- A

SUPPLY, INSTALLATION, TESTING AND COMMISSIONING (SITC):

- 2.1.1 As such, the scope of work of the contractor shall include complete replacement of CCTV surveillance system which shall involve supply and replacement/installation of 39 Nos. CCTV Cameras using wireless units and wired connectivity at some areas. The contractor shall install two Video Servers for the CCTV Cameras to store video footages data of upto 90days along with necessary software with monitoring and recording facilities.
- 2.1.2 The cameras are located in the Operational areas from where all video footages shall be transmitted via wireless modems or OFC to the Port’s Administrative Building where the Central Control Room is located on its first floor. The distances of the cameras to the Central Control Room range within from 2 to 5 kms. Video feeds from the Central Control Room are also provided to the Chairperson’s Office and Residence, Dy. Chairperson’s Office, Dy. Commdt/CISF Office, Signal-Station and TM for viewing purpose only. A Video wall along with suitable controller shall be

installed in the Central Control Room to view the real time and recording of the video footages.

- 2.1.3 The complete system shall be provided with a backup electrical power supply i.e. 02 Nos. UPS of 10KVA with parallel redundancy shall be installed at Central Control Room. One will provide steady uninterrupted power supply to video wall and the second one for Video servers, and other equipment's connected in Admin Bldg including the CCTV camera on the terrace of the building. All the equipment's (cameras, wireless modems, switches etc) that are outside the Main Admin Bldg. shall be provided with backup power supply from 1 KVA online UPS's for at least 1hr and shall take all power fluctuations. As such the contractor has to make arrangements for installing the same at all the locations.
- 2.1.4 All the above mentioned equipment's along with associated devices as necessary to commissioning of the CCTV Surveillance System shall be as per technical specifications indicated at 2.2.
- 2.1.5 The contractor shall plan the schedule for execution of works in co-ordination with the EIC to ensure no downtime on existing/remaining system or minimum down time. The scheme of network connectivity shall be as per layout given at **Annexure-1** and directions of the EIC. All the works related to the migration from old system to new system is in the scope of the Contractor.
- 2.1.6 Initially, the contractor shall install the video servers in the 32U fully loaded network rack and video wall in the CCTV Control Room in Main Admin Bldg. The video servers shall be tested with the existing camera before physically disconnecting any of the existing cameras. The Contractor shall ensure that all the wireless links are network license free. Further, he shall take care of existing running wireless frequencies in circulating areas of installations and tune-up their radios accordingly so as to avoid any interferences or channel clashing with others i.e. to ensure system run trouble free.
- 2.1.7 The contractor shall replace all the associated components i.e. outdoor CAT6A cables, PoE adapters, PoE Switches etc. of existing system as part of networking system of the cameras, except for the OFC.
- 2.1.8 There are 39 Nos. CCTV Cameras that are required to be installed of which 19 Nos. are Fixed and 20 Nos. are PTZ. The locations for installing the cameras are as follows:

- i) Gate No. 9 IN & OUT – 02 Nos. Fixed Cameras.
The contractor shall replace the existing Cameras on the Gate No. 9. The connectivity is established via wireless modem from Gate No.9 to New Gate No. 9 (at new Toll Plaza), further another wireless link from new Toll Plaza to Tower on Flotila Section Bldg. and then another wireless link from Flotila Section Bldg to Main Admin Bldg.
- ii) Gate No. 9 IN & OUT (at new Toll Plaza) – 02 Nos. Fixed Cameras
The contractor shall install 02 Nos. cameras at new toll plaza gate at the designated locations to monitor vehicular movement IN and OUT respectively. The connectivity is established via wireless modem from new Toll Plaza to Tower on Flotila Section Bldg. and then another wireless link from Flotila Section Bldg to Main Admin Bldg.
- iii) Gate No. 1 IN & OUT – 02 Nos. Fixed Cameras.
The contractor shall replace the existing 02 Nos. Fixed CCTV Cameras at Gate No. 1. The connectivity is from wireless pair between Gate No. 1 and Signal Station Bldg. Further another wireless is to be connected from Signal Station to Admin Bldg.
- iv) Gate No. 2 IN & OUT – 02 Nos. Fixed Cameras.
The contractor shall replace the existing 02 Nos. Fixed CCTV Cameras at Gate No. 2. From Gate No. 2 the network connectivity to Admin Bldg. is provided using EDP's OFC cable.
- v) Cruise Berth Gate IN & OUT – 02 Nos. Fixed Cameras.
The contractor shall replace the existing 02 Nos. Fixed CCTV Cameras at Cruise Berth Gate IN & OUT. Network connectivity is established via wireless modem from Cruise Berth Gate to Signal Station, and further another wireless link from Signal Station to Admin Bldg.
- vi) Signal Station Gate – 01 No. Fixed Camera.
The contractor shall replace the existing 01 No. Fixed CCTV Camera at Signal Station Gate. Network connectivity is established via wireless modem from Signal Station to Admin Bldg.

- vii) Substation A Gate – 01 No. Fixed Camera.
The contractor shall replace the existing 01 No. Fixed CCTV Camera at Substation A Entrance. Network connectivity is established via EDP's OFC cable.
- viii) Railway Over Bridge 1, 2 and 3 - 03 Nos. Fixed Cameras.
The contractor shall replace the existing 03 Nos. Fixed CCTV Cameras at Railway over bridge. Network connectivity shall be established from Railway Over Bridge to Old Railway Signaling Bldg, through outdoor CAT 6 cable of about 100 mtrs. And further from Old Railway Signaling Bldg to Admin Bldg. the path is given at 2.1.8.xvii.
- ix) Fire Station Bldg. - 01 No. Fixed Camera.
The contractor shall install 01 No. Fixed CCTV camera on Fire Station bldg. facing towards Ammonia Terminal. The network connectivity shall be provided from Fire Station office to Gate No. 2 using 50mtrs outdoor CAT 6 cable. The contractor shall lay cable along the wall of Fire Station Bldg., and further till Gate No. 2 by road cutting and back filling of about 15 mtrs length and 2 feet depth. Further from Gate No. 2 to Admin Bldg., the path is given at 2.1.8.iv.
- x) Gate 2 Substation - 01 No. Fixed Camera (180deg).
The contractor shall install 01 No. Fixed CCTV camera on Sub-Station bldg. outside Gate No. 2 facing towards Gate No. 2. The network connectivity shall be provided from Sub-Station bldg. office to Fire Station Bldg through outdoor CAT 6 cable of 100 mtrs approx. along the wall. Further from Fire Station Bldg. to Admin Bldg. the path is given at 2.1.8.ix.
- xi) Berth No. 4 on Tower - 01 No. Fixed Camera.
The contractor shall replace the existing PTZ camera with fixed camera. The network connectivity shall be provided from Berth No. 4 to Signal Station through wireless link. Further from Signal station to Admin bldg. the path is given at 2.1.8.vi.
- xii) Railway Signaling New Bldg. - 01 No. Fixed Camera.

The contractor shall install a fixed camera on the side wall of New Railway Signaling bldg. The network connectivity shall be provided through OFC cable from New Railway Signaling bldg. to Gate No. 2. Further from Gate No. 2 to Admin Bldg., the path is given at 2.1.8.iv.

xiii) Launch Jetty (HM 21) – 01 No. PTZ camera.

The contractor shall replace, 01 No. PTZ camera on Highmast No. 21 near launch jetty. The network connectivity shall be provided using wireless link from Highmast No. 21 to Tower on Flotila Section Bldg. and then another wireless link from Flotila Section Bldg to Main Admin Bldg.

xiv) Outer Channel (Signal Station) - 01 No. PTZ camera.

The contractor shall replace, 01 No. PTZ camera for Outer Channel at Signal Station. The network connectivity shall be provided from Signal station to Admin bldg.

xv) Port Channel (Admin. Bldg.) - 01 No. PTZ camera.

The contractor shall replace, 01 No. PTZ camera for Port Channel on Admin. Bldg. The network connectivity shall be provided using Outdoor CAT 6 Cable from Admin Bldg terrace to CCTV Control room.

xvi) Railway Signaling New Bldg. - 01 No. PTZ camera.

