

**MORMUGAO PORT AUTHORITY**

**MECHANICAL ENGINEERING DEPARTMENT**

**NOTICE INVITING BUDGETORY OFFERS**

Name of Work	<b>NAME OF WORK</b> “Replacement of existing CCTV Surveillance system at Port’s Operational Areas with a warranty period of 02 years followed by 5 years Comprehensive Maintenance Contract ”
Date of submission of budgetary quotation	On or Before <b>13.09.2024.</b>
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 : <a href="mailto:xene.mgpt@gmail.com">xene.mgpt@gmail.com</a>
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**EXECUTIVE ENGINEER (E-HL)  
MORMUGAO PORT AUTHORITY**

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**MECHANICAL ENGINEERING DEPARTMENT**

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

.09.2024

**Sub:** “Replacement of existing CCTV Surveillance system at Port’s Operational Areas with a warranty period of 02 years followed by 5 years Comprehensive Maintenance Contract”.

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

Mormugao Port Authority intends to carry out “Replacement of existing CCTV Surveillance system at Port’s Operational Areas with a warranty period of 02 years followed by 5 years Comprehensive Maintenance Contract”

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 13.09.2024.

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 02 years followed by 5 years Comprehensive Maintenance Contract”.

#### **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 5KVA 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 1.5 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 CAT6 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.

- xxxi) 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.
- xxxii) 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 CAMERA**

Sensor type	1/2.9-inch CMOS
Total sensor pixels	4MP or higher
Sensitivity	Color 0.24 lx, Mono 0.03 lx, With IR 0.0 lx
MTBF	MTBF > 100,000 Hrs
WDR approved & measured as per	OECF analysis according to IEC 62676 Part 5, it should be more 107 dB

True Day/Night	Auto, Color, Monochrome
Noise reduction	iDNR / 3DNR with separate temporal and spatial adjustments
Intelligent defog	Intelligent Defog automatically adjusts parameters for best picture in foggy or misty scenes (switchable)
Video resolution	3072 x 1728, 2688x 1512, 2304, 1296, 1080P, 720P, SD,
Video compression	H.265 , H.264 ; M-JPEG
Max. frame rate	30 fps
IR Range	Minimum 30m
Lens type	Automatic Varifocal 3 to 10 mm
Lens adjustment	Motorized zoom/focus
Detection Range of Objects	Up to 123m (403ft) as per EN-62676-4
Audio communication	Two-way, full duplex
Ethernet	10/100 Base-T, auto-sensing, half/full duplex
Ethernet connector	RJ45
Connectivity	ONVIF Profile S, Profile G GB/T 28181
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, AES128, AES256
Data Security:	<ul style="list-style-type: none"> <li>• Secured connections supported (HTTPS)</li> <li>• Password enforcement at initial set up</li> <li>• Execution of 3rd party software is disabled</li> <li>• Firmware updates via OEM digitally signed firmware files only</li> <li>• Detect changes in a configuration</li> <li>• Support of customer specific certificates</li> </ul>

	<ul style="list-style-type: none"> <li>Support of Microsoft Active Directory for safe management of user access rights</li> </ul> Regular updates via security patches
Hardware for data security	Unique Crypto-processor / TPM
Dual Power Supply for redundancy	<ul style="list-style-type: none"> <li>POE and 12VDC</li> </ul>
Operating temperature	-40 °C to +50 °C (-40 °F to +122 °F)
Humidity	5% to 100% Relative humidity ( condensing)
Ingress protection	IP66 and NEMA4X
Impact protection	IK10
Certifications:	CE, FCC, UL, VCCI, BIS

### **2.2.2 INTEGRATED SPEED IP PTZ DOME CAMERA**

Sensor type	1/1.8 inch HD CMOS
Total sensor pixels	4 MP or higher
Sensitivity	Color 0.0101 lux, Mono 0.0016 lux, 0 lx (IR ON)
MTBF	MTBF > 120,000 Hrs
WDR approved & measured as per	OECF analysis according to IEC 62676 Part 5, it should be more 108 dB
True Day/Night	Auto, Color, Monochrome
Noise reduction	iDNR / 3DNR with separate temporal and spatial adjustments
Intelligent defog	Intelligent Defog automatically adjusts parameters for best picture in foggy or misty scenes (switchable)
Video resolution	1440p, 1080P, 720P, SD, D1,
IR Distance	300 Mtr and above
Wiper	Integrated, long-life silicone wiper
Video compression	H.265 MP, H.264 MP; M-JPEG
Max. frame rate	60 fps
Optical and Digital zoom	30x Optical 16X digital
Lens type	Auto Focus zoom lens
Lens adjustment	Motorized zoom/focus
Pan angle	360 ° Continuous

