OPEN e-TENDER ENQUIRY (OTE)

CORRIGENDUM NO. 4

Date: 01/06/2024

e-Tender Enquiry No. 021/SAL/MMD-MAINT/2023-24 dated 17/02/2024

MSTC Event No.: BRBNMPL/Salboni Press/MMD/32/23-24/ET/51[SITC OF IP ICCTV SYSTEM]

e-Tender Name: SUPPLY, INSTALLATION &COMMISSIONING OF IP CCTV SYSTEM AT BRBNMPL, SALBONI

The following points of the referred tender are amended as per details given below: -

Sl. No.	NEW	Page No.	Parameter	As per Original Tender	Modification / New Insertion
1.	-	88	B: **Video Management System** (Sl.No.05)	Supply & installation of VMS Software and life time channel licenses for 750 Nos. Cameras	Supply & installation of VMS Software and life time channel licenses for 750 Nos. Cameras along with Failover licenses.
2	-	131	**Section XI: Price Schedule** 5(a)	Supply of VMS Software life time channel licenses for 750 Nos. Cameras	Supply of VMS Software life time channel licenses for 750 Nos. Cameras along with Failover licenses.
3	-	131	**Section XI: Price Schedule** 5(b)	Installation of VMS Software life time channel licenses for 750 Nos. Cameras	Installation of VMS Software life time channel licenses for 750 Nos. Cameras along with Failover licenses
4		76	Section VII: Technical Specifications and scope of work – **Clause(K)**	The offered system should be high-performance network infrastructure with stackable switches multiple 10G and 40/100G interfaces, and redundant connections for high availability.	The offered system should be high-performance network infrastructure with stackable switches multiple 10G interfaces and redundant connections for high availability.

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5	-	76	**Section VII:** Technical Specifications and scope of work – **Clause(l)**	The offered Core Switches should be high-performance Layer-3, stackable switches each have 48 Port 1/10G SFP+ ports and 4 number of 40/100G interfaces. They are to be equipped with dual hot-swappable power supply units (PSUs). The core switches must be connected to each other using 40G interfaces to achieve higher stacking bandwidth. They are to be configured in Active/Active mode for high availability meaning both switches actively handle traffic simultaneously.	The offered Core Switches should be high-performance Layer-3, stackable switches each have 48 x10/100/1000- Base-X ports 4 x *10G SFP+ ports. 10G SFP+ ports should be loaded with 10Gbps SFP+ Single Mode Modules based on design requirement Should be equipped with dual internal redundant power supplies for higher availability
6	-	114	**Video Wall**, Sl.No.01-Size (Diagonally)	46" or above	minimum 55" or above
7	-	88	**Networking Equipment** (C-9)	Supply, installation and Commissioning of L3 - Commercial Grade switch with minimum 12 x 1/10 G SFP+ ports and 36x 1/10G Base-T ports, 4x 40G QSFP+ ports with all accessories including fully Loaded (LIU, Patch panels, SFU Modules, Patch cords etc.)	Supply, installation and Commissioning of L3 - Commercial Grade switch with minimum 48 x10/100/1000- Base-X ports 4 x *10G SFP+ ports. 10G SFP+ ports should be loaded with 10Gbps SFP+ Single Mode Modules based on design requirement Should be equipped with dual internal redundant power supplies for higher availability with all accessories including fully Loaded (LIU, Patch panels, SFU Modules, Patch cords etc.)

8		132	**Section XI: Price Schedule** 9(a)	Supply of L3 -Commercial Grade switch with minimum 12 x 1/10 G SFP+ ports and 36x 1/10G Base-T ports, 4x 40G QSFP+ ports with all accessories including fully Loaded (LIU, Patch panels, SFU Modules, Patch cords etc.)	Supply of L3 - Commercial Grade switch with minimum 48 x10/100/1000-Base-X ports 4 x *10G SFP+ ports. 10G SFP+ ports should be loaded with 10Gbps SFP+ Single Mode Modules based on design requirement Should be equipped with dual internal redundant power supplies for higher availability with all accessories including fully Loaded (LIU, Patch panels, SFU Modules, Patch cords etc.)(Price bid to be amended as above.)
9		132	**Section XI: Price Schedule** 9(b)	Installation and Commissioning of L3 - Commercial Grade switch with minimum 12 x 1/10 G SFP+ ports and 36x 1/10G Base-T ports, 4x 40G QSFP+ ports with all accessories including fully Loaded (LIU, Patch panels, SFU Modules, Patch cords etc.)	Installation and Commissioning of L3 - Commercial Grade switch with minimum 48 x10/100/1000-Base-X ports 4 x *10G SFP+ ports. 10G SFP+ ports should be loaded with 10Gbps SFP+ Single Mode Modules based on design requirement Should be equipped with dual internal redundant power supplies for higher availability with all accessories including fully Loaded (LIU, Patch panels, SFU Modules, Patch cords etc.)
10	-	100	**Video Management Software**	Bidder can use or upgrade the existing VMS or Bidder can provide his own VMS in place of existing one. The details are given below;	The details are given below;

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11	-	106	b. VMS/Backup Application Server Sl. No. 4: **Network interface**	4 Nos. of 1 Gbps Gigabit ethernet ports	4 Nos. of 10 Gbps Gigabit ethernet ports
12	-	75	Section VII: Technical Specifications and scope of work –Clause 2(d)	Scope of work shall include IP based CCTV system, supplying, installation of items as per scope, testing and commissioning of the supplied system. The scope of work includes shifting of existing 122 IP cameras consisting of PTZ and Fixed, outdoor and indoor cameras which includes Face Recognition cameras 2 nos., Video Analytics Cameras 57 nos. and ANPR without recording cameras of Six (06) numbers into new IP CCTV system with applicable software and hardware licenses. The existing network of OFC and switches need to be integrated with supplied system	Scope of work shall include IP based CCTV system, supplying, installation of items as per scope, testing and commissioning of the supplied system. The scope of work includes shifting of existing 122 IP cameras consisting of PTZ and Fixed, outdoor and indoor cameras which includes Face Recognition cameras 2 nos., Video Analytics Cameras 57 nos. **(including Trip wire, Camera tampering, left object and Loitering)** and ANPR without recording cameras of Six (06) numbers into new IP CCTV system with applicable software and hardware licenses. The existing network of OFC and switches need to be integrated with supplied system
12	-	78	Section VII: Technical Specifications and scope of work Clause-**aa)**	System shall have provision to include Video Analytics feature, if any, in future.	VMS shall have support for both server and edge based analytics

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13	-	67	**IMPORTANT CONDITIONS AT A GLANCE FOR ATTENTION OF BIDDERS Point No.13**	<u>Training:</u> The bidder shall provide the training to BRBNMPL Employees for a period of minimum two weeks for proper operation and use of the CCTV system. The bidder should also conduct on site periodic refresher training during the period of DLP and CAMC. The training should cover detailed system administration, configuration and trouble sensing. End–user training including complete documentation shall be provided to the specified number of personnel identified by the BRBNMPL at site.	The bidder shall provide training which should cover detailed system administration, configuration, storage level maintenance and trouble sensing including operator level training for a period of minimum two weeks. The bidder should also conduct on site periodic refresher training during the period of DLP and CAMC. Operator level training to min. 15 nos. of personnels identified by BRBNMPL. System administration, configuration, storage level maintenance training to min. 10 nos. of personnels identified by BRBNMPL. Frequency of refresher training: Yearly
14	NEW -	87	Included as Point no. (k) at 7: Other Requirements	--	*"Bidder shall submit network bandwidth calculations along with network diagram and design architecture"*
15	NEW	96	Included as Point No.20 @ IP Based Outdoor Varifocal IR Bullet Cameras	--	Video Analytics: Defocus, tempering, motion, loitering, Virtual line, Entry/Exit, Appear/Disappear
16	NEW	96	Included as Point No.21 @ IP Based Outdoor Varifocal IR Bullet Cameras	--	Digital/Electronic Image Stabilization: Required

