

TECHNICAL SPECIFICATIONS-(PRT-II)

PRINCIPAL TECHNICAL PARAMETERS for Supply, Installation & commissioning of CCTV camera surveillance system at various 66 KV to 400 KV class Substation of GETCO.

Sr. No.	Item Description	Specifications	TECHNICAL SPECIFICATIONS
1	IP Bullet Camera 2 MP	Image Sensor:	1/2.8" 2 Megapixel progressive scan CMOS
		Min. Illumination:	Color:0.08 Lux; B/W:0 Lux 0 Lux with IR illumination ON or Better
		Lens:	Fixed F 1.2 or Better
		Day& Night:	Auto
		Wide Dynamic Range:	90dB or batter
		Digital noise reduction:	Supported
		IR Range:	Min. 50 meters
		Compression Standard	
		Video Compression:	H.265 or better
		Image	
		Image Resolution:	1920 x 1080
		Frame Rate:	25 to 30 fps
		Network	
		Protocols:	TCP/IP, ICMP, HTTP, HTTPS, FTP, DHCP, DNS, DDNS, RTP, RTSP, RTCP, PPPoE, NTP, UPnP, SMTP,SNMP, IGMP, 802.1X, QoS, IPv6, Bonjour
		Time synchronization	Auto Time synchronization of camera with NVR
		System Compatibility:	ONVIF support
		Interface	
		Communication Interface:	1 RJ45 10M / 100M Ethernet interface
		Built in memory card slot	Built-in memory card slot, support Micro SD/SDHC/SDXC, Min 128 GB
		General	
		Operating Conditions:	0 °C ~ 60 °C, less than 95 % RH
		Power Supply:	DC12V,PoE (802.3af) / (802.3at)
		Weather Proof:	IP66
		Make	Axis: Axis Communications AB. Pelco: Pelco, Inc. Honeywell: Honeywell International Inc. Bosch : Bosch Limited Matrix Comsec: MATRIX COMSEC PVT. LTD BEL : Bharat Electronics Limited American Dynamics : Tyco Security Products Vicon: Vicon Industries Inc. Sony : Sony India Pvt. Ltd.
		Certificate	Either Bureau of Indian Standards (BIS) OR UL certificate.
		Warranty	Three years

2	PTZ Camera 2 MP		
		Image Sensor:	1/2.8" 2 megapixel progressive scan CMOS
		Minimum Illumination:	Color: 0.3 Lux; B/W: 0.01Lux 0 Lux with IR illumination ON or Better
		White Balance:	Auto, Manual
		AGC:	Auto, Manual
		WDR (Wide Dynamic Range):	90 dB or better
		Shutter Time:	1/1 s to 1/15,000 s or better
		Day& Night:	Supported
		Digital Zoom:	16x or better
		Noise Reduction	Supported
		Focus mode:	Auto, Manual
		Lens	
		Focal Length:	4.3 mm to 129 mm or better
		Minimum Working Distance:	10 mm to 1500 mm (wide-tele)
		Aperture Range:	F1.2 to F5.0
		Pan & Tilt	
		Pan Range:	360° endless
		Tilt Range:	From 0° to 90°
		Number of Preset:	250
		Pattern:	Min-4
		Infrared	
		IR irradiation distance:	Min 150 m
		Network	
		System Compatibility	ONVIF support
		Image Resolution:	1920 × 1080
		Main Stream:	25 to 30 fps
		Image Compression:	H.265 or batter
		Communication Interface:	1 RJ45 10M / 100M Ethernet interface
		Protocols:	IPv4/IPv6, HTTP, HTTPS, FTP, SMTP, UPnP, SNMP, DNS, DDNS, NTP, RTSP, RTP, TCP/IP, UDP, IGMP, ICMP, DHCP, PPPoE, Bonjour, 802.1x
		Time synchronization	Auto Time synchronization of camera with NVR
		Storage:	Built-in memory card slot, support Micro SD/SDHC/SDXC, Min 128 GB
		Security Measures:	User authentication & Password protection supported HTTPS, 802.1x network authentication
		General	
		Power Supply:	24 VAC & PoE+
		Operating temperature/Humidity:	0 °C ~ to 60 °C, less than 90 % RH
		Protection Level:	IP66

