

SCHEDULE - B

NAME OF WORK: CONSTRUCTION OF CENTER OF EXCELLENCE (COE) FOR GREEN HYDROGEN AT GANDHIDHAM

Sr. No	Item Description	Total Qty.	Rate		Unit		Amount
			IN FIG.	IN WORDS	IN FIG.	IN WORDS	
	PART-G : IT & NETWORKING SYSTEM						
1	<p>Supply, Installation, Testing, and Commissioning (SITC) of AI Collaboration Camera system shall be designed with the following key specifications to ensure optimal performance and flexibility. The image sensor must be a minimum of 20.30 Megapixels, utilizing a 1 in. CMOS sensor to ensure high-resolution image capture. The lens shall be a high-precision, wide-angle, aspherical glass lens that guarantees superior clarity and minimal distortion across the full field of view. The field of view must be at least 103° diagonal, 92° horizontal, and 65° vertical, offering a broad perspective suitable for a wide range of applications. The aperture must be a minimum of f/2.9, allowing for efficient light capture in varying environments. Pan, tilt, and zoom functions shall be provided through a 5x digital zoom capability, facilitating smooth and precise control over the camera's viewing angle. Additionally, the system shall feature an autozoom function, known as Genius Framing, which intelligently adjusts and frames around people in the room, ensuring the optimal focus for a given subject without loss of quality. The system must be equipped with auto-flip functionality, automatically rotating the image by 180° when the camera is mounted upside down, ensuring proper orientation without manual intervention. Dynamic light optimization should be built-in, automatically adjusting light levels and white balance to maintain accurate and clear image rendering across varying lighting conditions. The output aspect ratio must be 16:9, ensuring compatibility with most modern display systems and providing a widescreen view for high-quality presentation. Noise reduction technology should be employed through bias compensating spatio-temporal filtering, wide-area chroma filtering, and flicker elimination, effectively enhancing image quality by minimizing unwanted noise and artifacts. Real-time scaling, dewarping, and perspective correction must be included, allowing for the precise adjustment of video images in dynamic environments. Continued</p> <p>The camera should feature people counting functionality, capable of detecting and reporting the number of people in the frame, assisting in analytics and security monitoring. The video output resolution shall support a minimum of HD 1080p at 30 frames per second, ensuring clear and smooth video performance for all recorded and live-streamed content. For connectivity, the system shall utilize an RJ45 connector, with compatible cable options including Cat 5e, 6, or 7 for reliable network communication. A USB 3.0 port must be included, enabling data transfer and connectivity through the provided USB to PoE adapter. Power requirement shall be a minimum of 5VDC, ensuring compatibility with common power sources. The housing of the system must be constructed from durable aluminum in a unibody design, providing strength, lightweight properties, and excellent heat dissipation while maintaining a sleek and professional appearance. These features must meet the essential requirements for durability, performance, and ease of use in various installation environments. The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation End</p>	1.000			NO	One Number	
2	<p>Supply, Installation, Testing, and Commissioning (SITC) of high-performance camera system shall be equipped with a minimum optical zoom capability of 12x and a digital zoom of 16x or better. The lens shall be designed with a focal length of f = 3.47mm to 41.65mm or better, and the aperture range shall be a minimum of F1.84 to F3.72 or better, ensuring superior image clarity. The horizontal angle of view shall be a minimum of 80.8° and extend to at least 7.5°, while the vertical angle of view shall range from a minimum of 49.9° to 4.3° or better. The camera shall perform optimally in low-light conditions with a minimum illumination of 0.5 Lux at (F1.8, AGC ON) or better. It shall feature a shutter speed range from a minimum of 1/30s to 1/10000s or better. White balance functionality shall include Auto, Indoor, Outdoor, One-Push, and Manual options. The system shall incorporate backlight compensation and advanced 3D digital noise reduction technology, achieving a minimum signal-to-noise ratio (SNR) of 55dB or better. The camera's horizontal rotation range shall be ±170° or better, and the vertical rotation range shall extend from -30° to +90° or better. The pan speed shall be adjustable within a range of 1.7° to 100°/s or better, and the tilt speed shall range from 1.7° to 69.9°/s or better. Essential features such as H & V flip and image freeze functionality shall be supported. The system shall support local storage and include a minimum of 255 preset positions with a preset accuracy of 0.1° or better. It shall utilize YUY2, H.264, and MJPEG compression options for the color system. YUY2 video format shall allow a maximum resolution of 1080P at 60fps, H.264 AVC and H.264 SVC formats shall support a maximum of 2160P at 60fps, and MJPEG shall support a maximum of 4K at 30fps. The camera shall support audio input through USB, adhering to UVC 1.1 to 1.5 USB video communication standards. The system shall offer video compression formats including H.265, H.264, and MJPEG, and video streams shall include both main and sub-streams. The main stream resolution options shall include 3840x2160, 1920x1080, 1280x720, and 1024x576 or better. Sub-stream resolutions shall include 720x576, 720x480, and 320x240 or better. T Continued</p> <p>he video bit rate shall range from a minimum of 32kbps to 102400kbps or better, with variable and fixed bit rate options. Frame rates shall support a minimum of . 50Hz from 1fps to 50fps and 60Hz from 1fps to 60fps. The system shall include audio compression formats such as AAC and G711, with audio bit rates of 48Kbps, 64Kbps, 96Kbps, and 128Kbps or better. Supported protocols shall include ND8 HX, TCP/IP, HTTP, RTSP, RTMP, Onvif, DHCP, and Multicast. HD output shall feature a minimum of 1x HDMI (Version 2.0) and 1x 3G-SDI (BNC type, 800mVp-p, 75Ω) compliant with SMPTE 424M standards. The network interface shall provide a minimum of 1x RJ45 supporting 10M/100M/1000M adaptive Ethernet, and audio interfaces shall include at least 1x 3.5mm Line In and 1x USB (Type-C) port or better. Communication interfaces shall include a minimum of 1x RS232 with an 8-pin Mini DIN connector supporting a distance of up to 30m and protocols such as VISCA, Pelco-D, and Pelco-P. The camera system shall be certified with BIS (Indian), CE, FCC, and RoHS. The OEM must maintain certifications including ISO 9001, 45001, 50001, 27001, and 14001 or better. The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation End</p>	16.000			NO	One Number	
3	<p>Supply, Installation, Testing, and Commissioning (SITC) of document camera that shall be equipped with a minimum 1/4" HD CMOS image sensor or better and a camera resolution of minimum 8 Mega Pixels (3264x2448) or better. The frame rate shall be capable of achieving minimum 15 fps at 3264x2448 resolution or better and minimum 30 fps at 1080P resolution or better. The system must be capable of minimum 20x zoom functionality, incorporating minimum 5x optical zoom and minimum 4x digital zoom or better. Connectivity options should include minimum 2x USB 2.0 ports or better, with optional HDMI output and minimum 2x VGA output ports and minimum 1x VGA input port or better. The device shall feature a scanning speed of minimum 1 second or better, video freeze capability, and support for minimum effective scanning areas including A4 and A3 (optional) or better. The shutter speed should be minimum 1 second or better, and the zooming mechanism should include mouse wheel zooming functionality or better. Image viewing shall support color and black-and-white modes, with additional options for mirroring, minimum 90-degree rotation up to 270 degrees, and previewing, and video recording in formats such as WMV or AVI or better. Continuous frame recording should be supported, with adjustable frame rates, and optional audio/video recording functionality must be included. Auto-adjustment of brightness, contrast, saturation, sharpness, and gain shall be provided, with quick image capture and support for PDF format as a minimum requirement. Scanning capabilities shall include support for single and multi-page scans, OCR functionality for multi language recognition, and a scanning landscape area of minimum A4, A5, and A3 or better. Auxiliary lighting shall be provided by LED lights or better. Power requirements must be fulfilled via USB power, and the scan speed shall achieve minimum 10 scans per second or better. The device shall comply with certification requirements, including minimum BIS (Indian), CE, FCC, and RoHS or better. The OEM must possess certifications for ISO 9001, 45001, 27001, and 14001 or better. The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation End</p>	1.000			NO	One Number	

4	Supply, Installation, Testing, and Commissioning (SITC) of Room Kit that shall include a 10" capacitive touch screen capable of 1080p resolution at 60Hz. Power shall be sourced from the box using Power over Ethernet (PoE). The kit shall feature one HDMI input supporting 1080p at 60Hz and one RJ45 port with PoE. Additionally, it shall have two USB 2.0 ports and one USB Type C port that shall support DisplayPort input and USB 2.0 functionality, along with a power button. The compute box shall be equipped with an Intel® Core™ i5-1135G7 Processor and shall have a memory capacity configured in dual channel with 2 x 4GB. The graphics processing unit (GPU) shall utilize Intel® Iris® Xe Graphics, and storage shall consist of a 256GB SSD utilizing M.2 SATA technology. The kit shall include Wi-Fi capabilities with AX201 and Bluetooth 5.0 support. Power requirements shall be DC 19V at 5A, and the I/O configuration shall consist of three HDMI outputs capable of 4K at 60Hz, one HDMI input also supporting 4K at 60Hz, one PoE input, one audio output (headphone), one LAN port supporting 10/100/1000M self adaptive, one hub, one USB Type C port with display functionality, one USB 2.0 port, and three USB 3.0 ports. The operating temperature shall range from 0°C to 40°C, with an operating humidity of 10% to 90% non condensing. Storage temperature shall be permissible from -20°C to 60°C, and storage humidity shall range from 5% to 95% non-condensing. The operating system shall be Windows 10 or higher. The Room Kit shall be designed to accommodate various classroom configurations, including circular, square, rectangular, and semicircular arrangements. The supplier shall provide certificates confirming compliance with BIS (Indian), CE, FCC, and RoHS standards, as well as OEM certifications for ISO 9001, 45001, 50001, 27001, and 14001. An OEM certified copy of all certifications, along with an ink-signed compliance letter, must be submitted by the EPC contractor for material approval; materials lacking these documents shall not be considered for approval. This adherence to specified makes and standards shall ensure that the system functions at peak efficiency and reliability, thereby meeting the demanding needs of professional environments. The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation. End	5.000				NO	One Number	
5	Supply, Installation, Testing and commissioning (SITC) of Wireless Presenter shall be equipped with an ARM Cortex A55 x 4 CPU or better, along with 8GB DDR and 32GB FLASH storage configuration to ensure smooth operation. The hardware ports must include 2 HDMI Outputs (1 supporting 4K @ 60Hz and 1 supporting 1080P @ 60Hz), 1 HDMI Input, 3.5mm Audio Output, 3.5mm Mic Output, 2 RS232 ports, 2 USB 3.0 Host Type-A, 2 USB 2.0 Host Type-A, 1 USB Touch, 1 Type-C port, 1 12V/3A DC Power Jack, 1 RJ45 LAN Port, 1 POE Port, and 1 Power Button with 1 Standby Button. Wireless transmission must support protocols including DLNA, Miracast, AirPlay, and Chromecast, with dual 5.8G Wi-Fi for Soft AP and Wi-Fi, supporting up to 128 simultaneous connections and a maximum transmission distance of 50m without obstacles. The system shall support BYOM features for Teams, Zoom, and GoToMeeting. Touch control shall include USB HD mouse mode, IR touch, and capacitive touch panel functionality. Video decoding should support H.264, H.265, VP8, RV, WMV, AVS, H.263, and MPEG4 with 4K resolution decoding. The presenter must support both wireless and wired bridging, with mirroring options including AirPlay, Miracast, Chromecast, and wireless USB dongles. The itemder is strictly required to adhere to these minimum design specifications. However, higher-performance alternatives will also be considered and are encouraged. The Itemder shall submit the Manufacturer's official letterhead along with the technical Item, accompanied by a compliance statement on the Manufacturer's official letterhead. If the product does not meet or exceed the minimum design requirements, the Item shall be subject to rejection without prior notice. Software mirroring for Windows, Mac, Linux, Android, and iOS is required, supporting 4K for all transmission methods and with a delay range of 60~180ms. Device management should allow centralized management with RS232 API for third-party integrations, and web GUI settings. The system must support photo rotation in 90°, 180°, and 270° increments, dynamic passwords, and adjustable audio output via HDMI or USB. Certifications required include CE, FCC, and RoHS, with compliance to ISO 9001, 45001, 27001, and 14001 standards; he specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation.	3.000				NO	One Number	
6	Supply, Installation, Testing and commissioning (SITC) of video processing and streaming device shall support a minimum of HD and SD video standards, providing robust capabilities for both video input and output. The input video formats shall include, but not be limited to, 1080p60/59.94/50, 1080p30/29.97/25/24/23.98, 1080i60/59.94/50, 720p60/59.94/50, 480i59.94, and 576i50, ensuring comprehensive support for a wide range of video sources. The output video formats shall cover, at a minimum, 1080p60/59.94/50, 1080p30/29.97/25/24/23.98, 720p60/59.94/50, and 480p29.97, ensuring high-quality video streaming capabilities. The device shall include a minimum of 1 x 3GHD/SD-SDI input, 4 x HDMI 1.4 inputs, with Channel 1 being selectable for either SDI or HDMI input, and 1 x USB 3.0 input for flexible connectivity. It shall support 3 x RTSP/SRT/NDI HX via IP stream input, enabling seamless integration with various streaming platforms and network-based video sources. The device shall also feature a mix capability for both HD and SD video sources, ensuring compatibility with diverse video production environments. For video output, the system shall include 1 x 3G/HD/SD-SDI loop-through, 1 x HDMI 1.4 output, 1 x HDMI 1.4 output supporting Multiview, and 2 x RJ-45 female connectors for 10/100/1000M Ethernet LAN and WAN connectivity. These interfaces shall provide comprehensive options for video routing and network integration. The built-in multi-view monitoring out shall be available via HDMI, facilitating easy monitoring of multiple video sources. The device shall support analogue audio input via XLR balanced audio, RCA unbalanced audio, SDI embedded audio, HDMI embedded audio, and IP audio, ensuring broad compatibility with professional audio sources. The analogue audio output shall be available via a 3.5mm headphone jack for easy audio monitoring. Audio delay calibration shall be available for each channel, with delay time adjustable from 0-3000ms to ensure synchronization between audio and video. Continued	1.000				NO	One Number	
	System configuration and control shall be facilitated through a web GUI, providing easy access to all settings. The device shall also support serial port control via RS-232 for integration with other systems. A built-in audio mixer shall be incorporated for on-the-fly audio adjustments, ensuring optimal sound quality during streaming. The system shall include SATA storage with support for FAT and exFAT file systems, enabling flexible file storage options. MP4 recording in H.264 video encoding and AAC-LC audio encoding shall be supported, with configurable bit rates for both video and audio. The streaming protocols supported shall include DHCP client, TS over UDP, RTSP over HTTP/TCP/UDP, RTMP, HLS, SRT, WebRTC, and NDI HX, ensuring compatibility with a wide range of streaming platforms and services. Firmware updates shall be performed via the web UI, ensuring that the system remains up-to-date with the latest features and improvements. Special features shall include vertical video crop or rotate, vertical video Multiview, and a 1RU rack-mount mainframe design or better, providing flexible deployment options for different professional environments. The supplier shall ensure that the product is compliant with all relevant certifications, including but not limited to, BIS (Indian), CE, FCC, and RoHS, with certified copies of all relevant certifications he specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation. End							
7	Supply, Installation, Testing and commissioning (SITC) of Fiber optic HDMI cable, boasting a length of 5 meters and equipped with connectors, shall be capable of maintaining a 90-degree cable angle, thereby ensuring a precise and nuanced signal transmission. This high-speed HDMI to HDMI cable, with a bandwidth of 18Gbps, shall support subsampling rates of 4:4:4/4:2:2/4:2:0, thereby facilitating the transmission of high-definition video signals, including HDTV, 3D, and 2160p/1080p resolutions. Furthermore, this cable shall be compatible with HDCP2.2, Ethernet, ARC, HDR, Ultra HD, and UHD 4K, thereby ensuring a high degree of versatility and compatibility. The cable shall support high-speed data transfer rates of 18Gbps, with capabilities for HDR, CEC, EDID, and HDCP2.2, thereby guaranteeing a precise and reliable signal transmission. Additionally, the cable shall support uncompressed audio and video sync, with a maximum resolution of 4K@60Hz, and a maximum audio sampling rate of 1536KHz. he specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation. End	50.000				NO	One Number	
8	Supply, Installation, Testing and commissioning (SITC) of Fiber optic HDMI cable, boasting a length of 10 meters and equipped with connectors, shall be capable of maintaining a 90-degree cable angle, thereby ensuring a precise and nuanced signal transmission. This high-speed HDMI to HDMI cable, with a bandwidth of 18Gbps, shall support subsampling rates of 4:4:4/4:2:2/4:2:0, thereby facilitating the transmission of high-definition video signals, including HDTV, 3D, and 2160p/1080p resolutions. Furthermore, this cable shall be compatible with HDCP2.2, Ethernet, ARC, HDR, Ultra HD, and UHD 4K, thereby ensuring a high degree of versatility and compatibility. The cable shall support high-speed data transfer rates of 18Gbps, with capabilities for HDR, CEC, EDID, and HDCP2.2, thereby guaranteeing a precise and reliable signal transmission. Additionally, the cable shall support uncompressed audio and video sync, with a maximum resolution of 4K@60Hz, and a maximum audio sampling rate of 1536KHz. he specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation. s End	36.000				NO	One Number	

