

Strengthening Capacity of Border Control for  
Responding to Infectious Diseases in Southwest Asia

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**DESIGN, SUPPLY, INSTALLATION,  
TESTING, AND COMMISSIONING  
OF A BIOMETRIC-ENABLED ACCESS  
CONTROL TURNKEY SYSTEM AT  
BANDARANAIKE INTERNATIONAL  
AIRPORT, SRI LANKA**

**Technical and Non-technical Requirements**

International Organization for Migration (IOM)  
Sri Lanka and Maldives

**VERSION 2.0**  
**November 2024**

#	Requirement	Bidders Response
<b>A</b>	<b>General requirements</b>	
A.1	<p><b>Scope of work:</b> The scope of work includes design, supply, installation, testing, training, and commissioning of a secure access pass issuance, access control, and tracking system at Bandaranaike International Airport, in conformity with the procedural, technical, functional, and non-functional specification given in this document.</p> <p>Supplying and Installing of complete Security Tracking &amp; Access Pass Issuing System which shall consist all required software including Database Management Systems, other third party software application (if required), etc and all required hardware such as Tracking Controller, Movement tracking antennas, Access controllers/ Readers, Central servers, Monitoring PCs, Database servers, Pass printers, CCTV cameras etc.</p> <p>All the Tracking Controller, Movement tracking antennas, Access controllers/ Readers, etc shall be connected to a central monitoring system where the functions and the alarms shall be given as real time alerts in addition to the management functions. Network connectivity from these sectors to the Central Monitoring system will be provided by the employer through the AASL network infrastructure.</p> <p>Bio Metric readers with Facial Recognition capability shall be provided on supply only basis along with the door hardware.</p>	
A.2	<p><b>Overview of Materials, Components, Works, and Services Under this Contract:</b></p> <p><b>a. Design, Supply, and Installation:</b></p> <ul style="list-style-type: none"> <li>• Provide a complete access pass management solution, including central infrastructure (servers, storage, and security equipment).</li> <li>• Supply and install control and management software modules.</li> <li>• Set up monitoring room infrastructure, including monitoring stations and software.</li> </ul> <p><b>b. Access Controllers and Tracking Receivers:</b></p> <ul style="list-style-type: none"> <li>• Supply and install compatible access controllers and tracking receivers at designated locations within the airport premises.</li> <li>• Integrate these devices with the central management solution.</li> </ul> <p><b>c. Video Monitoring Solution:</b></p> <ul style="list-style-type: none"> <li>• Supply and install a video monitoring solution at access control locations. Video logs shall be available for not less than 30 days</li> </ul>	

	<p><b>d. Access Pass Personalization and Issuing:</b></p> <ul style="list-style-type: none"> <li>• Supply and install access pass personalization, issuing, and lifecycle management solutions.</li> <li>• Provide necessary hardware components such as pass printers, etc.</li> </ul> <p><b>e. Training:</b></p> <ul style="list-style-type: none"> <li>• Offer training, both operational and administrative, to AASL users.</li> </ul> <p><b>f. Testing and Commissioning:</b></p> <ul style="list-style-type: none"> <li>• Conduct thorough testing and commission the system for live and production use.</li> </ul>	
A.3	<p><b>Facilities, Materials, and Services to be Provided by the AASL:</b></p> <p><b>a. IP Network Connectivity:</b> The AASL will provide IP network connectivity to all locations where equipment will be installed. Please note that the AASL will offer a single endpoint at each location.</p> <p><b>b. Power Supply:</b> The AASL will provide a 230V, 50Hz single-phase electricity supply from the airport power distribution network. This power will be supplied either as a single 13A socket or at the nearest distribution board. The contractor is responsible for installing any uninterrupted power sources to ensure the continuous operation of all the equipment (monitoring room, pass issuing station, All UHF readers, Workstations, door controllers with facial recognition, etc installed under this project.</p> <p><b>c. Provision of Space:</b> The AASL will provide empty space for installing the central ICT infrastructure components (UPS power will be provided for the equipment at the data center for the central serves etc.) , monitoring room equipment, and pass issuing station equipment. The contractor will be responsible for all necessary accessories and local civil works.</p>	
A.4	<p><b>Safety and Security:</b></p> <p><b>a. Backup Power:</b> The contractor is required to provide backup power, including battery backups or uninterrupted power supply as applicable, for all devices, ensuring their operation based on the main power available at the premises.</p> <p><b>b. Fail-Safe Operation:</b> All access control devices must operate in a fail-safe mode, especially in response to equipment, communication, or power failures. All the user credentials shall be stored in the device itself and shall be able to work independently in a system/server failure.</p>	