		Make	Axis: Axis Communications AB. Pelco: Pelco, Inc. Honeywell: Honeywell International Inc. Bosch : Bosch Limited Matrix Comsec: MATRIX COMSEC PVT. LTD BEL : Bharat Electronics Limited American Dynamics : Tyco Security Products Vicon: Vicon Industries Inc. Sony : Sony India Pvt. Ltd.
		Certificate	Either Bureau of Indian Standards (BIS) OR UL certificate.
		Warranty	Three years
3	Network Video Recorder- 8 Ch		
		Software	As per attached ANNEXTURE-C
		Video/Audio Input	
		IP video input:	8 IP channels
		Two-way audio input / Output:	1-ch, RCA (2.0 Vp-p, 1kΩ)
		Video/ Recording I Output	
		Interface	1 HDMI Port
		VIDEO Compression	H.265 or better
		Resolution	1920 x 1080
		Recording Resolution:	8MP, 6MP, 5MP, 3MP, 2MP
		Decoding / Playback	
		Live view / Playback:	1920x1080
		Layouts:	Simultaneously min 8 channel for 8Ch & Simultaneously min 16 channel for 16Ch
		Hard Disk	
		SATA Port:	1 or more Sata port
		Capacity:	Port support min. 6 TB capacity for SURVEILLANC HDD
		Network	
		Incoming bandwidth:	200Mbps
		Outgoing bandwidth:	190Mbps
		USERS	Min 10 Users
		Network Interface:	1 RJ-45 port (10/100/1000) Mbps
		Network Functions:	TCP/IP, DHCP, PPPOE DNS, DDNS, FTP, SMTP, NTP, RTP/RTSP, HTTP, CIFS/NFS, UPnP
		USB Interface:	Min. 2 USB port (1x USB 3.0, 2x USB2.0)
		Alarm In	1-Ch
		Alarm Out	1-Ch
		General	
		Power Supply:	240 ± 10% VAC , 50HZ
		Make	Axis: Axis Communications AB. Pelco: Pelco, Inc. Honeywell: Honeywell International Inc. Bosch : Bosch Limited Matrix Comsec: MATRIX COMSEC PVT. LTD BEL : Bharat Electronics Limited American Dynamics : Tyco Security Products Vicon: Vicon Industries Inc. Sony : Sony India Pvt. Ltd.
		Warranty	Three years

		Certificate	Either Bureau of Indian Standards (BIS) OR UL certificate.
4	Network Video Recorder- 16 Ch		
		Software	As per attached ANNEXTURE-C
		Video/Audio Input	
		IP video input:	16 IP Ch
		Two-way audio input / Output:	1 RCA (Audio output) 1 RCA (Audio input)
		Video/ Recording I Output	
		Interface	1 HDMI Port
		VIDEO Compression	H.265 or better
		Resolution	1920 x 1080
		Recording Resolution:	8MP, 6MP, 5MP, 3MP, 2MP
		Decoding / Playback	
		Live view / Playback:	1920x1080
		Layouts:	Simultaneously min 8 channel for 8Ch & Simultaneously min 16 channel for 16Ch
		Hard Disk	
		SATA Port:	1 or more Sata port
		Capacity:	For 1 SATA Port- support min. 12 TB capacity for SURVEILLANC HDD or For 2 or more SATA Port- support min. 6 TB capacity for SURVEILLANC HDD
		Network	
		Incoming bandwidth:	200Mbps
		Outgoing bandwidth:	190Mbps
		USERS	Min 10 Users
		Network Interface:	1 RJ-45 port (10/100/1000) Mbps
		Network Functions:	TCP/IP, DHCP, PPPOE DNS, DDNS, FTP, SMTP, NTP, RTP/RTSP, HTTP, CIFS/NFS, UPnP
		USB Interface:	Min. 2 USB port (1x USB 3.0, 2x USB2.0)
		Alarm In	1-Ch
		Alarm Out	1-Ch
		General	
		Power Supply:	240 ± 10% VAC , 50HZ
		Make	Axis: Axis Communications AB. Pelco: Pelco, Inc. Honeywell: Honeywell International Inc. Bosch : Bosch Limited Matrix Comsec: MATRIX COMSEC PVT. LTD BEL : Bharat Electronics Limited American Dynamics : Tyco Security Products Vicon: Vicon Industries Inc. Sony: Sony India Pvt. Ltd..
		Warranty	Three years
		Certificate	Either Bureau of Indian Standards (BIS) OR UL certificate.
5	POE SWITCH (4-Port)	Ports	
		Network Ports:	5
		PoE Port:	4, 10/100/1000 Mbps RJ45 ports
		SFP port	Min. 1 Port