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17	NEW	96	Included as Point No.22 @ IP Based Outdoor Varifocal IR Bullet Cameras	--	Defog: Required
18	NEW	98	Included as Point No.19 @ IP Based IR Indoor HD Bullet Cameras	--	Video Analytics: Defocus, tempering, motion, loitering, Virtual line, Entry/Exit, Appear/Disappear
19	NEW	98	Included as Point No.20 @ IP Based IR Indoor HD Bullet Cameras	--	Digital/Electronic Image Stabilization: Required
20	NEW	106	Included as Point No.21@ Video Management System, Server & Storage	--	VMS should have undergone cyber security vulnerabilities testing/audit and bidder shall submit requisite certificates

Note: These changes are applicable at all other places of tender including Page Nos. given above

(Page No.95 to 120 of tender document)

Amended and should be read as

ANNEXURE-B

Detailed Technical specifications

Bidder shall mention offered specification with page no. and line no. of the submitted brochure under which specification is compiled for below specifications in their technical bid.

1. **IP cameras**

a. **IP Based Outdoor Varifocal IR Bullet Cameras**

Sl. No.	Parameter	Specifications	Offered by bidder	Page No of Brochure
1	Image sensor & Minimum Effective Pixels (Resolution) or better	1/3" or better CMOS or Equivalent & Minimum 2 MP, FULL HD (1920*1080)		
2	Electronic Shutter	1/10 to 1 / 10000 s or better		
3	Min illumination/ light Sensitivity	0 Lux on IR on		
4	Wide Dynamic Range	min 120 dB		
5	BLC and HLC	BLC and HLC or equivalent technology		
6	Focus	Auto Focus		
7	Automatic Gain Control	Auto / Manual		
8	Sharpness, Brightness, Contrast	Auto / Manual		
9	IR Range	Min. 50 Meter		
10	Frame Rate	25 FPS @1920 x 1080 at H.265/H.264 Compression or better		
11	Lens	8-50 mm motorized varifocal lens or better		
12	**Video**			
a)	Day and Night Functionality	Automatic, Color, Mono		
b)	Video Resolution	≥ 2 MP (1920x1080)		
c)	Video Streams	Individually configurable 03 video streams H.264/H.265 at Full HD 1920X1080		
13	Compression	H.265/H.264 equivalent or better		
14	**Audio**			
a)	Audio support	Required		
b)	Two-way audio	Duplex		
c)	Input / Output	Minimum 01 IN & 01 OUT		
15	**Network & Interface**			
a)	Interface	RJ-45 for 10/100 base-T Ethernet		
b)	Network Protocols support	IPv4, IPv6, TCP/IP, HTTP, DHCP, UDP, DNS, SMTP, RTP, RTSP, SNMP,		

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		UPnP, NTP, ICMP, IGMP or compatible.		
c)	Alarm Event	Events / alerts send via SSH/ HTTP, Pre-Post alarm video buffering etc.,		
d)	Alarm I/O	Minimum 1 In & 1 Out terminal		
e)	ONVIF Network Interface Specifications	ONVIF Profile S , G and T Compliant		
16	Security	HTTPS encryption, 802.1x ▪ User account and password protection ▪ User access log ▪ To secure IP protocols including https and TLS (TLS1.2) that enable movement of data including passwords on secure channels. ▪ Network access control (IEEE 802.1x) ▪ IP address filtering to provide additional level of control by permitting access only from permitted IP addresses. • Closed API authentication etc.		
17	**General**			
a)	Operational temperature °C	0°C to 50° C or better		
b)	Humidity	5% to 95% RH non-condensing		
c)	IP Rating and Vandalle Protection	IP66, IK10 and NEMA4X, camera and housing should be of same make		
d)	Power Camera	POE based, as per system design or manufacturer's standard		
e)	Certifications	BIS, CE, FCC, UL or equivalent.		
18	**Local Storage**			
a)	SD card	128 GB or more		
19	Other	I/O Box, POE injector, patch cord, surge suppressors and other accessories required to connect the camera in IP network.		
20	Video Analytics	Video Analytics: Defocus, tempering, motion, loitering, Virtual line, Entry/Exit, Appear/Disappear		
21	Digital Image Stabilization	Digital/Electronic Image Stabilization: Required		
22	Defog	Defog: Required		

b. IP Based IR Indoor HD Bullet Cameras

Sl. No.	Parameter	Specifications	Offered by bidder	Page No of Brochure
1	Image sensor & Minimum Effective Pixels (Resolution) or better	1/3" or better CMOS or Equivalent & Minimum 2 MP FULL HD (1920*1080)		

2	Electronic Shutter	1/10 to 1 / 10000 s or better		
3	Min illumination/ light Sensitivity	0 Lux on IR on		
4	Wide Dynamic Range	min 120 dB		
5	BLC and HLC	BLC and HLC or equivalent technology		
6	IR Range	Min. 50 Meter		
7	Focus	Auto Focus		
8	Automatic Gain Control	Auto / Manual		
9	Sharpness, Brightness, Contrast	Required		
10	Frame Rate	25 FPS @1920 x 1080 at H.265/264 Compression		
11	Lens	2.8 - 12 mm Motorized varifocal lens or better		
12	**Video**			
a)	Day and Night Functionality	Automatic, Color, Mono		
b)	Video Resolution	Minimum 2 MP (1920x1080)		
c)	Video Streams	Individually configurable 03 video streams H.264/H.265 at Full HD 1920X1080		
d)	Compression	H.265/H.264 equivalent or better		
e)	Tri-stream H.265/H264 (Recording & viewing)	Required, Live stream 1080p should support min. 25 FPS		
13	**Audio**			
a)	Audio support	Required		
b)	Two-way audio	duplex		
c)	Input / Output	Minimum 01 IN & 01 OUT		
14	**Network & Interface**			
a)	Interface	RJ-45 for 10/100 base-T Ethernet		
b)	Upgrade	Through web browser, online, firmware Upgrade		
c)	Network Protocols support	IPv4, IPv6, TCP/IP, HTTP, DHCP, UDP, DNS, SMTP, RTP, RTSP, SNMP, UpnP, NTP, ICMP, IGMP or compatible		
d)	Alarm Event	Events / alerts send via SSH/HTTP, Pre-Post alarm video buffering etc.,		
e)	Alarm I/O	Minimum 1 In & 1 Out terminal		
f)	ONVIF Network Interface Specifications	ONVIF Profile S, G and T Compliant or equivalent.		
15	Security	HTTPS encryption, 802.1x ▪ User account and password protection ▪ User access log ▪ To secure IP protocols including https and TLS (TLS1.2) that enable movement of data including passwords on secure		

		channels. ▪ Network access control (IEEE 802.1x) ▪ IP address filtering to provide additional level of control by permitting access only from permitted IP addresses. • Closed API authentication etc.		
16	**General**			
a)	Operational temperature °C	0°C to 50 °C or better		
b)	Humidity	5% to 95% RH non-condensing		
c)	IP rating & Vandelle Protection	IP55, IK10, camera and housing should be of same make		
d)	Power	POE based, as per system design or manufacturer's standard		
e)	Certifications	BIS, CE, FCC, UL or equivalent.		
17	**Local Storage**			
a)	SD card	128 GB or more		
18	Other	I/O Box, POE injector, patch cord and other accessories required to connect the camera in IP network.		
19	Video Analytics	Video Analytics: Defocus, tempering, motion, loitering, Virtual line, Entry/Exit, Appear/Disappear		
20	Digital Image Stabilizer	Digital/Electronic Image Stabilization: Required		