The contractor shall replace, 01 No. PTZ camera on Railway Signaling New Bldg. The network connectivity shall be provided using EDP's OFC from Railway Signaling New Bldg to Gate No. 2. Further from Gate No. 2 to Admin Bldg., the path is given at 2.1.8.iv.

xvii) Railway Signaling Old Bldg. - 01 No. PTZ camera.

The contractor shall replace, 01 No. PTZ camera on Railway Signaling Old Bldg. The network connectivity shall be provided using wireless link from Railway Signaling Old Bldg. to Highmast 46. From Highmast 46 to Admin Bldg. the path is given at 2.1.8.xx.

xviii) Cruise Berth (HM 02) - 01 No. PTZ camera.

The contractor shall replace, 01 No. PTZ camera on Highmast No. 2 on Cruise Berth. The network connectivity shall be provided using wireless link from Highmast No. 2 to Signal Station. Further from Signal station to Admin bldg. the path is given at 2.1.8.vi.

- xix) Berth No.9 (CCP Bldg.) - 01 No. PTZ camera.
The contractor shall replace, 01 No. PTZ camera on CCP Bldg. for Berth No. 9. The network connectivity shall be provided using wireless link from CCP Bldg. to Flotila Section Bldg. From Flotila Section Bldg to Main Admin Bldg. the path is given at 2.1.8.i.
- xx) R&D Yard (HM 46) - 01 No. PTZ camera.
The contractor shall replace, 01 No. PTZ camera on Highmast No. 46 near R&D yard. The network connectivity shall be provided using wireless link from Highmast No. 46 to Gate No. 9. From Gate No. 9 to Admin Bldg. the path is given at 2.1.8.i.
- xxi) Near CCP (HM 06) - 01 No. PTZ camera.
The contractor shall replace, 01 No. PTZ camera on Highmast No. 6 near CCP Bldg. The network connectivity shall be provided using wireless link from Highmast No. 6 to Flotila Section Bldg. and then from Flotila Section Bldg to Main Admin Bldg. the path is given at 2.1.8.i.
- xxii) Behind GCB Building (HM 02) - 01 No. PTZ camera.
The contractor shall replace, 01 No. PTZ camera on Highmast No. 2 behind GCB Building. The network connectivity shall be provided using wireless link from Highmast No. 2 to Gate No. 9. From Gate No. 9 to Admin Bldg. the path is given at 2.1.8.i.
- xxiii) Near Gate 1. (HM 01) - 01 No. PTZ camera.
The contractor shall replace, 01 No. PTZ camera on Highmast No. 1 near Gate No. 1. The network connectivity shall be provided using wireless link from Highmast No. 1 to Signal Station Bldg. Further from Signal station to Admin bldg. the path is given at 2.1.8.vi.
- xxiv) Near IOC Building (HM 38) - 01 No. PTZ camera.

The contractor shall replace, 01 No. PTZ camera on Highmast No. 38 near IOC Bldg. The network connectivity shall be provided using wireless link from Highmast No. 38 to new toll plaza bldg. From new toll plaza gate to Admin Bldg. the path is given at 2.1.8.i.

xxv) Barge Jetty No. 1 (HM 12) - 01 No. PTZ camera.

The contractor shall replace, 01 No. PTZ camera on Highmast No. 12 near Barge jetty No.1. The network connectivity shall be provided using wireless link from Highmast No. 12 to Flotila Section Bldg. and then from Flotila Section Bldg to Main Admin Bldg. the path is given at 2.1.8.i.

xxvi) Near Berth No. 8 (HM 17) - 01 No. PTZ camera.

The contractor shall replace, 01 No. PTZ camera on Highmast No. 17 near Berth No. 8. The network connectivity shall be provided using wireless link from Highmast No. 17 to new railway signaling Bldg. Further from New railway Signaling Bldg. to Admin Bldg. the path is given at 2.1.8.xvi.

xxvii) Near old Church (HM 02) - 01 No. PTZ camera.

The contractor shall replace, 01 No. PTZ camera on Highmast No. 2 near old Church. The network connectivity is provided using OFC from Highmast No. 2 to Gate No.1. Further from Gate No. 1 to Admin Bldg. the path is given at 2.1.8.iii.

xxviii) Light House on Cruise Berth - 01 No. PTZ camera.

The contractor shall replace, 01 No. PTZ camera on Light House near Cruise Berth. The network connectivity shall be provided using wireless link from Light House to Main Admin Bldg.

xxix) Railway Crossing (HM 03) - 01 No. PTZ camera.

The contractor shall replace, 01 No. PTZ camera on Highmast No. 3 near railway crossing. The network connectivity shall be provided using wireless link from Highmast No. 3 to a pole erected near JSW compound which is further to be connected using outdoor OFC cable to Gate No.2. Further from Gate No. 2 to Admin Bldg. the path is given at 2.1.8.iv.

xxx) Opp. New Railway S&T HM 51 - 01 No. PTZ camera.

The contractor shall install, 01 No. PTZ camera on Highmast No. 51 Opp. New Railway S&T Bldg. The network connectivity shall be provided using wireless link from Highmast No. 51 to Flotila Section Bldg. then from Flotila Section Bldg to Main Admin Bldg. the path is given at 2.1.8.i.

xxxii) Opp. Berth No. 8 HM 55 - 01 No. PTZ camera.

The contractor shall install, 01 No. PTZ camera on Highmast No. 55 Opp. Berth No. 8. The network connectivity shall be provided using wireless link from Highmast No. 55 to Flotila Section Bldg. then from Flotila Section Bldg to Main Admin Bldg. the path is given at 2.1.8.i.

xxxiii) Near New Gate No. 9 (HM 34) - 01 No. PTZ camera.

The contractor shall install, 01 No. PTZ camera on Highmast No. 34 near new Gate No.9 (toll plaza). The network connectivity shall be provided using wireless link from Highmast No. 34 to Toll plaza Bldg. Further from new toll plaza bldg. to Admin Bldg. the path is given at 2.1.8.i.

NOTE: All the locations where network is established using EDP's OFC network, the items/equipment's required for connecting the cameras on this network shall be sourced by the Contractor.

2.1.9 The contractor shall replace one camera and associated set of devices at a time and only after that cameras is made fully operational the contractor shall move on with installation of the next camera in co-ordination with EIC until all 39 Nos. CCTV cameras are installed at the designated locations. In the process of replacing the camera, the contractor shall take utmost care not to disturb the existing setup for remaining cameras until the entire setup is replaced. To ensure this, the contractor shall get well versed with the existing system layout through the EIC. All the components shall be mounted on site appropriately keeping in mind the maintenance aspects. The contractor shall concur all such locations with the EIC to avoid maintenance issues in the future.

2.1.10 The complete system shall be installed, configured, tested and commissioned in-coordination with CISF and approval by Engineer – In –

Charge (EIC). The contractor shall access and include complete mounting, connection assemblies as necessary for the cameras, wireless modems, junction boxes, UPS, cables, connectors etc. All the brackets, clamps, JB's and other components fabricated shall be appropriately painted with one coat of red oxide primer and two coats of anti-corrosive silver paint. Similarly, all nuts, bolts and other hardware used shall be of Stainless Steel to sustain extreme saline site conditions. The dismantled/ removed equipment's shall be shifted to designated location by the contractor as instructed by the EIC at his own cost. The contractor shall arrange for necessary power cabling/LAN cabling, connecting IT devices, electrical switchgears, etc as necessary for complete commissioning of the system. The contractor shall access the site conditions before quoting to counter situations during guarantee/CMC such that if the proposed Line of Sight (LoS) is disturbed, the contractor shall establish/ restore the LoS at his own cost for any of the cameras.

2.1.11 Port intends to incorporate analytics in the CCTV system for better surveillance. The contractor shall make sure that all the analytic features are specified in technical specifications. However, Port reserves the right to enable a few or all of the analytics as felt necessary. The contractor's staff deployed during guarantee and CMC period shall be well-versed with the complete functioning of these features. Necessary software's or any additional software's, upgrades, patches etc. Likewise necessary hardware's or any additional hardware's if required shall be sourced by the contractor apart from the items indicating the BOQ, which shall be pre-loaded on the servers/cameras/wireless modems.