		Standard	
		Network Protocol:	IEEE802.3,802.3u,802.3x, 802.3af, 802.3at
		Address Database size	Min 4k MAC Addresses
		Flow Control:	IEEE802.3x full duplex
		Power Over Ethernet	
		PoE Standard:	IEEE802.3af, IEEE802.3at
		Power Budget	Min. 30W
		General	
		Power Supply:	100-240V AC, 50Hz
		Operating Conditions:	-10 °C ~ 60 °C less than 95 % RH
		Make	CISCO : Cisco Systems, Inc Netgear: Netgear Inc HP: HP Development Company, L.P. Allied Telesis: Allied Telesis, Inc. D-Link : D-Link (India) Limited
		Warranty	Three years
6	POE SWITCH (8-Port)	Ports	
		Network Ports:	9
		PoE Port:	8, 10/100Mbps RJ45 ports
		Uplink Port:	1, 1000Mbps Ethernet Port
		Standard	
		Network Protocol:	IEEE802.3,802.3u,802.3x, 802.3af, 802.3at
		Address Database size	Min 4k MAC Addresses
		Flow Control:	IEEE802.3x full duplex
		Power Over Ethernet	
		PoE Standard:	IEEE802.3af, IEEE802.3at
		Power Budget	Min. 65W
		General	
		Power Supply:	100-240V AC, 50Hz
		Operating Conditions:	-10 °C ~ 60 °C less than 95 % RH
		Make	CISCO : Cisco Systems, Inc Netgear: Netgear Inc HP: HP Development Company, L.P. Allied Telesis: Allied Telesis, Inc. D-Link : D-Link (India) Limited
		Warranty	Three years
7	POE + SWITCH (16-Port)	Ports	
		Network Ports:	18
		PoE Port:	16, 10/100Mbps RJ45 ports
		Uplink Port:	2, 1000Mbps Combo Port
		SFP port	Min. 2 port
		Standard	
		Network Protocol:	IEEE802.3,802.3u,802.3x, 802.3af, 802.3at
		Address Database size	Min 4k MAC Addresses
		Flow Control:	IEEE802.3x full duplex
		Power Over Ethernet	
		PoE Standard:	IEEE802.3af, IEEE802.3at
		Power Budget	Min. 150W
		General	

		Power Supply:	100-240V AC, 50HZ
		Operating Conditions:	-10 °C ~ 60 °C less than 95 % RH
		Make	CISCO : Cisco Systems, Inc Netgear: Netgear Inc HP: HP Development Company, L.P. Allied Telesis: Allied Telesis, Inc. D-Link : D-Link (India) Limited
		Warranty	Three years
8	22" LED Monitor With Wall Mount Bracket.	22" LCD Monitor	
		Max Resolution	1920×1080
		Interface	RGB IN, HDMI IN, Digital Audio Output
		Power Supply:	230V, 50Hz
		Make	Sony: Sony India Pvt. Ltd. LG: LG Electronics India Pvt. Ltd. Panasonic: Panasonic India Pvt. Ltd. Samsung : Samsung India Electronics Pvt. Ltd
		Warranty	Three years
9	32 "LED Monitor with Wall Mount Bracket.	32" LCD Monitor	
		Max Resolution	1920×1080
		Interface	RGB IN, HDMI IN, Digital Audio Output
		Power Supply:	230V, 50Hz
		Make	Sony: Sony India Pvt. Ltd. LG: LG Electronics India Pvt. Ltd. Panasonic: Panasonic India Pvt. Ltd. Samsung : Samsung India Electronics Pvt. Ltd
		Warranty	Three years
10	6 / 12 TB SURVEILLANCE HDD	RPM	7200
		Make	Seagate : Seagate Technology LLC Western Digital : Western Digital Corporation
		Warranty	Three years
11	1 KVA UPS with 1hr Battery Backup digital display indication	Input Voltage	230 VAC nominal
		Frequency	50 Hz +/- 1 Hz
		Output	
		UPS Capacity (total)	1000VA / 600W
		Output Voltage range	230 V +/- 10% with 50 Hz
		Voltage on Battery	230 VAC
		Frequency	On Battery 50 Hz ± 1 Hz
		Operating Temperature:	'-10 °C ~ 60 °C less than 95 % RH
		Battery	60 AH Maintenance-free
		Charger	5A
		Make	APC : Schneider Electric Vertiv Energy Private Limited Numeric (Legard) : Legrand Group or any other reputed make having valid BIS registration.
		Warranty	Three years
		Certificate	Bureau of Indian Standards (BIS)

