

**AHMEDABAD MUNICIPAL CORPORATION**  
**(ENGINEERING DEPARTMENT-NORTH ZONE)**



**REPAIRING AND RENOVATION OF LATE SHREE AMRUTBHAI  
MAGANLAL PATEL PARTY PLOT AT T.P.S. NO.11 RAKHIYAL , F.P. NO.85/P  
IN SARASPUR-RAKHIYAL WARD, NORTH ZONE, AHMEDABAD**

**TENDER DOCUMENT**

***Volume -1***

**Part D - Technical Specification For CCTV Work**

**Client-**  
**Municipal Commissioner**  
Ahmedabad Municipal Corporation.  
Sardar Patel Bhavan, Danapith,  
Ahmedabad

**Technical Specification**  
**For**  
**Supply, Installation, Testing & Commissioning of**  
**Permanent CCTV Surveillance**

## 1. Special Condition

- CCTV OEM should have direct Manufacturing in India from last 05 years. (not as joint venture, partnership firms or through any association) and R&D unit registered with Department of Scientific and Industrial Research (DSIR) in India. OEM should submit Manufacturing and DSIR certificates.
- OEM should not be blacklisted or barred by any Ministry of Government of India or any of the Government / PSUs or any other government department at the time of bidding. The OEM should not have any common directors who are also on the board of blacklisted companies
- CCTV OEM should have ISO 9001, 14001, 20000, 27001, 45001,
- CCTV OEM Offer camera must have IoTSCS { IoT System certification scheme} certification (ER) Essential Requirement from 'standardization Testing & Quality certification (STQC). Certificate of same is attached
- All Camera , NVR have to be a same make.

## TECHNICAL REQUIREMENT

The manufacturers/OEM authorized Dealer/Contractor are advised to consider latest equipment and materials of “State of Art & Innovative Technologies”. The proposed location is situated at Amreli Airstrip, Gujarat.

Location of layout for proposed site should be attached with the document “**Supply, Installation, Testing and Commissioning with Three Years Comprehensive O&M**” for work, however all agencies are advised to visit the site and arrange to prepare required drawings.

The work also includes design & execution of required work for proper installations as per site requirement. The required system control room & source of electrical power to be considered as per site requirement.

**Technical Specification of Table Content (Bidder must be submitted technical details at the time of submission, deviation in data sheet are not acceptable):**

**SITC of 5 MP IR Varifocal Lens Bullet Camera**

Sr. No	Parameter	Minimum Specification Requirement	Compliance (Y/N)
	General		
1	Imaging Device	1/2.8" 5Megapixel progressive scan CMOS	
2	Maximum Resolution	5MP - 2592 x 1944	
3	ONVIF	Profile S, G, T and M	
4	Minimum Illumination (May vary depending on the lens)	Color : 0.005Lux @F/2.0 B/W : 0Lux @F/2.0(IR on)	
5	Lens	5 ~ 50 mm, MFZ, DC-Iris, F1.8	
6	IR Range	100m	
7	Day/Night Method	Auto ICR	
8	Signal-to-Noise Ratio	55 db minimum	
9	Electronic Shutter Range	Auto/Manual, 1/3 ~ 1/100,000s	
10	Dynamic Range	130 db minimum	
11	Back light compensation	HLC, WDR(130dB)	
12	Digital Noise Reduction	3D Noise Reduction	
13	Built-in Video Analytics	Motion Detection, Scene Change, Tamper Detection, Smart Motion, Smart Intrusion, Smart Loitering, Smart Line Crossing Detection, Unattended Object Detection, Missing Object Detection, People Counter, Queuing, Crowd Gathering, Heat Map, Face Detection, Audio Detection	
14	Defog	Required	
15	Image Stabilization	Electronic Stabilization	
16	G-Sensor	Required	
17	Event Type	Analytics alarm, Disk alarm, Recording alarm, Tampering, Alarm input	
18	Event Linkage	Email, SD card recording, SFTP recording, NAS recording, Digital output	
19	Security	Firmware encrypted & Signed, User account and password protection, HTTPS, IP Filter, Digest authentication, Device Certificate, TLS 1.2 & 1.3, Stream encryption, AES128/256, SSH/Telnet closed, Secure boot, Prevent brute-force attack, Audit User Access/System/Event log management	
20	Prohibited Protocols	Port 21 (FTP), Port 23 (Telnet), GB/T 28191, SSH. There should not be any provision to enable or disable these protocols in the default firmware from manufacturer. Any special firmware developed to disable these features will not be allowed.	

21	Privacy masking	5, definable areas	
22	Region of Interest	6, definable regions	
23	Local storage	Micro SD/SDHC/SDXC card slot (2TB), SD card encryption with AES-256	
24	Audio	Two-way, Full Duplex, Line in/out, Built-in Mic supporting G.711, H.726, AAC	
25	Alarm	1 In and 1 Relay out	
26	Max. User Access	10 users	
27	Network	RJ45 (10 Base-T/100 Base-TX)	
28	Environmental Protection	IP66, IP67	
29	Impact protection	IK10	
30	Gore Vent	Required	
31	Housing Material	Aluminum + Polycarbonate	
32	Input voltage	12 VDC/24 VAC, PoE (IEEE 802.3 af)	
33	Power Consumption	Max 11W	
34	Operating Temperature	-30°C to 60°C (IR OFF)	
35	Operating Humidity	less than 95% (non-condensing)	
36	Certifications/ Compliances	ONVIF: Profile S, G, T, M	
37	Cyber Security & Safety Certificates	Cyber Security: Secure by Default, PCI-DSS	
38		Reliability: IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-4, IEC 60068-2-11, IEC 60068-2-27, IEC 60068-2-64	
39		Safety: UL 62368-1, BIS IS-13252 (Part 1)/IEC 69050-1	
40		Emission: FCC PART 15, CE (EN 55032), ICES- 003	
41		Immunity: CE (EN 50130-4, EN 55035)	
42		Environment: RoHS, REACH, WEEE	
43		Cyber Security: BIS-ER/ STQC	
44		NDAA: Sec 889	
45	Approved Make:	Honeywell, Matrix, Bosch, pelco, cp-plus	

