

SECTION 28 13 11
PHYSICAL ACCESS CONTROL SYSTEM (PACS)

PART 1 – GENERAL

1.1 DESCRIPTION

Provide and install a complete Physical Access Control System, hereinafter referred to as the PACS. Contractor shall contract for the services of the local Baker Group service vendor for all security related work, except for the installation of conduit, wiring and the devices. All programming and updates of the existing and new security panels and devices shall be completed by Baker Group. Local Contact: Doug Ruschill at 515-262-4000.

1.2 RELATED WORK

- A. For connection of high voltage, Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.
- B. For power cables, Section 26 05 21, LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES (600 VOLTS AND BELOW).
- C. For grounding of equipment, Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS.
- D. For infrastructure, Section 26 05 33, RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS.
- E. For Warranty of Construction, Section 00 72 00, GENERAL CONDITIONS.
- F. For General Requirements, Section 01 00 00, GENERAL REQUIREMENTS.

1.3 QUALITY ASSURANCE

- A. The Contractor shall be responsible for the installation and the operation of the PACS as shown. The Contractor shall also provide certification as required.
- B. The security system will be installed and tested to ensure all components are fully compatible as a system and can be integrated with all associated security subsystems, whether the security system is stand-alone or a part of a complete Information Technology (IT) computer network.
- C. The Contractor or security sub-contractor shall be a licensed security Contractor as required within the state or jurisdiction of where the installation work is being conducted.

1.4 SUBMITTALS

- A. Submit below items in conjunction with Master Specification Sections 01 33 23, SHOP DRAWINGS, PRODUCT DATA, and SAMPLES.
- B. Provide certificates of compliance with Section 1.3, Quality Assurance.

- C. Provide a complete and thorough pre-installation and as-built design package in both electronic format and on paper, minimum size 48 x 48 inches (1220 x 1220 millimeters); drawing submittals shall be per the established project schedule.
- D. Pre-installation design and as-built packages shall include, but not be limited to:
 - 1. Index Sheet that shall:
 - a. Define each page of the design package to include facility name, building name, floor, and sheet number.
 - b. Provide a complete list of all security abbreviations and symbols.
 - c. Reference all general notes that are utilized within the design package.
 - d. Specification and scope of work pages for all individual security systems that are applicable to the design package that will:
 - 1) Outline all general and job specific work required within the design package.
 - 2) Provide a detailed device identification table outlining device Identification (ID) and use for all security systems equipment utilized in the design package.
 - 2. Drawing sheets that will be plotted on the individual floor plans or site plans shall:
 - a. Include a title block as defined above.
 - b. Clearly define the drawings scale in both standard and metric measurements.
 - c. Provide device identification and location.
 - d. Address all signal and power conduit runs and sizes that are associated with the design of the electronic security system and other security elements (e.g., barriers, etc.).
 - e. Identify all pull box and conduit locations, sizes, and fill capacities.
 - f. Address all general and drawing specific notes for a particular drawing sheet.
 - 3. A detailed riser drawing for each applicable security subsystem shall:
 - a. Indicate the sequence of operation.
 - b. Relationship of integrated components on one diagram.
 - c. Include the number, size, identification, and maximum lengths of interconnecting wires.
 - d. Wire/cable types shall be defined by a wire and cable schedule. The schedule shall utilize a lettering system that will correspond to the wire/cable it represents (example: A = 18 AWG/1 Pair Twisted, Unshielded). This schedule shall also provide the manufacturer's name and part number for the wire/cable being installed.
 - 4. A detailed system drawing for each applicable security system shall:
 - a. Clearly identify how all equipment within the system, from main panel to device, shall be laid out and connected.
 - b. Provide full detail of all system components wiring from point-to-point.