9	Supply, Installation, Testing and commissioning (SITC) of Fiber optic HDMI cable, boasting a length of 15 meters and equipped with connectors, shall be capable of maintaining a 90-degree cable angle, thereby ensuring a precise and nuanced signal transmission. This high-speed HDMI to HDMI cable, with a bandwidth of 18Gbps, shall support subsampling rates of 4:4:4/2:2/4:2:0, thereby facilitating the transmission of high-definition video signals, including HDTV, 3D, and 2160p/1080p resolutions. Furthermore, this cable shall be compatible with HDCP2.2, Ethernet, ARC, HDR, Ultra HD, and UHD 4K, thereby ensuring a high degree of versatility and compatibility. The cable shall support high-speed data transfer rates of 18Gbps, with capabilities for HDR, CEC, EDID, and HDCP2.2, thereby guaranteeing a precise and reliable signal transmission. Additionally, the cable shall support uncompressed audio and video sync, with a maximum resolution of 4K@60Hz, and a maximum audio sampling rate of 1536KHz. The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation. End	36.000				NO	One Number	
10	Supply, Installation, Testing and commissioning (SITC) of Category 6A cable 30-year end-to-end channel performance warranty that shall be constructed with a 23 AWG bare copper solid conductor, designed as U/UTP unshielded, and shall feature an LSZH jacket. The cable shall comply with ANSI/TIA 568 C.2 standards and shall support a minimum bandwidth of 500 MHz, enabling a minimum speed of 10 Gbps shall be suitable for 10GBASE-T applications, with a minimum bandwidth of 500 MHz. It shall consist of four twisted pairs, complemented by a PE or PVC cross separator. The conductors shall be made of 23 AWG solid annealed bare copper. The conductor diameter shall be maintained at 0.57 ± 0.03 mm. Insulation shall be made from high-density polyethylene, with a diameter of 1.08 ± 0.05 mm. The LSZH jacket shall comply with IEC 60332-1 for flame rating, IEC 60754-1/2 for halogen acid tests, and IEC 61034-2 for smoke density tests. The nominal jacket thickness shall be a minimum of 0.80 mm, and the cable's outer diameter shall be 7.2 ± 0.5 mm. Operating temperature for the cable shall range from -20°C to +75°C, with a CPR Euroclass rating of Class Eca. The cable shall comply with IEEE 802.3bt standards for Type 1, Type 2, Type 3, and Type 4 Power over Ethernet (PoE). Furthermore, the cable shall not contain any form of non-metallic barrier tape or metallic shielding inside. The flame rating shall meet or exceed IEC 60332-1, and the temperature index and oxygen index shall conform to ASTM D 2863 standards. The minimum bend radius for the cable shall be eight times the cable diameter, and the resistance shall not exceed 7.5 Ω per 100 meters, with a maximum resistance unbalance of 5%. The mutual capacitance shall not exceed 5.6 nF per 100 meters, and the propagation velocity shall be nominally 69%. The dielectric strength shall be tested at 1500 V DC per minute. The minimum elongation at break for the insulation shall be 300%, and the minimum tensile strength for the jacket shall be 10 N/mm² (MPa). The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation. End	5000.000				MTR.	One Meter	
11	Supply, Installation, Testing and commissioning (SITC) of 24-Port 1U Unloaded Universal Modular Straight Patch Panel with 30-year end-to-end channel performance warranty that shall be preloaded with a cable support bar. The support bar shall include slots for properly tying individual cables, ensuring organized and secure cable management. Shuttered input/output (I/O) ports are not recommended, as malfunctioning shutters would render the entire I/O unusable patch panel shall be universal, featuring a stainless steel rear metal frame capable of supporting both Unshielded Twisted Pair (UTP) and Shielded Twisted Pair (STP) solutions. It shall be equipped with a cable strain relief retention tray, which shall also serve as the cable support bar with slots for tying individual cables securely. Each port of the panel shall feature an individual transparent labeling point, facilitating easy identification of connections. The panel shall include built-in transparent spring shutters for dust protection on each port, ensuring cleanliness and functionality. However, it must be noted that shuttered I/O ports are not recommended due to the risk of malfunction affecting usability. The patch panel shall comply with RoHS and UL 94V-0 standards, demonstrating its adherence to safety and environmental regulations. Additionally, the panel shall be UL 1863 rated, and certification shall be provided along with the bid to verify compliance. The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation. End	20.000				NO	One Number	
12	Supply, Installation, Testing, and Commissioning (SITC) of Category 6A RJ45 Unshielded Modular Jack that shall comply with ISO/IEC 11801:2nd edition, EN 50173-1, ANSI/TIA/EIA 568-C.2, and IEC 60603-7 (603-7). The jack shall be interoperable and backward compatible with Cat 6 standards, supporting both Universal 110 impact tool and tool-less termination methods for installation flexibility. It shall feature a minimum bandwidth of 500 MHz and a minimum speed of 10 Gbps, supporting at least 200 re-terminations and 750 plug mating cycles, with a current rating of 1.5 A and a plug retention force of 30 lbs. The jack shall be UL certified per UL 1863 and suitable for 10G Base-T applications per IEEE 802.3an up to 500 MHz. It shall be compatible with RJ standard plugs, including RJ11, RJ12, and RJ45, and provide PCB-based Universal 110 impact tool and tool-less connections for AWG 24-23 solid conductors. Each jack shall include a strain relief boot for pairs and an additional bend-limiting boot with an integrated locking clip for cable protection. The IDC termination shall feature color coding per EIA/TIA 568-A/B standards and gold-plated contacts to ensure 750 mating cycles and at least 200 IDC insertion cycles. Materials shall comply with RoHS standards, with housing made of polycarbonate or flame-retardant PVC (UL-94-V0). The modular jack shall endure DC/AC voltages of DC 1000V/AC 750V for 1 minute, exhibit a maximum DC resistance of 0.3 Ω, and operate within -10 to +60°C. The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation. End	700.000				NO	One Number	
13	Supply, Installation, Testing, and Commissioning (SITC) of The Cat6 Patch Cords shall be designed with a U/UTP unshielded construction and shall feature an LSZH (Low Smoke Zero Halogen) jacket to ensure compliance with safety standards. The minimum conductor size shall be 24 AWG, with an overall diameter of less than 6.0 mm or better. The patch cords shall be provided in a length of 1 meter, or better, to accommodate diverse installation requirements. The operational temperature range must be a minimum of -20 to +60 degrees Celsius, or better, ensuring reliable functionality under varying environmental conditions. The cable structure shall incorporate a U/UTP LSZH material composition with eight conductors organized into four twisted pairs. The conductors must be of bare copper, with stranded 24 AWG specifications or better. The insulation should consist of high-density polyethylene (HDPE), providing minimum durability and safeguarding against environmental stress. The specifications below outline the minimum design requirements, which the bidder must strictly adhere to. Higher-performance alternatives are encouraged and will be considered. The bidder must submit Manufacturer Authorization with the technical bid, along with a compliance statement on the Manufacturer's letterhead. Products failing to meet or exceed these requirements will be rejected without notice. The Cat 6A patch cord plug shall incorporate a round cable holder strain relief, with a transparent boot designed to prevent bending and maintain longevity and performance integrity. The jacket material shall be LSZH and comply with a minimum flame rating of IEC 60332-1 or better to emphasize safety in fire-prone scenarios. The patch cord plug shall ensure high repeatability in crosstalk performance with a minimum rating of 750 cycles, guaranteeing reliability and durability. Further, the patch cords must be verified by an ETL/NABL lab to certify adherence to industry standards for quality and performance. Compliance with these specified standards will ensure optimal system efficiency and reliability in demanding professional applications. OEM Authorization and Confirmation of Technical Compliances on OEM's	150.000				NO	One Number	
14	Supply, Installation, Testing, and Commissioning (SITC) of The Cat6 Patch Cords shall be designed with a U/UTP unshielded construction and shall feature an LSZH (Low Smoke Zero Halogen) jacket to ensure compliance with safety standards. The minimum conductor size shall be 24 AWG, with an overall diameter of less than 6.0 mm or better. The patch cords shall be provided in a length of 1 meter, or better, to accommodate diverse installation requirements. The operational temperature range must be a minimum of -20 to +60 degrees Celsius, or better, ensuring reliable functionality under varying environmental conditions. The cable structure shall incorporate a U/UTP LSZH material composition with eight conductors organized into four twisted pairs. The conductors must be of bare copper, with stranded 24 AWG specifications or better. The insulation should consist of high-density polyethylene (HDPE), providing minimum durability and safeguarding against environmental stress. The specifications below outline the minimum design requirements, which the bidder must strictly adhere to. Higher-performance alternatives are encouraged and will be considered. The bidder must submit Manufacturer Authorization with the technical bid, along with a compliance statement on the Manufacturer's letterhead. Products failing to meet or exceed these requirements will be rejected without notice. The Cat 6A patch cord plug shall incorporate a round cable holder strain relief, with a transparent boot designed to prevent bending and maintain longevity and performance integrity. The jacket material shall be LSZH and comply with a minimum flame rating of IEC 60332-1 or better to emphasize safety in fire-prone scenarios. The patch cord plug shall ensure high repeatability in crosstalk performance with a minimum rating of 750 cycles, guaranteeing reliability and durability. Further, the patch cords must be verified by an ETL/NABL lab to certify adherence to industry standards for quality and performance. Compliance with these specified standards will ensure optimal system efficiency and reliability in demanding professional applications. OEM Authorization and Confirmation of Technical Compliances on OEM's	150.000				NO	One Number	

15	Supply, Installation, Testing, and Commissioning (SITC) of The Cat6 Patch Cords shall be designed with a U/UTP unshielded construction and shall feature an LSZH (Low Smoke Zero Halogen) jacket to ensure compliance with safety standards. The minimum conductor size shall be 24 AWG, with an overall diameter of less than 6.0 mm or better. The patch cords shall be provided in a length of 1 meter, or better, to accommodate diverse installation requirements. The operational temperature range must be a minimum of -20 to +60 degrees Celsius, or better, ensuring reliable functionality under varying environmental conditions. The cable structure shall incorporate a U/UTP LSZH material composition with eight conductors organized into four twisted pairs. The conductors must be of bare copper, with stranded 24 AWG specifications or better. The insulation should consist of high-density polyethylene (HDPE), providing minimum durability and safeguarding against environmental stress. The specifications below outline the minimum design requirements, which the bidder must strictly adhere to. Higher-performance alternatives are encouraged and will be considered. The bidder must submit Manufacturer Authorization with the technical bid, along with a compliance statement on the Manufacturer's letterhead. Products failing to meet or exceed these requirements will be rejected without notice. The Cat 6A patch cord plug shall incorporate a round cable holder strain relief, with a transparent boot designed to prevent bending and maintain longevity and performance integrity. The jacket material shall be LSZH and comply with a minimum flame rating of IEC 60332-1 or better to emphasize safety in fire-prone scenarios. The patch cord plug shall ensure high repeatability in crosstalk performance with a minimum rating of 750 cycles, guaranteeing reliability and durability. Further, the patch cords must be verified by an ETL/NABL lab to certify adherence to industry standards for quality and performance. Compliance with these specified standards will ensure optimal system efficiency and reliability in demanding professional applications OEM Authorization and Confirmation of Technical Compliances on OEM's	150.000				NO	One Number
16	Supply, Installation, Testing, and Commissioning (SITC) of face plates that shall be of the style classified as square, specifically keystone-type shuttered faceplates, available in configurations of 1 ports. The faceplates shall be of UK style (square) and shall be offered in a white color finish Each faceplate shall be equipped with a spring shutter for each port to ensure protection and maintain a clean appearance when ports are not in use. The faceplates shall feature an elegant two-piece (2 plate) design that enhances aesthetics while providing functionality. The specifications below outline the minimum design requirements, which the bidder must strictly adhere to. Higher-performance alternatives are encouraged and will be considered. The bidder must submit Manufacturer Authorization with the technical bid, along with a compliance statement on the Manufacturer's letterhead. Products failing to meet or exceed these requirements will be rejected without notice. The cover and base materials of the faceplates shall meet a minimum standard of ABS-UL94-V2, ensuring durability and safety in installation. Additionally, the faceplates shall be suitable for both flush and wall-mounted gang boxes, offering flexibility in installation options dimensions of the faceplates shall be 86 x 86 x 12.8 mm, providing a standard fit for common installations. This adherence to specified makes and standards will ensure that the system functions at peak efficiency and reliability, meeting the demanding needs of professional environments OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation End	75.000				NO	One Number
17	Supply, Installation, Testing, and Commissioning (SITC) of face plates that shall be of the style classified as square, specifically keystone-type shuttered faceplates, available in configurations of 2, ports. The faceplates shall be of UK style (square) and shall be offered in a white color finish Each faceplate shall be equipped with a spring shutter for each port to ensure protection and maintain a clean appearance when ports are not in use. The specifications below outline the minimum design requirements, which the bidder must strictly adhere to. Higher-performance alternatives are encouraged and will be considered. The bidder must submit Manufacturer Authorization with the technical bid, along with a compliance statement on the Manufacturer's letterhead. Products failing to meet or exceed these requirements will be rejected without notice. The faceplates shall feature an elegant two-piece (2 plate) design that enhances aesthetics while providing functionality. The cover and base materials of the faceplates shall meet a minimum standard of ABS-UL94-V2, ensuring durability and safety in installation. Additionally, the faceplates shall be suitable for both flush and wall-mounted gang boxes, offering flexibility in installation options dimensions of the faceplates shall be 86 x 86 x 12.8 mm, providing a standard fit for common installations. This adherence to specified makes and standards will ensure that the system functions at peak efficiency and reliability, meeting the demanding needs of professional environments. OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation End	50.000				NO	One Number
18	Supply, Installation, Testing, and Commissioning (SITC) of face plates that shall be of the style classified as square, specifically keystone-type shuttered faceplates, available in configurations of 4 ports. The faceplates shall be of UK style (square) and shall be offered in a white color finish Each faceplate shall be equipped with a spring shutter for each port to ensure protection and maintain a clean appearance when ports are not in use. The specifications below outline the minimum design requirements, which the bidder must strictly adhere to. Higher-performance alternatives are encouraged and will be considered. The bidder must submit Manufacturer Authorization with the technical bid, along with a compliance statement on the Manufacturer's letterhead. Products failing to meet or exceed these requirements will be rejected without notice. The faceplates shall feature an elegant two-piece (2 plate) design that enhances aesthetics while providing functionality. The cover and base materials of the faceplates shall meet a minimum standard of ABS-UL94-V2, ensuring durability and safety in installation. Additionally, the faceplates shall be suitable for both flush and wall-mounted gang boxes, offering flexibility in installation options dimensions of the faceplates shall be 86 x 86 x 12.8 mm, providing a standard fit for common installations. This adherence to specified makes and standards will ensure that the system functions at peak efficiency and reliability, meeting the demanding needs of professional environments OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation End	20.000				NO	One Number
19	Supply, Installation, Testing, and Commissioning (SITC) of armoured fiber cable with 6/12 core single mode (OS2) configuration, compliant with ITU G.652.D and G.657A1 standards. This outdoor ECCS armoured fiber cable shall feature a PBT loose tube filled with thixotropic jelly, designed for durability and protection in harsh environments. The cable construction shall include a uni-tube design with color-coded fibres according to EIA/TIA 598 standards, ensuring ease of identification during installation The loose tube shall have a nominal diameter of 2.5mm and be armoured with corrugated ECCS tape, having a nominal thickness of 0.155mm, providing excellent tensile and crush resistance. The outer sheath shall be made of UV-resistant HDPE, with a moisture barrier provided by water-blocking tape located under the Armor. Glass yarns shall serve as the strength member over the central tube, enhancing the cable's overall mechanical integrity physical and mechanical characteristics of the fiber cable shall include an outer diameter of 9.0 +/- 1.0 mm and a nominal jacket thickness of 1.5 mm. The cable shall demonstrate a tensile strength of ≥ 2220 Newton (as per IEC 60794-1-2-E1) and a bending radius not exceeding 20 times the outer diameter (OD) (as per IEC 60794-1-2-E11). Crush resistance shall be at least 2200 Newton/100mm (as per IEC 60794-1-2-E3) and the cable shall meet the water penetration requirements outlined in IEC 60974-1-2 (24 Hr, 3 Meter Sample, 1 Meter Height). The weight of the cable shall not exceed 95 Kg/km environmental characteristics shall indicate an operating temperature range of -30°C to +70°C (as per IEC 60794-1-2-F1), a storage temperature range of -10°C to +60°C, and an installation temperature range of -30°C to +70°C. The cable shall be ROHS compliant, as stated in the data sheet. Optical characteristics shall specify that the fiber type is SM (9/125) OS2, with a maximum attenuation of 0.36 dB/km at 1310nm and 0.23 dB/km at 1550nm. The mode field diameter at 1310nm shall be 8.8 +/- 0.4 µm, and dispersion shall be ≤ 3.5 ps/nm.km and ≤ 17.5 ps/nm.km. Continued	300.000				MTR.	One Meter
	. The fiber cut-off wavelength shall be ≤ 1320 nm, while the cable cut-off wavelength shall be ≤ 1260 nm. The zero dispersion wavelength shall fall between 1300-1324 nm, with a zero dispersion slope of ≤ 0.090 ps/nm ² .km coating diameter shall measure 250 ± 15 µm, and the cladding diameter shall be 125 ± 0.7 µm. The fiber curl shall have a radius of ≥ 4 m, while the cladding non-circularity shall be ≤ 1%. The mode field concentricity error shall be ≤ 0.8 µm, and the coating/cladding concentricity error shall not exceed ≤ 12 µm. The cable shall be packaged in a wooden spool with a minimum roll length of 2KM. This adherence to specified makes and standards will ensure that the fiber optic cable functions at peak efficiency and reliability, meeting the demanding needs of professional environments OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation End						

