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DEPARTMENT OF PUBLIC WORKS

SECURITY

STANDARD TECHNICAL SPECIFICATION FOR A

INTEGRATED SECURITY SYSTEM FOR PRISONS

OCTOBER 2004

TECHNICAL SPECIFICATION FOR THE INTEGRATED SECURITY SYSTEM

INDEX

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1 COMPRESSED AIR SYSTEM, PNEUMATIC LOCKS AND LOCKING DEVICES

This section includes the pneumatic locking and operating devices, under electrical control, for individual swing and sliding prison doors.

1.1 System components:

a. Air compressors and storage tanks
b. Filtering and drying equipment
c. Air lines and associated fittings
d. Pneumatic swing door locks
e. Pneumatic sliding door locking devices

1.2 Compressed Air System and Components:

The tenderer in accordance with the component manufacturer's product requirements shall adequately size specific system components. The system shall be designed to provide a spare capacity of 100% of the normal operating load.

1.2.1 Air Compressors

The proposed Air Compressor shall be manufactured in accordance with ISO 9001 standards, and shall be certified in accordance with the following:

- CEE 89/392 machinery Directive
- CEE 87/404 simple pressure vessel Directive
- CEE 73/23 low voltage Directive
- Output measured in accordance with ISO 1217

A dual Screw driven air compressor system shall be provided with the individual compressors being mounted on CEE 87/404 approved air receivers.

The compressors shall be self-contained units incorporating all of the necessary filtering and air-drying components. The units shall comply with the following technical specifications:

Air-End	VT Rotary single stage air-end Lubrication by means of oil injection. Drive male rotor RM with a five lobe, offset profile. Drive female rotor RF with a six flute, offset profile.
Motor	7.5 kW - 10HP IP55 three phase 2 pole enclosed rated speed - 3000rpm @ 50HZ ; 3600rpm @ 60Hz insulation class F, service class S1.
Fan	Two pole, three phase, protection rating IP45, insulation class B, Direct coaxial.
Drives	Motor and compressor: Removable taper bushing pulleys and toothed v-belts.
Air dryer	Thermostat controlled cooling cycle, direct expansion, with Freon R134a gas.

	Pressure due point temperature 3 deg C. Clean air filtering degree 0.01um.
Capacity	145 psi / 1000 kpa – 1 .15 m3/h (1150 Litre/Min) based upon ambient air temperature of 20 degrees and atmospheric pressure of 100 kpa.
Working pressure	145 psi / 1000 kpa.
Noise level	64 dB(A) Measured in accordance with ISO 3744 +/- 3dB(A).
Max Dimensions	1170(W) x 650(D) x 1660(H).
Max Weight	335 kg.
Air receiver	275 or 500 litre
Maximum installation altitude	1000m
Minimum ambient temperature	+5 deg C
Maximum ambient temperature	+40 deg C

The compressors and pneumatic storage vessels shall be sized such that each compressor has the ability to meet the total air requirements under normal operation and not exceed a maximum 40 % duty cycle. The compressors shall be sized in order to provide sufficient air. The minimum size of pneumatic line between the remote pneumatic storage tanks and the doors that shall be 10mm, unless otherwise specified.

The following operational requirements shall be considered in order to size the compressor units:

1) **Cell and Stair Devices**: 8 operations per 24 hour period with a maximum of 4 operations in one hour

2) **Medium Use Corridor Device**: 150 operations per 24-hour period with a maximum of 15 operations per hour. (90% of all corridor doors may be considered medium use)

3) **High Use Corridor Device**: 320 operations per 24-hour period with a maximum of 40 operations per hour. (At a minimum, 10% of all corridor doors may be considered high use).

a. The compressor recovery time shall be no more than fifteen (15) minutes.

b. The Compressor shall incorporate the necessary starters, solenoid unloaders pressure switches, control gear, overload protection, circuit breakers and all other miscellaneous items electrical and other wise to

make this installation complete and in accordance with all the relevant S.A.B.S. regulations.

c. The exhaust silencers/muffler shall possess a 60db rating or less

1.2.2 Alternating Compressor Controller:

Provide an automatic compressor controller system for the facility

a. Under normal conditions, the compressors shall alternate. If one compressor is out of service or if the one compressor fails to start, the second compressor shall take over the duties of the first. If one compressor starts but cannot fulfill the demand, both compressors shall deliver air until the demand is met. The two compressors are to be installed in separate locations, and are to provide a redundant supply line.

b. The compressor controller shall consist of, but not be limited to, across the line starters, motor circuit protectors, timers, counters, relays, pressure sensing switches and transformers with all necessary interconnection wiring.

1.2.3 Compressed Air Dryer:

a. The air dryer for each air compressor system furnished shall be an integral component of the Air Compressor, and shall not require external control equipment.

1.2.4 Compressed Air Receiver/Storage Tanks:

a. Receivers and compressed air storage tanks shall be sized to provide sufficient air storage to limit compressors to a maximum of six (6) starts per hour and permit each swing lock and sliding door locking device to operate two (2) times without input from the compressors.

b. Storage tanks shall be required both at the compressor units as well as at remote locations for each control room area unless otherwise specified.

c. The tenderer shall be responsible for the complete pneumatic reticulation design, and will ensure that no control room shall be taken out of service if a pneumatic line elsewhere in the pneumatic installation is damaged.

d. Provide high pressure relief valves, air pressure gauges and pressure switches on all receivers and storage tanks

e. Pressure regulators shall be provided to reduce line pressure to a maximum of 900ka PA.

f. Automatic drains are to be provided, and shall be piped to the nearest floor drain

1.2.5 Air Quality

Air supplied to the devices shall have been processed through filtering, cooling and drying equipment and as a minimum, shall meet the following;

a. Solid particulate matter shall be filtered to 5.0 micron of less

b. Solid oil particles shall be filtered to 0.3 micron or less

c. Oil aerosols to be less than 0.1 P.P.M @ 30 degrees C.

d. The air must be free of water vapour to a pressure dew point of 3 degrees Celsius.

1.2.6 Air System Integrity

The air reticulation system shall incorporate a line pressure monitoring system, which shall be capable of detecting abnormal pressure drops of 0.01 bar.

The system shall be capable of detecting and isolating air leaks on both the main feed and control room supply lines. In the event of excessive air loss, the effected supply line shall be automatically terminated and the supply re-routed to the affected area.

The system shall be capable of generating an air supply status report on a 24-hour basis, and shall highlight potential problem areas where air loss exceeds pre-defined set points.

The status report shall form part of the overall system management application, which shall run on the management workstation.

1.3 Pneumatic operated security locks for individual swinging doors, complete with integrated electronic and pneumatic components.

Pneumatic swing door locks are to be installed in all corridor doors, where sliding devices cannot be installed due to a restriction in the corridor width.

1.3.1 Function

a. Normal Operation

1) When electrical power is applied to the solenoid valve, the latch-bolt shall retract. The bolt shall remain retracted as long as power is applied.

2) When power is removed, the latch-bolt shall extend, locking the door if closed, and allowing the door to be slam – locked if open.

b. Manual Operation

1) Each lock shall have a local manual key override lock/unlock feature, generally keyed on two sides.

2) Rotating the key shall mechanically retract the latch-bolt. Removing the key shall extend the bolt, locking the door if closed. and allowing the door to be slam-locked if open.

1.3.2 Components

a. Mechanical

1) The lock shall operate when supplied with air at a pressure between 275kPa and 860kPa.

2) The lock shall operate as a fail-secure slam-lock. The lock will unlock when energized.

3) At least the lock body shall be made of hot dipped galvanized steel or stainless steel, but all moving and non moving parts shall be of a high quality material which is maintenance free.

4) The lock shall be factory plumbed with a quick connect air fitting or fittings.

5) The lock shall be a high security lock and shall conform to ANSI or an equivalent international body.

6) Cylinder extensions shall be provided for locks keyed on two sides or keyed stop side where applicable.

b. Electrical

1) The solenoid valve shall be a low wattage, 12 or 24 VDC, continuous rated valve

2) The lock shall be provided with a lock status switch to provide interlocking capabilities

3) All switches shall be of the snap acting mechanical type or proximity type and shall have a 5-amp rating.

4) Locks shall be factory wired to a plug disconnect.

5) Lock status switches shall provide the following indications:

a) Locked and deadlocked indication
b) Unsecured indication.
c) Door closed indication

All medium and maximum security remote controlled pneumatic operated locks for individual swinging doors will be a mortised slam-locks, with automatic deadlocking for a prison door frame installation. The lock shall be supplied complete with all its integral electronic and pneumatic components. The lock and doorframe shall be deemed part of this tender.

1.3.3 Physical Characteristics:

1) The lock shall automatically deadlock when the door is slam-locked in the manual mode, even in the event of total loss or air and/or electric power

2) The lock shall have a mechanical deadlock actuator, and shall automatically deadlock when the door is closed.

3) Lock shall be designed to accept a mortise key cylinder. The key cylinder shall conform to ANSI.

1.4 **Pneumatic operated sliding devices for cell, sally-port and corridor doors;**

1.4.1 Components:

a. Mechanical

1) Door rollers shall be self-lubricating, incorporating sealed lifetime lubricated bearings. Rollers shall provide smooth and quiet operation. Full details of what is offered by the tenderer shall be included with the tender documentation.

The mechanism shall be guaranteed for a minimum life cycle of 1 million operations.

The door control mechanism shall have a proven history of installation in similar applications and the tenderer shall provide documented proof of a successful 1 Million-cycle test.

2) The door shall lock at the top and bottom in both the open and close positions.

3) The locking mechanism shall include an automatic mechanical deadlock feature.

4) The vertical lock bar shall be mechanically connected to the lock mechanism or to an emergency release latch above the door to ensure manual override.

5) Top and bottom door guides must be designed such that side motion of the door shall be limited to +- 1mm or less to significantly reduce rattle induced noise.

6) The doorframe shall fit tightly over the door opening and all gaps shall be sealed with vandal proof material.

a. Electrical:

1) All Pneumatic, electric and control equipment required for the control of a single sliding door shall be pre-assembled as a single control tray in order to simplify installation and maintenance requirements.

2) Any external status devices shall be factory wired to a multi-pin connector located on the door control module within the control tray. which is to be situated above each door.

3) All switches (mechanical or proximity) necessary for the functioning of the door, and for the required door status indication, shall be rated in accordance with the door control module requirements.

4) Individually isolated 24VDC power supplies are required for CPU and I/O requirements.

5) All solenoid valves shall be a low wattage, 24 VDC, and be continuously rated.

6) The door control module shall be supplied with status switches to provide indication and interlocking capabilities

7) The status switches shall provide the following indications:

a) Door fully closed.
b) Door fully open.
c) Lock bar fully down.
d) Lock bar fully up.

b. Housing

1) Housing covers to be constructed of 2mm (minimum) cold galvanised steel plate and shall be secured with security screws to the sliding door housing.

2) Housing covers shall be hinged, and allow easy access to all working parts during maintenance.

3) The door hanger slot shall be securely baffled in both the door open and door closed position.

4) To reduce the possibility of hidden contraband, there shall be no **exposed flat surfaces** on the housing or in the door hanger slot.

All security sliding doors installed in front of cell openings shall have an emergency release mechanism installed inside the pneumatic housing compartment, with an access point on the housing compartment for emergency release.

All other security sliding doors shall have a hip high key release on both sides of the door unless otherwise specified.

The key release feature shall provide for electric control under normal conditions and mechanical control in the case of failure.
The release mechanism shall be located approximately 1300 mm above the finished floor level.

c. Normal Operation

1) When the door is locked in the closed position, initiation of the open command shall cause the lock mechanism to release and the door to move to the fully open position and automatically deadlock.

2) When the door is locked in the open position, initiation of the closed command shall cause the lock mechanism to release and the door to move to the fully closed position and automatically deadlock.

3) Locking devices shall be capable of being controlled individually and in groups

4) The door shall be capable of opening or closing at a speed of plus minus 0.3 m/s Door speed shall be independently adjustable in each direction, and at each door within the maximum operating pressure of 5 bar.

5) The door shall decelerate as it reaches the fully open and fully closed positions by means of a mechanical cushion. The rate of deceleration shall be adjustable to ensure that the door opens and closes quietly.

6) The control mechanism shall allow for freewheeling of door in the event of total loss of air supply and /or electric power.

7) If an obstruction is placed in the path of the door, the door shall stall for a period of two seconds after which the door shall resume movement in the selected direction. The mechanism must be capable of being stalled indefinitely without **harming the device or pedestrians**. Once the obstruction is removed, the door should resume movement from any point in the door travel, without stalling. **The use of pressure as an indication medium to detect obstruction shall not be permitted.**

8) The maximum pressure exerted on an obstruction placed in the path of the door should not exceed 100 Newton, in order to protect both pedestrian traffic and the mechanical components within the device.

9) The mechanism should not rely on differential pressure as a means of detecting an obstruction to the normal movement of the door.

10) The operator shall be capable of 'instantly' reversing the direction of door travel at any point and immediately resuming the preset travel speed of the door. The change of direction should not affect the normal operation of the door or the detection of an obstruction.

11) A key release cylinder fitted at 1300mm above finished floor level shall electrically activate the door, duplicating the open/close functions of the security control system.

d. Manual Operation

1) In the event of total loss of air supply and /or electric power, individual doors may be released manually at the door. With the lock mechanism released, moving the door manually to the open or full closed position shall cause the door to automatically deadlock.

2) Manual operation of any door shall not interfere with the normal operation of other doors.

2. SECURITY MANAGEMENT SYSTEM (SMS)

2.1 General Description and System Overview:

The tenderer shall supply, install and commission a fully integrated multi-station security management system to facilitate the control and monitoring of all security sub-system components by means of a mouse activated operator workstation.

Operator consoles shall be located within each local control room as well as the Movement and Central control rooms within the facility.

The tenderer shall provide all materials, labour and supervision required to install, commission and document the complete system as required by this specification, and as indicated on the accompanying drawings.

The SMS shall have demonstrated proven operation in a correctional environment, and a list of reference sites shall be provided as part of the tender response.

2.2 Integrated Security Sub-Systems:

The following security sub-system hardware and software components shall be fully integrated into each operator workstation without the need for any additional control components such as keyboards, joysticks or proprietary operator panels.

System operators shall be capable of controlling all functions of the sub-system hardware components via a single mouse driven operator workstation running on a Windows NT/2000 operating platform and a single Security Management Application. The use of multiple applications in order to achieve sub-system integration shall not be accepted. All workstations shall be equipped with 21" SVGA VDU's.

2.2.1 Locking Sub-System

The locking sub-system hardware shall be integrated with the SMS via a high level Interface (HLI). The full functionality of the locking sub-system hardware shall be integrated with the SMS to provide enhanced features including but not limited to:

- Door Lock
- Door Unlock
- Door Inhibit
- Door lockdown
- Door lockdown time preset
- Door Status monitoring
- Door Alarm annunciation
- Door auto-close
- Hardware fault diagnostics.

The SMS shall provide the specific operational functionality as described in Section 2.14 of this specification.

The locking sub-system shall control and monitor all electrically and pneumatically controlled swing doors, sliding doors and gates within the facility.

The locking system control hardware (I/O points) shall be an integrated function of the door control module described in Section 5.2 of this specification.

2.2.2 I/O Alarm Monitoring Sub-System

An Alarm monitoring sub-system shall be provided to monitor specific hardwired alarm I/O points within the facility, which are available through other sub-system High Level Interfaces (HLI). Such Alarms shall include but not be limited to the following:

- DPS monitored door alarms.
- Panic/ Duress alarms.
- Standby generator alarms.
- Surge Voltage alarms.
- Air system alarms.

The alarm monitoring system control hardware (I/O points) shall be an integrated function of the door control module as well as the multiple I/O control modules described in Section 5.2 of this specification.

All alarm conditions shall be presented to the operator within the Fault queue as described in Section 2.14.2.11 of the specification.

2.2.3 Access Control Sub-System

The Access Control system shall control the log-on status of all operator workstations, which shall be achieved via a Biometric fingerprint reader installed at each operator workstation.

2.2.4 Intercom & Public Address Sub-System

The Digital Intercom and Public Address sub-system hardware shall be integrated with the SMS via a high level Interface (HLI). The full functionality of the system shall be integrated with the SMS to provide enhanced features including but not limited to:

- Station Call-In
- Station Fault Analysis
- Call In Divert
- Call Answer
- Call Cancel
- Call-In Queuing
- Tamper Alarm monitoring
- Threshold Monitoring (Disturbance detection)
- Individual station Speaker and Microphone sensitivity adjustment
- Page all

The Intercom and Public Address system shall enable the selection of any individual or group of intercom stations by any operator workstation within the facility.

2.2.5 CCTV Sub-System

The CCTV Matrix(s) shall be integrated with the SMS via a high level Interface (HLI) at each workstation or server. The full functionality of the system shall be integrated with the SMS to provide enhanced features including but not limited to:

- Camera to Monitor commands
- Sequence to Monitor commands
- Sequence programming commands
- Pan, Tilt, Zoom commands
- PTZ preset select commands
- PTZ preset save commands
- Monitor Blanking commands
- Black screen technology (See section 2.14.5)

The CCTV system shall consist of a modular and distributed matrix system, which shall provide the switching capability of video signals from cameras installed throughout the facility.

The High Level Interface (HLI) shall provide the logical connections with other security sub-systems such as the locking, Intercom and Digital Video recording systems.

Integration of the CCTV system with the SMS via potential free contacts shall not be accepted.

2.2.6 Digital Video Recording Sub-System

The Digital Video Recording system shall be integrated with the SMS system by means of a serial or IP protocol (High Level Interface) in order to enable logical recording of operator events, and shall have a sufficient number of channels to record all activity in the facility as indicated on the layout plans.

The full functionality of the DVR system shall be integrated with the SMS to provide enhanced features including but not limited to:

- Individual Channel Record and Stop commands based on other sub-system conditions such as Intercom, CCTV and Locking.
- Channel Playback select
- Play
- Stop
- Pause
- Back
- Left Jump
- Right Jump
- Left Shift
- Right Shift
- Plus
- Minus
- Log
- Search

- Analogue recording of captured material
- Zoom function on playback
- Minimum of 3 frames per second for every camera
- JPEG capture of pictures
- Embedded storage of recorded material

The search and playback facility shall be an integrated function of the SMS, and shall not require any third party software platform to perform these functions.

