16725-H: BUILDING SECURITY SYSTEMS

Applicability:
The information expressed herein is unique to UMHHC owned, operated, and leased facilities.

The Design Professional (A/E) shall adhere to UMHHC Design Guidelines for all work at UMHHC facilities. Any requested deviations from these guidelines, shall be sent, in writing, to UMHHC’s Facilities Planning and Development (FPD). Address the correspondence to the assigned FPD engineer for the given project. The deviation shall not be incorporated into the construction documents until written approval of the deviation is received by the Design Professional.

The Design Professional is fully responsible for the professional quality, technical accuracy, code compliance, and overall coordination of the contract documents. Compliance with these guidelines shall not be construed so as to relieve the Design Professional of any of that responsibility.

The following is an outline/scope for security systems’ functions to be installed in new buildings or renovated spaces owned or leased by UMHHC. Coordination between the security integrator and door hardware installer shall be required for all installations.

Basic Design Philosophies

1. Exterior of complex to be covered by video surveillance cameras (VMS)
2. Access controlled entrances to have card readers, telephone, and dedicated camera.
3. All electronic security system computers, monitors and controls to have dedicated circuits with UPS back-up.
4. Systems will be designed to be as automated as possible, i.e., do not assume security officers will be available to change doors from unsecured to secured state.

Network Topography

UMHHC uses a star configuration with each access/alarm point being a ‘home run’ back to the access control panel.

Definitions

1. Integrator, installer, and/or provider: The company supplying, installing, programming and/or activating the security system (or addition to the security system).
2. Monitoring Station: For all buildings on the UMHHC main campus and select remote site, the ‘Monitoring Station’ is the Facility Control Center in UH 1A201. If the project is off the main campus of UMHHC, refer to program statement.
3. Local level, and/or local area: Locations within 100-miles of Ann Arbor.
4. ACAM (Access Control Alarm Management): The associated work includes all related and necessary modifications to doors, door hardware, power operators, fire alarm, and other systems as appropriate for the project.
5. Egress/Secured Side: The side of the door with the area being secured.
6. Ingress/unsecured side: The side of the door outside of the secured area.
7. Door Open alarms:
   a. Door open: Door is forced open when 'not authorized'
   b. Door propped/door held open: Door is left open for more than a specified (short) time.
8. RTE (Request to Exit): A contact or device that bypasses the door open alarm when the door is opened from the secured side. Door prop, however, is not bypassed.
9. VMS (Video Management System): The associated work includes all related and necessary additions and modifications to system cameras and storage devices.
Qualifications for Installer/Providers of Security Systems

1. All integrators and their employees working on UMHHC projects shall meet the following requirements and qualifications at a local level and must submit evidence accordingly:
   a. Integrators shall be a Software House Certified Advanced Integrator with a factory authorized local service organization that shall carry a complete stock of parts and provide maintenance for the ACAM and UMS systems and related systems under this contract.
   b. Integrators will identify all subcontractors (electrical, etc.) they intend to utilize on the job and the qualifications of these subcontractors.
   c. Integrators and subcontractors must be able to demonstrate their ability to place sufficient factory trained and qualified personnel on the job to complete the project, with the proposed schedule.
   d. Integrators shall have certified employees working on this project. Personnel with specific factory training and certification for the products (s) being installed must perform or directly (by on-site personnel) supervise the installation and startup.
   e. All work performed must be under the supervision of the on-site certified person(s). This section is not intended to limit the use of subcontractors or non-certified person(s) to install cabling, cabinets, equipment and devices.

General Requirements and Notes

1. The types of equipment installed will be specified by UMHHC Security Services and are to be integrated to the greatest extent possible with existing systems being used and monitored at UMHHC.
2. UMHHC has purchased and installed the CCURE 8000 server software, database and licensing. New ACAM equipment shall integrate and utilize this server and its software. Integrator shall provide complete turnkey ACAM solution to be fully integrated with the existing UMHHC Software House Access Control and Alarm Monitoring System.
3. Access Control Alarm Management (ACAM) shall include card readers, electrified hardware, door monitor switches, request-to-exit (RTE) devices, EOL resistor and associated wiring.
4. Contractor shall provide complete turnkey VMS (Video Management System) solution consisting of IP based technologies to be integrated into the Network Video Recording (NVR) platform currently in use by the UMHHC.
5. All wiring and equipment required to interconnect the new equipment to the systems in Monitoring Station is to be part of project.
6. Any addition or change to security systems which are monitored by the Monitoring Station is to be reviewed to determine reprogramming needs. Such reprogramming is to be reviewed and approved by UMHHC Security services and is to be part of the project’s scope.
7. For Hardware and Keying requirements see the appropriate section of the Architectural Guidelines.
8. Electronic security systems equipment will be powered from the emergency power system (critical branch) whenever emergency power is available. In addition to emergency power provide battery back-up to operate system for 30 minutes. Where emergency power is not present provide battery back-up to operate system for 12 to 24 hours. Confirm needed duration with UMHHC electrical engineer.
9. The overall security system, including door hardware, hard key locks, power doors, door hold-opens, fire alarm interface, etc., shall all be coordinated by the A/E with Security when preparing the design. Also, the contractor shall be instructed to carefully coordinate work of all subcontractors in this regard.
10. Low voltage wire shall be run in conduit or within cable trays as directed by Security Services and FPD.
11. Verify with Project Design Manager if plans and specifications need to be submitted to the State (BFS & HFES) for review.
12. UMHHC approved Security System Contractors:
   a. Simplex Grinnell Tyco Fire and Security, (248) 427-5050 x5129 (John Keith).
   c. Siemens Building Technologies, (734) 456-3805; (734) 751-3319 (Mike Atzenhofer).
Related Sections

Basis Guideline: NA
For an explanation of the use of these guidelines, see SID-A-H “Design Guidelines for UMHHC Facilities”

Current edition of the University of Michigan Standard General Conditions, apply to this section.