c. IP Network Megapixel PTZ Full HD Camera for Indoor/Outdoor application

Sl. No.	Parameter	Specifications	Offered by bidder	Page No of Brochure
1	Image Sensor	1/3" Progressive CMOS or equivalent/ better		
2	Resolution	1920x1080, 1080p (≥ 2 MP)		
3	Minimum Illumination	0 lux IR on		
4	Lens	4.5 to 129 mm motorized Varifocal lens or better		
5	Angle of view	Minimum range 2.4 - 60 (H), 1.8 – 36 (V)		
6	Optical Zoom	30x or more		
7	Digital Zoom	12x or more		
8	Back Light Compensation	BLC & HLC & WDR or equivalent technology		
9	Motion Detection	On/ Off		
10	Wide Dynamic Range	True WDR; Min 120 dB		

11	Day/ Night	Auto/ Color/ BW, True Day/Night with ICR,		
12	Shutter Speed	1/1 to 1/10000 Sec or better		
13	Noise Reduction	3D Noise Reduction (3DNR)		
14	Electronic Image Stabilizer	On/ Off		
15	IR Illumination	Built-in IR LEDs with Min. 200 m illumination		
16	Pan Travel	360 degrees endless		
17	Tilt Travel	-10 to 90 degree, Auto flip 180 degree		
18	No. of Presets	250 or better		
19	Preset Accuracy	0.225 degree or better		
20	Video Compression	H.264/H.265 / MJPEG / MPEG4		
21	Video Streams	Minimum 3 streams (min 2 Configurable Primary Streams & 1 Service stream) or better Primary Streams: min 1080p @ 25/30 fps Service Stream: min 720p/D1/CIF @ 15/25/30fps		
22	Network Protocol support	IPv4/IPv6, HTTP, HTTPS, TCP/IP, UDP, UPnP, ICMP, IGMP, RTSP, RTP, SMTP, NTP, DHCP, DNS, DDNS, FTP, QoS, SNMP v2c/v3, RTCP or compatible		
23	ONVIF Network Interface Specifications	ONVIF Profile S, G and T Compliant		
24	Security	HTTPS encryption, 802.1x • User account and password protection • User access log • To secure IP protocols including https and TLS (TLS1.2) that enable movement of data including passwords on secure channels. • Network access control (IEEE 802.1x) • IP address filtering to provide additional level of control by permitting access only from permitted IP addresses. • Closed API authentication etc.		
25	Onboard Storage	128 GB Micro SD Card or more		

26	Onboard Recording Type	Event trigger recording Continuous and scheduled recording Automatic recording when network fails		
27	Event	Motion Detection, Video Tamper, Network Disconnection		
28	Event Notification	Record in SD Card/ SSH/HTTP, Relay Output, Snapshot etc		
29	Alarm Input/ Output	Minimum 1 Output, 1 input		
30	Audio Input/ Output	1 Input, 1 Output		
31	Audio Stream	Full Duplex		
32	Power Source	POE based, as per system design or manufacturer's standard		
33	Operating Temperature	0°C to 50°C or better		
34	Operating Humidity	< 90% RH (non-condensing)		
35	Vandal Protection	IK-10		
36	Ingress Protection	IP66 and NEMA4X, camera and housing should be of same make		
37	Regulatory	UL, EN, FCC, BIS or equivalent.		
38	Housing & Fixture	Required Housing & Fixture to be supplied. Camera, Housing & Fixture should be of same make		
39	Other	I/O Box, POE Injector, patch cord, surge suppressors and other accessories required to connect the camera in IP network.		

2. **Video Management System, Server & Storage**

a. **Video Management Software:** ~~Bidder can use or upgrade the existing VMS or Bidder can provide his own VMS in place of existing one.~~ The details are given below;

Sl. No.	Parameter	Specifications	Compliance (YES/NO)	Page No of Brochure
1	**Enterprise and Scalable Management Platform**	The VMS shall be an enterprise solution and scalable to support unlimited number of cameras. VMS should support latest Windows Server operating system (latest Release as on bid published date) on Server machine. It should support latest Windows OS on Client machine, independent of what operating system is there in the servers. VMS should support SQL/ MySQL/ Oracle DBMS.		

2	**Distributed Architecture and Openness**	The VMS shall support distributed video architecture which seamlessly integrates the video operations of numerous systems onto one virtual platform, allowing security operators to view and control all cameras, whether across a single facility or across the multiple locations. The VMS shall support seamless integration with other security and safety equipment / systems like Fire Alarm System, Access Control system, Perimeter Protection System etc. so as to monitor on the GUI, alert and automatically focus the nearby CCTV camera towards the area of alarm/incident. The VMS shall support ONVIF S, G, T, M profile and integrate all cameras supporting ONVIF ONVIF S, G, T, M profile		
3	**Standards for Software**	The VMS shall be designed and developed to the approved National and International standards		
4	**Server-Client Architecture**	The VMS shall Manage and support Enterprise Database servers, Recording Servers, Analytics Server, Storage and Operator workstations. The VMS shall support minimum 750 cameras managed per Enterprise Database Server. Systems shall be scalable by adding additional Servers. The VMS shall support Analytics Servers dedicated to analyze video streams. The Analytics Servers shall process the live video using preconfigured rules and Intelligent Video Analytics algorithms to determine events of interest. The VMS shall provide minimum 10 client software licenses. Also, VMS should be compatible with video controller/video wall.		
5	**Fault Tolerant Architecture and Redundancy**	The database server shall provide a central fault tolerant repository for all configurations and run time information for the complete system. The VMS must be capable of running a pair of similarly configured Database Servers in a hot backup configuration where at any point in time, one is the acting Primary and the other is acting as the Hot Backup. The backup Database Server shall be continuously synchronized with the master Database Server to ensure that it is always up-to-date and ready for fail- over, when required. The failover for Database Server should be seamless and should not affect recording of cameras. It must be possible to remove one of the redundant systems for maintenance without interrupting operation, and upon its reinstatement, automatically re- synchronize the databases, again without interruption to system operation. The VMS shall support Primary and Backup		

		Recording Servers allowing N:1 to N:N Redundancy. The failover and roll back mechanism between Preferred and Backup Camera Servers shall be configurable and support both automatic and manual operation. The failover process for Recording Server should not take more than 10 sec for Hot standby server. The VMS should include multicast and multi streaming supported. The system shall automatically switch to unicast, if client fails to connect to the multicast system.		
6	**Concurrent Web Clients and Console Stations**	The VMS shall provide Internet Explorer, Chrome & Mozilla Clients for users other than Operators in Command & Control Room. These clients will be used for viewing of cameras by Security Officers and other authorized users other than in Command & Control Room. The VMS shall provide a Surveillance Console interface for control room operators. Its primary role shall be to meet the operational requirements related to surveillance.		
7	**Operational Features of VMS**	The VMS console shall have a Navigation Pane that include separate tabs to display available cameras, Views, groups and locations available to the operator based on their security settings. It shall include a Multi-level camera tree with built-in filter search capability. It shall support user defined logical groups. The VMS shall have flexible workspace with simultaneous display of Live and Recorded video from the same or different cameras. Information describing the camera and associated video shall be shown in the tile including camera name, camera number, camera health status and whether the camera is currently recording, replaying video, paused or playing live video. The VMS shall have Wild- Card search feature for cameras in Camera Tree and Groups. The VMS console shall have a timeline control to display and play back recorded video for one or more cameras. Playback shall be possible on 1 or more cameras simultaneously for all cameras currently displayed in the Video Workspace. The Timeline toolbar shall include Play, Pause, Snapshot, Fast Rewind (up to 16x), Frame Rewind, Fast Forward (upto16x), Frame Forward, Jump Back, Motion Search and Calendar Control as standard features. The timeline will also have zooming and scrubbing feature for easy analysis of recorded videos.		