- c. Identify wire types utilized for connection, interconnection with associate security subsystems.
 - d. Show device locations that correspond to the floor plans.
 - e. All general and drawing specific notes shall be included with the system drawings.
- 5. A detailed schedule for all of the applicable security subsystems shall be included. All schedules shall provide the following information:
 - a. Device ID.
 - b. Device Location (e.g. site, building, floor, room number, location, and description).
 - c. Mounting type (e.g. flush, wall, surface, etc.).
 - d. Power supply or circuit breaker and power panel number.
 - e. In addition, for the PACS, provide the door ID, door type (e.g. wood or metal), locking mechanism (e.g. strike or electromagnetic lock) and control device (e.g. card reader or biometrics).
- 6. Detail and elevation drawings for all devices that define how they were installed and mounted.
- E. Provide manufacturer security system product cut-sheets. Submit for approval at least 30 days prior to commencement of formal testing, a Security System Operational Test Plan. Include procedures for operational testing of each component and security subsystem, to include performance of an integrated system test.
- F. Submit manufacture's certification of Underwriters Laboratories, Inc. (UL) listing as specified. Provide all maintenance and operating manuals per Section 01 00 00, GENERAL REQUIREMENTS.

1.5 APPLICABLE PUBLICATIONS

- A. The publications listed below (including amendments, addenda, revisions, supplement, and errata) form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American National Standards Institute (ANSI)/ Security Industry Association (SIA):
 - AC-01.....Access Control: Wiegand Card Reader Interface Standard
 - AC-03.....Access Control: Badging Techniques
- C. American National Standards Institute (ANSI)/ International Code Council (ICC):
 - A117.1.....Standard on Accessible and Usable Buildings and Facilities
- D. Department of Justice American Disability Act (ADA)
 - 28 CFR Part 36-90ADA Standards for Accessible Design
- E. Government Accountability Office (GAO):

- GAO-03-8-02.....Security Responsibilities for Federally Owned and Leased
Facilities
- F. National Electrical Contractors Association
303-2005Installing Closed Circuit Television (CCTV) Systems
- G. National Electrical Manufacturers Association (NEMA):
250-03Enclosures for Electrical Equipment (1000 Volts Maximum)
- H. National Fire Protection Association (NFPA):
70-05 Article 780-National Electrical Code
- I. Underwriters Laboratories, Inc. (UL):
294-99Standard for Access Control
305-97Standard for Panic Hardware
639-97Standard for Intrusion-Detection Units
752-05Standard for Bullet-Resisting Equipment
827-96Central Station Alarm Services
1076-95Standards for Proprietary Burglar Alarm Units and Systems
1981-03Central Station Automation System
2058-05High Security Electronic Locks
- J. Homeland Security Presidential Directive (HSPD):
HSPD-12.....Policy for a Common Identification Standard for Federal
Employees and Contractors
- K. Federal Information Processing Standards (FIPS):
FIPS-201Personal Identity Verification (PIV) of Federal Employees and
Contractors
- L. National Institute of Standards and Technology (NIST):
IR 6887 V2.1.....Government Smart Card Interoperability Specification (GSC-IS)
Special Pub 800-96.....PIV Card Reader Interoperability Guidelines
- M. Institute of Electrical and Electronics Engineers (IEEE):
C62.41.....IEEE Recommended Practice on Surge Voltages in Low-Voltage
AC Power Circuits
- N. International Organization for Standardization (ISO):
7810Physical Characteristics of Credit Card Size Document
7811Physical Characteristics for Magnetic Stripe Cards
7816-1Physical Characteristics of the Card
7816-2Dimensions and Contact Position of the card

- 7816-3Electrical Signals and Transmission Protocols
- 7816-4Inter-Industry Command for Interchange
- 14443RFID cards; Contactless Proximity Cards Operating at 13.56
MHz in up to 5 inches distance
- 15693RFID cards; Contactless Vicinity Cards Operating at 13.56 MHz
in up to 50 inches distance
- O. Uniform Federal Accessibility Standards (UFAS) 1984
- P. ADA Standards for Accessible Design 1994

PART 2 – PRODUCTS

2.1 EQUIPMENT AND MATERIALS

- A. All equipment associated within the PACS shall be UL 294 compliant and rated for continuous operation. Environmental conditions (i.e. temperature, humidity, wind, and seismic activity) shall be taken under consideration at each facility and site location prior to installation of the equipment.
- B. All equipment shall operate on a 120 volt alternating current (VAC), 60 Hz AC power system unless documented otherwise in subsequent sections listed within this specification. All equipment shall have a back-up source of power that will provide a minimum of 96 hours of run time in the event of a loss of primary power to the facility.
- C. The system shall be designed, installed, and programmed in a manner that will allow for easy of operation, programming, servicing, maintenance, testing, and upgrading of the system.
- D. All equipment and materials for the system will be compatible to ensure correct operation as outlined in FIPS 201, March 2006 and HSPD-12.