## 5 MP IP Fix Lens Bullet CAMERA

Sr. No	Parameter	Minimum Specification Requirement	Compliance
			(Y/N)
1	Type	IP Fixed Lens IR Rugged Bullet Camera	
2	Resolution (No of Pixels)	5 MP (2592 x 1944)	
3	Image sensor	1/2.8-inch CMOS, Progressive Scan	
4	Focal length	2.8mm, F1.4	
5	Lens	Fixed Lens	
6	Iris	DC-IRIS	
7	Removable IR-Cut Filter	Auto ICR	
8	Minimum illumination	Color: 0.005 Lux @F1.6 B/W: 0Lux (IR on)	
9	IR distance	Smart IR 40m, Day and Night mode switching based on IR sensor or schedule.	
10	Electronic Shutter	Auto/Manual, 1/100000s ~ 1/3s	
11	Wide Dynamic Range	130dB True WDR	
12	Back Light Compensation	Required	
13	High Light Compensation	Required	
14	Noise Reduction	2D-3D DNR	
15	Signal to Noise ratio	55 dB	
16	Video compression	H.265 HEVC, H.264, MJPEG, Smart Codec	
17	Angle of View	H:96.5° V:73.8°	
18	Protocols supported	Pv4, IPv6, TCP/IP, HTTP, HTTPS, RTSP/RTP/RTCP, IGMP/Multicast, SMTP, SNMP, DHCP, NTP, DNS, DDNS, CoS, QoS, 802.1X, UPnP, mDNS(Bonjour), UDP, ICMP, ARP, TLS, SFTP	
19	Number of Streams supported	Quad Video Streams @ H.265; Each stream independently configurable with different resolution and frame rate	
20	Stream Resolution	Main Stream: 5MP and lower resolutions Second Stream: 3MP and lower resolutions Third Stream: 720p and lower resolutions Fourth Stream: VGA and lower resolutions	
21	Frame rate	Main Stream: Max@50fps Second Stream: Max@50fps Third Stream: Max@50fps Fourth Stream: Max@50fps	

22	Features	Color, Brightness, Sharpness, Contrast, Automatic white balance, Gain control, Fine tuning of behavior at low light, Rotation, Character overlay and all other Image Settings in Web UI	
23	Built-in Video Analytics	Motion Detection, Scene Change, Tamper Detection, Smart Motion, Smart Intrusion, Smart Loitering, Smart Line Crossing Detection, Unattended Object Detection, Missing Object Detection, People Counter, Queuing, Crowd Gathering, Heat Map, Face Detection	
24	Defog	Required	
25	Image Stabilization	Electronic Stabilization	
27	Event Type	Analytics alarm, Disk alarm, Recording alarm, Tampering	
28	Event Linkage	Email, SD card recording, SFTP recording, NAS recording	
29	Security	Firmware encrypted & Signed, User account and password protection, HTTPS, IP Filter, Digest authentication, Device Certificate, TLS 1.2 & 1.3, Stream encryption, AES128/256, SSH/Telnet closed, Secure boot, Prevent brute-force attack, Audit User Access/System/Event log management	
30	Prohibited Protocols	Port 21 (FTP), Port 23 (Telnet), GB/T 28191, SSH. There should not be any provision to enable or disable these protocols in the default firmware from manufacturer. Any special firmware developed to disable these features will not be allowed.	
31	Privacy masking	5, definable areas	
32	Region of Interest	6, definable regions	
33	Local storage	Micro SD/SDHC/SDXC card slot (2TB), SD card encryption with AES-256	
34	Max. User Access	10 users	
35	Network	RJ45 (10 Base-T/100 Base-TX)	
36	Environmental Protection	IP66, IP67	
37	Impact protection	IK10	
38	Gore Vent	Required	
39	Housing Material	Aluminum + Polycarbonate	

40	Input voltage	12 VDC/24 VAC, PoE (IEEE 802.3 af)	
41	Power Consumption	Max 10W	
42	Operating Temperature	-30°C to 60°C (IR OFF)	
43	Operating Humidity	less than 95% (non-condensing)	
44	Certifications/ Compliances	ONVIF: Profile S, G, T, M	
		Cyber Security: Secure by Default, PCI-DSS	
		Reliability: IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-4, IEC 60068-2-11, IEC 60068-2-27, IEC 60068-2-64	
		Safety: UL 62368-1, BIS IS-13252 (Part 1)/IEC 69050-1	
		Emission: FCC PART 15, CE (EN 55032), ICES-003	
		Immunity: CE (EN 50130-4, EN 55035)	
		Environment: RoHS, REACH, WEEE	
		Regulatory Compliance: BIS-ER/ STQC	
45	Approved Make:	Honeywell, Matrix, Bosch, pelco, cp-plus	



