Proposal for Upgrading ELV Systems to SIRA Standards The Sustainable City Dubai

Abstract
Comprehensive upgrade of the CCTV system and infrastructure for Sustainable City, including centralized storage, video wall, and SIRA-compliant monitoring

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Proposal for Upgrading ELV Systems to SIRA Standards – The Sustainable City Dubai
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1 Executive Summary

This document presents a comprehensive technical evaluation and upgrade proposal for the security and ELV infrastructure at The Sustainable City (TSC), Dubai. The assessment covers CCTV, Access Control, ANPR, Gate Barriers, and the Central Control Room. The evaluation has been conducted in accordance with the latest SIRA Security System Technical Requirements (STR-2024) and relevant UAE regulatory frameworks.

The findings indicate that several components of the existing ELV ecosystem are either non-functional, outdated, or not aligned with current SIRA compliance standards. To ensure full regulatory compliance, operational reliability, and enhanced situational awareness, a complete security system modernization program is recommended.

The proposed solution delivers:

- Full compliance with SIRA STR-CCTV, STR-ACSS, STR-ANPR & SCCR standards
- Enhanced coverage with advanced 4–8MP cameras
- Enterprise-grade centralized VMS with 30–90 days retention
- Automated vehicle access (ANPR + RFID + Visitor QR)
- Robust access control across all critical facilities
- Fully upgraded command & control room compliant with SCCR-2024

The recommendation ensures that TSC is equipped with a future-ready, highly reliable, fully integrated security ecosystem.

Current ELV Systems

- CCTV System
- ANPR System
- Access Control System (ACSS)
- Gate Barriers & Vehicle Access
- Control Room Infrastructure
- Network, Storage & Power Redundancy

Regulatory & Compliance Framework

All proposed systems, equipment, and configurations adhere to the following mandatory requirements:

➢ SIRA Regulations

- **STR-CCTV-2024** – Technical Requirements for CCTV Systems
- **SCCR-2024** – Standards for Security Command & Control Rooms
- **STR-ANPR-2024** – LPR/ANPR System Compliance Requirements
- **STR-ACSS-2024** – Access Control & Door Security Standards
- **STR-NET-2024** – Network Architecture Requirements for Security Systems
- **SIRA PS-02** – General Security System Guidelines

➢ Applicable UAE & International Standards

- **UAE Fire & Life Safety Code (2024 Edition)**
- **ISO/IEC 27001** – Information Security
- **ISO 22301** – Business Continuity
- **ANSI/TIA-568** Structured Cabling Standards
- **IEC/EN 62676** – Video Surveillance Standards

Current Risks

- Non-compliance with SIRA standards may compromise security, operational efficiency, and community safety.
- Limited storage, outdated cameras, and lack of system integration reduce monitoring effectiveness.
- Insufficient redundancy in power and network may cause operational downtime.

Proposed Upgrade Strategy

- Phased Implementation: Prioritize critical areas first, then expand to full community integration.
- Rapid Implementation: Focus on high-risk zones including main entrances, control room, and residential blocks.
- Comprehensive Upgrade: Modernize all ELV systems to ensure future-proof smart city integration.

Benefits of Proposed Upgrade

- Achieve full SIRA compliance across all ELV systems.
- Enhance security coverage and enable real-time monitoring.
- Improve traffic and parking efficiency through ANPR automation.
- Standardize and centralize access control management.
- Provide professional-grade control room infrastructure with redundancy.
- Enable future-proof and scalable system integration for upcoming smart city features.

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2 Scope of Work

The scope includes:

- **CCTV System**

Assessment of existing cameras, coverage, retention, backend storage, network, and compliance with STR-CCTV-2024.

- **Access Control System (ACSS)**

Verification of door controllers, readers, electrified hardware, cabling, and system redundancy.

- **ANPR & Gate Barriers**

Evaluation of entrance/exit lanes, ANPR accuracy, barrier functionality, safety loops, and visitor management integration.

- **Control Room**

Assessment of video wall, operator consoles, servers, storage, UPS, physical layout, environmental controls, and SIRA SCCR compliance.

- **Security Network (Backbone)**

Review of switches, VLAN segregation, fibre routes, PoE budget, and redundancy.

Methodology

A structured, multi-stage methodology was adopted to assess, design, and implement the ELV system upgrade. The approach ensures technical accuracy, SIRA compliance, and minimal operational disruption.

1. **Comprehensive Site Survey**
   Conduct detailed field inspections supported with photographic and video documentation covering all critical zones.
2. **Review of Existing Documentation**
   Analyse all available as-built drawings, device inventories, network diagrams, and historical maintenance logs.
3. **Performance Assessment of Existing Systems**
   - Evaluate CCTV image quality, FoV, and PPM compliance.
   - Assess illumination levels and night-vision capability.
   - Measure ANPR accuracy, triggering, and processing time.
   - Review access control activity logs and system responsiveness.
   - Test network performance, bandwidth availability, latency, and interference.
4. **Compliance Verification**
   Compare all existing systems against applicable SIRA requirements and develop a detailed **SIRA Non-Compliance Matrix**.
5. **Design Development**
   Prepare upgraded ELV system designs, including storage calculations, bandwidth analysis, cable routing, selection of SIRA-approved devices, and updated drawings.
6. **Migration & Integration Planning**
   Develop a step-by-step migration plan to ensure continuity of operations during the upgrade.
7. **System Implementation & Testing**
   Execute installation, pre-commissioning, final commissioning, integration tests, operator training, and preparation of handover documentation.
8. **SIRA Submission**
   Prepare and submit the updated Security Plan and required documents for SIRA review and certification.

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3 As-Is System Assessment (Summary)

3.1 CCTV System

3.1.1 CCTV Assessment summary

Area	Status / Observation	Remarks	Compliance
Control Room (Storage / Retention)	Recording system operational	Retention period is 16–30 days vs. SIRA requirement of 31 days: insufficient storage capacity for full compliance	Non-compliant

Area	Status / Observation	Remarks	Compliance
Control Room (Displays & Workstations)	Video wall and operator stations functional	No centralized, tamper-proof logging for NVR/operator/ANPR events; lacks audit trail and event tracking	Non-compliant
Existing Cluster CCTV System	407 cameras installed	All clusters covered; partial coverage of plaza, parking and roads	Non-compliant
Plaza Coverage (Lifts / Corridors / Roofs)	Cameras installed, coverage incomplete	Multiple blind spots observed; critical areas not adequately monitored	Non-compliant
Plaza Facial Recognition	ID cameras partially installed	Several cameras non-functional; facial recognition currently unavailable	Non-compliant
Parking Clusters & Public Areas	CCTV partially operational	Large blind spots: many cameras aged, non-functional, or insufficient resolution for identification	Non-compliant
Ring Road Perimeter	Cameras installed along perimeter	Many cameras non-functional; intermittent network issues affecting live feed and recording reliability	Non-compliant
ANPR Integration	Gate cameras operational	Some ANPR cameras installed but not fully integrated; events not centrally logged; limited automation for access control	Non-compliant

3.1.2 Key Issues Identified

- **Insufficient Coverage:** Blind spots in plazas, corridors, lifts, rooftops, parking clusters, and perimeter roads reduce monitoring effectiveness.
- **Aged or Non-Functional Cameras:** Many cameras fail to meet minimum **SIRA resolution and PPM requirements** or are completely non-operational.
- **Retention & Storage:** Current storage capacity supports only 16–30 days of recording versus the **SIRA-mandated 90 days**.
- **Integration & Logging:** ANPR and access events are not centralized or tamper-proof; control room lacks complete audit trail.
- **Facial Recognition:** Incomplete or non-functional coverage diminishes community security and operational efficiency.
- **Network Limitations:** Intermittent connectivity affects real-time monitoring and recording reliability.

3.1.3 Detailed Findings & Failures (By Area)

✓ **Plaza (Annex)**

- **Findings:**
  - Cameras failing or missing in lifts, corridors, staircases, and main entrances.
  - Multiple blind spots require additional coverage.
- **Recommendation:**
  - Replace faulty cameras with SIRA-approved models.
  - Ensure full coverage of all entrances, corridors, lifts, and critical points.

✓ **Residential & Public Parking**

- **Findings:**
  - Many cameras are non-functional; corners, stairways, and blind spots uncovered.
  - Storage retention insufficient for SIRA compliance.
- **Recommendation:**
  - Replace or realign cameras and expand coverage to eliminate blind spots.
  - Upgrade storage capacity to ≥ 30 days retention.

✓ **Ring Road Perimeter**

- **Findings:**
  - Partial coverage with some cameras offline.
  - Limited fibre connectivity affects live feed reliability.
- **Recommendation:**
  - Add or realign cameras to ensure full perimeter coverage.
  - Upgrade backbone to single-mode fibre to enhance network stability.

✓ **Control Room**

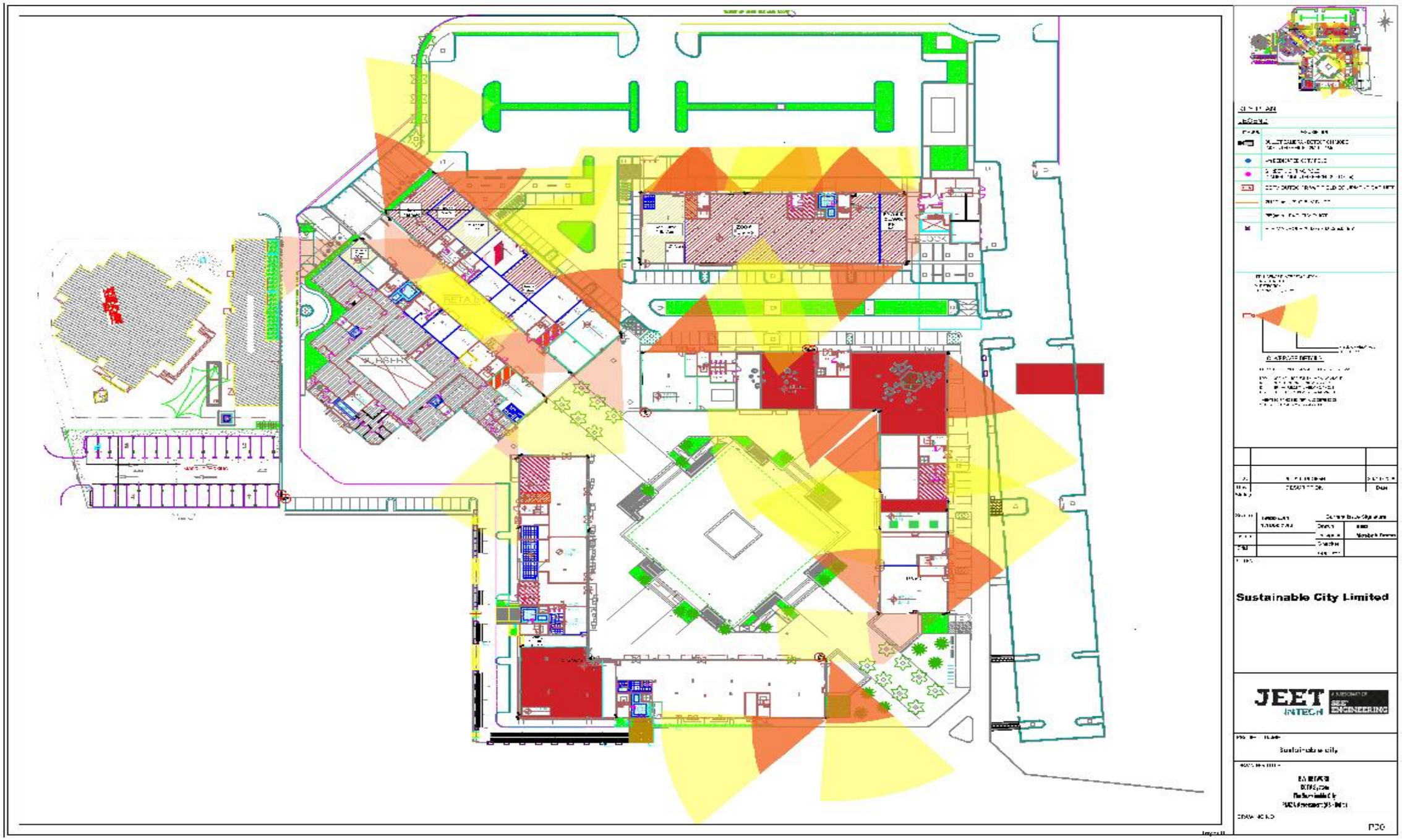
- **Findings:**
  - Storage retention is only 16–30 days, below SIRA-mandated 90 days.
  - Video wall displays are consumer-grade, not SIRA-approved.
  - Operator workstations have limited dual-monitor setups.
  - Events from motion and ANPR cameras are not centrally logged.
- **Recommendation:**
  - Upgrade storage using NAS/SAN/RAID solutions to meet ≥90 days retention.
  - Install professional-grade CCTV monitors for the video wall.
  - Configure operator workstations with dual-monitor setups for improved efficiency.
  - Integrate all cameras into a centralized VMS with tamper-proof logging of events.

3.1.4 Risk Assessment CCTV Systems (highlights)

Risk	**Effect**	**Priority**
Coverage gaps	Undetected incidents — legal/regulatory exposure	**High**
Non-functional cameras	Reduced evidence capture & deterrence	**High**
Retention shortfall	Non-compliance with SIRA / potential sanctions	**Critical**
Network & UPS failure	Loss of continuous monitoring	**High**

✓ **Area-Wise Findings Summary**

Area	Issue	Status	Risk	Recommendation
Plaza (8 Blocks) Annex A	Cameras	Samsung cameras failing; blind spots	High	Replace faulty cameras; realign and add missing coverage
	Coverage	Entrances, corridors, lifts partially monitored	High	Ensure full area coverage with SIRA-approved cameras
Residential & Public Parking Annex B	Cameras	Partially non-functional; corners and stairways uncovered	High	Replace/realign cameras; expand coverage
Ring Road Perimeter Annex C	Cameras	Partial coverage; some offline	High	Add/realign cameras to cover full perimeter
	Network	Limited fibre connectivity	Medium	Upgrade backbone to single-mode fibre; ensure stable connectivity
Control Room Annex D	Monitors	Consumer TVs	Professional-grade CCTV monitors	Upgrade to industrial monitors
	Storage Retention	16–30 days	≥30 days	Expand storage (NAS/SAN/RAID)
	Logging	No centralized tamper-proof logs	Required	Implement VMS with secure centralized logs
	Operator Workstations	Limited coverage	Adequate workstations for full monitoring	Add dual-monitor stations for efficiency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3.2 Access Control

3.2.1 Access Control Assessment Summary

Location / Area	Current Status	Key Non-Compliance / Remarks
Residential Blocks (A–F) – Entrances	Standalone locks or no system installed	No centralized monitoring; no event logging; emergency override buttons missing
Residential Blocks – Staircases, Roofs, ELV Rooms	No system installed	No ACSS; no audit trail; no emergency provisions; non-compliant for critical internal areas
Swimming Pools, Gym Hall, Dog Park	Standalone systems; partial functionality	Not integrated with CCTV; no event logs; emergency buttons missing; some devices malfunctioning
Football & Basketball Stadiums	Standalone systems; variable functionality	No centralized monitoring; no logging; non-compliant
Substation & Block F Service Rooms	No system installed	Critical infrastructure lacks ACSS, logging, and emergency controls
Road Main Entrance & Parking (Gate Barriers)	Barriers operational but standalone	No ACSS integration; manual operation required; no RFID; no logging; no safety warnings

3.2.2 Key Issues Identified

- **Absence of Centralized ACSS:** Most residential blocks and community facilities have either no access control or standalone locks with no central monitoring.
- **Lack of Event Logging:** Access events are not logged or auditable; tamper-proof records are absent.
- **Missing Emergency Features:** No emergency override buttons or safety controls installed in critical areas.
- **Non-Integrated Systems:** Access points, gates, barriers, and CCTV operate independently; no unified control exists.
- **Partial or Non-Functional Devices:** Some locks and barriers are aging, malfunctioning, or poorly maintained.

