SECTION 28 10 00

ACCESS CONTROL SYSTEM

**BASED ON DFD MASTER SPECIFICATION DATED 03/01/23**

Notes to A/E:

This section has been written to cover most (but not all) project conditions that you will encounter. Depending on the project, you may need to add material, delete items, or modify what is currently written.

Edit all areas as applicable to meet the requirements of the project. Common options or features recognized by the DFD, or items where A/E input is needed are enclosed in [brackets] and/or <less-greater brackets>.

Editing instructions are included throughout the document (italic text; red if viewed/printed in color). These instructions should be hidden or deleted for printing. Text can be hidden by modifying the MS-WORD Style “A/E Instructions” to use “Hidden Text” as part of the Font type. To display Instructions formatted as “Hidden Text”, configure MS-Word File Options /Display to “Show” Hidden Text on Screen.

Supplementary editing instructions which cover agency-specific information are available in a companion document, also available on the DFD website.

This document is structured to automatically update the Table of Contents when printed or in response to an “Update Field” command (right mouse click on TOC opens menu) in MS-Word. Confirm that changes to the document outline are reflected in the TOC. TOC entries are Hyperlinks and can be used to navigate the document.

The structure of this section assumes that the Access Control System is an extension and/or revision to an existing Access Control System and Sole Source Procurement of certain, compatible items are necessary. Include Class 1 notice as noted below and coordinate with the Lead A/E to include in the Instructions to Bidders page A-1.

If the project is not an extension of an existing system, delete the Class 1 notice and edit the section to include Access Control System product specifications.

Revision History:

In the on-line “DFD Document Library” Under “Master Specifications/Design Guidelines / 28 – Electronic Safety and Security”, see “Division 28 Revision History”.

1. GENERAL

Scope

This specification section describes the products and execution requirements relating to the furnishing, installation, testing, and commissioning of a complete Access Control System and placing it into satisfactory operation.

This system is an extension of the existing [IDENTIFY MANUFACTURER / SYSTEM TYPE] Access Control System.

For projects where Central Equipment, Credential Data Base, Badging, etc. is administered in Madison by the State Capitol Police, include the following paragraph. Otherwise, delete.

Central Equipment, Credential Data Base, Badging, etc. for the system is administered in Madison by the Wisconsin State Capitol Police. See PART 3 coordination requirements.

In general, work consists of installation of new [and relocation of existing] access control equipment, hardware and devices and all associated cabling as part of this project.

Provide bullet point list of sole source items including manufacturer and model or product series. Use generic terms such as “Controller”, “Credential Reader”, &c. Do not include technical details or specific part numbers.

For UW-Madison projects, identify applicable LENEL products.

Delete Notice if not used.

CLASS 1 NOTICE:

Notice is hereby given in accordance with Section 16.855(10), Wisconsin Statutes, that the Division believes it is in the best interests of the State to contract the following work from only one source, without the usual statutory procedures:

* [Product type – Manufacturer; Product Series]

Included are the following topics:

[PART 1 - GENERAL](#_Toc63242611)

[Scope](#_Toc63242612)

[Related Work](#_Toc63242613)

[Quality Assurance](#_Toc63242614)

[References](#_Toc63242615)

[Inspections and Permits](#_Toc63242616)

[Submittals](#_Toc63242617)

[PART 2 - PRODUCTS](#_Toc63242618)

[General](#_Toc63242619)

[Control Panel (Controller)](#_Toc63242620)

[Credential Readers and Keypads](#_Toc63242621)

[Miscellaneous Field Devices](#_Toc63242622)

[Key switch (Fire Department Override)](#_Toc63242623)

[Cabling](#_Toc63242624)

[PART 3 - EXECUTION](#_Toc63242625)

[General](#_Toc63242626)

[Coordination](#_Toc63242627)

[Continuity of Existing Services and Systems](#_Toc63242628)

[Installation](#_Toc63242629)

[Identification and Labeling](#_Toc63242630)

[Acceptance Testing](#_Toc63242631)

[Documentation](#_Toc63242632)

[Warranty](#_Toc63242633)

Major features of the Access Control System and responsibilities to furnish and/or install equipment, install cabling, and terminate cabling are as follows:

The following items and responsibilities are typical for a DFD Access Control System project. Where items are [bracketed], confirm requirements and responsibilities with agency and edit list to match project requirements. Coordinate with Division 08. Delete non-applicable items.