	<p>c. <b>Manual Override:</b> All access control devices should feature secured manual overrides that can be activated in case of emergencies, such as fire evacuations.</p> <p>d. <b>Protection against Surges:</b> All devices must be adequately safeguarded against power surges, lightning surges, and similar events.</p>	
A.5	<p><b>Scalability and Expandability:</b></p> <p>a. <b>Scalable Solution:</b> The proposed solution should be designed for scalability, allowing for the installation of additional access control points and tracking equipment in the future as required by the AASL.</p> <p>b. <b>API Integration:</b> The proposed solution must have the capability to integrate with external automation solutions that the AASL may introduce in the future, such as HR systems or ERP systems.</p> <p>c. <b>SSO Integration:</b> The proposed solution should support integration with an external single-sign-on (SSO) solution, utilizing standard protocols for administration, management, and monitoring access.</p>	
A.5	<p><b>Contractor Requirements and Activities:</b></p> <p>a. <b>Detailed Requirements Survey:</b> The contractor must conduct a comprehensive requirements survey and submit a design document that outlines the technical and operational design of the total solution. Approval from AASL must be obtained for this solution before any work commences.</p> <p>b. <b>Resource Provision:</b> The contractor is responsible for providing all necessary human resources, equipment, and materials required for the project activities.</p> <p>c. <b>Project Manager Designation:</b> The contract must designate a project manager who will serve as the single point of contact for all correspondence during the project's execution.</p> <p>d. <b>Technical Training:</b> The AASL technical staff must receive adequate technical training related to the operation, maintenance, and servicing of all components installed under the project.</p> <p>e. <b>Acceptance Tests:</b> A site acceptance test and an operational acceptance test will be conducted by the AASL before commissioning the system for production use. Final acceptance will be provided after a trial period of no less than 30 days of successful operations.</p>	

	<p>f. <b>As-Built Drawings:</b> The contractor must provide the AASL with as-built drawings of the solution before commissioning and final acceptance.</p> <p>g. <b>Facility Interference Mitigation:</b> During the installation and testing of the system, the Contractor must ensure that there is no damage, interference, or interruption to the operations of nearby facilities. The Contractor should provide plans before installation and testing to guarantee this.</p> <p>h. <b>Damage Restoration:</b> In the event of any damage to existing or newly placed facilities due to the Security Tracking and Access Pass Issuing System or other related operations, whether accidental or necessary for installation, the Contractor shall be responsible for restoration. The restoration must meet or exceed the qualities or performance capacities of the original work, with finishes matching the appearance of existing adjacent work.</p>	
A.6	<p><b>Licensing, Warranty, and Support:</b></p> <p>a. <b>Warranty for Active Equipment:</b> All active (powered) equipment provided under this contract must be covered by a comprehensive warranty of no less than 36 months from the date of final acceptance by AASL.</p> <p>b. <b>Warranty for Passive Components:</b> All passive components (cables, accessories, and fittings) must be covered by a comprehensive warranty of no less than 5 years from the date of final acceptance by AASL.</p> <p>c. <b>Software Licensing:</b> All software products must be licensed to AASL on a perpetual basis. No product or component shall be licensed based on variable parameters such as the number of enrollments, passes issued, transaction volumes, or user-based.</p> <p>d. <b>Post-Warranty Support:</b> After the warranty period, the solution must be supported with an annual maintenance contract with AASL.</p> <p>e. <b>Software Updates:</b> The contractor must provide all updates, new releases, security patches, etc., to all components free of charge during the warranty and maintenance period. The contractor shall ensure that such updates are deployed within 14 days from their release by the original manufacturer.</p>	