3.2.3 Detailed Findings & Recommendations (By Area) (Annex E)

✓ **Residential Blocks (A–F) – Entrances**

- **Current Status:** Standalone locks or no system installed; some intermittently operational.
- **Findings:**
  - No centralized monitoring or audit trail.
  - Emergency buttons missing.
  - Some locks are aged or malfunctioning.
- **Recommendations:**
  - Install SIRA-compliant ACSS controllers at all entrances.
  - Integrate with central server for monitoring, event logging, and real-time alerts.
  - Install emergency override buttons to meet safety requirements.
  - Ensure regular maintenance of locks and readers.

✓ **Residential Blocks – Staircases, Roofs, ELV Rooms**

- **Current Status:** No access control system installed.
- **Findings:** Non-compliant; no logging or emergency provisions.

- **Recommendations:**
    - Install card/biometric ACSS for all staircases, ELV rooms, and rooftops.
    - Centralize event logging and monitoring in control room.
    - Include emergency override controls for safety compliance.

✓ **Swimming Pools, Gym Hall, Dog Park, Football & Basketball Stadiums**

- **Current Status:** Standalone systems; variable functionality.
- **Findings:**
    - Systems not integrated with CCTV or centralized ACSS.
    - No audit trail or emergency controls; some devices outdated.
- **Recommendations:**
    - Upgrade to SIRA-compliant ACSS systems.
    - Integrate with CCTV and central monitoring for unified management.
    - Enable real-time monitoring, alerts, and emergency controls.

Note

- Most access control points are either missing or standalone and non-compliant.
- Achieving full SIRA compliance requires:
    - Centralized ACSS
    - Integration with CCTV and gate systems
    - Emergency override controls
    - Automated access solutions (ANPR + RFID + QR/OTP)
- Implementation of these recommendations will enhance security, ensure audit compliance, and improve operational efficiency across all residential and community facilities.

Detailed Findings ACCES CONTROL

Location / Area	Component / Feature	Status / Observation	SIRA Compliance	Remarks / Gaps
Block C	Standalone system, Lock, Push Button	Working	Non-Compliant	No emergency button, not centralized, no logs/events
Block B	Standalone system, Lock, Push Button	Working (keyboard issue)	Non-Compliant	No emergency button, not centralized, no logs/events
Block D1	Standalone system, Lock, Push Button	Working	Non-Compliant	No emergency button, not centralized, no logs/events
Block D2	Standalone system, Lock, Push Button	Working	Non-Compliant	No emergency button, not centralized, no logs/events
Swimming Pool	Standalone system, Lock, Push Button	Not Working	Non-Compliant	No emergency button, not centralized, no logs/events
Gym Hall – Entrance 1	Standalone system, Lock, Push Button	Working	Non-Compliant	No emergency button, not centralized, no logs/events
Gym Hall – Entrance 2	Standalone system, Lock, Push Button	Working	Non-Compliant	No emergency button, not centralized, no logs/events
Dog Park	Standalone system, Lock, Push Button	Working	Non-Compliant	No emergency button, not centralized, no logs/events
Swimming Pool 2	Standalone system, Lock, Push Button	Not Working	Non-Compliant	No emergency button, not centralized, no logs/events
Football Stadium	Standalone system, Lock, Push Button	Not Working	Non-Compliant	No emergency button, not centralized, no logs/events
Basketball Stadium	Standalone system, Lock, Push Button	Working	Non-Compliant	No emergency button, not centralized, no logs/events
Road Main Entrance & Parking	Gate Barrier	Working	Non-Compliant	Gate barrier not integrated with ACS, no logs of barrier operation. Audible/visual warnings required for safety.

3.3 ANPR & Gate Barriers

3.3.1 Assessment Summary

Area	Status / Observation	Non-Compliance / Remarks
Residential Parking Clusters	Partial ANPR coverage; some barriers aging	ANPR functional; several barriers require repair or replacement; limited integration with control room and VMS
Public Parking Areas	CCTV partially operational	Multiple blind spots; lack of real-time monitoring; absence of centralized event logging
Gate Barriers – Main Entrances	ANPR operational; barriers aging	Limited automation; partial integration with ANPR and VMS; no centralized logging or alert system
Gate Barriers – Secondary / Visitor Entrances	ANPR operational; barriers partially functional	Manual intervention required; event logging incomplete; limited automation
Control Room Integration	Partial integration of ANPR and gate barriers	Centralized logs not fully implemented; limited real-time monitoring capability

3.3.2 Key Issues Identified

- **Aged / Partially Functional Barriers:** Diminished operational efficiency and reliability.
- **Integration Gaps:** ANPR, RFID, and VMS systems operate in silos, limiting automation.
- **Event Logging & Audit Trails:** Current logging is insufficient and not tamper-proof.
- **Manual Operations:** Operational delays due to reliance on manual intervention.

3.3.3 Findings & Recommendations ANPR & Gate Barriers (Annex F)

- **Findings:**
  - ANPR operational; barriers partially functional; manual intervention required.
  - The system is partially operational with inconsistent coverage and multiple blind spots.
  - Existing cameras (Samsung / Hikvision legacy models) do not meet SIRA PPM requirements.
  - Storage retention is limited to 16–30 days, below the SIRA-mandated 30 days.
  - No redundancy mechanisms (RAID, failover, or centralized logging) are implemented.
  - Video wall employs consumer-grade displays, not compliant with SIRA standards.
  - ANPR is not integrated with the VMS, limiting automation, real-time monitoring, and centralized management.
- **Recommendation:**
  - Repair or replace faulty barriers.
  - Introduce RFID for frequent visitors/residents.
  - Implement visitor automation via QR Code, E-Pass, or OTP-based systems for temporary/scheduled access.
  - Fully integrate ANPR, RFID, and visitor management systems with central VMS for automated control, real-time alerts, and secure, centralized logs.

3.4 Control Room

3.4.1 Control Room Assessment Summary

Feature / Component	Current Status	Key Non-Compliance / Remarks
NVRs	14 units; continuous recording (Read/Write enabled)	Storage retention only **16–30 days**, below **SIRA 30-day requirement**; no redundancy (RAID / failover)
Connected Cameras	407 cameras	Clusters covered; **partial coverage** in plaza, roads, and parking areas
Storage Capacity	4.3 TB per NVR	Insufficient for SIRA-compliant retention and high-resolution streams
Video Wall / Displays	11 screens 55″ commercial displays	Non-compliant: consumer-grade screens, no 24/7 operation rating, no anti-burn-in protection
Additional NVR Feeds	3 NVRs not displayed	Incomplete visual monitoring; cameras not accessible to operators
Operator Workstations	1 desktop (motion cameras), 1 laptop (ANPR)	Limited functionality; no unified interface for CCTV/ANPR/ACSS
Motion Detection Integration	Partially connected	Alerts not centralized or logged; no audit trail
ANPR Integration	Managed via standalone laptop	Not integrated with VMS, missing centralized logs and automated alerts
Logging & Audit Trail	Not implemented	No tamper-proof logs for operator actions, playback, or configuration changes
Power & Network Infrastructure	Supports only partial operations	Insufficient for additional screens/workstations and future expansion
Control Room Operation	24/7 active	Operational but **not SIRA-compliant** due to system and infrastructure gaps

3.4.2 Key Issues Identified

- **Insufficient Storage & Retention**
  Current setup provides **16–30 days**, far below SIRA's **30-day continuous retention** requirement.
- **Non-Compliant Video Wall**
  Commercial TV screens are not suitable for 24/7 surveillance use.
- **Limited Operator Workstations**
  Operators lack unified access to motion detection, ANPR, and CCTV streams.
- **Incomplete System Integration**
  Motion and ANPR cameras not fully integrated with central VMS or operator stations.
- **No SIRA-Compliant Logging**
  No audit trail for user actions, playback, exports, or system configuration.

3.4.3 Detailed Findings & Recommendations

✓ **Video Wall & Operator Workstations**

- **Findings**
  - 11 screens installed.
  - Screens are consumer-grade with no anti-burn-in protection.
  - Insufficient workstations to monitor all NVR feeds.

- No unified control interface for CCTV, ANPR, Motion Detection, and ACSS.

- **Recommendations**
  - Replace all displays with 55″ SIRA-approved professional surveillance monitors.
  - Add three additional screens to cover all NVRs and cluster feeds.
  - Provide ergonomically designed operator consoles with dual-monitor configurations.
  - Ensure full integration of all systems (CCTV, ANPR, ACSS, Motion) into each workstation.

✓ **Recording & Storage**

- **Findings**
  - Retention capacity limited to 16–30 days.
  - No redundancy (RAID 5/6 or mirrored failover).
  - Distributed NVR storage makes data management inefficient.
- **Recommendations**
  - Deploy a centralized storage solution (NAS/SAN) with:
  - RAID 6 redundancy
  - Hot-swappable disks
  - Centralized backup and archiving
  - Ensure minimum 30-day retention for all video streams.
  - Implement centralized and secure access logging for storage systems.

✓ **Motion Cameras Integration**

- **Findings**
  - Only partially integrated using a single workstation.
  - Alerts not logged or displayed on the video wall.
  - Operators cannot access complete motion event history.
- **Recommendations**
  - Integrate all motion detection cameras into the VMS.
  - Configure:
    - Automated alerts
    - Event tagging
    - Audible/visual notifications on operator workstations
    - Enable full audit logging of:
    - Alerts received
    - Actions taken
    - Event playback

✓ **ANPR Integration**

- **Findings**
  - ANPR monitored via laptop, not part of video wall or main VMS.
  - No centralized logging or vehicle history tracking.
  - Limited analytics and no automated gate/ACSS linkage.
- **Recommendations**
  - Fully integrate ANPR feeds with the central VMS.
  - Enable:
    - Vehicle history tracking,
    - Automated barrier opening,
    - Alerts for blacklist/whitelist vehicles, Real-time dashboard view on video wall
    - Implement SIRA-compliant logs for all ANPR events.

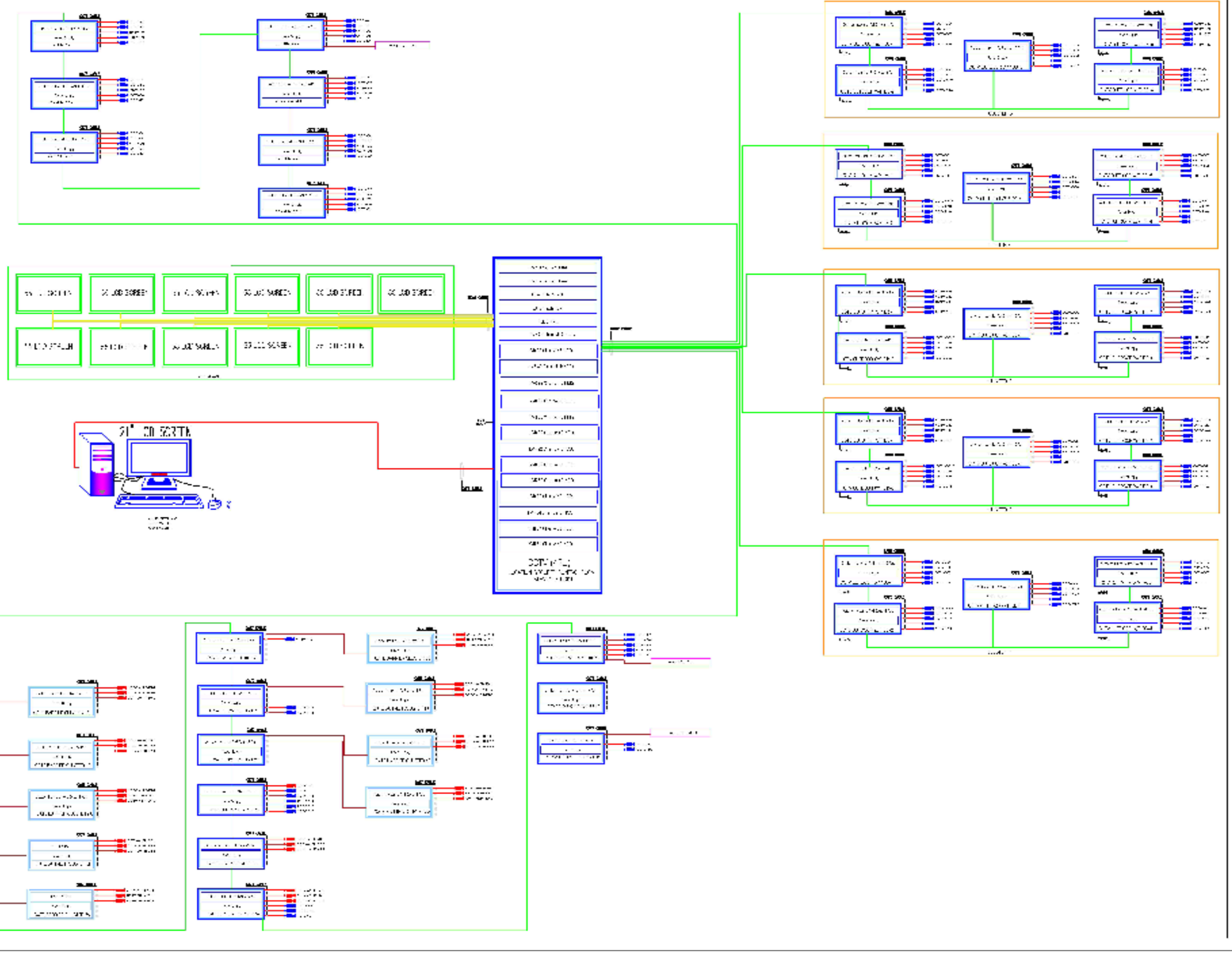
✓ **Logging & Audit Trail**

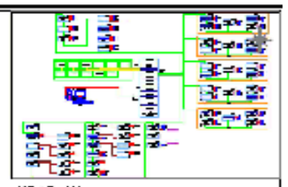
- **Findings**
  - Zero logging for critical actions: playback, export, login/logout, configuration changes.
  - High risk of non-compliance and evidence tampering.

- **Recommendations**
    - Operator login / logout
    - NVR/VMS configuration changes
    - Motion & ANPR events
    - Video playback and export
    - Alarm acknowledgements
    - Logs must be: Tamper-proof, timestamped (UTC +4), Retained for 90 days minimum

✓ **Power & Network Infrastructure**

- **Findings**
    - Current infrastructure insufficient for future expansion.
    - Limited UPS backup and network segregation.
- **Recommendations**
    - Upgrade power infrastructure (UPS redundancy + extended autonomy).
    - Segregate CCTV/ANPR/ACSS networks (VLAN-based design).
    - Add dedicated network switches for VMS and video wall.