08710H - “Finish Hardware”
08720H - “Auto Door Operators”
16000H - “Electrical General Requirements”
16010H - “Basic Electrical Requirements”
16050H - “Basic Electrical Materials and Methods”
16110 - “Underground Electrical Service”
16114H - “Cable Trays”
16120H - “Wires and Cables”
16140H - “Wiring Devices”
16195H - “Electrical Equipment Identification”
16450H - “Grounding”
16720H - “Fire Alarm Systems”
16740H - “Telecommunication/Data Systems”
16760H - “Intercom Systems”
16950H - “Electrical Acceptance Test”

Proposal Submittals

1. Documents to be provided by the Contractor in response to proposals shall include:
   a. Pre-engineered submittals, listing all equipment to be used and a high level line drawing indicating the design approach of the system.

Submittals

1. Submit for approval shop drawings and product literature to UMHHC. Shop drawings shall contain title blocks identifying the University's project name and the University's full project number. Submittals shall be marked to indicate the specific models, sizes, types and options being provided. Submittals not so marked will be rejected.
2. Engineered diagram of the system architecture they are proposing including all hardware and software interfaces and cabling.
3. Product Data: Submit manufacturer's catalog cuts and other information showing sizes, materials, finishes, and anchorages/fastenings to adjacent materials and construction.
4. Bill of material with Manufacturers’ names and model numbers for major components. Provide line item pricing for each item with extended pricing for multiple items.
5. Sequence of operation.
6. The Contractor is cautioned that all equipment must be approved. Any equipment purchased by the Contractor prior to approval of the Submittals must be replaced, if rejected, with approved equipment at no additional cost to the UMHHC or any interested party.

Design and Plans

1. Drawings and Specifications - The ACAM System and VMS shall have dedicated detail drawings in Electrical section of the construction plans. The detail drawings shall include:
   a. Control panel elevation.
   b. Riser diagram showing panels and devices on each floor.
   c. Security door matrix which includes door #, door size, hardware set/schedule, location, drawing #.
   d. Door detail and dimensioned elevation for each security door.
   e. Point-to-point wiring diagrams for interface of auto door operators with security system.
2. UMHHC Security Services, Facilities Planning and Development and the access control integrator will review designs for security system on new construction and existing structures.
3. Coordination and hardware review meetings will be set up by the design firm, between UMHHC Security Services, the door hardware consultant and the security system designer prior to bidding of projects.

4. A final walkthrough will take place with the general contractor, UMHHC Security Services representative, project managers and customer prior to acceptance of any work. All doors must be functioning properly in the field as well as within the access control software.

Project Closeout Documents

1. Point List: Electronic data file for all associated hardware and software including, but not limited to readers, operating systems, VMS cameras, ACAM devices, monitors, control systems, intercoms, etc.

2. Inventory Listing: Delivery of a complete inventory listing, both in paper and electronic forms, including the serial numbers of all major components and their installed locations, dates of manufacturer warranties in effect, manufacturers contact information.

3. As-Built Drawings: During system installation, the Contractor shall maintain a separate hard copy set of drawings, elementary diagrams, and wiring diagrams of the ACAM and VMS system to be used for record drawings.
   a. The Contractor shall accurately keep this set up to date throughout the project with all changes and additions to the ACAM and VMS system.
   b. This set shall be available for reference and review at any time during the project.
   c. A complete set of as-built drawings, electronically in AutoCAD R14 or higher and an electronic copy of PDFs shall be provided to the owner within 30 Days after completing the acceptance test.
   d. Three (3) hardcopies of the as-built drawings not less than ANSI C 11”x17” showing all wire runs, devices, device wiring, data panel layout and wiring, and system interfaces.

Acceptance and Testing

1. Prior to the final acceptance of this system by the owner, the Contractor shall complete a comprehensive test to ensure that all components of the ACAM, VMS and other related systems are fully functional and comply with specified sequence of operation.

2. The Contractor will forward a written report of the test results to the owner and/or their consultant.
   a. Upon written notification from the Contractor that the Security System is completely installed, integrated, operational, and the pre-testing completed, the owner and or their consultant will conduct a final acceptance test of the entire system.
   b. Prior to the final acceptance test, coordinate for security related construction clean up and patch work requirements.
   c. All equipment shall be on and fully operational during any and all testing procedures. Provide all personnel, equipment, and supplies necessary to perform all site testing.