A.7	<p><b>Information and Data Security</b></p> <p>a. <b>Protection Against Data Loss:</b> The system must be equipped with adequate protection and necessary equipment to safeguard against information loss or related disasters, including the provision of backup devices.</p> <p>b. <b>Securing System Components:</b> All system components must be appropriately secured to prevent unauthorized access or modifications. All the passwords shall be given to AASL after the DLP .</p> <p>c. <b>Network Connection Authorization:</b> The system should not be connected to any external communication links or networks, including the Internet, for maintenance or any other purposes without prior permission from AASL. Such connections must be monitored by AASL, and the contractor must facilitate these connections as needed.</p>	
B	Minimum technical requirements and quantities for key hardware modules to be supplied under this contract	
B.1	<p>Access pass tracking controllers</p> <ol style="list-style-type: none"> <li>a. Air interface protocol: / ISO 18000-63 and EPCglobal Gen2v2 compliant</li> <li>b. Antenna ports : More than 2</li> <li>c. Read zones (max): 30</li> <li>d. Transmit power (max, dBm) : More than 30 dBm.</li> <li>e. Receive sensitivity (dBm): More than 90 dBm.</li> <li>f. Quantity to be supplied: 12</li> </ol>	
B.2	<p>Access pass tracking antennas (for tracking controllers)</p> <ol style="list-style-type: none"> <li>a. Frequency Range: 865-868 MHz / 902-928 MHz</li> <li>b. Mounting: Flush or VESA mount</li> <li>c. Environmental Rating: IP67</li> <li>d. Up to 8m read range</li> <li>e. Quantity to be supplied: 24</li> </ol>	
B.3	<p>Hand-held (portable) access pass readers</p> <ol style="list-style-type: none"> <li>a. Shall be able store not less than 200,000 cardholders on-board in encrypted format.</li> <li>b. Shall be able to operate without power connection.</li> <li>c. Wireless network connection shall be available</li> <li>d. Rugged design and lightweight.</li> <li>e. Shall have high resolution captive touch screen.</li> <li>f. Quantity to be supplied: 2</li> </ol>	
B.4	<p>Access controllers for control entry points (Supply only basis) – 10 nos</p> <ol style="list-style-type: none"> <li>a. Type – Facial Recognition and Mifare chip detection (13.56 Mhz)</li> <li>b. Face Capacity not less than 30,000, card capacity not less than 50,000 cards.</li> <li>c. Face detection speed is not more than 0.5 seconds.</li> </ol>	

	<ul style="list-style-type: none"> <li>d. Operating height for Face detection – 1.4 meters – 1.9 meters</li> <li>e. False Acceptance Ratio (FAR) (Face ID) better than 1 to 1 Billion</li> <li>f. Live face detection shall be available (Anti Spoofing)</li> <li>g. Shall be able to detect faces in day light and during dark environments using built in lighting.</li> <li>h. Communication interface: Ethernet TCP/IP (host communication) Wiegand/ RS 485 (reader communication)</li> <li>i. Input /Output : Door Input monitoring and output control shall be available</li> <li>j. Shall be able to operate in “off line” mode during the event of a communication or host failure.</li> <li>k. System monitoring: Tamper detection, AC power failure, Battery failure shall be available. <del>as voltage free contacts</del></li> <li>l. Transaction buffer : not less than 50,000 events</li> <li>m. Shall be able to update and process data from the host system and shall be capable of updating the host system on the activities.</li> <li>n. Quantity to be supplied: 10 units</li> </ul>	
B.5	<p>Door control units (for access controllers)- (Supply only basis) – 10 nos to be provided</p> <ul style="list-style-type: none"> <li>a. Locking mode: Magnetic door lock</li> <li>b. Force handling capacity: Not less than 150 Kg force</li> <li>c. Lock must be provided with necessary interfacing accessories.</li> </ul>	
B.6	<p>Software for access control, security tracking, and monitoring.</p> <ul style="list-style-type: none"> <li>a. The software should support both tracking and access control functions to be managed and administrated by a common user interface.</li> <li>b. The software shall be capable of controlling, monitoring, and managing the access control gates.</li> <li>c. The software should have a Central Monitoring Display with a user-friendly graphical interface that can be configured on multiple locations.</li> <li>d. All pass holders' live movement and history shall be able to view.</li> <li>e. Software should support generating movement tracing reports shall be able to generate.</li> <li>f. The software should include a device monitoring facility.</li> <li>g. Software shall be capable of providing required alerts in both audio and graphical formats related to tracking process.</li> <li>h. Software shall have all standard features of commercially available in access control systems.</li> </ul>	