2.2 EQUIPMENT ITEMS

- A. Card Reader:
 - 1. Proximity / PIN Reader.
 - 1) Hirsch Electronics ScrambleProx – HID Model # DS47L-SSP-HID-HI
 - 2) 1.4 to 2.0in read range.
 - 3) Built-in 12 numeric keypads.
 - 4) Illuminated keypad for high ambient light environments.
 - 5) Power: 135 mA @ 24VDC when illuminated.
 - 6) Accessory: Mounting Box
- B. Request to Exit:
 - 1. Bosch Intrusion Systems DS160 Series High Performance Request-to-exit Detector
 - 2. Integrated sounder fully adjustable to 85 dB.

3. Power: 12 VAC or VDC to 30 VAC or VDC, 39mA at 12VDC in alarm

C. Motion Detector:

1. Honeywell DUAL TEC Motion Sensor DT6360STC
2. Detection Range: 50' diameter, 25' radius
3. Power: 10-14.4VDC, 40mA @ 12VDC
4. Accessory: Power Supply

D. Camera - Fixed

1. Relocate existing Viking cameras and DVR system located in existing Bldg. 4 Retail.
2. RG6 cable in conduit as required to connect to recorder in Canteen Office 129R.

H. Conduit

1. EMT.
2. All conduit, pull boxes, and junction boxes shall be clearly marked every with colored permanent tape or paint that will allow it to be distinguished from all other conduit and infrastructure.
3. Conduit fills shall not exceed 50 percent unless otherwise documented.
4. A pull rope shall be pulled along with signal and power cables to assist in future work.

I. Signal Cables:

1. Shall meet or exceed all specifications and requirements called out by the manufactures.
2. Shall be twisted pairs.

2.3 INSTALLATION KIT

- A. General: The kit shall be provided that at, a minimum includes all connectors and terminals, labeling systems, audio spade lugs, barrier strips, punch blocks or wire wrap terminals, heat shrink tubing, cable ties, solder, hangers, clamps, bolts, conduit, cable duct, and/or cable tray, etc., required to accomplish a neat and secure installation. All wires shall terminate in a spade lug and barrier strip, wire wrap terminal or punch block. Unfinished or unlabeled wire connections shall not be allowed. All unused and partially opened installation kit boxes, coaxial, fiber-optic, and twisted pair cable reels, conduit, cable tray, and/or cable duct bundles, wire rolls, physical installation hardware shall be turned over to the Contracting Officer. The following sections outlined are the minimum required installation sub-kits:

1. System Grounding:
 - a. The grounding kit shall include all cable and installation hardware required. All head end equipment and power supplies shall be connected to earth ground via internal building wiring, according to the NEC.
 - b. This includes, but is not limited to:

- 1) Coaxial Cable Shields
 - 2) Control Cable Shields
 - 3) Data Cable Shields
 - 4) Equipment Racks
 - 5) Equipment Cabinets
 - 6) Conduits
 - 7) Cable Duct blocks
 - 8) Cable Trays
 - 9) Power Panels
 - 10) Grounding
 - 11) Connector Panels
2. Coaxial Cable: The coaxial cable kit shall include all coaxial connectors, cable tying straps, heat shrink tabbing, hangers, clamps, etc., required to accomplish a neat and secure installation.
 3. Wire and Cable: The wire and cable kit shall include all connectors and terminals, audio spade lugs, barrier straps, punch blocks, wire wrap strips, heat shrink tubing, tie wraps, solder, hangers, clamps, labels etc., required to accomplish a neat and orderly installation.
 4. Conduit, Cable Duct, and Cable Tray: The kit shall include all conduit, duct, trays, junction boxes, back boxes, cover plates, feed through nipples, hangers, clamps, other hardware required to accomplish a neat and secure conduit, cable duct, and/or cable tray installation in accordance with the NEC and this document.
 5. Equipment Interface: The equipment kit shall include any item or quantity of equipment, cable, mounting hardware and materials needed to interface the systems with the identified sub-system(s) according to the OEM requirements and this document.
 6. Labels: The labeling kit shall include any item or quantity of labels, tools, stencils, and materials needed to label each subsystem according to the OEM requirements, as-installed drawings, and this document.
 7. Documentation: The documentation kit shall include any item or quantity of items, computer discs, as installed drawings, equipment, maintenance, and operation manuals, and OEM materials needed to provide the system documentation as required by this document and explained herein.