Tilt angle	-90° to 5° (Auto-flip 190°)
Guard Tour	2 (Maximum Total duration of 15 minutes for each Tour) and 2 Pre-position tour.
Sector/Blanking	16 Independent sectors with 20 characters on each title
Audio communication	Two-way, full duplex
Ethernet	10/100 Base-T, auto-sensing, half/full duplex
Ethernet connector	RJ45
Connectivity	ONVIF Profile S, ONVIF Profile M, ONVIF Profile G & ONVIF Profile 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
Memory card slot	Min. 512 GB 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, AES128, AES256
Data Security:	<ul style="list-style-type: none"> <li>• Secured connections supported (HTTPS)</li> <li>• Password enforcement at initial set up</li> <li>• Execution of 3rd party software is disabled</li> <li>• Firmware updates via OEM digitally signed firmware files only</li> <li>• Detect changes in a configuration</li> <li>• Support of customer specific certificates</li> <li>• Support of Microsoft Active Directory for safe management of user access rights</li> <li>• Regular updates via security patches</li> </ul>
Hardware for data security	Unique Crypto-processor / TPM
Dual Power Supply for redundancy	POE+ (IEEE 802.3bt) and 24VAC
Operating temperature	-40 °C to +60 °C (-40 °F to +140 °F)
Humidity	Up to 90% ( NON condensing)
Ingress protection	IP 66 and NEMA4X

External Mechanical Impact (IK Code or Impact rating)	IK10
Privacy Masking	32 Individual configurable
Certifications:	CE, FCC, UL, BIS

### 2.2.3 WIRELESS TRANSMITTERS & RECEIVERS

Data Rate	2.5Gbps@160Mhz/1.5Gbps/500Mbps and above
<b>Standard + Transmission Tech.</b>	Capable of Point to point and Point to Multipoint 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	20/40/80/160 Mhz
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	YES
GPS, Interference (Hub Site)	Supported
Symmetric/Asymmetric Tx (UL/DL Allocation)	Supported 25/75, 50/50, 75/25
Latency, ms (Two Way)	Minimum 5msec (average)
Frame Size, Bytes	9000 bytes or higher
NMS	SNMPv1/v3 supported
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 DiffServ
Encryption	AES256
Power Consumption, Watt	Up to 30W
Input Voltage	42.5–57.0 V
Temp.	(-40°C to 60°C/-40°F to 140°F)
Ingress Protection	IP67
Wind Load	180kmh/112 mph
Antenna Integrated/External	Both options available
Freq. Range	5.8 GHz WPC; 5.1 GHz WPC (default)
Gain, dBi	External Antenna Option Available



## 2.2.4 VIDEO SERVERS

Processor	Intel® Core™, 2.10GHz or higher
Cache	25 MB Intel® Smart Cache
Memory	16GB DDR4
HDD slots	12 slots, 3.5 in. SATA storage trays
Storage	192TB loaded
Max HDD capacity	Up to 18 TB/slot, up to 216TB
SSD for OS	2 SSD drives in RAID-1 configuration
OS	Microsoft Windows Server
RAID support	RAID-5 / 6
B/W capacity	Minimum 550 Mbit/s
Network	Dual Intel Gigabit LAN
Hot swappable HDDs	Yes
Hot swappable power supply	Yes
Power Input	240VAC
Form Factor	2 U Rack Mount
USB Ports	2 USB 3.2 & 2 USB 3.2 Gen1 ports
Operating Temperature	+10°C to +35°C (+50°F to +95°F)
Operating Relative Humidity	8 to 90%, non-condensing
Data security	Crypto coprocessor (TPM) Discrete TPM 2.0
Hard disk	18TB 6Nos enterprise grade SATA hard disk loaded with appliance.
VMS License	Device should support 128 Camera license and loaded with 45 Camera license from day one.

## 2.2.5 VIDEO MANAGEMENT SYSTEM (VMS) SOFTWARE:

S.NO	Video management software Minimum Specifications or better
1	The Video Management System (VMS) specified shall be an IP video security solution that provides seamless management of digital video, audio and data across an IP network for Viewing, Recording, control and Playback of IP CCTV system. It shall have all required Life Time Licenses for use of the entire system.
2	The VMS shall be highly scalable without any additional cost of hardware
3	The proposed solution shall not require proprietary computer, server, and storage hardware and shall provide seamless integration with third party security Infrastructure, wherever possible. Software shall be Open platform network video compliant with SDKs available for integration with 3rd party systems.