8	**Edge Recording and Backfill**	The VMS shall support edge recording of video on SD card inside the camera in case of network connectivity between camera and VMS/ SAN Storage is down. The VMS shall support restoration of edge recorded video in the VMS/ SAN storage once the network connectivity between camera and VMS is up.		
9	**Digitally Signed Export of Camera Videos**	The VMS shall support export of video for evidentiary purposes. It shall be possible to select the portion of video required and export only that portion in Windows Media Format and Native Format. The VMS must support all exported recordings and exported audit logs to be digitally signed to prove authentication (origin of the recording and audit log) and integrity (exported recording and audit log have not been altered or tampered with). The VMS system shall provide a default digital certificate for signing the exported recordings and audit logs. Customization shall also be provided to allow for the user to supply his/her own digital certificate.		
10	**Camera Tamper Detection Feature**	The VMS shall support tamper detection of alarm for the connected cameras/ Analytics Server. Tamper detection shall include changed field view, camera blurred and camera blinded.		
11	**PTZ Camera Control**	The VMS shall support Area configuration to allow users to view specified cameras only. The VMS shall support Control Level determining if a user is allowed to operate the PTZ Controls for a camera. The VMS shall support Control Reservation Period allowing if a particular user has controlled the camera no other user can control the camera until this reservation period has expired. Users with a higher security level shall be able to take control of the camera at any time.		
12	**Recording and Archiving of Camera Videos**	The VMS should support multiple streaming and parallel recording of cameras. The bidder has to provide sufficient storage inside the recording servers to record all cameras for 7 days at 1080p, 25 fps, H.264, H.265 compression. Parallelly, the video recordings shall be stored in the SAN storage also for 90 days back up. In case of loss of video to SAN storage due to any failure, there should be provision to copy/move data automatically or manually from camera server to SAN box for the failure duration. User can manually extend the retention period for important video recording by overriding normal video retention.		

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		The VMS shall provide the ability to automatically archive all recordings. It shall be possible to automatically archive any type of recording at a preconfigured period after the recording has completed. It shall be possible to modify the automatic archive setting for each recording individually, as required. The VMS shall support continuous background recording, scheduled recording, event activated recording and user activated recording for all connected cameras.		
13	**Search and Playback of recorded Videos**	The VMS shall provide a simple search for all video recorded. The user selects the time indicator which shows a calendar and time line. The user selects the required search period. Once the time criterion is entered, the —search is selected. Video recorded during the selected period will be returned by the search. The VMS shall provide an advanced search of recorded video. The search shall be based on recording time, camera and recording details. It should be possible in VMS to merge recorded video sequences from different or overlapping time intervals form different cameras to one and same the export. It will provide a consolidated video evidence for a complete overview of incidents.		
14	**Digital Zoom and Video Recording on live video client**	The VMS shall support the ability to digitally zoom into an area of the image as well as provide the ability to enhance the image viewed by adjusting the levels of brightness, contrast, noise levels and sharpness through camera Web page from live video. VMS client should support Hardware Acceleration feature by using the GPU for video decoding to bring down the CPU utilization and support more number of cameras on any given workstation. Client software should be able to overlay the following information on every video panel: 1. FPS 2. Codec info 3. Resolution 4. Hardware Acceleration Status 5. Motion Detected: Displayed as symbol. 6. Camera nomenclature (Camera name, Location etc.) 7. Time and Date		

15	**Alarm Module**	The VMS shall have integrated Alarm Module for video system and analytics alarms. The Alarm module shall have Alarm and Event summary with Video Clip attached. The Alarm module shall provide Audio Alert. The VMS shall have the feature to pop- up video from the camera on a dedicated alarm monitor in case of an alarm is generated in that camera. The cameras will be queued in sequence in case of multiple alarms till they are acknowledged by the operator. The alarm support shall allow for continuous monitoring of the operational status and event triggered alarms from servers, cameras and other devices. VMS should be capable to raise alarm in the following cases: 1. Storage Disconnection / Unavailability 2. Camera video loss 3. Recording Server Unavailability A bookmarking feature shall be included in the Video Management System, allowing the client viewer users to mark incidents on live and/or playback video streams.		
16	**Diagnostic Module**	The VMS shall provide diagnostic modules to assist with system health assessments and collection of diagnostic information. The Diagnostics applications shall provide a unified user interface for running tests, recording system activity, collecting diagnostic information and viewing system log files. It shall be possible to collect diagnostic information on all components of the VMS application including Database Servers, Recording Servers, Clients and network activities.		
17	**Report Management System**	The VMS shall have an integrated Alarms, Alarm Management and Reporting module which can create any desired reports at any incidence. Customized Reports for system downtime as SLA requirement.		
18	**Map Function**	Built-in map function in the client viewer shall Provide an intuitive overview of the system and shall offer integrated access to all system components. VMS should support GIS Map, CAD offline Maps (Google Maps, Bing and Open Street Maps). Map function shall be able use standard graphical file formats including jpg, gif, png, tif etc. It shall be possible to use any number of layered maps, and it shall be possible to easily drag-and-drop and point-and-click definition of cameras, servers, microphones, speakers, I/O devices, hot-zones, and PTZ camera presets. Hot zones shall be allowed for intuitive navigation between different map levels. Map function shall		

		support central overview of the surveillance system via an alarm list containing alarm indicators of high, medium or low prioritized alarms. Furthermore, the alarms shall be categorized by the following states; new, in progress, on hold, or closed. Alarms must be possible to acknowledge by right clicking elements on maps.		
19	**System Monitor & Configuration Report**	The system monitoring feature shall make it possible to view system information and create reports on: 1. Management servers (show CPU and memory usage) 2. Recording server (show CPU and memory usage and usage data for disks, storage, networks and cameras) 3. Failover servers (show CPU and memory usage) 4. Additional servers (show CPU and memory usage on log servers, events servers, and so on). 5. Cameras (such as camera status, if the individual camera is recording, the recording server the camera is connected to and more) The VMS solution shall support a functionality to generate a PDF that shall document all parts of the system configuration, including preview of Video.		
20	**Video Analytics**	The VMS shall Support an integrated Video Analytics system from same or other OEM. Events from the Video Analytics system shall start a recording and generate an alarm of configurable priority.		
21	**Other Requirements**	VMS should have undergone cyber security vulnerabilities testing/audit and bidder shall submit requisite certificates		

b.   VMS / Backup Application Server

Sl. No.	Parameter	Specifications	Offered by bidder	Page No of Brochure
1	Processor	10 Core Intel® Xeon or AMD equivalent and higher		
2	RAM	Min 32 GB and extendable upto 128 GB		
3	Internal storage	Disk Set 1 - NTFS formatted Type: SSD SATA/SAS Mixed Use Configuration: RAID 1 (Mirror) / RAID 10 (Striped Mirror) with required controllers and licenses Capacity: 240GB 4X 600GB SAS (15k RPM) on RAID 10 SQL DB and Transaction Logs		