## 5 MP IP Fix Lens DOME CAMERA

Sr. No	Parameter	Minimum Specification Requirement	Compliance
			(Y/N)
1	Type	IP Fixed Lens IR Rugged Dome Camera	
2	Resolution (No of Pixels)	5 MP (2592 x 1944)	
3	Image sensor	1/2.8-inch CMOS, Progressive Scan	
4	Focal length	2.8mm, F1.4	
5	Lens	Fixed Lens	
6	Iris	DC-IRIS	
7	Removable IR-Cut Filter	Auto ICR	
8	Minimum illumination	Color: 0.005 Lux @F1.6 B/W: 0Lux (IR on)	
9	IR distance	Smart IR 40m, Day and Night mode switching based on IR sensor or schedule.	
10	Electronic Shutter	Auto/Manual, 1/100000s ~ 1/3s	
11	Wide Dynamic Range	130dB True WDR	
12	Back Light Compensation	Required	
13	High Light Compensation	Required	
14	Noise Reduction	2D-3D DNR	
15	Signal to Noise ratio	55 dB	
16	Video compression	H.265 HEVC, H.264, MJPEG, Smart Codec	
17	Angle of View	H:96.5° V:73.8°	
18	Protocols supported	Pv4, IPv6, TCP/IP, HTTP, HTTPS, RTSP/RTP/RTCP, IGMP/Multicast, SMTP, SNMP, DHCP, NTP, DNS, DDNS, CoS, QoS, 802.1X, UPnP, mDNS(Bonjour), UDP, ICMP, ARP, TLS, SFTP	
19	Number of Streams supported	Quad Video Streams @ H.265; Each stream independently configurable with different resolution and frame rate	
20	Stream Resolution	Main Stream: 5MP and lower resolutions Second Stream: 3MP and lower resolutions Third Stream: 720p and lower resolutions Fourth Stream: VGA and lower resolutions	
21	Frame rate	Main Stream: Max@50fps Second Stream: Max@50fps Third Stream: Max@50fps Fourth Stream: Max@50fps	

22	Features	Color, Brightness, Sharpness, Contrast, Automatic white balance, Gain control, Fine tuning of behavior at low light, Rotation, Character overlay and all other Image Settings in Web UI	
23	Built-in Video Analytics	Motion Detection, Scene Change, Tamper Detection, Smart Motion, Smart Intrusion, Smart Loitering, Smart Line Crossing Detection, Unattended Object Detection, Missing Object Detection, People Counter, Queuing, Crowd Gathering, Heat Map, Face Detection	
24	Defog	Required	
25	Image Stabilization	Electronic Stabilization	
26	G-Sensor	Required	
27	Event Type	Analytics alarm, Disk alarm, Recording alarm, Tampering	
28	Event Linkage	Email, SD card recording, SFTP recording, NAS recording	
29	Security	Firmware encrypted & Signed, User account and password protection, HTTPS, IP Filter, Digest authentication, Device Certificate, TLS 1.2 & 1.3, Stream encryption, AES128/256, SSH/Telnet closed, Secure boot, Prevent brute-force attack, Audit User Access/System/Event log management	
30	Prohibited Protocols	Port 21 (FTP), Port 23 (Telnet), GB/T 28191, SSH. There should not be any provision to enable or disable these protocols in the default firmware from manufacturer. Any special firmware developed to disable these features will not be allowed.	
31	Privacy masking	5, definable areas	
32	Region of Interest	6, definable regions	
33	Local storage	Micro SD/SDHC/SDXC card slot (2TB), SD card encryption with AES-256	
34	Max. User Access	10 users	
35	Network	RJ45 (10 Base-T/100 Base-TX)	
36	Environmental Protection	IP66, IP67	
37	Impact protection	IK10	
38	Gore Vent	Required	

39	Housing Material	Aluminum + Polycarbonate	
40	Input voltage	12 VDC/24 VAC, PoE (IEEE 802.3 af)	
41	Power Consumption	Max 10W	
42	Operating Temperature	-30°C to 60°C (IR OFF)	
43	Operating Humidity	less than 95% (non-condensing)	
44	Certifications/ Compliances	ONVIF: Profile S, G, T, M	
		Cyber Security: Secure by Default, PCI-DSS	
		Reliability: IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-4, IEC 60068-2-11, IEC 60068-2-27, IEC 60068-2-64	
		Safety: UL 62368-1, BIS IS-13252 (Part 1)/IEC 69050-1	
		Emission: FCC PART 15, CE (EN 55032), ICES-003	
		Immunity: CE (EN 50130-4, EN 55035)	
		Environment: RoHS, REACH, WEEE	
		Regulatory Compliance: BIS-ER/ STQC	
		NDAA: Sec 889	
45	Approved Make:	Honeywell, Matrix, Bosch, pelco, cp-plus	

#### 1. 4 MP 40X IP PTZ CAMERA

Sr.No	Parameter	Minimum Specification Requirement	Compliance (Y/N)
1	Type	40X Outdoor IR Network Speed Dome Camera	
2	Resolution (No of Pixels)	4 MP (2592 x 1520)	
3	RAM	1 GB	
4	Flash	512 MB	
5	Image sensor	1/1.8-inch CMOS Progressive Scan	
6	Focal length	5~200mm (+/- 10% on each side) (40x) Autofocus MFZ lens	
77	Iris	P-IRIS	
8	Removable IR-Cut Filter	Auto ICR	
9	Minimum illumination	Color: 0.005 Lux @F1.6; B/W: 0Lux @F1.6 (IR On)	
10	IR Illumination	Internal or External	
11	IR Illumination Range	450 mtr distance from Camera to object	
12	Electronic Shutter	1/30000 ~ 1/1	
13	Back Light Compensation (BLC)	Required	
14	High Light Compensation (HLC)	Required	