3. Upon written notification of successful testing, the owner and/or their consultant may conduct up to two final acceptance tests. These tests may include but is not limited to:
   a. A physical examination of each door and alarm point location to ensure proper installation of newly purchased equipment and materials.
   b. A physical test of each door location and alarm point to verify proper operation of all locks, locking devices, readers, tamper switches, RTE and contacts.
   c. Testing of each individual door to assure proper reporting to the ACAM System workstation of door “held open,” “forced,” “card reject” and “reader tamper” alarms. The ACAM System will be programmed to display an alarm event to include floor plans, action plans (as determined by the owner) and a requirement to manually acknowledge this alarm by an operator.
   d. Testing of loss of power alarm.
   e. Anti-pass back programming.
   f. Testing of each delayed egress door to assure alarm condition reports upon door non-reversible delay countdown and a separate alarm upon door opening.
g. Testing of the delayed egress door to assure door unlocks upon Fire Alarm activation (Contractor responsible to coordinate with Fire Alarm manufacturer and UMHS Maintenance as required. This test may need to occur after normal business hours).

h. Testing of man-trap interlocking doors to verify operations and coordination of any life safety requirements.

i. Verification that there are no alarms lost when initiating devices from two or more points are activated simultaneously.

j. Testing of the ACAM and VMS Interface to assure proper cameras are displayed with appropriate pre-positions (where needed).

k. Testing of each VMS System cameras for verification of views, focus, pre-positioning, and tours.

l. A physical examination of each camera to ensure proper installation and mounting.

m. A review of VMS system programming to assure system titles, tours, shadow tours, masking, and dwell times are complete.

n. A review of intercom communications and interface requirements.

o. A thorough testing of all interfaces as indicated in these specifications.

p. A physical examination of security equipment installation in data closets.

q. A physical inspection of all wire and cable runs and connections.

r. A physical inspection that all wire is tied and bundled with a high level of workmanship and quality.

s. A review of all manuals and system documentation for completeness.

t. Review that training is completed.

4. The owner and/or representative retain the right to suspend or terminate testing at any time during the commissioning process if the system fails to perform as specified.

   a. If testing is suspended or terminated, any fees and / or expenses incurred as related to the delayed testing will be deducted from Contractor’s retainer. The Contractor should not schedule testing until the systems are fully ready.

5. A punch list will be established for all nonconforming tests and will be forwarded to the Contractor.

   a. The Contractor will provide in written form within two (2) working days of receipt of the report their plan to address all nonconforming items and time frame for completion.

6. Once all work is found to be acceptable and in compliance with the Project Drawings and Specifications, the Contractor will issue a letter of “Substantial Completion” indicating start date of system warranty.

7. The Security System shall not be considered as accepted by the owner until all punch list items from the acceptance testing have been removed.

Security Requirements for Selected Areas

ACAM Monitored Doors

1. Door monitor switches - Magnetic flush door contact switches or an alternate approved device are to be installed on all doors with ACAM and those defined by Security during design development phase. The contacts and ACAM are to be monitored by UMHHC Security Services at the Monitoring Station.

Magnetic Door Locks

1. Magnetic locks are to be UL rated. Magnetic locks open upon power interruption. Magnetic locks for egress doors shall be connected to the building fire alarm system to cause immediate release of the lock upon activation of fire alarm system. An emergency release push button shall be located within 5’-0 from doors. (Only utilize magnetic locks if approved by project Design Manager)

Delayed Release of Emergency Exit Doors.

1. General

   a. As permitted by applicable Life Safety or Building Codes and prior variances obtained from the Authority Having Jurisdiction (AHJ) delayed egress hardware with keyed bypass switch are to be installed. These devices will include a Built-In Nuisance Delay
which will trigger an audible warning which is activated for a three second delay of an exit attempt. If the attempt to exit sensor continues to be active after this nuisance delay period, the irreversible unlocking sequence is started.

b. Delayed egress hardware shall be UL listed and connected to the building fire alarm system to cause immediate release of the lock upon activation of fire alarm system.

c. Install a fixed position CCTV camera on the inside of the door to provide adequate facial identification of persons seeking to exit the building. Cameras are to be installed in a secure enclosure and are to be monitored by the Monitoring Station.

2. Operational Sequence for Controlled Fire Exits

   a. An electrically operated lock secures the door in a locked condition at all times, except when the building fire alarm system is in alarm (for emergency exiting), or after continuous pressure has been applied against an installed crash bar for 15-30 seconds, or upon use of a keyed bypass switch.

   b. After delay, lock is released to allow exiting.

   c. After the door closes, the entire system automatically resets itself to normal conditions.

   d. When the emergency exit has two or more doors or only the normally active leaf has the above noted controls. Each inactive leaf has an electrical lock that only releases on fire alarm or power failure.

   e. Keyed bypass switch will have three positions; normal, bypass, and open. In the normal position the system operates as noted above. The bypass position is a temporary bypass (simulating loss of power or activation of fire alarm system). Open is a maintained open.

Pharmaceutical Areas

1. Access into pharmacy areas shall be restricted and controlled by ACAM. Card reader shall be installed at main entrance and at other locations directed by UMHHC Security Services at Design Development phase of project.

2. Provide door monitor contacts for upper and lower doors of “Dutch” doors. “Dutch” doors shall also be furnished with mortise lock sets equipped with RTE switches.

3. Provide VMS system to monitor all alarm points (i.e.; main door, safe, duress button, etc).

4. Provide alarm contact points for narcotic safes. Coordinate technology with UMHHC Security Services during Design Development phase of project.

5. Install duress button at cashier or other locations as directed by UMHHC Security Services.

6. Install intrusion alarm motion detectors as required and specified by UMHHC Pharmacy and Security Services during design phase of project.