2.1.12 The contractor shall install the video wall as per the given specifications in the CCTV control room and configure all the camera feeds on the video wall. A dedicated controller for managing and controlling all the features of the video wall shall be supplied and commissioned.

2.1.13 The contractor shall be responsible for commissioning of the system and shall ensure to include any other items which are required but not listed the tender document, for completing the work in all respects to the satisfaction of the Engineer-In-Charge. The completion period for replacing all 39 Nos. CCTV cameras at operational areas and 09 Nos.

CCTV cameras as indicated at clause no. 2.1.15 at Admin Bldg. premises is 50 days from placement of Letter of Acceptance (LoA) by the Port. Beyond this date LD as applicable in the tender conditions will be levied. The system will be under testing for 07 days beyond 50 days from the date of completion of the Project. During this period the complete system will be monitored for its healthy functioning and only then, the system will be accepted as commissioned to the satisfaction of the EIC. The contractor shall provide 2 year warranty with on-site support after commissioning of work. After satisfactory completion of warranty period the contractor shall enter into a CMC for 5 years.

2.1.14 After successful commissioning of the proposed CCTV system, the contractor shall be responsible to provide training sessions to the Engineers and all associated CISF CCTV monitoring staff for monitoring, retrieving footages and basic trouble shooting until they are well versed and capable to operate the system. Since CCTV data is classified as confidential data of any organization, it is mandatory that the personnel handling the same should maintain its confidentiality and no data/information fully or partly can be shared within and outside this Port without prior permission of the EIC. In case any proof is established in this regard action will be taken against the concerned or personnel as deemed fit and as per provision of the law.

2.1.15 Presently there are 06 Nos. CCTV cameras installed in and around Main Admin Bldg. After completing installation of these 39 Nos. CCTV cameras, the contractor shall install 03 Nos. cameras that are removed from the above operational areas as directed by the EIC. All these 09 Cameras (06 Nos. existing + 03 Nos. removed after replacement) will have to be separately connected via wired network to one of the disconnected NVR's in the CCTV Control Room and feeds will have to be given on the video wall installed in the CCTV control room. The cameras, NVR and other accessories shall be used from removed existing system and will be supplied by the Port. Installation and commissioning of the system will be in contractor's scope.

2.2 Detailed Technical Specifications:-

2.2.1 IP FIXED /BULLET CAMERA

Sensor type	(1/2.9 to 1/2.7) inch CMOS
Total sensor pixels	4MP or higher
Sensitivity	Color 0.24 lx, Mono 0.03 lx, With IR 0.0 lx or better
MTBF	MTBF > 100,000 Hrs or higher
WDR approved & measured as per	120 dB or higher
True Day/Night	Auto, Color, Monochrome
Noise reduction	3DNR or better
Intelligent defog	YES
Video resolution	3072 x 1728/ 2688x 1512/ 2560 x 1920
Video compression	H.265 , H.264
Max. frame rate	30 fps
IR Range	Minimum 50m
Lens type	Automatic Varifocal 2.8 to 12 mm P Iris Lens
Lens adjustment	Motorized zoom/focus
Audio communication	Two-way, full duplex
Ethernet	10/100 Base-T, auto-sensing, half/full duplex
Ethernet connector	RJ45
Connectivity	ONVIF Profile S, G & T
Analysis Type	Edge Based Analytics
Alarm rules	Rule based alarms and tracking, Line crossing, Enter / leave field, Follow route, Loitering, Idle / removed object, People counting, Crowd density estimation
Other functions	Sharpness, Backlight compensation, Contrast enhancement, Display stamping (Name/logo/Time), Pixel counter
Analog Video Output	Required
Memory card slot	Min. 1TB support with card.
SD card health monitoring	Extreme lifetime and health monitoring support that provides early service indication
Protocols:	IPv4, IPv6, UDP, TCP, HTTPS, SNMP, DNS, SMTP, iSCSI, LLDP
Encryption	TLS1.0/1.2
Data Security:	<ul style="list-style-type: none"> Secured connections supported (HTTPS) Password enforcement at initial set up

	<ul style="list-style-type: none"> • 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 • Support of Microsoft Active Directory for safe management of user access rights • Regular updates via security patches • OS / Firmware Protect Encrypted Firmware, Secure boot, Signed Firmware • User authentication Digest Authentication, Prevent brute-force attacks • Secure Storage HTPM, SD card partition encrypt • Security Certificate Cyber Security assurance program UL CAP(UL 2900-2-3 L2) <p>NOTE: Bidder shall furnish the documentation proof of the above data security constraints on OEM letter head.</p>
Data security	Hardware based/Embedded cyber security.
Dual Power Supply for redundancy	POE and 12VDC
Operating temperature	-40 °C to +50 °C
Humidity	90% (non-condensing)
Ingress protection	IP66 and NEMA4X
Impact protection	IK10
Certifications:	CE, FCC, UL, VCCI, BIS, NDAA Certified series

NOTE: The bidder shall furnish documentary evidence from the OEM duly signed and stamped for all the above specifications supported by official documents such as manuals/ data sheets etc. to be submitted along with technical bid.

2.2.2 INTEGRATED SPEED IP PTZ DOME CAMERA

Sensor type	(1/2.9 to 1/2.7) inch CMOS
Total sensor pixels	4 MP or higher
Sensitivity	Color 0.0101 lux, Mono 0.0016 lux, 0 lx (IR ON) or better
MTBF	MTBF > 120,000 Hrs or higher
WDR approved & measured as per	120 dB or better
True Day/Night	Auto, Color, Monochrome
Noise reduction	3DNR or better
Intelligent defog	YES

Video resolution	2688 x 1520 or better
IR Distance	200 Mtr and above
Video compression	H.265 MP, H.264 MP
Max. frame rate	30 fps
Optical and Digital zoom	30x Optical 16X digital
Lens type	Auto Focus zoom lens 4.95 ~ 148.24mm or better
Lens adjustment	Motorized zoom/focus
Pan angle	360° Continuous
Tilt angle	-20° to 90°
Guard Tour	YES
Sector Masking/Blanking	YES
Audio communication	Two-way, full duplex
Ethernet	10/100 Base-T, auto-sensing, half/full duplex
Ethernet connector	RJ45
Connectivity	ONVIF Profile S, T & G
Analysis Type	Edge Based Analytics
Alarm rules	Rule based alarms and tracking, Line crossing, Enter / leave field, Follow route, Loitering, Idle / removed object, People counting, Crowd density estimation
Other functions	Sharpness, Backlight compensation, Contrast enhancement, Display stamping (Name/logo/Time), Pixel counter
Memory card slot	Min. 512 GB support or higher with card
SD card health monitoring	Extreme lifetime and health monitoring support that provides early service indication
Protocols:	IPv4, IPv6, UDP, TCP, HTTPS, SNMP, DNS, SMTP, iSCSI, LLDP,
Encryption	TLS1.0/1.2
Data Security:	<ul style="list-style-type: none"> • 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 • Support of Microsoft Active Directory for safe management of user access rights • Regular updates via security patches

	<ul style="list-style-type: none"> • OS / Firmware Protect Encrypted Firmware, Secure boot, Signed Firmware • User authentication Digest Authentication, Prevent brute-force attacks • Secure Storage HTPM, SD card partition encrypt • Security Certificate Cyber Security assurance program UL CAP(UL 2900-2-3 L2) <p>NOTE: Bidder shall furnish the documentation proof of the above data security constraints on OEM letter head.</p>
Data security	Hardware based/Embedded cyber security.
Dual Power Supply for redundancy	POE+ (IEEE 802.3bt) and 24VAC
Operating temperature	-40 °C to +50 °C
Humidity	Up to 90% (NON condensing)
Ingress protection	IP 66 and NEMA4X
External Mechanical Impact (IK Code or Impact rating)	IK10
Privacy Masking	YES
Certifications:	CE, FCC, UL, BIS, NDAA Compliant series

NOTE: The bidder shall furnish documentary evidence from the OEM duly signed and stamped for all the above specifications supported by official documents such as manuals/ data sheets etc. to be submitted along with technical bid.