Upon operator request the SMS system shall be capable of instructing the DVR system to playback video images to allow proper investigation of the visual event. The SMS management workstation shall be capable of recalling associated historical Video and Audio data based upon events logged to the event recording database on the severs.

System supervisors with the correct user level shall be able to query the event database as described in Section 2.10.4, and by double-clicking on a specific event shall be presented with the associated Video and Audio footage automatically.

Each recorder shall be capable of recording a minimum of 16 Channels of video at 3 frames/s per channel concurrently.

Each DVR shall be capable of performing cyclical recording onto internal hard disk, and be able to store data internally for up to 10 days (at zero compression ratio) without the need for archiving.

The recorded images shall utilise JPEG or MJEG at a zero compression rate for all recorded material.

The reviewing of video images by the operator shall not interrupt the recording modes. Video shall be viewed at various playback rates from the SMS workstation, which can be increase or decreased by the operator.

The search and playback of video sequences shall be an integrated function of the SMS, and shall not require any third party software to perform this function.

2.2.7 Perimeter Security Fence Sub-System

The Perimeter Fence system shall be fully integrated with the Security Management System by means of a TCP/IP socket interface (High Level Interface), in order to carry out logical connections with other security sub-systems such as the CCTV and Digital Video recording systems.

The operator shall be able to select a graphical layout of the entire facility, which shall also be automatically activated upon an alarm event from the perimeter fence system.

The Security management system shall be capable of, but not limited to the following monitoring and control functions relating to Perimeter Detection:

- Individual Taut Wire alarm status
- Individual Taut Wire maintenance status
- Individual Taut Wire healthy status
- Digital expansion Input status
- Field Node communication status
- Field cabinet tamper status
- Field Node logic monitoring status (Light on status)
- Field Node battery charger voltage
- Individual Taut Wire sensor deflection
- Sensor alarm Acknowledge
- Loop alarm Acknowledge
- Sensor alarm Reset
- Loop alarm Reset
- Inhibit Taut Wire Sensor alarm
- Inhibit Taut Wire Loop alarm
- Inhibit Digital Expansion Input alarm
- Inhibit Field cabinet Tamper alarm
- Individual Sensor sensitivity setting
- Loop sensitivity setting

2.2.8 Centralised UPS System

The full dual redundant centralized UPS 's shall be fully integrated with the Security Management System by means of a High Level Interface (HLI), to provide operators and technicians with detailed status and alarm conditions regarding the UPS systems.

Due to the Centralised configuration, the following detailed diagnostic information is required, and shall be presented to the operator via a drop down menu option within the SMS:

Battery Data:

- Battery Status
- Time Remaining in minutes
- Remaining Charge in %
- Battery Voltage
- Battery Temperature in Deg C

AC Input Data:

- Voltage per phase
- Power per phase

AC Output Data:

- Voltage per phase
- Power per phase
- Load % per phase

UPS Alarm Conditions:

- Battery Failure
- On Battery Power
- Low Battery
- Depleted Battery
- Over Temperature
- Output Overload
- Bypass Active
- Charger Failure
- Fan Failure
- Fuse Failure
- Communications Failure
- Shutdown Pending
- Shutdown Imminent

All alarm conditions shall be presented to the operator within the Fault queue as described in Section 2.14.2.11 of the specification.

2.2.9 Fire Detection System

The Main Fire Detection Panel shall be a full addressable smoke and heat detection system and shall be fully integrated with the SMS via a high level Interface (HLI) at the redundant SMS server workstations. The full functionality of the system shall be integrated with the SMS to provide enhanced features including but not limited to:

- Detector Healthy status
- Detector Alarm status
- Detector Fault/Maintenance status
- Detector Inhibit status

- Detector Inhibit Command
- Detector Un-inhibit Command

- Alarm Silence Command
- Alarm Reset Command
- Synchronise Clock Command
- Communication Failure Alarm

The position and status of each Detector, Sounder and Break-glass unit within the facility shall be indicated on the appropriate area map of the SMS.

A smoke Detection layer On/Off option shall be available through the menu structure, which shall toggle the display of the smoke detector icons on and off as required. This function is required to minimise congestion of icons on the area maps, due to the location of other sub-system equipment icons.

Upon an alarm condition regardless of Fire Layer status, the affected detector icon shall be displayed. and the alarm condition shall be presented to the operator within the Fault queue as described in Section 2.14.2.11 of the specification.

2.2.10 Nurse Call System

The Nurse Call system shall be a stand alone sub system with a reporting station (mimic control panel) situated in the hospital nurses station and shall provide the following information and functions:

- Nurse Call station active status
- Nurse Call station in-active status

A dedicated Nurse Call mimic panel shall be provided at the Nurse duty desk within the hospital section, and shall contain only the necessary nurse call icons to indicate the above mentioned functions. This shall be a hard-wired mimics panel for the annunciation of a nurse call-in.

2.3 System Configuration:

The Interactive Security Management System (SMS) shall consist of multiple Operator Workstations, situated in the local, movement, central control rooms and any other location so required by DCS, and shall be networked by means of a Fibre Optic Large Area Network (LAN). This network shall be a dedicated security network for use by the SMS only.

The network interface between control stations shall be by means of a Fibre Optic medium, and shall form a ring configuration from the Central Control and back to the central control room via each local control room or position to ensure easy fault finding in the case of a cable fault.

The Operator workstations shall serve as the graphic based operator interfaces between the corrections officers and the facility's locking controls system and other security subsystems as specified herein.

All operator functions shall be controlled by means of an optic mouse, and shall require the minimum movement and actions in order to complete a required task.

The operator VDU shall be recessed into the control console to ensure that operator visibility is maintained.

The audio sub-system components within each control room shall form an integral part of the control console and VDU, and shall not require the use of any external control equipment such as PTT buttons, Operator Keyboards etc.

All security sub-system control functions shall be interlocked to ensure that functional procedures are adhered to.

The following Interlock functions shall be programmed as an integrated function of the Security Management System:

- The selection of Cameras prior to Door opening
- The selection of Intercom communications prior to Door opening
- Automatic Camera select upon door opening
- Sally port door interlocking
- Monitored door interlocking
- Automatic Camera selection upon Intercom activation
- Automatic Video recording on camera image activity
- Automatic event recording on individual operator activity
- Automatic Control console "LOG-OFF" on control room door
- Interlock capability according to operator log-in level

Alarm processing, alarm logging, alarm response data entry, graphical and text based user interface, data entry, and other system management functions shall be performed by the SMS operator workstations connected to the SMS network. The operator workstations shall be located in the Central Control Room and other nominated locations.

The SMS server shall be located within the Central equipment room equipment cabinet, and shall implement 2x dual redundant servers each providing Hardware based Raid 5 redundancy configuration. (Raid 5 hardware controller card with the hard drives)

All Distributed control modules as described in Section 5 other than door control modules mounted in door headers are to be suitably mounted within secure and vandal proof enclosures to the approval of the Engineer and located in the respective buildings' security and communications equipment cupboard, or other secure area as approved by the Engineer and indicated on the security drawings.

The SMS shall utilise a single global database and shall be fully distributed to Distributed control modules connected to the SMS security network. All system operators shall have restricted password controlled (limited) access to this information/data from the operator workstations. The level of access shall be controlled by use of the Biometric logon facility available at each operator workstation.

The system shall be designed such that failure of any control module or operator workstation shall not functionally affect the operation of any other module, network, building or Operator workstation connected to the SMS network.

Similarly, should any area lose power or suffer a loss in communications due to a break in the communications cabling, all Distributed control modules installed in that area shall continue to operate with no loss of functionality.

The SMS shall be fully programmable to allow:

- Response instructions to be displayed for all alarms types.
- Use dynamic (real time) graphics to display device status.

- Initiate operator commands via system tailored icons.
- Display building layouts in a graphical representation.
- Easy to follow menus with single key select options with pop-up screens located on the VDU, to assist in the daily routine operations of each facility.
- Allocate alarm priorities.
- Set Alarm response properties.
- Set lock/unlock and access/secure operating schedules.
- Generate User defined reports.

The contractor shall allow adequate time to liaise with the Engineer, DPW and DCS representatives in order to detail any user specific requirements necessary for the operation of each building, sub system, alarm type, and alarm response configuration within the system. This shall include the configuration of maps. report formats, access schedules, alarm response instructions and the like, to suit each operator workstation. The liaison shall include for every sub system included in this installation.

The system shall be modular in design to allow for future system expansion (i.e. in excess 200 % of specified capacity) with minimum cost and disruption to the existing operational system.

Tenderers are to specify the systems total capacity for future expansions.
Such upgrades shall not render a redundancy in field hardware. the Central Processing Units or any major component of software, firmware or operating systems.
The tenderer shall note that all programmed software done in order to integrate all the sub systems and all other software, being written or purchased shall be the property of the Department of Correctional Services after hand over.

All un-compiled software shall form part of the final documentation and shall be handed over in three fold to the Department of Correctional Services after commissioning of this installation.

2.4 System Performance:

2.4.1 Central & Movement Operator Workstations

The interaction delay between activating a control icon on any given operator workstation and the controlled point activation, (i.e., the lock), shall be no greater than one second (1 sec).

The interaction delay between controlled point activation and any given operator workstation response either by activation of an audible alarm and/or the associate icon changing state (colour) shall be no greater than one second (1 sec).

The interaction delay between recalling any floor plan at any given operator workstation shall be no greater than one quarter of one second (0.25) second.

2.4.2 Local Operator Workstations

The interaction delay between activating a control icon on any given operator workstation and the controlled point activation, (i.e., the lock), shall be no greater than one half of one second (0.5 sec).

A dual redundant server configuration shall be provided, and shall consist of the following:

a. 2x 4U Industrial mount 19" PC workstation with a minimum of an Intel Pentium IV 3.2 GHz processor with 1Gb Ram with internal parity checking. Each server shall be provided with 3x 80G Byte IDE hard drives controlled by a Mylex Raid controller.

b. One 1.44M Byte three and one half inch (3.5") disc drive and one 52 x CD Rom shall be fitted to each workstation.

c. A 15" video system plasma Type and video driver card that shall be SVGA compatible and shall have a resolution of 1152 x 864 with 32-bit colour.

2.5.4 LAN Specification

Media

a. Distance <100m: Ethernet Category 5 – UTP
b. Distance >100m: Fibre Optics – 100Base-FX, 850nm Multimode
c. Conversion Mod: TX/FX Single Mode/Plus-SC

Central Switch Hardware

The central control room switch stack shall be capable of supporting 10 Mbps and 10/100 Mbps traffic. The switch shall be capable of cascading for expansion purposes.

The unit shall provide support for a range of backbone options including Fast Ethernet over fiber, Gigabit Ethernet, Layer 3 switching and ATM via a high speed module.

2.6 Minimum Software Requirements:

2.6.1 The Security Management System (SMS) software shall be design specifically for this type of environment Management Applications, shall have a proven track record in the industry, and shall be an Off-the-shelf package available through a distributor network. The off-the–shelf software shall be programmed and tailored to the specified functions and features described herein and as indicated on the accompanying drawings.

2.6.2 The software shall convey an accurate floor plan of all areas that require display on the VDU. The software shall utilize the maximum resolution and colours of the SVGA monitor to enhance and simplify the displayed control and status information. Fast orientation and ergonomics will be the goal of the graphic displays.

2.6.3 The software shall provide integrated Biometric (Fingerprint) log-on security functionality with security level protection for all Mouse driven operator workstations. The Biometric (Finger print) logon facility shall be capable of providing a one to many search algorithm to confirm operator credentials, without the need for entering user details or the swiping of a personal

identification card. It must be noted that although this software may be an additional software package the same protocol of the two software packages is not negotiable

There shall be a minimum of sixteen (99) levels of access, and shall be expandable.

The software shall provide a user database within the Management workstation. The database shall support a minimum of two thousand (6000) users.

2.6.4 The software shall provide on-line utilities accessed through the Management workstation menu structure. These utilities shall provided the system supervisor with the ability to edit and update required data bases, system operating variable, report configuration and generation, alarm tags and point descriptions, etc. These utilities shall be protected by security levels and Biometric Access.

2.6.5 All software licenses shall be transferred to the Owner at completion of the project. This shall include but not be limited to all original installation disks, software manuals, equipment manuals, etc. All project specific applications software shall be transferred at the end of the contract period.

2.7 Spares Holding:

The tenderer should allow for the following minimum spares holding:

a. One (1) SVGA 21" monitor as specified under hardware section of the specification. Packed in its original packaging. This shall include, power cords and interconnecting cables.

b. One (1) fully equipped PC 19" Industrial mount workstation as specified in the hardware section of this specification, and which shall be capable of replacing any workstation in the facility with the exception of the servers. This shall include; power cords and all required interconnecting cables.

This also includes all the software packages required to operate the facility. When one of the workstations fails, an exchange of computers must ensure that the system is immediately on line and active.

c. The equipment supplied under this section shall be fully supported and maintained locally by local contractors or support agents.

2.8 OPERATOR STATIONS (VISUAL DISPLAY UNITS)

2.8.1 General

The SMS system offered shall be capable of providing a multiple operator workstation environment, which may be configured for full or selective operational & functional monitoring and control of selected areas and functions.

Operator workstations shall be located as indicated in the tender drawings issued.

The operator workstations shall operate in both text and graphics based display. Any operator workstation enabled via the Biometric logon system shall be capable of controlling any area within the facility providing the respective operator is authorized to do so.

The operator workstation shall also be capable of implementing changes to the system configuration and parameters, provided the operator has the necessary administration rights.

Entries, deletions or modifications to the configuration shall be possible via the operator workstation VDU/Keyboard without loss of, or degradation to, any other system functionality.

The following workstation functions shall be possible:

- Displaying point status information.
- Manually initiating control commands.
- Displaying system events and alarms.
- Displaying staff, visitor and inmate photographs for positive identification.
- Enrolling and verifying staff, visitor and inmate fingerprints. (Visitation Management module)
- All prison management modules
- Guard patrolling records
- Assigning operator access levels.
- Altering time schedules and creating new time schedules.
- Assigning or modifying time schedules for automatic operation of monitored doors/gates and redirection of duress alarms and indicators appropriate to the user's building/department/etc.
- Overriding time controlled functions, momentarily, to allow operator control of doors/gates/and the like.
- Altering existing, or assigning new descriptions or actions.
- Displaying status of all alarm sectors within the user's areas.
- Remotely operate doors/gates within their restricted areas.
- Displaying all appropriate building activities.
- Performing on-line backup copies of complete system without any degradation in the overall system performance.
- Displaying building alarms including fire alarms, gas/vapour sensor alarms, duress push buttons, detection fence alarms etc.
- Enable the viewing of Sub-system status icons to be enabled or disabled through a built in menu structure of all sub systems and other equipment so required as part of this integrated system or DCS.

All of the above shall be restricted by user level based on the finger print access to the operator workstation.

In some cases access to any portion of the prison management system will be permitted with pass word access only. These operator work stations will be as requested and required by DCS

2.8.2 Monitors

All operator workstations shall be of robust construction, ergonomically designed to minimise operator fatigue and conform to the following minimum requirements:

Screen:	An effective viewing screen size of 21".
Character set:	ASCII with near letter quality fonts with crisp, fully formed characters.
Contrast:	Sufficient brightness and contrast to be easily readable by an operator with average vision, but not to cause burn-in of fixed display on screen. Screen saver functionality shall be provided to prevent burn-in.
Mounting:	Semi-sunken mounting at 45° in an industrial frame complete with cooling fan and intercom console.
Power:	230 VAC 50 Hz.
Other requirements	On screen microphone and speaker set

2.8.3 Keyboards

Keyboards shall be supplied with all workstations, however shall only be used for commissioning and maintenance purposes. All operator functions shall be performed by means of an optical mouse, with system screens being designed so as to require the minimum operator action. Functions such as audio system Push to talk, volume up and down control etc shall be possible by means of function keys on the SMS workstation.

2.8.4 Printer

A high quality Inkjet printer shall be supplied, installed and commissioned as part of this contract, for use with the management workstation in order to generate user defined management reports.

The following shall be included:

Paper feed:	Page feed capable of accepting paper at least up to 242 mm (A4) wide. Single page paper shall be used to allow users to print out historical events and system activity.
Character set:	ASCII & Graphics.
Print speed:	Minimum of 150 characters per second at 10 cpi.
Print type:	Ink jet type using continuous A4 fan fold paper handling.
Ink Storage:	Ink cartridge, including 2 spare cartridges/printer.
Print direction:	Bi-directional in text mode.
Pitch:	User selectable (i.e. 10, 12 or 15).
Print colour:	Black on white paper.

The printer shall incorporate a visible control panel with LED indication for power on, paper out and ready.

The printer shall be installed and configured into the Management workstation to be installed within the Central Control Room..

The printer shall be supplied with both power and data cables of suitable length to suit the location. In addition, the printer shall be set up complete with one full box of paper and two spare ink cartridges each.

2.8.5 Mouse

All mouse devices shall be optical of robust construction and suitably secured by an interconnecting cable.

2.8.6 Networking

Each SMS workstation installed on the security LAN shall be capable of monitoring and reporting the current status of all workstations on the network.

Should communications between workstations or control equipment be disrupted, an alarm shall be generated at the Central Control Room Operator workstations to alert the operators of the failure within the communications network.

Alarms generated shall be displayed at the operator stations, while updating the system database with the Time, Date and relevant workstation detail.

Failure of any operator workstation shall not prevent communication between any other workstation or Distributed control modules and their associated devices.

2.9 SOFTWARE

2.9.1 General

Software packages shall be fully proven prior to being supplied, installed, tested and commissioned.

The operator interface software shall incorporate English language descriptions and messages using both text based menus and graphical/icon displays. All configuration (e.g. entering of alarm response properties, adjusting time schedules, user data, etc) shall be performed on-line without effecting the operation of the overall system.

Selective access to different operator functions shall be configured based on an operator's user level. User levels shall be determined from the Biometric verification each time an operator logs on to a workstation.

After any predefined period, if no operator activity has occurred at the operator workstations, that station shall automatically request Biometric verification failing which the station shall log off.

The time period before automatic logging off of workstations shall be user configurable, and shall be determined during commissioning of the system, in liaison with the Engineer and the representative of the Department of Public Works and DCS.

2.9.2 Operating System

The operating system shall be a recognised and widely accepted standard operating system that shall suit the requirements of the system to be installed. The operating system shall be a real time multi-user/multi-tasking system such as NT, W2000, Unix or QNX.