Labor and Delivery and Pediatric Inpatient

1. Access into Labor and Delivery and Pediatric Inpatient areas shall be restricted and controlled by ACAM.

2. Install infant security system components at all exit points. Range and area covered by existing infant security systems shall be extended as required for renovation projects.

3. VMS cameras shall be provided at all exits adjoining stairwells and corridors. Monitors and other controls, as needed, to allow staff to identify, grant permission and bypass alarm to parents requesting to move a patient through an alarm entry point.

4. All entry/egress points will alarm and lock when an active tag is detected.

5. Interface infant security with elevators. Consult UMHHC Security Services on procedures.

Inpatient Psychiatry

1. Access into Inpatient Psychiatry area shall be restricted and controlled by ACAM. Card readers are required on all normally used doors into and out of unit. All emergency exit doors are normally hard-key locked. Staff has key to exit. Door locks will not release upon activation of fire alarm (verify operation with AHJ).

2. Video intercoms are required on outside of all perimeter doors to the unit to alert nurses that visitor/staff needs to get in. Video intercom master station with door lock release switches shall be located at nurse station. Door open switch will allow entry, and will bypass door switch monitor alarm.

3. If noted in program statement, also provide fixed and pan-tilt-zoom camera in corridors with monitor and controls at nurse station.
4. Duress call buttons are required at nurse stations. Other locations may be designated by mutual agreement between the unit and UMHHC Security Services. Wherever possible, security cameras will be programmed to target area to the alarm monitor in Monitoring Station.

5. Coordinate with user requirements for alarm notification horns.

**Gift Shop**

1. Access into Gift Shop area shall be restricted and controlled by ACAM. Install card reader at main entrance.

2. If noted in program statement, install VMS to monitor cash register, merchandise area and the access to/from shop. Mount camera inside of shop. VMS to be connected to Monitoring Station.

3. Door monitor switches are required on doors to corridor.

4. Article Surveillance is required at entrance. Local audible alarm horn needed. Activation of article surveillance system will automatically target VMS cameras to the door.

5. Duress call button is required at cashier station to summon security assistance. Duress alarm connected to Monitoring Station.

**Interior, Departmental Separation (For Departments Not Fully Staffed 24-Hours a Day)**

Note: These requirements are to be applied only to departments that are located in a well defined area that can be isolated with doors already included in the project.

1. Access into departmental areas shall be restricted and controlled by ACAM. Install card reader at the main doorway to department.

2. Install door monitor switches on all doors from department to public corridors or other departments. Install RTE’s on secured side of door.

3. If main doorway has power operated doors, the card reader circuit will deactivate the door from automatic entry operation during secured hours. Use of the card reader will, however, reactivate door, and initiate opening sequence. Normal exiting shall always be possible. No keyed switches shall be installed.

**Staff Locker Rooms Off of Public Corridors**

1. Access into locker rooms shall be restricted and controlled by ACAM. Card readers are needed at entrances.

**Link from One Building to Another or Elevator Lobbies**

1. VMS to be installed. Locate so public elevator lobby and link are visible.

**Surgery, Recovery, ICU, Major Computer, and Similar Suites**

1. Noted areas shall be restricted and controlled by ACAM. Install card readers at main staff or visitor entrances.

2. Install door monitor switches on all (public, patient, visitor) entrances to suites and to any fire exits. Install RTE’s to allow exiting without activating door monitor switch alarms.

3. If suite has power operated doors, the card reader circuit will deactivate the door from automatic entry operation during secured hours. Use of the card reader will, however, activate door, and initiate opening sequence. Normal exiting shall always be possible. No keyed switches shall be installed.

4. Install video intercom system and door open switches at nurse stations/computer control desk per section on Inpatient Psychiatry.

**All Labs**

1. Access into labs shall be restricted and controlled by ACAM. Card readers are needed at main entrances.

2. Door monitor switches to be installed at entrances into corridors. Install RTE’s to allow existing without activating door monitor switch alarms.

**Elevators**

1. Elevator controller and cabs to be configured to allow future installations of card readers. Coordinate with project programming.
**Helipads**

1. Access to helipads shall be restricted and controlled by ACAM. Install card reader on entrances to helipads.
2. Door monitor switches needed at all doors.
3. Outside dome, VMS, with pan, tilt, zoom will respond to door monitor switches.
4. Monitors and camera control will be from Survival Flight dispatch center in THC level 4, and, if noted in program statement, from Monitoring System.

**Medication Rooms**

1. Access to medication rooms shall be restricted and controlled by ACAM.
2. Any additional security beyond what was noted above will need to be specifically requested by Users and approved by UMHHC Security Services.
3. All duress buttons are to be co-located with supporting VMS.

**Cashiers Office or Other Cash Handling Facilities**

1. Access shall be restricted and controlled by ACAM.
2. VMS is required. Placement of devices to be determined during design phase of project.
3. Install intrusion alarm motion detectors as required and specified by UMHHC Security Services during design phase of project.
4. All duress buttons are to be co-located with supporting VMS.

**Additional Measures**

1. Any additional security beyond what was noted above will need to be specifically requested and approved by UMHHC Security Services.

**Standardized Equipment**

The following hardware is recommended hardware for access control integrations. These parts and pieces are commonly used and stocked by the University Locksmith Shop as well as the maintenance department. Hardware substitutions will be brought to the attention of the Owner’s Representative for approval.

