

SECTION 281300

ELECTRONIC ACCESS CONTROL SYSTEM (EACS)

PART 1 - GENERAL GUIDELINES

1.1 GENERAL

- A. This Section defines the general design requirements for an Electronic Access Control System that shall be followed for all OFCC Technology construction projects.
- B. Refer to Sections 8500, Technology Systems, 28 16 00 Intrusion Detection System, and 28 23 00 Video Surveillance System for additional information.

1.2 QUALITY ASSURANCE

- A. National Fire Protection Association.
- B. NFPA 730 – Guide for Premises Security
- C. NFPA 731 – Standard for the Installation of Electronic Premises Security Systems
- D. National Electric Code.
- E. American with Disabilities Act.
- F. Underwriter's Laboratory.
- G. Latest ANSI TIA/EIA-568, 569, 606, 607 Standards and Eleventh Edition (or later).
- H. BICSI Telecommunications Distribution Methods Manual (TDMM).

1.3 SYSTEM WARRANTY

- A. **The Access Control System and software shall be fully warranted for three (3) years from date of substantial completion by the contractor and manufacturer. If any defects are found within this warranty period, the defective system component shall be replaced at no extra cost to the Owner for parts or labor. Provide a statement of this warranty with the O&M manuals and to the Director of IT. Make available a service contract offering continuing factory authorized service of this system after the initial warranty period.**

1.4 GENERAL

- A. Base System - Furnish an Electronic Access Control System (EACS) to provide automated control and credential based access to building perimeter and interior spaces. In addition, the EACS, where required by Owner, shall have a complete suite for badge creation/printing and basic visitor management.
 - 1. Optional scope – Provide an Integrated Security Management (ISM) system that provides a simple and easy-to-use graphical user interface incorporating aspects of Electronic Access Control, Intrusion Alarm, Video Management, Visitor Management, Background Checks, and Intercom systems.
- B. The EACS shall be configured as a distributed system with centralized server, and control panels located either in TR spaces or out at each controlled portal. District wide solutions may have fail over servers. The servers can be virtualized.

1. In the event of a communications failure between the host server and the remote controllers, the controllers shall continue to make local access control decisions and save all transactions in memory until communications are restored. At that time the controller shall upload all stored transactions to the Central Server.
 - C. When a District has more than one building, the Central Server shall be located in one of the District's buildings and the other buildings shall be attached to the Central Server via the Wide Area Network. All buildings in the District shall interface to the Central Server and Control Consoles.
 - D. Provide a minimum of one (1) complete workstation with monitor/keyboard/mouse in each building, pre-loaded with all EACS software and clients.
 - E. Provide a minimum of one (1) complete workstation with monitor/keyboard/mouse/camera/printer in district, pre-loaded with all required EACS software and clients.
 - F. Credential Readers supporting various technologies shall provide data from user credentials via a door control unit that includes the electrical interface to the reader as well as inputs for door sensors and relays for outputs.
 - G. The following doors shall have EACS at a minimum
 1. Main Entry and Secure Vestibule
 2. Additional Public/Event Exterior Entrances
 3. Staff Exterior Entrances
 4. Kitchen Delivery Exterior Entrance
 5. Loading Dock Exterior Pedestrian Door Entrance.
 6. MER
 - H. Avoid providing key locks and dogging hardware on doors which have EACS control.
- 1.5 Door Control
- A. System shall include door control modules to accept inputs from door sensors, credential readers, and other door control inputs, and provide lock/unlock functionality to local controlled doors.
 - B. System shall utilize distributed Architecture which allows door access information to be stored locally for continuous operation in the event of loss of network connectivity to system server.
 - C. Panels to be located in the TR spaces or locally at each door and provided with IPconnectivity.
 - D. Power for panels to be sourced from building generator with battery back-up for short duration operation.
 - E. Provide panels for elevator control.
 - F. Optional – Provide I/O panels and other hardware for connection to building paging system, Building Energy Management System, and Building door intercom systems.
 - G. Door access to be granted based upon door group, user group, individual user, and TOD schedules.
 - H. Controllers to provide additional interface with automatic door openers, local door intercom door release, remote push button door release, and system wide threat level settings.

1.6 Credential Readers

- A. System to utilize multi-technology readers that can utilize proximity and smart cards. Options for keypads and biometrics as required by Owner.
- B. Readers shall have the ability to perform standard lock/unlock operation as well as secondary specialized functions with double/triple taps, etc.
- C. Readers located in elevator cab where required to restrict access.