20	Supply, Installation, Testing, and Commissioning (SITC) of 6 port 1U x 19" Line Interface Unit (LIU) that is fully loaded with single mode OS2 LC UPC adapters and LSZH pigtails, including splice trays. This unit will feature a minimum of four circular cable entry points, equipped with rubber grommets or glands to seal any open entries. Inside the panel, there will be cable holders to facilitate proper cable entry and management, heat shrink tubes for splices, and tubes for open fibers, ensuring a tidy and organized installation. The panel shall be constructed from a minimum of 1.2mm metal sheathing and finished with a powder coating to enhance durability and aesthetics, and it will carry a 30-year channel warranty. The factory-loaded LC UPC type LSZH pigtails will conform to various IEC standards, including IEC 61034-1, IEC 60332-1, and IEC 60754-1. The insertion loss for the pigtails will not exceed 0.35 dB, while the return loss will be greater than or equal to 50 dB for UPC and 65 dB for APC configurations. The attenuation will be specified at 0.3 dB/km for 1310 nm and 0.2 dB/km for 1550 nm, maintaining a repeatability of 0.2 dB over 1,000 mating cycles. Compliance with RoHS standards is mandatory, and the pigtails will also meet the requirements set forth in ANSI/TIA 568.3-D the fiber panel will include a telescopic sliding shelf that allows for easy access and smooth operational changes, whether for additions or modifications. cable holders to ensure efficient cable management LIU to be completely enclosed, the unit will prevent any open areas that could allow rodent entry, thereby ensuring the integrity and longevity of the installation. The pigtail buffer jacket material will adhere to LSZH specifications compliant with IEC 61034-1, IEC 60332-1, and IEC 60754-1. The performance parameters for the pigtails will be rigorously maintained, including connector insertion loss, which will be better than 0.35 dB, and the return loss, which should be greater than or equal to 50 dB for UPC and 65 dB for APC configurations. The unit's attenuation specifications will confirm performance at 1310 nm and 1550 nm, ensuring reliability and efficiency. The specifications below outline the minimum design requirements, which the bidder must strictly adhere to. Higher-performance alternatives are encouraged and will be considered. The bidder must submit Manufacturer Authorization with the technical bid, along with a compliance statement on the Manufacturer's letterhead. Products failing to meet or exceed these requirements will be rejected without notice. End	6.000				NO	One Number	
21	Supply, Installation, Testing, and Commissioning (SITC) of 12 port 1U x 19" Line Interface Unit (LIU) that is fully loaded with single mode OS2 LC UPC adapters and LSZH pigtails, including splice trays. This unit will feature a minimum of four circular cable entry points, equipped with rubber grommets or glands to seal any open entries. Inside the panel, there will be cable holders to facilitate proper cable entry and management, heat shrink tubes for splices, and tubes for open fibers, ensuring a tidy and organized installation. The panel shall be constructed from a minimum of 1.2mm metal sheathing and finished with a powder coating to enhance durability and aesthetics, and it will carry a 30-year channel warranty. The factory-loaded LC UPC type LSZH pigtails will conform to various IEC standards, including IEC 61034-1, IEC 60332-1, and IEC 60754-1, with performance specifications ensuring optimal functionality. The insertion loss for the pigtails will not exceed 0.35 dB, while the return loss will be greater than or equal to 50 dB for UPC and 65 dB for APC configurations. The attenuation will be specified at 0.3 dB/km for 1310 nm and 0.2 dB/km for 1550 nm, maintaining a repeatability of 0.2 dB over 1,000 mating cycles. Compliance with RoHS standards is mandatory, and the pigtails will also meet the requirements set forth in ANSI/TIA 568.3-D the fiber panel will include a telescopic sliding shelf that allows for easy access and smooth operational changes, whether for additions or modifications. The optical fiber pigtails will be factory-loaded within each individual port of Continued	5.000				NO	One Number	
	the panel, utilizing LSZH material for the buffer jacket to ensure compliance with relevant IEC standards. Furthermore, the panel will feature a minimum of four cable entry slots located at the back, supplied with cable holders to ensure efficient cable management LIU to be completely enclosed, the unit will prevent any open areas that could allow rodent entry, thereby ensuring the integrity and longevity of the installation. The pigtail buffer jacket material will adhere to LSZH specifications compliant with IEC 61034-1, IEC 60332-1, and IEC 60754-1. The performance parameters for the pigtails will be rigorously maintained, including connector insertion loss, which will be better than 0.35 dB, and the return loss, which should be greater than or equal to 50 dB for UPC and 65 dB for APC configurations. The unit's attenuation specifications will confirm performance at 1310 nm and 1550 nm, ensuring reliability and efficiency. OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation. End..							
22	Supply, Installation, Testing, and Commissioning (SITC) of Fiber Patch Cord 2 Mtr, specifically LC Duplex - LC Duplex, will feature 9/125µm OS2 single-mode duplex zip cord with a maximum outer diameter of 2.0mm. This fiber patch cord will meet stringent performance specifications, ensuring an insertion loss (IL) of no more than 0.35 dB and a return loss (RL) of at least 50 dB. The patch cord will be constructed with an LSZH (Low Smoke Zero Halogen) jacket that complies with IEC 60332-1, ensuring safety in environments where fire hazards are a concern. Operating within a temperature range of -40°C to +85°C, this fiber patch cord is designed to perform reliably in extreme conditions. It will adhere to the specifications outlined in ANSI/TIA 568.3-D, ensuring compatibility and performance in high-speed data transmission applications. The length of each patch cord will be 3 meters, suitable for a variety of installation needs. The cables can be configured as LC/LC, LC/SC, or SC/SC, and will consist of single-mode 9/125µm fiber for optimal performance. Each patch cord will have its OEM name prominently printed on the cable, ensuring authenticity and traceability. The attenuation specifications will be set at 0.35 dB/km for 1310 nm and 0.20 dB/km for 1550 nm, contributing to efficient data transmission over long distances. The repeatability of the connectors will guarantee a performance threshold of no more than 0.2 dB across 1,000 mating cycles, confirming durability and reliability in repeated use. Lastly, compliance with RoHS standards ensures that the materials used in the patch cords are free from hazardous substances, aligning with environmental safety regulations. The overall design and specifications of the Fiber Patch Cord will meet the highest industry standards, making them an ideal choice for professional networking environments. OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation. End.....	50.000				NO	One Number	
23	Supply, Installation, Testing, and Commissioning (SITC) of Core Switch shall be equipped with advanced functionalities including flow control, port mirroring, MAC address filtering, and robust support for IPv6 and IP address filtering. It shall incorporate iStacking Technology, sFlow, and support for various spanning tree protocols including Spanning Tree Protocol (STP), Rapid Spanning Tree Protocol (RSTP), and Multiple Spanning Tree Protocol (MSTP). VRRP support shall be mandatory for high availability. Additional features such as DHCP snooping, Access Control List (ACL) support, Quality of Service (QoS), Class of Service (CoS), Equal-Cost Multipath (ECMP) routing, DHCP relay, GARP VLAN Registration Protocol (GVRP), and Err Disable Recovery are required. Switch must also include One Network (ZON) for simplified management, CPU protection, IP source guard, ARP inspection, Network Timing Protocol (NTP), and advanced security protocols like Loop Guard and Smart Connect. Guest VLAN support is necessary for secure access management. The switch shall support flexible Multi-Gigabit connections, ranging from 100M to 10G speeds, and should include a console port (DB9). It shall come with a minimum of three fans to ensure proper cooling. The switch should deliver non-blocking wire-speed performance with a minimum switching capacity of 560 Gbps and a forwarding rate of 416 Mpps. Memory and storage requirements include support for a minimum of 32K MAC addresses, 4K VLANs, a 4M on-chip packet buffer (both Egress and Ingress), dual flash storage (64 MB), and 8GB of RAM. The switch should handle 12K byte jumbo frames and comply with the IEEE (802.3az) standard for energy efficiency, minimizing power consumption. Dual software image support is required for reliability during upgrades. Power management should include support for an optional external redundant power supply and removable fans, with an acoustic noise level of 58 dBA or better. It must comply with IEEE standards including IEEE 802.3, IEEE 802.3u, IEEE 802.3ab, IEEE 802.3z, IEEE 802.3x, IEEE 802.1p, IEEE 802.1X, and IEEE 802.3ad for traffic management and aggregation. For traffic management and QoS, the switch must support rate limiting with 64 kbps granularity, port-based egress traffic shaping, and broadcast storm control. It should support IEEE 802.1p with 8 priority queues per port and various scheduling algorithms like WRR, SPQ, and WFQ. Continued	5.000				NO	One Number	
	It must also support DSCP and DSCP to 802.1p priority mapping, along with IGMP snooping for versions v1, v2, and v3, with congestion control on all ports. VLAN capabilities should include port-based, protocol-based, and private VLANs, 802.1ad VLAN stacking (Q-in-Q), and automatic VLAN member registration (GVRP). The switch shall support static and dynamic VLANs, with at least 1K static VLANs and up to 4K dynamic VLANs. The switch must provide high bandwidth with true physical stacking capability, supporting up to 4 units for redundancy and resilience. It must support a total port density of 28 or more, including 4 ports compatible with 100M/1G/2.5G/5G/10G speeds. It should include 16 SFP+ (10Giga Fiber) ports and 8 additional 10Giga Ethernet ports for high-speed uplink and connectivity. Advanced security, management, and Layer-3 capabilities for robust network performance and manageability. It supports port-based VLANs and VLAN isolation, enhancing segmentation within the network. For security, it features an intrusion lock along with static and dynamic MAC binding, ensuring that only authorized devices can connect. The switch supports specific MAC forwarding per port, which allows only designated MAC addresses to access the network, thereby enhancing security through strict access controls. Additionally, it supports a limited MAC number per port with configurable MAC aging times, IP source guard, and loop guard. It also incorporates RADIUS for MAC login, IP filtering, TCP/UDP socket filtering, and BFD/UDF transparency. The switch implements 802.1X port-based authentication, allowing compensated assignment over VLANs and bandwidth for voice access, alongside support for TACACS+ and password encryption. Network administration security is reinforced through username/password requirements for web, Telnet, and local console access, two-level security by specific SNMP read/write community, and multiple login sessions with varying access permissions. The switch supports SSH v1/v2, SSL, IPv6 over Ethernet, and various IPv6 addressing features, including dual-stack and Neighbor discovery. Layer-3 capabilities include VRRP for redundancy, ECMP for multipath routing, and static routing with a minimum of 1,000 entries for both IPv4 and IPv6. Continued							

	<p>It features a management software suite for centralized control of multiple switches, supports a clustering of at least 20 switches under a single IP address, and offers web-based management, Telnet CLI, SNMP v1, v2c, v3, and RS 232c local console access. The switch includes IP management options for static IP or DHCP clients, RMON for enhanced traffic management, port mirroring capabilities, and intelligent ACLs based on various criteria, including MAC address, VLAN, IP address, protocol type, and TCP/UDP type. Overall, the Core Switch is built to meet rigorous standards for performance, security, and flexibility in a modern networking environment. Core Switch complies with industry standards and specifications, including support for RFC 1643 Ethernet MIB, RFC 2358 Ethernet-like MIB, and RFC 1757 RMON groups 1, 2, 3, and 9, along with RFC 2819 and 2925 for remote management. It adheres to various regulatory certifications such as LVD, SNMI, FCC Part 15 (Class A), CE EMC (Class A), BSMI ENC, and RoHS (Level A). The OEM brand must possess valid ISO 9000, ISO 14000, and ISO 50001 certificates, which should be submitted with the technical bid to ensure quality and environmental compliance. The operating temperature range for the switch is between 0°C to 50°C, with a storage temperature of -40°C to 70°C, and it operates efficiently in humidity levels of 10% to 95% (non-condensing). It features an internal dual AC power supply and boasts a Mean Time Between Failures (MTBF) of 65,620 hours or better. The switch is equipped with auto-detection capabilities to identify connected devices, providing information such as model, firmware version, MAC address, IP address, and system name on a web-based management interface. Users can access web redirection to connected devices and reset them to factory defaults if necessary. A centralized management utility is available to facilitate the discovery and configuration of network devices, simplifying network maintenance. To ensure seamless compatibility, all active components, including switches, access points, and SFP modules, must be of the same make and manufacturer and backed by the same OEM warranty. Additionally, the latest datasheet must be attached to the tender documentation. OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation. End</p>					
24	<p>Supply, Installation, Testing, and Commissioning (SITC) of Data Distribution Switches low control, VLAN support, IGMP snooping, Syslog support, port mirroring, Weighted Round Robin (WRR) queuing, MAC address filtering, Broadcast Storm Control, IPv6 support, URL filtering, IP address filtering, Multicast Storm Control, firmware upgradable, Weighted Fair Queuing (WFQ), Stacking Technology, sFlow, Spanning Tree Protocol (STP) support, Rapid Spanning Tree Protocol (RSTP) support, Multiple Spanning Tree Protocol (MSTP) support, DHCP snooping, Access Control List (ACL) support, Quality of Service (QoS), MLD snooping, STP Root Guard, IPv4 support, DHCP relay, Port Security, IP-MAC binding, SNMP trap, DHCP client, Energy Efficient Ethernet, Management Information Base (MIB), Multicast VLAN Registration (MVR), dual firmware images, Strict Priority Queueing (SPQ), Neighbor Discovery Protocol (NDP), loop prevention, NTP time synchronization, port isolation, Class of Service (CoS), tagged Anagentic VLAN Registration Protocol switch shall have a total of 30 Gigabit ports, including 24 units of 10/100/1000 Mbps RJ-45 Ethernet ports and 4 x 1G SFP/10G SFP+ slots modulated with SFP. It shall feature a non-blocking wire-speed switch fabric with a minimum backplane capacity of 168 Gbps or more and a minimum forwarding capacity of 125 Mpps or more. The switch shall be flexible enough to be managed in both cloud and standalone modes, with basic cloud management available from day one. It shall support a minimum of 32K MAC addresses and 4K VLANs. Switch shall include a USB-C out-of-band console port, a 2 MB packet buffer (egress/ingress), 64 MB flash memory, and 1 GB RAM or more. It shall support 1K IPv4 static routes and 512K IPv6 static routes. Furthermore, the switch shall comply with the Energy Efficient Ethernet (EEE) standard (802.3az) to minimize power consumption and shall support dual software (firmware) images. The switch shall have the capability to perform virtual stacking of up to 20 units per IP. It shall support the following standards: IEEE 802.3 (10BASE-T Ethernet), IEEE 802.3u (100BASE-TX Ethernet), IEEE 802.3ab (1000BASE-T Ethernet), IEEE 802.3z (1000BASE-X Ethernet), and IEEE 802.3x (flow control). It shall also comply with IEEE 802.1p class of service and priority protocols, IEEE 802.1X port authentication, and IEEE 802.3ad LACP aggregation. Continued</p> <p>switch shall support rate limiting with rule-based and port-based bandwidth control at 64 kbps granularity. It shall provide port-based egress traffic shaping and broadcast storm control. IEEE 802.1p shall be implemented with 8 priority queues per port for different traffic types, employing Weighted Round Robin (WRR), Strict Priority Queueing (SPQ), and Weighted Fair Queuing (WFQ) scheduling algorithms. The switch shall support DSCP and DSCP to 802.1p priority mapping. Additionally, it shall support IGMP snooping (versions 1, 2, and 3) with congestion control on all ports. Compliance with IEEE 802.3ad LACP for link aggregation shall be required, allowing for static manual port trunking of up to 8 aggregation groups with 8 ports per group. Selected randomly switch shall support MAC filtering per port to secure access to each port. It shall support IEEE 802.1Q tag-based and port-based VLAN configurations, as well as guest VLANs (port-based and MAC-based). The switch shall accommodate at least 9 MAC addresses per port (exclusive of protocol-based and IP subnet-based VLANs for 8/24 port devices). It shall support GVRP for automatic VLAN member registration, providing a minimum of 4K static VLANs, up to 4K dynamic VLANs, and full range 4K PVID support. The switch shall also support port-based VLAN and VLAN isolation, along with protocol- and IP-based VLANs, including guest VLANs, private VLANs, MAC-based VLANs, voice VLANs, dynamic VLANs, GARP with GVRP/GMRP, and double tagging (QinQ) switch shall support intrusion lock for enhanced security and shall implement static and dynamic MAC binding. It shall enable specific MAC forwarding per port, allowing only specified MAC addresses to access the network (port security). The switch shall limit the number of MAC addresses per port and be capable of setting MAC aging time. It shall support IP source guard and loop guard functionalities. Additionally, the switch shall incorporate RADIUS MAC login and IP filtering capabilities, along with TCP/UDP socket filtering and BPDU transparency. The switch shall comply with IEEE 802.1X port-based authentication and shall facilitate compensated assignment over VLANs and bandwidth for valid access. It shall also support TACACS+ and password encryption for network security. Switch shall require a username and password for web, Telnet, and local console administrators, providing two-level security through specific SNMP read/write community configurations. It shall allow multiple login sessions and support multiple access permission management. Continued</p> <p>The switch shall also support SSH versions 1 and 2, as well as SSL for secure management. The switch shall support IPv6 over Ethernet, including IPv6 addressing, IPv6 Path MTU, ICMPv6, dual stack functionality, Neighbor discovery, and DHCPv6 client and relay support. Switch shall be supplied with management software capable of managing and maintaining multiple switches from a central location. It shall support MED (Media Endpoint Discovery) and clustering for at least 20 switches, allowing management through a single IP address. The switch shall provide web-based management, Telnet CLI, and SNMP versions 1, 2c, and 3, as well as a USB-C out-of-band console port. It shall support both static IP and DHCP client configurations and shall function as a DHCP server with mirror CPU capabilities. The switch shall implement RMON with four groups (1, 2, 3, 9) for enhanced traffic management, monitoring, and analysis. Port mirroring shall support source, destination, and both port mirroring switch shall include intelligent ACL (Access Control List) functionality for L2, L3, and L4, based on MAC address, VLAN, IP address, protocol type, TCP/UDP type, and DSCP. Compliance with relevant standards and protocols shall include RFC 1066 (TCP/IP-based MIB), RFC 1213, RFC 1157 (SNMP v2c/v3 MIB), RFC 2011, 2012, 2013 (SNMP v2 MIB), RFC 1493 (bridge MIB), RFC 2674 (bridge MIB extension), RFC 1643 (Ethernet MIB), RFC 2358 (Ethernet-like MIB), RFC 1757 (RMON groups 1, 2, 3, 9), RFC 2819, and RFC 2925 (Remote Management MIB). Switch shall be CE-LVD, FCC, CE, BSMI, and RoHS compliant. The OEM brand shall possess valid ISO 9000 and ISO 14000 certifications, with all certificates submitted in the technical bid. The operating temperature shall range from 0°C to 50°C, with a storage temperature of -40°C to 70°C and an operating humidity range of 10% to 95% (non-condensing). The input power requirements shall be 100-240V AC at 50/60 Hz. OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation. End</p>	22.000			NO	One Number
25	<p>Supply, Installation, Testing, and Commissioning (SITC) of POE + Switches 24-port GbE L3 Access PoE+ Switch with 6 10G Uplink (400 W) shall be designed to serve as a robust Layer 3 access solution, featuring a total port count of 30. This switch must include 24 ports that support 100/1000 Mbps Ethernet connectivity, along with 2 additional ports for 1G/2.5G/5G/10G Ethernet (RJ-45), and 4 ports designated for Power over Ethernet (PoE) applications. Furthermore, the device shall be equipped with 2 ports for 1G SFP/10G SFP+ uplinks. In terms of power and PoE capabilities, the switch must provide a total PoE budget of 400 watts. Specifically, ports 1 through 16 shall support IEEE 802.3at (PoE+), while ports 17 through 24 shall support IEEE 802.3bt (PoE++ , 60 W). The maximum power consumption of the switch shall not exceed 477 watts to ensure efficient operation. Performance-wise, the switch shall have a switching capacity of 168 Gbps and a forwarding rate of at least 125 Mpps. Additionally, the packet buffer must be a minimum of 2 MB, supporting the smooth handling of network traffic. The MAC address table shall support up to 32,000 addresses, while the switch must accommodate jumbo frames of up to 9 KB. For routing capabilities, the switch shall include a Layer 3 forwarding table with a maximum of 1,024 IPv4 entries and 512 IPv6 entries. The routing table must provide support for 64 IP interfaces. Switch shall operate within an input power range of 100 - 240 V AC, 50/60 Hz and must include robust surge protection features, such as 2 kV for Ethernet ports and 1 kV for line-to-line protection. Furthermore, the Ethernet port must feature ESD protection ratings of 8 kV for air discharge and 6 kV for contact discharge. For environmental resilience, the switch must operate effectively in temperatures ranging from 20°C to 50°C (-40°F to 122°F) and humidity levels between 10% to 95% (non-condensing). Storage conditions shall allow for temperatures from -40°C to 70°C (-40°F to 158°F), with humidity levels maintained between 10% to 90% (non-condensing). To ensure reliability, the switch shall demonstrate a mean time between failures (MTBF) of at least 268,305 hours and a heat dissipation rating of 1626.57 BTU/hr. Acoustic noise levels at 25°C must not exceed 30.21 dBA (minimum) and 50.21 dBA (maximum). Switch shall be compliant with various IEEE standards, including but not limited to IEEE 802.3z (1000BASE-X), IEEE 802.3ab (1000BASE-T Ethernet), IEEE 802.3an (10G BASE-T Ethernet), Continued</p>	20.000			NO	One Number