1. **Access Control and Alarm Monitoring Overview**
   a. The UMHHC currently uses the Software House family of access control panels (iStar) and C-Cure 800 software with the primary system function to regulate the access through specific doors and to monitor various alarm points throughout the facilities.
   b. This system is utilized to locally control and operate door-locking devices both through the use of time schedules and proximity card readers.
   c. The system will monitor door openings, monitor alarm points, report alarm conditions, and permit the printing (to screen and printer) of management reports. Building perimeter integrity will be monitored through the use of door contacts.

2. **Controllers**
   a. Access control panels (ACP’s) shall be iStar Intelligent Network Series.
   b. Access control panels and similar equipment shall be mounted in communication rooms.

3. **Intelligent Network Controller**
   a. Field device panels shall be Software House iStar Pro (16 port) wall mounted units which shall provide full distributed processing of access control levels and alarm monitoring operations.
   b. Provide necessary external Software House APS power supply(s).
   c. Batteries shall be Altronix BT12/6 12VDC/7AH.
   d. The ACP’s in each communication room need at least two 24 volt power supplies. One is for ACP power; the other is for electrified hardware.

4. **Card Readers and Card Technology**
   a. The Access Control System shall be based on proximity card readers capable of reading HID DuoProx II Corporate 1000 35-bit 125 KHz proximity access control cards.
   b. All readers shall be Software House RM style proximity readers. Unless otherwise noted readers shall match existing building type.
5. VMS
   a. VMS System cameras to be integrated with the access control and alarm monitoring system and to allow for the real-time monitoring of and review of archived events.
   b. Install all components of the VMS System as described, including all mounts, housings, lightning protection for exterior mounted cameras, and other material, devices, hardware, software, labor or permits required to make this equipment fully operational.
   c. All camera wire shall be concealed and never exposed to public access including stairwell cameras.
   d. Installation of CAT 5 or 6 cables shall be by the Contractor designated by UM. Local 120VAC power shall be provided at exterior and PTZ camera locations as required.
      i. Provide each camera location with an RJ-45 network connection in a secured location not accessible by general public.
      ii. Security Contractor to provide necessary patch cable from camera to RJ-45 network connection.
      iii. Security Contractor to provide necessary patch cables within Data Closets from patch panel to network switch.
   e. All VMS devices will be IP based, integrate with the NVR system and shall meet or exceed the operational specifications of the AXIS™ product line. All cameras shall be PoE unless otherwise specified.
      i. Indoor fixed view camera shall be mini-dome or approved equal. Special applications may require vandal resistant housings and will be specified per project as needed.
      ii. Exterior building mounted fixed view cameras shall be a model which is approved and has weather tight HOV housing with wall or parapet mount based on location and local 120VAC power as needed.
      iii. Exterior Pan/tilt/zoom cameras shall be an approved model. Integrate with approved exterior housing and local 120VAC power.
   f. Security Contractor shall integrate into management software provided by University of Michigan.
   g. All cameras and encoders shall use H.264 compression. Mega-pixel models may be specified at the owner’s discretion.
   h. All cameras shall be color, CCD type, with equivalent of 500 lines per inch resolution, 1/2” or 2/3” lenses, auto iris, with sensitivity to clearly record scenes from 0.1 foot-candle of illumination to bright sunlight.
   i. Pan-tilt-zoom (PTZ) cameras will be intelligent. These cameras can PTZ to specified targets and do patrols when an alarm contact is closed, or when instructed by the officer. They will also be fast pan, with the ability to do continuous 360 degree scans if desired.
   j. Coordinate with UMHHC Security Services to reprogram switcher, monitors and recording devices as needed to meet needs of cameras being installed.

6. Devices to Bypass Open Door Alarms
   a. Install Request-To-Exit (RTE) switches in mortise locks or panic bars. Coordinate with hardware specifications for inclusion of RTE switches. The RTE switches will then bypass the door open alarm when a person exits the space from the “secure” side of door.
      i. If door has an electric strike, select a strike with a latch bolt monitor.
      ii. Contacts to be rated 120 volts, 1 amp MAX.
   b. If a door needs to be retrofitted and rework of the door and door frame is cost prohibitive, it is acceptable to install motion detectors in lieu of RTE switches. The motion detector will then bypass the door open alarm where a person exits the space from the “secured” side of the door.
      i. All motion detectors (except for the required dual-technology detectors in pharmacies) are to be of the passive infrared type, have high sensitivity, adjustable ranges, and are to be designed to prevent false activation.
      ii. Detectors are to operate 12 or 24 volts AC/DC and have one or more C contacts. Output contacts to be rated 120 volts, 1 ampere.
      iii. Detectors are to be compact and unobtrusive in appearance and trim plate.
      iv. Detectors to have a two (2) year warranty and be UL rated for application if UL is then rating such devices.
7. Electrified Hardware (Mortise Locks & Electric Strikes)
   a. See architectural sections of these guidelines for electrified hardware requirements.
   b. Electrical strikes shall be normally specified to be fail-secure (FSE) conditions; loss of power locks the door.
   c. Mortise locks shall be provided with RTE switches.

8. Magnetic Locks
   a. Magnetic locks will typically be powered by 24 volts DC and shall, by their nature, be fail safe to unlock. In buildings with a generator, the power will be restored in 10 seconds. In addition to emergency power provide battery back-up to operate system for 30 minutes. Where emergency power is not present provide battery back-up to operate system for 24 hours. Confirm with UMHHC electrical engineer.
   b. Magnetic locks shall have a minimum locking force of 750 pounds, and shall have no exposed wiring.
   c. Lock shall have a built-in sensor for remote sensing of status of magnetic lock and built-in electronics to eliminate residual magnetism.
   d. Magnetic locks shall be interface with fire alarm system to release the lock upon a fire alarm.