B.7	<p>Requirements of the access pass issuing solution and the workflow process.</p> <ul style="list-style-type: none"> <li>a. Online Access pass requests shall be able to be raise through a web portal using a defined templates. Various templates shall be available based on the requirements that will be identified in the requirement-gathering stages.</li> <li>b. Both AASL employees and outside organizational users shall be able to raise pass requests through the system, and those requests shall be able to be identified separately for further processing.</li> <li>c. The system shall facilitate outside organizational users to register to the system as pass requesters and/or request approvers. AASL security shall hold the administrative rights, and a designated security officer shall be able to activate and inactivate those accounts.</li> <li>d. Account holders shall be able to raise pass requests for themselves and on behalf of other organizational members.</li> <li>e. Divisional-level online approval workflow shall be able to be defined for AASL employees, and the approval workflow of other organizations should also be defined in the system as per the requirement.</li> <li>f. Authorized online pass requests shall be forwarded to the security division for further processing.</li> <li>g. The requesting party shall be able to get the printouts of the authorized pass requesting application and other filled documents, which will be further explained in the requirement gathering stages.</li> <li>h. Pass requester shall be able to retrieve previously entered details (if available) using his/her unique identity (NIC, Passport, etc.) to avoid data re-entering time when filling the application.</li> </ul>	
B.8	<p>Requirements of the main pass issuing software module: The main pass issuing module must support the following key functions and processes.</p> <ul style="list-style-type: none"> <li>a. All above-mentioned (B.7) approved online pass requests shall be able to be retrieved by the security officers for future processing.</li> <li>b. Security officers shall also be able to create new pass requests when a requester has not used online request facility.</li> <li>c. Security users shall be able to do necessary updates and send pass requests through an approval workflow by the system.</li> </ul>	