The operating system shall have proven and demonstrated reliable and stable operation in the security environment.

Facilities shall be provided by the Department of Correctional Services to store all programs on site and include all equipment necessary to backup and reload all system programs, including the operating system with all user specific system parameters.

2.9.3 System Access

Operators shall be required to "log on" to operator workstations using the finger print reader provided at each operator station before being able to access the system or user information, reset alarms or access any other system functions.

Access to all workstations shall be limited through allocation of access levels.

A minimum of 2000 users and 99 User levels shall be available. Only users allocated with a user level of 99 shall be capable of the assignment and changing of passwords to all levels.

Each operator shall be allowed to access different operator commands and functions, and view certain individually assigned events, menus and functions based on their assigned user level.

2.9.4 Scheduling

The SMS system shall have the ability to configure schedules which do not restrict the user to pre-determined times, dates or access levels. Access to and editing of these schedules shall be possible via the Management workstation. This scheduling as detailed above must be possible but only as an option in those cases where the user department require this facility.

The following schedules shall be configurable:

1. Automated Public Address Announcements.
2. Operator station Access times.
3. Designated Alarm priority changes.
4. Automated door locking/unlocking.
5. Cell and Passage lighting control.

2.10 ARCHIVING HISTORICAL DATA

2.10.1 General

Archiving of historical data shall take place automatically according to a configurable time frame, which shall be set via a Management workstation. The archived files shall be stored on the Raid 5 servers situated in the Central Control Room equipment rack. The system shall be capable of storing archived history files for a minimum period of 12 months.

The management workstation shall provide the option of backing up selected archived history files onto the 2 Gbyte DAT drive installed within the Management workstation.

Archived history files shall be read directly from the current or archived databases, without terminating or suspending the logging of current events.

2.10.2 Overwriting

The SMS software shall display an alarm to system operators warning of the imminent loss of archived data once the available disk space becomes full. The alarm shall occur with sufficient margin to allow the systems operator to execute a manual history file dump to the removable storage medium, if required (normally 80%). The percentage alarm set point shall be variable by the highest user level.

Should the disk space be 100% full the system will automatically start to dump the oldest archived data and rewrite the newest data in it's place.

2.10.3 System Logging

The server workstations shall be capable of logging the following data on request:

Data should only be logged if requested to. All events not required and not requested by the user department should not be logged at all.

Event related data:

Item	Database Fields
1	Time and Date Stamp
2	Equipment Type
3	Control Area
4	Equipment Designation
5	Equipment Location
6	Alarm/Event Type
7	Alarm/Event Status
8	Responsible Operator
9	Operator Workstation Name
10	Control Area
11	Alarm/Event Priority

Logged Events/Alarms:

Item	Intercom Events/Alarms
1.1	Intercom Station Call in

1.2	Intercom Station Activated
1.3	Intercom Station I/O Failure
1.4	Intercom Station Tamper Alarm
1.5	Intercom Station Threshold Alarm
1.6	Intercom Station Fault
1.7	Intercom Call-in Transferred
1.8	Intercom Call-in Unanswered
1.9	Intercom Station Isolated
1.10	Intercom Station Isolated warning
1.11	Intercom System Hardware Failure
1.12	Intercom System Communication Failure
1.13	Intercom Alarm/Failure Acknowledged
1.14	Intercom System Call Central Command
1.15	Intercom System Call Movement Command
Item	**CCTV Events/Alarms**
2.1	CCTV Camera Activated
2.2	CCTV PTZ Preset Edited
2.3	CCTV Sequence Selected
2.4	CCTV Sequence Edited
2.5	CCTV System Hardware Failure
2.6	CCTV System Communication Failure
2.7	CCTV Alarm/Failure Acknowledged

Item	DVR Events/Alarms
3.1	DVR Channel Record Command
3.2	DVR Channel Halt Record Command
3.3	DVR System Hardware Failure
3.4	DVR System Communication Failure
3.5	DVR Alarm/Failure Acknowledged

Item	Door Events/Alarms
4.1	Door Open Command
4.2	Door Closed Command
4.3	Door Fault on Closing
4.4	Door Fault on Opening
4.5	Door Forced Open Manually
4.6	Door Open outside of limits
4.7	Door Open for extended period
4.8	Door Control module Communication Failure
4.9	Door DPS Opened
4.10	Door DPS Closed
4.11	Door Interlock Override Command
4.12	Door Group Activated
4.13	Door Group Edited
4.14	Door Emergency Release Activated

4.15	Door Control System Hardware Failure
2.16	Door Control System Communication Failure
2.17	Door Alarm/Failure Acknowledged

Item	Gate Events/Alarms
5.1	Gate Open Command
5.2	Gate Stop Command
5.3	Gate Close Command
5.4	Gate Fault on Closing
5.5	Gate Fault on Opening
5.6	Gate Forced Open Manually
5.7	Gate Open outside of limits
5.8	Gate Open for extended period
5.9	Gate Control module Communication Failure
5.10	Gate Alarm/Failure Acknowledged

Item	Lighting Events/Alarms
6.1	Lighting Zone Activated
6.2	Lighting Zone De-activated
6.3	Lighting Zone Scheduled Reset

Item	Public Address Events/Alarms
7.1	Public Address Zone Manual Activation
7.2	Public Address Zone Scheduled Activation

Item	Intrusion Events/Alarms
8.1	Intrusion Zone Activated
8.2	Intrusion Zone Alarm Acknowledged

Item	Panic Button Events/Alarms
9.1	Panic Button Activated
9.2	Panic Button Activation Acknowledged

Item	UPS Events/Alarms
10.1	UPS Mains Failure Alarm
10.2	UPS Load on Bypass
10.3	UPS Battery Low
10.4	UPS Battery Failure
10.5	UPS Load not protected
10.6	UPS Surge Arrestor Failure
10.7	UPS Communication Failure
10.8	UPS Alarm/Failure Acknowledged

Item	Air System Events/Alarms
11.1	AIR System Compressor Off
11.2	AIR System Maintenance Request
11.3	Air System Zone Pressure Test Failure
11.4	Air System Zone Low Pressure Alarm
11.5	Air System Dryer Off
11.6	Air System Dryer Failure
11.7	Air System Compressor On Load
11.8	Air System UPS Alarm/Failure Acknowledged

Item	Emergency Air System Events/Alarms
12.1	Emergency Air System Zone Low Pressure Alarm
12.2	Emergency Air System Zone Low Pressure Alarm Acknowledged

Item	SMS Events/Alarms
13.1	New Operator Enrollment Successful
13.2	New Operator Enrollment Failed
13.3	Operator Details Edited
13.4	Operator Details Deleted
13.5	Workstation Logon Successful
13.6	Workstation Logon Failed
13.7	Workstation Unauthorised Access Attempted
13.8	Workstation Manual Logoff
13.9	Workstation Automatic Logoff
13.10	Workstation Inhibited
13.11	Workstation Re-instated
13.14	Workstation Online
13.15	Workstation Offline
13.16	Workstation Communication Failure
13.17	Workstation Alarm/Failure Acknowledge

2.10.4 System Reporting

The SMS shall be capable of performing SQL queries to the current or archived databases on the server workstations, format the data into customised reports which shall allow for the following:

- Display of all relevant information on any individual alarm point including alarm point identification by device number and alarm point status.
- Display all alarm points in the system in alarm or normal condition, as a single log.
- Display all emergency procedures applicable to any alarm type with corresponding alarm response actions and locations, per alarm device.

Reporting details shall include:

- Alarm point status
- Alarm count per device.
- Alarm activity over a time period, selected by time and date.
- Display of selected alarm transactions based on alarm type and a calendar / time period.
- Display system operators login/out history
- Display all operator commands entered by any or all operators based on time/calendar interval.

2.11 SYSTEM STATUS

The SMS shall provide a pop up menu option which, when selected, allows the system to display or print a list of current alarms, faults and conditions including the current fault conditions relating to SMS workstations, Distributes control modules, sub-system equipment hardware and associated devices.

In graphical display mode the system shall display maps of each building complete with all internal levels and shall indicate all systems equipment status (i.e. locked/unlocked; open/closed; secure/access; isolated/active; alarm; tamper etc).

2.12 CURRENT ALARM WINDOW

The system shall provide an efficient and reliable alarm handling procedure and shall include both audio and visual annunciation, logging to the database and recording of the history file the device description, point description, location, time and date the alarm occurred.

The system software shall have the ability to route only selected alarms to specific operator workstations, allowing different locations or applications to be segregated on a building or system basis.

All systems activity shall be presented to ensure proper actions have been taken and that no alarm is left unattended for any lengthy period. Alarms, which have been acknowledged, and not cleared/reset shall be clearly distinguishable.

Upon occurrence of an alarm(s) a user configurable audible tone shall sound at the operator workstation(s) and display an indication of the incoming alarm together with its priority.

If there are additional alarms to acknowledge the operator's station shall continue to sound the appropriate alarm tone, display the number of alarms waiting and identify the highest priority alarm.

The first alarm displayed shall be the highest priority alarm followed by the next highest priority alarm, etc.
All alarms are required to be separately acknowledged by the operator, by means of the mouse provided to acknowledge and reset each alarm separately.

Each time new alarms are created the system shall restack the alarms so the operator sees them in order of priority.

The system shall also have an alarm/event status display available to the operator at all times on the operator's station.

The display shall be a real-time dynamic display of alarms in the active state, or system component failures.

An audit trail shall be used to log the actions taken by all system operators in response to an alarm. The audit trail shall note:
- When the alarm was activated.
- When the alarm was acknowledged.
- Who acknowledged the alarm.
- When the alarm was restored.

The system shall record every user command, acknowledgment and log every operator login.

These transactions shall be routed to the history database.

Any alarm point which has been suppressed/inhibited by the operator shall on expiry of the time zone, or when unsuppressed by the operator, generate an alarm if the alarm point is in the "active" state. The report to the operator terminal shall be the same as described above.

Each alarm point shall have the facility for a description of the alarm occurring. A comprehensive outline for operator instructions, detailing all response actions shall be provided for all alarms.

2.13 GRAPHICAL DISPLAY

The SMS shall support a minimum of 200 colour maps for the purpose of displaying the location and real time status of any SMS input or output.

Graphical maps to be included within the initial configuration are to show in detail the following areas:

- Site plan showing all buildings and locations of all alarm points and operator workstations.
- A plan of each accommodation unit and building.
- All buildings devices/status/alarms and the like.
- All building tamper, communications, power and the like devices/status/alarms and the like.
- The perimeter fence and devices.
- Other maps as required to clearly display all alarm input within buildings, or an external equipment cubicle locations.

Each site map shall be provided with a site plan key, which shall be common to all maps and situated in the same position. The key shall provide a means for the operator to quickly navigate through the entire facility without the need to use standard navigation buttons or the main site map.

All device location and statuses shall be detailed on each map and coloured accordingly for ease of recognition of both the device type and real time status.

Text messaging identifying the device type, designation and alarm status shall be available in a "mouse over" or "icon" pop-up screen structure to minimise text on individual maps.

All text descriptors shall be approved by the Engineer prior to final acceptance. Liaise all requirements through the Engineer when programming these maps and other alarm/response descriptions.

Function key descriptions shall also be displayed as mouse over or pop-up screen hints.

Graphical map displays shall be of high resolution to enable accurate images to be represented.

The system shall allow maps to be linked by means of navigation buttons to allow operators to "zoom" in or out to display either additional detail or an overall map.

Point status and locations shall be clearly displayed using colour-coded icons. All icons shall display real time status of each point with continuous updates being provided to any dynamic screen display.

Updates shall occur every 1 second or less.

2.14 SECURITY MANAGEMENT FUNCTIONS

2.14.1 Configuration

The SMS shall consist of a multiple screen representation of the entire facility, which shall contain all of the necessary icons to control all security sub system equipment and devices situated throughout the prison. All icons shall be activated with the use of a mouse. All icons and status indicators shall be a minimum of 5mm in diameter. All symbols shall provide status by colour and/or associated text. All symbols shall be to the approval of both the Engineer as well as the representatives of PDW and DCS.

2.14.2 Global Function Operations:

Global function icons shall be located at the bottom of each graphic screen in the form of a footer window, which shall be common to all area maps. These icons, if active, shall control the global functions for the entire facility.

2.14.2.1 System Control

Activating this icon shall cause the system to switch to the system control screen. The System Control screen shall provide a complete system diagnostic window for all sub-system components and communication systems within the entire facility.

The diagnostic information shall include but not be limited to the following:

1. Compressor Status:

    a. Low Oil Pressure
    b. Compressor Tripped
    c. Air Dryer Failure

2. Air Reticulation System:

    a. Air Reticulation integrity per zone
    b. Operating Air pressure in Kpa
    c. Normal Air pressure status per zone
    d. Emergency Air pressure status per zone

3. UPS System (Per Zone):

    a. Load on Bypass
    b. Load not protected
    c. Mains Failure
    d. Battery Fault
    e. Battery Low
    f. Surge Arrestor Failure

4. Control Hardware Status (Per Zone):

a. TCP/IP communication Failure
b. Control Network communication Failure
c. Device Network communication Failure
d. I/O Device Failure
e. Communication Redundancy Integrity
f. CCTV Matrix communication Alarm

5. Perimeter Protection System (Per Zone):

a. Taut Wire Alarm
b. Tamper alarm
c. Sensor post alarm
d. AC power failure
e. Fire optic sense alarm
f. Micro wave system TX/RX failure alarm

6. Door position switch violation alarm per DPS
7. Controlled door security violation alarm per door
8. Fire door security violation alarm per door
9. Panic Button activated alarm per Panic Button
10. Intercom Call In Failure per Intercom
11. Operator Log On Violation

Where applicable all alarm conditions shall allow for operator acknowledgement and automatic selection of the alarmed zone layout screen.

2.14.2.2 Site Plan

The site plan shall consist of an interactive miniature layout of the entire facility, and shall be situated on the bottom Right hand side of each operator screen.

The site plan shall provide the operator with a quick method to access an individual area to monitor and / or control.

The site plan shall also indicate critical operational information to the operator, which shall include but not be limited to the following:

1. Fire Doors Unsecured
2. Sally port Doors Unsecured
3. Local Control Room Logon Status
4. Local Control Room Call In
5. Local Control Room Communication Alarm

2.14.2.3 Volume Up

Activating and maintaining this icon shall result in an increase in the operator console speaker volume. The icon shall change status to RED to indicate activation of this function.

2.14.2.4 Volume Down

Activating and maintaining this icon shall result in a decrease in the operator console speaker volume. The icon shall change status to RED to indicate activation of this function.

2.14.2.5 Select

Activating this icon shall result in either the first audio call-in or the currently selected audio call-in in the Audio Call-in Queue to be answered. Upon answering the call, the call shall be removed from the Audio Call In queue on all workstations.

2.14.2.6 Reset

Activating this icon shall result in either the first audio call in or the currently selected audio call-in in the Audio Call-in Queue to be reset. Upon resetting the call, the call shall be removed from the Audio Call In queue on all workstations.

2.14.2.7 Push To Talk

Activating and maintaining this icon shall results in the PTT function being activated within the audio control hardware. Releasing the icon resets the PTT function

2.14.2.8 All Page

Activating the ALL PAGE icon on the footer window shall activate all Public Address station within the immediate area of control, and in the case of a Central Operator shall activate all stations within the facility. The PTT function shall be enabled and remain enabled until the ALL PAGE icon is selected again in which case the stations are de-activated and the PTT released.

The ALL PAGE icon shall change colour when active to clearly indicate the current status.

2.14.2.9 Call Central/Movement

Each local operator workstation's footer window shall contain a "Call Central" and a "Call Movement" icon. When selected the SMS shall generate a high priority call-in at the Central or Movement Control operator workstations. Central and Movement control room operators shall respond to these call-ins in the same manner as with a normal intercom station call request.

Movement Control workstations shall be equipped with "Call Central" functionality only.

2.14.2.10 Audio Call In Queue

The SMS footer window shall contain an Audio Call-in queue facility into which audio call requests are entered on a first in first out (FIFO) basis.

Upon receipt of an audio call-in from any intercom station in the facility, the call-in detail listing the control area, equipment designation and the specific location of the calling intercom station shall be entered into a FIFO queue.

The call-in priority of each Intercom station within the facility shall be individually configurable within the SMS, and station priority shall take preference over the FIFO queue. Intercom station call requests of higher priority e.g. Control room call-in requests shall be entered into the top of the queue.

The following methods of answering calls-ins shall be possible:

a. Highlighting the desired call-in in the Audio queue and clicking on the "Select" icon in the footer window.
b. Clicking repeatedly on the "Select" icon in the footer window, which shall automatically answer the oldest entry in the Audio queue.
c. Double clicking on any entry in the Audio queue.

Any of the above-mentioned methods of answering a call-in shall reset the currently selected intercom station and enable the selected station as well as simultaneously removing the entry from the Audio queue on all workstations.

When the local operator workstations are logged on, call-ins from the relevant local area shall be directed to the local workstation. In the event that the call is not answered within thirty seconds, the call shall be forwarded to the Central Control room workstations. Call-ins from local areas in which a local operator is not logged in, shall be forwarded immediately to the Central Control room operators.

2.14.2.11 Fault Queue

The SMS footer window shall contain a Fault queue facility into which all security sub-system or control system faults are entered in order of priority.

Upon receipt of any security sub-system or control system fault, the relevant fault detail including the control area, equipment designation and the specific location of the fault shall displayed as a pop-up screen on the Graphical display. Upon acceptance of this fault by the

control room operator by selection of the "alarm accept" icon the fault shall be entered into the Fault queue. By selecting this icon the control room operator accepts full responsibility for acceptance and reporting of the alarm, as this event is logged into the event logging system.

The Fault queue is intended to provide a quick reference to the system operator of current alarms, and is intended to replace functionality of the Current Alarm window described in section 2.12 of the specification.

Faults may be dealt with in the following ways:

a. By right clicking on a specific fault in the queue, the operator shall be presented with an "Acknowledge" option again. Clicking on the Acknowledge option shall enter the acknowledgement into the event recording system again. The fault shall remain in the fault queue until such time that the fault is cleared. Only then will the fault automatically remove itself from the fault queue.

b. By double clicking on a specific fault in the queue, the appropriate area map shall be displayed with the faulty equipment control icon clearly visible. The equipment icon shall display the fault detail in a mouse-over or "hint" fashion. Right clicking on relevant equipment icon shall present the operator with an "Acknowledge" option again. Clicking on the Acknowledge option shall enter the acknowledgement into the event recording system again. The fault shall remain in the fault queue until such time that the fault is cleared. Only then will the fault automatically remove itself from the fault queue.