Division 08 contractor-furnished, Division 08 contractor-installed

* ADA Door Operators
* ADA Door Operator Pushbuttons
* Electric Latches and Strikes
* Push-bars with integrated request-to-exit switches
* Power-transfer Door Hinges
* [Door-Position Switches]

Agency-furnished, Division 28 contractor-installed

* [Control Panels (Controllers)]
* [Control Panel Enclosures]
* [Network Switches]

Division 28 contractor-furnished, Division 28 contractor installed

* Cabling:

ADA door operators to ADA door operator pushbuttons

Field Device to Controller (incl. signal and power)

Network Cabling (Controller to Network Switch)

Cable Termination at Field Devices

[Cable Termination at Controller]

* Credential Readers and/or Keypads
* Door lock Power Supplies
* Key Switch (Fire Department Override)
* Request-to-Exit Devices (PIR)
* [Door Release Pushbuttons]
* [Local Locking/Unlocking Switch]
* [Control Panels (Controllers)]
* [Control Panel Enclosures]
* [Door-Position Switches]
* [Network Switches]

Agency-furnished, Agency-installed or Existing

* Badging System
* Central Equipment Hardware
* Central Equipment Software / Credential Database
* Database Updates (door assignments, scheduling other programming)
* [Network Switches]

All raceways and pull boxes, conduit and cables supports, grounding hardware, and bonding as required for a full and functioning system shall be installed and documented by this Division 28 Contractor, as detailed in this and related section(s).

Related Work

Applicable provisions of Division 1 govern work under this Section.

Edit as applicable to match project requirements. Delete reference to sections that do not appear in the project documents. Add other sections that apply.

Section 01 91 01 or 01 91 02 – Commissioning Process

Section 08 71 00 – Door Hardware

Section 26 05 26 – Grounding and Bonding for Electrical Systems

Section 26 05 29 – Hangers and Supports for Electrical Systems

Section 26 05 33 – Raceway and Boxes for Electrical Systems

Section 26 05 36 – Cable Tray for Electrical Systems

Section 26 05 53 – Identification for Electrical Systems

Section 27 05 53 – Identification for Communications Systems

Section 27 10 00 – Structured Cabling

Section 27 11 00 – Communications Equipment Room Fittings

Section 27 16 19 – Communications Patch Cords, Work Area Cords, and Cross Connect Wire

Section 28 23 00 – Video Surveillance System

Quality Assurance

Bidder Qualifications

The intent of these quality assurance requirements is to ensure that the installing contractor has the capabilities to engineer, install, and commission the devices as specified under this section.

A/E should confirm with the user agency if any ongoing warranties, maintenance contracts or support agreements are in place on the existing system which is to be modified. Confirm with the

Installing contractor must be a firm specializing and experienced in Access Control system installation for no less than 3 years.

Installing contractor must be a branch office or an authorized representative of the manufacturer of the specified Access Control System” as required to support the warranty stated herein. Such authorization must have been in effect for a period of not less than three years at the time of Bidding and remain so throughout project.

Identify any requirements on the installing contractor as required to ensure that there is no effect on ongoing maintenance agreements.

<Add content re: effect of new work on ongoing maintenance agreements HERE.>

Installation of equipment and cabling shall be done by qualified staff in the direct employ or directly subcontracted and under the supervision of the manufacturer or Authorized Representative.

References

All work and materials are to conform to applicable rules and requirements of the Wisconsin State Electrical Code (SPS 316), the National Electrical Code (NFPA 70), other applicable National Fire Protection Association codes, the National Electrical Safety Code, Federal Communications Commission (FCC) rules, and present manufacturing standards (including NEMA).

All materials shall be listed by UL and shall bear the UL label. If UL has no published standards for a particular item, then other national independent testing standards shall apply, and such items shall bear those labels. Where UL has an applicable system listing and label, the entire system shall be so labeled.