1.7 Door Hardware

- A. Controlled doors to be provided with electronic locks consisting of electric strike, electric latch, electrified panic, electrified trim, integrated locksets (reader built into hardware) or electromagnetic lock. Electronic door hardware to be provided with low voltage power from either local power supplies or centralized power supplies in the TR spaces.
- B. Door locks to be operated on building generator and/or battery power for a fully functioning opening in the event of the loss of normal building power.
- C. Access controlled doors to be provided with request to exit alarm shunt devices (hardware based or local PIR motion detector) to prevent forced-door alarms upon valid egress.
- D. Access controlled doors to be provided with door position switches.
 - 1. All exterior doors to have door position switches and have the door status monitored through the EACS.
- E. Optional – Access controlled doors to include latch position/lock monitoring hardware.
- F. Wireless door locking hardware should be considered, recommend real time monitoring with full alarm functionality and battery life monitor.
- G. Consider integrated locksets with direct network connection and Power of Ether (PoE) lock power on a single CAT 6 drop.
- H. Infrastructure at each controlled doors including wall boxes, door frame connections, conduit and low voltage power and control cabling.

1.8 Badge/Credential Creation

- A. Equipment to create and print single or double sided, color credential cards including PC workstation with color camera and color 2-sided badge printer. Provide quantity of stations as required by Owner's program and use requirements.

1.9 Visitor Management

- A. Provide visitor management software module along with workstation and color camera and printer to enroll visitors and create and print out visitor badges,
- B. Optional – Provide enhanced features including license reader and on-line sex offender database look-up.

1.10 Software

- A. Graphical Maps

1. System to provide graphical maps with building floor plans which include real-time, m interactive icons for all controlled points. Maps to allow quick access to perform basic lock/unlock/status functions at individual doors.
- B. Reports
1. System to provide both pre-configured and custom configurable system wide reports on all levels of activity throughout the system
- C. Alarm Log
1. System to provide a real time alarm/event log which displays system events in real time with provisions for acknowledging events, silencing alarms, searching for events, etc.
- D. User Management
1. System to provide interface for creation and management of individual users including totally customizable user information fields.
- E. Door Management
1. System to provide interface for creating and managing individual doors and control points along with groups, rules based privileges, threat levels, time of day schedules,
- F. System Management
1. System to provide real time monitoring and status of all connected hardware and servers.
- 1.11 Optional
- A. CCTV Integration – Provide direct network or serial based communications with CCTV system to tie alarm events to video surveillance system, to provide access to live video through the EACS interface and icons on the graphical map,
 - B. Building Management Integration – Provide interface and programming to trigger building systems such as A/C, lighting, etc. by EACS events such as first card reader in.
 - C. Intrusion Alarm Integration - Provide direct network or serial based communications with Intrusion Alarm system to activate functions on the alarm system based upon card reader input, and to incorporate alarm points in the live view and graphical map interfaces.
 - D. Building Paging Integration – Provide interface to broadcast pre-recorded messages based upon EACS activity such as change in threat level, lock-down, etc.
 - E. Door Intercom Integration – Provide interface with door intercom system to allow remote unlock of doors through intercom master stations.
- 1.12 Special Operations
- A. Provide secure vestibule operation at main entry with outer entrance doors, inner vestibule doors, and Office Entry Door each controlled as a separate point.
 - B. Provide panic duress capability in the Main Office, Principal/Vice Principal Office, Counselor's Office, and other areas identified by the Owner.

1.13 TRAINING

- A. **Provide training to the District's personnel. Training session(s) shall cover the following topics at a minimum:**
 - 1. **System Equipment Connectivity**
 - 2. **Device Configurations**
 - 3. **Operation, maintenance, and upgrade procedures.**
- B. **Training to be arranged with District personnel and as required based upon a new system or a system expansion.**
- C. **Training to occur in maximum of 2 hour increments per personnel or groups or personnel.**
- D. **Consider requiring Contractor to provide manufacturer training vouchers for a portion of the training, which are valid during the warranty period.**
- E. **Training shall be by certified manufacturer instructor.**
- F. **Training schedule shall be coordinated with District personnel and their needs.**
- G. **Training plan, time line, and agenda shall be provided to District IT personnel and signed off by District and Contractor.**
- H. **Warranty certificate and agreement shall be provided to District IT personnel at initial training session.**
- I. **Provide a digital video copy of the training sessions.**

END OF SECTION

SECTION 281600

INTRUSION DETECTION SYSTEM

PART 1 - GENERAL GUIDELINES

1.1 GENERAL

- A. This Section defines the general design requirements for an **optional** uniform Intrusion Detection System that shall be followed for all OFCC Technology construction projects.
- B. Refer to Sections 8500, Technology Systems, 28 13 00 Access Control **System** and 28 23 00 Video Surveillance **System** for additional information.
- C. Due to the varied nature of use for individual facilities, the use of a building wide intrusion alarm system needs to be discussed with the Owner during the programming phase. A building wide intrusion alarm system is not a required technology component.
- D. Where an intrusion alarm system is part of the building project, the following specifications shall be utilized as a guide for system design.

1.2 SECTION INCLUDES

- A. Intrusion Detection System.
- B. Uninterruptible Power Supply (UPS).