4	Network Interface	4 Nos 10 Gbps Gigabit Ethernet ports		
5	HBA interface	Dual Port PCI-e FC HBA		
6	Operating System	Microsoft Windows Server 2019 and above / latest (64 bit) Standard Edition. License Copy would be in the name of BRBNMPL. Not applicable in case of preloaded or sticker license		
7	SQL Server	SQL Server 2019 Standard / latest		
8	Licensed Software	VMS licence should be in the name of BRBNMPL & database used for VMS should have licence in the name of BRBNMPL		
9	Power Supply	Dual Redundant Power Supply		
10	Optical Drive	DVD +/-RW		
11	Keyboards and Mouse	USB type to be supplied		
12	USB port	YES		
13	Form Factor	Rack mounted		

c.   **Video Recording Server / Camera Server**

Sl. No.	Parameter	Specifications	Offered by bidder	Page No of Brochure
1	Processor	**Dual 8 Core Intel® Xeon or AMD equivalent and higher**		
2	RAM	Min 32 GB DDR4 ECC and extendable up to 128 GB		
3	Internal storage	Disk Set 1 - NTFS formatted Type: SSD SATA/SAS Mixed Use Configuration: Single hard drive or RAID 1 Capacity: 240GB Software: Windows operating system, Camera Server software Disk Set 2 Configuration: Single hard drive or RAID 5/6 Capacity: Refer to system sizing tool Software: VMS Recordings		
4	Network Interface	4 Nos 10 Gbps Gigabit Ethernet ports		
5	HBA interface	Dual Port PCI-e FC HBA		
6	Operating System	Microsoft Windows Server 2019 and above / latest (64 bit) Standard Edition/linux. License Copy would be in the name of BRBNMPL. Not applicable if preloaded or sticker license.		
7	Software License	All software including VMS licenses should be		

		in the name of BRBNMPL.		
8	Power Supply	Dual Redundant Power Supply		
9	Optical Drive	DVD +/-RW		
10	Keyboards and Mouse	USB type to be supplied		
11	USB port	YES		
12	Form Factor	Rack mounted with redundant Power supply & redundant OFC network port.		

d.   **NAS Storage**

Sl No	Feature	Required Product Specifications	Compliance (Yes/No)	Page No
1	High Availability and Storage Processors	The Proposed Solution should be a Scale-Out NAS System with support for NAS, NFS V3 & V4.1, SMB 3, and S3 API natively protocols configured with dual redundant Active-Active Controllers * Each Controller must have minimum 64 physical Core Processors and total 2048 GB physical Memory * The Proposed Solution should be based on real time optimized operating system. (It should not be a general-purpose OS)		
2	Memory and HDD Support	The controllers should have minimum 2048 GB physical memory spread across dual controllers. * The Proposed Solution should be scalable to more than 300 Drives in the same Storage Array / group of arrays without upgrading the controllers. * The Storage System should support the latest SSD, SAS and NLSAS Drives		
3	Host Connectivity and Storage Backend Disk Connectivity	The offered Storage System shall be supplied with at least 16 nos of 10Gb Optical Ports across multi Controllers for Host Connectivity. * The array proposed should have a minimum of 4nos x 12Gbps 2.0 SAS / SSD backend architecture.		
4	Total Aggregate Storage Bandwidth	The Proposed Storage System should ensure a minimum total aggregate bandwidth of 3GBps on a 90% Write & 10% Read Video Management Application Workload		
5	RAID Support	Storage System to be configured with RAID 6 protection and Global Hot Spares.		

6	VMS Validation on the Storage System	The System integrator has to test and validate the Bandwidth mentioned for VMS application compatibility with the storage as per the total requirement of the project for 750 cameras.		
7	Storage Capacity Requirements	The Proposed Storage System should be configured with Minimum 2000TB Usable Capacity using minimum 8TB to not more than 10 TB NL-SAS Drives / SSD Drivers. The usable capacity is defined as the Net storage capacity available for the application stack, after deducting the penalties imposed by storage infrastructure requirements, disk and array formatting, RAID penalties, host OS and file system formatting including overheads or any other penalties which eat away usable disk space. Drives offered for the above capacity can be of the Highest Capacity offered by the Vendor		
8	Statement of Compliance	This Information Technology Equipment is compliant with the electromagnetic compatibility (EMC) and product safety regulations/standards required by the countries in which the product is sold. EMC compliance is based on FCC part 15, CISPR22/CISPR24 and EN55022/EN55024 standards, including applicable international variations. EMC compliant Class A products are marketed for use in business, industrial, and commercial environments. Product Safety compliance is based on IEC 60950-1 and EN60950-1 standards, including applicable national deviations. Or Equivalent BIS or Reputed International laboratories Certificates.		
9	Storage Software Licenses	All the standard Storage Software Licenses like Unified Storage Management software for File, Block & VOLs, Snapshots, Remote Replication, Performance Optimization, Thin provisioning, QOS, Proactive Remote Support to be included.		
10	Supported Server Operating System Support	Windows Server 2012, Windows Server 2016 R2, Windows Server 2019 and latest release, Microsoft Hyper-V, Novell Suse Enterprise, Oracle, RedHat Enterprise, & x86 VMware® vSphere.		
11	Storage Validation Test report	The System integrator has to test and validate the Bandwidth mentioned for VMS application compatibility with the storage as per the total requirement of the project for 750 cameras.		

3. Network Equipment

a. **L 3 Network switch Commercial grade**

SL No	Parameter	Specification	Compliance (Yes or No)	Page No.
1	Ports Density	48 x10/100/1000- Base-X ports 4 x 10G SFP+ ports. 10G SFP+ ports should be loaded with 10Gbps SFP+ Single Mode Modules based on design requirement Should be equipped with dual internal redundant power supplies for higher availability		
2	Performance	Switching Capacity: Non-Blocking, Forwarding Rate: Wire Speed Non- Blocking Multicast: Wire Speed Non-Blocking Energy efficient Ethernet IEEE 802.3az		
3	Resiliency	Should have the technology capability of Active-Active Clustering VSS/equivalent high availability technology for higher availability and resiliency. The Active - Active Virtual chassis cluster should support technology functionality locally or over geographically diversified locations The proposed VSS or equivalent technology should support high availability for both Layer 2 and Layer 3 (RIP, OSPF) Including for IP Multicasting (PIM-SM, PIM-DM),for video applications to ensure hitless failover In case of any kind of failure in the VSS cluster the migration to secondary Active core should be seamless ensuring no real time traffic disruption Should support sub 50ms ring resiliency as per REP/ ERPS / IEEE 802.17/RRPP or equivalent to ensure no impact on video traffic during any failure across the network		
4	Layer2/ Layer 3 Features	Static Routing Should support RIP v2, RIPng, OSPFv2, OSPFv3, PIM-SM, PIM-DM, PIMv6-SM IEEE 802.1ad, IEEE 802.1Q, IEEE 802.1v, IEEE 802.3ac, Voice VLAN, LLDP-MED, IEEE 802.1D MAC bridges, IEEE 802.1s (MSTP), IEEE 802.1w (RSTP), VRRP v3		
5	Multicast Features	Multicast Support: IGMP query solicitation, IGMP snooping v1, v2 and v3, MLDv1 and v2, Source-specific multicast for IP, IGMP query solicitation		
6	IPv6 Features	IPv4 and IPv6 dual stack, Device management over IPv6 networks with SNMPv6, Telnetv6 and SSHv6, ICMPv6, NTPv6, DNSv6, DHCPv6 relay, 6to4 tunneling		
7	Security	SSH remote login, SSLv2 and SSLv3, TACACS+, IEEE 802.1X authentication protocols (TLS, TTLS, PEAP and MD5), IEEE 802.1x, MAC-based and Web-based can be enabled simultaneously on the same port. IEEE 802.1X port-based network access control, RADIUS, RADIUS accounting, Secure Shell (SSHv2), ACL, Dynamic VLAN assignment, DHCP (snooping, client, Server and relay). Switch should provide the ability to monitor events and take corrective action proactively. Control plane denial-of-service (DoS) protection		