Add other requirements as applicable to contractor-furnished equipment.

Other applicable standards are as follows:

FCC Part 15 as applicable to the equipment type(s) included

UL 294 Standard for Access Control System Units

Include the following for UW-Madison. Otherwise Delete.

University of Wisconsin – Madison campus Technical Guidelines; <https://cpd.fpm.wisc.edu/technical-guidelines/>; Division 28 – Security.

Inspections and Permits

Refer also to Division 1, General Conditions, Permits, Regulations, Utilities and Taxes.

Obtain and pay for all required state or local installation inspections and permits except those provided by the Architect/Engineer. Deliver originals of required certificates DFD Construction Representative. Include copies of the certificates and reports in the Operating and Maintenance Manuals.

Submittals

General

Under the provisions of Division 1, prior to the start of work, submit:

* Bidder Qualifications
* Shop Drawings

Group Submittals to include complete documentation of related systems, products, and accessories in a single submittal.

Submittals shall be electronic format (ADOBE Portable Document format “.pdf”) thereof.

Bidder Qualifications

Furnish documentation of contractor capabilities as identified under “Quality Assurance / Bidder Qualifications” above.

Where installing contractor is an authorized representative of the Card Access System manufacturer, submit written confirmation of such authorization from the manufacturer. Indicate in letter of authorization that installing contractor has successfully completed all necessary training required for engineering, installation, and commissioning of equipment. Letter should indicate the start date of such authorization.

Shop Drawings

* Product data for all equipment, hardware cabling and miscellaneous components proposed.
* Schematic drawings - specific to project - of all circuits from the field devices to the required connection points. The diagrams shall show schematic wiring of equipment and all connections to be made to devices. Terminal connections in the equipment shall be numbered to correspond to the diagrams for use in making connections. Wiring diagrams shall be coordinated so that terminal numbering, circuit designation and equipment or device designations are the same on all drawings. All drawings must be submitted and approved by the Engineer before installation starts, but such approval will not waive specification requirements unless specifically stated.

Mark submittal package with specification section number. Do not mix sections in a single submittal.

Work shall not proceed without Engineer approval of the submitted items.

No substituted materials shall be installed except by written approval from the Engineer.

Test Plan

Submit Test Plan during construction. See Part 3.

Confirm local inspection and/or permitting requirements for the project location.

Work Permit

Edit to indicate any local inspection and/or permitting requirements.

For projects in the City of Madison, certain agencies may opt to provide the Madison Fire Department (MFD) with project information. If applicable, obtain and work with the agency to complete the CITY OF MADISON – FIRE DEPARTMENT INSPECTION / ACCESS CONTROL/DELAYED EGRESS WORK PERMIT. A copy of the request document is available from the MFD at the Department’s “Construction” website:

<https://www.cityofmadison.com/fire/permits-inspections/construction>.

If no inspections or permitting apply, add “None required.”

Mock-ups

Upon request, provide a mock-up of Control Panel enclosure. Include applicable hardware, cabling, interface types (barrier strip, modular jack, etc.).

1. PRODUCTS

The following articles cover most equipment types that will be required. Add any other equipment applicable to the project. Regardless of whether equipment is to be agency- or contractor-furnished, A/E should confirm compatibility of the model(s) with planned or existing Access Control System.

Identify Sole-sources items by Manufacturer, Model and part #. Include all applicable options. Some common examples are included. Confirm all equipment assumptions with Agency.

General

All contractor-furnished items shall be compatible with the existing system as identified above.

New system devices installed as part of this project will integrate into the existing campus-wide system. No substitutions will be allowed unless otherwise noted.

Licensing where applicable will be provided by the owner.

Control Panel (Controller)

Control Panel and Enclosure

Control Panel: [Manufacturer\Model]

Control Panel Enclosure: [Manufacturer\Model]

Credential Readers and Keypads

Proximity Card Reader

Include both frequencies for UW-Madison projects. Confirm requirement with other agencies.

Frequency: [125 kHz][ and 13.56 MHz].

Include both Weigand and OSDP for UW-Madison projects. Confirm requirements with other agencies.