	<ul style="list-style-type: none"><li>d. Security users shall be able to get the printout of the pass request application for physical signatures and any other purposes.</li><li>e. Security users shall be able to get the required payment through the system, and should be able to issue payment receipts. Facility to pay for access passes by credit and debit cards (including payment gateway integration and POS-based payments) shall be available.</li><li>f. POS terminals and the payment gateway shall be able to integrate with pass-issuing software to get the transaction details automatically.</li><li>g. Required financial information shall be transferred to the ERP system as and when required.</li><li>h. Photos of the pass holder should be taken by a camera that is connected to the system/ computer through the computer with the required quality, and the same shall be incorporated to the pass.</li><li>i. The pass holder's signature shall be able to be taken through a digital signature pad which will be connected to the system and shall be included to the pass just after sign by the user.</li><li>j. All required details, such as areas allowed, Name, NIC, and Organization that will be identified during the requirement gathering sessions, shall be incorporated to the system and printed in the pass using a pre-defined pass template.</li><li>k. Once the pass request application is processed, the access pass shall be able to print through the system on a compatible RFID tag-enabled PVC card. The system shall be capable of enrolling the data of the Facial data, UHF-enabled chip and MiFARE chip.</li><li>l. Multiple pass templates (one or two sides) of the pass shall be able to be designed, stored, and used in the system since templates may vary based on criteria like year of pass issuance, requesters organization, pass type, etc.</li><li>m. Multiple sites(Airports) pass issuing process shall be able to manage from a central location.</li><li>n. Shall be able to remove inactive cards/stored images from the system that have not been used within the given time period.</li><li>o. Validation readers shall be connected to the pass-issuing computers to check the pass before issuing it to the requester.</li><li>p. A temporary pass-issuing facility shall be available for visitors.</li><li>q. Visitor movement shall be able to trace and pass shall be able to return for future use.</li></ul>	
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	<ul style="list-style-type: none"> <li>r. The system shall be capable of producing a pass or vehicle tag for vehicles that are relevant to the pass holder. The system shall store details of vehicles such as Vehicle Make, Model, and Registration number.</li> <li>s. Relevant documents shall be uploaded capable to the system by associating them with Vehicle and pass holder identification.</li> <li>t. The system shall be capable of getting necessary reports through the system.</li> <li>u. Reports can be customized to include only the required information.</li> <li>v. Quick reports shall be able to generate using saved template</li> <li>w. Critical reports shall be able to scheduled and email to required persons automatically.</li> <li>x. Any other reports which will be identified during requirement gathering sessions</li> </ul>	
B.9	<p>Specifications for main pass printers 5 Nos to be provided</p> <ul style="list-style-type: none"> <li>a. Dye sublimation retransfer printing capability shall be available.</li> <li>b. One or two-sided printing shall be available.</li> <li>c. Full-bleed, Over-the-edge full-card printing shall be available.</li> <li>d. Full-colour images shall be printed.</li> <li>e. Printing resolution shall be not less than 300 dots per inch (11.8 dots/mm)</li> <li>f. Automatic card feed facility shall be available.</li> <li>g. Reject card slot shall be available.</li> <li>h. The following card types shall be capable to print. <ul style="list-style-type: none"> <li>• ISO ID-1/CR-80 size (3.370 in. x 2.125 in. / 85.6 mm x 53.98 mm)</li> <li>• PVC, ABS, PET, PET-G and Polycarbonate</li> <li>• 0.25 mm to 1.0 mm thickness (10 mil to 40 mil)</li> </ul> </li> <li>i. The printer shall be able to connect to the PC through USB or Ethernet.</li> <li>j. High-speed printing shall be available (Full color one sided card shall be printed within 30 seconds).</li> <li>k. Shall be able to connect with Windows1 or the latest Operating systems.</li> <li>l. The laminating facility required with below specifications <ul style="list-style-type: none"> <li>• Lamination transfer speed: 21 seconds or better</li> <li>• Laminator dimensions: L 13.2 in. x W 8.3 in. x H 14.2 in. (210 mm x 330 mm x 360 mm)</li> </ul> </li> <li>m. Printing material such as YMCK ribbons, laminating films to print not less than 10,000 cards shall be provided with the printer.</li> </ul>	