KEY PLAN

CCTV LEGEND

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VIDEO SURVEILLANCE NETWORK (CCTV) SCHEMATIC DIAGRAM

PDC

4 Design Requirements & SIRA Compliance

4.1 General Requirements

- **Compliance**: All systems shall conform to SIRA (Security Industry Regulatory Agency) standards and applicable UAE regulations.
- **Integration**: CCTV, Access Control, Gate Barriers, ANPR, RFID, and visitor management systems shall be fully integrated through a central VMS/ACSS platform.
- **Centralized Monitoring**: All access points, cameras, and barriers must be viewable, controllable, and logged from a centralized control room.
- **Audit & Logging**: Tamper-proof event logging with timestamped audit trails must be implemented across all systems, retaining records for a minimum of 30 days.
- **Reliability & Redundancy**: Redundant storage, power supply, and network infrastructure to ensure continuous 24/7 operation.
- **Scalability**: Systems must support future expansion and additional integrations without major infrastructure overhaul.
- **Environmental Compliance:** Devices must operate reliably within UAE temperature and humidity ranges; outdoor devices must be IP66-rated and vandal-resistant.
- **Cybersecurity:** All networked ELV systems must adhere to SIRA and ISO/IEC 27001 cybersecurity standards, including VLAN segregation, firewalls, and secure authentication protocols.

4.2 CCTV System Requirements – SIRA Compliant Requirements

Feature	SIRA-Compliant Requirement
Cameras	SIRA-approved IP cameras, 4–8MP, WDR 120 dB, full DORI compliance for detection, observation, recognition, and identification.
Camera Placement	Full coverage of plazas, corridors, lifts, rooftops, parking areas, ring roads, and critical zones; eliminate blind spots.
ANPR Integration	All entry/exit cameras integrated with ANPR system for automated vehicle recognition and centralized logging.
Motion Detection	Integrated with VMS for automated alerts; centralized event logging in control room.
Recording & Storage	Centralized NAS/SAN, RAID 5/6 redundancy, hot-swappable disks, dual-controller failover; minimum 90-day retention.
Control Room Displays	SIRA-approved professional monitors, 55″+, anti-burn-in, 24/7 operation, minimum 500 nits brightness.
Operator Workstations	Dual-monitor ergonomic workstations; full access to CCTV, ANPR, and motion camera feeds; real-time alerts and audit logging.

Feature	SIRA-Compliant Requirement
Network & Redundancy	PoE+ managed switches, VLAN isolation, Fiber backbone redundancy, UPS-backed for continuous operation.
Audit & Logging	Tamper-proof logs for all video access, playback, export, and configuration changes; stored ≥90 days.
Cybersecurity	VLAN segregation, firewalls, secure authentication per SIRA & ISO/IEC 27001 standards.
Environmental Compliance	Outdoor devices IP66/IK10-rated, operate reliably under UAE temperature/humidity conditions.

Design Objectives (SIRA Compliant):

- Replace all outdated cameras with SIRA-approved IP cameras.
- Ensure full DORI coverage across all areas.
- Expand coverage in plazas, parking, ring roads, and critical facilities.
- Integrate all cameras into central VMS with audit logging and cybersecurity hardening.
- Upgrade storage to centralized NAS/SAN with RAID, failover, encryption, and ≥90-day retention.

CCTV Placement Compliance Grid (SIRA)

Area	Required	Existing	Proposed
Plaza Blocks	100%	65%	100%
Parking	100%	30%	100%
Ring Road	100%	10%	100%
Entrances	100%	70%	100%

4.3 Access Control System & Gate Barriers – SIRA Compliant Requirements

Feature	SIRA-Compliant Requirement
Readers & Doors	Card, RFID, or biometric readers at all entrances, staircases, rooftops, ELV rooms, and shared facilities.
Centralized Server	Full integration with CCTV, ANPR, and Gate Barriers for real-time monitoring, reporting, and centralized logging.
Visitor Management	Pre-registration with QR code, OTP, or temporary RFID access; notifications integrated with residents/security.
Automation & Safety	Automated gates and barriers integrated with ANPR/RFID, audible/visual warnings, emergency override controls, and fail-safe mechanisms.

Feature	SIRA-Compliant Requirement
Event Logging & Audit Trail	Tamper-proof, timestamped logs for all access events, barrier operations, and emergency activations; retention ≥90 days.
Emergency & Safety Features	Break-glass emergency buttons, override controls, audible/visual alerts, and integration with fire/alarm systems.
Access Hierarchy & Policies	Configurable access levels for residents, staff, visitors, and service personnel; real-time revocation of credentials if needed.
Network & Cybersecurity	VLAN isolation, firewall protection, secure authentication, and integration with SIRA-approved network infrastructure.
Environmental Compliance	Devices rated for UAE temperature/humidity conditions and outdoor IP66/IK10 where applicable.
Maintenance & Reliability	Systems must include redundancy, failover, and scheduled preventive maintenance to ensure continuous 24/7 operation.

Design Objectives (SIRA Compliant):

- Install centralized ACSS controllers at all critical access points.
- Integrate all residential, facility, and service access into a unified platform.
- Enable automated vehicle and visitor access via ANPR, RFID, QR/OTP.
- Ensure full audit logging with tamper-proof retention and reporting.
- Provide emergency override capabilities and fail-safe mechanisms at all critical points.
- Enable future scalability and seamless integration with other smart city systems.

4.4 Network & Control Room – SIRA Compliant Requirements

Feature	SIRA-Compliant Requirement
Network Architecture	Fully managed Layer-3 network, VLAN segregation for CCTV, ACSS, ANPR, and other ELV systems; fibre backbone with ring redundancy.
PoE & switching	Enterprise-grade PoE+ switches for all IP devices; redundant uplinks and managed configuration.
UPS & Power Redundancy	UPS-backed power for all critical devices; redundant power supplies to ensure 24/7 operation.
Control Room Design	Ergonomic dual-monitor operator stations, full access to CCTV, ACSS, ANPR, and gate barriers.
Video Wall	SIRA-approved professional-grade displays, anti-burn-in, ≥55″, 24/7 operation, real-time monitoring of all zones.
Storage & Retention	Centralized NAS/SAN storage with RAID 5/6, dual-controller failover, ≥90-day retention, encrypted recordings.
Audit & Logging	Tamper-proof logs for all video, access, barrier events, and configuration changes; retention ≥90 days.
Cybersecurity	Firewalls, VLAN isolation, secure authentication, and SIRA-compliant cybersecurity measures (ISO/IEC 27001 aligned).
Environmental Compliance	24/7 HVAC, fire-rated doors, secure racks, non-reflective lighting, silent operator environment; devices rated for UAE climate.
Remote Monitoring & Reporting	Support for secure remote monitoring, centralized alerts, and reporting for operational flexibility.

Feature	SIRA-Compliant Requirement
Scalability & Redundancy	Network and control room must support future expansion and high availability.

Design Objectives (SIRA Compliant):

- Implement fully centralized and segregated network for all ELV systems.
- Ensure redundant power and network infrastructure for uninterrupted 24/7 operation.
- Deploy ergonomic control room with dual-monitor workstations and professional video wall.
- Enable secure, tamper-proof logging of all events and system changes.
- Ensure future scalability for system expansions and integrations.

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5 SIRA Compliance Matrix (High-Level)

Summary of Key Issues

- Centralization Gaps: Most systems are standalone or partially integrated. Unified ACSS + VMS required.
- Event Logging & Audit Trail: Missing across all systems; SIRA requires tamper-proof, centralized logs.
- Retention & Storage: CCTV storage insufficient for SIRA 30-day retention; redundancy lacking.
- Operational Inefficiencies: Manual gate operations, partial ANPR integration, and aged devices reduce security and automation efficiency.
- Emergency & Safety Features: Emergency buttons, alerts, and safety mechanisms missing at access points and barriers.
- Device Upgrade Requirements: Many cameras, barriers, displays, and locks are aged or non-compliant; replacement or repair required.

System	Area / Component	Current Status	Non-Compliance / Gap	Recommended Action	Compliance
CCTV	Control Room – Video Wall	11 screens 55″ commercial TVs	Not SIRA-compliant; lacks 24/7 operation, anti-burn-in	Replace with 75″ SIRA-approved screens; add 3 extra screens	Non-complaint
CCTV	Operator Workstations	Partial connection to NVRs and motion cameras	Insufficient monitoring; partial integration	Install dual-monitor workstations; connect all NVRs, motion, and ANPR feeds	Non-complaint
CCTV	NVR Recording & Storage	16–30 days retention, 4.3 TB per NVR, no redundancy	Below SIRA 90-day retention; no redundancy	Upgrade to centralized NAS/SAN with RAID, retention ≥90 days	Non-complaint
CCTV	Motion Cameras	Partially integrated	Alerts not centralized; no audit trail	Connect all motion cameras; configure automated alerts and centralized logging	Non-complaint
CCTV	ANPR Cameras	Managed via laptop; partially integrated	Not centralized; no SIRA-compliant tracking	Integrate with central VMS, operator workstations, and barriers; log all events	Non-complaint
CCTV	Logging & Audit Trail	Not implemented	No centralized, tamper-proof logs	Implement SIRA-compliant logging; centralized, tamper-proof, ≥90 days retention	Non-complaint
Access Control	Residential Blocks A–F	Standalone locks or no system	No centralized monitoring, event logs, or emergency buttons	Install centralized ACSS; integrate with CCTV and gate barriers; add emergency features	Non-complaint
Access Control	Staircases, Roofs, ELV Rooms	No system installed	No audit trail; non-compliant	ACSS installation with logging, emergency buttons, and centralized monitoring	Non-complaint
Access Control	Facilities (Pools, Gym, Dog Park, Stadiums)	Standalone systems, partially working	Not integrated with CCTV; no logs; no emergency	Upgrade to ACSS with CCTV integration, centralized logging, emergency buttons	Non-complaint
Access Control	Road Main Entrance & Parking	Barrier standalone, not integrated	No ACSS integration, no RFID, no logging, no safety warnings	Upgrade barriers; integrate with ACSS, RFID, CCTV, centralized logging, safety alerts	Non-complaint
ANPR Cameras / Gate Barrier	Main Entrances	Barrier aging; ANPR operational	Manual operation; partial automation	Replace/repair gates; integrate fully with ANPR, RFID, central VMS; enable centralized logs	Non-complaint
ANPR Cameras / Gate Barrier	Secondary / Visitor Entrances	Barriers partially functional; ANPR operational	Partial automation; no visitor management	Repair/replace barriers; add RFID for residents; QR/OTP for visitors; integrate with VMS	Non-complaint
ANPR Cameras / Gate Barrier	Parking Clusters	Mixed conditions: arms bent/damaged; flashers not working	Operational delays; maintenance issues; partial compliance	Repair/replace gates; routine maintenance; integrate all ANPR and barrier events with VMS	Non-complaint
Network Backbone	TSC	VLAN segregation insufficient	VLAN segregation insufficient	Needs redesign	Partially Compliant

Summary of Required Enhancements

✓ Replace outdated cameras with SIRA-approved 2MP/4MP/8MP models

✓ Add new cameras to achieve full coverage

✓ Upgrade storage to meet 30-day retention

✓ Deploy new ANPR cameras and safety accessories

✓ Upgrade access control controllers & monitoring sensors

✓ Establish dedicated Surveillance Network (Security VLAN)

✓ Upgrade Control Room with new VMS server + video wall

✓ Provide full BOQ for each subsystem (CCTV, ACSS, ANPR, Network, Control Room): Technical Design Requirements (SIRA-Compliant)

Standard References:

- STR-CCTV-2024
- STR-ACSS-2024
- STR-GB-2024
- SCCR-2024 (Security Control Room Requirements)
- UAE Fire & Life Safety Code (where applicable)

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6 Proposed (TO-BE) Solution – SIRA Compliant

6.1 TO-BE Summary

Sub-System	Location / Coverage	Device Type / Specification	SIRA Compliance Notes
CCTV Cameras	Plaza, Parking, Ring Road, Lifts, Roofs	2–8MP IP, WDR 110–120 dB, IP66/IK10	Full DORI compliance, integrated with VMS & ANPR
ANPR Cameras	Gate barriers, Ring Roads	4MP PTZ / Bullet, License Plate Capture	Real-time recognition; centralized logging
Access Control	Residential Blocks, ELV Rooms, Roofs	Card, RFID, Biometric	Centralized ACSS; emergency override; full audit
Visitor Management	Gate barriers	QR Code / OTP / Mobile NFC	Temporary access; centralized logging
ANPR, Gate Barriers	Main / Visitor Entrances, Parking	Automated barriers, sensors	Audible/visual alerts; integrated with ACSS/ANPR
Storage	Centralized Control Room	NAS/SAN, RAID 5/6, ≥90-day retention	Redundant, encrypted, automated disk failure alerts
Network Backbone	Campus-wide	Fiber + Cat6a, Layer-3 switches, VLAN	Redundant paths, PoE+, SIRA-compliant segregation
Control Room	Centralized Monitoring	Dual-monitor operator stations, video wall	24/7 operation, tamper-proof logs, ergonomic
Power & UPS	Control Room & Field Devices	UPS 10 kVA, dual setup	Continuous operation; redundant power supply