8	Management	Switch should able to support management via CLI, Web interface SNMP v1, v2, v3 support, RMON (groups 1,2,3 and 9), SNMP traps, sflow, Optical digital diagnostic monitoring as per SFF– 8472 or equivalent standards for 1G SFP and 10G SFP+ Module. Switch should be manageable through both IPv4 & IPv6. An External memory card / USB or equivalent, allowing switch firmware, configurations to be stored for backup and distribution to other switches		
9	Power input	Should be equipped with dual internal redundant AC power supplies for higher availability		
10	Certifications	UL-UL60950-1, EN 55024, CE, ROHS		
11	Operating Temperature	0-40C in continuous operation of 365 days 24 hrs		
12	Interoperability	For ease of integration all active components (switches, SFP's) should be of same OEM		

b. L2 Network Switch: Commercial grade Commercial grade (24 port)

SL No	Parameter	Specification	Compliance (Yes or No)	Page No of Brochure.
1	Type	Enterprise Grade, Fully Manageable, Layer-2, Ethernet PoE+ Switch.		
2	Application	Access Switches: Primarily providing network connectivity to IP CCTV cameras, remote clients and also providing power to cameras which comply to IEEE 802.3af & IEEE 802.3at standards through Cat-6 A cable and connectivity to Layer 3 Switch through Single mode Fiber optic cable (FOC).		
3	Port Density & Hardware Requirement	Switch should have minimum 24x100/1000 Base-T PoE ports and 4 x 10G SFP+ uplink ports. 4 nos 10G SM module should be loaded. Minimum PoE budget should be 740Watt And Inbuilt redundant power supply		
4	System Capacity & Performance	Switch should have 128Gbps switching fabric and 95Mpps forwarding rate		
		Switch should support min 16 K MAC addresses and min 4K configurable VLANs.		
5	Resiliency	The proposed Virtual chassis or Equivalent technology should support high availability for both Layer 2 and Layer 3 Including for IP Multicasting optimized for Real time applications like Voice and Video IP traffic		

BHARATIYA RESERVE BANK NOTE MUDRAN (P) LIMITED

(Wholly owned subsidiary of Reserve Bank of India)

P.O. RBNM, Salboni, Dist. Midnapore (W), West Bengal, Pin Code 721132

SUPPLY, INSTALLATION &COMMISSIONING OF IP CCTV SYSTEM AT BRBNMPL, SALBONI

T.E. No. 021/SAL/MMD-MAINT/2023-24 dated 17/02/2024

		The stacking bandwidth of the switches shall be min of 40 Gbps and should support the redundancy across the geographically diversified locations (min 800 Mtrs), also Vendors should offer required cables/modules.		
6	L2 Features	Switch should have full Layer 2 features like GVRP, STP, RSTP, MSTP/PVST, LACP/IEEE802.3ad, 50ms link recovery, ACL, QoS and IGMPv1/v2/v3 .		
7	L3 Features	Switch should have Static Routing for IPv4 & IPv6. Switch should be scalable full layer 3 functionality like RIP, OSPFv3, RIPng, BGP, PIM and other Layer 3 Multicasting features without changing the base hardware for future scalability		
8	Multicasting	Should support IGMP v1/v2/v3 snooping and MLD snooping		
9	QOS	Should support 8 queues per port and Policy-based QoS based on VLAN, port, MAC and general packet classifiers		
10	Security Features	Switch support MAC Based Authentication, Web – based Authentication and 802.1x, RADIUS, TACACS/TACACS+, AAA & SSH.		
11	IPv6 Features	IPv6 management features, SNMPv6, Telnetv6 and SSHv6, Syslogv6, NTPv6 client and server.		
12	Management & Diagnostic Features	Dedicated Console and USB interface for easy management.		
		Should support Syslog, SNMPv1, v2 and v3, RMON, SSHv2, Sflow/NetFlow or equivalent, telnet and web management, SSL V3, DHCPv4		
		Digital optical monitoring (DOM) as per SFF-8472 or equivalent and UDLD/equivalent, Ping polling and Trace Route for IPv4 and IPv6		
13	Certification	Certification: FCC class A/ VCCI class A/ UL/ cUL/ TUV. IEEE / BIS or equivalent		

c. **L2 Switch: Outdoor-Industrial Grade (8 port)**

SL No	Parameter	Specification	Compliance (Yes/No)	Page No.
1	Type	Industrial Grade, Fully Manageable, Layer-2 Switch. (PoE+)		
2	Application	Access Switches: Primarily providing network connectivity to IP CCTV outdoor cameras through		

		Cat-6A cable and connectivity to Layer 3 Switch through Single mode Fiber optic cable.		
3	Port Density & Hardware Requirement	Rugged outdoor Din Rail mountable switch with Min 8*10/100/1000 Base-T port of POE + and 2* 1 G Fiber slots with suitable AC PSU; dual power inputs. 2 nos 1 G SM modules should be loaded.		
4	PoE Features	POE + Standards should be in accordance with IEEE 802.3af and IEEE 802.3at standards with 30W PoE+ support with PoE budget of 240W		
5	Performance & System Capacity	The switch should have min. 24 Gbps of switching capacity & min. 17 Mpps of forwarding rate Switch should support 8K MAC addresses		
6	L2 & L3 Features:	Support for Port-based VLANs, 4096 VLANs (IEEE 802.1Q), GARP VLAN Registration Protocol (GVRP), MAC-based VLANs, Port-based Private VLANs, IP subnet-based VLANs 256.		
7	Multicasting	Support IGMP snooping v1/v2 /v3, MLD snooping (v1 /v2), PIM for IPv4 & IPv6, PIM for video multicast		
8	IPv6 Features	Should support IPv4 and IPv6 dual stack for data & management, SNMPv6, Telnetv6 and SSHv6, DAD or equivalent, DHCPv6 relay, DHCPv6 client		
9	Security Features	Should support ACLs, DHCP snooping, IEEE 802.1x based port authentication, DHCPv4 (Snooping, server/ client), RADIUS, TACACS+, SSL, SSH, SSLv3, Port Mirroring, NTP, sflow/netflow, Dynamic ARP Inspection, IP source guard, UDLD/equivalent		
10	Management	SNMPv1, v2 and v3, Web GUI, CLI, USB or equivalent memory card, IEEE1588v2 PTP, NTP		
11	Operating Temperature	Min of 0 to 75 Degrees or better, Humidity: 5% to 95% or better		
12	Certifications	UL/IEC/EN 60950-1 or equivalent		

d. L2 Switch: Outdoor-Industrial Grade (4 port)