	<p>IEEE 802.3ae (10 Gbit/s Ethernet over fiber), IEEE 802.3af (PoE), IEEE 802.3at (PoE+), IEEE 802.3bt (60 W) PoE over 4 pair, IEEE 802.3az (EEE), IEEE 802.3x (flow control), IEEE 802.1AB (LLDP/LLDP-MED), IEEE 802.1Q (VLAN tagging), IEEE 802.1p (CoS prioritization), and IEEE 802.1X (port authentication) resilience and availability features shall include IEEE 802.1D (Spanning Tree Protocol), IEEE 802.1w (Rapid Spanning Tree Protocol), and IEEE 802.1s (Multiple Spanning Tree Protocol), along with static port trunking, IEEE 802.3ad (LACP), loop guard, root guard, BPDU guard, and err disable recovery. The switch shall support flexible stacking via 2 or 4 ports and must allow for both static and dynamic VLANs, with a limit of 4,000 VLANs. The switch must also provide advanced traffic control mechanisms, including port-based VLANs, VLAN isolation, vendor ID-based VLANs, protocol-based VLANs, IP subnet-based VLANs, MAC-based VLANs, private VLANs, and voice VLANs. The switch shall support flexible stacking via 2 or 4 ports and must allow for both static and dynamic VLANs, with a limit of 4,000 VLANs. The switch must also provide advanced traffic control mechanisms, including port-based VLANs, VLAN isolation, vendor ID-based VLANs, protocol-based VLANs, IP subnet-based VLANs, MAC-based VLANs, private VLANs, and voice VLANs. Independent VLAN Learning (IVL) to ensure the flexibility of VLAN management. Additionally, it shall provide VLAN Translation, VLAN trunking, VLAN mapping, and support for IEEE 802.1AD VLAN stacking (QinQ), allowing for a comprehensive VLAN configuration. The switch must implement VLAN ingress filtering to enhance network security and management capabilities. For link aggregation, the switch shall utilize the LACP algorithm for source/destination IP or MAC, ensuring optimal bandwidth utilization and redundancy. The switch must also support GVRP for dynamic VLAN registration and L2PT Security to protect against unauthorized access. Security features shall include port security, Layer 2 MAC filtering, Layer 3 IP filtering, and Layer 4 TCP/UDP socket filtering. Furthermore, static MAC forwarding shall be supported to ensure reliable traffic routing. To enhance authentication and authorization, the switch shall accommodate multiple RADIUS and TACACS+ servers, enabling 802.1x VLAN and 802.1p assignment by RADIUS. It must provide login authentication via both RADIUS and TACACS+, along with accounting capabilities for both protocols. Compound authentication and authorization via RADIUS and TACACS+ shall be supported to strengthen security protocols. The switch must support SSH v2 and SSL for secure communications. Continued</p> <p>the switch shall feature MAC freeze, IP source guard (for both IPv4 and IPv6), DHCP snooping, and DHCP Server Guard to mitigate the risk of unauthorized network access. ARP inspection, ARP freeze, and anti-ARP scan functionalities must be included to protect against ARP spoofing. The switch shall support static IP-MAC-Port binding and policy-based security filtering to provide granular control over network access. Furthermore, features such as port isolation and MAC search shall enhance network segmentation and security. Guest VLAN functionality must also be included to support secure guest access. Access Control Lists (ACL) for packet filtering (both IPv4 and IPv6) shall be implemented to manage incoming and outgoing traffic effectively. The switch must provide CPU protection and allow for interface-related traps to be enabled or disabled by port. MAC-based authentication per VLAN and BPDU transparency shall be supported to streamline network management. The switch must also offer PPPoE relay agent support and option 82 for effective PPPoE management, as well as Wake-on-LAN (WoL) and WoL relay capabilities. In terms of Quality of Service (QoS), the switch shall feature a minimum of 8 hardware queues per port for standalone configurations and 6 queues for stacking, ensuring optimal traffic management. Storm control and event logging for broadcast, multicast, and unknown unicast (DLF) traffic must be included to monitor and manage network performance. Port-based rate limiting for both ingress and egress traffic shall be supported, alongside rate limiting per IP, TCP, and UDP per port. The switch must incorporate policy-based rate limiting and implement 802.3x flow control to manage congestion effectively. For Layer 2 multicast support, the switch shall feature L2 multicast functionality, along with IGMP snooping (versions 1, 2, and 3) and related features such as fast leave and immediate leave. The switch must support configurable IGMP snooping timers and priorities, along with IGMP snooping statistics, throttling, and filtering. Selection between IGMP proxy mode and snooping mode shall also be available, along with multicast load sharing over trunking ports and static multicast support. Additionally, Multicast VLAN Registration (MVR) and MLD snooping (MLD v1 and v2) must be supported for enhanced multicast management. Routing capabilities shall include static routes, IP port moving functionalities, and DHCP relay to streamline network operations. For manageability, Continued</p> <p>the switch must support SNMP versions 1, 2c, and 3, with SNMP trap groups and RMON (1, 2, 3, and 9) for monitoring and reporting. ICMP echo and echo reply functionalities shall be implemented, along with Syslog support for both IPv4 and IPv6. The switch shall feature IEEE 802.1AB LLDP and LLDP-MED for device discovery and network mapping, with customizable defaults for ease of management. switch shall support IPv6 over Ethernet as specified in RFC 2464 and adhere to the IPv6 addressing architecture defined in RFC 4291. It must implement dual stack capability in accordance with RFC 4213, facilitating seamless operation in both IPv4 and IPv6 environments. The switch shall support ICMPv6 as per RFC 4443 and Path MTU discovery based on RFC 1981, with a minimum path MTU size of 1280 bytes as specified in RFC 5095. It must ensure encapsulation for a maximum PMTU of 1500 bytes. Additionally, the switch shall implement Neighbor Discovery as per RFC 4861, support DHCPv6 snooping, and provide IPv6 binding for both static and dynamic configurations. It shall extend RADIUS server capabilities for IPv6 and support DHCPv6 relay along with a default DHCP client mode. Device management capabilities must include standalone management through a web interface and cloud management via the Control Center. The switch shall feature a networked AV mode accessible through the web interface, providing an intuitive cloud connection status. Stacking technology must be supported for simplified management. Management options shall include console access, Telnet, and SNMP for versatile control. The switch shall facilitate remote firmware upgrades via FTP, web, or TFTP, as well as configuration saving and retrieving functionalities. Support for multiple logins must be included, along with a configure clone option and custom default configuration capabilities. Continued</p> <p>A multilevel CLI and a Cisco-like CLI shall be provided for ease of management. The switch must support DHCP relay per VLAN, DHCP client for both IPv4 and IPv6, and DHCP client option 60, along with DHCP option 82 for enhanced configuration. Features such as Daylight Saving Time, DHCP relay MAC proxy, Auto PD Recovery, and NTP support for both IPv4 and IPv6 shall also be included. Additional management functionalities must comprise port mirroring (policy-based, VLAN-based, and mirror CPU), a USB-C out-of-band console port, scheduled PoE, PoE default consumption mode, continuous PoE, LLDP power via MDI, and sFlow for network traffic analysis. The switch must comply with various certifications to ensure safety and electromagnetic compatibility (EMC). Safety certifications shall include LVD and BSMI. EMC certifications shall adhere to FCC Part 15 (Class A), CE EMC (Class A), and BSMI EMC standards. Additionally, the switch must comply with RoHS Level A regulations for environmentally friendly design. OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation. End</p>						
26	<p>Supply, Installation, Testing, and Commissioning (SITC) of 8 Port Gigabit + 2 Port Gigabit SFP Managed Industrial PoE Switch. The detailed technical specifications for the network switch are as follows: Network Ports: The device must feature 8 x 10/100/1000Mbps Ethernet ports, 2 x 1000Mbps Small Form-factor Pluggable (SFP) ports, and 1 console port. Additionally, it should support a group of alarm output and relay output, which can be configured for various custom condition triggers. Network Standards: It must adhere to the IEEE standards, including IEEE 802.3i, IEEE 802.3u, IEEE802.3ab, IEEE802.3x, IEEE802.3az, IEEE802.3af, and IEEE802.3at. Twisted Pair Transmission: It should support transmission over 10BASE-T (Cat3, 4, 5 UTP up to 100 meters), 100BASE-TX (Cat5 or higher UTP up to 100 meters), and 1000BASE-T (Cat5 or higher UTP up to 100 meters). Optical Cable: For optical transmission, it must support multi-mode (850nm up to 550 meters), single-mode (1310nm up to 40 kilometres, 1550nm up to 120 kilometres). Transfer Method: Store-and Forward. MAC Address Table: It should support a MAC address table with a capacity of 8K addresses. Switching Capacity and Forwarding Rate: The switching capacity should be 20Gbps, and the forwarding rate must reach 14.88Mpps (million packets per second). Packet Buffer and Jumbo Frame: A packet buffer of 4 Mbits is required, with support for jumbo frames up to 12K bytes. Indicators: The switch must have network indicators for link status (yellow), SFP status (green), PoE status (green), and a system indicator (green). Power Specifications: The switch must have a maximum PoE power budget of 120W and support a 4-core power supply using pins 1/2 (+) and 3/6 (-). The power input should be dual DC 48-56V suitable for industrial-grade power supplies. The maximum per port power consumption is 30W, with overall power consumption being less than 100W in standby mode and less than 240W at full load. 8 Port Gigabit + 2 Port Gigabit SFP Managed Industrial PoE Switch. The detailed technical specifications for the network switch are as follows: Network Ports: The device must feature 8 x 10/100/1000Mbps Ethernet ports, 2 x 1000Mbps Small Form-factor Pluggable (SFP) ports, and 1 console port. Additionally, it should support a group of alarm output and relay output. Continued</p>	8.000			NO	One Number	