Note: all details in annex

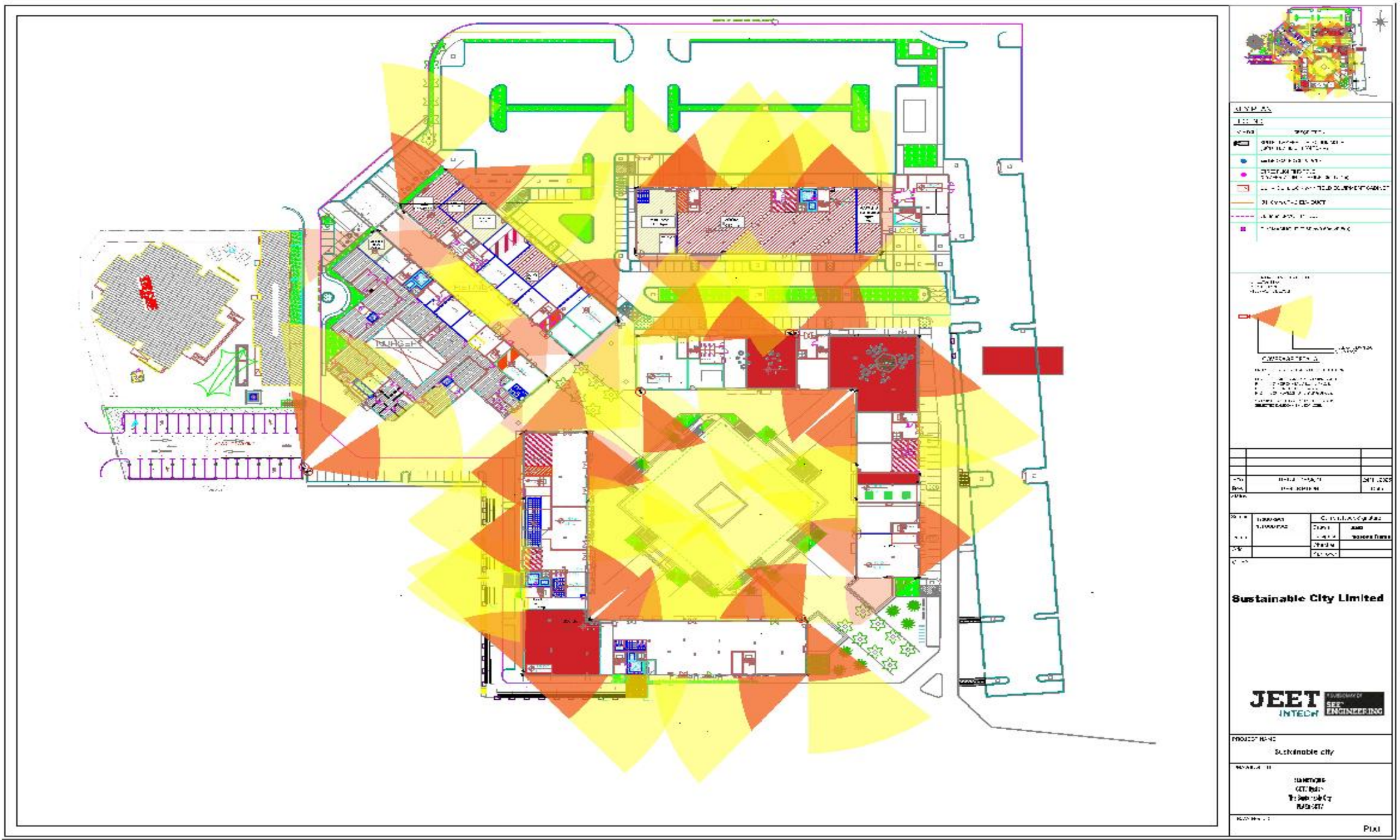
6.2 CCTV SYSTEM

6.2.1 Full SIRA-Compliant Engineering BOQ

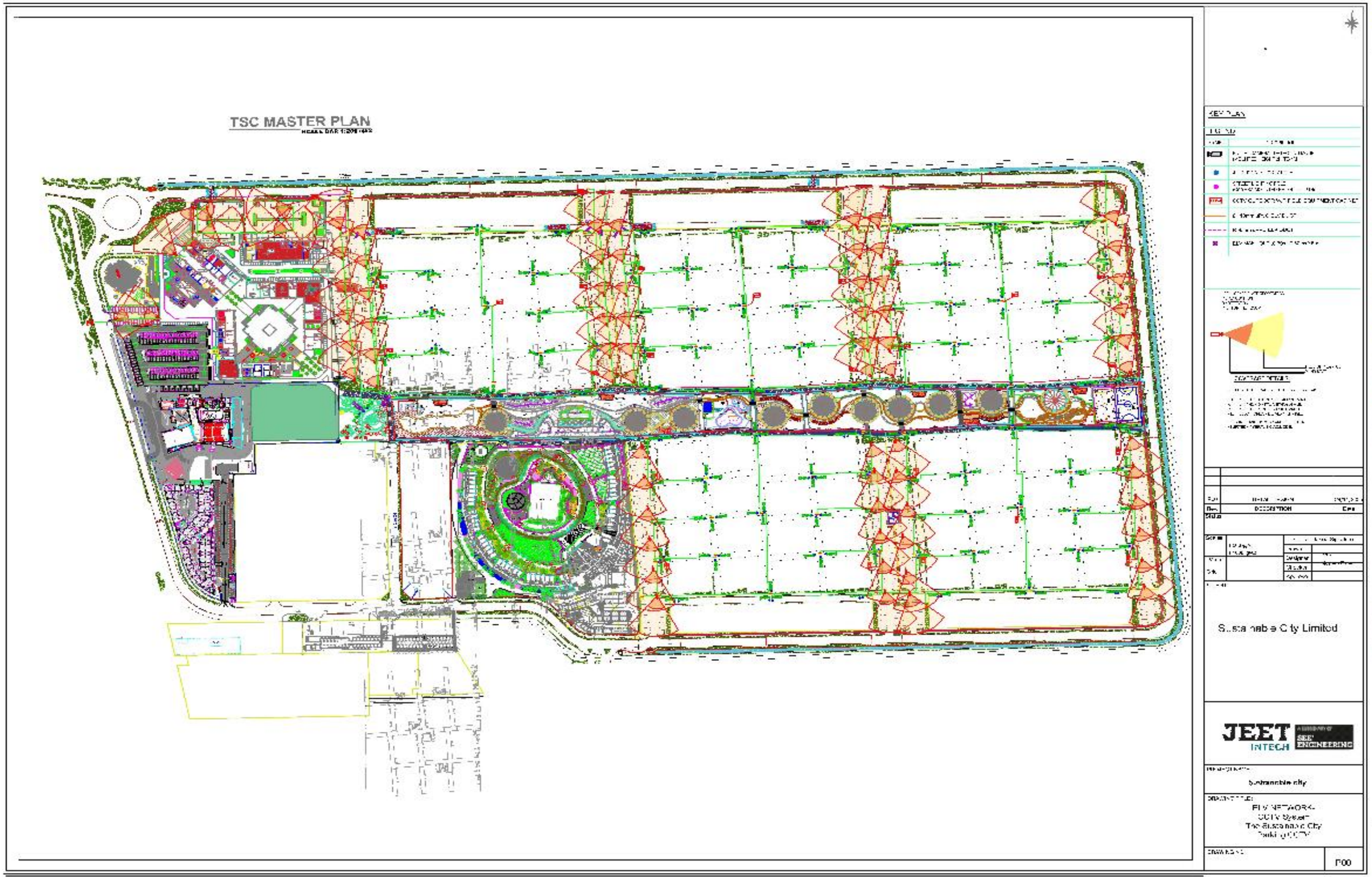
Standard Used: STR-CCTV-2024
Note: Quantities are based on **SIRA Coverage Requirements**

Item No	Description	Model / Manufacturer	Technical Specifications	SIRA Reference	Remarks
CCTV-01	4MP Outdoor Bullet Camera	Hikvision / Dahua / Axis (SIRA Approved)	4MP, Motorized VF 2.8–12mm, IR 50m, WDR 120dB, IP67, IK10, H.265+, ONVIF S/G	STR-CCTV-2024 / Sec.6.1	Plaza + Ring Road Coverage, Parking
CCTV-02	8MP Outdoor Bullet Camera	Hikvision / Dahua / Axis (SIRA Approved)	8MP, Varifocal, VF 2.8–12mm, IR 50m, WDR 120dB, IP67, IK10, H.265+, ONVIF S/G, face recognize	STR-CCTV-2024 / Sec.6.2	High-risk main entrance
CCTV-03	4MP Dome Camera (Indoor)	Hikvision / Dahua / Axis (SIRA Approved)	4MP, Fixed Dome, WDR, IK10, H.265+	STR-CCTV-2024 / Sec.6.1	Control rooms / indoor corridors
CCTV-04	PTZ Camera 25X Optical Zoom	Hikvision / Dahua SIRA-approved	2MP, 25X zoom, 150m IR, Auto-tracking	STR-CCTV-2024 / Sec.6.3	Critical intersections / wide areas
CCTV-06	PoE+ Switch 24-Port/16-Port /8-Port	Cisco / HP / Ruijie / Hikvision Pro	24-Port Gigabit, ≥ 370W PoE Budget, 2×10Gb SFP+ uplinks	STR-CCTV-2024 / Sec.8	For camera segments
CCTV-07	Layer-3 Core Switch	Cisco / HP / Ruijie	10Gb SFP+ uplinks, L3 routing, VLAN, QoS	STR-CCTV-2024	Control room core
CCTV-08	SM Fiber Cable	Corning / D-Link	6-core, Single Mode, armored	STR-CCTV-2024	For inter-building backbone
CCTV-09	Fiber Patch Panel	12/24 Core	LC connectors	STR-CCTV-2024	Plaza + Control Room
CCTV-10	SFP+ Modules	10Gb LC	10Gb long-range	STR-CCTV-2024	Core + edge