12	6U Rack (Outdoor)	Dimension:	550 x 400 x 350 mm Wall Mount / Floor Standing / Table Mount option, Front door with Toughen Glass & Lockable, Closed Rubber Grommet at Cable Entry
		Complete Body	Top and Bottom of 18 SWG CRCA Material, Door & inside Channels of 16 SWG CRCA Material
			Weather proof & Compatible to accommodate LIU, Switch, PoE adopter etc. and fitted with cable manager and with mounting accessories
		Make	Valrack/APW/Rittal/APW President
13	9U Rack	Dimension:	Width 600 mm and depth 450 mm – Wall Mount / Floor Standing / Table Mount option, Front door with Toughen Glass & Lockable, Closed Rubber Grommet at Cable Entry
		Complete Body	Top and Bottom of 18 SWG CRCA Material, Door & inside Channels of 16 SWG CRCA Material
		Power Distribution Unit	1.5 meter cable length for 240/220V AC Supply having 4 sockets of 5 Amp to be used for other devices.
		Fan	Top mounted 90 CFM Fan (01nos.) with finger guard
		Make	Valrack/APW/Rittal/APW President
14	CAT-6 Armored cable	Size:	Armored CAT-6 (4 Pair) cable design for external use burial and or Arial use, 24 AWG solid copper conductor. Armored GI wire size: 0.9 mm
		Make	D-Link / TYCO / Systimax / Molex / Schneider / Digisol / Commscope / Panduit(Pannet) / Siemon
15	Fiber cable – 6 core cable	Size:	Unitube, Single Mode, Outdoor Direct Burial Cable, Central loose tube with jelly compound, High strength ripcord under armored Cable protected from moisture, suitable for indoor and outdoor use and protected against bending / damage.
		Make	D-Link / TYCO / Systimax / Molex / Schneider / Digisol / Commscope / Panduit(Pannet) / Siemon
16	LC-SC Single Mode Optical fiber duplex patch cord	Size/Length:	LC-SC SM Duplex, the patches to be supplied shall be of full standard optical specifications, length of 1 mtr.
			Terminated connector: compatible with industry standard i.e. EIA/TIA, IEC, ANSI
		Make	D-Link / TYCO / Systimax / Molex / Schneider / Digisol/Commscope/Panduit(Pannet)/Siemon
17	LIU (Line interface Unit) (Optical Fiber interconnecting unit) 06 port fully loaded	<ul style="list-style-type: none"> - Rack mount type with 06 ports Loaded (SC) SM, pigtail and splice tray. - Aluminum base material for light mounting - Front - mounted cable saddles for jumper management - Can manage both splice and terminations - Preassembled shelves in multiple configuration - Rubber fiber slotted bracket built in, metal splice shelf to protect the fibers - Removable Front and rear covers for better access to interior of LIU - The pigtails to be supplied shall be SC simplex of length 1 meter. The pigtails to be supplied shall be good end face geometry, standard optical specifications, precise length & tolerance. 	
		Make	D-Link / TYCO / Systimax / Molex / Schneider / Digisol
18	Pigtail	The Pigtails to be supplied shall be LC SM SIMPLEX of length 1 meter. The pigtails to be supplied shall be of good end face geometry, full standard optical specification.	
		Make:	D-Link / TYCO / Systimax / Molex / Schneider / Digisol
19	Media Converter	The media converter should support Single Mode fiber and shall be suitable for interfacing with the camera / Ethernet switch.	