PART 3

3.1 INSTALLATION

- A. System installation shall be in accordance with UL 294, manufacturer and related documents and references.
- B. The Contractor shall visit the site and verify that site conditions are in agreement with the design package. The Contractor shall report all changes to the site or conditions that will affect performance of the system. The Contractor shall not take any corrective action without written permission from the Government.
- C. Provide all control and power cables required for a complete operating system.
- D. Connect to existing HIRSCH Electronics Model 8 Control Panel located in Bldg. 1W, Rm. W100.
- E. Program the panel per the manufacturer's programming guidelines.
- F. The Contractor shall make written requests and obtain approval prior to disconnecting any signal lines and equipment, and creating equipment downtime. Such work shall proceed only after receiving Contracting Officer approval of these requests. If any device fails after the Contractor has commenced work on that device, signal or control line, the Contractor shall diagnose the failure and perform any necessary corrections to the equipment.
- G. The Contractor shall be held responsible for repair costs due to Contractor negligence, abuse, or improper installation of equipment.
- H. The Contracting Officer shall be provided a full list of all equipment that is to be removed or replaced by the Contractor, to include description and serial/manufacturer numbers where possible. The Contractor shall dispose of all equipment that has been removed or replaced based upon approval of the Contracting Officer after reviewing the equipment removal list. In all areas where equipment is removed or replaced the Contractor shall repair those areas to match the current existing conditions.
- L. Control Panels:
 - 1. Connect signal lines to control panel.
 - 2. Program the panel as outlined by the design and per the manufacturer's programming guidelines.
- N. Card Readers:
 - 1. Connect all signal inputs and outputs as shown and specified.
 - 2. Terminate input signals as required.
 - 3. Program and address the reader as per the design package.

4. Readers shall be surface or flushed mounted and all appropriate hardware shall be provided to ensure the unit is installed in an enclosed conduit system.

Q. Door Status Indicators:

1. Install all signal input and output cables as well as all power cables.
2. RTE's shall be surface mounted and angled in a manner that they cannot be compromised from the non-secure side of a windowed door, or allow for easy release of the locking device from a distance no greater than 6 feet from the base of the door.
3. Door position sensors shall be surface or flush mounted and wide gap with the ability to operate at a maximum distance of up to 2" (5 cm).

R. Entry Control Devices:

1. Install all signal input and power cables.
2. Strikes and bolts shall be mounted within the door frame.
3. Mortise locks shall be mounted within the door and an electric transfer hinge shall be utilized to transfer the wire from within the door frame to the mortise lock inside the door.
4. Electromagnetic locks shall be installed with the mag-lock mounted to the door frame and the metal plate mounted to the door.

S. Camera System:

1. Install all manufacturer recommended signal input and power cables to integrate cameras.

T. System Start-Up:

1. The Contractor shall not apply power to the PACS until the following items have been completed:
 - a. PACS equipment items and have been set up in accordance with manufacturer's instructions.
 - b. A visual inspection of the PACS has been conducted to ensure that defective equipment items have not been installed and that there are no loose connections.
 - c. System wiring has been tested and verified as correctly connected as indicated.
 - d. All system grounding and transient protection systems have been verified as installed and connected as indicated.
 - e. Power supplies to be connected to the PACS have been verified as the correct voltage, phasing, and frequency as indicated.
2. Satisfaction of the above requirements shall not relieve the Contractor of responsibility for incorrect installation, defective equipment items, or collateral damage as a result of Contractor work efforts.

U. Supplemental Contractor Quality Control:

1. The Contractor shall provide the services of technical representatives who are familiar with all components and installation procedures of the installed PACS; and are approved by the Contracting Officer.
2. The Contractor will be present on the job site during the preparatory and initial phases of quality control to provide technical assistance.
3. The Contractor shall also be available on an as needed basis to provide assistance with follow-up phases of quality control.
4. The Contractor shall participate in the testing and validation of the system and shall provide certification that the system installed is fully operational as all construction document requirements have been fulfilled.

3.2 TESTING AND TRAINING

All testing and training shall be compliant with the VA General Requirements, Section 01 00 00, GENERAL REQUIREMENTS.

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