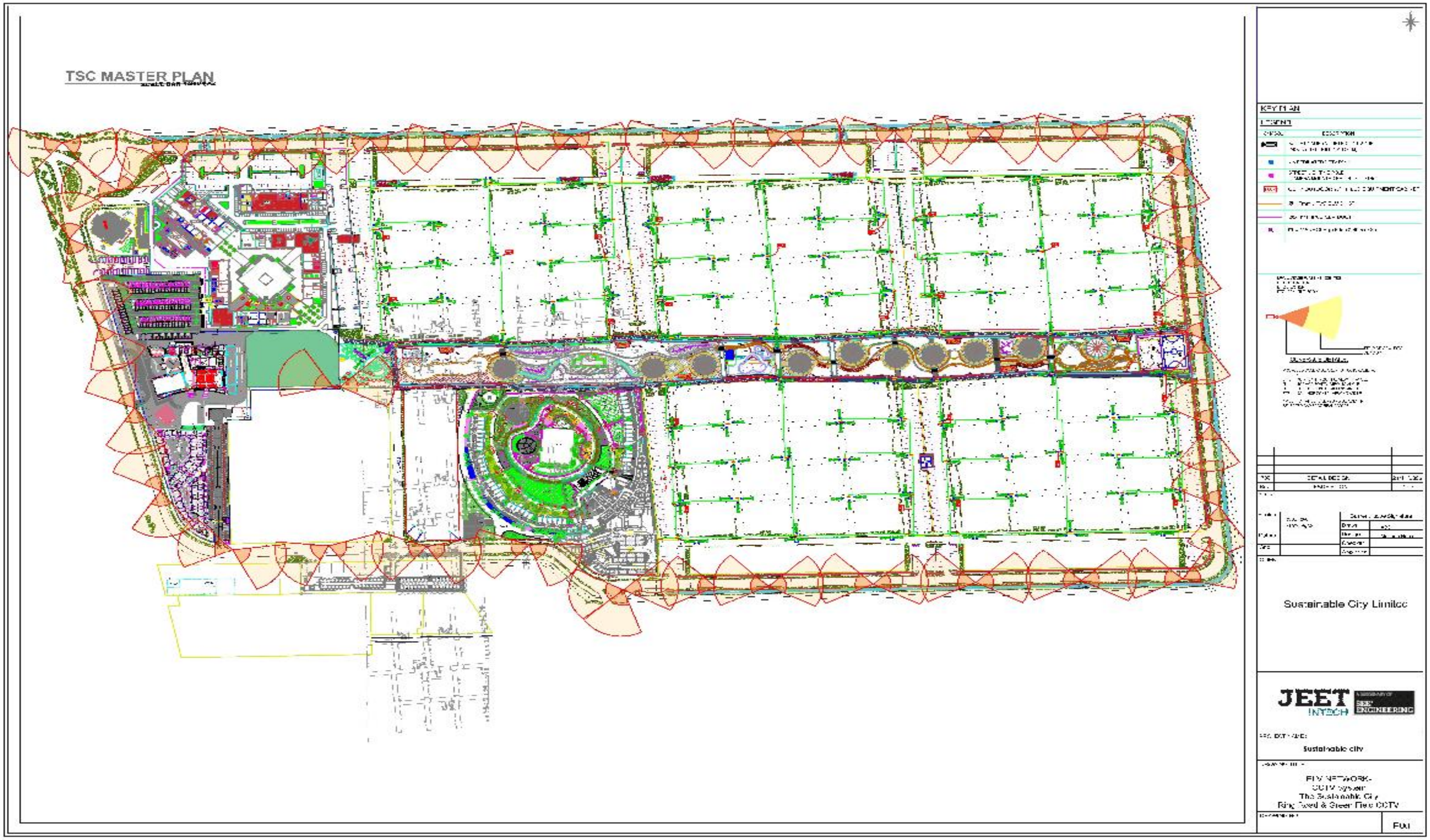
6.2.2 Plaza Blocks A–F — CCTV Proposal



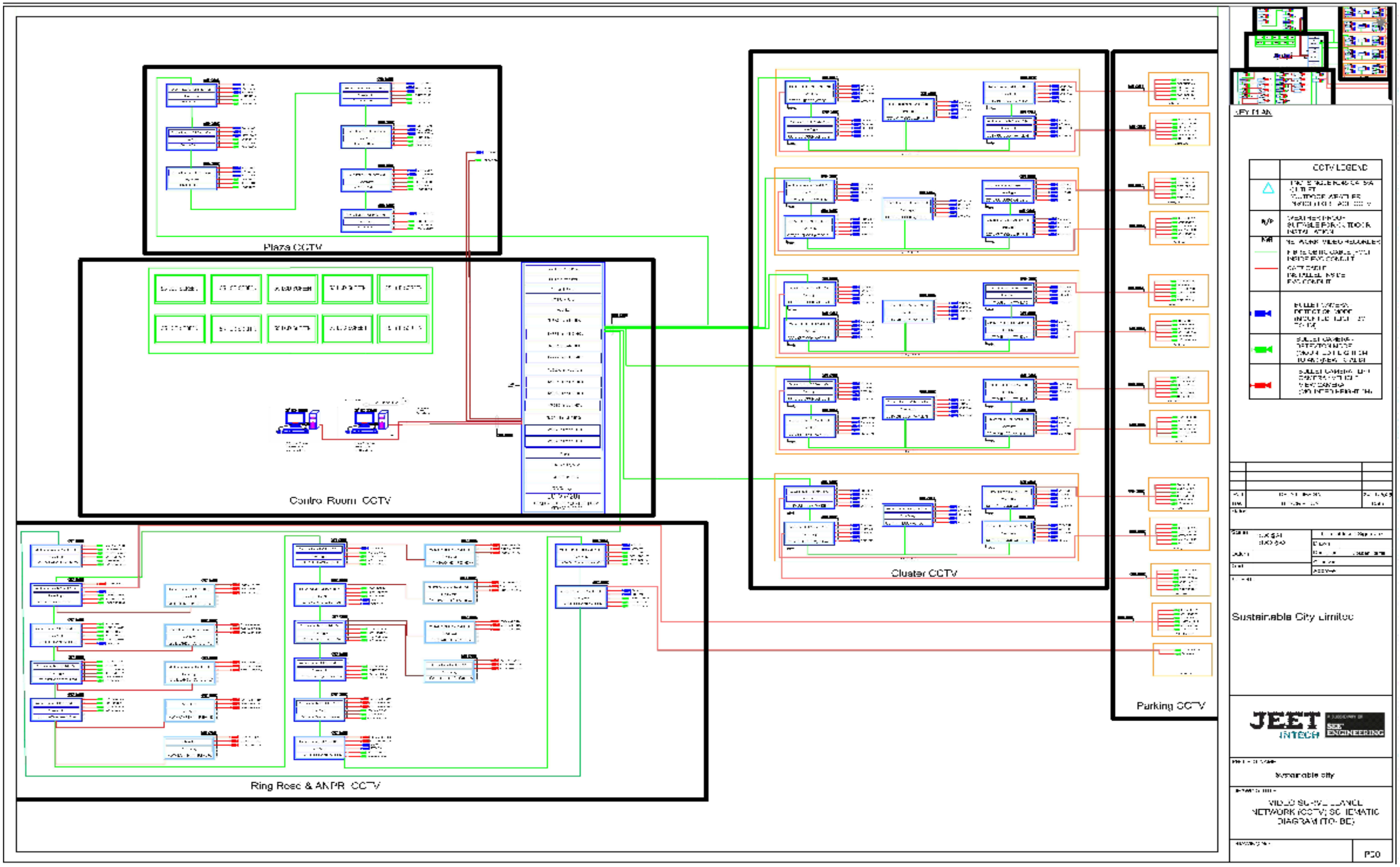
6.2.3 Parking CCTV proposal 1

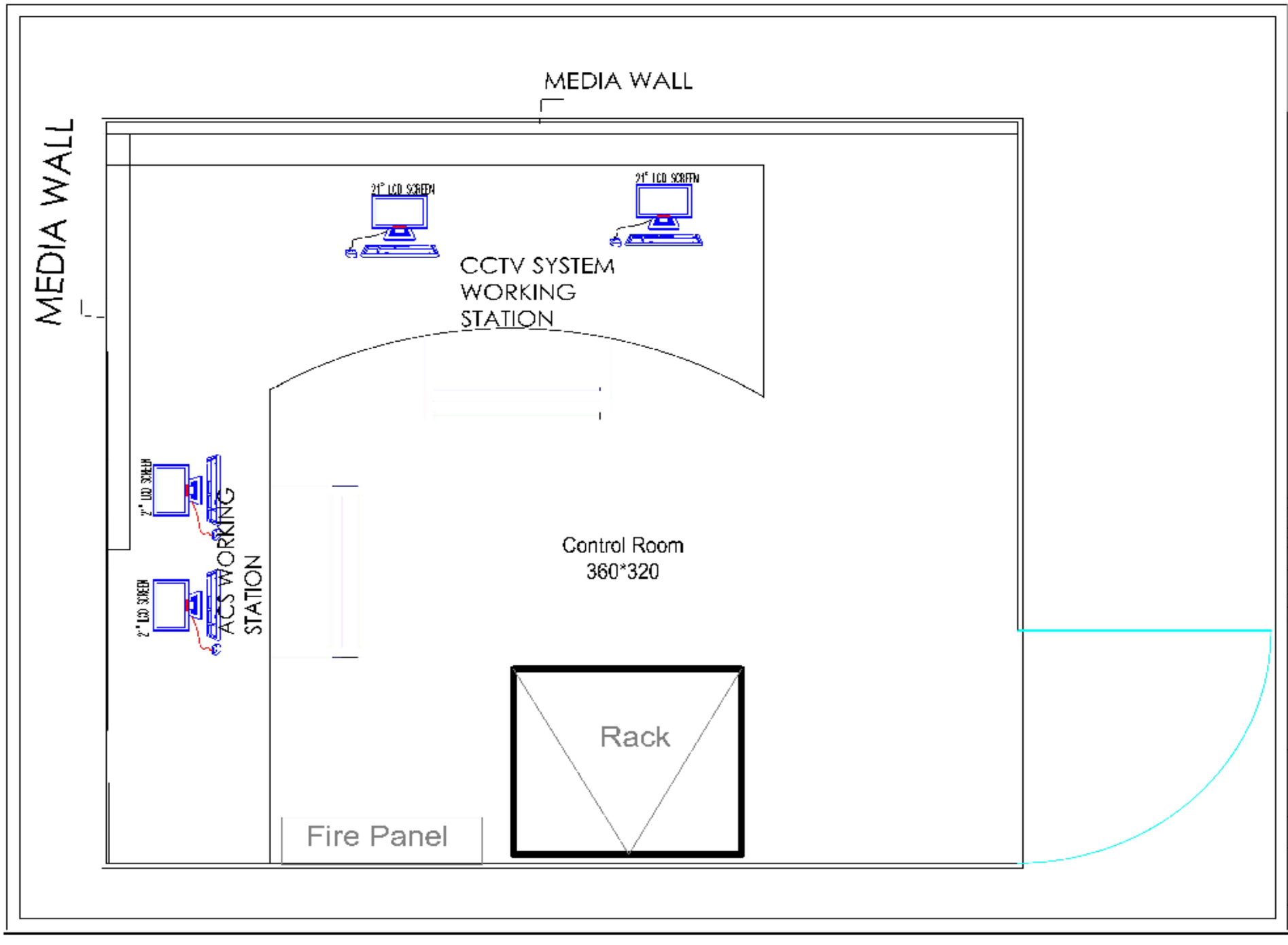


6.2.4 Ring Road and Green Field CCTV Proposal



6.2.5 Control Room Proposal





KEY PLAN

Sustainable City Limited

JEET INTECH

VIDEO SURVEILLANCE
CONTROL ROOM

P30

6.3 Access Control Door Schedule

No	Building / Area	Reader Type	Control Unit	Lock	Emergency	Notes / Proposed Upgrade
1	Residential block (annex D)	Card & PIN	Controller	Electric Strike or Magnetic Lock	Break Button	Centralized access; integrate with CCTV
2	TSC Facility (annex D)	Card, PIN, Biometric	Controller	Magnetic Lock	Break Button	Centralized access; integrate with CCTV
3	ELV Room 1 (annex D)	Biometric + Card	Controller	Magnetic Lock	Break Button	Restricted access; SIRA compliance
4	Roof / Pump Room (annex D)	Card	Controller	Electric Lock / Magnetic Lock	Break Button	Controlled access; event logging

6.3.1 Access Control Proposal

S/N	Location / Area	Current Status	Required ACSS Upgrade (SIRA-Compliant)
1	**Block A service room**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
2	**Block A staircase 1**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
3	**Block A staircase 2**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
4	**Block A ELV room 1st floor**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
5	**Block A ELV room 2nd floor**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
6	**Block A roof**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
7	**Block B main entrance**	Standalone lock + push button, working (keyboard issue), no emergency, no logs, not centralized	Install ACSS controller, central server integration, logs, and emergency button
8	**Block B staircase**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
9	**Block B service room**	No system installed	Install ACSS controller, central server integration, logs, and emergency button
10	**Block B ELV room 1st floor**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
11	**Block B ELV room 2nd floor**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
12	**Block B roof**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
13	**Block C main entrance**	Standalone lock + push button, working, no emergency, no logs, not centralized	Install ACSS controller with reader, central monitoring, event logging, and emergency button

14	**Block C Staircase**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
15	**Block C service room**	No system installed	Install ACSS controller with reader, central monitoring, event logging, and emergency button
16	**Block C ELV room 1st floor**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
17	**Block C ELV room 2nd floor**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
18	**Block C Roof**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
19	**Block D1 main entrance**	Standalone lock + push button, working, no emergency, no logs, not centralized	Install ACSS with central monitoring, event logging, and emergency button
20	**Block D1 staircase**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
21	**Block D1 service room**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
22	**Block D1 ELV room 1st floor**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
23	**Block D1 ELV room 2nd floor**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
24	**Block D1 Roof**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
25	**Block D2 main entrance**	Standalone lock + push button, working, no emergency, no logs, not centralized	ACSS with centralized monitoring, logs, and emergency button
26	**Block D2 service room**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
27	**Block D2 staircase**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
28	**Block D2 ELV room 1st floor**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
29	**Block D2 ELV room 2nd floor**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
30	**Block D2 Roof**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
31	**Block E1 staircase**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
32	**Block E1 ELV Room**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
33	**Block E1 ELV room 1st floor**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
34	**Block E1 ELV room 2nd floor**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
35	**Block E1 Roof**	No system installed	Install ACSS with card access, central server, event logs, and emergency button

36	**Block E2 staircase**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
37	**Block E2 ELV Room 1st floor**	No system installed	Install ACSS with centralized monitoring, logs, and emergency button
38	**Block E2 ELV room 2nd floor**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
39	**Block E2 Roof**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
40	**Swimming Pool 1**	Standalone, **not working**, no emergency, no logs, not centralized	Replace system, install ACSS controller, integrate with CCTV, add emergency button
41	**Swimming Pool 1 ELV Room**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
42	**Swimming Pool 1 Pump Room**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
43	**Gym Hall – Entrance 1**	Standalone, working, no emergency, no logs, not centralized	Upgrade to ACSS with card/biometric access, central logs, and emergency button
44	**Gym Hall – Entrance 2**	Standalone, working, no emergency, no logs, not centralized	Same as above – ACSS upgrade with central monitoring, logs, emergency button
45	**Dog Park**	Standalone, working, no emergency, no logs, not centralized	Upgrade to ACSS with central monitoring, integration with CCTV, and emergency button
46	**Swimming Pool 2**	Standalone, **not working**, no emergency, no logs, not centralized	Replace system, install ACSS with CCTV integration, logging, and emergency button
47	**Swimming Pool 2 ELV Room**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
48	**Swimming Pool 2 Pump Room**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
49	**Football Stadium**	Standalone, **not working**, no emergency, no logs, not centralized	Install ACSS with card access, central server, event logs, and emergency button
50	**Basketball Stadium**	Standalone, working, no emergency, no logs, not centralized	Upgrade to ACSS with central server integration, event logs, and emergency button
51	**Block F Pump Room**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
52	**Block F ELV Room**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
53	**Block F CCTV Room**	No system installed	Install ACSS with card access, central server, event logs, and emergency button
54	**Block F solar Panel control Room**	No system installed	Install ACSS with card access, central server, event logs, and emergency button

6.3.2 ACCESS CONTROL SYSTEM (Full SIRA-Compliant Engineering BOQ)

Standards Used: STR-ACSS-2024

Item No	Description	Model / Manufacturer	Technical Specifications	SIRA Reference	Unit	Qty	Remarks
ACSS-01	4-Door Access Controller	HID / ZKTeco Pro / Suprema / Honeywell	Supports 2 doors, Anti-pass back, Fail-safe, 32-bit CPU, Wiegand/OSDP, Event caching	STR-ACSS-2024 Sec.5	Nos	10	For 39 controlled doors
ACSS-02	2-Door Access Controller	HID / ZKTeco Pro / Suprema / Honeywell	Supports 2 doors, Anti-pass back, Fail-safe, 32-bit CPU, Wiegand/OSDP, Event caching	STR-ACSS-2024 Sec.5	Nos	08	For 15 controlled doors
ACSS-03	Power Supply with Battery Backup	12V/5A	Metal enclosure, fused outputs, battery charger	STR-ACSS-2024	Nos	18	One PSU per controller
ACSS-04	RFID Reader (Card + PIN)	HID / Suprema / ZKTeco Pro	MIFARE 13.56 MHz, IP65, backlit keypad, tamper	STR-ACSS-2024 Sec.6	Nos	54	One reader per door
ACSS-05	Indoor Reader (Card Only)/ push button	HID / Suprema	MIFARE, Wiegand/OSDP, LED indicator	STR-ACSS	Nos	54	Optional exit readers
ACSS-06	EM Lock 1200 lbs	1200 lbs holding force, fail-safe	STR-ACSS-2024	STR-ACSS-2024	Nos	58	Main controlled doors
ACSS-07	Door Contact Sensor	Magnetic, surface-mounted	STR-ACSS	STR-ACSS	Nos	58	Door monitoring
ACSS-08	Emergency Break Glass	Resettable, DPDT Switch	STR-ACSS	STR-ACSS	Nos	54	Fire integration

6.4 Control Room (Storage, Power & Network) proposal upgrade

Component	Calculation / Capacity	Notes / Proposed Upgrade
Storage	31 days retention (current) → upgrade to ≥30 days, 24/7 recording, RAID 5/6	Implement centralized NAS/SAN with redundancy. Ensure adequate disk space for all cameras, ANPR, and access devices. Include automated alerts for disk failures.
PoE Switches	24-Port × 2 Units + 20% margin	Deploy managed PoE+ switches to support all IP cameras, access readers, and edge devices. Enable VLAN segmentation for CCTV, ACSS, and ANPR traffic.
UPS	3 kVA × 1 units	Provide 1-hour backup for control room, network switches, NVRs, and critical field devices. Ensure dual UPS setup for redundancy.
Network Backbone	Fiber / Cat6a backbone	Deploy redundant fiber backbone with Cat6a edge connections. Ensure ring topology or failover paths to minimize downtime. SIRA-compliant segregation of security systems from IT traffic.
Central VMS Server	1 Enterprise-grade VMS server (virtualized)	Integrate all NVRs, ANPR, Access Control, and CCTV into a single VMS for centralized monitoring, logs, and scalability.

Notes: Storage calculates in annex G

6.4.1 Control Room (Full SIRA-Compliant Engineering BOQ)

Item No	Description	Model / Manufacturer	Technical Specifications	SIRA Reference	Unit	Qty	Remarks
CR-01	VMS Recording Server	Dell / HP Enterprise	Xeon Silver CPU, 32–64 RAM, Dual PSU, 2×10Gb NIC, GPU decoding. High-performance Video Management Server for centralized CCTV operations• Intel Xeon Silver/Gold Processor• 32GB ECC RAM (expandable)• 480–960GB SSD (RAID-1 for OS)• External Storage via NAS/SAN with 10GbE uplink• Dual Gigabit/10GbE Network Ports (RJ45/SFP+)• Dual Hot-Swappable Power Supplies• Industrial 2U/4U Rackmount Chassis• Supports 24/7 operation and high-availability architecture• Windows Server / Linux (as per VMS requirement)• Supports Hik Central / Milestone / Genetec / NX or equivalent• Full user management, audit logs, event handling• Complies with SIRA STR-CCTV-2024• Supports 90-day retention via external storage• Secure video export with watermark• To be installed in SIRA-approved CCTV Control Room	SCCR-2024 / Sec.5	Nos	1	Main recording server
CR-02	VMS Base Software License	Hik Central / Milestone / Genetec / NX or equivalent		SCCR-2024 / Sec.5	License	1	Core VMS platform license• Required for channel licenses and system management
CR-03	Camera Channel Licenses – Standard	Hik Central / Milestone / Genetec / NX or equivalent	• Per-camera license• Supports recording, playback, DORI compliance, events• ONVIF-compatible	SCCR-2024 / Sec.5	License		Total cameras- VMS base channel
CR-04	ANPR Integration License		(As required)		ANPR Integration License	License	• Enables ANPR camera integration for gates• Supports plate capture, recognition, and alerts
CR-05	VMS Workstation / Client License		(As required)	SCCR-2024 / Sec.5	VMS Workstation / Client License	License	• For operator access to live view, playback, and control room monitoring
CR-06	Video Analytics License (Optional)		(As required)		Video Analytics License (Optional)	License	• AI analytics modules: intrusion detection, line-crossing, counting, face detection, etc.
CR-07	**System Health Monitoring License**		RAID5, dual PSU, hot-swappable drives• 10GbE redundant controllers• 12×18TB HDD or equivalent• Supports SIRA 90-day video retention		License		Monitors camera status, storage, network, CPU load, and generates alerts
CR-08	**Enterprise NAS/SAN Storage**	QNAP / Synology Enterprise	• RAID5, dual PSU, hot-swappable drives• 10GbE redundant controllers• 12×18TB HDD or equivalent• Supports SIRA 90-day video retention	STR-CCTV-2024	Nos		31-day video retention
CR-09	Surveillance Grade HDD	Seagate Skyhawk / WD Purple	18TB Enterprise Disks	STR-CCTV	Nos	36	31-day storage array
CR-10	Video Wall Controller	Datapath / Hikvision / Dahua	Multi-input, 4K support, IP decoding, Supports 4K, HDMI/DP, VMS control	SCCR-2024	Nos		Controls all displays