1.3 QUALITY ASSURANCE

- A. National Fire Protection Association.
- B. NFPA 730 – Guide for Premises Security.
- C. NFPA 731 – Standard for the Installation of Electronic Premises Security Systems.
- D. National Electric Code.
- E. American with Disabilities Act.
- F. Underwriter's Laboratory.
- G. Latest ANSI TIA/EIA-568, 569, 606, 607 Standards and Eleventh Edition (or later).
- H. BICSI Telecommunications Distribution Methods Manual (TDMM).
- I. UL 1610 -- Central-Station Burglar-Alarm Units.
- J. UL 1023 -- Standard for Safety Household Burglar-Alarm System Units.
- K. UL 609 -- Standard for Safety Local Burglar Alarm Units and Systems.
- L. UL 365 -- Standard for Safety Police Station Connected Burglar Alarm Units and Systems.
- M. UL 365 -- Standard for Safety Police Station Connected Burglar Alarm Units and Systems.
- N. Products -- Factory Mutual approved.

1.4 SYSTEM WARRANTY

- A. ***The Intrusion Detection System and software shall be fully warranted for three (3) years from date of substantial completion by the contractor and manufacturer. If any defects are found within this warranty period, the defective system component shall be replaced at no extra cost to the Owner for parts or labor. Provide a statement of this warranty with the O&M manuals and to the Director of IT. Make available a service contract offering continuing factory authorized service of this system after the initial warranty period.***

1.5 System Components

A. ***Main System Control Panel***

1. ***Control panel to provide network and phone system (in the case of a remote dialer) interface. Consider option for IDS which is an integrated platform with the EAC (281300) system.***

B. ***Keypad entry station (asa required)***

1. ***Keypad with alpha numeric display for annunciating and local arm/disarm of security system zones and partitions. Quantity and location as required.***

C. ***Detection Devices (as required)***

1. ***Motion Detectors – Utilize as primary sensing device within facility to indicate presence during restricted times. Utilize dual technology devices to minimize false alarms. Utilize various coverage patterns to provide appropriate coverage of all areas required to be covered.***
2. ***Door Contacts – Utilize balanced magnetic contacts for door position. Contacts maybe utilized by EACS as well so configure number of poles accordingly.***
3. ***Glass Break – Utilize for coverage of large glass expanses, backup with motion detector within space.***

D. ***Annunciation Devices (as required)***

1. ***Keypad entry stations to also provide alarm point/zone/partition alarm status information.***
2. ***Building siren (interior or exterior mounted)***
3. ***Interface with paging system for building wide alarm tones***
4. ***Telephone system dialer***

1.6 SYSTEM OPERATION

- A. Upon entering a valid access code via a system control keypad, the system shall disarm the applicable zones, disarm the alarm system, and log the transaction pertaining to time, date, and user.
- B. The Intrusion Detection System shall provide the following functions:
1. A system control panel, control keypads, magnetic door contacts, motion sensors, glass break sensors, and alert sirens.
2. Provide interconnection to the District provided dedicated telephone connection for monitored response to after-hours alarms. Consider cellular backup system.
3. Provide interconnection to the central control panel for monitoring all applicable doors with door contacts.

4. Option for system to be fully integrated with the building's EACS, CCTV System and Paging System.
 5. Option for the system to be integrated with the building lighting system and activate the corridor lights and other selected areas in the event of alarm activation.
 6. The System shall be supervised, i.e. power failure, line cuts and communication failures shall signal the monitoring station(s) of the problem.
 7. The System shall provide monthly reports, detailing as a minimum:
 - a. Alarm System usage.
 - b. Door Openings.
 - c. Door Closings.
 - d. Alarm Conditions.
- C. The System shall be programmed to accept individual access codes from authorized employees. Codes shall not be shared.

1.7 EXTERIOR ENTRANCE / EXIT DOOR

A. KEYPAD

1. A keypad shall be mounted within six (6) feet of the entrance on the inside of the facility.
2. The keypad shall utilize a minimum of a two (2) line, 32-character LCD display and an integral multi-tone speaker.
3. The keypad shall contain an internal diagnostics program allowing for system troubleshooting without disabling the system.
4. The keypad shall allow for the use of three dedicated keys to function as panic keys.
5. Keypads shall have a keypad activated duress code feature.
6. All keypads shall be interfaced with the Control Panel.

B. DOOR CONTACT

1. All keypads shall be interfaced with the Control Panel.
2. The contact switch shall be installed recessed into the doorframe where applicable.

C. CENTRAL CONTROL PANEL

1. Provide one Central Control Panel, which shall be equipped with a lock and door panel.
2. The Central Control Panel shall provide the required input zones, operate on 24V D.C., indicate ground fault, and activate audio and visual devices.
3. The Central Control Panel shall have a battery charging system and battery(s).
4. Connect the Central Control Panel to the Main Equipment Room, generator powered, UPS Units.
5. Provide necessary auxiliary contacts (alarm and trouble), for sending signals to the digital communication system.
6. Provide necessary auxiliary contacts to power the exterior bell.
7. The Central Control Panel shall provide a telephone digital communication actuation and supervisory circuit.
8. Connect Central Control Panel to the District provided telephone line(s).