	n. Input hopper shall be 100 cards.	
B.10	<p>Requirements and specifications for paper-based visitor pass printer - 8 units to be provided .</p> <ol style="list-style-type: none"> <li>a. Print methods: direct-thermal or thermal-transfer</li> <li>b. LCD multilingual graphical user interface and full function keypad</li> <li>c. USB 2.0/USB 3.0 and Ethernet connectivity</li> <li>d. Resolution: 8 dots per mm/203dpi/ 12 dots per mm/300dpi (optional)</li> <li>e. Maximum Print Width: 4.09 in./104 mm</li> <li>f. Print speed: 152mm/6" per second</li> <li>g. Maximum media roll size: 203mm/8.0" O.D on a 76mm/3.0" I.D. core</li> <li>h. Media thickness: 0.076mm/0.003" to 0.25mm/0.010"</li> <li>i. Media Types: Continuous, die-cut, notch, black mark</li> <li>j. Supports user-defined fonts and graphics, including custom logos</li> <li>k. Bi-fold media door with large clear window</li> <li>l. Side-loading supplies path for simplified media and ribbon loading</li> </ol>	
B.11	<p>Specifications for signature pads</p> <ol style="list-style-type: none"> <li>a. Slim and ergonomic design.</li> <li>b. LED status indicators.</li> <li>c. Display size shall be not less than 4" (10.5 cm), and resolution shall be not less than 320X160 pixel.</li> <li>d. Backlit display.</li> <li>e. Real-time signature display.</li> <li>f. Resistive touch technology.</li> <li>g. 1024 or higher pressure level.</li> <li>h. AES encryption of data transfer between the pad and the computer.</li> <li>i. Power shall be supplied Via USB cable or external power supply.</li> <li>j. Number of signature pads to be supplied : 04 units</li> </ol>	
B.12	<p>Specifications for main camera connected to pass issuing system:</p> <ol style="list-style-type: none"> <li>a. Camera Format: APS-C/full frame</li> <li>b. Pixels: Not less than 24 MP</li> <li>c. Aspect Ratio: 3:2</li> <li>d. Sensor Size: Approx. 22.3 mm x 14.9 mm or larger</li> <li>e. Image File Format: JPEG, Raw</li> <li>f. Shutter Speed: 1/8000 to 30 Seconds, 1/8000 to 900 Seconds</li> <li>g. Metering Method: Centre-Weighted Average, Highlight Weighted, Matrix, Spot</li> <li>h. Exposure Modes: Aperture Priority, Manual, Program, Shutter Priority</li> </ol>	

	<ul style="list-style-type: none"> <li>i. White Balance: Auto, Cloudy, Colour Temperature, Daylight, Flash, Fluorescent, Incandescent, Preset Manual, Shade</li> <li>j. Self-Timer: 2/5/10/20-Second Delay</li> <li>k. Focus Type: Auto and Manual Focus</li> <li>l. Focus Mode: Continuous-Servo AF, Full-Time Servo, Manual Focus, Single-Servo AF</li> <li>m. Autofocus Points: Phase Detection: 51 (15 Cross-Type), Phase Detection: 273</li> <li>n. Memory Card Slot: Dual Slot: SD/SDHC/SDXC (UHS-II)</li> <li>o. Connectivity: USB Type-C (USB 3.1), HDMI C (Mini), 2.6.16.</li> <li>p. Wireless: Bluetooth/ Wi-Fi</li> <li>q. Number of camera units to be supplied: 02 units must be supplied with all required accessories, including a mounting tripod and flash-light.</li> </ul>	
B.13	<p>Specifications for laptop computer:</p> <ul style="list-style-type: none"> <li>a. Microprocessor: Intel Core i5 or higher</li> <li>b. Memory : 4 GB DDR4-2666 SDRAM</li> <li>c. Video graphics: Intel UHD Graphics</li> <li>d. Hard drive: 1 TB SSD</li> <li>e. Optical drive: DVD-Writer</li> <li>f. Display: 15.6" diagonal HD SVA BrightView micro-edge WLED-backlit (1366 x 768)</li> <li>g. Wireless connectivity: Wifi and Bluetooth</li> <li>h. Network interface: Integrated 10/100/1000 GbE LAN</li> <li>i. Keyboard: Full-size, backlit</li> <li>j. Operating System: Genuine Windows 11 or later</li> <li>k. Number of units to be supplied: 01 unit</li> </ul>	
B.14	<p>Specifications for monitoring PCs 12 Units to be provided</p> <ul style="list-style-type: none"> <li>a. Operating system: Windows 11 or later</li> <li>b. CPU: Intel Core i5, 2GHz, or higher</li> <li>c. Graphics: Intel HD Graphics 5000</li> <li>d. RAM: 8GB DDR3 or better</li> <li>e. Storage: 256GB</li> <li>f. Ports: 3x USB3.0, 1x USB-C, 1x HDMI, audio jack, RJ-45 gigabit Ethernet</li> <li>g. Connectivity: 802.11 a/b/g/n/ac, Dual-band Wi-Fi 2.4GHz/5GHz, Dual wireless antenna, Bluetooth 4.0</li> <li>h. Internal amplified speaker system for basic audio playback</li> <li>i. 3.5 mm line out socket (rear access)</li> <li>j. USB Keyboard shall be provided</li> <li>k. USB Mouse shall be provided</li> <li>l. LED monitor shall be provided</li> </ul>	