	<p>which can be configured for various custom condition triggers. Network Standards: It must adhere to the IEEE standards, including IEEE 802.3i, IEEE 802.3u, IEEE802.3ab, IEEE802.3x, IEEE802.3az, IEEE802.3af, and IEEE802.3at. Twisted Pair Transmission: It should support transmission over 10BASE-T (Cat3, 4, 5 UTP up to 100 meters), 100BASE-TX (Cat5 or higher UTP up to 100 meters), and 1000BASE-T (Cat5 or higher UTP up to 100 meters). Optical Cable: For optical transmission It should support a MAC address table with a capacity of 8K addresses. Switching Capacity and Forwarding Rate: The switching capacity should be 20Gbps, and the forwarding rate must reach 14.88Mbps (million packets per second). Packet Buffer and Jumbo Frame: A packet buffer of 4 Mbits is required, with support for jumbo frames up to 12K bytes. Indicators: The switch must have network indicators for link status (yellow), SFP status (green), PoE status (green), and a system indicator (green). Power Specifications: The switch must have a maximum PoE power budget of 120W and support a 4-core power supply using pins 1/2 (+) and 3/6 (-). The power input should be dual DC 48-55V suitable for industrial-grade power supplies. The maximum per port power consumption is 30W, with overall power consumption being less than 10W in standby mode and less than 240W at full load. The switch must have a maximum PoE power budget of 120W and support a 4-core power supply using pins 1/2 (+) and 3/6 (-). The power input should be dual DC 48-55V suitable for industrial-grade power supplies. The maximum per port power consumption is 30W, with overall power consumption being less than 10W in standby mode and less than 240W at full load. Port Features: It should support IEEE802.3x flow control, broadcast storm suppression, speed limit control with a minimum granularity of 64Kbps, and power-saving EEE settings. PoE Management: The device must include PoE power limit configuration, allocation per port, power status display, priority settings, and scheduling functions. LAN Support: It should support port-based VLAN (up to 4K VLANs), IEEE802.1q, MAC based VLANs, voice VLANs, and include Access, Trunk, Hybrid configurations, as well as QinQ and GVRP Resiliency. Support for loopback detection, IEEE 802.1AB for LLDP, and EAPS/ERPS protocols must be present. Continued</p> <p>Layer 3 Functions: It should support L2+ network management functions including IPv4/IPv6 management, soft routing for communication across different network segments, static routing, and ARP software forwarding. Port Aggregation: It should support LACP and static aggregation, with a maximum of 8 aggregation groups and up to 8 ports per group. Spanning Tree and Industrial Ring: It must support STP (IEEE802.1d), RSTP (IEEE802.1w), and MSTP (IEEE802.1s). It must support multi-mode (850nm up to 550 meters), single-mode (1310nm up to 40 kilometres, 1550nm up to 120 kilometres). Transfer Method: Store-and Forward. MAC Address Table: It should also support G.8032 (ERPS) with a capacity of up to 255 loops and 1024 devices per ring, with a self-healing time of less than 20ms. QoS: The switch should support Diff-Serv QoS, 802.1p/DSCP priority mapping, and a queue scheduling mechanism including SP, WRR, and SP+WRR. It should also support traffic shaping and prioritization features. Security Features: Required security measures include user grading management, AAA and RADIUS authentication, MAC address learning restrictions, IEEE802.1X authentication, ARP intrusion detection, and DoS attack protection, among others. IPv6: The device must support IPv6 features including ICMPv6, DHCPv6, ACLv6, Telnet, and Neighbor Discovery. Multicast: It must support IGMP Snooping V1/V2, with support for up to 1024 multicast groups, MLD Snooping V1/V2, and multicast VLANs. ACL: Support for L2 to L4 packet filtering, based on various criteria such as MAC and IP addresses, TCP/UDP ports, VLANs, etc. Mirroring and Management: The device should support bi-directional port mirroring, DHCP options, SNMP, and various remote management protocols including SSH and HTTPS. Maintenance features should include system logging, ping tests, and support for network time protocols. Operating Temperature and Humidity: The switch should operate reliably in temperatures ranging from -40°C to +75°C, with a relative humidity range of 5% to 90% (non-condensing). These detailed specifications ensure that the switch meets the industrial requirements for network performance, durability, and security in diverse environments. OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation End</p>					
27	<p>Supply, Installation, Testing, and Commissioning (SITC) of Indoor wireless access point shall comply with the IEEE 802.11 standards, including a, ac, n, g, b, and a, ensuring comprehensive wireless connectivity. It must support MIMO (Multiple Input Multiple Output) and MU-MIMO (Multi-User MIMO) technologies to enhance performance and capacity. The device is designed to provide wireless speeds of 575 Mbps at 2.4 GHz and 2400 Mbps at 5 GHz. Operating within the frequency bands of 2.4 GHz, which encompasses 2.412 to 2.462 GHz in the USA (FCC) and 2.412 to 2.472 GHz in Europe (ETSI), as well as 5 GHz, which covers 5.15 to 5.35 GHz and 5.470 to 5.850 GHz in the USA and 5.15 to 5.35 GHz and 5.470 to 5.725 GHz in Europe, the access point ensures compatibility across regions. The device must also support various bandwidth options, including 20, 40, 80, and 160 MHz, to optimize network performance. Typical transmit output power is limited by local regulatory requirements, with maximum values set at 23 dBm for 2.4 GHz and 28 dBm for 5 GHz in the US, while in the EU, these values are 19 dBm for 2.4 GHz and 25 dBm for 5 GHz. The RF design features a dual-optimized antenna configuration, comprising 4x4 and 2x2 setups, achieving peak antenna gains of 5 dBi at 2.4 GHz and 6 dBi at 5 GHz, with a minimum receive sensitivity of -101 dBm. Wireless access point shall include several key features such as band steering, WDS/Mesh support, and fast roaming capabilities, including pre-authentication and PMK caching according to 802.11r/v. Dynamic Channel Selection (DCS) and load balancing functionalities must be available, alongside robust encryption options including WEP, WPA, WPA2, and WPA3. Authentication will be facilitated through IEEE 802.1X/RADIUS, while access management features like L2 isolation, MAC filtering, and rogue AP detection shall be incorporated to enhance security. Networking capabilities must include support for IPv6, VLANs, WMM, U-APSD, and Diffserv marking, ensuring comprehensive traffic management. The operating mode of the access point shall allow for Cloud management, controller management, and standalone operation. Additionally, the ZON Utility is essential for the discovery of switches, APs, and gateways, along with centralized batch configurations such as IP configuration, IP renew, device reboot, locating devices, web GUI access, firmware upgrades, and password configurations. Wireless Optimizer must provide functionalities for Wi-Fi AP planning, coverage detection, and wireless health management. Management interfaces shall include a web UI and CLI, with SNMP support for effective network monitoring. Continued</p> <p>he access point will feature one 10/100/1000/2500M LAN port and another 10/100/1000M LAN port, with power requirements including PoE (802.3) drawing 19.5 W or a DC input of 12 VDC at 2 A. Environmental specifications must adhere to operating temperatures ranging from 0°C to 50°C (32°F to 122°F) and humidity levels of 10% to 95% (non-condensing), while storage conditions shall be maintained between -30°C to 70°C (-22°F to 158°F) with humidity levels of 10% to 90% (non-condensing). Certifications for the device shall include compliance with radio standards such as FCC Part 15C, FCC Part 15E, ETSI EN 300 328, EN 301 893, and LP0002. For EMC compliance, it must meet FCC Part 15B, EN 301 489-1, EN 301 489-17, EN55022, EN55024, and EN61000-3-2/-3, as well as EN60601-1-2 and BSMI CNS13438. Safety certifications shall align with EN 60950-1, IEC 60950-1, and BSMI CNS14336-1, ensuring the device meets stringent safety and performance standards. OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation End</p>	50.000			NO	One Number
28	<p>Supply, Installation, Testing, and Commissioning (SITC) of outdoor wireless access point shall have 802.11ac Dual Radio External Antenna 3x3 Outdoor Access Point should provide reliable wireless connectivity across both the 2.4 GHz and 5 GHz frequency bands. This device shall feature a dual radio configuration, supporting the 2.4 GHz band in compliance with IEEE 802.11 b/g/n standards, the operational frequency should range from 2.412 to 2.462 GHz, while in Europe, it shall span from 2.412 to 2.472 GHz. For the 5 GHz band, the access point should comply with IEEE 802.11 a/n/ac standards, with operational frequencies ranging from 5.15 to 5.35 GHz and 5.725 to 5.850 GHz, the band must range from 5.15 to 5.35 GHz and 5.470 to 5.725 GHz, consistent with the specifications. Access point must have advanced 802.11n/ac features, including 3x3 Multiple-Input Multiple-Output (MIMO) technology, which should utilize three spatial streams to enhance data throughput and reliability. It shall also support Maximal Ratio Combining (MRC), 20-, 40-, and 80-MHz channels, packet aggregation via A-MPDU and A-MSDU, as well as Cyclic Delay Diversity (CSD) and Maximum Likelihood Demodulation (MLD). Additionally, it should support Low-Density Parity Check (LDPC) to improve error correction. The device must include six N-type connectors for antenna deployment, facilitating enhanced signal quality. The supported data rates should vary across different standards, with 802.11a/g offering rates from 1 Mbps up to 54 Mbps, while 802.11b must support rates up to 11 Mbps. Under 802.11n, data rates should reach up to 450 Mbps, and under 802.11ac, they shall go up to 1300 Mbps, depending on the channel bandwidth. Receiver sensitivity for the device must be a minimum of -102 dBm, ensuring robust performance in challenging environments. The typical transmit power for 11b/g/n/a standards should be specified at 29 dBm in the FCC region, with the European regulations capping it at 15 dBm for 2.4 GHz and 23 dBm for 5 GHz. Access point shall feature one 10/100/1000M LAN interface and must include a console port for management purposes. Power over Ethernet (PoE) should be supported, with a power draw of 25 watts. The WLAN capabilities shall enable a maximum throughput of up to 900 Mbps, and the device must support multiple SSIDs and VLANs to enhance network segmentation and security. Security features should include WEP, WPA/WPA2-PSK, and various EAP types for enterprise-level security, ensuring that the device meets the demanding needs of various applications. Continued</p>	8.000			NO	One Number

	<p>Management capabilities must be robust, with utilities available for centralized configurations, monitoring, and management through a web GUI, CLI, and SNMP protocols. The access point should also support integration with third-party applications and facilitate smooth communication and management among multiple devices within a network. In terms of physical specifications, the device must have a plenum rating for safety and should support a Kensington lock for added security. It shall be compliant with multiple industry standards, including IEEE 802.3 and IEEE 802.11 protocols. The operating temperature range should extend from -40°C to 60°C ensuring functionality in harsh weather conditions, while storage temperatures must range from -40°C to 70°C. The device should be rated for IP68 weather protection, allowing it to withstand outdoor conditions effectively. Included with the access point must be accessories such as pole and wall mounting kits, a PoE injector, and a power cord, ensuring that all necessary components for installation and operation are provided OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without</p>					
29	<p>Supply, Installation, Testing, and Commissioning (SITC) of Fire wall with Minimum 3-year Subscription the device shall feature a flexible interface configuration with 12 configurable ports and 2 x SFP (configurable) ports, allowing for versatile connectivity options tailored to various network architectures. It must include 2 USB 3.0 ports for peripheral support and a DB9 console port for efficient management. The device shall be rack-mountable, facilitating deployment in server racks. Furthermore, the design shall be Fanless, ensuring silent operation and energy efficiency. System Capacity and Performance device must deliver exceptional performance metrics, including a SPI firewall throughput of 8,000 Mbps and a VPN throughput of 1,500 Mbps. The IPS throughput shall reach 2,700 Mbps, while the Anti-Malware throughput must be 2,000 Mbps. For comprehensive security with Unified Threat Management (UTM) capabilities, the throughput shall be 1,900 Mbps, enabling multi-layered protection without compromising performance. The system shall support a maximum of 2,000,000 TCP concurrent sessions and up to 1,000 concurrent IPsec VPN tunnels, with a recommended configuration of 300 gateway-to-gateway IPsec VPN tunnels and 500 concurrent SSL VPN users. It shall accommodate 128 VLAN interfaces, facilitating effective segmentation and traffic management. Various essential security services, including Sandboxing, Web Filtering, Application Patrol, Anti-Malware, IPS, Reputation Filter, Geo Enforcer, Secure porter, Collaborative Detection & Response, and Device Insight, must be integrated to ensure comprehensive security Features and WLAN Management The VPN functionality shall support multiple protocols, including IKEv2, IPsec, SSL, and L2TP/IPsec, ensuring compatibility with a wide range of environments, including Microsoft Azure and Amazon VPC. For WLAN management, the device must support a default number of 8 managed access points, with a recommended maximum of 300 APs in a single group. The secure WiFi service shall allow for a maximum of 130 tunnel mode access points and up to 520 managed APs, ensuring robust wireless coverage. The device must support Cloud Mode for comprehensive central management, offering unlimited registration of devices and seamless monitoring. It shall include features such as Device HA Pro, Link Aggregation (LAG), and support for a Maximum power consumption shall be capped at 46 watts, with an efficient heat dissipation rate of 120.1 BTU/hr. Operating conditions must allow for a temperature range of 0°C to 40°C (32°F to 104°F) with humidity levels from 10% to 90% (non-condensing), while storage conditions must support temperatures from -30°C to 70°C (-22°F to 158°F). The device shall have a mean time between failures (MTBF) of approximately 947,736 hours, ensuring high reliability. The device must comply with various certifications, including FCC Part 15 (Class A), CE EMC (Class A), C-Tick (Class A), and BSMI for EMC. Safety certifications shall include LVD (EN60950-1) and BSMI compliance, ensuring adherence to industry standards. Firewall capabilities must support both routing and transparent (bridge) modes, including stateful packet inspection, SIP NAT traversal, and H.323 NAT traversal. Advanced features such as traffic anomaly detection, DoS/DDoS protection, and a unified policy management interface for content filtering, application patrol, and SSL inspection must be included to ensure a robust security posture. The Intrusion Prevention System (IPS) capabilities shall include both detection and prevention functionalities, supporting allowlists and rate based signatures to effectively mitigate risks. The Application Patrol feature must identify and control thousands of applications and behaviours, while Sandboxing should provide cloud based multi-engine inspection for comprehensive threat analysis. The Anti-Malware scanning engine shall support a wide range of file types and protocols, ensuring efficient threat detection and remediation. Additional features such as IP Reputation Filters, DNS Threat Filters, and Web Filtering must enhance the overall security framework, providing granular control over network traffic. The system shall offer Geo IP blocking and Device Insight for agentless scanning and classification of network devices, enhancing visibility. Networking functionalities shall include support for Multi-WAN and dual-WAN setups, ensuring robust failover and load balancing capabilities. The device must allow for WAN connection failover via 3G and 4G USB modems, providing added reliability in connectivity. Furthermore, it shall support IPv6 compatibility, ensuring readiness for the next generation of internet protocols. Continued</p> <p>device shall feature Cloud Mode for comprehensive management, enabling unlimited registration and centralized control over configurations, monitoring, and reporting. The authentication framework must include a local user database, cloud user database, and support for external user databases such as Microsoft Windows Active Directory, RADIUS, and LDAP. It shall also support IEEE 802.1x authentication, captive portal web authentication, and single sign-on (SSO) capabilities for enhanced security. Logging and monitoring capabilities must include comprehensive local logging, syslog support for up to four servers, and real-time traffic monitoring. The device shall provide built-in daily reports and support email alerts to up to two servers, ensuring operational transparency and quick response to incidents. End</p>	2.000		NO	One Number	
30	<p>Supply, Installation, Testing, and Commissioning (SITC) of Active Directory support a dual CPU configuration, with each CPU having a thermal design power (TDP) of less than 180W. The memory configuration shall include four (4) 32GB RDIMM modules operating at 3200MT/s in a dual-rank arrangement, ensuring optimal performance and memory capacity. The storage solution shall incorporate two (2) 1.2TB SAS ISE 12Gbps 10,000 RPM hard drives with 512n sector size in a 2.5-inch format, compatible with a 3.5 inch hybrid carrier. Power supply requirements shall consist of dual, hot-plug, non-redundant power supplies, each rated at 1400W. The server shall be equipped with two (2) jumper cords, specifically C13/C14 rated for 250V and 10A, compliant with India BIS standards, and measuring 4 meters in length. The riser configuration shall be designated as 0, utilizing a half-length, low-profile design with five (5) 16-pin slots and one (1) 4-pin slot, supporting seamless integration and expansion capabilities. Server management capabilities shall include Open Manage Enterprise Advanced and iDRAC9 Enterprise 15G, ensuring robust system management and monitoring. Networking shall be supported by Ethernet mezzanine adapters, specifically the Broadcom 57412 dual-port 10GbE SFP+, along with an OCP NIC 3.0 BOSS-S2 controller card that includes two (2) M.2 240GB drives configured in RAID 1 for optimized storage. Additionally, the server shall feature hot-plug capabilities, sliding rails with a cable management arm for efficient organization, and an internal optical drive with DVD±RW and SATA connectivity. The system shall support a second M.2 storage device, specifically a 480GB stick, without RAID configuration, alongside a PERC H745 front-load controller managing the two (2) 1.2TB SAS hard drives. The server shall include BIOS and advanced system configuration settings, featuring a performance BIOS setting and UEFI BIOS boot mode with GPT partition support for enhanced flexibility and performance. A minimum of six (6) standard fans shall be incorporated for adequate cooling, with additional provisions for power cords (two (2) C13/C14 jumper cords, 2 meters in length, rated for 250V and 10A per India BIS standards). Furthermore, the server shall support PCIe riser configuration 2, accommodating half-length cards with four (4) x8 slots. Embedded systems management shall be facilitated through multi iDRAC9 Enterprise 15G support, and the server shall include network adapters as specified in the network design documentation to ensure</p>	1.000		NO	One Number	
31	<p>Supply, Installation, Testing, and Commissioning (SITC) of Data server processor designed for a dual CPU configuration, with each CPU having a thermal design power (TDP) of less than 180W. The server shall support four (4) 32GB RDIMM modules operating at 3200MT/s in a dual-rank configuration, ensuring optimal memory performance and capacity. Additionally, the storage solution shall comprise two (2) 1.2TB SAS ISE 12Gbps 10,000 RPM hard drives with a 512n sector size in a 2.5-inch format, compatible with a 3.5-inch hybrid carrier power supply system shall include dual, hot-plug power supplies, each rated at 1400W. The server shall be equipped with two (2) jumper cords, C13/C14 rated for 250V and 10A, compliant with India BIS standards, measuring 4 meters in length. The riser configuration shall be designated as 0, utilizing a half-length, low profile design featuring five (5) 16-pin slots and one (1) 4-pin slot to facilitate seamless integration and expansion capabilities. Management capabilities shall include Open Manage Enterprise Advanced and iDRAC9 Enterprise 15G to ensure robust system management and monitoring. Networking shall be supported by Ethernet mezzanine adapters, specifically the Broadcom 57412 dual-port 10GbE SFP+, alongside an OCP NIC 3.0 BOSS-S2 controller card, which shall include two (2) M.2 240GB drives configured in RAID 1 for optimized storage performance. The server shall feature hot-plug capabilities, sliding rails with a cable management arm for efficient organization, and an internal optical drive with DVD±RW and SATA connectivity. The server shall support a PCIe Riser configuration, specifically riser configuration 2, accommodating half length cards with four (4) x8 slots. Embedded systems management shall be facilitated through multi iDRAC9 Enterprise 15G support, and network adapters shall be provided as per the project design specifications to ensure comprehensive connectivity and performance. ProSupport and Next Business Day Onsite Service shall be included, covering a period of 84 months for hardware support to ensure reliable operational continuity. End</p>	1.000		NO	One Number	