D. MOTION SENSOR

1. ***The Technology Designer shall verify requirements of motion sensors with the school district.***
2. The system **type** shall be dual technology motion detectors.
3. The sensors shall be microprocessor controlled and contain a false alarm protection feature.
4. The sensors shall provide the required coverage pattern.

5. Short, medium and long-range motion detectors shall be selected as required to suit the area to be covered.
6. The sensors shall be capable of mounting either on a ceiling, wall surface or in a corner.
7. **Consider sensor installations** on all floors of the facility, in corridors and all rooms with outside access.
8. **Consider** each entry point backed up by Motion Detectors.
9. **Consider motion detectors in computer labs.**
10. Locate motion detectors to provide full coverage and minimize false alarms.

E. ALARM SIREN

1. The system shall be provided with an external alarm siren(s) (horn) and strobe light as required.
2. The alarm sirens and strobes shall be housed in a tamper proof, weather resistant metal enclosures.

1.8 INSTALLATION

- A. The system wiring and installation shall comply with all applicable codes and drawings, and shall be installed in accordance with the manufacturer's recommendations.
- B. All wiring shall be color-coded and labeled at each end with self-laminating, machine-printed labels.
- C. All wiring shall be installed in metallic raceways and shall comply with the latest edition of the National Electric Code (NEC).

1.9 MOUNTING HEIGHTS

- A. All mounting heights shall comply with the Americans with Disability Act (ADA).
- B. Mount Motion Detectors to provide maximum coverage, and minimal false alarms. Do not obstruct viewing angle.

1.10 TRAINING

- A. Provide a minimum of four (4) hours training on the operation of the system.
- B. Provide **a digital video** copy of all training.

END OF SECTION

SECTION 282300

VIDEO SURVEILLANCE SYSTEM

PART 1 - GENERAL GUIDELINES

1.1 GENERAL

- A. This Section defines the general design requirements for a uniform Video Surveillance System that shall be followed for all OFCC Technology construction projects.
1. Refer to Sections 8500, Technology Systems, 28 13 00 Access Control **System** and 28 16 00 Intrusion Detection **System** for additional information.
- B. The intent of the video surveillance system is to provide the required camera coverage with appropriate resolution detail to be utilized as a forensic tool. Additional requirements for the CCTV system may be necessary based upon Owner requirements for a more real-time proactive use of the system with live monitoring.
- C. The designer is strongly encouraged to have a preliminary meeting with the Architect, the Owner, and local first responders to define areas of coverage, environmental barriers to coverage (landscaping, building shape, etc.), resolution density to be achieved, overall project budget, and provide an understanding of expectations which will form the foundation for the design concept of the CCTV system.
- D. The following primary categories are recommended for discussion concerning the desired level of CCTV coverage:
1. Site
 - a. Parking and site vehicular entrances
 - b. Athletics
 - c. Recreation (playground)
 - d. Bus drop-off/pick-up
 - e. Building Perimeter
 2. Interior
 - a. Interior of all entry doors
 - b. Corridors
 - c. Stairwells
 - d. Elevator Lobbies
 - e. Office Waiting
 - f. Cafeteria
 - g. Gymnasium
 - h. Auditorium
 - i. Kitchen, Serving and Point of Sales
 - j. Restroom entrances
 - k. Computer Labs
 - l. Industrial Tech Labs
- E. Design considerations that shall be utilized include definition of the areas of coverage, and the minimum resolution density (pixels per foot) to be achieved in each of the coverage areas. A basis of design document should be produced at the end of the programming phase that clearly defines the design parameters and Owner's expectations for the total system configuration.

1.2 SECTION INCLUDES

- A. Integrated Video Surveillance System

- B. Uninterruptible Power Supply (UPS)

1.3 QUALITY ASSURANCE

- A. National Fire Protection Association.
- B. NFPA 730 – Guide for Premises Security
- C. NFPA 731 – Standard for the Installation of Electronic Premises Security Systems
- D. National Electric Code.
- E. American with Disabilities Act.
- F. Underwriter’s Laboratory.
- G. FCC Class B.
- H. NEMA Type 4AX.
- I. NEMA Type 1.
- J. NTSC/EIA.
- K. ISO/IEC 14496-2 MPEG-4.
- L. H..264.
- M. Latest ANSI TIA/EIA-568, 569, 606, 607 Standards and Eleventh Edition (or later).
- N. BICSI Telecommunications Distribution Methods Manual (TDMM).

1.4 SYSTEM WARRANTY

- A. ***The Video Surveillance System and software shall be fully warranted for three (3) years from date of substantial completion by the contractor and manufacturer. If any defects are found within this warranty period, the defective system component shall be replaced at no extra cost to the Owner for parts or labor. Provide a statement of this warranty with the O&M manuals and to the Director of IT. Make available a service contract offering continuing factory authorized service of this system after the initial warranty period.***

1.5 GENERAL

- A. Furnish a new Integrated Video Surveillance System that provides a simple and easy-to-use graphical user interface.
- B. The system shall provide local and central operational control and viewing of all cameras.
- C. Provide an all IP System.
- D. **All** Designs shall use IP for new Cameras, POE+ Ethernet Switches and Local **NVR** units per building.
- E. When a District has more than one building, the Video Management Server and Remote Viewing Station may be located in one of the District’s buildings and the other buildings may

be attached to the Central Server via the Wide Area Network. All buildings in the District shall have local recording NVR units for recording of local cameras, and interface to the Central Server and Control Consoles and shall function as a single unified system.