2.2.3 WIRELESS TRANSMITTERS & RECEIVERS

1. 1.2Gbps Wireless modem

Operation	Radio System should operate in India WPC Band in 5Ghz band in accordance with G.S.R. 1048(E) dated 18 th Oct 2018 for outdoor deployment
Data Rate	1.2Gbps at 80Mhz net aggregated through put
Standard + Transmission Tech.	TDD Capable of Point to point connectivity Radio should have the capability to adapt the modulation mode depending on the link environment, ensure best throughput in non LOS situation. Modulation level shall be dynamically adaptive.
ETA	To be enclosed along-with Technical Bid
MTCTE	To be enclosed along-with Technical Bid
Band width in Mhz	20/40/80Mhz
Modulation	YES
Spectral Efficiency,	15 bps/Hz and above
ACS	Supported
DCS	Supported
Dynamic Channel Bandwidth	Supported 20/40/80/160 MHz

Adaptive Modulation & Coding	Supported
ATPC	MCS
GPS, Interference (Hub Site)	Supported with spectrum analyser to find the best available frequency.
Symmetric/Asymmetric Tx (UL/DL Allocation)	Configurable 25/75, 50/50, 75/25
Latency, ms (Two Way)	Minimum 5msec (average)
Frame Size, Bytes	9000 bytes or better
Planning tool, Software	Supported
Ports/PoE	100/1000/2500Mbps Full Duplex RJ45 PoE, 1000Mbps Full Duplex SFP
Network Management	SNMPv1/v3 supported
VLAN	802.1Q tagging for management
QoS	Packet classification to 8 priority queues according to 802.1P or Diff Server
Encryption	AES256 or better
Power Consumption, Watt	Up to 30W
Input Voltage	42.5–57.0 V
Safety Standards	UL, Lightning protection as per EN 61000-4-5, Class 3(2KV)
Temp.	(-40°C to 60°C/-40°F to 140°F)
Ingress Protection	IP67
Wind Load	180kmh/112 mph
Antenna Integrated/External	YES
Freq. Range	5.8 GHz WPC; 5.1 GHz WPC (default)
Gain, dBi	24dBi or higher integrated Antenna.

NOTE: The bidder shall furnish documentary evidence from the OEM duly signed and stamped for all the above specifications supported by official documents such as manuals/ data sheets etc. to be submitted along with technical bid.

2. 500 Mbps Wireless modem

Operation	Radio System should operate in India WPC Band in 5Ghz band in accordance with G.S.R. 1048(E) dated 18 th Oct 2018 for outdoor deployment
Data Rate	500 Mbps net aggregated through put
Standard + Transmission Tech.	TDD Capable of Point to point connectivity Radio should have the capability to adapt the modulation mode depending on the link environment, ensure best throughput in non LOS situation. Modulation level shall be dynamically adaptive.
ETA	To be enclosed along-with Technical Bid
MTCTE	To be enclosed along-with Technical Bid
Band width in Mhz	20/40/80Mhz user configurable
Modulation	YES
Spectral Efficiency,	15 bps/Hz and above
ACS	Supported

DCS	Supported
Dynamic Channel Bandwidth	Supported 20/40/80/160 MHz
Adaptive Modulation & Coding	Supported
GPS, Interference (Hub Site)	Supported with spectrum analyser to find the best available frequency.
Symmetric/Asymmetric Tx (UL/DL Allocation)	Configurable 25/75, 50/50, 75/25
Latency, ms (Two Way)	Not more than 10msec (average)
Frame Size, Bytes	9000 bytes or better
Planning tool, Software	Supported
Ports/PoE	100/1000 Mbps Full Duplex RJ45 PoE
Network Management	SNMPv1/v3 supported
VLAN	802.1Q tagging for management
QoS	Packet classification to 8 priority queues according to 802.1P or Diff Server
Encryption	AES256 or better
Power Consumption, Watt	Up to 15W
Input Voltage	42.5–57.0 V
Temp.	(-30°C to 60°C/-40°F to 140°F) or better
Ingress Protection	IP67
Wind Load	180kmh/112 mph
Safety Standards	UL, Lightning protection as per EN 61000-4-5, Class 3(2KV)
Gain dBi	22dBi or higher integrated Antenna.

NOTE: The bidder shall furnish documentary evidence from the OEM duly signed and stamped for all the above specifications supported by official documents such as manuals/ data sheets etc. to be submitted along with technical bid.

2.2.4 VIDEO SERVERS

Role	Primary Management & Recording Server
Processor	1 x Xeon Silver 4410 or better
RAM	32 GB or better
Drive	2 x 480GB SSD RAID 1
OS	Windows 2022 (or latest)
Network (NIC)	2 x 1Gbe NIC
Power Supply	2x 1100W Dual Power Supply (Redundant)
Storage	Minimum 192 TB RAW Data pre-loaded
RAID controller	Dedicated storage controller: RAID controller with a minimum of 2 GB cache. Controller must support RAID 0, 5, 6, and 10
Recording Throughput	Recording: minimum 500 Mbps. Redirection : 150 mbps Playback: minimum 20 Mbps;
Antivirus	machine-learning based antivirus native to the security appliance
Support	5-year global onsite warranty (Defective storage devices shall be retained with the Port.)
Certification	Must be certified by the VMS manufacturer for the performance.
Safety approvals	UL Listed Safety Approval

Additional Specs for Video Recording Server	<p>The recording server shall be a server-class computer and shall meet the following minimum requirements:</p> <ul style="list-style-type: none"> • Certified Solution by the Video Management Software Provider. • extensively tested and hardened for security to prevent malicious attack • Built in application to backup the video management software configuration data • security appliance must make changes to the operating system to follow Microsoft Windows cybersecurity practices • single source for support for both the manufacture of the security appliance and the VMS • built in maintenance tool developed by the manufacturer of the video management system • The certified solution must come with guaranteed performance • Management Port: iDRAC Dedicated Network Port • Pre-configured optimal RAID configuration for VMS solution.
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NOTE: The bidder shall furnish documentary evidence from the OEM duly signed and stamped for all the above specifications supported by official documents such as manuals/ data sheets etc. to be submitted along with technical bid.

Role	Failover Server
Processor	1 x E-2436 or better
RAM	32 GB or better
Drive	2 x 480GB SSD RAID 1
OS	Windows 2022 (or latest)
Network (NIC)	2 x 1Gbe NIC or better
Power Supply	2x 600W Dual Power Supply (Redundant)
Storage	Minimum 48 TB RAW data
RAID controller	Dedicated storage controller: RAID controller with a minimum of 2 GB cache. Controller must support RAID 0, 5, 6, and 10
Recording Throughput	Recording: minimum 300 Mbps. Redirection : 150 mbps Playback: minimum 15 Mbps;
Antivirus	machine-learning based antivirus native to the security appliance
Support	Provide 5-year global onsite warranty (Defective storage devices shall be retained with the Port.)
Certification	Certified by the VMS manufacturer for the performance.
Safety approvals	UL Listed Safety Approval
Additional Specs for Video Recording Server	<p>The recording server shall be a server-class computer and shall meet the following minimum requirements:</p> <ul style="list-style-type: none"> • Certified Solution by the Video Management Software Provider. • extensively tested and hardened for security to prevent malicious attack • Built in application to backup the video management software configuration data. • security appliance must make changes to the operating system to follow Microsoft Windows cybersecurity practices • single source for support for both the manufacture of the security appliance and the VMS • built in maintenance tool developed by the manufacturer of the

	<p>video management system</p> <ul style="list-style-type: none"> • The certified solution must come with guaranteed performance • Management Port: iDRAC Dedicated Network Port • Pre-configured optimal RAID configuration for VMS solution.
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NOTE: The bidder shall furnish documentary evidence from the OEM duly signed and stamped for all the above specifications supported by official documents such as manuals/ data sheets etc. to be submitted along with technical bid.