32	<p>Supply, Installation, Testing, and Commissioning (SITC) of Network Attached Storage The form factor of the proposed storage solution shall be a 2U 8-bay controller, featuring a single controller configuration. The controller shall be equipped with default DDR3 cache memory of 4GB, with an upgrade option available to a maximum capacity of 16GB, ensuring efficient data handling and performance. Connectivity shall be facilitated through four 10GbE (RJ 45) host ports, enabling robust network integration The controller shall support a 6Gb/s SATA drive interface and accommodate both 2.5" SATA SSDs and 3.5" 7,200 RPM SATA HDDs. Advanced features shall include support for S.M.A.R.T., automatic bad-sector reassignment, and dedicated bandwidth allocation to each connected drive, enhancing the reliability and performance of the storage system. RAID options shall be extensive, allowing configurations for RAID 0, RAID 1, RAID 3, RAID 5, RAID 6, RAID 10, RAID 30, RAID 50, and RAID 60 to meet various redundancy and performance needs Data services shall encompass default software features such as SSD caching (both block and file level), thin provisioning (block level), and snapshot capabilities with 64 snapshots per source volume and 128 per system. Local replication shall be supported with four instances per source volume and up to 16 per system. Additionally, remote replication shall be enabled at the file level, supporting Rsync with 128-bit SSH encryption. Optional software features requiring an additional license shall include automated storage tiering (up to four tiers per pool), advanced snapshot management (up to 1,024 per folder), and advanced local and remote replication capabilities. The system shall support major operating systems, including Microsoft Windows Server, Red Hat Enterprise Linux, macOS X, and VMware Supported protocols shall include file-level access through CIFS/SMB, NFS, AFP, FTP/FXP, and WebDAV, while block-level access shall be provided via iSCSI. Management of the storage solution shall be facilitated through web-based management software, enabling user account management, group management, folder access control, quota management, and folder encryption with AES. Integration with Microsoft Active Directory (AD) and Linux LDAP shall be included, along with storage resource management for historical resource usage analysis. The system shall employ a multi-factor authentication login mechanism, Continued</p> <p>with notification capabilities via email and SNMP traps The proposed solution shall ensure high availability and reliability through features such as immutable object storage, hot-swappable hardware modules, a device mapper, antivirus protection, trunk group configuration, UPS support, and WORM (file level only). Safety standards shall comply with UL, BSMI, and CB certifications, while electromagnetic compatibility shall meet CE, BSMI, and FCC standards. The system shall also adhere to green design principles, utilizing 80 PLUS-certified power supplies delivering over 80% energy efficiency and intelligent multi-level drive spin-down Power supplies shall be redundant and hot-swappable, with a capacity of 250W. The operating AC voltage range shall be from 100VAC at 5A to 240VAC at 2.5A with PFC (auto-switching), and the frequency shall range from 50 to 60 Hz. Environmental specifications shall dictate an operating temperature range of 0°C to 40°C and a non-operating range of -40°C to 60°C. The controller shall be designed to operate at altitudes up to 3,660 m (12,000 ft) and can withstand non-operating conditions up to 12,192 m (40,000 ft). Relative humidity shall be maintained between 5% to 95% non-condensing for both operating and non-operating conditions. NAS Should be 64 TB Populated from Day first End</p>	1.000			NO	One Number	
33	<p>Supply, Installation, Testing, and Commissioning (SITC) of All-in-One PC shall support the Windows 11 Home operating system, ensuring compatibility with modern applications and a user-friendly interface. It must be powered by the Intel® Core™ N-series processor, specifically the Intel® Processor N100, which should operate at speeds of up to 3.4 GHz, utilizing Intel® Turbo Boost Technology. This processor shall include a minimum of 6 MB L3 cache, with four cores and four threads, to enhance multitasking capabilities and overall performance. Memory capacity must be no less than 8 GB of DDR5-4800 MHz RAM, organized in a single SODIMM slot. The system shall support a total of two SODIMM slots to allow for future upgrades. Storage must include a minimum of 512 GB PCIe® NVMe™ M.2 SSD to provide fast data access speeds and sufficient storage capacity for applications and files The display shall measure 54.5 cm (21.45 inches) diagonally, with a Full HD resolution of 1920 x 1080 pixels. The display technology must be VA with an anti-glare coating, and the brightness should be at least 250 nits. The bezel design must feature a three-sided micro-edge layout to maximize the screen-to-body ratio, which shall be no less than 98.98%. Touchscreen capability is not required, but the display must be flicker-free to enhance user comfort during extended use. Multimedia capabilities shall include dual 2 W speakers to ensure adequate audio output for communication and entertainment. Input devices must consist of a wired USB mouse and keyboard to the device must integrate a 10/100/1000 GbE LAN network interface along with a Realtek Wi-Fi 6 (1x1) and Bluetooth® 5.3 wireless card. These features should ensure fast and reliable wireless connections, compliant with local wireless access point availability. The rear I/O ports must include at least one USB Type-C® port with a 5Gbps signalling rate, two USB Type-A ports with the same signalling rate, two USB 2.0 Type-A ports, one headphone/microphone combo jack, and one RJ-45 port. Expansion capabilities must be supported with a minimum of two M.2 slots, one for SSD and another for WLAN, along with a single HDMI-out 1.4 video connector The integrated webcam shall be a minimum of 720p HD with temporal noise reduction and should feature dual array digital microphones for clear audio during video calls. The power supply must be a 65 W Smart AC adapter. The unit should meet energy efficiency standards, including EPEAT® registration and ENERGY STAR® certification. In addition, the system shall include a lifetime subscription to Microsoft Office Home & Student 2021, ensuring essential productivity tools are readily available End</p>	5.000			NO	One Number	
34	<p>Supply, Installation, Testing, and Commissioning (SITC) of printer shall function as a multifunctional all-in-one device with a monthly duty cycle capable of handling up to 30,000 pages for both letter and A4 formats. It is recommended that the number of printed pages per month be maintained within the stated range of 250 to 1,500 pages for optimum device performance. The printer shall include a single paper tray with a standard capacity of 250 sheets and shall not feature an envelope feeder. support wireless printing, allowing users to print directly from mobile devices. It shall include an automatic document feeder, support for two-sided printing, and offer scanning capabilities to email and PDF formats. A user-friendly touchscreen interface shall enhance the overall experience, while a quiet mode shall be available to reduce noise during operation printer shall utilize Thermal Inkjet technology, offering automatic duplex printing for A4 and letter sizes. It shall support multitasking; however, it shall not include an automatic paper sensor shall achieve a print speed of up to 22 pages per minute (ppm) for black and 18 ppm for color in standard ISO quality. In draft mode, print speeds shall increase to 34 ppm for both black and color prints. Connectivity and Communications Mobile printing capabilities shall include support for Chrome OS, a Smart app, Apple AirPrint™, and Mopria™ Certified solutions. The printer shall feature built-in dual-band Wi-Fi (802.11 a/b/g/n/ac) with a self-heal solution for reliable wireless connectivity. Wired connections shall include one Ethernet port and one Hi-Speed USB 2.0 port The printer shall use a four-cartridge system (black, cyan, magenta, yellow) with pigment-based ink. The black cartridge shall yield approximately 1,250 pages, while each color cartridge shall yield around 800 pages. The total number of print head nozzles shall be 6,272, with four cartridges—one each for black, cyan, magenta, and yellow. Printing Media Handling The printer shall support a maximum input capacity of up to 250 sheets and offer output capacities of up to 75 sheets. It shall accommodate various media sizes including A4, A5, A6, B5 (JIS), and envelopes (DL, C5, C6, Chou #3, Chou #4). Print Area Margins shall be set at 3.3 mm for the top, left, right, and bottom for A4 printing The printer shall deliver a print quality of up to 1200 x 1200 rendered dpi for black and up to 4800 by 1200 optimized dpi on HP Advance Photo Paper. Copier Specifications Continued</p> <p>The maximum number of copies shall be up to 99, with settings available for copies, size, quality, lighter/darker adjustments, paper size, resizing, two-sided copies, ID copy, collating, binding margins, enhancements, cropping, and a copy preview function. The copy speed for black shall be up to 18 copies per minute (cpm) scanner shall utilize CIS technology and support color scanning. Maximum scan size shall be 216 x 356 mm, with a bit depth of 24 bits and 256 levels of grayscale. Supported file formats for scanning shall include JPEG, TIFF, PDF, BMP, and PNG. The hardware scan resolution shall be up to 1200 x 1200 dpi, while the optical scan resolution shall also be up to 1200 dpi. printer shall be compatible with Windows 11, Windows 10, macOS 11 Big Sur, macOS 12 Monterey, macOS 13 Ventura, Linux, and Chrome OS. Memory The printer shall have 512MB of memory without any memory slots. Advanced Features The printer shall include digital fax capabilities for sending faxes to a PC, available with Windows software. System Components The control panel shall feature a 2.7" (6.86 cm) touchscreen with a color graphic display, LED indicator light, and three buttons for home, help, and back The maximum dimensions shall be 581 x 849 x 306 mm when the cleanout and output tray are fully extended. When not extended, dimensions shall be 581 x 445 x 306 mm. Power Consumption The printer shall consume 0.11 watts (Manual-Off), 4.67 watts (Standby), and 1.17 watts (Sleep). It shall include an internal built-in universal power supply. Software and Applications The printer shall support various applications and provide a seamless printing experience across compatible devices End</p>	4.000			NO	One Number	

35	Supply, Installation, Testing, and Commissioning (SITC) of standard rack shall be constructed with a welded frame comprising four pillars made of 1.5 mm thick Cold Rolled Close Annealed (CRCA) sheet, utilizing a five-fold profile for enhanced structural integrity. The frame shall be reinforced through welding from the top to the bottom and connected to top and bottom covers featuring air-cooled ventilation to facilitate the exhaust of hot air. The front door shall incorporate provisions for both glass and perforation, ensuring adequate ventilation, while the rear door shall also be perforated for optimal airflow. Both side panels shall be fitted with slam latches to allow for easy removal. Frame The rack shall utilize a 1.5 mm CRCA multi-fold fabricated frame designed to achieve high structural strength, capable of supporting a load of up to 1250 kg. The design shall facilitate easy assembly with a semi knocked-down (SKD) configuration. Doors The rack shall feature a single front perforated dual door and a rear dual perforated door to provide It shall also support the installation of a cable tray. 19" Rails The rack shall include four U-marked rails made of 2 mm CRCA sheet, adjustable to accommodate varying depths. Ingress Protection Certifications IP 20 in accordance with IEC 60529. Impact Protection: IK 08 in accordance with IEC 62262. Corrosion Resistance: Tested via the Salt Spray test per ISO 9227 for 168 hours. Process validations conducted through NABL accredited laboratories to ensure compliance and robustness. rack shall have a weight capacity of up to 1250 kg. Painting Shade The rack shall be finished in RAL 9005 with a fine texture, achieving a thickness of 60 to 80 microns. Powder Coating A fine texture finish shall be achieved through the application of an epoxy polyester hybrid powder coating, with a deposit thickness of 60 to 80 microns. The finish shall provide a high degree of scratch resistance against sharp objects. side panels shall be removable and constructed from sheet steel, featuring a single-point locking mechanism with quick-release latches. Cooling Fans Cooling fans shall operate at 230V AC, delivering a flow rate of 90 CFM with a noise level of 42 dB. Power Box The rack shall include a power distribution unit capable of accommodating 06/13 or 6/16 Amp multi-standard sockets, providing a total of 12 sockets shall be equipped with a set of four castors (2'3" height), with two featuring brakes on the front side and two without brakes for mobility. Mounting Hardware The rack shall be supplied with a mounting hardware packet, including a set of M6 screws, cage nuts, and washers, in quantities of either 10 or 20. End	5.000			NO	One Number	
36	Supply, Installation, Testing, and Commissioning (SITC) of Network Management System (NMS) shall provide a comprehensive suite of supported protocols out of the box, including but not limited to SNMP, JSON, WinRM, XML, SQL, JMX, SFTP, FTP, JDBC, HTTP, HTTPS, VMware, WS-Management, and Prometheus. This system must support any type of provisioning, encompassing automatic, directed, topology, interface, and service discovery. Additionally, it shall interoperate seamlessly with virtually any configuration management system to ensure broad compatibility and functionality. Fault Management The NMS shall incorporate robust fault management capabilities, including service assurance via intelligent periodic polling. It must support autonomous device problem reporting and message enrichment to facilitate accurate and timely issue identification. Performance Management The system must excel in performance management by providing the broadest suite of data collection protocols, including 14 distinct options, thus eliminating the need for third-party tools. The NMS shall enable streaming telemetry, real-time custom thresholding, trend analysis, and forecasting. Furthermore, it must facilitate time-series performance data analysis, visual plotting, and operational forecasting in real-time, allowing for comprehensive performance insights. Application Perspective Monitoring The NMS shall enable monitoring of service availability from multiple perspectives. It must pinpoint not only where issues occur but also assess their impact on the digital experience of users and machines, ensuring a holistic view of application performance. BGP Monitoring Protocol (BMP) Support The system shall support monitoring of Border Gateway Protocol (BGP) sessions and routing information on routing devices. This capability is essential for leveraging status updates and statistics to enhance advanced monitoring and management functions. Business Service Monitoring The NMS shall offer monitoring and modelling capabilities for high-level business services, allowing users to swiftly identify critical problems that may affect these services. This feature is vital for maintaining operational integrity and service quality. NMS shall include a remote data collection feature that provides access to previously inaccessible areas. his capability will be complemented by application perspective monitoring, which will monitor service availability at specific locations from diverse perspectives. system must support five flow protocols, with the ability to handle over 350,000 flows per second. It shall provide deep-dive analysis and enterprise-level. Continued	1.000			NO	One Number	
	T reporting, ensuring that users have access to comprehensive traffic data. NMS shall allow for the configuration of most features through a user-friendly web interface or XML scripting. Customization options must enable users to tailor the NMS to meet specific operational requirements effectively. NMS must be designed for scalability, enabling the monitoring of tens of thousands of devices through a distributed and tiered architecture. It shall manage 1.2 million data points every five minutes, monitor over 5,000 interfaces, and handle hundreds of thousands of discrete devices, millions of performance metrics, and thousands of events per second, thereby supporting enterprise-level operations. Enterprise Reporting and Visualization The NMS shall provide real-time notifications for high-priority responses and customizable Grafana dashboards. It must include resource graphs, database reports, and various charting capabilities to ensure users have a clear view of their network performance. Topology Maps The system must support the definition of complex layered topologies, utilizing semantics and focal point features that allow for rapid adjustments and enhancements to the maps. Integration of topology maps into service problem ensure timely communication of important alerts. Alarm Correlation The system shall incorporate an artificial intelligence framework that logically groups related faults (alarms) into higher-level objects (situations). This functionality must enable users to quickly detect, visualize, prioritize, and resolve situations across the entire IT infrastructure, thereby enhancing overall incident management. NMS shall be compatible with Java versions 8 through 11, with the most recent version of JDK 11 strongly recommended. It must support PostgreSQL version 10 or higher (up to and including 13). For proof-of-concept workloads, the system shall require a minimum configuration of 4GB RAM and 2 CPUs. Supported operating systems shall include RHEL 7.x and 8.x, as well as CentOS 7.x and 8.x. Common Outbound Ports The NMS must not be limited to, but shall include common outbound ports such as ICMP (echo-request), SNMP (161/udp), SSH (22/tcp), HTTP (80/tcp), and HTTPS (443/tcp). Monitoring Capabilities Finally, the NMS shall be capable of monitoring virtually any service on any device, ensuring a versatile and comprehensive network management solution that meets the evolving needs of modern IT environments. End						
37	Supply, Installation, Testing, and Commissioning (SITC) of PTZ Camera Shall have image sensor must be a minimum of 1/2.8-inch Progressive Scan Complementary Metal-Oxide-Semiconductor (0.9071 cm) with a minimum resolution of 2 Megapixels, and it must provide effective pixel output of at least 1920(H) x 1080(V). The video output shall include a minimum of one Bayonet Nell-Concelman (BNC) connector port, delivering a signal of 1.0 volts peak-to-peak at 75 ohms. The signal-to-noise ratio must exceed 56 decibels, ensuring clarity in captured footage. The minimum illumination capacity must include 0.005 Lux in color mode and 0.0005 Lux in black and white mode at F1.6, with 0 Lux capability when infrared is activated. Focal length should range from 3.95mm to 177.7mm. White balance must offer options for automatic, automatic tracking, indoor, outdoor, and manual modes. Focus control must support both auto and manual adjustments, while the close focus distance must be at least 100mm to 1000mm. The angle of view should range from a horizontal minimum of 70.3° to 1.8°. The camera must support an electronic shutter speed between 1/1 second and 1/30,000 seconds, with automatic gain control available in both auto and manual modes. The backlight compensation must include options for backlight compensation, high light compensation, and wide dynamic range (WDR) with a minimum of 120 decibels. Optical zoom must be no less than 45x, and digital zoom must be at least 16x. Pan travel shall support a range of 0° to 360° endlessly, with a speed range of 0.1° to 200°/second, while tilt travel must range from -20° to 90° with auto-tilt at 180° and a speed range of 0.1° to 120°/second. The camera shall support manual speed adjustments for pan and tilt as specified. The unit must include at least 300 presets with a preset speed of 240°/second for pan and 200°/second for tilt. Special features shall include infrared coverage up to 300 meters, defog capabilities, 5 patterns, 8 tours, auto pan, and auto scan functionalities. It must support up to 24 privacy mask areas. A power-up action feature must restore the camera to its previous Pan-Tilt-Zoom (PTZ) and lens status after a power loss, and the idle motion feature shall activate preset, scan, tour, or pattern modes if idle for a user-defined period. Continued	3.000			NO	One Number	
	The camera must include a Day/Night Infrared Cut Filter (ICR) with auto (ICR), color, and black and white settings. Video compression formats should include a minimum of H.265+, H.265, H.264+, and H.264. The video streaming capabilities must accommodate a main stream with 1080P/1.3 Megapixels/720P at 15/60/60 frames per second, and sub-stream support should be available at D1/CIF with 125/30 frames per second, with another sub-stream option for various resolutions at frame rates of 1 to 25/30 frames per second. Motion detection and Region of Interest (ROI) functionalities must be supported. The camera must have audio streaming capabilities with a minimum of 1 input and 1 output channel. Networking requirements include Registered Jack 45 for 10Base-T/100Base-TX connections, along with a recommended RS-485 port for communication. Intelligent Video Surveillance (IVS) must support tripwire detection, intrusion detection, abandoned or missing objects detection, face detection, and heat map analysis. Supported protocols should include IPv4/IPv6, HTTP, HTTPS, SSL, TCP/IP, UDP, UPnP, ICMP, IGMP, SNMP, RTSP, RTP, SMTP, NTP, DHCP, DNS, PPPoE, DDNS, FTP, IP filtering, QoS, Bonjour, 802.1x, ONVIF Profiles S&G, and an APLAlarm functionality must include a minimum of 7 input channels and 2 output channels. Infrared range must reach at least 300 meters. The operational temperature must range between -40°C and 60°C, with a relative humidity of less than 95%. The camera should be compatible with smartphones, including iPhone, iPad, and Android phones. The memory slot must support network-attached storage, local PC instant recording, and a microSD card up to 256GB. The weatherproof rating must comply with International Protection Marking 67 standards, ensuring resilience in harsh conditions. • Additionally, the equipment must be accompanied by OEM authorization and compliance certification provided on the OEM letterhead. Furthermore, a copy of the Standardisation Testing and Quality Certification (STQC) must be submitted with the technical bid to verify adherence to required quality standards. End.....						