Local operator workstations shall display alarms and faults related to the immediate area of control only. Central operator workstations shall display all current alarms within the entire facility.

2.14.2.12 Synchronized Clock System

All operator workstations footer windows shall contain a synchronized digital clock, which indicates the Date and Time in 24 Hour mode. The accuracy of the synchronised digital clock system shall be within +- one (1) minute within a thirty (30) day period, and shall be synchronised with the management workstation within the central control room each hour on the hour.

2.14.2.13 Operator Logon Details

The SMS footer window shall contain the detail of the currently logged on operator including full name and authorized user level.

2.14.3 Locking Operations:

2.14.3.1 Door Position status (Monitored Only):

There shall be a status icon for each monitored door to indicate the position of the door. The status icon shall illuminate red when the door is unsecured and shall be green when the door is secure.

Each DPS icon shall provide mouse over or "hint" fashion detail of fault conditions relating to the equipment element as well as indicating the equipment designation.

A right mouse click over any icon shall provide the operator with an option to acknowledge an alarm condition as well as to view the engineering properties of the element provided the necessary user level is active.

2.14.3.2 Unlock Icon (Swing Door):

There shall be a single control icon with visual status indication for each controlled swing door lock. Activating the UNLOCK command shall apply power to the lock and activate the UNLOCK control cycle. The associated status icon shall indicate red when the incorporated lock status switch indicates an unsecured state and green when the lock is secured. Each door icon shall provide mouse over or "hint" fashion detail of fault conditions relating to the door.

A right mouse click over any icon shall provide the operator with an options to acknowledge an alarm condition, to inhibit a door open command, or to view the engineering properties of the element provided the necessary user level is active. Inhibiting a door open command shall change the icon colour to blue.

2.14.3.3 Unlock / Lock Icon (Sliding & Fire Doors):

There shall be a single control icon with visual status indication for each controlled sliding door control mechanism. Activating the UNLOCK/LOCK icon shall either activate the UNLOCK cycle or the LOCK CYCLE of the mechanism in a toggle fashion. The associated status icon shall illuminate red when the door is unsecured and green when the lock is secured. Activation of this icon whilst the associated door is in travel shall cause the door to instantly change its direction of travel. Each door icon shall provide mouse over or "hint" fashion detail of fault conditions relating to the door.

A right mouse click over any icon shall provide the operator with an options to acknowledge an alarm condition, to inhibit a door open command, or to view the engineering properties of the element provided the necessary user level is active. Inhibiting a door open command shall change the icon colour to blue.

2.14.3.4 Open / Close / Stop Icons (Sliding gates):

There shall be three individual control icons with visual status indication for each controlled sliding gate. Activating the OPEN icon

shall activate the OPEN cycle of the controlled device Activating the CLOSE icon shall activate the CLOSE cycle of the controlled device. Activating the STOP icon while the device is in the OPEN cycle or CLOSE cycle shall STOP the device. The associated status icon shall illuminate red when the locking device is unsecured and shall be green when the locking device is secured. Each gate icon shall provide mouse over or "hint" fashion detail of fault conditions relating to the door.

A right mouse click over any icon shall provide the operator with an option to acknowledge an alarm condition or to view the engineering properties of the element provided the necessary user level is active.

2.14.3.5 Emergency release:

An Emergency release icon shall be provided for each housing unit day room area, which shall be used to initiate an automated opening sequence for Cell and Exercise yard doors. The opening sequence shall be configurable within the SMS in order to provide the most efficient opening sequence.
Activating this icon shall cause a pop-up window to appear on top of the graphically displayed area. Located within this window shall be text explaining to the operator that the activation of this function shall result in all controlled doors in the corresponding area to be released under an emergency procedure. Also located within this window there shall be three icons namely "Open", "Close" and "Cancel". Activating the icon with the text "Open" text will activate the emergency open routine. Activating the icon with the text "Close" text will activate result in the same doors to simultaneously close. Activating the icon with the text "Cancel" shall remove the pop-up window and resume normal operation.

Once an emergency release routine has been activated the doors in the controlled area shall open and indicate an emergency condition by flashing the affected door icons in RED. The activation of the emergency close routine shall return the icon status to normal.

2.14.3.6 Interlock Group Status

Activating a door lock icon that is part of an interlocked group of doors of which one or more doors are currently open, shall cause a pop-up window to appear on top of the graphically displayed area to indicate to the operator that an interlocked door is currently open and that the "Interlock Override" function should be activated to open the door.

Right clicking on the door icon shall provide the operator with an interlock lock group option, which when selected shall indicate each door contained in the relevant interlock group.

2.14.3.7 Interlock Override

Activating this icon shall enable the operator to override an interlocked door. The override function shall only remain active for 10 seconds. Activating a door control icon while override is active shall cause the associated door to unlock or open. When the override timeout limit is reached, the system shall return to normal operation.

During the active 10s period the Icon shall Flash RED to indicate activity.

2.14.3.8 Group Assign Icon

Activating this icon shall result in the door status icons of all doors in the corresponding Cell area to turn White. By toggling the door control icon whilst in the "Group Assign" mode shall toggle the door icon colour from White to Grey. A White icon shall indicate that the door is included in the controlled group, whilst a Grey icon indicates that it is not included in the group.

Upon activating the Group Assign icon for a second time the system shall return to a normal state and set the controlled door group into memory. Re-activation of the Group Assign icon shall cause the door control icons to indicate there current group assign status from memory.

2.14.3.9 Group Release:

Activating this icon shall cause a pop-up window to appear on top of the graphically displayed area. Located within this window shall be three icons namely "Open", "Close" and "Cancel". Activating the icon with the text "Open" text will result in the doors included in the Group Assign memory to Open. Activating the icon with the text "Close" text will result in the doors included in the Group Assign memory to Close. Activating the icon with the text "Cancel" shall remove the pop-up window and resume normal operation.

2.14.4 Intercom Operations

2.14.4.1 Audio Control – Staff/Cell Intercom Icon:

The SMS shall provide a control icon with visual status indication for each intercom station within the entire facility.

The icons shall be used to initiate or terminate an audio channel between the relevant control room operator's audio console and the selected intercom station.

Each Intercom station icon shall provide mouse over or "hint" fashion detail of fault conditions relating to the station as well as indicating the equipment designation.

The alarm detail displayed by the "hint" function shall include:

- Intercom station Tamper alarm

- Intercom station Threshold alarm
- Intercom station I/O alarm
- Intercom station Communications alarm

All alarm conditions shall be presented to the operator within the Fault queue as described in Section 2.14.2.11 of the specification.

A right mouse click over any icon shall provide the operator with an option to acknowledge an alarm condition, to inhibit an intercom station, or to view the engineering properties of the element provided the necessary user level is active. Inhibiting an intercom station shall change the icon colour to blue.

a. **Intercom Station Call Up:**

Activating a staff or inmate station icon shall open a talk path between the operator and the associated intercom station. The associated status icon shall illuminate yellow to indicate an active channel.

Activating the staff station icon a second time shall close the talk path and the status icon shall extinguish.

b. **Staff Station Call-In:**

Upon activation of a Staff or Cell station call-in button located on the intercom station faceplate, the associated status icon shall illuminate and flash between yellow and grey with an audible tone. Activating the associated intercom station icon shall open a talk path between the operator and the staff station. The status icon shall illuminate yellow and the audible tone shall silence. Once complete, activating of the staff station icon a second time shall close the talk path and the associated status icon shall extinguish.

c. **Automatic termination of an audio channel:**

Should multiple audio call in's be received by the local operator, the operator shall only be required to select each audio icon once. The second icon selected shall initiate an audio channel to the appropriate intercom station and initiate an automatic de-select command to the previous channel.

d. **Delayed Call-In:**

Upon activation of a Staff or Cell station call-in button on an intercom station which falls under the control of a local control workstation, provided the particular operator is logged in, the call shall at first be routed to the local operator. If the local operator fails to respond to a call in within 60 seconds, the call is automatically routed to central control. This event is to be logged to the event recording system.

d. **Audio Queue:**

An Audio Call-in queue facility shall be provided as an integrated function of the SMS system. Refer to Section 2.14.2.10 for the functional requirement of this facility.

2.14.5 Closed Circuit Television (C.C.T.V.) Operation:

2.14.5.1 C.C.T.V. Fixed Camera Select

The SMS shall provide a single control icon with visual status indication for each CCTV Fixed Camera within the entire facility.

Activating a camera icon shall cause the associated camera to be switched to the relevant operator's spot monitor via the High Level Interface to the CCTV Matrix. By selecting another camera icon the spot monitor image shall change accordingly.

Camera to Monitor commands shall be configured within the SMS to determine the allocation of spot monitors to operator workstations.

Currently selected camera icons shall illuminate RED, whilst un-selected icons shall illuminate GREEN.

Each Camera icon shall provide mouse over or "hint" fashion detail of the camera designation.

A right mouse click over any icon shall provide the operator with an option to view the engineering properties of the element provided the necessary user level is active.

2.14.5.2 C.C.T.V. PTZ Camera Select

The SMS shall provide a single control icon with visual status indication for each CCTV PTZ Camera within the entire facility.

Activating a PTZ camera icon shall cause the associated camera to be switched to the relevant operator's spot monitor via the High Level Interface to the CCTV Matrix. By selecting any other camera icon the spot monitor image shall change accordingly.

Camera to Monitor commands shall be configured within the SMS to determine the allocation of spot monitors to operator workstations.

Currently selected PTZ camera icons shall illuminate RED, whilst un-selected icons shall illuminate PURPLE.

Each PTZ Camera icon shall provide mouse over or "hint" fashion detail of the camera designation.

A right mouse click over any icon shall provide the operator with an option to view the engineering properties of the element provided the necessary user level is active.

2.14.5.3 C.C.T.V. PTZ Control

Once a PTZ camera icon has been selected by the operator, the SMS shall provide a pop-up control window, which shall allow the following PTZ control functions:

- Pan Left
- Pan Right
- Tilt Up
- Tilt Down
- Simultaneous Pan Left, Tilt Up
- Simultaneous Pan Right, Tilt Up
- Simultaneous Pan Left, Tilt Down
- Simultaneous Pan Right. Tilt Down
- Zoom In
- Zoom Out
- Continuous rotate Left
- Continuous rotate Right
- Rotate Stop
- Preset Position Select
- Guard tour initiate

2.14.5.4 C.C.T.V. PTZ Preset Save

The SMS shall provide the operator with a menu option which shall initiate a pop-up control window, which shall allow the following PTZ control functions:

- PTZ Camera Select (1-n)
- PTZ Preset Select (1-99)
- Pan Left
- Pan Right
- Tilt Up
- Tilt Down
- Simultaneous Pan Left, Tilt Up
- Simultaneous Pan Right, Tilt Up
- Simultaneous Pan Left, Tilt Down
- Simultaneous Pan Right, Tilt Down
- Zoom In
- Zoom Out
- PTZ Preset Store Command
- PTZ Preset Load Command

The SMS shall be able to assign a specific PTZ Preset position to a standard fixed camera icon. The operator shall be able to click on a fixed camera icon, which shall load a PTZ preset position onto the appropriate spot monitor.

2.14.5.5 Sequence to Monitor Select

The SMS shall provide a single control icon with visual status indication for each Monitor within the individual control rooms or adjudicated positions.

A control room layout map shall be configured within the SMS, indicating the physical layout of the control desk and the CCTV monitors for the relevant SMS workstation.

The Monitor icon shall illuminate RED if a CCTV sequence has not been assigned to a specific monitor, and GREEN when a logical sequence has been assigned. The sequence number and description shall be displayed within the Monitor icon when a logical sequence has been assigned.

The operator shall be able to select the desired camera sequence by means of a Right mouse key function on the monitor icon.

Camera sequences may be assigned to any Monitor in the facility including the spot monitors if required, however the manual selection of a camera image shall automatically override the sequence allocation.

2.14.5.6 Perimeter Detection - Black Screen Technology

The SMS shall provide integrated Black screen technology, which shall enable the automatic selection of relevant Perimeter PTZ Cameras to allocated Monitors in the case of a Perimeter Detection alarm.

The SMS through its high level interface to the Perimeter Detection, CCTV and DVR sub-system hardware shall make logical selections of preset camera images to the alarm zone. The system shall allow for three simultaneous perimeter alarm conditions with cameras preset to include the full zone in each case and displayed on the three dedicated monitors for the perimeter fence alarms situated in the Central Control room.

Once an alarm has been activated and the camera preset to that zone, the control room operator shall be able to zoom in on the specific fault and escape attempt thus providing valuable recorded material for later use by the authorities.

The three monitors shall be installed adjacent to one another

Under normal conditions all three monitors shall be BLANK (Black), specifically to ensure that the operators attention is drawn to the monitors when an event occurs.

Once a Perimeter alarm is triggered, the relevant zone PTZ camera image shall be switched to the first monitor. Should a second

simultaneous alarm be detected the second monitor will display the preset PTZ image.

The three monitors shall be permanently connect to three dedicated recording channels in the Digital Video Recording system (DVR), which shall be automatically recorded (4 frames/s) the instant an alarm occurs.

The technology is required to ensure that all Perimeter alarm conditions are brought to the attention of the Central Control room operators immediately, and to present them with the necessary information to respond to the event.

The PTZ preset position monitor allows the operator to immediately view the alarm zone, and to follow the offender via the PTZ control functions.

2.14.6 Lighting and small power operations:

2.14.6.1 Cell Light Control Icon:

The SMS shall provide a control icon with visual status indication for each Cell light within the entire facility.

The icons shall be used to toggle the state of the Cell light. The status icon shall illuminate yellow when the light is on and shall be grey when the light off.

Each Cell light icon shall provide mouse over or "hint" fashion detail of light status as indicating the equipment designation.

A right mouse click over any icon shall provide the operator with an option to view the engineering properties of the element provided the necessary user level is active.

There shall be a single control icon with visual status indication within each cell on the graphical layout. The icon shall be used to toggle the cell light between the ON and OFF state. Central control operators shall be able to control any cell or day room lighting in the entire facility.

2.14.6.2 Day Room Bay Light Control Icon:

The SMS shall provide a control icon with visual status indication for the Day room high-bay lights for each housing units

The icons shall be used to toggle the state of the Day room lights. The status icon shall illuminate yellow when the lights are on and shall be gray when the lights are off.

3. DISTRIBUTED CONTROL SYSTEM

3.1 General

All Distributed control modules and associated hardware required to provide the alarm inputs, control outputs, access control, device monitoring and the like described in this document shall be included as part of this Contract.

The modules shall be designed to continually monitor all devices connected and supervise all general inputs (i.e. or alarm points) and cabling to control outputs.

As a minimum requirement, all inputs shall be "end of line resistor" monitored and provide indication of normal, alarm and tamper (open or short) conditions.

All inputs shall be continuously supervised for high or low impedance (using end of line resistors). Upon a change of this impedance an appropriate alarm shall be annunciate to the various devices (including operator's terminal, printer and history file).

All alarms generated in the field shall be received by the Distributed control modules, and shall generate an interrupt to signify to the system that an alarm has occurred, and report its status, which shall be enunciated to any or all devices such as operator stations, printers and the history file.

Various Distributed control modules shall be used dependant on the application, and as detailed below.

Any input throughout the system shall be able to be interlocked with any other input or output through software assignment of conditional logic.

It shall be possible to disable individual or groups of alarm inputs and control any output via any operator station.

During suppressed/inhibited mode, the alarm point wiring shall be monitored to detect any unauthorised tampering (i.e. tamper alarms shall be monitored 24 hours a day, every day).

The Distributed Control System shall consist of autonomous control systems located within each local control area. Each local control system shall be capable of utilising multiple processing units to perform the application specific logic functions, as well as to provide system redundancy.

The failure or loss of any single door or I/O control device shall not hamper the operation of any other control device or processing unit, and shall not degrade the overall system response time as indicated under Section 4.4 – System Performance Guidelines.

Each control systems shall be capable of communicating in a peer-to-peer configuration over a communication network utilizing a non-proprietary, commercially available technology and open protocol.

The communication network shall be configured in a transparent net – sub net topology. All door control modules in a local control zone (i.e. housing pod) shall be connected to one or more local sub networks to provide isolation from network failures, errors and communication traffic, which may occur in other control zones.

The use of discreet multi-core cabling to each door to control door functions shall not be accepted as an alternative to a bus topology.

3.2 System Modules:

a. All system modules shall share the same control language and programming structure, where applicable.

b. All system modules shall have built-in comprehensive self-test and self-diagnostic capabilities.

c. All system modules shall have built in status indication of power supply voltages and module processor healthy indication to show proper operation.

d. All 24 VDC system modules shall have on board voltage regulation for logic power supply.

e. All system modules shall have on board, auto-resetting over – current protection devices for the logic supply and field input circuits.

f. The system modules shall provide all necessary logic functions, timing functions, input points, output points memory, communication capabilities and software for the operating functions and features shown in the contract documents.

g. All system modules shall be general non-location specific in their construction. They shall be made location specific and operationally customized by software configuration of network variables during the installation process.

h. The system shall be stable at all times without the risk of losing any information due to chance (industrial PLC)

3.2.1 Door Modules:

The door module shall be such to cater for the full requirements of sliding and swing doors, and shall be installed in a recessed housing or door header located above the door or lock.

The module shall be provided with two separate 24VDC power supplies in order to supply the CPU and I/O power requirements separately. The two supplies shall be galvanic ally isolated from one another within each module.

The module shall have a minimum of five (5) high current, solid-state contacts for the control of pneumatic components, locking devices and Cell Lights.

The module shall also have a minimum of four (4) optically isolated inputs for the monitoring of door position switches and / or reset call switches.

The module shall also provide for the connection of a minimum of two (2) intercom staff or cell stations with call buttons.

The door module shall incorporate full digital audio capability with the ability to connect a minimum of two staff or cell intercom stations directly, without the need for additional/external audio hardware at each door. **Should the offered module be separate modules, the rate for supply and installation and space provision for this will be the responsibility of the tenderer and at his cost.**

The module shall also be used as an interface to other security and miscellaneous monitored and controlled devices.