2.2.5 VIDEO MANAGEMENT SYSTEM (VMS) SOFTWARE:

1	Video Management System (VMS) with 50 licenses scalable upto 128 from installation.
1.1	The Proposed VMS Solution Shall support native Fail over with in application with no dependency on any external application for both hardware and application redundancy. Solutions with external clustering like Windows, NEC etc. should not be proposed. The native fail over architecture must be for both management and recording servers.
1.2	The Fail over and Fall back management and recording Server shall be on hot standby, ready to take over during the primary management server fails. No manual action from the user shall be required. The fail over time should not be beyond 1 Min and there should not be any loss in the Live video and recorded video.
1.3	The Application shall support Direct Multicast from Camera. For network topologies that restrict the Application from sending multicast UDP streams, the application shall redirect audio/video streams to active viewing clients on the network using multicast UDP directly from cameras and the architecture should not use Multicast streaming via recording servers or any other servers and increase the overall compute capacity of Recording servers.
1.4	The Application shall allow important video sequences to be protected against normal disk cleanup routines.
1.5	The application shall have the following options when protecting a video sequence: Until a specified date, for a specified number of days, indefinitely (until the protection is explicitly removed for evidence).
1.6	Video Management System should support End to End Multicast (i.e Clients should be able to view the video Footages Directly from the Multicast stream of the Cameras)
1.7	VMS shall support the parallel recording on primary and secondary control room, once Primary server goes offline then videos which are parallely recorded at secondary server shall be automatic sync to primary server without user intervention
1.8	<p>Dashboards:</p> <p>The VMS shall support the ability to create native dashboards Dashboard shall consist of a canvas with various widgets displayed on the canvas. All widgets should offer the ability to specify location and size to the widget, a title to the widget, a background color to the widget, and the ability to refresh periodically the content of the widget. Dashboard widget types shall be Image, Text, Tile, Web Page, Entity Count, Report</p>

1.9	<ul style="list-style-type: none"> · VMS shall have SQL Database info log like Event Count, Source Count, Video file count, Size on disk. VMS shall have provision to set notification for Disk space and Database usage goes set value. · VMS shall support the backup of SQL database from VMS GUI console. · VMS client shall show on live stream about routing information like unicast, multicast or streaming from recording server
1.10	<p>Failover and Standby Requirements</p> <p>The VMS shall support native and off-the-shelf failover options.</p> <p>The Standby Management Server shall act as a replacement Primary Server on hot standby, ready to take over as the acting Failover in case the primary Server fails. The failover shall occur in less than one minute. No action from the user shall be required.</p> <ul style="list-style-type: none"> · The VMS shall support up to five (5) Management Server on standby, lined up to take over as the acting Management Server in a cascading fashion. · The Standby Management Server shall keep its configuration database synchronized with the primary Server. · The Standby Management Server shall support disaster recovery scenarios where a server can be located in another geographic area (or building) and only take over if all other Server become offline. <p>The Standby Management Server shall support synchronization of the configuration databases using a backup and restore mechanism. The synchronization period shall be configurable from 15 minutes to 1 week.</p>
1.11	<p>The VMS shall offer the ability to encrypt the media stream, including video, Audio, and metadata with authenticated encryption. Media stream encryption shall be done at rest and in transit and be a certificate- based AES 128-bit encryption.</p>
1.12	<p>The VMS shall support end to end encrypted streams with cameras supporting Secure RTP (SRTP) both in unicast and multicast from the camera.</p>
1.13	<p>The Application shall support digitally sign recorded video using 248-bit RSA public/private key cryptography.</p>
1.14	<p>The application must support encryptions at the rest and not only on the exported videos footage</p>
1.15	<p>The proposed VMS platform must be UL 2900-2-3 Level 3 Cybersecurity certification</p>
1.16	<p>VMS should support Dual sign in to log in to the system administrator and client – Log in shall be permitted when two authorized persons login. Any user can login first and second user will authenticate. There shall be no restriction which user login first or second.</p> <p>VMS shall support auto lock of client after specified time with inactivity.</p> <p>VMS shall support able to give alarm if specified user is login in, log off. VMS shall support able to give alarm if specified user is login failed.</p>
1.17	<p>Password Management:</p> <p>VMS shall support password management tool which randomly generate the password and apply the password on camera based on user trigger.</p>
1.18	<p>Mobile App Interface and Core Functionalities:</p> <ol style="list-style-type: none"> a. Ability to display a geographic map with VMS entities geo-located on the map. b. Ability to search cameras or location on the map. c. Ability to display live and recorded video side-by-side for a specific camera. d. Ability to perform actions on cameras such as add a bookmark, control a PTZ, control the iris/focus function, save a snapshot, start/stop recording. e. Ability to use the camera of the smartphone and stream a live video feed to a video recorder in the system. f. Ability to locate the mobile app user on map and provisioning to message and

	collaborate in real time with the central command center or field staff.
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NOTE: The bidder shall furnish documentary evidence from the OEM duly signed and stamped for all the above specifications supported by official documents such as manuals/ data sheets etc. to be submitted along with technical bid.

2.2.6 LED DISPLAY VIDEO WALL

1	Dimensions	Available space 8 X 6 feet
2	Pixel Pitch	1.5 mm or lesser;
3	Pixel density (Pixel/Sqm)	Minimum 4,96,000 pixels per sqm or better
4	Pixel Configuration & Type	1R, 1G, 1B, SMD 3 in 1.
5	Colour LED	YES
7	Brightness (in Cd/sqm)	600 or Better
8	Minimum life of the LED display (in Hrs)	1,00,000
9	Refresh Rate	3840 Hz or Better
10	Luminance Control & auto Diming	Should be automatically provide different luminance levels but shall also be controllable from the Control Center using the software
11	Contrast Ratio	8000:1 or Better
12	Picture Display	a. Capable of displaying real-time messages generated by the Control Center. b. Signal Interface for the display- LAN / DVI / HDMI
13	Viewing Angle	Viewing Angle- H 160 deg / V 160 deg or better
16	Multiple Data Communication interface/port	RJ45 Ethernet/RS232/RS 485/FC port or any other suitable.
17	Communication (connectivity)	Wired & GPRS-based wireless technology with 4G capability. Communication/Signal cable(As option)- (Cat-5 or Cat 6): up to 50m; Fiber Optic Cable: 1000m Wireless – 4G
18	Operating Temperature	-20°C~+60°C
20	Humidity (RH)	0~90% or better
21	Protection Level	The complete Digital Display should be minimum of IP 30 protection level from the front and minimum of IP60 from the side and rear.
22	Power	Preferably 170-250V AC (more than 90% power factor) or DC as per equipment requirement. Power supply (Input voltage) & supply module- SMPS Modules 110V / 60HZ, 240V / 50HZ
25	Mounting, Installation and finishes	a. The mounting structure shall be mounted as per site requirements. (Wall Mount) b. The mounting shall be capable of withstanding vibrations at the site of installation.
26	Cabling, connections and Labelling.	a. All cable conductors shall be of ISI marked for quality and safety. It shall be of copper insulated, securely fastened, grouped, wherever possible,

		<p>using tie warps approximately every 10-20 Cms or cable trays.</p> <p>b. All connections shall be vibration-proof quick-release connections except for power cables terminating in terminal blocks, which shall be screwed down.</p> <p>c. All cables shall be clearly labelled with an indelible indication that can clearly be identified by maintenance personnel using “As built: drawings”.</p> <p>d. The Bidders have to provide BIS Certification of the OEM (mandatory) along with CE, and FCC certifications.</p>
28	Certification	BIS,MII
LED Video wall Controller		
1	Inputs	1 x (H_4xHDMI input card), 2 x USB 2.0, 1 x RJ 45
2	Output	1 x (H_16*RJ45 & 2*Optical) 16 x Ethernet Port or should support the LED video wall system. 2 Optical ports support.
	Power	
3	Input Power	100-240V, 50/60Hz, 4.0A
4	Power Consumption	<210W
5	Operating Temperature	0°C to +45°C
6	Humidity (RH)	0~80% RH
7	Compatibility	LED controller should be compatible with the proposed video processor/input Source/Media Player

NOTE: The bidder shall furnish documentary evidence from the OEM duly signed and stamped for all the above specifications supported by official documents such as manuals/ data sheets etc. to be submitted along with technical bid.