4	The VMS system shall be based on the latest in software programming technology. The software should be compatible with Windows Operating Systems (Windows Server 2022/ Windows 11 or later versions) and should be user friendly. The system should allow operation with PC Keyboard, Mouse, CCTV Keyboard.
5	The system shall allow the recording, live monitoring, playback of multiple archived video, audio, and data simultaneously
6	The VMS shall allow for 2-way audio communication between camera unit and client, without any need of additional software licenses.
7	The VMS should support storage of RAID-5/6 configuration with hot swappable Hard disks. The VMS should support iSCSI protocol.
8	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.
9	In case of Network Failover, the video should be stored in local storage.
10	Offered VMS should support 64 bits OS
11	Offered VMS shall have capability to multicast videos to clients
12	The VMS shall support the Open Network Video Interface Forum (ONVIF) compliant Cameras and devices
13	The offered video management system should have integration with Video Wall
14	The management server shall be able to intelligently scan an IP network for new devices (cameras or servers etc.) simultaneously
15	The system administrator shall have the following rights <ul style="list-style-type: none"> <li>a. To add/delete/configure users with rights.</li> <li>b. To view the rights of each user or the cameras which can be viewed / controlled by each user.</li> <li>c. To add/delete cameras, configure cameras, assign priorities to users, configure alarm monitors etc.</li> <li>d. To configure user groups with different rights and assign users to user groups.</li> </ul>
16	Built-in map function in the Client shall be provided for an overview of the system and for instant camera preview on mouse click on the MAP.
17	Alarm list with extensive filtering capabilities and an alarm preview in both Live and Playback mode
18	The system shall protocol every event and alarm in an SQL database. The alarm entry shall contain the camera titles that have been recorded due to this alarm.
19	The video management system shall support switching of cameras to monitors connected to decoders. The cameras shall be selectable via drag and drop from the logical tree or from the sitemaps
20	VMS Server software shall allow the client's seamless operation of all cameras regardless of the actual connection to different recording servers. VMS Software shall allow the client applications to interact with all the camera / database servers simultaneously and allow simultaneous display of live video/recorded video
21	It shall be possible to define priority based camera control rights for each camera or a group of cameras
22	Client applications shall support any form of IP network connectivity including: LAN, WAN, VPN, Internet, and Wireless

23	Client application shall be able to control the playback with play, pause, forward, and speed buttons.
24	Client application shall allow operators to add identification with description to recorded clips of video or audio.
25	Cameras utilize an on-board caching mechanism, which allows them to mitigate short network outages and continue recording without any loss of frames.
26	All events shall be stored in the logbook of the video management system to allow to search through these events. All generated metadata shall be stored side-by-side to the video surveillance footage to enable operator to search through previous events without any pre-configuration of video analytic events.
27	The video management system shall be able to encrypt recorded video data using AES-256 without reducing the performance (number of cameras and throughput) of the recorder.
28	The video management system is listed as an ONVIF Profile-S conformant product on the ONVIF website.
29	The system shall protocol every event and alarm in an SQL database. The alarm entry shall contain the camera titles that have been recorded due to this alarm
30	The exported data in MP4 or MOV format may be played back using standard software, for example VLC.
31	Declaration by OEM stating the following for the quoted product <ol style="list-style-type: none"> <li>1. Does not contain Malicious code is not embedded in the firmware or software in any form.</li> <li>2. Does not contain HI silicon chipset not used in the products.</li> <li>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.</li> <li>4. MAF declaration by OEM.</li> </ol> (Bidder may furnish these documents at the time of cover -1 evaluation)

## 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	<b>Luminance Control &amp; auto Diming</b>	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	<b>Picture Display</b>	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	<b>Multiple Data Communication interface/port</b>	RJ45 Ethernet/RS232/RS 485/FC port or any other suitable.
17	<b>Communication (connectivity)</b>	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	<b>Operating Temperature</b>	-20°C~+60°C
20	<b>Humidity (RH)</b>	0~90% or better
21	<b>Protection Level</b>	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	<b>Power</b>	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	<b>Mounting, Installation and finishes</b>	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	<b>Cabling, connections and Labelling.</b>	a. All cable conductors shall be of ISI marked for quality and safety. It shall be of copper insulated, securely fastened, grouped, wherever possible, using tie warps approximately every 10-20 Cms or cable trays. b. All connections shall be vibration-proof quick-release connections except for power cables terminating in terminal blocks, which shall be screwed down. c. All cables shall be clearly labelled with an indelible indication that can clearly be identified by maintenance personnel using “As built: drawings”. d. The Bidders have to provide BIS Certification of the OEM (mandatory) along with CE, and FCC certifications.
28	<b>Certification</b>	BIS
<b>LED Video wall Controller</b>		
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.
	<b>Power</b>	
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	<b>Compatibility</b>	LED controller should be compatible with the proposed video processor/input Source/Media Player