15	Noise Reduction	3D DNR	
16	Wide Dynamic Range (WDR)	140 dB True WDR	
17	Signal to Noise ratio	55dB	
18	Video compression	H.265 HEVC, H.264, MJPEG, Smart Codec	
19	Protocols supported	IPv4, IPv6, TCP/IP, HTTP, HTTPS, UPnP, RTSP/RTP/RTCP, IGMP, SMTP, DHCP, NTP, DNS, DDNS, QoS, SNMP, 802.1X, UDP, ICMP, ARP, TLS	
20	Number of Streams supported	Primary, secondary, and tertiary video streams; Each stream independently configurable with different resolution and frame rate @ H.265	
21	Stream Resolution	Primary: 2592 x 1520/1920 x 1080/1280 x 720; Secondary: 1920 x 1080/704 x 576/640 x 480/352 x 288 Tertiary: 640 x 480/352 x 288/320 x 240	
22	Frame rate	25 fps for all resolutions; 50 fps @ 1080p (Primary Stream)	
23	Features	Automatic white balance, Automatic Gain control, 3D Noise reduction	
24	Built-in Video Analytics	Smart motion, Scene Change, Intrusion, Multi loitering, People counter, Face detection, Line crossing detection, Unattended object detection, Missing object detection, Audio detection	
25	Event Type	Analytics alarm, Security alarm, Disk alarm, Recording alarm	
26	Event Linkage	Email, Push notification, SD card recording, Digital output	
27		User account and password protection, IP Filter, Digest authentication, HTTPS, TLS 1.2, Stream encryption, AES-128/256, Secure boot and Secure authentication, Signed and Encrypted firmware	
28	Encryption	Hardware based Chipset Built-in	
29	Prohibited Protocols	Port 21 (FTP), Port 23 (Telnet), GB/T 28191, SSH. There should not be any provision to enable or disable these protocols in the default firmware from manufacturer. Any special firmware developed to disable these features will not be allowed.	
30	Defog	On/Off	
31	Image Stabilization	Digital	
32	Privacy masking	4, Programmable	
33	Region of Interest	4, Programmable	

34	Pan Range	360° endless	
35	Tilt Range	-10° to 90° ; Auto flip 180°	
36	Pan Speed	High Speed and quick response rotation up-to 300°/sec	
37	Tilt Speed	High Speed and quick response Tilt up-to 300°/sec	
38	Presets	400	
39	Auto Pan Mode	Required	
40	Auto Tracking	Required	
41	Tour	4 nos.	
42	Patrol	4 nos.	
43	Auto Resume after power failure	Required	
44	Local storage	Micro SD / SDHC / SDXC card slot (up to 1 TB), SD card Encryption	
45	Ethernet	10 Base-T / 100 Base-TX Ethernet (RJ-45)	
46	Audio	Two-way (Line IN/OUT) supporting G.711	
47	Alarm	7 In and 2 Relay out	
48	Environment	IP67 rated outdoor protection	
49	Impact Protection	IK10 rated vandal protection	
50	Heater / Fan	Yes	
51	Input voltage	AC24V, PoE++ (802.3 BT)	
52	Power Consumption	Max 45 W	
53	Operating Temperature	-40°C to 70°C	
54	Operating Humidity	less than 90% (non-condensing)	
55	Certifications/Compliances	ONVIF: Profile S, G, T, M	
		Cyber Security: PCI-DSS compliant, Secure by Default	
		Safety: UL 62368-1	
		Emission: FCC PART 15B, EN 55032	
		Immunity: CE (EN 50130-4)	
		RoHS: CE (EN 63000)	
		Cyber Security: BIS-ER/ STQC	
		NDAA: Sec 889	
56	Approved Make:	Honeywell, Matrix, Bosch, pelco, cp-plus	

## I. 16 Channel NETWORK VIDEO RECORDER

Sr.No.	Parameter	Required Minimum Specifications	Compliance Yes/No
1	IP video input	16 Channels HD, Linux Embedded Operating Systems	
2	Network Port	1 Port -Dual Gigabyte for Load Balancing	
3	Display interface	INTERFACE 2 HDMI (1 HDMI up to 3840 × 2160); 1 VGA	
4	Display Resolution	3840 × 2160; 1920 × 1080; 1280 × 1024; 1280 × 720; 1024 × 768	
5	Recording Compression	H.265/H.264/MJPEG/MPEG4	
6	Recording Resolution	12 MP (4000 × 3000); 8 MP (3840 × 2160); 6 MP (3072 × 2048); 5 MP (2560 × 1920); 4 MP (2560 × 1440); 3 MP (2048 × 1520); 1080p (1920 × 1080); 720p (1280 × 720); D1 (704 × 576 / 704 × 480); CIF (352 × 288 / 352 × 240)	
7	Motion Detection	Required	
8	Synchronous playback	Minimum 4 channels	
9	Hard disk	Minimum 2 Slot Required-Each Slot should take Minimum 10TB	
10	eSATA	1 eSATA interface	
11	Capacity	2HDD Slot, Each Slot 10TB capacity	
12	Network Protocols	HTTP, TCP/IP, IPv4/IPv6, UPnP, RTSP, UDP, SMTP, NTP, DHCP, DNS, IP Filter, PPPoE, DDNS, FTP, Alarm Server, IP Search, P2P	
13	USB	4 (2 rear USB3.0; 2 front USB2.0)	
14	Alarm in	8	
15	Alarm out	1	
16	Power supply	Single, 100~240 VAC, 50/60 Hz	
17	Consumption	NVRs: 17.5 W max (without HDD) PoE: 25.5 W for a single port (150 W total)	
18	Working Temperature	-10 °C ~+55 °C	
19	Working humidity	10%~90%	
20	IPC	Third party ONVIF IP camera supported	
21	Certifications	CE, FCC, UL/EN	
22	Approved Makes	Honeywell, Matrix, Bosch, pelco, cp-plus	