Bidder shall furnish Declaration by OEM of CAMERA, SERVER and VMS stating the following for the quoted products at the time of cover -1 evaluation

1. Does not contain Malicious code is not embedded in the firmware or software in any form.
2. Does not contain HI silicon chipset not used in the products.
3. Does not have any hardware, firmware or software product, assembly, component or part used in the offered solution (hardware /software) that supports with GB28181, GB/T 28181-2011 standards.
4. MAF declaration by OEM.

2.2.6 Network switch 8port MultiGig PoE switch

1	Switch Should Support 8 100/1000/2500 BASE-T PoE and 2 SFP+ Uplink ports
2	Switch Should Support up to 80 Gbps Switching Capacity and forwarding capacity 59Mpps.
3	Switch Should Support IEEE 802.3af & at compliance (for PoE ports) and up to 120W Power Budget.

4	Layer 2 features:
5	switch should support STP, RSTP, MSTP, ERPS
6	802.1Q/port/Asymmetric VLAN
7	Port Mirroring, IGMP/MLD Snooping
8	LACP, DoS attack prevention.
9	Web Based GUI
10	Built in SNMP MIB for remote NMS
11	Auto Surveillance VLAN
12	Auto Voice VLAN
13	Loop back detection.
14	Cable diagnostics
15	LLDP/LLDP-MED

NOTE: 1. The Port's EDP network switches are of CISCO, as such the switches offered shall be compatible with CISCO or of the same brand.

2. The bidder shall furnish documentary evidence from the OEM duly signed and stamped for all the above specifications supported by official documents such as manuals/ data sheets etc. to be submitted along with technical bid.

24port L3 Network Switch

SI No	Description
1	Switch should have 20 x 10/100/1000Base-T ports + 4 x Combo 10/100/1000Base-T/SFP ports + 4 x 10GE SFP+ ports for uplink to Switch or Servers for Stacking and option for connecting External Redundant power supply.
3	Switch shall have RJ-45 and Mini-USB console ports for out-of-band CLI management.
6	Switch shall have 1 x USB 2.0 Type A port for easy file store & restoration like firmware, configuration file, boot image, syslog.
7	The Switch shall have Min. 128 Gbps Back plane or higher and Min. 32K Mac address or more
11	The Switch shall support IPv4 Routing Table
12	The Switch shall support IPv6 Routing Table
14	The Switch shall have minimum 80 Gigabit Stacking Backplane and Should support Jumbo Frame up to 12 Kbytes
18	The Switch should have Policy Based Routing ,BGPv4 & VRRP
19	The Switch should have Up to 256 IP Interfaces & 10K route entries or more and should support ERPS (Ethernet Ring Protection Switching)
21	The Switch should have Port Mirroring One to one/Many to One & RSPAN
22	The Switch shall have the intelligence to detect the loop occurring from the unmanaged network segment
25	It shall have centralized VLAN Management.
27	It shall support 802.1v & Q-in-Q Vlan
29	The LAN switch shall support IEEE 802.1x and shall support DHCP Interface Tracker
32	The LAN switch shall have CLI support.

33	It shall support Network Timing Protocol (NTP/SNTP).
36	Switch should be CE, FCC Class A, UL, CB, VCCI, RoHS certified
37	Switch shall have 6 KV surge protection on all Ethernet access ports

NOTE: The bidder shall furnish documentary evidence from the OEM duly signed and stamped for all the above specifications supported by official documents such as manuals/ data sheets etc. to be submitted along with technical bid.

2.2.8 Racks 9U.

Mounting Arrangement	Wall mount
Dimensions	9U rack with 500mm depth
Paint	Powder coating
Thickness	high quality metal sheet 0.8mm
Front	Toughened glass door with lock
Cable Entry	Top & bottom with rubber protection at edges
ventilation	Sufficient perforation provided at side & front with Fan on top side
Points	2Nos Fully loaded. 6 Socket 5 Amp,

2.2.7 UPS 10KVA

Technical Specification for 10kVA ups with Parallel redundancy	
REQUIREMENT	10KVA ON-LINE UPS WITH DSP TECHNOLOGY BUILT IN ISOLATION TRANSFORMER AND PARALLEL REDUNDANCY
Capacity VA	10000VA
Power Watt	8KW
INPUT	
Input Voltage Range	400 VAC - 15% + 18% , 3P + N + PE
Input Power Factor	At full Load > 0.92- 0.99
Input Frequency Range	45 - 55 HZ
Rectifier	IGBT
OUTPUT	
Output Voltage Range	230VAC 1P + N ± 1% Static.
Recovery	0% - 100% - 0% load, maximum output tolerance ± 5%, recovery time <40ms.
Efficiency	Up to 95%
Output Frequency Range	50Hz ± 0.5% synchronous with the network, 0Hz ± 0.2% Battery Mode
Output Voltage THD	Linear Load < 2% / Non-Linear Load < 6%
Crest Factor (CF)	3:1
Protections:	
Overload Capacity	110% for 60Minutes, 150% for 1minute
Short Circuit Current	Short Current for 0.1s (200% current)
BATTERY	
DC Volts	240VDC
Charge Value (C)	Nominal 0.1 C, adjustable
Battery Power	Maximum 25% of the Rated power of UPS
Battery Rating/VAH	12V 26AH 20Nos SMF batteries with battery stand.

COMMUNICATION	
Communication Port	RS232 Standard, RJ45 with SNMP adaptor optional
CERTIFICATES	
Quality	ISO and BIS Certified.
GENERAL	
TECHNOLOGY	Online, Double conversion, DSP Controlled Technology, 3phase-1phase UPS system parallel redundancy for load sharing or fail over.
Design	Stand alone and Parallel operation.
Isolation	Built in Galvanic Isolation should be provided.
Operating Temperature	For UPS 0°C ~ 40°C,
Storage Temperature	For UPS - 15°C ~45°C, For Batteries -10~ 60°C
Protection Class	IP20
Chassis	Anti-Static Paint Protection
Humidity	0 - 95 %
UPS Control	From front panel to monitor output Voltage, current, On/Off, Load transfer, Voltage setting etc.

NOTE: The bidder shall furnish documentary evidence from the OEM duly signed and stamped for all the above specifications supported by official documents such as manuals/ data sheets etc. to be submitted along with technical bid.

Technical Specification for 1kVA On-Line UPS with isolation Transformer	
REQUIREMENT	1KVA ON-LINE UPS WITH DSP TECHNOLOGY and 0.8 PF
Capacity VA	1000VA
Power Watt	800W
INPUT	
Input Voltage Range	230 VAC - 15% + 18% , 3P + N + PE
Input Power Factor	At full Load > 0.99
Input Frequency Range	45 - 65 Hz (selectable)
Rectifier	IGBT
TPUT	
Output Voltage Range	220VAC 1P + N ± 1% Static.
Recovery	0% - 100% - 0% load, maximum output tolerance ± 5% , recovery time <40ms.
Efficiency	Up to 95%
Output Frequency Range	50Hz ± 0.5% synchronous with the network, 0Hz ± 0.2% Battery Mode
Output Voltage THD	Linear Load < 2% / Non-Linear Load < 6%
Crest Factor (CF)	3:1
Protections:	
Overload Capacity	110% for 60Minutes, 150% for 1minute
Short Circuit Current	Short Current for 0.1s (200% current)
BATTERY	
DC BUS	36VDC with 5A Charging Current

Charge Value (C)	Nominal 0.1 C, adjustable
Battery Power	Maximum 25% of the Rated power of UPS
Battery Power	12V 26AH 3Nos Sealed Maintenance Free batteries.
COMMUNICATION	
Communication Port	RS232 Standard, RJ45 with SNMP adaptor optional
CERTIFICATES	
Quality	ISO certified
GENERAL	
TECHNOLOGY	Online, Double conversion, DSP Controlled Technology, 1phase-1phase UPS system with built in isolation transformer
Design	Stand alone.
Isolation	Built in Galvanic Isolation provided.
Bypass switch	System has built in auto bypass as well as manual bypass switch
Operating Temperature	For UPS 0°C ~ 40°C,
Storage Temperature	For UPS - 15°C ~45°C, For Batteries -10~ 60°C
Protection Class	IP20
Chassis	Anti-Static Paint Protection
Humidity	0 - 95 %

NOTE: The bidder shall furnish documentary evidence from the OEM duly signed and stamped for all the above specifications supported by official documents such as manuals/ data sheets etc. to be submitted along with technical bid.