### **2.2.7 SURGE PROTECTORS.**

MAX Dc supply	60V DC-650mA
Nominal discharge: Line/ Line	<500A @8/20 micro seconds
Nominal discharge: Line/ Ground	2000A @8/20 micro seconds
Ingress Protection	IP67
certification	UL/CE

### **2.2.6 Network switch 4 POE Port 10/100/1000 MBPS switch**

8 port 10/100/1000Mbps.(4Port POE & 4 Port LAN)

### **2.2.7 Network switch 24 Port 10/100/1000 MBPS switch**

24 port 10/100/1000Mbps and 4 SFP.

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

### **L3 Network Switch**

2 Nos x 24 port L3 CISCO switch 10/100/1000 Mbps and 4 x 10G SFP with stack Cable (Redundant Switch)

Note: Network Switches should be procured in the name of "Mormugao Port Authority"

### **2.2.8 Racks 9U.**

Mounting Arrangement	Wall mount
Dimensions	550x400x230 mm
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	Fully loaded. 6 Socket 5 Amp, 5 Socket 5/15 Amp

### **2.2.8 UPS 1.5KVA & 5KVA:**

Max Configurable Power	1.5KVA / 5.0KVA, ONLINE
Phase	Single
Output Voltage Distortion	Less than 2 %

Output Frequency (sync to mains)	50/60 Hz +/- 3 Hz Sync to mains
Other Output Voltages	220 V, 240 V
Power factor	0.99%
Battery	12V
Load Crest Factor	3 : 1
Topology	Double conversion online
Waveform type	Sine wave
Bypass	Internal bypass (automatic and manual)
Display	LCD/LED display
Input frequency	40 - 70 Hz Auto-sensing
Input voltage range for main operations	100 - 275 Adjustable (half load)V
Other Input Voltages	220 V, 240 V
Battery type	Lead-acid battery
Typical recharge time	1.5hour(s)
Interface Port(s)	RJ-45 10/100 Base-T, RJ-45 Serial, Smart-Slot, USB
Operating Temperature	0 - 40 °C
Emergency Power Off (EPO)	YES
Surge Protection and Filtering	YES
certification	CE /UL

- 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 Armoured cable.**

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

- Conductor Diameter : 0.520mm Nominal
- Insulation Diameter: 0.940mm Nominal
- Armoured with 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-6, Power cable in PVC pipe.

#### **2.2.13 STAINLESS STEEL JUNCTION BOX (JB)**

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.

Dimensions (mm) : 650(Height) X 490(Width) X 300 (Depth),

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 4X4 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, 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 02 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.

## **2.5 PART – B**

### **COMPREHENSIVE MAINTENANCE CONTRACT (CMC) PERIOD.**

The installation shall be covered under Comprehensive Maintenance Contract (CMC) for a period of 5 years after successful completion of 02 years guarantee period. During this period the contractor shall be responsible for maintaining the complete system (all 39 cameras and recording / viewing system fully functional) which may include repair/replacement of all defective components of the system including the cameras.

Performance of work quality will be assessed by the Port at the end of guarantee period and only after satisfactory compliance to the same, Port will permit the contractor to enter into CMC of 5 years and thereafter the remaining retained 5% of Security Deposit will be released.

#### **2.5.1 MAINTENANCE DURING COMPREHENSIVE MAINTENANCE CONTRACT PERIOD.**

- i. The contractor shall provide five-year Comprehensive Maintenance Contract (CMC) for the complete CCTV system supplied under SITC. The maintenance during CMC 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. Therefore, Bidders shall assess the environmental conditions, wind speed and other site conditions if found necessary.
- ii. During the CMC period, the contractor has to deploy 02 Nos. employees, one of which 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. Valid Police verification of the deployed staff has to be furnished by the contractor. The contractor shall furnish all the supporting documents for complying with the above before commencement of CMC period. The contractor shall be responsible to provide them with necessary gate entry passes throughout the period along with vehicle passes for their personnel to access Port's operational areas.