### **32 Channel NETWORK VIDEO RECORDER**

<b>Sr.No.</b>	<b>Parameter</b>	<b>Required Minimum Specifications</b>	<b>Compliance Yes/No</b>
1	IP video input	32 Channels HD, Linux Embedded Operating Systems	
2	Network Port	1 Port -Dual Gigabyte for Load Balancing	
3	Display interface	INTERFACE 2 HDMI (1 HDMI up to 3840 × 2160); 1 VGA	
4	Display Resolution	3840 × 2160; 1920 × 1080; 1280 × 1024; 1280 × 720; 1024 × 768	
5	Recording Compression	H.265/H.264/MJPEG/MPEG4	
6	Recording Resolution	12 MP (4000 × 3000); 8 MP (3840 × 2160); 6 MP (3072 × 2048); 5 MP (2560 × 1920); 4 MP (2560 × 1440); 3 MP (2048 × 1520); 1080p (1920 × 1080); 720p (1280 × 720); D1 (704 × 576 / 704 × 480); CIF (352 × 288 / 352 × 240)	
7	Motion Detection	Required	
8	Synchronous playback	Minimum 4 channels	
9	Hard disk	Minimum 4 Slot Required-Each Slot should take Minimum 10TB	
10	eSATA	1 eSATA interface	
11	Capacity	4 HDD Slot, Each Slot 10TB capacity	
12	Network Protocols	HTTP, TCP/IP, IPv4/IPv6, UPnP, RTSP, UDP, SMTP, NTP, DHCP, DNS, IP Filter, PPPoE, DDNS, FTP, Alarm Server, IP Search, P2P	
13	USB	4 (2 rear USB3.0; 2 front USB2.0)	
14	Alarm in	8	
15	Alarm out	1	
16	Power supply	Single, 100~240 VAC, 50/60 Hz	
17	Consumption	NVRs: 17.5 W max (without HDD) PoE: 25.5 W for a single port (150 W total)	
18	Working Temperature	-10 °C ~+55 °C	
19	Working humidity	10%~90%	
20	IPC	Third party ONVIF IP camera supported	
21	Certifications	CE, FCC, UL/EN	
22	Approved Makes	Honeywell, Matrix, Bosch, pelco, cp-plus	

**SITC of 55" 4K resolution commercial Display**

Sr.NO.	Parameter	Minimum Specifications	Compliance (Y/N)
1	Screen Size	139.7 cm	
2	Panel Type	IPS Panel / D-LED	
3	Color Gamut (CIE1931)	DCI-P3 95%	
4	Color Depth (Number of Colors)	10bit (8bit + A-FRC)	
5	Pixel Pitch (mm)	0.181 [mm] x 0.181 [mm]	
6	Response Time	6ms (G to G)	
7	Refresh Rate	60Hz	
8	Aspect Ratio	16:9	
9	Resolution	3840 x 2160	
10	Brightness	400cd/m <sup>2</sup>	
11	Contrast Ratio	3000:1	
12	Viewing Angle	1784/178°	
13	Surface Treatment	Anti glare, 3H	
14	HDMI	Yes x2 (ver 2.0) with HDCP 2.2	
15	Display Port	Yes x1 (ver 1.2) with HDCP 2.2	
16	PC In	Mini D Sub 15Pin	
17	Input Power	100~240 V, 50/60 Hz	
18	Power Consumption	140W	
19	PC Audio In	M3	
20	Speaker	Built in 20W	
21	DC Off (Max.)	0.3W	
22	Make	LG, SAMSUNG, PANASONIC	



**SITC of 24Port Switch, with 4 SFP Module ( 1G/10G Up link)**

Sr. No.	Technical Specification	Compliance (Y / N)
1	<b>Physical Specification:</b>	
2	The LAN switch shall be rack mountable with 24 Nos. 10/100/1000 Base-T ports with 4 Nos. SFP+ Ports	
3	<b>General Specification:</b>	
4	The LAN switch shall be available with minimum 128 Gbps Gbps Switching Fabric.	
5	The LAN switch shall have minimum packet forwarding rate of 95.23 Mpps million packets per second at 64 byte packet length.	
6	The LAN switch shall support minimum 16K MAC addresses.	
7	There shall be 512 IGMP groups.	
8	The switch shall be able to work on both IPv4 and IPv6 (dual stack) from day one.	
9	The Lab Switch must have 24× 802.3at/af-compliant PoE+ ports with a total power supply of 384 W*.	
10	All ports in the switch shall operate at wire-speed / line-rate.	
11	The switch shall be capable of working with AC Power Supply with a voltage varying from 170-240Volts at 50 +/-2 Hz.	
12	The switch shall support 19 inch rack mounting.	
13	<b>Layer - 2 Features:</b>	
14	The LAN switch shall support IEEE 802.1Q VLAN encapsulation. Maximum 4K VLAN Groups.	
15	It shall support for Automatic Negotiation of Trunking Protocol, to help minimize the configuration & errors.	
16	It shall support 802.1d, 802.1p, 802.1Q, 802.1s, 802.1w, 802.1x, 802.1ab,802.3ad.	
17	It shall support spanning-tree root guard or any other industry standard protocol to prevent other edge switches becoming the root bridge.	
18	It shall support IGMP snooping v1, v2 and v3.	
19	It shall support Link Aggregation Protocol (LACP).	
20	It shall Support 802.3ah Ethernet Link OAM for Detection of Unidirectional links and to disable them to avoid problems such as spanning tree loops	
21	It shall be able to discover the neighboring device of the same vendor giving the details about the platform, IP Address, Link connected through etc, thus helping in troubleshooting connectivity problems.	
22	It shall support for Switch port auto recovery (err disable) to automatically re- enable a link that is disabled because of a network error.	
23	It shall support Multicast VLAN registration.	