UPS shall deliver 100% power without de-rating Battery, backup provided shall be for minimum one hour consistently.

2.2.10 POWER CABLE

Supply and Laying of 3 core, 1.5 sq. mm copper conductor power cable (ISI approved). The contractor shall provide 1 no. 5A switch & socket assembly for powering all the equipment's which is also included in the scope.

2.2.11 CAT6 A Outdoor cable.

Supply and Laying of CAT-6A UFTP weather proof cable for outdoor cameras (CCTVs), CAT 6A UFTP Cable Transmission frequency of 250 MHz (Minimum).

- The outdoor Category 6A cable should contain 4 Pair UTP sheathed with a grey LSZH compound. The anti-rodent and anti-termite cable has an additional layer of black LSZH outer jacket rendering the cable suitable for outdoor installations. Enhanced performance cable for transmission of high

speed data, digital and analog, voice and video (RGB) signals on LANs. Supports Gigabit Ethernet (1000 base T) standard.

- Category 6A ANSI/TIA/EIA 568.2-D Flammability Test IEC 60332-1 Acid Gas Emission Test - IEC60754-1 Smoke Density Test - ASTM 2843
- Conductor Diameter : 0.520mm Nominal
- Insulation Diameter: 0.940mm Nominal
- Insulation Material: HD-PE
- Should be ISI certified

NOTE: The cable should be compact so as not to allow any water seepage, any camera/wireless failures due to seepage of water through these cables will on Contractors account.

2.2.12 PVC HEAVY DUTY CONDUIT.

Supply and Laying of PVC pipe of suitable size to be fixed on wall (including with saddle, Gitti at sufficient distance with junction box, bend etc.). Cost is inclusive the laying cost fiber, CAT-6A, Power cable in PVC pipe.

2.2.13 12U IP 55 grade out door network rack

JB shall be of 3mm SS material with lock, Outdoor Pedestal type **with top Canopy.** The JB shall be designed to be IP 67 compliant/degree of protection from dust, dampness, vermin and weather proof. It shall be provided with, single door type (Right side door hinge) with cam lock door sealing Gasket.

It should well earthed and should be satisfactorily grouted by maintain 0.5mtr height from the ground.

JB to keep accessories such as power supply units, media convertors, etc. the design shall be spacious for easy maintenance. Removable gland plates shall be provided at the bottom for bringing in the external cables.

The technical features specified are indicative. However, the contractor shall provide any other feature/accessories as found necessary for proper functioning of panel.

2.2.14 Supply and installation of 32U surface mounting network rack

Supply and installation of 32U surface mounting network rack, complete with power strip with 12 sockets, 04 fan, front glass door & rear perforated MS body with lock and key arrangement.

2.2.15 Miscellaneous Items

Miscellaneous items, like, 8X8 and 2X2 outdoor type junction box (as per the load demands), 3 core 1.5 sq.mm PVC flexible wire, RJ45 connectors, Patch cords, 2 nos. 5A switch socket combined, 24V industrial grade power supply units, PoE, LIU's, SC-LC patch cords, OFC modules, MCB's saddles, GI pipes, mounting brackets for cameras/wireless etc., fitting materials, screws, nuts, fasteners, jointers, sealants etc as required for the total commissioning, to be provided by the Contractor to commission the system successfully and to the satisfaction of EIC.

2.3 INSTALLATION & COMMISSIONING

- i.) The Contractor shall carry the work as per the BOQ.
- ii.) The Contractor shall commence and complete the work within 50 days from date of issue of LOA to the satisfaction of the Chief Mechanical Engineer or his representative and commissioning should be accepted by Port within 7 days thereafter. Necessary safety measures for entire erection shall be done by the contractor as per prevailing safety standards and regulations in force.
- iii.) The special tools/instruments/software's/applications/licenses/affiliations needed for installation and thereafter for regular servicing / maintenance working shall be furnished/supplied by the Contractor. All the materials required for the installation and commissioning at site shall be supplied by the Contractor. Misc. items, like saddles, fitting materials, switch, sockets, screws, nuts, fasteners, jointers, sealants, accessories, etc as required for installation and to run the system shall be included in quote.
- iv.) The work should be carried out with utmost precaution not to disrupt existing CCTV system in any way. The installation of the various equipment's shall be carried as per the site conditions and as directed by the EIC.
- v.) The contractor shall arrange for laptop/networking device or any other interfacing device required for commissioning/troubleshooting at his own cost. Port will not be responsible for arranging the above.

- vi.) Special care may be taken to prevent any damage to the Port's property during installation and commissioning. The workmanship shall be neat, clean and elegant/ aesthetic in appearance etc. The rack and other metallic components supplied shall be painted with Marine paint to withstand saline atmosphere prevailing in the area.
- vii.) The Contractor shall access the existing client PC's used for viewing CCTV footages and accommodate any additional hardware or software required for maintaining the existing client systems for the newly installed CCTV system.
- viii.) All the quantities indicated in the price schedule/BoQ are indicative. However, the work shall be carried out as per site conditions.
- ix.) The contractor shall engage one qualified Service Engineer and one experienced Service technician to attend day to day maintenance and breakdown calls during the entire guarantee period of 02 years. This staff should be well-versed with the complete system and should be competent to handle any breakdown issues on the system. In case the personnel's are not in a position to make the system functional the contractor shall have to arrange OEM or other entities to resolve the issue or has to arrange for a stop gap arrangement to reduce the downtime on the system.
- x.) Technical brochures/ data sheets/Certification, affiliations etc of equipment's such as of Video Server, Camera, wireless modem etc. should be submitted with the tender specifically for models the tenderer intends to supply.
- xi.) Power and water will be provided by the Port on free of cost basis.

2.3.1 Manuals & Drawings

On completion of the work the Contractor shall supply 3 sets of operation and maintenance manuals after commissioning. The soft copy of all the **AS BUILT drawings** and **manuals** should also be provided which shall include General arrangement with principle details, Schematic line diagrams (SLD), and any other special features implemented in the system. **The login credentials/passwords and rights if any shall be handed over to the Port after completion of testing/acceptance Period.**

2.3.2 TEST & CERTIFICATIONS

Relevant CE or UL certificate and ONVIF standards for Video Servers, Cameras etc shall be submitted along with materials to the satisfaction of the Chief Mechanical Engineer or his representative, failing which the materials will be rejected by Port.

The Bidder is required to liaison on Port's behalf for all the licenses, latest firmware/software upgrades, latest security patches and other related documents from the OEM for the respective equipment's, which are meant for commissioning, fixing software glitches, vulnerabilities, functional enhancements etc. Further, the Bidder is required to install firmware/software upgrades as well as apply latest patches as and when released by the OEM for fixing software glitches, vulnerabilities or functional enhancements during the guarantee period of two years and further period of five years for CAMC.

The Bidder should furnish certificate on OEM letter head stating that the Equipment supplied should be latest product release indicating the year of release and shall not be declared as "End of Life" Product by the respective OEM for the next SEVEN years from the date of submission of the Tender.

2.4 GUARANTEE

The installation shall be guaranteed for 03 years from the date of handing over of the complete system to the Port. The contractor shall carryout free maintenance and replacement if required during the guarantee period.

2.4.1 MAINTENANCE DURING GUARANTEE PERIOD.

- i. The contractor shall provide two-year guarantee for the complete CCTV system supplied under SITC. The maintenance during guarantee period shall include replacement of all defective components of the system including the Video Servers, Cameras, wireless modems etc. to maintain **minimum 98% uptime** of the entire system.
- ii. During the guarantee period, the contractor has to deploy 02 Nos. employees, one of them should be having experience of minimum 03 years in maintenance of high end CCTV system and minimum qualification of Diploma/ Degree in Electronic/Telecommunication, and second employee should have minimum experience of 02 years and minimum educational qualification as ITI in Electronics. The

contractor shall furnish all the supporting documents for complying with the above qualifications and experience before commissioning of the system. Handing over of the CCTV system shall be carried out only after satisfactory compliance to the above conditions. The contractor shall be responsible to provide them with necessary gate entry passes throughout the period including vehicle / vehicle passes for their 02 Nos. employees to access Port's operational areas as and when necessary.