- iii. If the same staff deployed for carrying out maintenance during **guarantee period** are retained for monitoring during the CMC period, the contractor will be exempted from furnishing the documents pertaining to the employed personnel. Without complying with documentation procedures the contractor shall not depute any personnel at any given point of time during the CMC period.
- iv. They should be reporting exclusively to MPA daily and should be permanently stationed at the Administration Building during working hours so as to ensure proper monitoring to any breakdown calls promptly. **The staff 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.** No Holidays will be admissible to the employed personnel except Sundays. 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. The Contractor shall also furnish escalation matrix upto 3 levels to contact regarding the contract related queries. The staff so posted has to be capable of carrying out any kind of troubleshooting which may include re-configuration/software upgrades etc. of the existing system. Only extremely difficult issues may be handled with intervention of OEM.
- 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.
- 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. Also, the staff has to undertake any works assigned by the Engineer In Charge (EIC) related to other CCTV system in the Port from time to time.

- vii. All tools and tackles required for effective upkeep and maintenance such as Laptop, LAN tester, Multimeter, Crimping tools, line tester, minor accessories etc. or any other tools required besides these specified shall be provided by the contractor and should be available at site till completion of the contract period. The contractor should note that most of the equipment's are mounted on structures that are at a height from the ground (on lattice towers and tripod pole structures). The staff deployed should be capable to climb these structures adopting due safety procedures in force for carrying out such repair works. Delay encountered in such works will be on contractors account and will be attracting penalty clause stipulated in the tender document.
- viii. During the CMC period, the Port shall not bear any charges incurred by the contractor for deputing additional skilled manpower, logistics involved in shifting man and material, licenses or materials to carry out any form of repairs.
- ix. Preventive Maintenance (PM) shall be carried out strictly in four equal intervals of time per annum. The contractor's staff deputed to the Port shall ensure prompt attending to any breakdown calls and carry out any other regular maintenance that is required such as cleaning of the cameras front glass from time to time to ensure picture perfect visibility. Also, once in a year painting of the power supply panels of the cameras mounted on high masts and of the camera mounting poles, lattice towers etc., complete with scrapping and painting of one coat of red oxide primer and two coats of anti-corrosive silver paint to the satisfaction of the EIC.
- x. During CMC if any of the equipment are found defective /Damaged, same has to be replaced/repared by the Contractor at their cost. The Contractor shall maintain bare minimum and critical spares for upkeep of the CCTV Surveillance system, list of which is detailed below, however, the records of the same shall be submitted to EIC.
  - a) PTZ camera: 2 nos.
  - b) Bullet Camera: 2nos.
  - c) Networks switches : 1 nos.

- d) Wireless modems : 3 sets
- e) HDMI cables 15 Mtrs. : 2 nos.

- xi. Maintaining adequate spares to meet any eventuality. **In case any camera needs to be replaced with the spare unit until it is repaired, it has to conform to relevant and prevailing cyber security related regulations/standards and only as a stop gap arrangement.**  
Original camera/equipment has to be replaced within a maximum period of two weeks. However, if any of the camera found defective and cannot be repaired, the Contractor shall make necessary arrangement to replace the defective camera with a new camera of equivalent or higher technical specifications of existing camera within a period of three weeks. **It may be noted that the contractor has to provide validity / evidence considering End of Life (EOL) of the product along with other technical specifications to the Port, before carrying out any such replacement.**
- xii. Maintaining operation and maintenance logbooks and records of preventive maintenance, non-availability of the system. The contractor shall upgrade firmware and security patches from time to time and maintain updated records of the same.
- xiii. During the CMC period in case need arises to install new cameras or and wireless units, the contractor shall supply and install the new cameras as per the technical specifications that are equivalent to the above installed 39 Nos. CCTV Cameras or and wireless units. The rates for such requirement are to be indicated at PART B of the BOQ. For the equipment's that are added during the CMC period, the contractor shall provide a guaranty of 02 years and CMC for the remaining years as per the tender conditions. The contractor shall include the same while generating invoice for any such additions, based on pro-rata value.
- xiv. Similarly, in case Port decide to remove/discontinue with any of the CCTV Camera, the amount equivalent to the pro-rata rates for the amount of cameras of the CMC for that particular year will be deducted from the subsequent invoice.



### **2.5.2 PENALTY CLAUSE DURING CMC 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 absenteeism or 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.
- iii) 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 accounts.