- F. The Video Surveillance System shall seamlessly integrate with the Electronic Access Control System (EACS).
- G. The NVR/NVS Systems shall be located in the Main Equipment Room (MER) and be connected to generator-powered UPS Units. Backup power shall be provided for both cameras and recording equipment.
- H. Mount external cameras to the side of the building for most situations. Use pole mounting for special circumstances, as required.
- I. Connect a minimum of one building mic to the CCTV Recording system. Locate the Mic in the Central Office area (typical). Connect the audio output from the building paging system to the CCTV recorder. Consider connecting the audio output from the PABX E911 calling system to the CCTV recorder.
- J. Systems shall be monitored with an HDTV monitor in the Central Office area. Supply monitors based on system camera requirements. If required by the Owner, post the appropriate signs advising the public that audio/video recording is taking place in the facility.

1.6 CAMERAS

- A. Resolution - **Minimum 2MP resolution (1920 x 1080) progressive scan. Specific camera resolution and lens selection shall be engineered to match coverage requirements. Cameras to produce full resolution at 30 frames per second.**
 - 1. 360 Panoramic cameras, where utilized, shall be minimum 8MP with full frame rate, and either camera side or NVR side dewarping.
- B. Features
 - 1. All cameras shall have automatic iris, automatic gain control, and remote focus capabilities.
 - 2. All cameras providing coverage for scenes with widely varying light levels shall be true Wide Dynamic Range (min 120dB).
 - 3. All cameras requiring coverage in very low light shall utilize integrated IR of configuration consistent with camera coverage.
 - 4. All exterior cameras shall utilize true day/night features.
 - 5. Removable media card support.
 - 6. Camera side motion detection.
 - 7. Minimum dual stream.
 - 8. ONVIF compatibility as required by feature set being utilized (PTZ, motion detection, etc.).
- C. Enclosure - All cameras shall be contained in vandal-resistant enclosures, indoor or outdoor rated as required. Consider bulletproof enclosures for high crime areas.
- D. Lens - Lenses specific to each placement and required field of view will be used. In addition, cameras require megapixel lenses of matching resolution to camera. Utilize vari-focal lenses when possible for the greatest flexibility.1. Typical **interior** lenses range from **2.8-12mm; typical exterior lenses range from 5-50mm.**
- E. Coordinate placement of all cameras with District.

- F. All cameras shall be PoE powered from associated Telecommunication Room switches, generator powered, **with local** UPS Unit.
- G. All PTZ cameras shall meet the following minimal features:
 - 1. 22X Optical Zoom, 10X Digital Zoom.
 - 2. Window Blanking.
 - 3. 64 Presets.
 - 4. 0.5° Preset Accuracy.
 - 5. 140°/second Pan Speed.
 - a. Rotating Discreet Liner.
 - b. One Dynamic Window Blanking Area.
 - c. Proportional Pan and Tilt.
 - d. Programmable Zoom Speeds.
 - e. 360 Degree scan.
 - f. Day/Night Operation.
 - 1) 0.08 lux at ½ sec shutter (Color).
 - 2) 0.30 lux at 1/60 sec shutter (B/W).
 - 3) 0.013 lux at ½ sec shutter (B/W).
 - 4) 30 fps – NTSC.
- H. Exterior pole mounted cameras to utilize either fiber optics with local power or long range coax with network or local power.

1.7 NETWORK VIDEO RECORDER (NVR)

- A. New installations shall use Network Video Servers (NVS).
- B. The NVR shall provide a high quality, recorder capable of storage and playback of images from all cameras at full resolution and frame rate. The NVR shall support new IP cameras with ONVIF compliance. ***NVR quantity and size guidelines are based upon bandwidth, not quantity of cameras. Designer to establish the following minimum criteria to be utilized for storage calculations:***
 - 1. Resolution
 - 2. Compression (MPEG4, MJPEG, H.264, H.265, etc.)
 - 3. Frame Rate
 - 4. Motion Recording
 - 5. # Days storage
 - 6. RAID requirements
- C. The NVR shall be able to record full-screen video images continuously, upon motion detection, or according to a time schedule to its internal hard drives.
- D. The NVR shall have the capability to simultaneously record, archive background images, and allow multiple user network viewing and playback with no loss of performance.
- E. All recording to the hard drive shall have a digital signature applied to the disk file including time, date and camera info.
- F. The **NVR** shall support simultaneous audio recording and playback on at least one channel in real time.
- G. The **NVR** shall have video motion search to allow recorded searches on the hard disks, based on movement in a particular area of the image.
- H. The **NVR** shall provide a list of the activity events that occurred within a defined area.