- iii. They should be reporting exclusively to MPA daily and should be permanently stationed at the Administration Building during working hours so as to ensure attending to any breakdown calls promptly as well as to carry out regular maintenance besides cleaning of the camera faces from time to time as required to ensure picture perfect visibility.
- iv. The staff so posted has to be capable of carrying out any kind of troubleshooting which may include re-configuration/software upgrades, minor modifications etc. of the existing system. Only extremely difficult issues may be handled with intervention of OEM. The contractor should take cognizance of the fact that they are handling Port's highly confidential data which is critical and important. In this regard, Police verification of the deployed staff has to be furnished within 30 days of placement of work order. In case any of the staff is on leave and as in being replaced by the contractor, Port needs to be informed and all the above formalities have to be complied in advance.
- v. A breakdown register shall be maintained by the service technician's under the control of the CISF's representative to whom the technicians should report and it will be countersigned by the CISF's representative from time to time. **The technicians should be present from 8.30 A.M. to 5.30 P.M. from Monday to Saturday for attending the work and will submit, on monthly basis, the day to day service reports.** Attendance of these technicians will be recorded with the Port's EIC. In case need arises, the technicians should be present after office hours including Sundays without any extra cost and liability to the Port. The tenderer shall provide contact telephone number/fax/mobile/E-mail address to also register

complaints at his office. An escalation matrix shall be provided by the contractor upto 3 levels to contact in case of breakdown and contract related queries.

- vi. These deployed staff will have to undertake any works pertaining to shifting of cameras or installation of new cameras for which material will be provided by the Port.
- vii. The Contractor shall arrange his own tools and tackles, ladders, instruments, meters etc. for carrying out the works during the installation and guarantee period.
- viii. In case, any heavy equipment's are to be shifted anywhere as part of the work, the same is in the contractors scope.

2.4.2 PENALTY CLAUSE DURING GUARANTEE PERIOD

- i. The fault should be attended within 04 hrs from receipt of complaint from Port, during guarantee period, and shall be resolved in 24 hrs, failing which an amount of Rs. 500/- per day will be deducted per camera as penalty until the fault is restored & camera/system is re-commissioned in addition to the target of maintaining system uptime of 98%.
- ii. In case of failure to deploy manpower to duty, the Contractor shall be penalized at a rate equal to the daily wages of the absent workmen. This will be in addition to the deduction of Rs. 500/- per person per day from the monthly bill.

The calculation for system availability shall be carried out by the contractor at the end of each month and shall be concurred by CISF representative and EIC. The calculation of monthly availability is as follows:

Net breakdown (In Hours) = A

Downtime excluded from availability (In Hours) = B

$$\text{Availability} = \frac{\{(\text{No. of Days in the month} \times 24 \text{ Hrs}) - A - B\} \times 100}{\{(\text{No. of Days in the month} \times 24 \text{ Hrs}) - A\}}$$

N.B.: Non-availability of the equipment due to the following reasons shall not be to Contractors account.

- 1) Non-availability of power supply from MPA supply source
- 2) Force Majeure
- 3) Any other cause which is beyond the reasonable control of the contractor for which the contractor has promptly notified MPA with

sufficient justification acceptable to the Engineers representative. In case of any disagreement in determining whether the cause is beyond reasonable control of the contractor or not, the decision of the Chief Mechanical Engineer shall be final and binding.

In case the system availability is below 98%, the penalty equivalent to the percentage downtime will be applicable for deduction from the invoice produced for payment.

All these penalties will be recorded on monthly basis and shall be informed to the contractor from time to time. The cumulative amount of penalties during the entire guarantee period will be deducted from retention amount before releasing the Security Deposit.

3.0 Other Conditions:

- i.** The firm is advised to visit the site in his own interest but not compulsorily and get acquainted regarding the nature of the work involved at site conditions before quoting the offer.
- ii.** CCTV system should be handed over to Port in working condition after completion of CMC period of 05 years.
- iii.** Advance intimation of at least 24 hours shall be given by the contractor before undertaking any major maintenance works.
- iv.** The Contractor should submit escalation matrix (contact details of technical persons in the hierarchy) at least up to 3 levels.
- v.** The Contractor has to follow all safety, security and General Rules as per relevant IS standards and environmental regulations enforced by Mormugao Port Authority.
- vi.** No labour, Materials, Testing Equipments, calibration or Transport will be provided throughout the contract period by the Port.
- vii.** The Port will not be responsible for any loss or injury of the personnel / materials / tools / plants engaged by the contractor during the work at site / transportation during the currency of the contract. If any Port property is damaged by the contractor during the currency of the contract, the same shall be made good by the contractor free of cost.
- viii.** No advance payment will be made by the Port.
- ix.** The payment for the CMC shall be made on Quarterly basis.

PRICE SCHEDULE (BILL OF QUANTITIES)

SUPPLY, INSTALLATION, TESTING AND COMMISSIONING							
Sr No	Description	HSN/ SAC Code	Unit	Qty	Rate(Rs)		Amount (Rs)
					In Figures	In Words	
1.	Supply, installation, testing and commissioning of Outdoor type IP based Fix/Bullet Camera as per Tender Technical specification.						
	Supply.		No.	19			
	Installation		No.	19			
2	Supply, installation, testing and commissioning of Outdoor type IP based Dome PTZ Camera as per Tender Technical specification.						
	Supply		No.	20			
	Installation		No.	20			
3	Supply, installation, testing and commissioning of High power bandwidth 1.2Gbps @80MHz wireless transmitter and receiver						
	Supply		Pair	05			
	Installation		Pair	05			
4	Supply, installation, testing and commissioning of 500Mbps wireless transmitter and receiver						
	Supply		Pair	17			
	Installation		Pair	17			
5	Supply, installation, testing and commissioning of 128 Channel Video Server with fail over redundancy						
	Supply		Set	1			
	Installation		Set	1			
6	Installation of Video Management Software		No.	1			

	(VMS) along with all relevant licenses for the CCTV system during the entire currency of the contract including CMC period as per specifications detailed at Clause No. 2.2.5.						
7	Supply, installation, testing and commissioning of LED Video wall with Controller						
	Supply		No.	1			
	Installation		No.	1			
8	Supply, installation, testing and commissioning of 8Port MultiGig PoE Switch						
	Supply		No.	15			
	Installation		No.	15			
9	Supply, installation, testing and commissioning of L3 24 Port Switches						
	Supply		No.	1			
	Installation		No.	1			
10	Supply, installation, testing and commissioning of fully loaded 32U Network rack						
	Supply		No.	1			
	Installation		No.	1			
11	Supply, installation, testing and commissioning of 9U Network rack						
	Supply		No.	4			
	Installation		No.	4			
12	Supply, installation, testing and commissioning of 10kVA On line UPS with parallel redundancy						
	Supply		Set	1			
	Installation		Set	1			
13	Supply, installation, testing and commissioning of 1 kVA On-line UPS						
	Supply		Set	28			
	Installation		Set	28			

14	Supply, installation, testing and commissioning of Power Cable 3Cx1.5sqmm armored							
	Supply		Mtr.	900				
	Installation		Mtr.	900				
15	Supply, installation, testing and commissioning of CAT6A Out door Ethernet Cable							
	Supply		Mtr.	2500				
	Installation		Mtr.	2500				
16	Supply, installation, testing and commissioning of Conduit Pipe							
	Supply		Mtr.	1000				
	Installation		Mtr.	1000				
17	Supply, installation, testing and commissioning of 12U IP 55Junction box							
	Supply		No.	16				
	Installation		No.	16				
18	Testing and Commissioning of the complete system.		LS	01				
19	Installation of CCTV Cameras in Admin bldg. premises as per clause no. 2.1.15		LS	01				
GRAND TOTAL								

Rupees _____ only.

Date:

Signature:

Place:

Name:

Address:

Office Seal of firm

Note: 1.The offered rates shall be exclusive of GST.