The door module with the following minimum requirements, shall allow for the direct termination of all field signals, speakers, call request buttons, light relays etc, as well as the connection of the data, Audio and power services, without the need for external switching relays or communication devices:

Power Supply Requirements

1.	CPU Supply Voltage:	24VDC
2.	I/O Supply Voltage:	24VDC
3.	Supply Protection:	Self Resetable Fuses
4.	Input Protection:	Individual Opto Isolation
5.	Output Protection:	Short circuit proof

Output Requirements

The module shall allow for the direct termination of the following Output points:

2x Sliding / Swing Door Open solenoid valve
2x Sliding Door Close solenoid valve
2x Lock Bar Up solenoid valve
2x Lock Bar Down solenoid valve
2x Cell Light Interface Relay supply

2x Intercom station speakers

Technical Specification (Outputs)

4 x 24VDC 500ma Solid state outputs (Solenoid Valve Supply)
2 x 24VDC 1A solid sate outputs (Cell Light Interface Supply)
2 x 24VDC 50W 2 Pole N/O Contact Relays (Intercom Station)

Input Requirements

The module shall allow for the direct termination of the following Input points:

2x Sliding Door Closed
2x Sliding Door Open
2x Lock Bar Up
2x Lock Bar Down
2x Sliding Door Obstruction Detection

2x Swing Door Lock Secure
2x Door Position Switch Closed
2x Audio Request 1
2x Intercom Station call buttons
2x Intercom station microphones

Technical Specification (Inputs)

6 x 15-24VDC source @ 10mA
2 x 0VDC sink @ 10mA

Termination of services

The module shall allow for the direct termination of the following Buss terminations:

CPU Power Supply (24VDC)
I/O Power Supply (24VDC)
Communication Protocol
Audio Bus

All services shall be terminated with Pluggable connectors with securing screws

3.2.2 Control Modules:

The control panel modules shall be designed to be installed within each local control room cabinet. The module shall provide for the control of 16 Output points and 16 input points. Connection to the control panel will be via front mounting Pluggable screw cage terminations.

a. Communication - refer to section 5.2.3
b. Outputs – 16 points current - 500mA – 24VDC
c. Inputs – 16 points – 24VDC

16 way input modules compatible with the control system shall be used to receive status information of panic buttons, DPS devices etc.

16 way output modules compatible with the control system shall be used to control status indicators cell and dayroom lighting etc.

3.2.3 Communication Network:

The communication network shall provide for communication between system control modules. **The network shall be segmented into sub-nets for each control zone and/ or area. The network shall be configured so as to provide a one-half (0.5) second worst case latency from input point**

activation to programmed output point response for modules located on the same sub-network.

Sub-net-to-Sub-net latency shall be one second or less under the same conditions. Sub-net to sub-net interface shall be provided by means of a bridge to provide electrical isolation between sub-nets.

Data error checking and network data collision detection shall be an integral function of each system module and the system network protocol.

All system modules shall be capable of authentication of data by system protocol interrogation without the need for specific diagnostic equipment.

The communication network shall meet the following **minimum** specifications:

a. Communication data rate: a minimum of 500 kilo bits per second (Kbs)

b. Network Transceiver DC isolation from the network buss with an international standard proven protocol

c. Minimum network length: 500m

d. Cabling: Cat 5 UTP - 0.2mm square shielded twisted pairs

e.Designed to comply with: FCC pare 15 level B and VDE 0871 Level B

f. Electrostatic Discharge: 15kV no errors, no hardware failures to 20 kV

3.2.4 Intercommunication audio Bus:

The intercommunication audio bus shall be installed in the same cableway system as the communication network and module power supplies.

Should additional cabling be required in the offered solution, this associated cost shall both be the responsibility and at the cost of the tenderer, as well as all associated cost as a result of this.

The Audio data bus shall provide full digital audio communications to each door control module on the individual bus segments.

Dual Audio/data networks shall be acceptable, which shall eliminate the need for an additional audio bus cable.

3.2.5 Maintenance and Spare equipment

The contractor shall provide 10% spares of all system modules, control modules, door modules including peripheral equipment, with a minimum of one modules of each type.

The contractor shall provide the Using Agency with the following:

1. One printed copy of all application source code that is specific to this project, including comments; I/O lists, binding lists and a complete instruction document detailing the replacement of each module type.

2. One copy of all application source code that is specific to this project in digital format (CDRom or ¼" disks). The files contained shall include both compiled and un-compiled source code.

The contractor shall demonstrate that the un-compiled source code contained on the digital media is the current version of the code contained in the system modules.

3. One system-programming device to facilitate control module replacement and/or expansion.

4. CONTROL PANEL SHEETMETAL WORK

4.1 General:

All control cabinets shall be adequately sized with an additional 25% spare capacity, and shall house the necessary control equipment, which shall include but not be limited to the following:

Control system racks, modules and processors
CPU and I/O 24VDC power supplies
Camera 24VAC transformers
Lighting Interface Relays
Small power protection equipment
Field terminations
Intercom Pre-amplifier
Public Address Power amplifier
Audio switching circuitry
CCTV Matrix
CCTV Multiplexers
Local Operator 19" Workstation
Fibre Optic conversion equipment
LAN services

Control Cabinets shall be sized so as to be installed in the locations as indicated in the contract drawings.

4.2 Panel Construction:

Metal cabinets shall be constructed of materials in size, thickness and type that are suitable for the final installation environment and normal operating conditions. All cabinets shall be IP28 rated.

1. Panels are to be manufactured with a suitable means of anchoring and/or affixing to permanent plant structures. Panels should be modular in nature to facilitate ease of installation and must have a suitable method for anchoring to adjacent panels.

2. Panels and structural members shall be cleanly welded, and shall be free of gaps in corners. All joins shall be free of protruding and/or sharp edges that may cause injury. Panel work shall be inspected prior to installation to ensure that an acceptable level of workmanship has been applied during the manufacturing process.

   The use of standard 19" modular cabinets is preferred to the manufacture of purpose made panel work. Drawings of all-purpose build panels shall be submitted for approval prior to manufacture.

3. All cabinets are be supplied as floor mount units with bottom entry cable access. The cabinets shall be supplied with a plinth recessed from the front of the cabinet by a minimum of 50mm.

4. Louvered openings shall be supplied on all panels requiring excessive heat dissipation.

5. All panels housing equipment that requires routine maintenance shall be supplied with hinged and lockable doors, with handles to allow easy but controlled access to the equipment. Doors shall be manufactured consistent with the panels supplied. All panels shall make use of a common keying system. Screw type access panels shall only be accepted in areas where structural conditions prohibit the use of hinged doors.

6. All panels shall be painted as per the architect's detail.

7. All wire ways, laminated counter tops and counter supports shall be, and do not form part of security contract explicitly noted otherwise on the contract drawings.

8. It remains the contractor's responsibility to ensure that adequate notice has been taken of the architectural requirements prior to finalisation of cabinet detail.

5. CONTROL PANEL ASSEMBLY

5.1 Manufacture and Supply

The panels shall be supplied complete with all necessary floor channels and securing bolts, inter-panel wiring, bus wiring, trough wiring, accessories and all necessary equipment to provide a complete assembly.

5.2 Layout

The layout of the panels in the control room/s is shown on the accompanying drawing/s, and all dimensions shall be adhered to. The layout of control equipment in the panels shall be the responsibility of the contractor. Attention should be paid to the effects of Electromagnetic coupling, and the overall responsibility for providing an acceptable control system shall remain with the contractor.

Panels shall be of the single-row (simplex) type comprising one or more modules mounted adjacent to each other, or of the double-row (duplex) type consisting of two,

four or more modules mounted back-to-back. Dust proof seals shall be provided on all doors. Rubber seals will not be acceptable.

All holes through which wiring must pass shall have chamfered edges or grommets to prevent damage to insulation.

5.2.1 Simplex Panel

This panel shall comprise one, two or more modules mounted side-by-side, each module being of the unit construction, free standing cubicle design to enable a complete panel to be removed from the end or the middle of a suite of panels without affecting the operation of adjacent panel.

It must be possible to remove the rear portion with associated wiring and fittings, leaving only the channel base and bus-toughing with bus-wires and trough-wires undisturbed. Also, it must be possible to remove the bus-toughing without disconnecting any through-running wires.

Each simplex module shall have a cover fitted over the slot in the rear of the bus-toughing. Each suite of panels shall have slot cover plates on the extreme ends of the bus-toughing. Cover plates shall also be provided to blank-off holes in the sides of the end panels of a suite.

Vertical wiring troughs shall be provided on each side of the rear portion. Each trough shall have a maximum depth of 50mm and shall be fitted with insulated covers divided into three sections

The panel must be complete with fuses and links, terminals wiring and associated vertical and horizontal "wash lines ", blank gland plates, earthing bars together with all remaining accessories, swing frames or full length doors, if specified, labels and cubicle lights.

5.2.2 Duplex Panel

This shall consist of two. four or more modules mounted back-to-back and connected by a horizontal trough which constitutes the roof of the corridor formed by the two modules or rows of modules. This trough secures the modules and shall be used for inter panel, bus- or trough- wiring. The corridor formed by the two rows shall be provided with a dust proof door at each end.

5.3 Panel Finish

After fabrication is complete the metal surfaces shall be thoroughly degreased and cleaned of all mill scale and rust by means of shot- or sand –blasting or by pickling.

After cleaning the equipment shall be given one coat of an approved primer followed by two coats of an approved finishing paint of colour as specified. In the case of cold-rolled sheets the preparation may be waived providing an etching primer or other approved means is used.

The panels and toughing shall be finished light grey, No. 631 to BS. 381C with a semi-gloss (egg shell) finish.

The front and rear mounting channels shall receive an undercoat and two coats of bright black paint. Interior surfaces of the panels and the fuse and link mounting brackets shall have a gloss white finish.

Paint work damaged during transport or erection shall be made good by the Contractor, and one litre of un-thinned paint of each colour shall be provided on handover of the project.

5.4 ACCESSORIES

5.4.1 Fuses

The domestic type of cartridge fuse is preferred which has the cover plate and fuse carrier coloured as follows:-

- 5 amp - White
- 15 amp – Green (for d.c. Control Circuits)
- 15 amp – Blue (for a.c circuits V.T.)
- 30 amp – Red
- links – Black (rated for 30 amps continuous).

All d.c. circuits shall have a fuse in each phase leads.

Labels shall be affixed alongside each fuse group designating the purpose and size of the fuses.

Fuses are to be mounted as near to top and rear of panel as practicable so as to provided maximum access to their terminals and to equipment mounted at the top of the faceplate. Fuses shall not project beyond rear of panel.

5.4.2 Terminals

All terminals for connection to field wiring shall be to approval.

Not more than two conductors shall be connected to any side of a terminal.

Panel wiring shall be connected to the side of the terminal strip, which is nearest the front of the panel whilst cable tails and trough wiring shall be connected to the side nearest to the panel rear.

These terminal strips shall be mounted on the sides of each panel in such a manner as to permit easy access to all equipment after the terminals have been wired. Separate terminal studs shall be provided for incoming leads and for the corresponding internal wiring leads.

Each terminal strip shall be complete with 5% spare terminals. The terminals shall be provided with labels.

5.5 General

5.5.1 Wiring Identification

Wiring leads shall be marked at both ends with an approved type of marking device, permanently marked with black letters impressed on a white background.

Interlocking type ferrules are preferred and shall match the size of wire onto which they will be fitted. The "slip-on" type is preferred but for the smaller sizes of wire the "clip-on" type are acceptable.

For all wire without lug terminations, the ferrule must not fall off when disconnecting the wire and in this regard, the use of one strand of wire to retain the ferrule is acceptable providing that this is used in a very neat manner.

Ferrules should be handed so as to read the right way up on the cable terminal strips and to read from insulation to crimped lug in the case of relay and instrument connections, etc.

5.5.2 Cable Gland Plates

Removable blank gland plates shall be provided. They shall be fixed to the panel by hexagon headed screws. All drilling of gland plates, cabling, making-off and connection of cable tails shall be the responsibility of the contractor.

5.5.3 Earthing

A tinned copper earth bar shall be provided per panel and shall be fitted to the bottom rear at a position such that it can be connected to the earth bar of the adjacent panel by the use of a copper-connecting strap.

The Contractor shall ensure that all metal non-current carrying parts are effectively connected to this earth bar either by means of their mounting arrangement on the panel or by means of a special earthing conductor.

5.5.4 Labels

Labels shall be provided on the front of each panel, also in the interior for fuses and terminal strips.

Labels shall have a minimum thickness of 1mm and shall not discolour or distort in service. Labels made from white/black/white sandwich board, engraved through one white layer to give black letter on a white background, are preferred although labels made from white opal Perspex having black-filled lettering are acceptable provided that the medium used for filling is black brushing cellulose lacquer.

Filling waxes are not acceptable.

For labels manufactured from sandwich board, the depth and angle of engraving cut shall be such that the black lettering shall be clearly visible and legible when viewed at an angle of 45 degrees. Width of cut is to be taken as width of exposed "Black".

The label edges shall be chamfered to give an overall neat finished appearance.

5.5.5 Panel Lighting

Each panel shall be provided with an internal lamp suitable for a 220-volt a.c. supply.
A switch shall be provided in each panel.

5.6 INSPECTION AND TESTS

The user reserves the right to inspect the panels in the manufacturer's works at any stage of their manufacture. The Contractor shall advise the user in writing within 7 days of commencement of assembly /wiring etc.

Tests shall include insulation resistance, earth continuity and wiring accuracy tests in the manufacturer's works.

The Commission reserves the right to test the panels in the manufacturer's works before dispatch. Testing can be carried out "piecemeal", i.e. on individual panels or circuits as they become completed, as it is unnecessary to wait for all panels to be completed before testing is arranged.

The Contractor shall give the user at least 3 days notice of the date on which panels will be ready for final inspection and testing.

5.7 DRAWINGS

As soon as they become available, duplicate copies of the panel, shall be handed to the user.

The contractor's panel and wiring diagrams shall be submitted for approval within three months of placing the order. These wiring diagrams will be approved by the user in principle only, as the user regards these diagrams as an intermediate step used by the Contractor to assist in the manufacture of control/relay panels.

The user may on occasion supply their own panel wiring diagrams and these may be used by the contractor to assist in manufacture. The user reserves the right to correct any manufacturing errors that may be found and to charge the contractor with appropriate costs.

6. LIGHTNING/SURGE SUPPRESSION

6.1 General:

The contractor shall provide and install all the necessary Transient Voltage Surge Suppression (TVSS) devices, for the protection of the electrical/ electronic control equipment, communication and data lines. TVSS devices shall protect all AC and DC circuits from the effect of lightning induced over voltages, internally generated transients and utility switching transients.

6.2 TVSS Technology – AC Power Applications

6.2.1 The primary suppression path shall be pure silicon avalanche diodes

6.2.2 Silicon avalanche diodes must be bi-polar, of grade A, +- 5 % tolerance

6.2.3 Surge suppression devices shall provide 'power on' and 'failure' indication. An optional remote status capability for indication of primary suppression path failure shall be available.

6.2.4 All AC TVSS devices shall be UL listed and bear the UL label on each component. All AC TVSS devices shall be tested in accordance with the ANSI/IEEE testing standard.

6.2.5 Gas tubes, Selenium plates, MOV or Hybrid type suppressors will not be accepted

6.2.6 AC power protection units shall be in accordance with the specifications and regulations as proposed by the IEC.

6.2.7 AC protection components shall be installed on the supply side of the local control room UPS.

6.3 TVSS Technology – DC Applications

6.3.1 The primary suppression path shall be pure silicon avalanche diodes

6.3.2 Silicon avalanche diodes must be bi-polar, A grade, +- 5% tolerance.

6.3.3 Surge suppression devices shall operate in parallel to the protected circuit shall not employing switching components and have no series resistance.

6.3.4 Surge suppression devices shall provide a minimum of 5 joules or silicon avalanche diode per line, not per device.

6.3.5 Initial clamping voltage shall not exceed the signal line voltage by more than 25% unless recommended by the security equipment manufacturer.

6.3.6 Gas tubes, selenium plates, MOV or hybrid type suppressors will not be accepted

6.3.7 Coaxial transient suppressor: TCS-CP 1 or approved equal.

6.4 Application

6.4.1 Install TVSS devices on all AC supply lines and communication lines to protect against surges induced on all control lines, sensors, data lines and cables, which enter and exit buildings.

6.4.2 Communication protection devices shall be mounted in IP54 enclosures with all wiring in the enclosure to be kept in plastic wiring troughs.

The incoming cables shall be separated from outgoing cables.

There shall be an earth bar in the lower corner of each enclosure and shall be sized to accept a 16mm square BCW. The Bare Copper Wire shall be terminated to the nearest earth mat.

6.4.3 AC protection devices can be located in the equipment cabinet and must be installed prior to any distribution (i.e. multi-outlets).

The contractor shall ensure that lightning surges of 10Ka @ 8/2 can be safely accommodated by the TVSS devices installed without damaging the surge suppression equipment permanently.

7. UNINTERRUPTIBLE POWER SUPPLY SYSTEM

7.1 General:

The contractor shall supply, install and commission an adequately sized dual redundant hot standby centralised uninterruptible power supply system for all security related equipment including but not limited to Closed Circuit Television equipment, Control hardware, Operator workstations, Audio control equipment, Alarm monitoring systems and Sliding/Swing door locking devices.

The UPS system shall be centralised and consist of a full dual redundant UPS units each individual UPS unit shall be capable of supplying the total load requirement of the security installation.

The contractor shall take note that a 25% spare capacity shall be allowed in the supplied centralised UPS (dual redundant) system to allow for system growth as well as to sufficiently allow for system start ups.

The units shall receive their power supply directly from the main / emergency power (generator) supply of the facility, within the Central equipment room provided. The contractor shall be responsible for the complete UPS power reticulation system including the supply of the Incoming and outgoing distribution cabinet, appropriately sized supply cables to each local control area, all DB's required and associated with this supply and all necessary surge protection equipment.

The UPS system shall enable the entire security system to operate independently of the general facility power supply, and shall be capable of providing at least 35 minutes of uninterrupted power per individual UPS (not per set) in the case of failure of the facility supply.

In the event of a failure of the facility and emergency (standby generator) power sources, the UPS system shall provide visual and audible fault indication and report the appropriate condition to the local and central operator workstations.

The interface to the Security Management System shall be via a high level interface (HLI) to the SMS server situated in the Central equipment room control cabinet. Interface. Interface via dry contact shall not be acceptable.