38	<p>Supply, Installation, Testing, and Commissioning (SITC) of Camera must incorporate a 1/2.8" 2MP PS CMOS image sensor with an effective pixel resolution of 1920 (H) × 1080 (V), providing optimal image quality. It must operate effectively with a minimum illumination of 0.006 Lux@F1.6 in color mode at 30 IRE, 0.0006 Lux@F1.6 in B/W at 30 IRE, and 0 lux when IR is on, ensuring clarity even in low-light conditions. Shutter speed settings must be adjustable between auto and manual from 1/3 s to 1/100,000 s for flexible image capture. The device should provide angle adjustments of 0°~355° for pan and rotation, and 0°~65° for tilt to accommodate various installation scenarios. The device must include 512 MB RAM and 128 MB ROM, allowing for efficient operation. White balance options should include auto, natural, streetlamp, outdoor, manual, and regional custom settings to adapt to different lighting environments. The motorized lens must feature a variable focal length of 2.7mm to 13.5mm with a fixed iris type and a maximum aperture of F1.6, offering a close focus distance of 0.8 meters for detailed imaging. DORI distances must be up to 144.8 meters for detection, 57.9 meters for observation, 29.0 meters for recognition, and 14.5 meters for identification, ensuring effective coverage. Backlight compensation must support BLC, HLC, and WDR (120dB), enabling optimal performance in challenging lighting situations. The device must provide a horizontal angle of view ranging from 109° to 30°, a vertical angle of 56° to 17°, and a diagonal angle of 131° to 35°, ensuring comprehensive scene coverage. It should support H.265 Quad Stream for efficient video streaming and deliver a signal-to-noise ratio (S/N) greater than 56 dB, ensuring clear video output. Video format compatibility must include both PAL and NTSC, with support for various video compression methods like Interstream, H.264+, H.265, H.264, H.264H, H.264B, and MJPEG (available only through the sub-stream). Resolution capabilities must include options from 2MP down to CIF, with adjustable bit rate control modes (CBR/VBR) ranging from 3 kbps to 6144 kbps for H.264 and H.265 formats. The device should provide 3D DNR for noise reduction and electronic image stabilization (EIS) for steady image capture. Motion detection must support up to 4 rectangular areas, while privacy masking must allow for 4 customizable zones. • Audio functionalities should include two-way talk, a built-in mic, and support for audio input and output through RCA ports. Continued</p> <p>Audio compression options must encompass PCM, G.711a, G.711Mu, G.726, MPEG2 Layer2, and G.722.1 formats, ensuring flexible audio management. Alarm capabilities must include 1 input channel (5mA, 3V~5V DC) and 1 output channel (300mA, 12V DC). The OSD must allow for the display of camera titles, date, and time. The device should support a range of network protocols, including SFTP, IPv6, IPv4, DNS, RTCP, NTP, RTP, HTTP, HTTPS, SNMP V1/V2/V3, TCP/IP, PPPoE, UPnP, NFS, UDP, ICMP, SSL, DHCP, SMTP, RTSPS, ONVIF (Profile S, Profile G, Profile T), unicast, and multicast, ensuring compatibility with diverse network environments. It must also support IVS features like tripwire, intrusion detection, object abandonment or missing detection, SMD, and face detection. Ethernet connectivity should be provided through an RJ-45 port with 10/100Base-T support, and the device must function in day/night mode with options for Auto(ICR), color, or B/W. Alarm events should cover motion detection, tampering, audio detection, network disconnection, IP conflicts, memory card state, and space detection. Cybersecurity features must include AES 256-bit encryption, configuration encryption, trusted execution, security logs, WSSE, account lockout, syslog, video encryption, IP/MAC filtering, HTTPS, trusted upgrade, and trusted boot, providing a secure environment for data transmission. The device should support up to 20 users or hosts with a total bandwidth capacity of 80 Mbps. Browser compatibility must include Microsoft Edge and Chrome. It should also offer a mirror function, storage options via SFTP, micro SD card support up to 512 GB, and NAS compatibility. Frame rate flexibility is essential, supporting main and sub-stream configurations up to 30fps across various resolutions. The IR functionality must provide an effective range of 40 meters with three IR LEDs for night vision. Image rotation capabilities must include 0°, 90°, 180°, and 270° orientations, supporting 90° and 270° rotations at resolutions of 1080p and lower. Defog functionality must be included for enhanced image clarity in adverse weather conditions. Weatherproof and vandal-resistant standards should be IP67 and IK10, respectively, ensuring reliable operation in challenging environments. Continued</p> <p>The device must operate within a temperature range of -30 °C to +60 °C (-22 °F to +140 °F) with an operating humidity level of up to ≤95% RH non-condensing. Storage temperature should range from -40 °C to +60 °C (-40 °F to +140 °F), and storage humidity must support 10%-95% RH non-condensing. Power options should include 12 VDC, 24 VAC, or PoE (802.3af) with a basic power consumption of 1.6 W (12 VDC), 1.9 W (24 VAC), and 3.1 W (PoE). The maximum power consumption should be 7.9 W (12 VDC), 9.5 W (24 VAC), and 9.9 W (PoE) when operating with H.265, WDR, Intelligence, and IR functionalities enabled. End</p>	97.000			NO	One Number
39	<p>Supply, Installation, Testing, and Commissioning (SITC) of Video management Software with Licenses 200 From Day 1st. The system must be scalable, allowing easy expansion up to 20,000 channels and a 2 GB storage capacity through a distributed system. System should serve as the upper-level platform to manage and cascade Series of products, ensuring smooth scalability. For high availability, the system must support hot standby and N + M redundancy, allowing failover servers to back up primary recording and event servers, ensuring continuous operation. System should be AI-driven, providing intelligent search capabilities for locating humans and vehicles across specific time and locations. It must enable the archive to manage events, pictures, videos, and documents uniformly, with the capability to conduct cross-event tracking. Customizability is essential; the system must allow integration with other systems and devices using API/SDK/ONVIF/Bridge to meet user-specific requirements, thus enhancing market competitiveness. System capabilities must include support for hot standby for the main server, distributed deployment, N + M redundancy, cascading deployment, and compatibility with both LAN and WAN setups. Independent database deployment should also be supported for optimal system organization. The PC client configuration should facilitate online and offline activation and deactivation of licenses. System parameters must allow configuration of data storage duration for logs, alarms, POS records, and other relevant data. Time synchronization capabilities must include timed synchronization and device connection synchronization, ensuring accuracy. The system should support email server and active directory configurations, the import of HTTPS certificates, setting POS end signs, device login modes, and remote logging capabilities, with support for independent database deployment. Backup capabilities must include both automatic and manual options, with flexibility in backing up system databases daily, weekly, or monthly, and restoration options from server or local files. The synthesis feature must enable event synchronization, acting as middleware to connect with third-party systems, configure event schemes, and trigger linkages. It must also support data synchronization with third-party databases for attendance and access control records. Device management functionalities should support initializing devices, adding devices via multiple methods such as IP, domain, or automatic registration (including 3G, 4G, and DHCP devices), and managing CP Plus and third-party devices through ONVIF protocol. Continued</p> <p>The system must facilitate importing devices in batches, linking cameras for alarm display, and configuring encoder parameters like image, video, snapshot, OSD, and audio. Additionally, the system should support intelligence configurations, including IVS, face detection, people counting, and heatmaps. User management should be role-based, offering three types of roles: super administrator, administrator, and common role, with customizable permissions. Users should be able to log into different clients simultaneously using the same account and be restricted by MAC addresses or expiration details if required. The system must ensure password security through expiry dates, forced changes at first login, and the ability to lock users. Storage management feature must support both edge and central storage, with central storage expandable via iSCSI. It should include disk quota management, allowing the allocation of cameras to different disk groups for effective storage utilization. Application configuration must allow flexible recording plans, setting storage destinations, recording stream types, and creating templates based on various time frames. It must also support backing up videos and retrieving body-worn files. Personnel and vehicle management feature should facilitate adding, editing, and deleting personnel information, with the capability to import data like ID, card, fingerprint, and face from devices or templates. It should enable issuing cards or fingerprints via USB readers and managing access through door and vehicle groups. The system should provide robust watch list management for both personnel and vehicles, including start and end times for vehicle monitoring. The monitoring center must provide real-time video viewing capabilities with customizable layouts and PTZ control. It should support electric focus, remote barrier operations, digital zoom, fisheye dewarping, smart tracking for panoramic cameras, and audio talk functionalities. The system must allow for alarm management, real-time event display, and region of interest division for detailed video analysis. Playback features must include playing back recordings from devices or central storage, applying video filters, reverse playback, digital zoom, frame-by-frame viewing, and locking or marking important recordings. Users should be able to download videos in multiple formats and decode videos to video walls. The system must support smart and thumbnail searches to improve retrieval efficiency. Continued</p>	1.000			NO	One Number

	<p>For video wall management, the system must facilitate creating and managing different video wall tasks, decoding real-time video, and scheduling tasks. It should include remote access to video streams, supporting up to 64 video channels per screen. The system must allow for stream adjustments, audio management, and video channel tours Mapping capabilities should support both online and offline maps with GIS integration. It must provide features like hot spot configuration, live or recorded video viewing on maps, and distance measurement. Alarm sources must be visible on the map, with remote door controls available. Event management must include various event types, customizable event schemes, priority settings, and linkage actions like recording, snapshot, and alarm outputs. It should support real-time event monitoring and history tracking, with the ability to forward events to relevant users for efficient response The system must include comprehensive event statistics that can be analyzed on a daily, weekly, and monthly basis. It should provide detailed event information statistics, including the total count, processing status, and processed events, allowing for efficient tracking of events based on priority levels—high, medium, and low. Users must be able to generate event trend reports, which will help in analyzing the types and resources associated with frequently occurring ents.The DeepXplore feature should facilitate rapid retrieval of historical records and target location, enabling searches for faces and human bodies using specific features or images. The system must allow users to search person and vehicle archives effectively and generate tracks based on person, vehicle, and access control records The Case Bank function is essential for creating a centralized case database to manage case-related events, pictures, videos, and documents efficiently. This functionality must support quick report generation and case archiving, with the ability to customize case report logos and maintain records of case updates, including modification history details such as user, time, and specifics of changes. Users should also be able to upload videos and pictures related to cases and analyze case statistics, including total, open, and closed case counts Continued</p> <p>A robust Maintenance Center must be integrated, providing real-time monitoring of server status, including CPU, RAM, disk, network, and service health. Device status should cover a variety of components such as encoders, ANPR systems, access control devices, video intercoms, alarm controllers, and others. The system must provide detailed source and storage information for video channels, face/alarms pictures, and incident files, along with the capability to conduct exception searches and export detailed reports. Scheduled reporting should allow for daily, weekly, and monthly summaries. Additionally, the system must support batch upgrades for CP Plus IPCs and access control devices Access Management features should include the ability to add, edit, and delete door groups, granting access permissions associated with those groups. The system must support advanced access control rules, including anti-passback, first card unlock, inter-door locks, multiple card unlocks, and remote verifications. Monitoring door status and events should be facilitated with related video visibility and the capability to lock or unlock doors with a single command. Global operations for door management, including opening or closing all doors simultaneously, should also be available, alongside comprehensive log information and record extraction capabilities In terms of video intercom functionality, the system should manage call configurations, including device groups and management relations, as well as provide the ability to issue and manage contact lists. Users must be able to conduct video intercom communications based on SIP protocol with video intercom devices, and the system must enable users to view, delete, or freeze user accounts as needed. Recording and exporting video intercom records should also be supported. The attendance module must allow the configuration of access control devices to function as attendance stations, including time period and holiday management, as well as attendance shift arrangements. Attendance reports should encompass various types of records, including anomaly and card-swiping reports, with export capabilities and synchronization for offline attendance records Visitor management features must support visit and appointment registration, allowing for access permissions to be issued via card or face recognition. The system should enable automated visitor management for arrivals and departures, maintain visitor records, and configure default permissions and email templates. For entrance management, Continued</p> <p>the system must facilitate parking lot configuration, displaying total and available parking spaces and binding parking space displays to information screens. It should provide real-time license plate recognition capabilities and allow barrier control via card or remote access. Users should be able to manage on-site vehicle records and ANPR details, with search and export functionalities for vehicle records. The intelligent analysis component must provide real-time counts and historical data analysis, generating reports on a daily, weekly, monthly, and yearly basis. Users should be able to visualize and export area specific people counting analyses and access video intercom records, along with heat maps.The alarm controller must support arming and disarming of devices, subsystems, and partitions, with options for forced arming and bypassing zones. Users must be able to isolate zones as needed In EVMS Pro V2.0, history records should allow users to view recently accessed channels, enabling quick access to live video or playback of those records. The system must support multiple channel views simultaneously, with a maximum of 16 channels, and provide various stream quality options (HD, SD, and fluency)Live view functionalities must include PTZ control, snapshot capabilities, local recording, and audio communication. The system should allow for horizontal screen playback and support fisheye dewarp features for enhanced visualization For playback, users should be able to access both device and center recordings, with a visual calendar indicating available videos. The playback features must include a range of speeds, including up to 8X and 1/8X, and support manual recording and snapshot functions.Mapping capabilities should integrate Google maps and raster maps, allowing users to visualize video channels and access live and recorded video feeds Access control management must display relevant device information, with remote door management capabilities, including states like always open or always closed. Users should be able to revert doors to these default settings easily.Face recognition functionalities must enable users to search the face database or snapshot records for targets by uploading face images, alongside effective management of the face database The system should also support video metadata classification for easy searches of targets, distinguishing between people, vehicles, and non-motor vehicles. Video intercom information must be accessible, detailing device names, types, and numbers, along with call histories for tracking communication activity Continued</p> <p>Alarm management features should include alarm subscription capabilities, offline notification pushes, and the ability to search and handle alarm messages effectively, including access to historical alarm data Favourites management should enable users to quickly view videos from channels marked as favourites, streamlining access to preferred content. File management should support viewing pictures and videos saved locally, with export options to mobile devices, and allow for the deletion of media as needed. Message functions should provide access to unlocking records and alarm messages for comprehensive event tracking. The system settings must allow users to view account information, enable event subscriptions, set stream encryption, and configure gesture passwords for enhanced security. Lastly, visitor management should support the generation of visitor passes and facilitate the search for visitor records to maintain an organized visitor tracking system End</p>						
40	<p>Supply, Installation, Testing, and Commissioning (SITC) of Network Video Recorder The device must feature an industrial-grade embedded processor and operate on an embedded LINUX operating system. It should support input from up to 128 IP camera channels and offer user access through a web interface or a local GUI. Video output capabilities should include 2-channel VGA and 4-channel HDMI, with resolutions as follows: VGA outputs must support up to 1080p, HDMI1 and HDMI2 up to 4K, HDMI3 up to 8K, and HDMI4 up to 1080p in simultaneous mode. In heterogeneous mode, VGA1 and HDMI1, as well as VGA2 and HDMI2, should output video simultaneously, with VGA maintaining a resolution of 1080p and HDMI outputs reaching up to 4K for HDMI1, HDMI2, and HDMI3, while HDMI4 supports up to 1080p The device must support a variety of compression formats, including H.265, Smart H.264+, H.264, MPEG4, and MJPEG, and should utilize an Interstream encoding strategy. It should have a single RCA channel for audio input and output, with audio compression in G.711a, G.711u, PCM, and G.726 formats. For Automatic Number Plate Recognition (ANPR), it must accommodate up to 32 channels, with a database capacity of up to 20,000 entries for blacklist and allowlist management. It should include advanced AI capabilities, supporting up to 24 channels for perimeter performance AI with 10 IVS rules per channel, and provide support for 64 channels of perimeter AI processing directly from the camera. The Smart Motion Detection Plus (SMD Plus) functionality must be available for up to 32 channels through the NVR and up to 64 channels through the camera, offering enhanced filtering of human and motor vehicle movements to minimize false alarms The AI functionality by the camera must encompass capabilities such as face detection, face recognition, video metadata generation (for humans, motor vehicles, and non-motor vehicles), stereo analysis, crowd distribution, people counting, ANPR, vehicle density analysis, and object monitoring. The NVR's AI functionality should similarly support face detection, recognition, and video metadata analysis, including human attributes like gender, age, and the presence of accessories like glasses or masks. The face database should accommodate up to 40 databases, storing a maximum of 300,000 images with a total capacity of 48 GB. Each image should allow for associated details like name, gender, date of birth, address, credential information, and regional data. Continued</p>	1.000			NO	One Number	