Item No	Description	Model / Manufacturer	Technical Specifications	SIRA Reference	Unit	Qty	Remarks
CR-11	Video Wall Panel 55"	LG / Samsung / Dahua	55”, 500 nits, 24/7, <2mm bezel	SCCR-2024 Sec.7	Nos		3×2 configuration
CR-12	Operator Console Desk		24/7 ergonomic, dual level	SCCR-2024	Nos	1	For CCTV operators
CR-13	Operator PC		i7 CPU, 16GB RAM, Dual HDMI + Keyboard/Mouse Set	SCCR-2024	Nos	1	VMS viewing
CR-14	Dual Monitor Set		27”, IPS, 1080p	SCCR-2024	Nos	2	For operator desk
CR-15	Online UPS 6KVA	APC / Eaton	Online UPS, 6KVA, 30–60 min backup	SCCR-2024	Nos	1	For servers & video wall
CR-16	Security Firewall		Layer-7, IDS/IPS, VPN, VLAN routing	STR-CCTV-2024	Nos	1	Network isolation per SIRA cybersecurity policy
CR-17	NTP Time Server		GPS-based	STR-CCTV			Required for VMS sync
CR-18	Video Garde		Delivered by SIRA				

6.4.2 CCTV Storage Calculation –SIRA Complaint

Assumptions:

- Cameras: 600
- Resolution: 4 MP
- Frame rate: 10 FPS
- Codec: H.265+
- Retention: 31 days
- Recording: 24/7 continuous
- RAID: 5
- HDD size: 20 TB

1. Estimate Bitrate per Camera
Bitrate per Camera (Mbps)=1 Mbps (H.265+ average for 4 MP at 10 FPS)
Bitrate (MB/s) =Mbps ÷ 8 =1 ÷ 8 ≈ 0.125 MB/s

2. Daily Storage per Camera
Daily Storage (GB)=Bitrate (MB/s) × 86,400 sec/day ÷ 1024
0.125 × 86,400 ÷ 1024 ≈ 10.54 GB/day ≈ 11 GB/day

3. Storage per Camera for 90 Days
Storage per Camera (TB) = Daily Storage (GB) × Retention Days ÷ 1024
11 × 31 ÷ 1024 ≈ 0.33 TB per camera

4. Total Raw Storage for 600 Cameras
Total Raw Storage (TB) = Storage per Camera × Number of Cameras
0.33× 600 ≈ 198 TB

5. Storage with RAID 5 Overhead
RAID 5 uses 1 disk for parity per array. To estimate total storage including RAID 5 overhead:
Total Storage Required (RAID5) ≈ (Raw Storage × N) ÷ (N-1)
Assuming large arrays of 20 TB disks, let's approximate 1 extra disk per 20 for parity:
RAID5 Storage ≈ 1,98 × (21 ÷ 20) ≈ 207.9 TB

6. Number of 20 TB HDDs Required
Usable HDD per RAID 5 Array:
Usable Disk = 20 × (N – 1) ÷ N ≈ 20 × (23 ÷ 24) ≈ 19.17 TB
Number of HDDs = Total RAID 5 Storage ÷ HDD capacity = 208 TB ÷ 19.17 TB ≈ 10.85 ≈ 11 HDDs

7. NAS Units Required (24-Bay Each)
NAS Units = Number of HDDs ÷ Disks per NAS = 11 ÷ 16 ≈ 3.125 → 1 NAS units

Summary Table

Parameter	Value / Details	Notes
Number of cameras	600	Total cameras for plaza, parking, road, gates, and access control areas
Camera resolution	4 MP	Sufficient for facial recognition and ANPR per SIRA standards
Frame rate (FPS)	10	Optimized for storage efficiency while ensuring smooth video
Video codec	H.265+	Efficient compression reduces storage requirement without compromising quality
Retention period	31 days	Meets SIRA requirement for continuous recording in security-sensitive areas
Storage per camera	11 GB	Calculated for 4 MP, 10 FPS, H.265+, 90-day retention
Total raw storage required	198 TB	Sum of all camera storage before RAID overhead
RAID configuration	RAID 5	Provides redundancy; protects against single drive failure
Total usable storage (RAID)	207.9TB	Includes RAID 5 parity overhead; ensures fault tolerance
HDD capacity	20 TB	Enterprise-grade, 24/7 operation, recommended for NAS/SAN
Number of HDDs required	11 HDD	Rounded up for full deployment
Storage system	NAS / SAN 16 BAY	Hot-swappable drives, dual controllers, SIRA-compliant
Notes / Recommendations	–	Ensure proper cooling, UPS backup, and optional offsite replication for disaster recovery

7 Implementation & Migration Plan

Phase	Duration	Start Date	End Date	Description
Phase 1	**14 Days**	TBD	TBD	**Control Room Setup:** Installation of VMS, video wall, workstations
Phase 1/A	**5 DAYS**	TBD	TBD	**Infrastructure & Cabling**
Phase 1/B	**5 DAYS**	TBD	TBD	**Server & VMS Setup**
Phase 1/C	**2 DAYS**	TBD	TBD	**Video Wall**
Phase 1/D	**2 DAYS**	TBD	TBD	**Testing & Commissioning**
Phase 2	**120 days**	TBD	TBD	**Field Installation**
Phase 2/A	**30 Days**	TBD	TBD	**CCTV PLAZA**
Phase 2/B	**30 Days**	TBD	TBD	**CCTV RING ROAD**
Phase 2/C	**30 Days**	TBD	TBD	**CCTV PARKING**
Phase 2/E	**30 Days**	TBD	TBD	**ACCESS CONTROL**
Phase 3	**14 Days**	TBD	TBD	**Integration, Testing, Commissioning:** FAT, SAT, PPM, emergency tests
Phase 4	**14 Days**	TBD	TBD	**Handover & Documentation:** Operator sessions, documentation handover

Phase 1 – Control Room Core Setup & Pre-Migration
Objective: Establish a fully functional control room as the baseline for all integration.
Control Room Upgrade

- Install new video wall, operator workstations, and servers.
- Connect PoE switches and fibre backbone with redundancy.
- Install and configure the central VMS (Video Management System).
- Integrate NAS/SAN storage with RAID 5.
- Commission UPS 10kVA for backup and failover readiness.
- Set up network backbone, including racks, patch panels, and switches.
- SIRA & Client Approvals
- Submit updated system design including VMS as the baseline reference.
- Rollback Plan
- Prepare manual control Room procedures and temporary monitoring during transition.

Phase 1/A: Infrastructure & Cabling

- Install racks, cabling, switches
- Connect NAS/SAN and servers
- Configure VLAN & firewall

Phase 1/B: Server & VMS Setup

- Install Hik Central
- Integrate NVRs & cameras
- Configure ANPR module

Phase 1/C: Video Wall

- Install 75" displays
- Program video wall controller

Phase 1/D: Testing & Commissioning

- SIRA-compliant testing
- Redundancy & failover tests
- Storage retention verification
- Audit logs & NTP sync verification

Phase 2 – Field Installation & Controlled Migration

Objective: Install all field devices, integrate with central systems, and perform controlled testing.

2A. Plaza Area CCTV

- Install mini dome and bullet cameras.
- Connect cameras to central VMS and configure feeds.
- Verify coverage, recording quality, and SIRA compliance.

2B. Parking Area CCTV

- Install bullet cameras in all parking areas.
- Integrate feeds with central VMS.
- Ensure night vision, ANPR functionality, and PoE connectivity.

2C. Roads / Ring Road CCTV

- Install high-resolution bullet cameras along all roads.
- Connect feeds to VMS, test real-time monitoring, and redundancy.
- Include fibre optic backbone for long-distance camera connections.

2E. Access Control (ACSS)

- Install door access panels, proximity/MIFARE readers, electromagnetic locks, emergency break-glass units, and exit push buttons.
- Connect all doors to the central ACSS server.
- Ensure integration with CCTV, logs, and reporting.

Phase 3 – Finalization, Training & Handover

System Validation

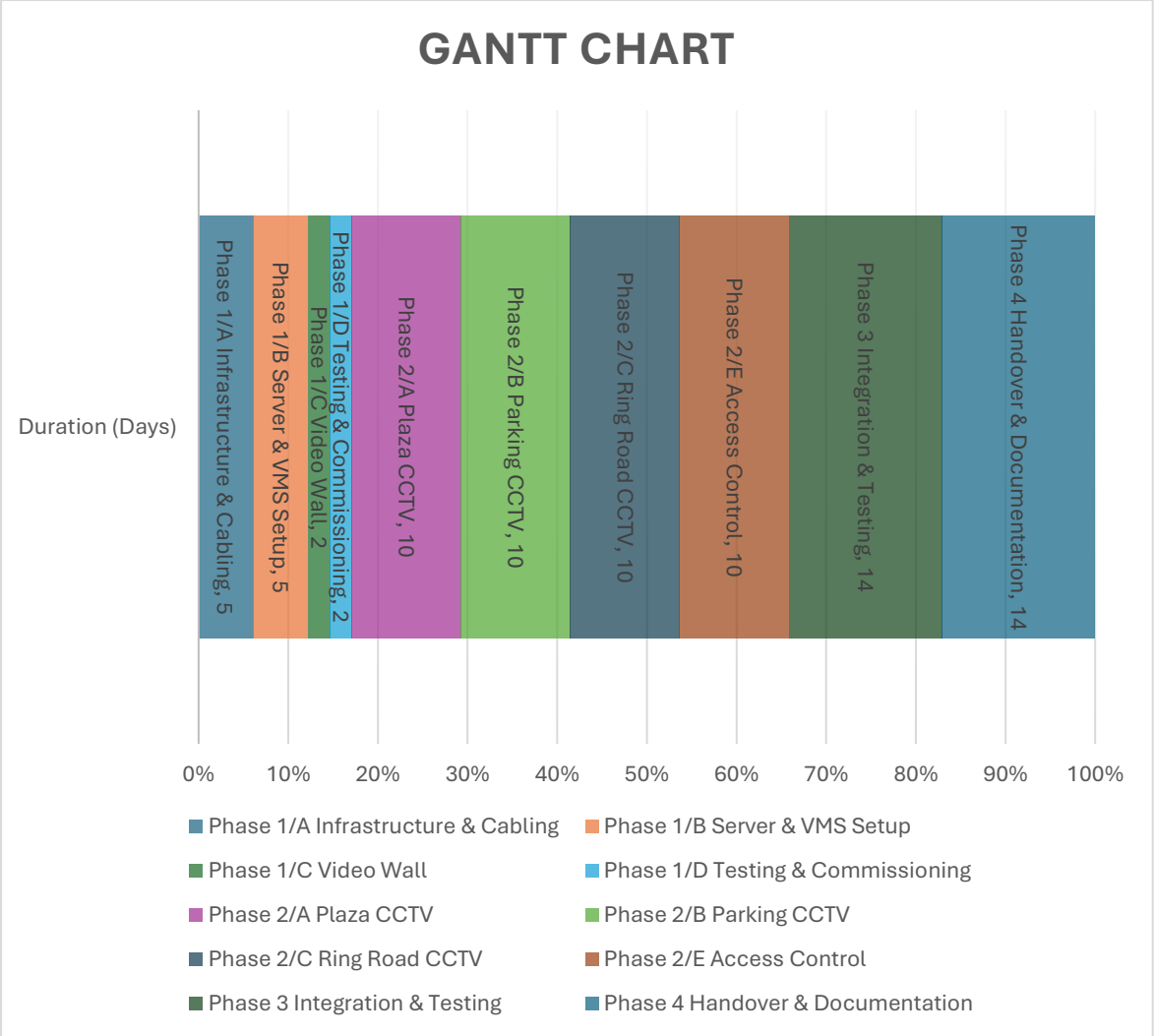
- Conduct end-to-end testing of CCTV, Access Control, and Gate Barriers in the new VMS.
- Confirm real-time monitoring, tamper-proof logs, and failover compliance.
- Training: Train operators on new VMS dashboards, ANPR management, access logs, and QR/OTP workflows.

Phase 4 – Handover & Documentation

- Deliver as-built drawings, operation manuals, and maintenance schedules.

Rollback Readiness

- Ensure manual fallback procedures are documented and operational.



TSC project

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TASK	ASSIGNED TO	Duration	PROGRESS	START	END
Phase 1	Control Room	14	0%	1	14
Phase 1/A	Infrastructure & Cabling	5	30%	1	5
Phase 1/B	Server & VMS Setup	5	60%	6	10
Phase 1/C	Video Wall	2	90%	11	12
Phase 1/D	Testing & Commissioning	2	100%	13	14
Phase 2	CCTV Systems	14	0	15	134
Phase 2/A	Plaza CCTV	30	25%	15	44
Phase 2/B	Parking CCTV	30	50%	45	74
Phase 2/C	Ring Road CCTV	30	75%	75	104
Phase 2/E	Access Control	30	100%	105	134
Phase 3	Integration & Testing	15	100%	135	149
Phase 4	Handover & Documentation	15	100%	150	164

8 Risk Assessment & Mitigation

Risk	Impact	Likelihood	Mitigation Measures
Delay in VMS hardware delivery	High	Medium	Pre-order equipment, maintain backup servers, schedule buffer time
Integration issues between ANPR, ACSS, and VMS	High	Medium	Perform system staging in Phase 1, conduct thorough FAT
Network outages during migration	Medium	Medium	Deploy redundant fibre backbone, UPS backup, phased cutover
Non-compliant legacy devices	High	High	Replace all outdated cameras, gates, and access control devices
Operator training gaps	Medium	Low	Conduct multiple hands-on sessions, provide manuals and SOPs

Notes:

- Risks will be tracked continuously with weekly project review meetings.
- Rollback procedures for gate and access control systems prepared during migration

9 Testing, Commissioning & Acceptance

This phase ensures that all ELV systems are fully operational, compliant with SIRA standards, and meet client performance expectations. Testing and commissioning will follow internationally recognized procedures, with proper documentation for handover and acceptance.

- **Factory Acceptance Test (FAT)**

- Conducted at the vendor/manufacturer site for key systems (VMS servers, access control panels, ANPR cameras, control room workstations).
- Verifies functionality against design specifications before delivery.
- FAT includes:
    - Software configuration validation
    - Hardware performance verification
    - Network connectivity tests

- **Site Acceptance Test (SAT)**

- Performed after installation at The Sustainable City site.
- Confirms integration of all systems (CCTV, ANPR, access control, automation, barriers) in real operational conditions.
- SAT includes:
    - End-to-end system testing
    - Redundancy and failover tests
    - Control room monitoring functionality

- **Planned Preventive Maintenance (PPM) & DORI Compliance**

- All CCTV cameras tested for PPM adherence and DORI (Detection, Observation, Recognition, Identification) coverage as per SIRA standards.
- Includes:
    - Verification of image resolution and coverage
    - Field of view adjustments
    - Lighting/WDR performance checks

- **ANPR Performance & Read Ratios**

- Test all ANPR cameras for accuracy under various conditions (day/night, high traffic).
- Verify read ratios against manufacturer and SIRA requirements (target ≥ 95% correct reads).
- Document any misreads, blind spots, or calibration needs.

- **Emergency & Safety Tests**

- Simulate emergency scenarios to ensure system reliability and compliance:
    - Fire alarm integration with access control
    - Panic buttons and emergency exit
    - Fail-safe operation of barriers and gates
- Document response times and system behaviour.

- **Acceptance & Handover**

- Compile complete test reports, including FAT/SAT results, ANPR read statistics, PPM checks, and emergency scenario outcomes.
- Formal acceptance signed by client and contractor upon successful verification of compliance with design and SIRA standards.

Deliverables:

- FAT & SAT reports
- ANPR read ratio reports
- PPM/DORI compliance checklist
- Emergency test logs
- Final Acceptance Certificate

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10 Handover Documentation & Training

Ensure smooth transition of the upgraded ELV systems to the client's operational team and provide all necessary documentation for maintenance and future reference.