7.2 Construction:

The uninterruptible power supply shall have a three phase output voltage of 380 VAC (star configuration) and a full load current capable of supplying all systems indicated herein.

The contractor shall utilise each of the single phase 230VAC for distribution of UPS power.

The contractor shall note that the UPS shall be considered the main earth reference for the entire security installation and all earthing for the security installation shall be done from this point.

The units shall operate with an input voltage of 380 VAC, three phase, 50 Hz.

The output frequency stability when operating without an input (inverter mode) shall be not less than +- 0.25 %. Static voltage regulation shall not exceed +- 3% with a dynamic regulation of at least +-10% for any load change not exceed 20% of full load rating. The contractor is responsible for sizing UPS systems to meet the correct requirements.

7.2.1 The unit shall operate normally with a +- 12% input voltage with **an unity** power factor, from 0 degree to 40 degree C n a humidity of 0 % to 95 % and shall deliver 200% of rated power for 10 seconds and 125% for 10 minutes.

7.2.2 All units shall feed power **on line** and in the event of a loss AC input power, the unit shall continue to provide power to the equipment.

Output power shall remain constant during transfer to/from input AC line power of DC source inverter power.

In the event of an inverter malfunction the unit will indicate and sound an inverter malfunction alarm and the inverter will shut down. The inverter shall shut down and drive an alarm when the input voltage drops below 12% of rated input voltage.

7.3 Batteries

The batteries shall be sealed lead acid/gel/cell maintenance free type. The batteries shall have heavy duty, radial grids for mechanical strength with low grid corrosion rate and PCV plastic separators for low internal resistance.

Batteries shall be sized as recommended by the manufacturer to supply the necessary DC power to the UPS system for the extended run time required.

The batteries shall be protected with a circuit breaker and the charger shall give a fault indication and shut down if an over voltage condition exists.

The charger shall receive source power from the same AC line circuits as the UPS AC inputs.

Sufficient batteries shall be provided in order to supply 230 volts to the load for a period of time as required above. The complete system (batteries and UPS) shall be furnished and guaranteed by the same manufacturer.

The batteries shall be sealed lead acid/gel/cell maintenance free type. The batteries shall have heavy duty, radial and be guaranteed for a period of 10 years.

7.4 Status Indication

7.4.1 The unit shall have an indicator panel with the following condition indicators:

a. UPS Overload
b. Electronics Fault
c. Battery Fault
d. Ambient Temperature warning
e. Percentage load per UPS
f. Lamp Test
g. Operation on Manual Bypass
h. Operation in Online Mode
i. Operation on Battery

7.5 Integration with the Security Management System

The Dual redundant centralized UPS's shall be fully integrated with the Security Management System by means of a High Level Interface (HLI), to provide operators and technicians with detailed status and alarm conditions regarding the UPS systems.

Due to the Centralised configuration, the following detailed diagnostic information is required, and shall be presented to the operator via a drop down menu option within the SMS:

Battery Data:

- Battery Status
- Time Remaining in minutes
- Remaining Charge in %
- Battery Voltage
- Battery Current
- Battery Temperature in DegC

AC Input Data:

- Frequency per phase
- Voltage per phase
- Current per phase
- Power per phase

AC Output Data:

- Frequency per phase
- Voltage per phase
- Current per phase
- Power per phase
- Load % per phase

UPS Alarm Conditions:

- Battery Failure
- On Battery Power
- Low Battery
- Depleted Battery
- Over Temperature
- Input Supply Out of Limits
- Output Out of Limits
- Output Overload
- Bypass Active
- Bypass Inhibited
- Charger Failure
- Fan Failure
- Fuse Failure
- Diagnostic Test Failure
- Communications Failure
- Shutdown Pending
- Shutdown Imminent

All alarm conditions shall be presented to the operator within the Fault queue as described in Section 2.14.2.11 of the specification.

8. CELL, DOOR INTERCOM AND PUBLIC ADDRESS SYSTEM

8.1 GENERAL

The system shall consist of a full duplex intercommunication system to provide digital voice communication, public address, voice recording, event logging, and interface to other security sub-systems.

Intercom stations shall be connected in a modular bus configuration in order to reduce cabling requirements. Point to point systems shall not be considered.

Analogue/digital hybrid systems making use of separate data and audio bus cabling shall not be accepted, and the tenderer shall provide sufficient technical literature to fully evaluate the data/audio protocol utilized by the system.

The system shall be compatible with standard voice over IP products (IP Telephony), which employ such protocols as SIP, and be capable of communicating both data and audio signals over standard TCP/IP and UDP Protocols. Where possible the system should make use of existing Large Area Networks for the transmission of control and Audio data.

The overall design of the system software and cabling shall be such that as far as practical, failure of one part (building) of the system does not affect normal operation of any other part of the system.

The system shall employ full duplex digital audio technology and provide clear undistorted speech communications, free from background noise and/or external interference.

Amplification shall be provided at each intercom or PA station in order to provide the option of piping music to groups or individual stations as required.

The system shall be capable of transmitting at least 32 simultaneous full duplex conversations via the TCP/IP network running between control areas, whilst being capable of transmitting two simultaneous full duplex conversations across any local intercom station bus, in order to pipe music to all speakers, whilst simultaneously holding a conversation with any selected intercom station.

The intercom system shall be capable of being fully integrated with the SMS via a bi-directional high level interface to allow remote monitoring of all intercom station calls by the SMS with select calls being used to trigger the CCTV system camera and display of door and gate intercoms to the SMS operator terminals, in a picture-in-picture format. All such interfacing of systems shall be configured such that if any one system fails to operate, the other systems shall continue to operate without any detrimental effect.

8.1.1 Cell and Passage Door Intercom Stations

The contractor shall supply, install and commission a networked Cell and passage door Intercom System to the locations nominated in the accompanying drawings. Monitoring locations shall be provided in each local control room, with the primary central monitoring location to be installed in the Central Control room.

Calls originated from cell and passage door intercom stations shall be routed to the respective local control room SMS Operator terminal.

A Call diversion facility in the event of un-answered or unattended mode shall be provided, and shall be configured to the engineer's specification.

All conversations between Control stations and Cell intercom stations shall be digitally recorded on the cell intercom digital recording system.

The Digital Recording System shall be expandable to cater for future system expansion.

8.2 GENERAL OVERVIEW

The systems major components shall be located as follows:

8.2.1 Central Control Room

19" rack mount Central Processor located within an equipment rack in the Central Control Room security equipment cupboard.

Rack mount Ethernet based Communication Controllers to interface to the local control racks situated in the Local control room equipment cupboards.

Digital Voice Recording System located within an equipment rack in the Central Control Room security equipment cupboards.

System power supplies.

8.2.2 Local Control Locations

19" rack mount local controller.

Rack mount Ethernet based Communication controller to interface to the Central Control Room intercom rack.

Rack mount Communication Master controller cards to interface to intercom stations in a Bus configuration.

8.3 SYSTEM OF OPERATION

8.3.1 General

Within each nominated building, the contractor shall supply and install an integrated intercom system. The system shall be complete with cell and passage digital intercom stations, 19" rack mountable field controllers to provide voice communications to the local control room and/or the Central Control Room.

The system shall provide the following minimum system functions:

8.3.1.1 Normal calls

Calls initiated from Cell/Staff Intercom stations to system operators or vice versa

8.3.1.2 Alarm calls

Emergency calls initiated by officers or automatically triggered by system events such as audio level alarms.

8.3.1.3 Tamper calls

Tamper calls initiated when an attempt is made to gain unauthorized access to intercom station electronics

8.3.1.4 Database for prisoner data

The system shall provide a database for prisoner and/or staff personal data. It shall be possible to import existing prisoner databases by means of an import tool. It shall be possible to display data from the central database on multiple operator workstations according to authorisation levels. Editing of database entries shall be password protected.

8.3.1.5 System error messages and event logging

System errors and disturbances shall be displayed on appropriately configured operator workstations according the type and location of the error or event. Disturbances such as raised voice levels in cells shall automatically generate alarms, which shall be documented in a log file and on a printer.

System functionality shall not be influenced in the event of failure of any one part of the system or operator station. Each operator workstation shall be configured as an autonomous system. In the event of an operator system failure, the functionality of that station shall be transferred to another operator workstation on the system according to a pre-configured set of rules.

8.3.1.6 Data Integrity

In the event of power failure, the actual status information in the system at the time of the failure shall not be lost. When the power is reconnected, all status information at the time of the power failure shall be retrievable and will be displayed on the relevant screens.

8.3.1.7 Listen-in

A "Listen-in" function shall be provided, and configured in accordance with the engineer's specification, to provide either overt or covert operation or to be disabled altogether.
Overhearing (listening-in) from one cell to another via the cell station shall not be possible.

8.3.1.8 Public Address system

It shall be possible to annunciate messages in two ways:

- By initiating a group call to a selected group or all intercom stations.
- By initiating a group, or all PA stations which have been configured on the system.

Any operator workstation on the system shall be capable of being configured with PA functionality as required.

8.3.1.9 Audio level detection

Each intercom station shall be capable of automatically detecting excessive Audio Levels, and shall be configured remotely by means of the installation bus cabling. The system supervisor shall be capable of individually setting the audio alarm level sensitivity of each cell intercom station.

8.3.1.10 Call Monitor

A Call Monitor facility shall be provided, which shall provide the operator with station identification together with information of inmate(s) housed in appropriate cells. The call monitor shall display the calls and events from individual cell intercom stations in a priority based text listing.

The Call Monitor function shall be capable of displaying the following information.

Normal calls, Tamper calls, Alarm calls, Guard present, Intercom Station Error, Intercom Station Failure
It shall be possible to configure the call or event priority on the operator GUI.

The system shall automatically provide the operator with inmate data including a list of inmates housed in this area as well as an option to select a specific name on this list as well as a photograph and a graphical representation of the area in which the inmate is being housed, should this be a requirement of DCS.

8.3.2 Establishing a Call

At a minimum the system shall be capable of establishing calls in the following three ways:

8.3.2.1 Search by data

It shall be possible to select a specific field within the database by which to search for an inmate i.e. the Surname and name field may be selected and an inmate search performed by typing the inmate Surname and name into the system.

Once the entry has been found a simple keystroke shall establish a call to the appropriate intercom station.

8.3.2.2 Respond to Normal Calls

Call-ins shall be entered into Call-in queue on a first in – first out (FIFO) bases. and sorted by priority level. Priority levels shall be set for each intercom station on the system. On receiving a call-in the operator shall only need make a single keystroke to answer the highest priority call that has been in the queue for the longest period of time. It shall also be possible to select a specific call-in and initiate a call by making a single keystroke.

8.3.2.3 Response to Alarm Calls

The system shall be capable of automatically detecting raised audio levels at nominated intercom stations. It shall be possible to configure the system to automatically initiate calls to intercom stations that report audio level alarms. The system must have the facility to de-activate this reporting or detecting capability.

8.3.3 Call & Event Logging

All calls and events shall be logged to a log file. Log files shall be named and stored by date.

The current or historical log files shall be displayed on the screen or printed out on request. The system shall maintain log files for a minimum of six months. The system shall provided the operator with a warning prompt indicating the files should be backed up if required for a longer duration.

8.3.4 System Maintenance

The system shall be provided with a system configuration tool whereby system parameters may be set for individual intercom stations. All system parameters shall be downloaded from a Central station, and shall not require the opening of intercom points in order to change system parameters.

All setting changes shall be automatically updated in the work-files without saving. When loading the maintenance tool, the last entered data in the work-files shall be used.

8.3.5 Operator Microphone and speaker set

Activation of calls or the selection of calls in the control rooms shall be done by selecting the intercom icon on the SMS. When the call is connected, this event shall be recorded at the central controller processor including date, time, cell call station number and duration of the call.

When the icon has been selected the call will be connected. By selecting the same icon a second time will cancel the call.

When the call has been activated, a microphone situated on the plasma SMS screen shall serve as the control room microphone.

The speakers situated on the SMS plasma screen provided in each control room shall serve as the listening in speaker set.

It shall also be possible to answer calls by means of lifting an operator handset from the cradle in locations where a handset is specified.

Call shall be cancelled by replacing the handset. When the call is connected, this event shall be recorded at the central controller processor including date, time, cell call station number and duration of the call.

A tone shall sound from the intercom whenever a call is answered.

Upon cancellation of a call the Operator station shall indicate the next priority call for that building.

8.3.6 Call Routing

If a call is not answered or cancelled locally within a user adjustable pre-determined time of 30-600 seconds the call shall be automatically switched to the Central Control station.

8.3.7 Multiple or Simultaneous Calls

Cell calls arriving at the local control panel or nominated Central Control Room operator's terminal shall be queued so that calls are listed and answered consecutively, in accordance with their priority and chronological arrival time.

Raised voices in cells shall automatically trigger an alarm condition once the set point has been reached. The alarm condition shall be reported to the local control station as an alarm call-in.

The Audio level set point for each station shall be configured over the data network, and shall not require the station to be removed.

This function shall be de-selectable

8.3.11 Future Expansion

The Cell Intercom system shall be capable of being expanded for extended use within the total complex for future extensions. All upgrades to provide this service shall not affect the existing service as specified in this document or render the equipment, as specified, redundant in any form.

All system upgrades shall be configured using similar equipment and operate in the same manner in all respects. Any upgrades should cause minimal disturbance to the existing service.

8.4 INTERCOM STATIONS

Intercom stations shall be mounted in flush wall boxes as detailed on the Engineer's drawings. The accommodating wall boxes complete with acoustic material, conduits and draw wires for cabling access and cabling are to be supplied and installed as part of this project.

Intercom stations shall consist of a vandal resistant, momentary action, call switch, speaker and microphone mounted into a stainless steel flush plate.

Cell intercom units shall be designed/constructed/installed as follows:

- Front plate to be stainless steel 3 mm thick with 2.5 mm radius corners.
- The Speaker grille will be a grid pattern of 3 mm holes.
- A 3 mm thick baffle plate with a corresponding 3 mm offset grid pattern.
- Mylar speaker with 5 watt power rating.
- The microphone shall have a minimum 36 DB dynamic range.
- The unit is to be fixed to the back box using 4 security screws.
- An exterior, which does not facilitate the concealment of contraband.
- Sealed to the mounting surface with an anti-pick mastic or silicon beading agent.
- The electronics so designed so that shorting any pair of intercom unit cable pairs will not cause damage or blow a fuse in any part of the system.
- A tamper alarm separate to the call alarm to notify the respective operator station of an intercom unit's removal.
- A call LED protected by a flush polycarbonate lens will operate when the call button is pushed.
- The call button is to be a robust, vandal resistant push button manufactured of stainless steel.
- The call button shall activate a micro switch and bear against a solid shoulder, which resists knock through. An internal neoprene gland seals the button to IP65.
- Build in 1-Watt amplifier with software adjustable gain.
- Cabling shall be a Cat5, bus feed, fully digital transmission of speech and data.
- Adjustable microphone sensitivity

Intercom station electronic circuitry shall be optically isolated from the incoming data/audio bus.

8.5 DIGITAL AUDIO RECORDING SYSTEM

A digital voice recording and playback system shall be supplied and installed as part of the Works.

The central processor and associated peripherals shall support digital recording for a minimum of 32 channels without the requirement for additional central processors installed in each local area.

The system shall support up to 32 channels of voice data information per central processor.

Time and date stamping shall be automatically logged to all audio channels.

Central processors for the digital voice recording system shall be installed in the Central Control Room Security equipment panels.

The voice recording system central processor shall provide immediate access to, and recording of, voice inputs via an onboard storage medium to a minimum capacity of 1200 hours of on-line data.

Each unit shall have an in-built audio tape deck or output jack complete with compatible headphones for monitoring of conversations without interruption to normal operation.

A CD-drive shall be installed as part of the central processor configuration for the archival of data.

The audio recording system shall provide the following alarm conditions:

- Recording medium capacity consumed by 80%
- Audio recording system non-operational due to power failure or failure of unit to record.

When the hard disk reaches full capacity the system shall automatically over write the oldest dated data file. Access to the voice recording system shall be controlled by password authorisation. A minimum of three levels of access rights shall be provided.

The Intercom system supplied and installed, as part of these works shall be interfaced to the voice recording system.

All voice communications shall be automatically recorded on a digital recording medium with time and date being encoded on the same channel as each conversation.

8.6 NON-CONTACT INTERCOMS

Provide individual audio monitoring and recording of the non-contact visiting booths in the nominated locations.

Provide visitation intercom stations to the same specification to that of the cell and passage intercom stations, however without the call button.

All voice communications shall be automatically recorded on a digital recording medium with time and date being encoded on the same channel as each conversation.

8.7 DOOR INTERCOM OPERATION

The door intercom system shall be configured to provide the functionality shown on the drawings.

In general, when a door intercom point is activated the intercom shall be answered from the relevant SMS operator station via a dedicated handset or by selection of the intercom icon on the SMS with a picture-in-picture image of the general area of the call point displayed on the same SMS operator station.

The SMS terminal shall include a graphical display to connect and cancel intercom calls as elected.

The video image shall remain active until:

- The respective door is opened and subsequently closed.
- The call is terminated by the SMS operator.

In the event of a door intercom point not being answered within the default time period of 30 seconds or the relevant SMS operator terminal being off-line the call shall automatically divert to the Central Control Station.

8.8 PUBLIC ADDRESS SYSTEM.

The public address system shall be provided as an integral part of Intercom system.

The system shall include internal public address to nominated buildings via ceiling or wall mounted speakers and externally mounted horn-type speakers for non-building areas such as exercise yards and external association areas at the locations indicated on the drawings.

PA stations shall be provided with a built-in 10W audio amplifier, and shall be capable of providing a continuous music channel if required.

8.9 CABLING

Bus Cabling between individual intercom and PA stations shall consist of the following:

1.) 1x 3 Core 1,5mm Power Cable
2.) Cat5 Data/Digital Audio Cable.

All intercom circuit cabling shall be terminated to the relevant Master Controllers situated in the local control racks.

9. CLOSED CIRCUIT TELEVISION SYSTEM (CCTV)

9.1 Acceptable Manufactures:

The contractor shall provide the manufacturer and model detail of all CCTV system components in the Section referring to (Information to be rendered by tenderer) of the tender document.

The CCTV components selected shall be suitable for installation in a maximum-security facility, and shall require the prior written approval of the Department.

9.2 General:

The contractor shall provide a complete closed circuit television system to comply with the requirements as detailed throughout this document, and which shall comply fully with the requirements of this specification for a direct supervision facility.