24	It shall support LLDP / LLDP-MED including client location information. It shall exchange link and device information in multi vendor networks.	
25	It shall support configuration rollback to replace current configuration with any saved configuration file.	
26	It shall support configurable maximum transmission unit (MTU) of up to 9000 bytes, with a maximum Ethernet frame size of 9018 bytes (Jumbo frames) for bridging on Gigabit Ethernet ports.	
27	It shall support auto sensing speed on 10/100/1000 ports, auto negotiating half/full-duplex on all ports and Auto-MDIX.	
28	<b>QoS Features:</b>	
29	The LAN switch shall have per-port broadcast, multicast, and unicast storm control.	
30	It shall have standard 802.1p CoS and DSCP classification using marking and reclassification on a per-packet basis by source and destination IP address, source and destination MAC address, or Layer 4 TCP or UDP port number.	
31	There shall be eight egress queues per port to enable differentiated management of up to eight traffic types.	
32	There shall be weighted round robbin (WRR) or any other industry standard protocol to provide congestion avoidance.	
33	There shall be strict priority queuing mechanisms.	
34	Granular Rate Limiting functions to guarantee bandwidth in increments shall be as low as 64 Kbps.	
35	Rate limiting support based on source and destination IP address, source and destination MAC address, Layer 4 TCP and UDP information, or any combination of these fields, using QoS ACLs (IP ACLs (IPv4 and IPv6) or MAC ACLs), class maps, and policy maps shall be available. ACL should be based on user defined packet content (Max. 6bytes length user defined).	
36	There shall be support for Asynchronous data flows upstream and downstream from the end station or on the uplink using ingress policing and egress shaping.	
37	There shall be support for Automatic Quality of Service for easy configuration of QoS features for critical applications.	
38	<b>Network Security Features:</b>	
39	The LAN switch shall support IEEE 802.1x to allow dynamic, port-based security, providing user authentication.	
40	The LAN switch shall support for Admission Control features to improve the network's ability to automatically identify, prevent, and respond to security threats and also to enable the switches to collaborate with third-party solutions for security-policy compliance and enforcement before a host is permitted to access the network.	

41	It shall support port-based ACLs (PACLs) for Layer 2 interfaces to allow application of security policies on individual switch ports. It shall also support VLAN based filters.	
42	It shall support unicast MAC filtering to prevent the forwarding of any type of packet with a matching MAC address. It shall support Unicast and Multicast MAC addresses and associated VLANs.	
43	It shall support unknown unicast and multicast port blocking to allow tight control by filtering packets that the switch has not already learned how to forward.	
44	It shall support IGMP filtering which shall provide multicast authentication by filtering out no subscribers and limits the number of concurrent multicast streams available per port.	
45	It shall support for SSHv2, SNMPv3 to provide network security by encrypting administrator traffic during Telnet and SNMP sessions.	
46	The switch shall support 2 session of Port Mirroring based on port basis / VLAN basis to support intrusion prevention system deployment in different VLANs. It shall support bidirectional data on mirror port which allows IDS to take action when an intruder is detected.	
47	It shall support RADIUS authentication to enable centralized control of the switch and restrict unauthorized users from altering the configuration.	
48	It shall support MAC address notification to allow administrators to be notified of users added to or removed from the network / It shall support SNMP Trap for new MAC notification.	
49	It shall support DHCP snooping to allow administrators to ensure consistent mapping of IP to MAC addresses. This can be used to prevent attacks that attempt to poison the DHCP binding database, and to rate limit the amount of DHCP traffic that enters a switch port.	
50	It shall support DHCP Interface Tracker (Option 82) to augment a host IP address request with the switch port ID.	
51	It shall support port security to secure the access to an access or trunk port based on MAC address. After a specific timeframe, the aging feature should remove the MAC address from the switch to allow another device to connect to the same port.	
52	It shall support multilevel security on console access to prevent unauthorized users from altering the switch configuration.	
53	It shall support BPDU Guard feature, to shut down Spanning Tree Protocol Port Fast-enabled interfaces when BPDUs are	

	received to avoid accidental topology loops.	
54	It shall support Spanning-Tree Root Guard (STRG) to prevent edge devices not in the network administrator's control from becoming Spanning Tree Protocol root nodes.	
55	It shall support for up to 512 access control entries (ACEs).	
56	<b>Management:</b>	
57	The LAN switch shall have CLI support to provide a common user interface and command set with all routers and switches of the same vendor.	
58	It shall have Remote Monitoring (RMON v1 and v2) software agent to support for enhanced traffic management, monitoring, and analysis.	
59	It shall have support for RMON groups through the use of a mirrored port, which permits traffic monitoring of a single port, a group of ports, or the entire switch from a single network analyzer or RMON probe.	
60	It shall have layer 2 trace route to ease troubleshooting by identifying the physical path that a packet takes from source to destination or it shall support OAM 802.3ah.	
61	It shall support Trivial File Transfer Protocol (TFTP) and File Transfer Protocol (FTP) to reduce the cost of administering software upgrades by downloading from a centralized location.	
62	It shall support Simple Network Time Protocol/Network Timing Protocol (SNTP/NTP) to provide an accurate and consistent timestamp to all intranet switches.	
63	It shall support RMON v1 and v2 standards.	
64	It shall support SNMPv1, SNMPv2, and SNMPv3 and Telnet interface to deliver comprehensive in-band management, and a CLI-based management console to provide detailed out-of-band management.	
65	It shall support IPV6 management. ACL and QoS and IPv6 Neighbor Discovery.	
66	It Shall Support SDN Platform and have Provision to be Work Standalone or Controller Based and support Zero-Touch Provisioning (ZTP	
67	Device OEM must be must be ISO 9001, 14001 & 27001 Certified at the time of bidding	
68	Proposed Product must be Made in India	
69	Approved Make: TPLink, D-Link, Netgear, Cisco, Zyxel	