- 1) Non-availability of power supply from MPT 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 MPT 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.

### **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)**

<b>PART – A</b>							
<b>SUPPLY, INSTALLATION, TESTING AND COMMISSIONING</b>							
Sr No	Description	HSN/SAC Code	Unit	Qty	Rate(Rs)		Amount (Rs)
					In Figures	In Words	
1.	Supply, installation, testing and commissioning of Out-door type IP based Fix Camera as per Tender Technical specification.						
	Supply.		No	19			
	Installation		No	19			
2	Supply, installation, testing and commissioning of Out-door type IP based Dome PTZ Camera as per Tender Technical specification.						
	Supply		No	20			
	Installation		No	20			
3	Supply, installation, testing and commissioning of Surge protector for protection of Camera and wireless units.						
	Supply		No	55			
	Installation		No	55			
4	Supply, installation, testing and commissioning of High power bandwidth 2.5Gbps @160MHz wireless transmitter and receiver						
	Supply		Pair	04			

	Installation		Pair	04			
5	Supply, installation, testing and commissioning of High bandwidth 1.5 Gbps wireless transmitter and receiver						
	Supply		Pair	3			
	Installation		Pair	3			
6	Supply, installation, testing and commissioning of 500Mbps wireless transmitter and receiver						
	Supply		Pair	15			
	Installation		Pair	15			
7	Supply, installation, testing and commissioning of 64 Channel Video Server with 192TB HDD						
	Supply		No	2			
	Installation		No	2			
8	Supply, installation, testing and commissioning of LED Video wall with Controller						
	Supply		No	1			
	Installation		No	1			
9	Supply, installation, testing and commissioning of 8Port PoE Switch						
	Supply		No	17			
	Installation		No	17			
10	Supply, installation, testing and commissioning of 24port POE Network Switch						
	Supply		No	3			
	Installation		No	3			
11	Supply, installation, testing and commissioning of L3 24 Port Switches						
	Supply		No	2			

	Installation		No	2			
12	Supply, installation, testing and commissioning of fully loaded 32U Network rack						
	Supply		No	1			
	Installation		No	1			
13	Supply, installation, testing and commissioning of 9U Network rack						
	Supply		No	4			
	Installation		No	4			
14	Supply, installation, testing and commissioning of 5kVA On line UPS with parallel redundancy						
	Supply		No	2			
	Installation		No	2			
15	Supply, installation, testing and commissioning of 1.5 kVA On-line UPS						
	Supply		No	28			
	Installation		No	28			
16	Supply, installation, testing and commissioning of Power Cable 3Cx1.5sqmm armoured						
	Supply		Mtr	900			
	Installation		Mtr	900			
17	Supply, installation, testing and commissioning of CAT6 Out door Ethernet Cable						
	Supply		Mtr	2500			
	Installation		Mtr	2500			
18	Supply, installation, testing and commissioning of Conduit Pipe						
	Supply		Mtr	1000			
	Installation		Mtr	1000			

19	Supply, installation, testing and commissioning of Junction box						
	Supply		No	16			
	Installation		No	16			
20	Testing and Commissioning of the complete system.		LS	01			
21	Installation of CCTV Cameras in Admin bldg. premises as per clause no. 2.1.15		LS	01			
<b>PART - A TOTAL</b>							
<b>PART – B</b>							
<b>COMPREHENSIVE MAINTENANCE CONTRACT (CMC)</b>							
Sr No	Description	HSN/SAC Code	Unit	Qty	Rate(Rs)		Amount (Rs)
					In Figures	In Words	
1	Comprehensive Maintenance Contract for the 39 Nos. of CCTV Cameras including all accessories & networking components						
	a. 1 <sup>st</sup> year		No.	01			
	b. 2 <sup>nd</sup> year		No.	01			
	c. 3 <sup>rd</sup> year		No.	01			
	d. 4 <sup>th</sup> year		No.	01			
	e. 5 <sup>th</sup> year		No.	01			
2	Supply of Out-door type IP based Fix Camera as per Tender Technical specification.		Nos.	02			
3	Supply, installation, testing and commissioning of Out-door type IP based Dome PTZ Camera as per Tender Technical specification.		Nos.	02			
4	Supply, installation, testing and commissioning of 500Mbps wireless transmitter and receiver		Nos.	04			
<b>PART –B TOTAL</b>							
<b>GRAND TOTAL</b>							

Rupees \_\_\_\_\_ only.

**Date:**

**Signature:**

**Place:**

**Name:**

**Address:**

**Office Seal of firm**

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