- Compilation and submission of as-built drawings reflecting all changes and new installations.
- Preparation of operation and maintenance manuals for CCTV, Access Control, Parking/ANPR, Gate Barriers, and Automation systems.
- Submission of schedules, including preventive maintenance and inspection timelines.
- Conduct operator training sessions covering system usage, emergency procedures, and troubleshooting.

- Provide a handover report summarizing completed work, compliance with SIRA standards, and recommendations for ongoing system management.

Deliverables:

- As-built drawings (digital and hard copy).
- Operation & maintenance manuals for all ELV systems.
- Preventive maintenance and inspection schedules.
- Handover report highlighting work completion, SIRA compliance, and operational guidelines.
- Completion of operator training sessions with attendance record.

Notes / Recommendations:

- Training should include practical hands-on sessions on Control Room operation, ANPR & CCTV monitoring, and Access Control management.
- Documentation should be cross-checked with installation teams to ensure accuracy.
- Handover to be done in a phased manner aligned with system commissioning to ensure continuity of operations.

SIRA Approval Documents

Ensure all project documentation is SIRA-compliant and ready for regulatory submission.

Required Documents:

- **Security Plan –** Overall ELV security strategy, including CCTV, ACSS, gates, and integration.
- **Site / Layout Drawings –** Detailed floor plans, camera positions, access points, and control room layout.
- **Device Schedules –** Lists of cameras, ANPR units, barriers, access readers, and ACSS devices with specifications.
- **Storage & Retention Policy –** Centralized NAS/SAN architecture, RAID, ≥90-day retention policy.
- **Access Policies –** ACSS hierarchy, emergency override, visitor management workflow.
- **Maintenance Plan –** Preventive maintenance schedule, SLA response times, critical spares inventory.
- **Signage –** Placement of CCTV, access control, emergency exits, and restricted areas per SIRA standards.
- **Certificates –** Vendor certifications, product compliance certificates, installation verification, and FAT/SAT reports.

Notes:

- All documents will be compiled digitally and submitted to SIRA for review.
- Handover will include a complete package of as-built drawings, system manuals, and compliance evidence.

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11 Warranty, Maintenance & SLA

Ensure the long-term reliability and performance of the upgraded ELV systems through structured maintenance and support agreements.

- Provision of manufacturer warranty for all new equipment and system components.
- Implementation of a preventive maintenance program covering CCTV, Access Control, Parking/ANPR, Gate Barriers, and Automation systems.
- Definition of response times for technical support and corrective maintenance for critical and non-critical issues.
- Identification and availability of critical spare parts to minimize downtime and ensure operational continuity.
- Establishment of a Service Level Agreement (SLA) with clear performance metrics and reporting procedures.

Deliverables:

- Warranty certificates for all installed equipment.
- Preventive maintenance schedule and checklist.
- SLA document detailing response times, escalation procedures, and performance KPIs.
- Inventory list of critical spares with recommended stock levels.
- Maintenance logs and reports for tracking system health and performance.

Notes / Recommendations:

- SLA response times should differentiate between emergency, high-priority, and routine service calls.
- Preventive maintenance should be scheduled quarterly, semi-annually, or annually based on system criticality.
- All maintenance activities should be logged and reported to the client for transparency and auditing purposes.

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12 Financial proposal

Provide a clear financial overview of the ELV system upgrade, including all major components, phases, and optional items.

- Detailed cost estimation by system: CCTV, Access Control, Parking/ANPR, Gate Barriers, Control Room, and Automation & Infrastructure.
- Breakdown of costs by implementation phase (Phase 1–3).
- Identification of optional upgrades or enhancements with separate pricing.
- Inclusion of equipment, installation, commissioning, testing, and training.

12.1 Budgetary Estimate

Phase	System / Component	Quantity	Budget	Notes
Phase 1	Control Room Setup	1	**AED187,044.39**	Includes video wall, operator workstations, VMS, storage, UPS, network
Phase 2/A	CCTV Plaza Upgrade	1	**AED58,206.00**	Includes replacement, installation, and configuration, Integration with ACSS & VMS
Phase 2/B	CCTV Ring Road Upgrade	1	**AED93,031.00**	Includes replacement, installation, and configuration, Integration with ACSS & VMS
Phase 2/C	CCTV Parking Upgrade	1	**AED89,925.00**	Includes replacement, installation, and configuration, Integration with ACSS & VMS
Phase 2/D	Access Control (ACSS)	1	**AED102,638.16**	Readers, controllers, locks, emergency buttons
Phase 3	Testing & Commissioning	Lump Sum	**AED45.000.00**	FAT, SAT, PPM, DORI checks, ANPR validation
Phase 4	Training & Documentation	Lump Sum	**AED25.000.00**	Manuals, operator training, as-built drawings

Notes:

- Optional items (facial recognition software, cloud-based storage, mobile monitoring apps) to be quoted separately.

12.2 Proposed BOQ by phase

Phase 1: Control Room SYSTEM BOQ					
Item No.	**Description**	**Unit**	**Qty**	**Unit price**	**Total price**
CCTV-SCR/1	Enterprise HDD Seagate Exos X20 20TB 3.5" SATA, 7200 RPM	Unit	11	AED1,850.00	AED20,350.00
CCTV-SCR/2	NVR HIKVISION DS-9664NI-M Series 8K 64-Ch IP inputs, h.265+ (option if VMS installed)	Unit	2	AED3,850.00	AED7,700.00
CCTV-SCR/3	DELL PowerEdge 750xs 2U rack server Intel Xeon Silver 4310 16 GB 1X 1.2TB	Unit	1	AED16,065.00	AED16,065.00
CCTV-SCR/4	Central VMS / Management Server – Hik Central Professional P-VSS-300Ch/Base/Promo	License	1	AED26,624.70	AED26,624.70
CCTV-SCR/5	Hik Central Professional Additional Camera Licenses HikCentral-P-VSS-1Ch	License	300	AED107.21	AED32,163.00
CCTV-SCR/6	HikCentral-P-AcuSeek-4Ch/Module (optional)	License	1	AED2,390.07	AED2,390.07
CCTV-SCR/7	HikCentral-P-AcuSeek-1Ch/RealTime & Search	License	4	AED531.39	AED2,125.56
CCTV-SCR/8	Hik Central ANPR Module License (optional) HikCentral-P-VSS-1Ch/ANPR (optional)	License	24	AED438.81	AED10,531.44
CCTV-SCR/9	Hik Central ACS base software (optional) HikCentral-P-ACS-16Door/Base/Promo(optional)	License	1	AED2,329.36	AED2,329.36
CCTV-SCR/10	Hik Central ACS base software HikCentral-P-ACS-1Door(optional)	License	38	AED117.21	AED4,453.98
CCTV-SCR/11	Hik Central smart wall-module	License	1	AED1,194.65	AED1,194.65
CCTV-SCR/12	Video Wall Controller HIKVISION DS-6912UDI Supports multiple inputs (HDMI/DVI), 4K output, matrix control, integrates 10×75" screens, controllable via VMS	Unit	1	AED5,811.00	AED5,811.00
CCTV-SCR/13	HIKVISION DS-5055UC 4K Professional-grade 55" Narrow-Bezel Surveillance Screens 4K UHD, bezel ≤5mm, 24/7 operation, brightness ≥500 nits, anti-burn-in, HDMI/DP/RS232/LAN control, split view up to 64 feeds, SIRA-compliant	Unit	10	AED2,716.51	AED27,165.10
CCTV-SCR/14	Operator Workstation (Desk + PC + Dual Monitors) DELL Vostro 3910 i5, 32–16GB RAM, 512 GB HDD, 24"+ monitors ASUS VA279HG 27", PTZ joystick, SIRA-compliant	Set	1	AED5,326.00	AED5,326.00
CCTV-SCR/15	Firewall Fortinet FG-60F FortiGate 60F 10 x GE RJ45 ports FG	Unit	1	AED1,945.00	AED1,945.00
CCTV-SCR/16	UPS & Power Backup 3kVA APS SMART-UPS C 3000VA Rack Mount	Unit	1	AED869.53	AED869.53
CCTV-SCR/17	Structured Cabling, Connectors, Mounting Hardware include Full motion screen wall Mount 55", Labels & Marking	Lot	1	AED5,000.00	AED5,000.00
CCTV-SCR/18	Installation, Testing & Commissioning Includes VMS config, Include Video Garde delivered by Sira	Lot	1	AED15,000.00	AED15,000.00
Total					**AED187,044.39**

Phase 2/A: PLAZA CCTV SYSTEM BOQ					
SN	**Items**	**Unit**	**Qty**	**Unt Price**	**Total Price**
CCTV-PL/01	Supply and installation Outdoor Bullet Camera Hikvision DS-2CD2043G2-I 4MP (SIRA Approved) Fixed VF 2.8, IR 50m, WDR 120dB, IP67, IK10, H.265+, ONVIF S/G including mounting, cabling, and configuration.	Nos	24	AED474.00	AED11,376.00
CCTV-PL/02	supply and replace recognize / ID cameras HIKVISION DS-2CD2347G2-LU 4MP ColorVu Strobe, Fixed Turret Network Camera, 24/7 Colorful Imaging, Focus on Human including mounting cabling and configuration	Nos	8	AED840.00	AED6,720.00
CCTV-PL/03	Supply and installation HIKVISION DS-2CD1123G2-LIU(F) SIRA Approved 2.0 MP IR Dome Camera (Indoor) WDR, IK10, H.265+ including mounting cabling and configuration	Nos	11	AED435.00	AED4,785.00
CCTV-PL/04	fix and repair existent cameras including replacement cable, connectors and configuration	Nos	17	AED300.00	AED5,100.00
CCTV-PL/05	PoE Switch 16-Port Gigabit PoE Switch, 250W+ Power Budget	Nos	3	AED750.00	AED2,250.00
CCTV-PL/06	PoE Switch 8-Port Gigabit PoE Switch, 120W+ Power Budget	Nos	2	AED725.00	AED1,450.00
CCTV-PL/07	Supply and installation of a 24-Port Cat6 UTP Patch Panel for network cabling management of IP cameras, including labelling and termination.	Nos	5	AED150.00	AED750.00
CCTV-PL/08	Rack Cable Management horizontal	Nos	5	AED50.00	AED250.00
CCTV-PL/10	Cat6A RJ45 Connectors and accessories	Lots	1	AED25.00	AED25.00
CCTV-PL/11	Patch Cords, Cat6A Factory Terminated, LSZH Jacket, 1m/lot	Lots	1	AED50.00	AED50.00
ACSS-10	Supply & Installation Cat6A UTP Cable (23 AWG, UTP LSZH)	Roll	10	AED700.00	AED7,000.00
CCTV-PL/12	Cable Trays & Conduits GI / PVC, Junction Box	Lots	43	AED150.00	AED6,450.00
CCTV-PL/13	Installation, Labels, Marking, Testing & Commissioning Includes testing and VMS configuration	Lots	1	AED12,000.00	AED12,000.00
Total					**AED58,206.00**

Phase 2/B: RING ROAD CCTV SYSTEM BOQ					
SN	**Items**	**Unit**	**Qty**	**Unt Price**	**Total Price**
CCTV-RR/01	Supply, delivery, wall/pole mounting, connection to NVR, configuration, and testing of 4MP Bullet Camera Hikvision DS-2CD2043G2-I. Resolution: 4MP (2560×1440), Lens: 2.8mm fixed, Video Compression: H.265/H.264, Night Vision: Up to 30m IR, PoE RJ45, IP66, Vandal-resistant, SIRA compliant. Includes brackets and mounting accessories.	Nos	64	AED474.00	AED30,336.00
CCTV-RR/02	Supply, delivery, rack mounting, connection, configuration, and testing of 16-Port Managed PoE Switch Hikvision DS-3E0316P-E/M with Fiber Support. Specifications: 16 × Gigabit RJ45 PoE ports, PoE budget 250W, 2 × SFP slots for fibre optic uplink 1G/10G, SNMP, QoS.	Nos	5	AED750.00	AED3,750.00
CCTV-RR/03	Supply, delivery, mounting, and connection of outdoor camera junction box / housing. Material: Metal, IP66 rated, suitable for wall/pole installation	Nos	64	AED72.00	AED4,608.00
CCTV-RR/04	Supply and installation of rack accessories. Includes shelves, brackets, cable managers, and other rack organization tools.	Nos	13	AED250.00	AED3,250.00
CCTV-RR/05	Supply and installation of Rack Cooling / Ventilation system.	Nos	13	AED99.00	AED1,287.00
CCTV-RR/06	Supply and installation of Single-Mode SFP Fiber Optic Module with LC connector for 16-Port Managed PoE Switch	Nos	20	AED150.00	AED3,000.00
CCTV-RR/07	Supply, installation, termination, labelling, testing, and patch panel termination of 6-Core Single-Mode (SM) Fiber Optic Cable LC-LC, 9/125 µm, Cable Jacket: LSZH or PVC	meters	1000	AED15.00	AED15,000.00
CCTV-RR/08	Supply & Installation Cat6A UTP Cable (23 AWG, UTP LSZH)	Roll	12	AED700.00	AED8,400.00
CCTV-RR/09	Patch Cords, Cat6A Factory Terminated, LSZH Jacket, 1m/lo Cat6A RJ45 Connectors and accessories.	Lots	1	AED1,000.00	AED1,000.00
CCTV-RR/10	Cable Trays & Conduits GI / PVC, Junction Box	Lots	64	AED150.00	AED9,600.00
CCTV-RR/11	Installation, Labels, Marking, Testing & Commissioning Includes VMS configuration	Lots	64	AED200.00	AED12,800.00
Total					**AED93,031.00**

Phase 2/C: PARKING CCTV SYSTEM BOQ					
SN	**Items**	**Unit**	**Qty**	**Unt Price**	**Total Price**
CCTV-PR/01	Supply, delivery, wall/pole mounting, connection to NVR, configuration, and testing of 4MP Bullet Camera Hikvision DS-2CD2043G2-I. Resolution: 4MP (2560×1440), Lens: 2.8mm fixed, Video Compression: H.265/H.264, Night Vision: Up to 30m IR, PoE RJ45, IP66, Vandal-resistant, SIRA compliant. Includes brackets and mounting accessories.	Nos	77	AED474.00	AED36,498.00
CCTV-PR/02	Supply, delivery, rack mounting, connection, configuration, and testing of 16-Port Managed PoE Switch Hikvision DS-3E0316P-E/M with Fiber Support. Specifications: 16 × Gigabit RJ45 PoE ports, PoE budget 250W, 2 × SFP slots for fibre optic uplink 1G/10G, SNMP, QoS.	Nos	10	AED750.00	AED7,500.00
CCTV-PR/03	Supply, delivery, mounting, and connection of outdoor camera junction box / housing. Material: Metal, IP66 rated, suitable for wall/pole installation	Nos	77	AED72.00	AED5,544.00
CCTV-PR/04	Supply and installation of rack accessories. Includes shelves, brackets, cable managers, and other rack organization tools.	Nos	17	AED250.00	AED4,250.00
CCTV-PR/05	Supply and installation of Rack Cooling / Ventilation system.	Nos	17	AED99.00	AED1,683.00
CCTV-PR/06	Supply & Installation Cat6A UTP Cable (23 AWG, UTP LSZH)	Roll	10	AED700.00	AED7,000.00
CCTV-PR/07	Patch Cords, Cat6A Factory Terminated, LSZH Jacket, 1m/lo Cat6A RJ45 Connectors and accessories t	Lots	1	AED500.00	AED500.00
CCTV-PR/08	Cable Trays & Conduits GI / PVC, Junction Box	Lots	77	AED150.00	AED11,550.00
CCTV-PR/09	Installation, Labels, Marking, Testing & Commissioning Includes VMS configuration	Lots	1	AED15,400.00	AED15,400.00
Total					**AED89,925.00**