The system shall contain a microprocessor-based video-switching matrix utilising fiber optic technology as trunk lines from each local matrix to the Central and Movement control rooms.

The system shall support a serial interface capable of communicating via proprietary hardware and software in order to route switching commands from any operator workstation to the relevant switching matrix.

Fixed camera lenses shall be interchangeable in order to adjust received images to comply with the requirements of direct supervision as detailed in the security guidelines of the Department.

9.3 Camera Equipment:

All cameras provided shall be the product of a single manufacturer whose product have been UL rated.

9.3.1 Interior Wall Mount Camera Locations

Interior wall mount camera shall comply with the following specifications:

a. Camera

1/3" CCD Colour cameras incorporating the latest CCD technology shall be used throughout the facility. The camera shall require a maximum of 0.4 lux for usable video and 0.8 lux for full video. The camera shall include the following features:

- back light compensation – on/off
- an automatic shutter with an adjustable limit
- fixed or automatic white balance. Automatic sensing 3200K to 5500K
- Video output 1.0Vp-p plus minus 0.1 Vp-p, 75 ohms
- Aperture correction: horizontal and vertical
- Horizontal Resolution Minimum 582 TVL
- Auto shutter, 1/50 to 1/100 000
- BNC video out

- Working temperature minus 20 degrees to 50 degrees Celsius

The camera shall incorporate the latest digital signal processing technology, and shall offer enhanced video quality.

Innovative digital adjustment control will automatically set colour.

The camera shall be compatible with standard auto-iris and DC controlled lenses

The camera shall have the supply voltage of 24VAC or DC and shall be suitable for a **PAL B** colour system.

b. Camera lens

A 1/3" format camera lens with a 6mm fixed focal length is required.

Image focusing shall be performed by the camera.

The auto iris and iris video input signal should have a supply voltage ranging between 8 and 12 VDC.

The lens shall be an auto iris lens with an f-stop iris range of 1.4 to 64.

The operating temperature of the lens shall be between minus 20 degrees and 50 degrees Celsius.

c. Camera Housing

Internal housings shall be vandal-proof and suitable for a 1/3" format CCD camera. The housing shall be UL rated and include a camera-mounting cradle that can be rotated 180 degrees.

The housing shall contain an abrasion resistant viewing window. The rear end of the housing shall contain 3 fittings to permit the passing of the video, AC power and PTZ control wiring.

9.3.2 Interior Ceiling Locations

Interior ceiling mount cameras shall comply with the following specifications:

a. Camera

1/3" CCD Colour cameras incorporating the latest CCD technology shall be used throughout the facility. The camera shall require a maximum of 0.4 lux for usable video and 0.8 lux for full video. The camera shall include the following features:

- back light compensation – on/off
- an automatic shutter with an adjustable limit
- fixed or automatic white balance. Automatic sensing 3200K to 5500K
- Video output 1.0Vp-p plus minus 0.1 Vp-p, 75 ohms

- Aperture correction: horizontal and vertical
- Auto shutter, 1/50 to 1/100 000
- Horizontal resolution minimum 582 TVL
- BNC video out
- Working temperature minus 20 degrees to 50 degrees Celsius

The camera shall incorporate the latest digital signal processing technology, and shall offer enhanced video quality.

Innovative digital adjustment control will automatically set colour.

The camera shall be compatible with standard auto-iris and DC controlled lenses

The camera shall have the supply voltage of 24VAC or DC and shall be suitable for a PAL B colour system.

b. Camera lens

A 1/3" format camera lens with a 6mm fixed focal length is required.

Image focusing shall be performed by the camera.

The auto iris and iris video input signal should have a supply voltage ranging between 8 and 12 VDC.

The lens shall be an auto iris lens with an f-stop iris range of 1.4 to 64.

The operating temperature of the lens shall be between minus 20 degrees and 50 degrees Celsius.

c. Maximum Security Ceiling Mount Housings

Ceiling mount housings shall be rated for maximum-security applications. These housings shall be used for all high security conditions where cameras are required, and shall be suitable for a 1/3" format CCD camera

The housing shall be manufactured from cold-rolled steel and shall be equipped with a viewing window. The access doors shall be secured by a quality key lock.

Cable entry access shall be through the rear of the housing.

The housing shall include a slide out shelf with an adjustable mini tilt bracket to allow for camera mounting.

9.3.3 External Camera Locations

External mount cameras shall comply with the following specifications:

a. Camera

1/3" CCD Colour cameras incorporating the latest CCD technology shall be used throughout the facility. The camera shall require a maximum of 0.4 lux for usable video and 0.8 lux for full video. The camera shall include the following features:

- back light compensation – on/off
- an automatic shutter with an adjustable limit
- fixed or automatic white balance. Automatic sensing 3200K to 5500K
- Video output 1.0Vp-p plus minus 0.1 Vp-p, 75 ohms
- Aperture correction: horizontal and vertical
- Auto shutter, 1/50 to 1/100 000
- Horizontal resolution minimum 582 TVL
- BNC video out
- Working temperature minus 20 degrees to 50 degrees Celsius

The camera shall incorporate the latest digital signal processing technology, and shall offer enhanced video quality.

Innovative digital adjustment control will automatically set colour.

The camera shall be compatible with standard auto-iris and DC controlled lenses

The camera shall have the supply voltage of 24VAC and shall be suitable for a PAL B colour system.

b. Camera lens

For some outdoor applications fixed focal length lenses are required and for others pan tilt cameras are required under this contract as indicated in the camera schedule.

Fixed focal length camera lens

Image focusing shall be performed by the camera.

The auto iris and iris video input signal should have a supply voltage ranging between 8 – 12 VDC.

The lens shall be an auto iris type with an f-stop iris range of 1.4 to 64.

The operating temperature of the lens shall be between - 20 degrees and 50 degree Celsius.

Pan Tilt Zoom camera lens

A 1/3" format camera lens with a variable focal length of 8 to 48 is required.

The lens shall be an auto iris type with an f= Stop iris range of 1.4 to 360.

The auto iris and iris video input signal supply shall be between 8 and 12 VDC.

The operating temperature of the lens shall be between –20 and 50 degrees Celsius.

c. **Camera Housing:**

The Outdoor camera housing shall be manufactured from extruded aluminum and shall include a one-piece camera mounting cradle with front and read end caps. The viewing window shall be manufactured of glass. The housing shall be equipped with an integral heater designed to ensure minimal fogging due to inclement weather. The housing shall be suitable for a 1/3" format CCD camera.

The cable entry access shall be through the rear of the housing.
Inside the housing shall be a removable cradle assembly for to mount the camera and lens. The cradle shall be able to rotate with 36 degrees.

The enclosure shall at least be manufactured to IP65.

d. **Sun Shield**

A sun shield to protect the camera from direct sun shall be provided for all outdoor housings.

e. **Tamper Kit**

A tamper kit for suitable for outdoors housing shall be provided.

f. **Blower**

A fan/thermostat combination shall be provided for outdoor housing units. The fans shall be UL listed.

The thermostat shall operate between 26 and 35 degrees Celsius.

The supply to the blower shall be 230VAC, 50 Hz or 24V AC or DC.

g. **Pan/tilt Unit**

Weatherproof outdoor pan/tilt units are required for all outdoor pan/tilt cameras. The pan tilt offered shall be a compact, low profile unit and shall be constructed from corrosion-resistance material. The devices offered shall be fully system compatible with CCD cameras, lenses and housing combinations.

The motor of the pan/tilt unit shall be capable of a 100% duty cycle, to permit continuous operation, and shall require low maintenance.

Minimum set point adjustment:

- Pan (Horizontal): 15 - 355 degrees
- Pan (Vertical) +20 - -90 degrees
- Pan/Tilt Speed: 6.3 degrees / Second
- Operating Temp: -20 to 60 degrees C
- IP Rating: IP66
- Power Supply: 240VAC 50Hz

PTZ Functional Requirements:

- Full featured pant/tilt/zoom/auxiliary control
- Auto-pan/random pan
- Multidrop RS485 communication protocol
- Communication to Matrix Switchers via a proprietary protocol
- Minimum of 3 auxiliary outputs
- Minimum of 99 preset positions
- Minimum of 8 alarm presets positions
- 10-bit resolution for position accuracy

9.4 Mounting Brackets:

All brackets shall be of the heavy-duty type.

9.4.1 Outdoor use

All brackets shall be suitable fore outdoor use and shall be able to carry a load of at least 60kg.

9.4.2 Indoor use

All wall-mounted cameras shall be provided with locking, swivel, adjustable heads with an adjustable pan of 360 degrees and tilt of 180degrees.

9.5 Monitors:

All CCTV monitors supplied shall be super high-resolution colour monitors.

All Monitors, Cameras and associated hardware shall be supplied by the same manufacturer, to ensure system compatibility.

The monitors composite video output channel shall be compatible with the Digital Video Recording Input Channel impedance.

All equipment shall be PAL compatible, and shall be supplied with 230 V, 50Hz.

9.5.1 Sequencing and/or dedicated monitors

Sequence Monitors shall be at least 14" super high resolution colour monitors, and where applicable shall be mounted in recessed mounting brackets as indicated in the control room layout drawing.

9.5.2 Spot Monitors

Spot Monitors shall be at least 14" super high resolution colour monitors, and where applicable shall be mounted in recessed mounting brackets as indicated in the control room layout drawing.
Each control room shall be equipped with at least one spot monitor.

9.5.3 Quad Monitors

Quad Monitors shall be installed in control rooms requiring in excess of five (5) sequencing monitors (>20 Cameras).

Quad monitors shall be at least 20" high-resolution colour monitors, and the quad image shall be obtained through the installation of Real Time quad units.

Multiplexers shall not be used for this purpose in order to avoid the effects of time slicing.

9.6 CCTV Matrix Switchers

9.6.1 A Matrix switcher shall be installed within each control room panel, and networked via a proprietary protocol to the Master Matrix switcher/s situated in the Central Control room.

9.6.2 The local CCTV matrix shall be fully integrated with the local operator control workstation, from which commands shall be issued to the Matrix via a serial protocol. The use of camera selection via potential free contacts shall not be accepted.

9.6.3 The driver interface between the operator console and the matrix shall be capable of issuing the complete command language set of instructions via the serial link, and shall include the ability to control the PTZ functions of appropriate cameras.

9.6.4 By selecting the appropriate icon on the operator control console, the camera image shall be transferred to the spot monitor via the switcher output channel. The matrix shall be capable of reverting to a pre-programmed sequence display after a programmed timeout period.

9.6.5 The Central matrix switchers shall be capable of selecting any camera in the facility by issuing a command to the relevant matrix via the proprietary protocol.

9.6.6 All switchers will include a 16 character camera title, non-volatile memory back up, on screen status line and on-screen configurations menus.

9.7 Matrix Switcher Functional Requirements

9.7.1 The switchers provided shall be microprocessor-based units and modular in construction.

9.7.2 The unit shall be fully programmable and be capable of switching any camera input to any monitor output either via a serial command or automatically via an internal camera sequence.

9.7.3 Programmed sequences shall be capable of being run in the forward or reverse direction

9.7.4 All units shall be capable of controlling external PTZ cameras via an integrated RS485 Multi-drop output.

9.7.5 Any monitor or group of monitors shall be capable of display cameras under alarm conditions

9.7.6 The switchers provided shall be equipped with a 230V, 50 Hz power supply.

9.7.7 Video switchers shall be equipped with keyboard an external keyboard port to enable system configuration and system control in the event of serial communication failure.

9.7.8 The quantities of input and output modules as well as the matrix switcher model shall be determined by the contractor to provide a complete and functional system.

9.8 Quad video Processors (QVP):

Quad Video Processors may be installed in order to reduce the number of recorded channels within the installation.

The QVP shall produce high quality Real Time video output.

Each input channel shall enable automatic gain and level control.

No external synchronization shall be required, and the unit shall accept inputs with a 2:1 interlaced source.

The unit shall be programmable and enable either Quad, Full screen or sequenced display with a programmable dwell time.

The unit outputs shall be capable of displaying current time and date information as well as an 8-character camera title.

9.9 Colour Video Multiplexes:

Colour Video Multiplexers shall be provided to enable action alarming on camera inputs, in order to minimize the number of cameras in the sequence queue on all control room sequence monitors.

The unit shall be programmable and enable either Quad, Full screen or sequenced display with a programmable dwell time.

The unit outputs shall be capable of displaying current time and date information as well as an 8-character camera title.

10. DIGITAL VIDEO RECORDING (DVR) SYSTEM

10.1 General

10.1 The CCTV Matrix system shall provide the Digital Video Recording system with video signals in order to record all activity relating to door control and Audio selection.

10.2 The DVR system shall automatically record activity on any camera in the facility, and shall be capable of simultaneous playback of any recorded channel via a dedicated DVR LAN. **Only embedded DVR systems shall be accepted.**

10.3 The contractor shall employ the necessary number of Digital Video Recorders in the system to ensure complete coverage of the facility, and to ensure all events have been recorded.

10.4 The play back, viewing of live video or video archiving shall have no impact on the recording of images or the normal recording frame rate. The DVR system, although fully integrated with the Security Management System, shall be a standalone solution in terms of its hardware, software and networking requirements.

10.5 In the case of a failure on the DVR system, the CCTV matrix system shall not be affected. The DVR shall provide for built-in and suitably terminated video loop outputs that are failure independent of the digital video recording process in the DVR.

10.6 In case of failure of the DVR control station, or the failure of any one DVR on the networked DVR system, the recording process and configuration of the remaining DVR units shall not be affected.

10.7 In the case of failure of the LAN interconnecting the networked DVR system, or failure of any camera input, the configured, automated recording process of the individual DVR units shall not be affected.

10.8 In the case of a network communications, camera of power input failure to any DVR of the DVR control station, the system shall, upon re-establishment of the required input(s); provide automated recovery of the configured recording process.

10.9 The DVR shall provide for configurable image recording rate per individual camera input in the range of zero (in the case of no motion or picture change) to 32 images per second. The DVR shall be capable of recording at a minimum totaled rate per DVR of 64 images/sec for up to 16 cameras activated simultaneously, and at SHVS resolution.

10.10 All necessary hardware and accessories, including cabling that is required for the effective operation of the DVR system, shall be included by the tenderer.

10.2 Functional Requirements

10.2.1 The system shall include the necessary software required for performing the following operations:

1. Digital Recording
2. Viewing of Live Images
3. Playback of Recorded Images
4. Image Archiving both by means of CD and VHS recordings to a SHVS resolution.

10.2.2 The system shall allow the pre-programming of various recording configurations, and shall be capable of operating in the following modes:

1. Continuous minimum recording rate at 4 frames / second
2. Start and stopping of recording according to a pre-programmed schedule
3. Automatic recording upon activity detection
4. Alarm triggered recording
5. Recording upon operator request

10.2.3 Continuous recording shall allow the automatic recording of images without the need for operator intervention. For as long as the recorders are powered they shall continue to record.

10.2.4 Alarm recording shall allow the recording to record certain input channels when an alarm condition exists. The alarm event shall be communicated to the DVR from the SMS system by means of a serial of IP protocol.

10.2.5 Recording on alarm event, or automatic activity detection, will save on storage space and reduce non-essential image recording.

10.2.6 Scheduled recording shall allow the recorders to record certain input channels only during specific times in the day. The remainder of the time the channel shall remain idle and thereby save storage space.

10.2.7 The recorded video shall retain information relating to the recording process such as time, date, and video source. This data shall be used by the search mechanism for efficient search and playback functionality.

10.2.8 The capture date, start time and stop time shall be stored for each clip, whilst the source of the video (camera ID information as generated internally within the DVR) shall be stored for each stream.

10.2.9 A search and reporting utility shall allow efficient tracking of alarms, incidents, operator logs and service requests.

10.2.10 The system shall provide sufficient storage capacity to ensure 7 days of continuous recording per input channel without the need for archiving. Storage capacity shall be expandable. (The memory required shall be calculated on worse case conditions allowing movement for all 16 cameras connected to the DVR)

10.2.11 Each recorder shall store the recorded images on its own hard drive. As the hard drive becomes full, the oldest images shall be transferred for archiving within a central archiving server.

10.2.12 Configuration of the archiving system shall be possible via the system software from the management workstation within the central control room.

10.2.12 In the case of no archiving done by the user department the recorder will automatically start re-recording over the oldest recorded material.

10.3 DVR Recording Multiplexer:

1. The DVR shall be able to record on at least 16 PAL camera inputs.
2. The sampling rate of the DVR shall be at least 64 images per second.
3. The DVR recording multiplexer setup shall allow for individual control of frame rate, image quality, trigger type, and video motion detection. For example, camera 1 recorders at 18 ips while camera 2 records at 4 ips.
4. During recording, all video shall be compressed to a size that will provide a recorded image of SVHS quality.
5. The recorded material shall be recorded in MJPEG format.

10.4 Hardware Alarms:

1. The DVR shall have 16 dry contact alarm inputs.
2. Each alarm input shall be selectable as either normally open or normally closed.
3. Each alarm input shall be capable to trigger recording on a variable figure as required.
4. The alarm recording time shall either be adjustable, or allow recording for as long as the alarm is present.
5. The DVR shall have at least one alarm output that can be triggered on detecting motion on any selected camera.

10.5 Network Alarms:

1. The DVR shall be capable to receive recording triggers on a TCP/IP network.
2. The network trigger shall allow for individual camera recording, i.e., associate a selected camera with the network trigger.

10.6 Continuous recording:

1. It shall be possible to have the DVR record on any camera continuously without any triggers.

10.7 Video Motion Detection:

1. The video motion detection (VMD) shall allow for at least 300 programmable VMD zones on any camera.
2. The VMD sensitivity shall be adjustable.

10.8 Playback:

1. On playback, it shall be possible to distinguish between the following 4 recording trigger types on playback:

   - Hardware alarm recording
   - Network triggered recording
   - Continuous recording
   - VMD triggered recording

2. It shall be possible to select a video clip based on the starting and end times, with a resolution of 1 minute.
3. It shall be possible to select a video clip based on the camera number.
4. It shall be possible to play back any number of cameras simultaneously in a split screen display.
5. It shall be possible to save any image during playback to a removable magnetic medium, (such as 1.4MB stiffy) in a standard image format (Jpeg).
6. The playback shall give a time resolution of milliseconds.
7. The playback shall have a single image digital zoom function.
8. The video data shall have tamper detection.