- I. The **NVR** shall have a standard Ethernet connection and The Ethernet connection shall allow live and recorded viewing on a networked PC using a manufacturer's Network Viewer or via web pages over a standard Internet browser.
- J. The **NVR** shall support file export of digitally signed images over the network.
- K. The **NVR** shall provide a user-friendly, paged menu system that is controlled from the face of the **NVR** and viewable **through a local monitor**. **Consider the use of a KVM when multiple NVR units are combined in the same rack.**
- L. The **NVR** central Viewing station shall be completely integrated with the Intrusion Detection and Access Control Systems.

1.8 REMOTE VIDEO SERVERS

- A. Remote Video Servers shall have the following minimum features:
 - B. Store and Forward capability - Store data at the edge of the LAN/WAN and only forward over the network when required.
 - C. Event based recording for intrusion or access control activity.
 - D. Provide local storage of video streams in the event of WAN communication failure to the Central Storage Servers.
 - E. Complete control over frame rate, video resolution and other settings on a timed and trigger basis.
 - F. **All current** compression **technologies**.
 - G. Integrated with Access Control and Intrusion Detection Systems.
 - H. PTZ support.
 - I. Motion detection support.
 - J. Integrated web server for configuration.
 - K. Video loss alarm capability.

1.9 IP VIDEO DECODERS

- A. Stand-alone appliance or software client on a SFF (small form factor) PC at the display location.
- B. Utilize either single stream or multi-stream decoders (minimum 2x2 image per display) as required.
- C. Where multiple streams are required on a single display, utilize a high end PC with advanced video processing, running the CCTV remote view software and connected to the local monitor.

1.10 INSTALLATION

- A. The system wiring and installation shall comply with all applicable codes and drawings, and shall be installed in accordance with the manufacturer's recommendations.

- B. All wiring shall be color-coded and labeled at each end with self-laminating, machine-printed labels.
- C. All wiring and component installations shall comply with the latest edition of the National Electric Code (NEC).

1.11 TRAINING

- A. ***New Systems - Provide a minimum of forty (40) hours of training to the District's personnel. Plan for multiple training trips to the site. Training session(s) shall cover the following topics at a minimum:***
 - 1. ***System Equipment Connectivity***
 - 2. ***Device Configurations***
 - 3. ***Operation, maintenance, and upgrade procedures.***
- B. ***Existing Systems – Provide a minimum of four (4) hours of training to the District's personnel to review the new equipment added to the system.***
- C. ***Training to be arranged with District personnel. Hours should be spread out over the length of the warranty (Ex: 8 hours at project turnover/completion, 8 hours at 3 months, 8 hours at 6 months, 8 hours at 1 year, 4 hours at 2 years, 4 hours at 3 year).***
- D. ***Training to occur in maximum of 2 hour increments per personnel or groups of personnel.***
- E. ***Consider requiring Contractor to provide manufacturer training vouchers for a portion of the training, which are valid during the warranty period.***
- F. ***Training shall be by certified manufacturer instructor.***
- G. ***Training schedule shall be coordinated with District personnel and their needs.***
- H. ***Training plan, time line, and agenda shall be provided to District IT personnel and signed off by District and Contractor.***
- I. ***Warranty certificate and agreement shall be provided to District IT personnel at initial training session.***
- J. ***Provide a digital video copy of the training sessions.***

END OF SECTION

SECTION 282600

AREA OF REFUGE INTERCOMMUNICATION SYSTEM

PART 1 - GENERAL

1.1 General

- A. This section defines the general design requirements for an ADAAG and Ohio Building Code (OBC) compliant Area of Refuge Assistance Intercommunications System that shall be followed for all OFCC Technology projects where applicable.
- B. Coordinate requirements and device locations with the project Architect.

1.2 Section Includes

- A. Area of Refuge Intercommunication System

1.3 Quality Assurance

- A. National Fire Protection Association
- B. National Electric Code
- C. American with Disabilities Act
- D. Underwriter's Laboratory
- E. Products – Factory Mutual approved

1.4 System Warranty

- A. The Area of Refuge Intercommunication System shall be warranted by the contractor for a period of **three (3) years** from date of substantial completion.

1.5 System Operation

- A. The system shall provide two-way communication between each location and the Fire Command Center or a central control point location approved by the Fire Department. System shall include both audible and visual signals.
 - 1. Where the central control point is not constantly attended, a two-way communication system shall have a timed automatic telephone dial-out capability to a monitoring location or 911.
- B. The System is used to call for assistance from each required location as defined in the Americans with Disabilities Act and the OBC.
- C. When a call is placed from a remote station, it is annunciated at the master station with both audible and visual signals and displayed on an alpha-numeric display. The alpha-numeric display shall indicate the name and location of the calling station. Once a call is acknowledged at the Master Station, the remote station provides visual and audible confirmation. The Master Console controls the direction of the talk circuit.