SL No	Parameter	Specification	Compliance (Yes/No)	Page No.
1	Type	Industrial Grade, Fully Manageable, Layer-2 Switch. (PoE+)		
2	Application	Access Switches: Primarily providing network connectivity to IP CCTV outdoor cameras through Cat-6 A cable and connectivity to Layer 3 Switch		

		through Single mode Fibre optic cable.		
3	Port Density & Hardware Requirement	Outdoor Din Rail mountable switch with Min 4*10/100/1000 Base-T port of POE + and 2* 1 G Fibre slots with suitable AC PSU; dual power inputs. 2 nos 1G SM modules should be loaded.		
4	PoE Features	POE + Standards should be in accordance with IEEE 802.3af / IEEE 802.3at standards with 30W PoE support with PoE budget of 120 W		
5	Performance & System Capacity	The switch should have min. 12 Gbps of switching capacity & min. 8 Mpps of forwarding rate. Switch should support 8K MAC addresses		
6	L2 & L3 Features:	Support for Port-based VLANs, 4096 VLANs (IEEE 802.1Q), GARP VLAN Registration Protocol (GVRP), MAC-based VLANs, Port-based Private VLANs, IP subnet-based VLANs 256.		
7	Multicasting	Support IGMP snooping v1, v2 and v3, MLD snooping (v1 and v2), PIM for IPv4 & IPv6, PIM for video multicast		
8	IPv6 Features	Should support IPv4 and IPv6 dual stack for data & management, SNMPv6, Telnetv6 and SSHv6, DAD or equivalent, DHCPv6 relay, DHCPv6 client		
9	Security Features	Should support ACLs, DHCP snooping, IEEE 802.1x based port authentication, DHCPv4 (Snooping, server/ client), RADIUS, TACACS+, SSL, SSH, SSLv3, Port Mirroring, NTP, sflow/netflow, Dynamic ARP Inspection, IP source guard, UDLD/equivalent		
10	Management	SNMPv1, v2 and v3, Web GUI, CLI, USB or equivalent memory card, IEEE1588v2 PTP, NTP		
11	Operating Temperature	Min of 0 to 75 Degrees or better, Humidity: 10% to 90% or better		
12	Certifications	UL/IEC/EN 60950-1 or equivalent		

4. **VMS Client Work stations & Display**

a. **Video wall**

Sl. No.	Parameter	Specifications	Offered by bidder	Page No.
1	Size (Diagonally)	46" or above		
2	Grid size	2 X 5		
3	Panel Technology	Direct LED / IPS / VA or any Latest technology		

4	Resolution	1920x1080 (Full HD)		
5	Aspect Ratio	16:09 or better		
6	Native Contrast Ratio	1000 :1 or better		
7	Brightness	700 nits or more		
8	Bezel width	1.15(u/l) , 0.55mm(R/B) , 1.8 mm bezel width or lesser		
9	Viewing angle (H/V)	178 degree/178 degree		
10	Operation Hour	24X7		
11	**Connectivity** Input_ RGB Video HDCP **Output** RGB Audio External control	Analog D-SUB, DVI-D, Display Port (DP1.2) HDMI2.0x2 HDCP2.2 DP1.2 loop out Stereo Mini Jack RJ45 Any other port required for Satisfactory working of Video Wall to be provided by System Integrator		
12	Operating Temperature	$0^0C \sim 40\ ^0C$		
13	Humidity	10~80%		
14	Certification	UL (USA) /FCC(USA) / CE(Europe)/ BIS certification or equivalent		

b. **Video wall controller**

Sl. No.	Parameter	Specifications	Offered by bidder	Page No.
1	Processor	Intel Xeon quad processor dual E5 series or better		
2	Video inputs	12 DVI/HDMI each supporting resolutions of minimum 1920*1080		
3	Video outputs	12 DVI/HDMI each supporting resolutions of minimum 1920*1080		
4	Streaming inputs	Should be capable of showing 72 streamed H.264 / H.265 inputs on the screen, in any layout, size etc		
5	Networking	Dual-port Gigabit Ethernet Controller Inbuilt Supports Add on copper/ optical fiber adapters		

6	Scalability	Display multiple source windows in specified size, on the wall		
7	Display Configuration	Display will be configured in the matrix of 2x5, each display shall have DVI input		
8	Transmission Distance	10-50m		
9	Hard drive	Minimum 2TBx2 or more		
10	RAM	32GB		
11	Operating system	Windows latest version		
12	Software License	License Shall be in the name of BRBNMPL. Not applicable in case of preloaded / Sticker license		
13	Power supply	Dual & Redundant		
14	Mounting	Rack Mounted		
15	Certification	BIS/ CE/ FCC/UL		

c.   Client station

Sl. No.	Parameter	Specifications	Offered by bidder	Page No.
1	Processor	Intel Core i7 processor -9700 @ 3.00GHz or latest generation, or equivalent latest processor of AMD or other make.		
2	RAM	Min 32 GB DDR4 ECC		
3	Internal storage	500GB SATA 3.0Gb/s or better		
4	Network Interface	1Gbits/sec or greater		
5	Optical Drive	Single drive: DVD +/-RW+CD-RO		
6	Graphics	Radeon™ Pro WX 4100, 4 GB, 4 DP or equivalent and better shall support UHD screens @ 60Hz		
7	Display	21" LED screen Full HD		
8	Keyboard & Mouse	USB based		
9	Port	Minimum 6 Nos USB ports, HDMI / DVI and VGA ports- As per Video wall design		
10	Operating System	Microsoft Windows 11 (64 bit) or Latest		
11	Cabinet	Tower		

5. <u>Equipment racks</u>

a.   **EQUIPMENT RACK-42 U**

Sl. No.	Features	Description	Offered by bidder	Page No.
1	Frame structure	• Deep Powder coated Steel Frame Rack 800 Wide x 2000 Height x 1000D, 2 mm thick angle. • Top and bottom cover with suitable no. of cutouts for cable entry. 1.5 mm thick sheet • All cutouts blanked with Plastic caps. • 2 pairs, 42 U height 19" L type angle, Front & rear, on • Vertical Cable Trough (LH & RH) 2 Pair		
2	Doors	Perforated Doors		
4	Handle and Lock	Ergoform Handle with Lock Insert Key Lock Type		
5	Cooling Fans	230 Volt AC, 90 cfm, min. 4 Nos. on top / side cover.		
7	Cable entry	Provision for top and bottom cable entry,		
8	Power supply	Redundant power source with 2 sets of 6/16 A, 230 V socket strip having 10 sockets/switch with 2.5-meter power chord with 16 Amp Top. (Shall be customized according to the requirement)		
9	Accessories	Metal shunting Ring to manage the network cables. All other hardware and accessories required for housing the equipment and dressing of various related cables.		
10	Approvals	UL, Underwriters Laboratories / USA/ Equivalent BIS certification		

b. EQUIPMENT RACK – 12U for L2 Switch (Wall Mounted)

Sl. No.	Features	Description	Offered by bidder	Page No.
1	Frame structure	· Deep Powder coated Steel Frame Rack 600x600x600 (HxWxD), 2 mm thick angle. * Wall Mounted enclosure with front sheet steel glass door. * Top and bottom cover with suitable no. of cut outs for cable entry. Integrated side walls 1 pair of 19" angles with wall mounting provision * All cut outs blanked with Plastic caps.		
2	Lock	Insert Key type Lock		

3	Cooling Fans	230 Volt AC, 90 cfm fan with Inlet and Outlet Filter, min.2 Nos. on top/side cover		
4	Power supply	19 "Mountable 1 set of 5A, 230 V Universal socket strip having 6 sockets/switch with 2meter power chord with 5 Amp Top (Shall be customized according to the requirement)		
5	Accessories	All other hardware and accessories required for housing the Switch and other components with Air Filter for Inlet and outlet		
6	Approvals	UL, Underwriters Laboratories / USA/ Equivalent BIS certification		

c. IP enclosure / JB (wall mounted) for outdoor application.