Phase 2/D: ACCESS CONTROL BOQ					
SN	**Items**	**Unit**	**Qty**	**Unt Price**	**Total Price**
ACSS-01	Supply & Installation of 4-door controllers Panels, TCP/IP, expandable, SIRA-approved including wiring, Termination, testing	Nos	10	AED1,500.00	AED15,000.00
ACSS-02	Supply & Installation of 2-door controllers Panels HIKVISION DS-K2802, TCP/IP, expandable, SIRA-approved including wiring, Termination, testing	Nos	8	AED1,300.00	AED10,400.00
ACSS-03	Supply & Installation of Power Supply Units with Battery Backup (12VDC/5A/7Ah, metallic box, SLA batteries)	Nos	18	AED95.00	AED1,710.00
ACSS-04	Supply & Installation of Proximity/MIFARE Card Readers HIKVISION DS-K1107MK (IP65, RFID Reader (Card, PIN), Wiegand/OSDP, SIRA-approved)	Nos	54	AED284.44	AED15,359.76
ACSS-05	Supply & Installation of Exit Push Buttons HIKVISON DS-K7P01 (Stainless steel, heavy duty)	Nos	54	AED75.00	AED4,050.00
ACSS-06	Supply & programming of Mifare HIKVISION DS-k1F820 cards/ card Fobs/ Key tags	Nos	100	AED8.00	AED800.00
ACSS-07	Supply & Installation of Electromagnetic Locks (600 lbs holding force, fail-safe,) with Door Contact Sensor	Nos	58	AED168.00	AED9,744.00
ACSS-08	Supply & Installation of L-Z Brackets HIKVISION DS-K4H258-LZ for Electromagnetic Locks for glass door installations	Nos	12	AED83.70	AED1,004.40
ACSS-09	Supply & Installation of Emergency Break Glass Units (green & resettable, with protective cover)	Nos	54	AED95.00	AED5,130.00
ACSS-10	Cat6A UTP Cable (23 AWG, UTP LSZH)	Roll	4	AED700.00	AED2,800.00
ACSS-11	cable 2 pair 0.75	Roll	6	AED370.00	AED2,220.00
ACSS-12	2.5*3 power cable	Box	1	AED400.00	AED400.00
ACSS-13	PVC Trunking / GI conduits	Lots	54	AED130.00	AED7,020.00
ACSS-14	wiring, installation, programming, commissioning of door access control include integration with fire alarm and control room server	Lots	54	AED500.00	AED27,000.00
Total					**AED102,638.16**

Annex: Detailed CCTV Plaza Findings & Recommendations

Block	Area	Location	Installed	Status	Recommendation	Require
BLOCK A	Ground Floor	GF Main Door 1 (ID Camera)	1	Not Working	Replace with IP facial recognizes Camera	1 ID camera
		GF Main Door 2 (ID Camera)	1	Not Working	Replace with IP facial recognizes Camera	1 ID camera
		Lift 1	0	Not Installed	Install IP Mini Dome Camera	mini dome camera
		Lift 2	0	Not Installed	Install IP Mini Dome Camera	mini dome camera
		GF Lift Lobby	2	Working	No action required	
		GF Lift Lobby 2	2	Working	No action required	
		GF Staircase 1	1	Working	No action required	
		GF Staircase 2	1	Working	No action required	
	First Floor	1st Floor Staircase 1	1	Working	No action required	
		1st Floor Staircase 2	1	Working	No action required	
		1st Floor Lift Lobby 1	1	Not Working	Replace with IP Dome Camera	ID camera
	Second Floor	2nd Floor Staircase 1	1	Working	No action required	
		2nd Floor Staircase 2	0	Not Installed	Install IP Dome Camera	Dome camera
		2nd Floor Lift Lobby 1	1	Working	No action required	
		2nd Floor Corridor	0	Not Installed	Install 2x IP Dome Cameras	2 Dome camera
		2nd Floor Lift Lobby 2	0	Not Installed	Install IP Dome Camera	Dome camera
	Roof	Roof Staircase 1	1	Working	No action required	
		Roof	0	Not Installed	Install IP Bullet Camera	Bullet camera
	Outside	A Outside (Various)	4	Working	install 02 Bullet Camera	
		Corner retail 1 focussing on main entrance (BLOCK A OUTSIDE 1)	1	Working	No action required	
		Corner retail 1 focussing on block A side BLOCK A OUTSIDE 2)	1	Working	No action required	
		Corner retail 4 focussing on main entrance 2 (BLOCK A OUTSIDE 3)	1	Working	No action required	
		corner retail 4 focussing to side 2(BLOCK A OUTSIDE 4)	1	Working	No action required	
		nursery side	0	Not Installed	install 2x IP Bullet Cameras	2 Bullet cameras
BLOCK B	Ground Floor	GF Main Door (ID Camera)	1	Not Working	Replace with IP facial recognizes Camera	ID camera
		GF Lift Lobby	2	Working	No action required	
		Lift	0	Not Installed	Install IP Mini Dome Camera	Dome camera
		GF Staircase 1	1	Working	No action required	
		GF Staircase 2	0	Not Installed	Install IP Dome Camera	Dome camera
	First Floor	1st Floor Staircase 1	1	Working	No action required	
		1st Floor Lift Lobby 1	1	Working	No action required	
	Second Floor	2nd Floor Staircase 1	1	Working	No action required	
		2nd Floor Lift Lobby 1	1	Working	No action required	
		2nd Floor Corridor	2	Working	No action required	
		2nd Floor Staircase 2	1	Working	No action required	
	Roof	Roof Staircase 1	1	Working	No action required	
	Outside	B Outside (Various)	6	Working	No action required	
		Corner 1 Pharmacy focussing on main entrance (BLOCK B OUTSIDE 1)	1	Working	No action required	
		Corner 2 pharmacy focussing block side (BLOCK B OUTSIDE 2)	1	Working	No action required	

		Corner 2 pharmacy focussing retails (BLOCK B OUTSIDE 3)	1	Working	No action required	
		Corner 3 focussing on retails (BLOCK B OUTSIDE 4)	1	Working	No action required	
		Corner 3 focussing block side to block E (BLOCK B OUTSIDE 5)	1	Working	No action required	
		corner 4 focussing on main entrance (BLOCK B OUTSIDE 6)	1	Working	No action required	
BLOCK C	Ground Floor	GF Main Door (ID Camera)	1	Not Working	Replace with IP ID Camera	ID camera
		GF Lift Lobby	2	Working	No action required	
		Lift 1	0	Not Installed	Install IP Mini Dome Camera	Dome camera
		GF Staircase 1	1	Working	No action required	
	First Floor	1st Floor Staircase 1	1	Working	No action required	
		1st Floor Corridor	2	Working	No action required	
	Second Floor	2nd Floor Staircase 1	1	Working	No action required	
		2nd Floor Lift Lobby	1	Working	No action required	
		2nd Floor Corridor	2	Working	No action required	
	Roof	Roof Staircase 1	1	Not Working	Inspect and Repair/Replace	Bullet camera
`	Outside	C Outside (Various)	8	2 Not Working	Inspect and Repair 2 cameras	
		Corner 1 market focussing on main entrance market (BLOCK C OUTSIDE 1)	1	Working	No action required	
		close to the main door, focusing on the market (BLOCK C OUTSIDE 2)	1	Working	No action required	
		close to the main door, focusing on veterinary	1	Not Working	Inspect and Repair/Replace	
		corner 2 focussing on main entrance	1	Not Working	Inspect and Repair/Replace	
		Corner 3 focusing on the path between Block C and F (BLOCK C OUTSIDE 6)	1	Working	No action required	
		corner 3 focussing to back side of the building (BLOCK C OUTSIDE 5)	1	Working	No action required	
		Corner 4 focussing on back side of the building	1	Not Working	Inspect and Repair/Replace	Bullet camera
		Corner 4 focussing on block side	1	Not working	Inspect and Repair/Replace	Bullet camera
BLOCK D1	Ground Floor	GF Main Door (ID Camera)	1	Not Working	Replace with IP Dome Camera	Dome camera
		Corner 4 focussing on block side	1	Not working	Inspect and Repair/Replace	Bullet camera
BLOCK D1	Ground Floor	GF Main Door (ID Camera)	1	Not Working	Replace with IP Dome Camera	Dome camera
		GF Lift Lobby	2	Working	No action required	
		Lift 1	0	Not Installed	Install IP Mini Dome Camera	Dome camera
		GF Staircase 1	1	Working	No action required	
		GF Staircase 2	2	Not Working	Inspect and Repair/Replace	Bullet camera
	First Floor	1st Floor Staircase 1	1	Working	No action required	
		1st Floor Lift Lobby	1	Working	No action required	
		1st Floor Corridor	2	Working	No action required	
	Second Floor	2nd Floor Staircase 1	1	Working	No action required	
		2nd Floor Lift Lobby	1	Working	No action required	
		2nd Floor Corridor	2	Working	No action required	
		2nd Floor Staircase 2	1	Working	No action required	
	Roof	Roof Staircase 1	1	Not Working	Inspect and Repair/Replace	Bullet camera
		Roof	0	Not Installed	Install IP Bullet Camera	
BLOCK D2	Ground Floor	GF Main Door (ID Camera)	1	Not Working	Replace with IP Dome Camera	ID camera
		GF Lift Lobby	2	1 Working, 1 Not	Repair non-working camera	
		Lift 1	0	Not Installed	Install IP Mini Dome Camera	Dome camera
		GF Staircase 1	1	Working	No action required	
		GF Staircase 2	2	1 Working, 1 Not	Repair non-working camera	
	First Floor	1st Floor Staircase 1	1	Working	No action required	
		1st Floor Lift Lobby	1	Working	No action required	
		1st Floor Corridor	2	Working	No action required	

	Second Floor	2nd Floor Staircase 1	1	Working	No action required	
		2nd Floor Lift Lobby	1	Working	No action required	
		2nd Floor Corridor	2	Working	No action required	
		2nd Floor Staircase 2	1	Working	No action required	
	Roof	Roof Staircase 1	1	Working	No action required	
		Roof	0	Not Installed	Install IP Bullet Camera	Bullet camera
	Outside	D Outside (Various)	12	6 Not Working	Repair 1 camera. Install 3 new IP Bullet Cameras	
		corner retail 1 focussing on main door D1 (BLOCK D1 OUTSIDE 1)	1	Working	No action required	
		corner between D1 and D2 focussing on D1	1	Not Working	Inspect and Repair/Replace	
		corner between D1 and D2 focussing on D2	1	Not working	Inspect and Repair/Replace	
		corner 1 D2 focussing on D2 (BLOCK D2 OUTSIDE 2)	1	Working	No action required	
		corner 2 D2 focussing on D2 side (BLOCK D2 OUTSIDE 3)	1	Working	No action required	
		corner 2 D2 focussing on main door D2 (BLOCK D2 OUTSIDE 4)	1	Working	No action required	
		Above main door D2	1	Not Working	Inspect and Repair/Replace	Bullet camera
		corner D1 and D2 side parking focussing on main door D2 (BLOCK D2 OUTSIDE 5)	1	Working	No action required	
		corner retail 1 focussing on path	0	Not installed	Install IP Bullet Camera	
		Above main door D1	2	Not working	Inspect and Repair/Replace	2 Bullet camera
		Path D1	2	Not Working	Inspect and Repair/Replace	
		path D2 (BLOCK D2 OUTSIDE 6)	1	Working	No action required	
BLOCK E1	Ground Floor	GF Main Door (ID Camera)	1	Not Working	Inspect and Repair/Replace	Dome camera
		GF Staircase 1	1	Not Working	Inspect and Repair/Replace	Bullet camera
		GF Lift Lobby	2	Working	No action required	
		Lift 1	0	Not Installed	Install IP Mini Dome Camera	Dome camera
		GF Staircase 2	0	Not Installed	Install IP Dome Camera	Dome camera
	First Floor	1st Floor Staircase 1	1	Working	No action required	
		1st Floor Staircase 2	1	Working	No action required	
	Second Floor	2nd Floor Staircase 1	1	Working	No action required	
		2nd Floor Staircase 2	1	Working	No action required	
	Roof	Roof Staircase 1	1	Working	No action required	
		Roof	0	Not Installed	Install IP Bullet Camera	bullet camera
BLOCK E2	Ground Floor	GF Main Door (ID Camera)	0	Not Installed	Install IP Dome Camera	
		GF Lift Lobby	2	Working	No action required	
		Lift 1	0	Not Installed	Install IP Mini Dome Camera	Dome camera
		GF Staircase 1	1	Working	No action required	
	First Floor	1st Floor Staircase 1	1	Working	No action required	
		1st Floor Lift Lobby	1	Working	No action required	
		1st Floor Corridor	2	Working	No action required	
	Second Floor	2nd Floor Staircase 1	1	Working	No action required	
		2nd Floor Lift Lobby	1	Working	No action required	
		2nd Floor Corridor	2	Working	No action required	
		2nd Floor Staircase 2	1	Working	No action required	
	Roof	Roof Staircase 1	1	Working	No action required	
		Roof	0	Not Installed	Install IP Bullet Camera	Bullet camera
	Outside	E Outside (Various)	13	11 Not Working	Inspect & repair or replace 12 cameras. Install 1 new camera.	
		corner 1 E1 focussing on retail E1	1	Not Working	Inspect and Repair/Replace	Bullet camera

		corner 2 E1 focussing E1 side	1	Not Working	Inspect and Repair/Replace	Bullet camera
		corner 2 E1 focussing main entrance clinic	1	Not Working	Inspect and Repair/Replace	Bullet camera
		corner 3 E1 focussing main entrance clinic	1	Not Working	Inspect and Repair/Replace	Bullet camera
		corner 1 E2 focussing on main entrance	1	Not Working	Inspect and Repair/Replace	Bullet camera
		corner 2 E2 focussing on main entrance (BLOCK E2 OUTSIDE 4)	1	Working	No action required	
		Corner 3 E2 focussing E2 side (BLOCK E2 OUTSIDE 5)	1	Working	No action required	
		Corner 3 E2 focussing on E1	1	Not Working	Inspect and Repair/Replace	Bullet camera
		corner between E1 and E2 focussing on E2	1	Not Working	Inspect and Repair/Replace	Bullet camera
		corner between E1 and E2 focussing on E1	1	Not Working	Inspect and Repair/Replace	Bullet camera
		Block E1 above retail 2 focussing on retail 1	1	Not Working	Inspect and Repair/Replace	Bullet camera
		Path E1	1	Not Working	Inspect and Repair/Replace	Bullet camera
		Path E2	1	Not Working	Inspect and Repair/Replace	Bullet camera
GENERAL OUTSIDE	Perimeter	Block F side	0	Not Installed	Install IP Bullet Camera	Bullet camera

Signature & Approval

Eng**. Ahmed Galaleldin**

Commercial Manager

Eng. **Abed Shadfan**

Head Of Technology