9. Door Monitor Contacts
   a. Door monitor contacts shall be Sentrol (GE) series, mounted in door frame and to be hidden from normal view. If a door needs to be retrofitted and rework of the door frame is cost prohibitive, it is acceptable to surface mount contacts on door and frame. If this is done, however, the detector shall be mounted on secured side of door; and shall have no exposed wiring.
   b. Doors that have a secondary, typically inactive leaf will need to be contacted and managed as if a part of the access controlled door.
   c. Overhead doors shall receive a heavy-duty surface mounted contact with armored cabling.

10. Door Control Module and Housing

11. Door Locking Power Supplies
    a. For applications utilizing local door locking power supplies, the supplies shall be provided as part of the door hardware package.
    b. Contractor shall coordinate with the door hardware supplier, the exact mounting location and coordinate power requirements. When mounted locally the power supplies should be mounted on the secure side of the door.
    c. The Contractor is responsible for the coordination and any costs, if applicable, when working with the electrical contractor to tie in 120VAC power, directly to the power supplies.
       i. All door locking power supplies shall be on the facility Emergency circuits (critical branch).

12. Intercom
    a. Contractor shall provide direct point to point intercom door stations and master stations as indicated per project specifications.
    b. Door stations shall be approved Aiphone models series for interior and exterior units.
    c. Master stations shall be approved Aiphone model.
    d. Contractor shall provide all necessary power supplies, wire and configuration.
    e. Provide interface with ACAM system for door unlocking.

System Interfaces

1. Video Management System
   a. The access control and alarm monitoring system shall interface with the VMS System and provide the necessary communication for the VMS System to call up appropriate cameras and initiate preposition VMS functions.
   b. Upon activation of an alarm point, the Access Control System will communicate with the VMS System, call up and move the camera(s), if applicable, to designated positions, and direct the VMS camera(s) previously identified by the Owner to designated monitors.
   c. All VMS will be IP based as referenced elsewhere within this document.
2. Fire Alarm  
   a. Where required by fire codes, the facility’s fire alarm system shall provide for the unlocking of delayed exit egress doors in a manner consistent with all applicable building codes and as approved by the Authority Having Jurisdiction (AHJ).  
   b. These locking systems shall be fail-safe and shall unlock doors, without delay, upon activation of the facility’s fire alarm system.  
   c. The Contractor shall be responsible and work with the fire alarm supplier and the AHJ to ensure operation of locking devices is code compliant and that all equipment, wiring, programming, software and hardware needed are included in the cost of the system.  
   d. Except for reporting that a door has been unlocked, the interface between the Access Control System and the fire alarm system shall be transparent to the user and shall not require any user action to unlock doors in the event of fire alarm conditions.  
   e. In the event a door is, after being unlocked by activation of the fire alarm system, opened, the Access Control System will report this alarm condition.  
   f. Fire Alarm system functions (i.e.; providing positive latch on doors with electric strikes) shall not be performed by the ACAM system.  Fire alarm interfaces shall be located adjacent to each door where control via the fire alarm system is required.

3. Digital Video Recording  
   a. The Contractor shall provide for an interface with the Network Video Recording (NVR) platform.  
   b. The Contractor shall program with the system database alarm video with associated system alarms and/or coordinate with the current NVR system Contractor.

4. Infant Security System (HUGS)  
   a. The Contractor shall provide for an interface with HUGS Infant Security System if installed in the facility or part of project scope.  
   b. The Contractor shall provide all necessary equipment including panels, door modules, software licensing, etc. to seamlessly integrate into the existing system.  
   c. The Contractor will coordinate all installation with the HUGS system Contractor.  
   d. Interface to include VMS camera call up upon HUGS exciter activation.

5. Duress Button  
   a. The Security Contractor shall provide and install a duress button at the locations indicated on the project drawings and tied into iStar panel inputs.  
   b. Unless otherwise specified the device shall be a Honeywell 269R. Substitutions may be made with Security Services approval.  
   c. When required, provide a supervised wireless solution with hand-held devices for consultation room locations. Make and model dependent upon owner approval.  
   d. Device activations shall be programmed to initiate an alarm to the UMHHC Security Facility Control Center (FCC) via the Software House system.

6. Automated Doors, Sliding Doors and Other Special Doors  
   a. Carefully coordinate specifications for security systems with those of automated door/special door supplier.  
   b. Operation of door from unsecured side.  
      i. Completed system shall allow normal door operation by actuator, or motion detector, whenever door is in unsecured mode.  
      ii. When in secured mode, actuator and/or motion detector on unsecured side shall be deactivated. When access control system is operated by person trying to gain access, and clearance is given, the door shall open with no further action by person trying to enter.  
      iii. The access control system will automatically change status of door from secure to unsecured operation. No local key switch shall be installed for this.  
   c. Normal exiting will not be restricted.  
   d. Confirm operation of break-away function on sliding automatic doors, and coordinate locking and monitoring hardware as required within limits of Codes.