# SITC of 8+2G-port Gigabit PoE managed Ethernet switches with

Sr. no	Specification	Compliance Y/N
1	Device should support IEEE 802.3i:10BASE-T Ethernet IEEE 802.3u:100BASE-X Fast Ethernet IEEE 802.3ab:1000BASE-T Gigabit Ethernet IEEE 802.3z: 1000BASE-X Gigabit Ethernet (Optical fiber) IEEE 802.3x: Flow Control IEEE 802.1p: Traffic Class Expediting and Dynamic Multicast Filtering IEEE 802.1q: Virtual Bridged Local Area Networks	
2	Device must have atleast 2× 10/100/1000 Mbps PoE++ RJ45 Ports 6× 10/100/1000 Mbps PoE+ RJ45 Ports 2× Gigabit SFP/RJ45 Combo Ports	
3	Device should support auto negotiation/auto MDI/MDIX	
4	Device must Support 802.3 af/at/bt with POE Budget up to 240W	
5	Device must Support IP40 with DIN-rail mounting / Wall mounting and must have Fanless Design	
6	Device should have Switching Capacity of 20 Gbps	
7	Device must Support Input Voltage of range from 12-57V DC	
8	Device should have mac address table of 8K or more	
9	Device should support jumbo frame of 15KB	
10	Device should Support QOS features like Port-based, 802.1p and DSCP priority	
11	Device should Support QOS features like 8 priority queues	
12	Device should Support QOS features Queue scheduling: SP, WRR, SP+WRR	
13	Device should Support QOS features Port/Flow- based Rate Limiting	
14	Device should Support Layer 2 features like IGMP Snooping V1/V2/V3	
15	Device should Support 802.3ad LACP and Up to 4 aggregation groups containing 2 ports per group	
16	Device should Support Spanning Tree features like STP/RSTP/MSTP	
17	Device should Support BPDU Filtering/Guard and TC/Root Protech	
18	Device should Support Loop back detection and 802.3x Flow Control	
19	Device should Supports 4K VLAN IDs	
20	Device should Supports up to 32 simultaneously of 4K VLAN IDs	

21	Device should support features like Broadcast/Multicast/Unknown unicast Storm Control	
22	Device should support Web-based GUI and CLI management	
23	Device should support CPU Monitoring and Port Mirroring	
24	Devcie should certified by FCC, CE and RoHS	
25	Device OEM must be must be ISO 9001 & 14001 Certified at the time of bidding	
26	Device Must support IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 4 kV; Signal: 6 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF: 100 A/m EN 55032/35 EN61000-6-2 EN61000-6-4	
27	Device must Support Shock IEC 60068-2-27 , Freefall IEC 60068-2-32 ,Vibration IEC 60068-2-6	
28	Device OEM must be Gartner Magic Quadrant for Enterprise Wired and Wireless LAN Infrastructure in Last 6 Quarter	
29	Approved Make: TPLink, D-Link, Netgear, Cisco, Zyxel	

**SITC of CAT 6 Twisted Pair Armored Cable**

S.No	Parameter	Minimum Technical Specification	Compliance (Y/N)
Construction			
1	Conductor	Solid Bare Electrolytic Grade Copper	
2	Nominal Conductor Diameter	23 AWG	
3	Insulation	Polyethylene	
4	Rip Cord	Yes	
5	Inner Jacket	PVC - GREY	
6	Thickness of Inner Jacket	0.65 to 0.70mm	
7	Armoring	Aluminium Wire	
8	Size of Wire	0.80mm	
9	Sequential Marking:	At Every Meter	
10	Temperature Rating	-20° to + 60°c	
11	Outer Jacket	FR PVC - Black	
12	Thickness of Outer Jacket	0.85mm (Nom.)	
13	Colour of Jacket	Black	
14	Approximate OD	9.50 mm	
15	Filler	HDPE	
16	Operational bandwidth	250 MHz	
17	Supported channel performance	Up to 70 Mtr	
Electrical properties			
18	Conductor Resistance (DC)	93.5 ohm /1000 mtr @20°c Max	
19	Resistance Unbalance	5% Max	
20	Mutual Capacitance	5.6 nf/100 mtr Max	
21	Capacitance Unbalance Pair/Ground	330PF/100M Max	
22	Propagation Delay Skew	536 nS/100M	
23	Worst Case cable skew	45ns/100m	
24	NVP	69%	
25	Impedance	100±15% ohm	
26	TIA/EIA-568-C compliant	Yes	
27	Make	D-link, AMP, Tyco	