10.9 Backup:

1. It shall be possible to make a permanent backup of any video clip to aremovable magnetic medium.
2. It shall be possible and included with this contract to make a permanent backup of any video clip via a 6 head video recorder onto a VHS tape.
3. It shall be possible to make a permanent backup of any video clip to a network server.
4. The DVR shall offer the option of a backup scheduler to allow automated periodical backups.

10.10 User Access:

1. The DVR shall have individual password control of up to 6 users.
2. It shall be possible to assign individual rights to users.

10.11 Video Outputs:

1. The DVR shall have 5 video outputs for the purpose of live monitoring.
2. Each video output shall have independent control and be able to switch any of the video inputs.
3. Video output switching shall either be manually or sequenced with programmable delays.

4. Camera title shall be overlaid on the video with date and time on at least 1 video output.
5. The DVR shall provide a terminated output for each input video signal, suitable for distributing the incoming camera video signals to other standard analogue video input devices.

10.12 Memory:

The DVR shall be able to support up to 1000 GB of memory per recorder.

The DVR shall be supplied at a minimum of 120 GB of memory per recorder.

10.13 Self Diagnostics:

1. The DVR or its support system shall be able to automatically detect critical failures (any kind of recording failure) within 60 minutes.
2. The DVR or its support system shall be able to automatically report system failures to a manned support desk within 5 minutes of detection.
3. It shall be possible to completely remotely configure the DVR via a TCP/IP network. It shall however be possible to do the same through the provided control panel of the DVR.
4. It shall be possible to download camera pictures remotely to a support desk.
5. The option shall be available that in the event that a single (video) hard disk fails, the recorder shall not lose any recorded footage.
6. The option shall be available that in the event that a single (video) hard disk fails, the recorder shall continue to record without interruption.

10.14 Other:

1. It shall be possible to label camera names on the DVR.
2. The option shall be available to set and automatically synchronise the time clock of the DVR to a national time standard on a daily basis. For this purpose, the DVR shall be connected to a single point time reference via a network.
3. The DVR shall have a recording scheduler to allow different multiplexer setups for different times of the day and week.
4. The DVR shall have camera signal loss detection with a mechanism to inform a central operator in the event of a camera signal loss on any of its video inputs.

10.15 System Topology

10.15.1 The tenderer shall propose an acceptable system topology that will ensure the recording of all events within the CCTV system.

10.15.2 Recorders shall be placed at strategic positions throughout the facility, and network together via the DVR LAN.

10.15.3 The DVR LAN shall allow for the following operations:

1. Transfer of event commands to the appropriate DVR.
2. Configuration of recording schedules and modes of operation.
3. Playback of recorded images.
4. Viewing of Live images.

10.15.4 The management workstation within the central conurol room shall be capable of configuring all DVR's on the network, without the need for local intervention.

10.15.5 The communication between recorder and the server management workstation shall be IP based. The communication media for connecting the various elements of the system will be dedicated fibre optic cables that shall be installed by the security contractor, as well as the DVR LAN.

10.15.6 The offered DVR equipment and technology shall have a proven track record in the local market with established local factory capabilities offering ongoing engineering, upgrade ability and product repair support.

11. FIXED PANIC PUSH BUTTON ALARM SYSTEM

11.1 Panic buttons

The panic buttons shall consist of a latching industrial type red mushroom head button with key release.

The device shall be flush mounted in a standard 100mm by 100mm socket outlet connection box.

These panic buttons are required in all offices where contact between inmates and staff may occur.

11.2 Activation

Activation of any push button shall sound an audible tone in the associated control room and cause the associated icon on the operator control console to flash.

The audible tone may be silenced from the control console causing the icon to remain steady with a red colour. The emergency condition of the icon shall only be reset once the latched button has been reset with the key release.

All panic condition are time and date stamped and logged within the management workstation together with the current operator detail.

12. EMERGENCY RELEASE SYSTEMS:

As specified by the hardware schedule the following emergency release functions shall be provided for sliding cell door locking devices.

12.1 Emergency Air Release System

12.1.1 The contractor shall provide compressed air emergency release tank(s) and valve assembly in order to unlock all cell doors simultaneously in the case of an emergency. The system shall be defined in groups, which shall be activated by operating a manual air valve in the case of a total loss of air and/or electric power.

12.1.2 The emergency release tank(s) and valve assembly shall be installed in a lockable cabinet as per the architectural layout. The cabinet shall be clearly labelled "Emergency release system"

12.1.3 The emergency release system shall be totally manual in operation. Once the system has been activated, the doors shall unlock and remain unlocked until the system is deactivated. Once unlocked, doors may then be manually moved to the open position.

12.1.4 Non return valves shall be installed into the supply line of each tank to prevent a loss of emergency air pressure when the compressor is not loading the tank.

12.1.5 The air lines supplying each group of doors in the emergency release system shall be run in the same raceway/conduit as the normal air supply lines.

12.1.5 Air tubing for the emergency release system shall be a minimum of 6mm outside diameter, and shall be colour coded.

13. SECURITY HOLLOW METAL DOORS AND FRAMES

13.1 Clearance and Tolerances

13.1.1 Edge clearance shall be as follows:

a. Between doors and frames at head and jambs: 3.5mm
b. At door sills where no threshold is used: 10mm max (A.F.F.)
c. At door sills where threshold is used; 20mm max (A.F.F.)
d. Between edges of pairs of doors: 3.5mm

13.1.2 Manufacturing tolerances shall be maintained within the following limits:

a. Frames for single door or pair of doors width, measured between rabbets at the head: Nominal opening width +1.6mm – 0.8mm; height (total length of jamb rabbet): Nominal opening height +1.2mm

b. Cross section profile dimensions:

1. Face: +1mm
2. Stop: +1mm
3. Rabbet: 0.5mm
4. Depth: 1mm
5. Throat: 1.6mm

c. Frames overlapping walls are to have a throat dimension of 3.2mm greater than dimensioned wall thickness to accommodate irregularities in wall construction section.

d. Hardware cut-out dimensions:

1. Template dimensions +0.5mm
2. Hardware location: +1mm

e. Doors:

1. Width: +1.25mm
2. Height: 1.25mm
3. Thickness: 1.16mm
4. Hardware cut-out dimensions: Templates dimensions +0.4mm
5. Hardware location: +0.8mm

13.2 Requirements for Security Hollow Metal Frames

13.2.1 Materials:

Frames shall be constructed of commercial quality steel, which complies with the SATM A366 standard. The steel shall be free of scale, pitting. coil breaks or other surface defects. Meal thickness shall be not less than 2mm.

13.2.2 Fabrication

All frames shall be custom-made welded units of the sizes and types shown on approve shop drawings and in compliance with ASTM E1450 and the SABS equivalent standard. All frames shall be manufactured to ANSI/ NAAMM HMMA 863-90(8d).

a. All finished work shall be strong and rigid, neat in appearance, square, and free of defects, warps or buckles. Pressed steel members shall be straight and of uniform profile throughout their lengths.

b. Jamb, header, and sill profiles shall be as scheduled by the architect and the door and frame details as shown on the approved shop drawings.

c. Corner joints shall have all contact edges closed tight with faces and stops either butted or mitered. Corner joints shall be continuously welded. The uses of gussets of splice plates will be unacceptable.

d. Minimum depth of stops in doorframe openings shall be 16mm and in glass or panel openings shall be 32 mm.

e. Frames will call switches will be provided with factory cut hole and enclosed in an enlarged lock pocket per manufacturers recommendations.

f. Frames having jamb mounted remote operated locks, door position switches, staff stations and/or other electronic hardware will be provided with factory installed back boxes and conduit with compression fitting which shall be grout tight.

g. Frames for multiple openings shall have mullion members which, after fabrication, are closed tubular shapes conforming to profile shown on approved shop drawings, hand having no visible seams or joints.

All joints between faces or abutted members shall be welded and finished smooth. All joints between stops of abutted members shall be welded along the depth of the stop and shall be left neat and uniform in appearance.

h. A Styrofoam filler pad shall be permanently placed underneath each hinge reinforcement.

i. Glass stops to be match drilled and held in place by two (2) Phillips head screws. Mortar guards will be provided at each hole. The screw holes in the removable stops will be 3.2mm larger than the diameter of the screw to allow for adjustment. Screw head will be of sufficient size to conceal the hole in the removal stop.

j. All glass stop screws to be torx self tapping

k. All frames with either stripping shall have a continuous mortar guard at the point of installation. Screw holes to be filed located by installer.

l. Provide mortar guards at all silencers.

13.2.3 **Hardware Reinforcements and Preparation:**

Frames shall be mortised, reinforced, drilled and tapped for all tem plated hardware including surface mounted hardware in accordance with the final approved hardware schedule and tem plated provided by the hardware supplier.

a. Minimum thickness of hardware reinforcing plates shall be as follows;

1. Hinge and pivot reinforcements: 6mm x full width of hinge x 250mm in length.
2. Strike reinforcements; 3.5mm
3. Flush bolt reinforcements: 3.5mm
4. Closer reinforcements: 3.5mm
5. Reinforcements for surface applied hardware: 3.5mm

13.2.4 In cases where electrically operated hardware is required and where shown on approved shop drawings, hardware enclosures and junction boxes shall be provided and shall be interconnected using galvanized steel 20mm conduit, elbows and connectors. Also, where shown on submittals drawings, junction boxes with access plates shall be provided to facilitate the proper installation o f wiring. Access plates shall be the same size as the frame and fastened with a minimum of four tamper proof machines screws, but not to exceed 150mm o.c. All conduit ends to be duburred at the factory. Where frames are to be grouted in places, the conduit shall be connected to lock pockets and boxes with compression type fittings and grout tight. Frames with lock pockets and/or electrically operated hardware, which do not allow access for control conduit installation (by others), shall be provided with the conduit installed to the perimeter of the frame. Bu the hollow metal manufacturer.

13.2.5 **Floor Anchors:**

Floor anchors with two holes for fasteners shall be fastened inside jambs with at least four (4) spot welds per anchor.

a. Where no scheduled, adjustable floor anchors. providing no less than 50mm height adjustment, shall be fastened in place with at least four (4) spot-welds per anchor.

b. Plate thickness of floor anchors shall be the same as frame.

13.2.6 **Jamb Anchors:**

a. Frames for installation in masonry walls shall be provided with adjustable jamb anchors of the yoke a strap type made from the same gauge steel as frame. The number of anchors provided on each jamb shall be as follows;

1. Frames up to 2.25m height: 4

2. Frames 2.25m to 2.5m height: 5

3. Frames over 2.5m height: 1 anchor for each 450mm or fraction thereof.

4. Frames for installation in pre-finished concrete openings shall be purchased and countersunk for expansion bolt anchors and provided with hat shaped reinforcements, same thickness as frame, secured in place with at least four (4) spot welds each. The number and spacing of anchors provided shall be as specified above.

5. Frames to be installed in pre-finished concrete, or masonry openings, but not to be anchored using expansion bots, shall be constructed and proved with anchoring systems of suitable design as shown on the approved shop drawings.

b. Mortar/plaster guards made from no less than 0.5mm steel shall be welded in place at all hardware preparations on frames to be set to masonry or concrete openings. Preparations are to be totally sealed to prevent any mortar, grout or plaster from entering the protected area.

c. All frames shall be provided with two (2) temporary steel spreaders welded to the feet of the jambs to serve as bracing during shipping, handling and installation.

13.2.7 **Removable Glazing Stops:**

Removable glazing stops shall be pressed steel angles 32mm x 32mm minimum, not less than 2.5mm or 32mm x 32 m steel tubes, not less than 2mm. Stops shall be tight fitting at the corner joints and secured in place with hardened tamper proof button head torx self-tapping machine screws spaced 230mm maximum. Stops shall be installed on the most secure (non-prisoner) side of the frame. The frame underneath the glazing stops and the inside of the glazing stop shall be treated for maximum paint adhesion and painted with rust inhibitive primer prior to installation in the frame.

13.3 **Requirements for Security Hollow Metal Doors:**

13.3.1 Materials:

Doors shall be constructed in compliance with all the SABS standards for security doors, and shall be manufactured to the requirements as detailed in ANSI/NAAMM HMMA 863-90(8d) using commercial quality steel, which complies with the correct SABS standard. The steel used shall be free from scale, pitting, coil, breaks or other surface imperfections. The steel shall also be free of buckles, waves or any other defect caused by the use of improperly leveled sheets. Face sheets shall not be less than 2mm.

13.3.2 Fabrication:

All doors shall be custom made of the types and sizes shown on the approved shop drawings, and shall be prepared for hardware per the final approved hardware schedule.

a. Door edge seams shall be welded and finished smooth.

b. Door thickness shall be as specified by the architectural drawings and requirements. All doors shall be rigid, neat in appearance, and free from warp or buckle. Edge bends shall be true and straight and of minimum radius for the gauge metal used.

c. Face sheets shall be stiffened by continuous vertically formed steel sections spanning the full thickness of the interior space between door faces. These stiffeners shall be 1mm minimum, spaced so that the vertical interior webs shall be no more than 100 mm o.c., unless supported by test data, and securely fastened to both face sheets by welding. Spaces between stiffeners shall be filled with fiberglass or mineral rock wool batt-type material.

d. A continuous steel channel shall reinforce the vertical edges, not less than 2mm, extending the full length of the door. The top and bottom edges shall be closed with a continuous channel also not less than 2mm, welded to both face sheets not more than 75mm o.c. unless supported by test data. The 2mm closing end channel shall be continuously welded to vertical reinforcing channel at all four corners producing a fully welded perimeter reinforcing channel.

e. The top end channel shall be fitted with a flush closing channel of not less than 1.3mm. The flush closing channel shall be welded in place at the corners and at the center. Installation of closer channel using screws, security or otherwise shall be deemed unacceptable. The end channel and flush closer channel shall be installed such that they are permanent and non-removable.

f. The security contractor shall allow for one door to be picked at random on site after installation of the door, to be cut opened to check for compliance. One security swing door and one security sliding door will be selected for this purpose.

13.3.3 Hardware Reinforcements:

Doors shall be mortise, reinforced, drilled and tapped at the factory for all template hardware including surface mounted hardware, in accordance with

the final approved hardware schedule and templates provided by the hardware supplier.

a. Minimum sizes for hardware reinforcements shall be as follows;

1. Full mortised hinges and pivots: 4mm
2. Surface applied maximum security hinges; 6mm plate
3. Reinforcements for lock mountings, conceals holders, or surface mounted closer: 2mm
4. Internal reinforcements for all other source applied hardware: 2mm
5. Lock bolt keeper closer: 2mm

13.3.4 **Glass Moldings and Stops:**

Where specified, doors shall be provided with steel moldings to secure glazing included in this contract in accordance with glass sizes and thickness shown on approved shop drawings or detailed else where in this document. If not specified on either of the above the tendered shall allow for 175mm x 700 mm x 6mm high impact glass for all swing and sliding doors equipped with view panels. The following door types will be equipped with view panels unless specified differently else where:

a. Control Room doors
b. Cell doors
c. Hospital ward doors
d. Fixed glass melding shall be no less than 2mm and shall be welded to both face-sheets at 125mm o.c maximum

e. Removable glass stops shall be pressed steel angels 32mm x 32mm minimum, not less than 2mm. Stops shall be tight fitting at the corner joints, and secured with button head, self-tapping torx screws located 230mm o.c maximum.

f. Where glass thickness dictates, 2mm offset surface mounted glass stop shall be used. The corners shall be tight fitting and the glass stop shall be secured to the face of the door using button head, self-tapping torx screws spaced 230mm o.c maximum.

13.4 Finish

13.4.1 All hollow metal doors and frames shall be thoroughly cleaned and coated inside and out with a fine grade corrosion resistant iron oxide-zinc chromate primer. After fabrication, all tools marks and surface imperfections shall be dressed clean by grinding, filling and sanding as necessary to make all faces and vertical edges smooth, level and free of all irregularities. Doors shall be treated to insure maximum paint adhesion and coated on all exposed surfaces with a rust inhibitive primer whish shall be fully cured before shipment.

13.5 ASTM Compliance

13.5.1 All hollow metal doors and frames provided shall comply with the following ASTM standards:

ASTM	F1643-95 Horizontal impact test – Hollow metal sliding detention doors
ASTM F1450-97	Edge crush test – Hollow metal sliding detention doors
ASTM F1450-97	Racking test – Hollow metal sliding detention doors
ASTM F1450-97	Static load test – Hollow metal sliding detention doors
ASTM F1450-97	Horizontal impact test – Hollow metal swinging detention doors
ASTM F1643-95	Tool manipulation attack test – Hollow metal sliding detention doors
ASTM F1643-95	Remote unlocking force test – Hollow metal sliding detention doors

13.5.2 A copy of the relevant manufacturers ASTM certification shall be submitted together with the tender documents.

14. MISCELLANEOUS HARDWARE FOR SECURITY DOORS

14.1 Product Description:

14.1.1 Hinges:

a. Full Mortise Detention Hinges shall be 115mm x 115mm x 6mm, investment cast stainless steel prime painted, with hospital tips and integral studs on both leaves.

Pins shall be hardened stainless steel, concealed and non-removable. Each hinge shall be supplied with eight (8) flat head torx machine screws.

b. Surface Mounted access floor hinges shall be 75mm x 100mm x 6mm, fabricated from bonderised steel and prime painted: Hinge barrels shall be solid with no visible pin line. Pin shall be fully welded. Each hinge lead shall be countersunk and be supplied with four (4) flat head torx screws.

14.1.2 Pulls

a. Grip Type Door Pulls shall be cast of brass or bronze with satin finish unless specified otherwise in hardware schedule. Overall length, 225mm hand hold, 135mm grip clearance, 40mm attachment holes, 200mm o.c. Provide tow (2) oval head torx screws. Provide clear lacquer finished baked for 15 mm at 175 degrees Celsius and allow to cool before packaging.

b. Knob Type Door Pulls shall be cast of bronze with stain finish unless specified otherwise in hardware schedule. Diameter, 80mm projection, 55mm. Provide three (3) oval head torx crews. Provide clear lacquer finish, baked for 15 min at 175 degrees Celsius and allow to cool before packaging.

c. Flush type door pulls, or equal and approved shall be cast of brass or bronze with satin finish unless specified otherwise in hardware schedule. Size, 100mm x 125mm x 4mm x pocket grip 25mm deep. Provide four (4) oval head torx screws. Provide clear lacquer finish, baked for 15 min Celsius and allow to cool before packaging.