- D. A call may only be canceled from the Master Console after it has been acknowledged. After the call has been canceled from the Master Console, the indicators extinguish and communication is terminated.
 - E. The Master Console may initiate audio communication with a Remote Call Station at any time by dialing the station number on its keypad or by pressing the button associated with the station. The Master Console may also page a group of Remote Call Stations to broadcast evacuation information. In the event of circuit trouble with any Remote Call Station, the Master Console will display the location and number of the station and "Trouble."
- 1.6 System Head-end
- A. Provide a multi-station, code compliant 2-way Emergency Communications system.
- 1.7 Call in Stations
- A. The call in stations shall supervised communications Architecture. Multiple stations and masters may be on one main.
 - B. The stations can be flush, semi-flush or surface mounted, weather/vandal resistant with tamperproof hardware, speaker/microphone for voice communication, a call button and two LED indicator. The panel resists damage from common cleaning agents. Supervision of the station is indicated at the Master Console.
- 1.8 Master Station
- A. Wall mounted centralized panel at location of Fire Command Center with backlit display panel, low-light readability, alpha-numeric display of station number and name, handset privacy or hands-free communication, auto-answer by lifting handset or scroll to any call, group voice page, digital volume keys, call tones with mute for calls in progress, programmable station name.
 - B. Master station may be either desk mounted or flush wall mounted with appropriate hardware.
- 1.9 Telephone Interface
- A. Telephone Interface – the PBX telephone interface connects a call from a remote station to a PBX telephone system. The interface allows calls from remote stations to be forwarded to outside telephones. Interface is used in conjunction with the Master Station.
- 1.10 Signage
- A. Signage indicating special accessibility provisions shall be posted.
- 1.11 Installation
- A. The system wiring and installation shall comply with all applicable codes and drawings, and shall be installed in accordance with the manufacturer's recommendations.
 - B. All wiring shall be color coded and labeled at each end with self-laminating, machine printable labels.
 - C. All wiring shall be installed in metallic raceways from rough-in boxes to above accessible ceilings. Cabling installed open above accessible ceilings shall be supported with manufacturers and approved cable support systems and shall comply with the latest edition of the National Electric Code (N.E.C.).

- D. All equipment shall follow manufacturer's guidelines for mounting heights and installation methods.

1.12 Testing

- A. Verify proper operation of system.

1.13 Training

- A. Provide a minimum of **four (4)** hours training including system programming, trouble shooting and basic operation.
- B. ***Provide a digital video copy of all training.***

END OF SECTION

SECTION 283213

EMERGENCY RESPONDER RADIO COVERAGE SYSTEM (ERRCS)

PART 1 - GENERAL

1.1 General

- A. This section defines the general design requirements for a code compliant ERRCS that shall be followed for all OFCC Technology projects where applicable.
- B. Coordinate requirements and device locations with the project Architect.

1.2 Section Includes

- A. Emergency Responder Radio Coverage System (ERRCS)

1.3 Quality Assurance

- A. National Fire Protection Association
- B. National Electric Code
- C. Ohio Fire Code
- D. American with Disabilities Act
- E. Underwriter's Laboratory
- F. Products – Factory Mutual approved

1.4 System Warranty

- A. The ERRCS shall be warranted by the contractor for a period of **three (3) years** from date of substantial completion.

1.5 System General

- A. The system shall be composed of a roof mounted donor antenna, Bi-Directional Amplifier (BDA) a series of interconnected interior distributed antennas and cabling (DAS).
- B. The design professional shall verify the radio system frequencies, channels, talk groups, etc. that are utilized by the Police, Fire and first responders responsible for coverage at the building site and shall incorporate those specifications into the system design.
- C. The BDA (and associated secondary power supplies where required) shall meet all requirements of the local codes and Authority Having Jurisdiction including sources of power and shall be installed in a NEAM 4x cabinet.
- D. New Buildings/Building Additions - Final ERRCS system design and layout shall be established utilizing an on-site RF survey once the building/building addition is substantially complete.
- E. Existing buildings - ERRCS system design and layout shall be established utilizing an on-site RF survey of the existing building.

- F. General building coverage shall be provided with minimum 95% floor area radio coverage.
- G. The ERRCS shall provide monitoring of the essential system components as required by code to include not less than Antenna failure, Booster Failure, AC power supply failure, and system UPS failure per NFPA 72.
- H. System shall include the code required testing/commissioning once the system is complete.