20	Power cable	Size:	Un- armored 3 core, 2.5 sq.mm with standard copper conductors
		Insulation:	PVC insulated 1100V grade, FR type suitable for steady temperature of 70 degree C.
		Make:	Finolex/KEI/ Polycab/Universal/Asian/Delton/Havells
21	Junction Box (Outdoor)	Size:	Whether proof, FR type suitable for IP based CCTV Camera, Dimension: (100 x 100 x 50) mm,
		Make:	Any Standard make
22	HDPE Pipe	Size:	- Dia: Min 25 mm (Inner) - Thick : Min 2.3 mm
		Make:	Any Standard make
23	3 Mtr Pole (Tubular)	Size:	Height: 3 Mtr GI Tubular Poles. Size: Middle 2 Mtr. Long, 88.9mm dia & 3.25mm thick 03-meter heighted pole which to be installed on control room building including clamps and other accessories to be fixed is in the scope of bidder
		Make:	Any Standard make
24	9 Mtr Pole (Tubular) including foundation casting.	Swaged type welded GI tubular pole of Height: 9 Mtrs Size: Bottom 5 Mtr. Long, 114.2mm outer dia & 3.5mm thick, Middle 2 Mtr. Long, 88.9mm dia & 3.25mm thick, Top 2 Mtr long, 76.1 mm dia (outer) and 3.25mm thick. Foundation: 1.5 mtr x 0.450 mtr x 0.450 mtr Pole erection by excavating in any type of soil by providing of M15 Grad concrete (1:2:4) foundation of 1.5 mtr x 0.450 mtr x 0.450 mtr in the scope of bidder	
		Make:	Any Standard make
25	Laying of CAT-6 armor/ Fiber optical cable and Power Cable in PVC / HDPE pipe with all necessary accessories.		
26	Digging suitable width up to 450 mm and back filling in any type of soil for laying of surveillance system cable.		
27	Splicing of Single mode Pigtail with Fiber core		
28	<p>Installation and commissioning charges for CCTV surveillance system including providing & Mounting Stand for LED and brackets for IP Bullet/PTZ camera, Patch cord, LIU, power adopter, HDMI cable, connectors, required splicing of cable etc. as per tender terms and condition.</p> <p>All equipment under this package is to be installed in various substation. The OFC cable and Power cable shall be laid in HDPE conduits either in cable trenches or underground depending upon site requirement. If it is underground the depth of trench shall not be less than 2 feet. Civil work if any during the installation activity shall be carried out by the bidder without any extra financial implication to GETCO.</p>		

Software for Network Video Recorder (NVR)

Software for 8 Channel / 16 Channel NVR:

The Software should be designed for open platform and no proprietary hardware required for installation of the software. It should be completely scalable CMS/ CCTV system. The software should support Min. 2 Mega pixel and higher camera and should facilities viewing up to Full HD/ H.265 (0 to 30 fps) on the work station. Recording can be scheduled for the various video source with different frame rates.

Sitemap:

- **Alarms:** The alarms are displayed in the sitemap, enabling the user to take timely action.
- **Field of view:** The user can create field of view of the cameras, indicating the area of coverage.

Recording and playback

- **Video:** An optional streaming is available for rendering additional streams for recording and live viewing. Video Recording on Selected Channel.
- **Search Mode:** Date and Time, Camera, Event, Recording Type
- **Playback Modes:** Fast Forward, Slow Forward, Slow Reverse, Fast Reverse at Different Speed Control, Next Previous Frame
- **Export:** Exporting the video data in native format with multiple file export option makes it a hassle free export and playback of the video sequence. Manual Backup over USB through USB2.0 / USB3.0 interface

Events and controls

- **Alarms:** Supports inbuilt video analytic alarms such as Face detection, Boundary Crossing detection, camera occlusion, Unexpected activity detection, Motion Detection, View Tampering, Connection Failure, Recording Failure, Storage Alert, Disk Volume Full, Disk Fault, Scheduled Backup Fail.
- **Event action:** Automatic actions can be configured per camera for each event. The actions supported comprise SMS, email with Snapshot, camera pre-set, Turn On/Off Alarm Outputs, Buzzer Notification.
- **PTZ controls and digital zoom:** Digital zoom supports both on live and recorded videos.
- **Snapshots:** The snapshot of any camera in the tile can be taken and saved in the database for future investigation and evidence purposes.
- **Camera discovery:** IP cameras of different makes and models can be added automatically. Manual and bulk additions of cameras are also supported.

Reports:

A comprehensive reporting on the alarms, event logs, health status of the devices such as IP Camera, Server and Workstation are provided.

Type Test for Bullet Camera, PTZ Camera & NVR

(1) Following Type Test certificates shall be submitted in Technical specification for IR bullet camera and PTZ camera.