**SITC of Optical Fiber Cable Armored 6 Core SM**

S.No	Parameter	Minimum Technical Specification	Compliance (Y/N)
1	Core	6 SM	
2	Operating Temperature	-20°C to +60°C	
3	Storage Temperature	-40°C to +60°C	
4	Jacket Material	HDPE/LSZH	
5	Fiber Count	6	
6	Outer Diameter(mm)	7.2±0.5	
7	Thickness of Jacket(mm)	1.8±0.2	
8	Nominal cable weight(kg/km)	55/70	
9	Pulling Tension	1000N	
10	Crush Load(N/100mm)	2000	
11	Bend Radius(mm)	200	
12	Other Important Parameter	Central Loose tube with jelly compound	
		waterproof and moisture resistance	
		crush resistance performance, light weight, compact structure	
		High quality Electro Chromium Coated	
		Corrugated Steel tape (ECCS)	
		Armoured design with Music Quality Steel wire	
		HDPE/ LSZH Sheath	
13	Make	D-Link, AMPS, TYCO	

**SITC of IP55 Outdoor Junction Box**

S. No	Parameter	Minimum Technical Specification	Compliance (Y/N)
1	Outdoor cabinet Size Width X Depth Hight	600W/600D/ 6U/9U/ 12 U /15U	
2	Material	CRCA (IS 513 Grade)	



3	Type	single skin welded rigid with vandal proof construction	
4	Front Door	steel door with three-point lock with swing handle. & Pad lock Air inlet provision with external IP Hood & washable filter arrangement shall be provided on the door.	
5	Side & rear panels	Fixed & non-removable	
6	Mounting Option	Floor, Pole /wall mount	
7	Roof Canopy	Yes	
8	Accessories	2X 90 cfm 230 VAC fans 1U PDU Horizontal Power distribution unit with 6 nos. of 5 Amp sockets with 16 Amp MCB & 3. Mtr main cord Two pairs of with 19" angles with "U" marking	
9	IP Ratings	IP55 standards	
10	Finishing	Enclosures shall be provided powder coating 7 tank pretreatment with "Nano Ceramic process" for longer life. Powder coating minimum 60 to 80Microns	
11	Rack Standards	DIN 41494	
12	Certifications	ISO 9001-2000, ISO 14001-20015 ISO 19001, ISO 18000 Certified by 3rd Party lab CPRI ROHS compliant (Restriction of Hazardous Substances).Raw material Certificate	
13	Make	Alpine, Wallrack, President	

#### **SITC of 1 KVA Online UPS**

S. No.	Parameter	Minimum Technical Specification	Compliance (Y/N)
1	Nominal Input Voltage	230 V	
2	Input Frequency	40-70 Hz	
3	Input Voltage	100-285 V Output de-rated < 160 V ... 50% capacity at 100V	

4	Input Power Factor	0.98	
5	Input Protection	Circuit Breaker	
6	Output Power Capacity	800 W	
7	Nominal Output Voltage	230 V	
8	Other Programmable Voltages	220 V / 240 V	
9	Efficiency at Full Load (Double-Conversion, AC-AC)	> 93%	
10	Efficiency at Full Load (Green mode)	97%	
11	Waveform	Sine wave	
12	Bypass Type	Internal Bypass (automatic & manual), Self-powered	
13	Bypass Input Voltage Range	160 V – 270V	
14	Supported Battery Types	SMF / Flooded (selectable)	
15	Battery Bank Voltage	36 V nominal	
16	Charger Power / Current	1.5 A max (Auto adjusting per battery Ah selected)	
17	Operating Temp	0 – 50C (Output de-rated above 40C)	
18	Storage Temp	-15C to 60C	
19	Operating Elevation	1000m without de-rating	
20	Humidity	0 to 95% RH, non-condensing	
21	Make	APC, Emerson or Equivalent (Approved by Consultant)	

#### **SITC of 2 KVA Online UPS**

S. No.	Parameter	Minimum Technical Specification	Compliance (Y/N)
1	Nominal Input Voltage	230 V	
2	Input Frequency	40-70 Hz	
3	Input Voltage	100-285 V Output de-rated < 160 V ... 50% capacity at 100V	
4	Input Power Factor	0.98	
5	Input Protection	Circuit Breaker	
6	Output Power Capacity	1600 W	
7	Nominal Output Voltage	230 V	

8	Other Programmable Voltages	220 V / 240 V	
9	Efficiency at Full Load (Double-Conversion, AC-AC)	> 93%	
10	Efficiency at Full Load (Green mode)	97%	
11	Waveform	Sine wave	
12	Bypass Type	Internal Bypass (automatic & manual), Self-powered ( )	
13	Bypass Input Voltage Range	160 V – 270V	
14	Supported Battery Types	SMF / Flooded (selectable)	
15	Battery Bank Voltage	48 V nominal	
16	Charger Power / Current	2 A max (Auto adjusting per battery Ah selected)	
17	Operating Temp	0 – 50C (Output de-rated above 40C)	
18	Storage Temp	-15C to 60C	
19	Operating Elevation	1000m without de-rating	
20	Humidity	0 to 95% RH, non-condensing	
21	Make	APC, Emerson or Equivalent (Approved by Consultant)	

NOTE: I HAVE ALSO GONE THROUGH TECHNICAL SPECIFICATIONS FOR THE ITEMS AND UNIT (AS PER STANDARD P.W.D. TECHNICAL SPECIFICATION FOR THE ITEMS & UNIT AND ALSO I HAVE THE BOOK OF THE SAME) AND AGREE TO ABIDE BY THEM. IN CASE OF WHERE THERE IS NO TECHNICAL SPECIFICATION FOR THE ANY ITEMS AVAILABLE, SPECIFICATION GIVEN BY THE ENGINEER-IN –CHARGE / MANUFACTURER’S STANDARD SPECIFICATION SHALL BE FOLLOWED AND FOR THE SAME I AGREE TO ABIDE BY THEM.

**Seal and Signature of the Bidder**