7. General  
   a. Carefully coordinate all hardware for doors with architectural trades to ensure compatibility.  
   b. Extreme caution in coordination of hardware is needed with doors with automatic openers, remote releases, etc. Automatic doors with ACAM shall be wired so the access control system directly opens door when the door is in secured mode.
c. All doors in fire or smoke rated partitions shall have a positive latch at all times. Carefully coordinate this on doors with electric strikes, interfacing with the fire alarm system may be required.

d. Install RTE switches in door hardware to minimize false activation of alarm contacts or use motion detectors as noted in previous section.

e. Security and door hardware systems will always allow immediate exiting from secured side of door. The only exception is emergency exit with delayed release as noted above.

**Installation Requirements**

1. **ACAM and VMS Wire Installation**
   a. The Contractor shall provide all ACAM wire in support of each security device including system data panels and to each door or portal controlled or monitored, etc. utilizing cable trays or conduits as directed by Security Services and FPD.
   b. All VMS wire shall be current MCIT standard either CAT-5 or CAT-6. Provide required low voltage power cable as necessary as indicated on drawings to specified exterior mounted cameras.
   c. All wire shall be plenum rated (where required) and meet the ACAM system manufacturers recommended specifications.
   d. ACAM wire shall be what is minimally required by the manufacturer and UMHS Standards.
   e. All wire shall be UL listed and shall meet all national, state and local code requirements.
   f. Wire installation shall be certified and run continuous from device location to the termination point with no splices.
   g. All wire shall be home run to designated Data Closet where it will interface with field patch panel devices and network switches.
      i. NOTE: all VMS system wire runs shall not exceed 100M or 328 from device to Data Closet
   h. Wire run to field devices and system data panels shall be neatly installed with wire ties as appropriate, pulled tight with slack removed, and routed in such a way to allow for free access to the equipment located within the device enclosure.
   i. All device punch-outs shall have grommets or other strain relief available to avoid excess tension or abrasions to the wire.
   j. Wire shall not be taped or wire tied, or secured in any other fashion to existing conduit or other overhead structures nor shall it rest on the ceiling tiles or support system.
   k. All wire shall be marked at both ends using cable marking tape. Wire connections to the access control panel are to be clearly labeled.
   l. Spare cables shall be marked appropriately and neatly bundled out of the way.
   m. All wire around door shall be run within conduit.
   n. Wire may run open once inside secured Communication Closet, however, shall be bundled and run through wire guides, harnesses, or other cable management devices down wall to termination point.
   o. Provide surge protection on all exterior mounted cameras that are exposed to potential lightning strikes

2. **ACAM and VMS Wire Pathways**
   a. Provide all necessary, raceways, core holes, wall penetrations, sleeves, wire support (J-hooks) etc., to accommodate the ACAM System wire, outside of what is provided by the General Contractor.
      i. Minimum conduit size is 3/4 inch.
   b. All low voltage wire shall be run in conduit or within cable trays as directed by Security Services and FPD. All wire run through hallways and above ceilings that is not in cable trays or conduits shall be installed with dedicated supports using approved J-hooks provided and installed by the Contractor.
   c. Provide conduit rough-in at all doors to meet door hardware requirements and stub up above ceiling to accessible location.
   d. All penetrations through fire rated partitions and slabs shall be sleeved and appropriately filled using contemporary and approved UM fire proofing techniques.
e. All low voltage and communications wire shall be appropriately ran and isolated from high voltage power.

f. All junction boxes must be covered and contents labeled when appropriate (i.e. “junction box with relay for handicap button”).

3. General System Programming
   a. All Security Systems shall be completely programmed consistent with the UMHHHC system.
   b. Contractor will work with the owner’s designee to program the VMS system to include VMS camera titles, pre-positions, camera call-ups and display with access control system interface, masking, tours, shadow tours, and macros.
   c. Contractor shall anticipate working with the owner for the initial programming of the access control system to include nomenclature, action plans, floor plans, access levels, codes and clearance rights, time of day schedules, locking and unlocking schedules, alarm shunts, etc.
   d. Immediately after initial programming system back-ups shall be completed.

4. VMS Installation and Programming
   a. Camera locations are indicated on system plans; however, the Contractor shall coordinate exact mounting location, heights and anticipated camera view with the owner and/or Consultant before installation.
   b. All IP based cameras shall be minimally configured to allow for multiple video streams based on the owners needs.
   c. Document all IP based cameras MAC address and exact location.
   d. Configure cameras minimally 4CIF resolution.
   e. Contractor shall closely coordinate with MCIT all network switch QoS setting, IP addresses, subnet masks, etc.
   f. Contractor shall closely coordinate with MCIT all network switch operational requirements (layer 1 or 2) and VLAN configuration needs to isolate video traffic.
   g. Coordinate with MCIT all interfaces with PoE switches, as provided by others, and with exact port to plug into.
   h. Provide necessary patch cables from cross connect patch panel into network switch within room Data Closets.
   i. PoE network switch shall be provided by others to support all IP cameras.
   j. All cameras and camera power supplies shall be on the facility Emergency circuits.