Sl. No.	Features	Description	Offered by bidder	Page No.
1	Application	All the Driver Unit, Power Supply, FO Converter, Circuit Breakers, LIU, etc. At outdoor locations will be housed in a suitable IP65 more rated junction box as per environmental condition of the area, which will be mounted properly near the camera location. All the Power and Signal Cables shall be terminated in the junction box through proper glanding.		
2	Size	800H X 600W X 220D (in mm) (to accommodate various CCTV components like LIU, Ethernet Switch, Surge Protector, MCB, Power Supply adapters, Termination blocks etc. as applicable)		
3	Cable entry	Minimum 8 nos. ½" NPT as per requirement.		
4	Frame structure	Wall mount enclosure with door. · L type plate – 2mm thick · Gland plate at bottom – 1.5mm thick (for cable entry) · Mounting plate – 3mm thick · DIN rail 35mm wide 150mm long · Front plain door - 2mm thick		
5	Lock	Insert Key type Lock		
6	Cooling Fans	230 Volt AC, 90 cfm fan with Inlet and Outlet Filter, 2 Nos. on top/side cover		
7	Power supply	19 "Mountable 1 set of 5A, 230 V Universal socket strip having 6 sockets/switch with 2 meter power chord with 5 Amp Top (Shall be customized according to the requirement)		

| 8 | Accessories | All other hardware and accessories required for housing the Switch and other components with Air Filter for Inlet and outlet 8 nos. double compression ½" NPT SS cable glands to be supplied with each junction box. | | |
| 9 | Approvals | UL, Underwriters Laboratories /USA/ Equivalent BIS certification | | |

6. **Cables & Conduits**

Armoured Single Mode Fiber Optic Cable

The 12-core cable shall be 9/125micron core/cladding, single mode, Armoured Fiber Optic Cable. The cables shall have identification tags of connections at each end and such details shall be submitted along with documentation.

Sl.No.	Item	Specifications	Offered by bidder	Page No.
1	**Optical Fiber Cable Structure**			
a	Number of core	12 cores		
b	Certification	Applicable BIS/ IEC/ IEEE certificate		
2	**Optical Characteristic**			
a	Attenuation at 1310nm:	≤1.0dB/km		
b	at 1550 nm:	≤1.0dB/km		
c	Temperature and Humidity	The cable shall retain the optical properties, detailed in the present specification over the following condition: Working/Storage Temp.: -30ºC to +70ºC Humidity: 0--100%		

7. **Miscellaneous**

Sl.No.	Features	Description	Offered by bidder	Page No.
a. Surge Suppressor for cameras and associated hardware / Earth Pit				
1	Salboni place is prone to lightning. To protect the system from Lightning, required class of surge suppressor and suitable earth pits as per IS :3043 to be supplied and installed. In case of any failure of component due to lightening, the bidder to replace the defective components in free of cost during warranty as well as CAMC period to make the system serviceable.			
b. Armoured Power Cable				
1	3 core, 2.5 sq. mm., 1.1 Kv grade, copper conductor, PVC insulated, armoured, cable conforming to IS:1554 (Part-I) with FRLS PVC outer sheath. The cable shall have ISI / BIS stamp and marking of length at each meter.			

c. 1 KVA UPS Technical specifications

Sl.No.	DESCRIPTION	Technical Specification	Offered by bidder	Page No.
1	Capacity	1 KVA		
Input Characteristics.				
2	Nominal Input Voltage	230 Vrms Single phases		
Battery Parameters.				
3	Type of Batteries	SMF VRLA Lead acid in suitable rack		
4	Battery Back up	Minimum 60 minutes		
Output Parameters.				
8	Nominal Output voltage	230 Volts		
9	Output Frequency	50 Hz ± 0.1 Hz;		
10	Output Waveform	Pure sine wave		
11	Power Rating	1 KVA		
12	Duty	Continuous duty		
13	Overall efficiency (AC to AC)	>90 %.		
Physical and Environmental Characteristics.				
14	Ambient Temperature	0 - 40 Deg C		
15	Humidity	0-95 % non-condensing		
16	Enclosure Protection Grade	IP 20		
Metering (Digital display)				
17	Display	LCD/ LED based Display System, able to monitor Input Voltage/ Battery Voltage/ Output Voltage/ Output Frequency /Input Frequency		
18	Protection	Overload/ Short Circuit/ Battery Deep Discharge/ Low Battery/ Reverse Battery/ Inverter Current Limitation/Over Temprature/ Output Overvoltage.		
Standards				
19	**BIS certified**			
20	**Pole Specification:**	Galvanized circular pole of min. 6 mtrs height with base plate and earthing points. Nominal bore 100 mm, outer dia 114.3 mm. Pole should have manufacturer's		

		marking, grade of steel and BIS certification marking on it. Pole top should be sealed to protect from rainwater.		
d. Network Management or SDN Controller				
1	Network Management System/SDN Controller:	Licenses to be supplied to cover all switches and devices		
2	Monitoring	monitor the entire network from a single, centralized interface. comprehensive view of network health, performance, and security, detect problems		
3	Detection	The software to detect potential network issues, such as bandwidth congestion, device failures, or security breaches. Help administrator to take preventive actions before issues escalate and impact network performance or user experience.		
4	Network Inventory	The software maintains an up-to-date inventory of network devices, configurations, and connections.		
5	Automate Tasks	automatic device configuration backups, firmware updates, and network performance reports.		
6	Performance analytics and reporting:	provide network trends, usage patterns, and historical data.		

8. **Armoured Cat 6 A cable: Armoured Cat 6 A cable of any reputed make**

9. **HDPE pipe for OFC cable: HDPE pipe 40mm with ISI of any reputed make**

10. **PVC conduit for Cat6a cable: PVC conduit with ISI of any reputed make**

11. **PVC conduit for OFC cable: PVC conduit with ISI mark of any reputed make**

12. **Laying of Power, CAT6 and Fiber Optic cable:**

The cable shall be laid on wall/ceiling or above false ceiling etc. The rate quoted for cable laying shall include for supply and fixing of GI saddles, spacers etc. & cable trays at required areas on wall/ceiling or above false ceiling and providing other accessories as required. Rate shall also include for making required holes, if any, in brick/RCC walls, RCC Ceiling etc. and making good the same complete in all respect as required to complete the job. The cables shall be properly dressed in a neat manner. The cable shall have marking of length at each meter. The Power cable shall be terminated with copper lugs, glands etc. In case of CAT Cable and Fiber optic Cables, the termination shall be done by providing suitable end connectors.

Underground OFC cable laying shall be done in 40mm HDPE pipe. Trench digging, cable laying and backfilling shall be done as per IE standards. Trench shall be 700mm deep and 300 mm wide and there shall be 8 bricks per meter with sufficient sand filling.

Bidders shall submit

1) copy of Reply to pre bid queries duly sealed & signed along with their Bid.

2) **Corrigendum-4 duly filled sealed & signed along with their Bid**

All other terms and conditions remain unchanged. Bidders may please note that Originals (or self-attested copies of Originals) of specified scanned uploaded documents (except Price Schedule) must be physically submitted in a sealed cover before the bid submission deadline at mentioned venue as specified in the tender. Failure to do so is likely to result in the bid being rejected.

This Corrigendum / Amendment form a part of the referred Tender. This Corrigendum / Amendment No.4 is to be submitted along with Techno-Commercial Bid (Part – I) duly signed and sealed by authorised signatory in a separate envelope superscribed with Corrigendum No.4 and tender details (in MSTC Portal along with Physical Submission of Originals).

For & on behalf of BRBNMPL, Salboni

Sd/-

(Amitav Mishra)
Deputy General Manager