1.6 Submittals

- A. System Design – Submit results of field RF surveys and RF predictive modeling indicating locations of antennas and signal coverage “heat maps”.
 - 1. Include a minimum of (1) building elevation depicting the location of any outdoor antennas associated with the proposed system. Include height of antenna centerline above building, orientation, and location of all external grounding connections.
 - 2. Include a plan view of each interior floor where indoor antenna systems are proposed. Include antenna numbers, coaxial cable routes, and the locations of any other system components including splitters, couplers, filters, amplifiers, etc. All components shall be named or labeled for reference in power budget calculations tables. Overlay approximated coverage radii indicating a –95 dBm downlink (base to mobile) signal strength around each proposed indoor coverage antenna. Include results of any previous coverage testing per grid, if available.
 - 3. Specify antenna grounding and surge protection in accordance with NEC Article 810.
 - 4. Specify the backup power source (Life Safety), and include calculations to ensure the backup power requirements as specified in this standard are met.
- B. Equipment Specification Sheets
 - 1. Provide copies of manufacturer specification sheets of all system components, including:
 - a. Amplifiers.
 - b. Antennas.
 - c. Coaxial cable, couplers, splitters, combiners, or any other passive components proposed.
 - 2. Operation and maintenance data.
 - 3. Backup battery and charging system.
- C. Submit product certificates signed by the manufacturer of radio system components certifying that their products comply with specified requirements.

1.7 Installation

- A. The system wiring and installation shall comply with all applicable codes and drawings, and shall be installed in accordance with the manufacturer’s recommendations.
- B. All wiring shall be color coded and labeled at each end with self-laminating, machine printable labels.
- C. Cabling installed open above accessible ceilings shall be supported with manufacturers and approved cable support systems and shall comply with the latest edition of the National Electric Code (N.E.C.).
- D. All equipment shall follow manufacturer’s guidelines for mounting heights and installation methods.

1.8 Testing

- A. Upon completion of the system installation, programming and initial start-up, the contractor shall be responsible for providing performance acceptance testing. This testing shall be scheduled and performed in the presence of the Owner and the Engineer.
- B. All signal measurement acceptance testing shall be performed by the contractor with their own equipment, by qualified personnel who have specific training and familiarization with the test equipment, and with test equipment which have been calibrated within the previous 12 months. Signal measurement results shall be stored electronically and presented with final system documentation including information pertaining to the location of each of the signal measurement tests.
- C. All signal quality and performance acceptance testing shall be performed with local Fire Department radios. Coordinate with the local Fire Department to acquire a test set (properly tuned and calibrated) for use during the acceptance testing.
- D. Tests shall be made using frequencies close to the frequencies used by the Fire Department and appropriate emergency services. If testing is done on the actual frequencies, then this testing must be coordinated with the local Fire Department unit. All testing must be done on frequencies authorized by the FCC. A valid FCC license will be required if testing is done on frequencies different from the police, fire or emergency medical frequencies.
- E. Testing Procedures
 - 1. Measurements shall be made with the antenna held in a vertical position at 3 to 4 feet above the floor to simulate a typical portable radio worn on the belt or turnout coat pocket.
- F. Pre-testing: The radio system shall be pre-tested to ensure that two-way coverage on each floor of the building meets the minimum coverage described above.
- G. Final Acceptance Testing
 - 1. All acceptance testing shall be done in the presence of a Fire Department representative at no expense to the Owner/Fire Department.
 - 2. Small scale drawings (11 inch x 17 inch maximum) of the structure shall be provided by the Contractor. The plans shall show each floor divided into the grids as described below, and the results of the pre-testing. Each grid shall be labeled to indicate the DAQ result from the final acceptance testing.
 - 3. The Contractor shall provide the latest approved plans for the system, including any manufacture's data sheets for any equipment changes not submitted in the original submittal.
- H. The ERRCS shall be tested to ensure that the two-way coverage on each floor of the building meets the requirements of the OBC/OFC and at a minimum covers 95 percent of general building areas and 95% of building Critical Areas. The test procedure shall be conducted as follows:
 - 1. Each floor of the building shall be divided into a grid of 20 approximately equal areas.
 - 2. The test shall be conducted using a calibrated portable of the latest brand and model used by the agency talking through the agency's radio communications system.
 - 3. A maximum of two non-adjacent areas shall be allowed to fail the test.
 - 4. In the event that three of the areas fail the test, in order to be more statistically accurate, the floor may be divided into 40 equal areas. A maximum of four nonadjacent areas shall be allowed to fail the test. If the system fails the 40 area test, the system shall be altered to meet the 90-percent coverage requirement.

5. A test location approximately in the center of each grid area shall be selected for the test, then the radio shall be enabled to verify two-way communications to and from the outside of the building through the public safety agency's radio communications system. Once the test location has been selected, that location shall represent the entire area. If the test fails in the selected test location, that grid area shall fail, and prospecting for a better spot within the grid area shall not be allowed.
6. The gain values of all amplifiers shall be measured and the test measurement results shall be kept on file with the building Owner so that the measurements can be verified during annual tests. In the event that the measurement results become lost, the building Owner shall be required to rerun the acceptance test to re-establish the values.
7. As part of the installation a spectrum analyzer or other suitable test equipment shall be utilized to insure spurious oscillations are not being generated by the subject signal booster. This test shall be conducted at the time of installation and subsequent annual inspections.

1.9 Training

- A. Provide a minimum of **four (4)** hours training including system programming, trouble shooting and basic operation.
- B. ***Provide a digital video copy of all training.***

END OF SECTION