	<p>m. Shall be capable to provide required alerts in both audio and graphical formats related to tracking process at the tracking points</p>	
B.15	<p>Requirements for central ICT infrastructure and storage servers</p> <ol style="list-style-type: none"> <li>a. The central ICT equipment should have sufficient capacity to maintain records of over 50,000 passes and transaction log for not less than 5 years.</li> <li>b. The solution should be fully redundant and should include any single point failure</li> <li>c. The solution must be provided with a suitable data backup device, software. The system should be configured for automatic backup at regular intervals</li> <li>d. All components used in the central infrastructure must be industry standard devices with authorized agents support and maintenance available within Sri Lanka</li> <li>e. The server operating systems must be either Windows or Linuz based and in their current released versions.</li> </ol>	
B.16	<p>CCTV Cameras : IP based 24 Nos to be provided</p> <ol style="list-style-type: none"> <li>a. Images of the cameras shall be integrated to the proposed system for analyzing purposes .The camera images shall be available at the workstations as live view ,playback of recorded videos .</li> <li>b. Recording shall be archived for minimum 30 days at full resolution @ full frame rate .Contractor to provide a suitable storage</li> <li>c. Type : Motorized Varifocal Dome</li> <li>d. Resolution : Not less than 3 mega pixels (2048 x 1536)</li> <li>e. Frame Rate : Not less than 25fps @ 1080p</li> <li>f. Lens : 2.7 – 12 mm @ F 1.4 – Auto Iris and remote focus</li> <li>g. Minimum Illumination : 0.005 lux / F1.4 (color)</li> <li>h. IR Cut</li> <li>i. Filter : Shall be available and automatic operation in day night mode</li> <li>j. IR Distance : Not less than 10m</li> </ol>	

	<p>k. Video Compression : H.265, H.264 &amp; MJPEG</p> <p>l. Multiple Individual Configurable Streams : Not less than 3</p> <p>m. Image Enhancement Features : DNR, AGC, AWB Shall be available</p> <p>n. Network Protocols : TCP IP, UDP, ICMP, HTTP, RTSP, IPv4 Shall be available</p> <p>o. Digital PTZ : Shall be available</p> <p>p. Compliance: Onvif profile S or third-party Onvif compatible protocol shall be comply</p> <p>q. Network Interface : RJ45 10M, 100M Ethernet Interface</p> <p>r. Day and Night Operation: Shall be possible</p> <p>s. Operating Condition : 10 – 60 C /Humidity 95%</p> <p>t. Power : PoE IEEE 802.3at (Class 4)</p> <p>u. Flicker Correction : Shall be available for 50Hz and 60 Hz line frequency</p> <p>v. Mounting : 3 Axis adjustable mounting shall be provided with the camera</p> <p>w. Housing : Minimum IK8, IP66 shall be available</p>	
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### Bill of Quantities (BoQ - Minimum Requirements)

Item	# of Units
UHF Tracking controller	12
Tracking Antenna	24
Monitoring PC units with tracking software ( for Tracking locations )	12
Handheld reader	2
Bio metric ( Facial Recognition ) /Access Controller/Reader	10
Workstations for pass office with necessary software /hardware for Pass issuing process including enrollment of UHF,Mifare,facial data.	12
Access permit pass printer(RFID cards)	5
Access permit pass printer - paper based	8
Signature pad	4
Server (Redundant)	2
Digital camera for photo ID with necessary lighting accessories, tripod stands, PC interfaces etc.	2
CCTV cameras (integration into the proposed system)	12
Others (hardware/Software, etc) to make a fully functional system	Lot 1