S/n	Test Name	Type Test Standard	Confirmation (Tick <input checked="" type="checkbox"/> any one)
1	Electrical Fast Transient/burst immunity test (EFT)	IEC 61000 – 4 - 4	YES / NO
2	Damped Oscillatory (1MHz & 100 KHz)	IEC 61000 – 4 – 18	YES / NO
3	AC Voltage Dips & Interruption and voltage variation immunity test	IEC 61000 – 4 – 11	YES / NO
4	Electrostatic immunity test	IECv61000 – 4 – 2	YES / NO
5	Power Frequency Magnetic Field	IEC 61000 – 4 – 8	YES / NO
6	Ripple on DC input Power Supply Port immunity test	IEC 61000 – 4 – 17	YES / NO
7	Immunity to conducted disturbance, induced by radio-frequency fields	IEC 61000 – 4–6	YES / NO
8	Radiated, radio-frequency, electromagnetic field immunity test	IEC 61000 – 4–3	YES / NO
9	Surge immunity test	IECv61000 – 4–5	YES / NO
10	Limits for harmonic current emission (equipment input current $\leq 16A$ per phase)	IEC 61000– 3–2	YES / NO
11	Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current $\leq 16 A$ per phase and not subject to conditional connection	IEC 61000– 3–3	YES / NO
12	Audio/Video, information and communication technology equipment-part 1: safety requirement	IEC 62368-1:2018	YES / NO
13	For FCC	47 CFR FCC Part 15-Sub part B (Class B) ANSI:2009	YES / NO
14	For IP66	IS/IEC 60529:2001 Clause No. 12.2,12.3,13.4,13.6,14.2.6,14.3	YES / NO
15	For Vibration	IEC 60068-2-6:2007	YES / NO
16	For IK10	IEC 62262:2002	YES / NO

***** The validity of Type Test shall be 7 years.**

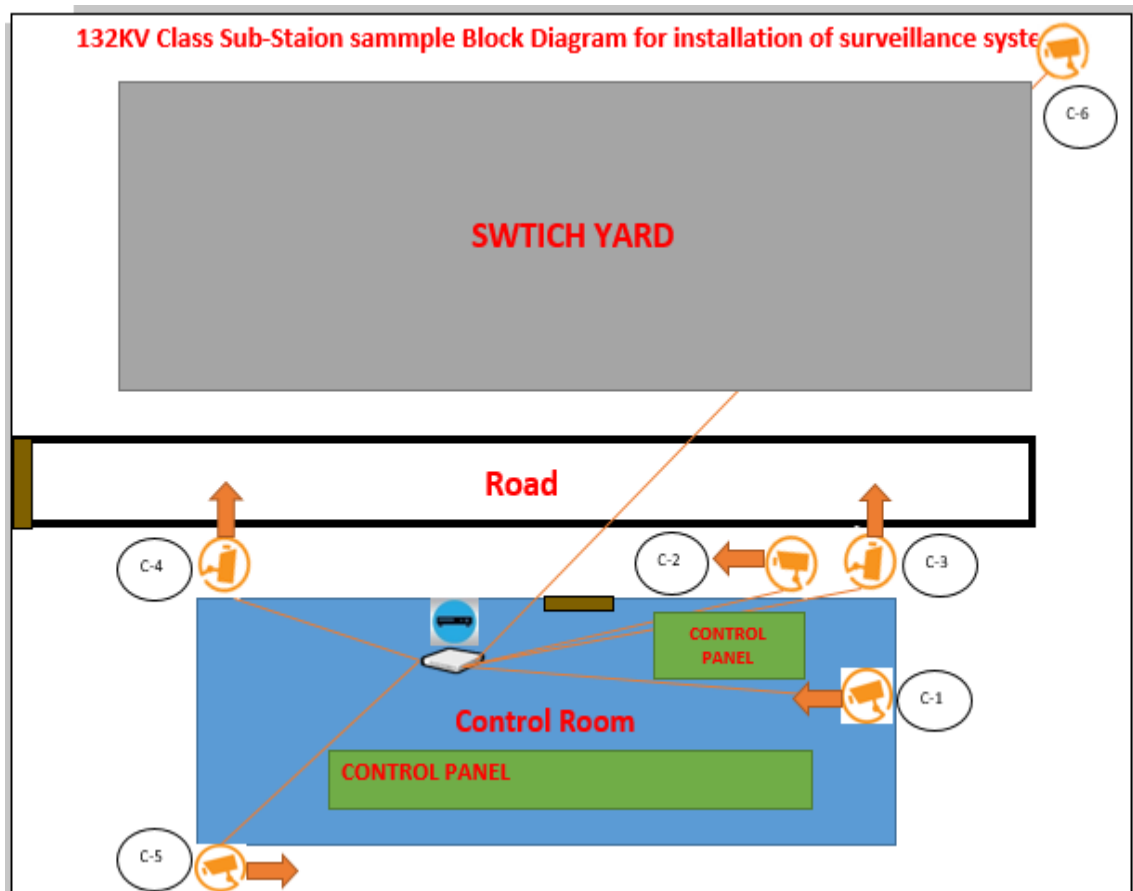
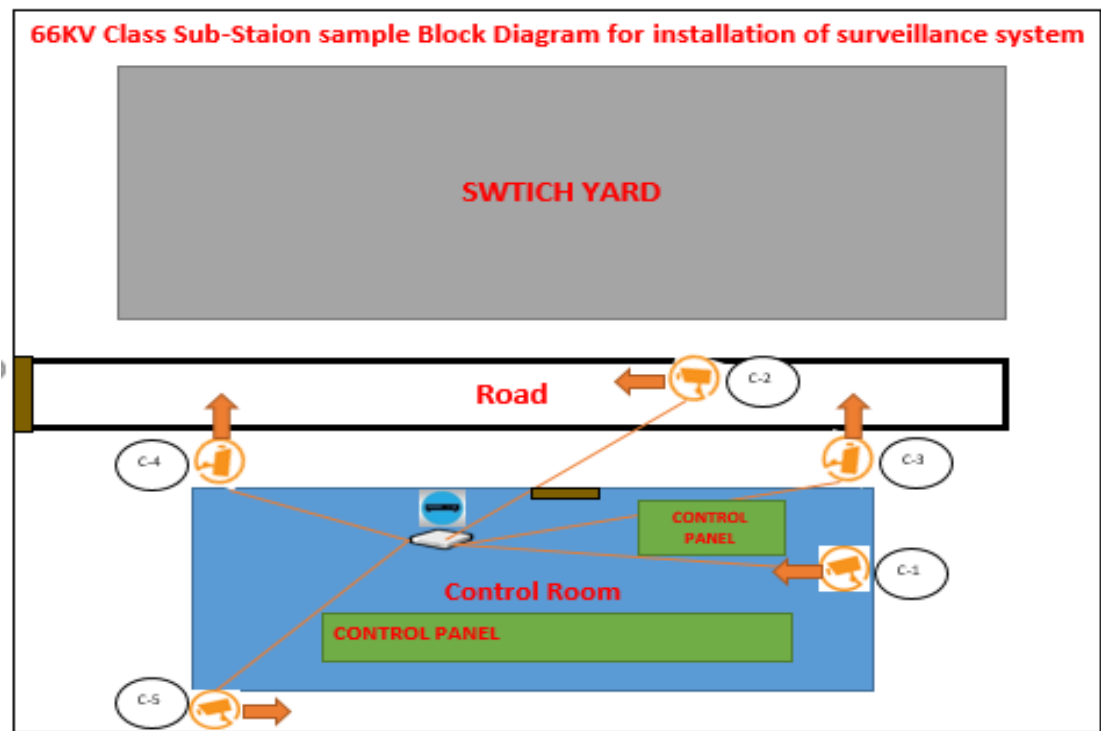
(2) Following Type Test certificates shall be submitted in Technical specification for NVR.:

S/n	Test Name	Type Test Standard	Confirmation (Tick <input checked="" type="checkbox"/> any one)
1	For CE (EMI-EMC)	IEC/EN 61000-3-3:2003 CISPR 22:2008 CISPR 24:2010 IEC/EN 61000-3-2:2005 + A1:2008 + A2:2009	YES / NO
2	For FCC	47 CFR FCC Part 15-Sub part B (Class B) ANSI:2009	YES / NO
3	For Safety	IEC/EN 60950-1:2005 + A1:2009+A2:2013	YES / NO

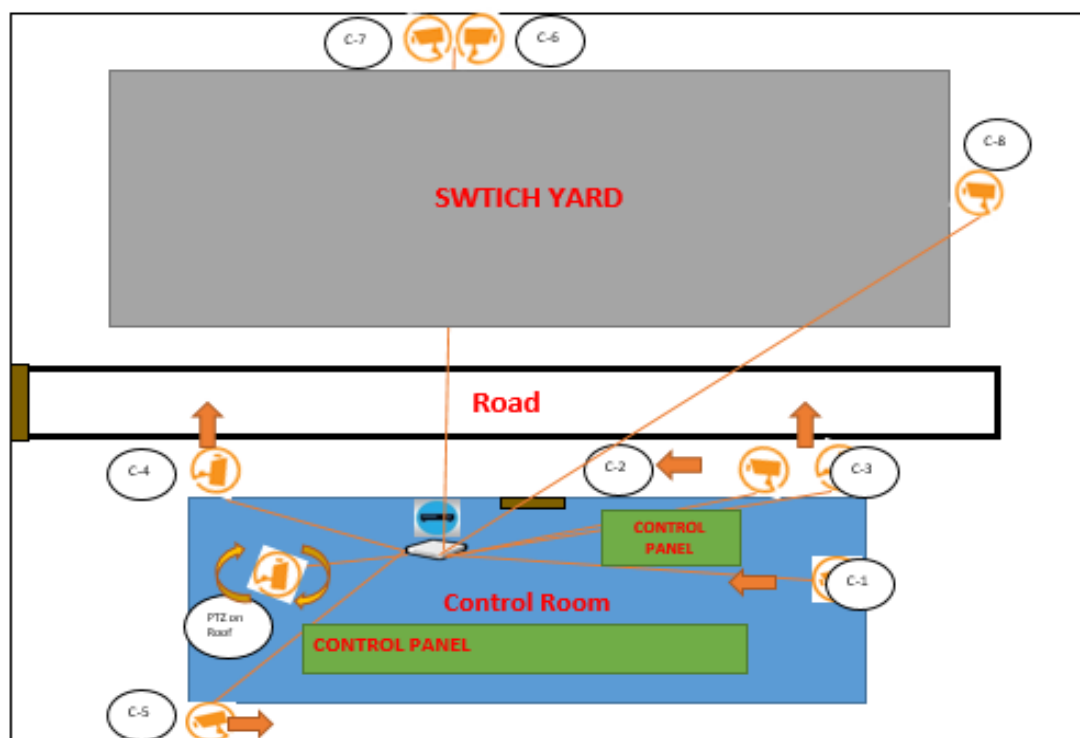
*****The validity of Type Test shall be 7 years.**

All Type test for Bullet camera, PTZ Camera & NVR are mandatory and submit along with GTP.

Sample architectural drawing for installation of complete surveillance system

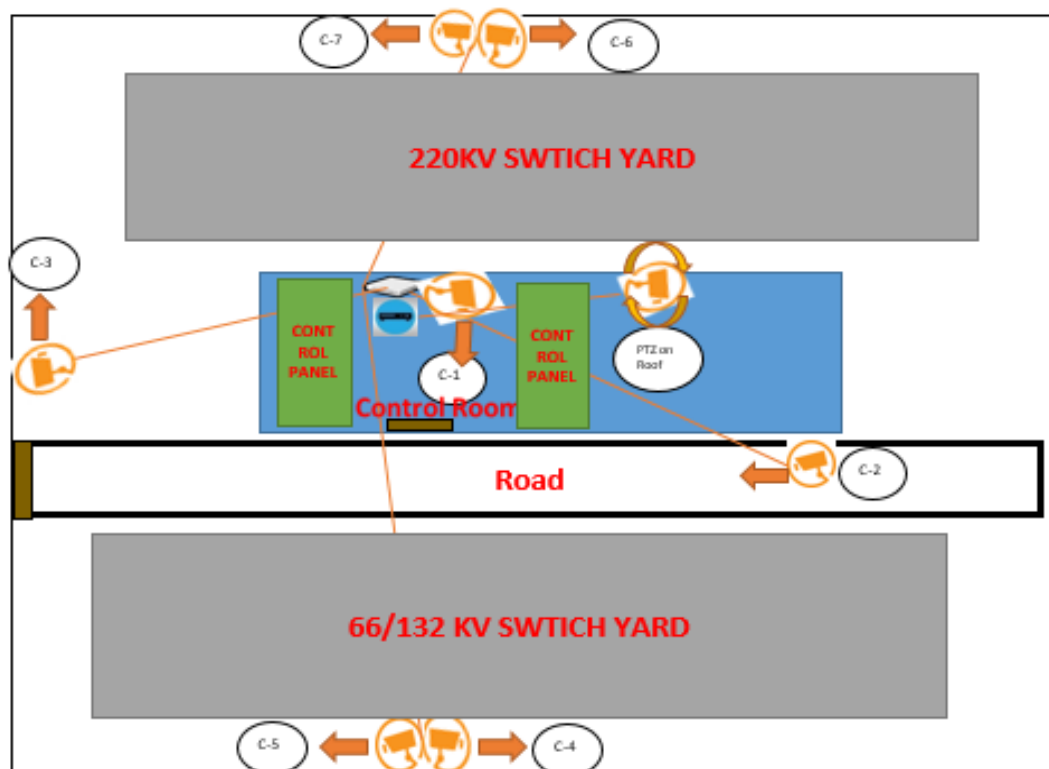


220KV Class Sub-Staion sample Block Diagram for installation of surveillance system



OR

220KV Class Sub-Staion sample Block Diagram for installation of surveillance system



400KV Class Sub-Staion sample Block Diagram for installation of surveillance system