	<p>Face recognition performance by the NVR must support configurations of 20 channels for face detection by camera with face recognition by the recorder, processing 20 images per second, or 4 channels of face detection and recognition by the recorder itself, processing 12 images per second. The device should also support up to 8 channels of metadata performance through the NVR and up to 32 channels through the camera. In terms of network capabilities, the device must handle a bandwidth of 1024 Mbps for incoming, recording, and outgoing data streams when AI is disabled, and 512 Mbps when AI is enabled. Video display options should include a variety of splits for both the main screen (up to 64 splits) and sub-screen (up to 36 splits), with support for multi-channel playback of up to 16 channels. The device should offer decoding capabilities ranging from 2-channel 32 MP at 30 fps down to 160-channel D1 at 30 fps. Playback features must include standard functions like play, pause, stop, and fast forward, as well as frame-by-frame viewing and partial zoom. It should support various recording modes, such as manual, alarm-triggered, motion-detection, and scheduled recording, with multiple backup options including portable hard drives, eSATA disks, burners, USB devices, and network backups. Alarm management should support 16 input channels and 8 output channels, with a range of alarm types including motion detection, video tampering, video loss, scene changes, and more. Anomalous conditions like camera offline status, storage errors, and IP conflicts must also be supported, alongside intelligent alarms for face detection, perimeter protection, and other AI-driven notifications. Alarm linkage features should include recording, snapshots, external alarm outputs, and various alerts like buzzer and email notifications. The device should support iOS and Android smartphones for remote access, include RAID support for RAID 0/1/5/6/10 with hot-swapping capabilities, and allow for the installation of up to 16 SATA hard disks with a capacity of 16TB each. The available ports must include 4 USB (2 front USB 2.0 and 2 rear USB 3.0), RS485 and RS232 interfaces, an eSATA port, and 4 HDMI and 2 VGA video output ports. It should support network configurations with 4 Ethernet ports (10/100/2500 Mbps RJ-45) and various network modes such as multi-address mode, load balancing, and fault tolerance. Continued</p> <p>For communication protocols, the device must support HTTP, HTTPS, TCP/IP, IPv4, RTSP, UDP, NTP, DHCP, DNS, SMTP, UPnP, DDNS, Alarm Server, IP Search, Multicast, InstaOn cloud, Auto Registration, iSCSI, ONVIF 22.06 (Profile S/T/G), CGI, and SDK. It should be compatible with web browsers like Chrome, IE 9 or later, and Firefox. Power requirements include a range of 100-240V AC at 50Hz, with support for redundant power supply options. The power consumption should be less than 18W without hard disks installed, and the device must operate within a temperature range of -10°C to +55°C and a humidity range of 10%-93% non condensing. End</p>					
41	<p>Supply, installation, commissioning, and testing of. Multi-Camera Switching Server system shall provide full support for titles, graphics, and layouts, with the ability to incorporate titles, logos, and backgrounds easily. An intuitive graphic design interface shall be included to facilitate the creation of multi-source layouts, enhancing visual flexibility and user experience. The program recording capability must support MP4 files using the H.264 codec, with a user-selectable bitrate of up to a minimum of 10 Mbps. The system shall also offer ISO recording functionality, allowing MOV file formats. The recording capacity must incorporate a minimum of 316 GB SSD internal storage, allowing for efficient and reliable storage of recorded content. For streaming capabilities, the system must support streaming to any RTMP server, ensuring compatibility with a wide range of streaming platforms. Additionally, NDI® support shall be mandatory, covering both inputs and program output for flexible connectivity options. Camera control features shall enable management of Crestron 1 Beyond PTZ cameras and tracking cameras over IP, with compatibility to be verified against a complete list of supported cameras. For comprehensive third-party control, the system shall offer REST API over network (TCP). The system must support a wide range of compatible codecs, including output via 3G-SDI, with SDI to USB-A 3.0 converters included, facilitating connections to external conferencing codecs such as Microsoft Teams® software, Zoom Rooms® software, and others. The system configuration shall be browser-based, with secure login and user administration features. Customizable preset options must be provided for sleep, wake, and scenario actions, allowing for efficient management and customization of system behavior. For communication, Ethernet support must include minimum 100/1000/2500Mbps throughput, ensuring optimal network speed for all operations. USB connectivity shall provide a minimum of USB 3.2 host ports, compatible with devices such as mouse, keyboard, data drives, and camera signals. Continued</p>	1.000			NO	One Number
	<p>The system shall be equipped with NDI® HX support, enabling up to a minimum of 12 NDI® HX inputs and 1 NDI® HX output, ensuring flexibility for high-quality video communication. USB connectivity shall include (2) USB Type-A 3.2 (Gen 2) connectors on the front and (5) USB Type-A 3.2 (Gen 2) connectors, along with (1) USB Type-C 3.2 (Gen 2, 5V/5A) connector on the rear for various peripherals and camera connections. SDI input/output capabilities must include (7) 3G-SDI mini DIN connectors for camera video input and (1) 3G-SDI mini DIN connector for output, supporting high-quality video connections. HDMI output shall consist of (2) HDMI 2.0b connectors to provide HDMI digital video/audio output, while (4) DisplayPort™ 1.4a connectors shall be included for monitor connections. The LAN ports shall be no less than (3) RJ-45 connectors, supporting 10/100/1000/2500 Mbps Ethernet connections for reliable network communication. Audio input and output functionalities shall incorporate (1) 1/8 in. 3.5 mm TRS connectors for unbalanced line-level audio input and output, ensuring high-quality audio signal handling. Additionally, Dante® networking audio input and output shall be supported to integrate with professional audio systems. In terms of environmental compliance, the system shall operate within a temperature range of 32° to 104° F (0° to 40° C) and humidity range of 5% to 90% RH (non-condensing), ensuring optimal functionality across various environments. Heat dissipation shall be a minimum of 477 BTU/hr, with a maximum of 1706 BTU/hr to manage heat efficiently during operation. The device shall comply with all necessary regulatory standards, including Part 15 Class A, IC Class A, CE, and Intertek® ensuring that it meets industry-wide safety and performance standards. Specifications outlined above reflect the minimum required standards for the system's design, and the bidder must ensure all design parameters are adhered to without compromise. Any deviations from these specifications must be accompanied by detailed justifications and will be subject to review and approval. End</p>					
42	<p>supply installation testing and commissioning of BMS Computer System: i7 Processor or Equivalent Server PC, Intel(R) Xeon(R) Processor, 2.93GHz, 4MB Cache with 32 GB RAM, & 1 TB HDD, 10/100 Mbps Ethernet card, USB connection & internal modem, Microsoft(R) Windows(R) 7 OS Professional Enterprise, Web server software, DVD-ROM Drive (with RAM), 100/1000 Mbps NIC for Network connection and anti virus software with 32" colour graphics monitor as per Tender Specifications. Accessories included Optical Mouse, Key Pad, Laserjet colour A4 printer with the above BMS System configuration. Windows Licensed software compatible with the BMS platform etc. complete as required.</p>	1.000			NO	One Number
43	<p>Supply, Installation, Testing and commissioning (SITC) of The printing system shall be of minimum dye sublimation or resin thermal transfer technology, ensuring a resolution of minimum 300 dpi (11.8 dots/mm) continuous tone while supporting a minimum color depth of up to 16.7 million colors and 256 shades per pixel or better. The print ribbon configuration must be such that it provides both a disposable ribbon cartridge (EZ) and an economical, eco-friendly refill ribbon for cartridge (ECO), with both variants supporting a full-color resin black and overlay panel, with a minimum yield of 250 prints (YMCKO*), while additional options shall include but not be limited to resin black standard with a minimum 1000 prints, full-color half-panel with resin black and overlay panel (YMCKO*) supporting a minimum of 350 prints, with exclusive EZ configurations including full-color with two resin black panels and overlay panel (YMCKOK*) supporting a minimum of 300 prints, resin black with overlay panel (KO*) supporting a minimum of 500 prints, resin black premium with a minimum of 1000 prints, resin white with a minimum of 1000 prints, and metallic gold with a minimum of 450 prints or better. The system shall exhibit a minimum printing speed of 6 seconds per card for K*, 8 seconds per card for KO*, 16 seconds per card for YMCKO*, and 24 seconds per card for YMCKOK* or faster. It must be equipped with security features including but not limited to resin scramble technology to obscure any resin panel-printed information making it unreadable, with minimum AES 256 encryption compliance or better. The system shall support minimum standard card sizes of CR-80 (3.375"L x 2.125"W / 85.6 mm L x 54 mm W) and CR-79 adhesive back (3.313"L x 2.063"W / 84.1 mm L x 52.4 mm W) while ensuring a minimum print area of CR-80 edge-to-edge (3.36"L x 2.11"W / 85.3 mm L x 53.7 mm W) and CR-79 (3.3"L x 2.04"W / 83.8 mm L x 51.8 mm W) or better. It must accept minimum card thickness from .009" - .040" / 9 mil - 40 mil / .229 mm - 1.016 mm and support minimum PVC or polyester cards with polished PVC finish, requiring monochrome resin for 100% polyester cards or rewrite functionality. The system shall possess an input hopper capacity supporting a minimum of 100 cards (.030" / .762 mm) and an output hopper capacity supporting a minimum of 30 cards for single-sided and 100 cards for dual-sided printing (.030" / .762 mm) or higher. Card cleaning shall be automated with a card cleaning roller integrated within the ribbon cartridge and replaced automatically at each ribbon change or better.</p>	1.000			NO	One Number

	The system shall include a minimum memory of 32 MB RAM and support drivers for Windows 7, 10, 11, Server 2012, Server 2016, Server 2019, Server 2022, or better. The interface shall include USB 2.0 with an optional Ethernet configuration featuring an internal print server or better. The operating temperature shall range between a minimum of 65° F (18° to 27° C) with a humidity tolerance of minimum 20–80% non-condensing or better. The physical dimensions of the system shall be as follows: for a single-sided printer, a minimum of 8.8"H x 13.7"W x 7.9"D (224 mm H x 348 mm W x 201 mm D), and for a dual-sided printer, a minimum of 9.8"H x 18.7"W x 9.2"D (249 mm H x 475 mm W x 234 mm D) or smaller. The system shall maintain a minimum weight of 7.5 lbs. (3.4 Kg) for single-sided and 10 lbs. (4.54 Kg) for dual-sided configurations or lighter. It shall comply with minimum safety and environmental agency listings including but not limited to UL 60950-2, CSA C22.2 (60950-07), CE, FCC Class A, EN 55022 Class A, EN 55024, CCC, BSMI, KC or better. The system must be designed for energy efficiency, supporting refillable supply cartridges (ECO) and card rewrite functionality or better. The minimum supply voltage shall be 100-240Vac, 50-60Hz, with a maximum current draw of 1.6 Amps or better. The supply frequency must be a minimum of 50 Hz / 60 Hz. The warranty shall include a minimum of three years coverage for the printer and an additional three years with unlimited card passes for the printhead with UltraCard™ or better. Encoding capabilities must include support for smart card and magnetic stripe encoding technologies at a minimum, including 125 kHz HID Prox reader; 13.56 MHz iCLASS® Standard / SE / SR / Seos, MIFARE Classic®, MIFARE Plus®, MIFARE DESFire®,					
	MIFARE DESFire EV1/EV2, ISO 14443 A/B, ISO 15693 read/write encoder; contact smart card encoding supporting ISO7816 1/2/3/4 memory and microprocessor smart cards (T=0, T=1) and synchronous cards, ISO magnetic stripe encoding, dual high- and low-coercivity supporting tracks 1, 2, and 3 or better. The system must support access control credential programming for a minimum of iCLASS Standard/SE/SR/Seos, MIFARE Classic, MIFARE DESFire EV1, and HID Prox or better. Additional optional features must include but not be limited to dual-sided printing, smart card encoding (contact/contactless), magnetic stripe encoding, printer cleaning kit, Ethernet with internal print server, and secure proprietary consumables system or better. The included software shall be a minimum of diagnostic utility with Color Assist spot color matching functionality or better. The printer display shall feature color-changing status buttons or better, ensuring seamless operational monitoring and ease of use.					
44	The system shall include a minimum memory of 32 MB RAM and support drivers for Windows 7, 10, 11, Server 2012, Server 2016, Server 2019, Server 2022, or better. The interface shall include USB 2.0 with an optional Ethernet configuration featuring an internal print server or better. The operating temperature shall range between a minimum of 65° F (18° to 27° C) with a humidity tolerance of minimum 20–80% non-condensing or better. The physical dimensions of the system shall be as follows: for a single-sided printer, a minimum of 8.8"H x 13.7"W x 7.9"D (224 mm H x 348 mm W x 201 mm D), and for a dual-sided printer, a minimum of 9.8"H x 18.7"W x 9.2"D (249 mm H x 475 mm W x 234 mm D) or smaller. The system shall maintain a minimum weight of 7.5 lbs. (3.4 Kg) for single-sided and 10 lbs. (4.54 Kg) for dual-sided configurations or lighter. It shall comply with minimum safety and environmental agency listings including but not limited to UL 60950-2, CSA C22.2 (60950-07), CE, FCC Class A, EN 55022 Class A, EN 55024, CCC, BSMI, KC or better. The system must be designed for energy efficiency, supporting refillable supply cartridges (ECO) and card rewrite functionality or better. The minimum supply voltage shall be 100-240Vac, 50-60Hz, with a maximum current draw of 1.6 Amps or better. The supply frequency must be a minimum of 50 Hz / 60 Hz. The warranty shall include a minimum of three years coverage for the printer and an additional three years with unlimited card passes for the printhead with UltraCard™ or better. Encoding capabilities must include support for smart card and magnetic stripe encoding technologies at a minimum, including 125 kHz HID Prox reader; 13.56 MHz iCLASS® Standard / SE / SR / Seos, MIFARE Classic®, MIFARE Plus®, MIFARE DESFire®,	20,000		NO	One Number	
45	Supply, Installation, Testing and commissioning (SITC) of Control panel electrical specifications for the system must meet the following criteria: The input voltage must be 12V DC (-15%/+20%) or 24V DC (-15%/+20%), and the input current for the board should be a minimum of 500 mA at 12V DC or 250 mA at 24V DC. The maximum power for the system, accounting for boards and attached devices, shall be 5A at both 12V DC and 24V DC. The system shall be capable of dissipating a typical heat output of 140 BTU/hr. In terms of optional PoE+ module support, the system must be compliant with PoE (802.3af) delivering a maximum of 12.95 W and PoE Plus (802.3at) offering a maximum of 25.5 W. Power negotiation must use a two-state physical discovery or LLDP-MED protocol. The available power for attached devices through PoE must be 550 mA at 12V, while PoE Plus must deliver 1,000 mA at 12V. The physical dimensions for the enclosure must be 305 x 305 x 101 mm (12 x 12 x 4 inches), and the board must be 190 x 146 x 25 mm (7.5 x 5.75 x 1 inches). The shipping box dimensions should be 381 x 330 x 178 mm (15 x 13 x 7 inches), and the system must weigh no more than 4.2 kg (9.3 lbs) with the enclosure. The enclosure shall include a lock and tamper switch, with mounting standoffs for two expansion modules (18, 18-CSI, R8, or RM-4).n terms of environmental performance, the system must operate within a temperature range of 0°C to 50°C (32°F to 122°F) and be capable of withstanding humidity levels from 5% to 95% RH. The system must include a network port for PoE (Port 1).Operationally, the system memory must consist of a minimum of 16GB Flash eMMC and 2GB RAM. The cardholder capacity shall be 1,000,000 with ten clearances and five cards per person, supporting 40-digit cards. The processor must be an NXP iMX7, and the operating system should feature a hardened Linux kernel based on the Yocto Project (YP). The system must support dual GigE LAN ports, and network authentication must use TLS 1.3 with AES256 symmetric encryption and unique certificates. Port authentication must comply with the 802.1X port authentication protocol.	4,000		NO	One Number	
	The system shall support four readers, with compatibility for OSDP, RM, Wiegand, and Touchscreen (a maximum of two touchscreens and two Wiegand onboard). The maximum distance to the reader must be 1,200 m (4,000 ft) for OSDP and RM, with power varying according to the application for touchscreen RM Mode (1,200 m or 4,000 ft) and Smart Mode (10 m or 33 ft). Wiegand connections should support a maximum of 150 m (500 ft). For reader power, the system shall provide 12V DC at 750 mA for Wiegand and 12V DC at 1.2A for RS485. The system must offer eight supervised inputs, including tamper, low battery, and power fail notifications. Auxiliary input power must support 12V DC with two inputs at 350 mA each. The system should support input expansion of up to 64 additional inputs using I8 expansion modules. For outputs, the system shall provide four individually configurable outputs via jumper, supporting either power sourcing (wet) or dry contact relay. The system shall allow for output expansion of up to 64 additional Form C outputs using R8 expansion modules. The output power for wet outputs must be 12V DC or 24V DC, providing a minimum of 0.75A per port. Output protection must include a load switch rated for 0.75A, with snubber and transorb protection. For dry contact outputs, the system should handle a rating of 30V AC/DC at 3A. Approved Make - Tyco / Suprima/Bosch					
46	Supply, Installation, Testing and commissioning (SITC) of Time & Attendance Module Per 1000 Visited	1,000		NO	One Number	
				TOTAL OF PART G = Rs.		