5. ACAM Installation and Programming
   a. Install all readers, intelligent controllers, I/O devices, and other related equipment.
   b. Contractor shall work closely with a UMHHHC designee to assure that system database configuration, naming conventions, and other requirements are properly coordinated to match current programming standards.
   c. UMHS MCIT shall provide, configure and maintain all required servers & workstations. Contractor shall work with Architect, MEP, UMHS Facilities Engineering, UMHS Security, MCIT Distributed Services, MCIT EDEM, MCIT Security and MCIT Networking for system and connectivity requirements, and plan sufficient on site and consultation time to ensure systems integration success to Owner’s satisfaction. This is in addition to labor and training provided for any other tasks specified herein. Provide also to Owner at least two licenses of any client based software and any other software/firmware needed for a complete and correctly operable installation.
   d. Security Contractor responsible to fully review the door hardware schedule and related sequence of operations information and to assure door operation conforms to the requirements.
   e. Minimally, readers shall be programmed to report “held open”, “forced,” “card reject”, “reader tamper” and “loss of communications” alarms.
   f. Configure iStar panels to report power and loss of communications alarms.
   g. Intelligent Controller panels shall have door tamper switches and be programmed to report and alarm when the door is opened.
   h. Intelligent Controller iStar devices shall be secured within a lockable cabinet and mounted within specified Data Closets as indicated on project drawings.
      i. Panel shall be equipped with a network interface connection to allow each panel to reside on the UMHHHC LAN/WAN infrastructure.
ii. Provide standby batteries sufficient to operate card readers, lock interfaces, infrared detectors, and other attached devices for a period of at least 4 hours in each panel. Provide a minimum of 7 amp-hour battery backup.

iii. Panel and any network device server shall be wired through power supply with battery backup.

i. Contractor to tie in 120VAC Emergency power circuit, directly to the iStar panel/external APS power supply(s).
   i. Panel and/or power supply may not be plugged into standard wall mounted receptacle and must have a hardwired connection.
   ii. Access control panel and power supplies shall be on dedicated circuit(s). This circuit will be on emergency power where available.
   iii. Panel and any network device server will be wired through power supply with battery backup.

j. Contractor shall closely coordinate with MCIT all network interfaces between the panel and network to include QoS settings, IP addresses, subnet masks, etc.

k. iStar panels shall be bonded to communication closet grounding bars.

l. Install iStar panel(s) at dedicated wall space within Data Closets.
   i. The installation of multiple panels shall be such that they are vertically aligned.
   ii. Provide wall mounted wire trough for cable feed management into each panel.

m. Provide within each locked iStar panel cabinet, a schematic diagram of that particular panel, indicating all field device and termination points.
   i. Note: in order to provide for future changes of this system, no data panel shall be configured to more than 80% of its capacity based on the purchase and installation of all system components including access control, security monitoring, and other functions. Panel configuration shall be based on this limitation.
   ii. The MAC address and IP address for each panel/device will be posted on the inside panel door.
   iii. Each panel will have a list of readers (door number) connected to it located on the inside cover.

n. Exterior readers will be weather proof and installed in a weather resistant manner consistent with the manufacturers recommendations.

o. Card readers must be mounted in accordance with UMHHC FPD guidelines.

p. Contractor shall provide all required mounting hardware and back boxes for readers.

q. Contractor shall coordinate a network connection to each panel.

r. All portals which are part of a defined ACAM perimeter shall include door monitor switches with REX unless otherwise noted during design phase.

s. Door Monitor Switch
   i. Door monitor switches will be surface mounted or flush mounted on the opposing side of the door from the hinges. The switch will be mounted on the top of the door and will be no further than three inches from the interior portion of the door frame.
   ii. Surface mounted switches will have armored cable between the switch and the cable entrance hole in the door.
   iii. Surface mount switches will have tamper resistant screws to attach switch to door and door frame.
   iv. A screw-locking adhesive such as ‘Loctite’ will be used to secure all screws.
   v. Flush mount switches are to be mounted in the top portion (header) of the door frame and in the adjoining portion of the door.
   vi. The holes for flush mounted door switches must be drilled the exact size for the switch being used. A tight friction fit must be achieved.
   vii. No hinge contacts are to be used.

6. Electrified Door Locking Hardware
   a. Specified doors will have electrified door locking hardware provided as part of the hardware package.
   b. Closely coordinate pre-installation rough-in needs to assure the Software House system appropriate interfaces as required within these specifications.
   c. The Contractor is responsible to interface with all 120VAC and low voltage lock power supplies which are provided.
i. All door locking power supplies shall be on the facility Emergency circuits.

d. Contractor shall provide and install communications wire, provide necessary terminations to the specified hardware (electric mortise locks, electric latch retraction units, delayed egress units, mag locks, emergency push buttons, door position contacts, etc.) and is responsible to make each access control point fully functional as described in the hardware schedule sequence of operations.

e. The Contractor shall assure all door locking devices are code compliant. Where applicable, provide necessary fire alarm interfaces to meet life safety code compliancy as defined by the local Authority Having Jurisdiction (AHJ). Contractor is responsible to work with the fire alarm supplier for any system tie-ins.

f. Contractor will be responsible for all low voltage wire between the iStar panels and door lock which shall include the card reader, power supply (as applicable), and REX and Electric Thru Wire hinge.

g. Contractor shall also be responsible for all terminations and testing of locks.

h. Contractor shall make operable the provided door locking hardware, alarm contacts, and other components as indicated in the facility plans.

i. Installation shall be consistent with the manufacturer's specifications and all applicable codes and standards.

j. Each identified portal or doorway with magnetic contacts shall report as an individual point to the Security System.

k. Grouping of multiple points into a zone shall not be permitted. Cases where there are double doors may report as a single alarm monitoring point.