Output format: [Wiegand][ and Open Supervised Device Protocol (OSDP)]

Read Range: up to 8.0 inches (Wall-mount); up to 6.0 inches (Mullion-mount). Dependent upon installation conditions and credential type.

Power: 5-16 VDC

Include for UW-Madison projects. Confirm requirement with other agencies.

Bluetooth enabled to support mobile devices.

Include for UW-Madison projects. Confirm requirement with other agencies.

Able to support Smart Card Operating System (SCOS) type cards.

Polycarbonate housing, IP55 rated for indoor and outdoor use, operating temperature of -22 to 150 degrees Fahrenheit.

Reader provides visual – typically a change in color of LED from red to green – and an audible indication of acceptance or denial of credentials when card is presented to the reader.

Confirm agency requirement for credential reader type. Select MultiClass-type for any project where connectivity to Wisconsin Capitol Police is a design requirement.

For UW-Madison projects, verify with UWPD the card reader requirements and models – typically HID MultiClas – to specify.

Wall-mount: [HID MultiClass ####][HID ProxPro® II 5455][Other]

Mounts in 1-gang electrical box.

Mullion-mount: [HID MultiClass ####][HID MiniProx® 5365][Other]

Proximity Card Readers manufactured by others shall be considered equals provided they meet or exceed in performance and quality as specified.

Color: Architect to select standard color option. Confirm during shop drawing review.

Keypad

[Add specification here if applicable. Otherwise delete.]

Biometric Devices

[Add specification here if applicable. Otherwise delete.]

Miscellaneous Field Devices

Request-to-Exit (REX)

Refer to drawings and schedules for applicable REX type(s).

Integral to Door Hardware type: By Division 08 Contractor.

Motion-Sensor type:

* Passive infrared (PIR) sensing with an adjustable 8 ft. x 10 ft. coverage area.
* Designed for wall mounting above a door.
* Listed as an access control device under the UL 294 standard.
* Configured with a minimum of two from “C” relay contacts with an adjustable latch time.
* Programmable for fail-safe or fail-secure modes. Configured with an activation LED.

Door Release Pushbuttons

Code required exit pushbuttons shall be wired to directly remove power to the lock at the door location and not through the electronic card key control panel.

Time delay to relock shall be adjusted for 30 second

SCHLAGE Cat. No. 631-AL-EX or approved equal.

Local Locking/Unlocking Switch

Local switch for locking/unlocking door(s) shall be a DPDT toggle switch with indicator LED.

DORTRONICS 5236 with optional DPDT toggle switch and optional LED or approved equal.

Door Position Switches

Magnetic-type contacts.

Switch contacts shall be of the reed switch type with plating eliminating cold welding, sticking, and resistance build-up.

All contacts shall be hermetically sealed for long term 10,000,000 contact cycles.

Surface-mounted contacts: Magnetic contacts with a maximum gap range of 38 mm for standard applications and 64 mm for wide-gap applications. Honeywell 950 or 7945 (wide-gap), SENTROL 1085T series, or approved equal.

Recessed contacts for steel doors: GENERAL ELECTRIC 1078C series or approved equal.

The Key Switch language is included in the Access Control spec as it is required in certain municipalities – Madison for example. Confirm requirements with agency staff or the AHJ.

Key switch (Fire Department Override)

Momentary action, 5 amp rated, DPDT switch, with Bi-color LED – Green to signify secure, Red to signify unsecure.

1.25” or 1.125” mortise cylinder will be provided by Division 08. Keying shall be per user agency requirements.

Faceplate: Etched labeled in red lettering with “FIRE DEPARTMENT OVERRIDE”

Wiring: 18 AWG (minimum); conductor quantity per manufacturer recommendations.

SECURITRON MK series (MKS) or approved equal.

Cabling

General

All cables shall be suitable for installation in the environment defined.

Any cabling installed unenclosed shall meet a [CM][CMP][CMR] rating (or approved substitutes as defined by the referenced NEC).

Cables shall be Underwriters Laboratory (UL) listed and comply with Article 800 (Communications Circuits) of the National Electrical Code.

Use consistent wire colors throughout the project for field device and other connections.

Field Device to Controller

Per manufacturer’s recommendations.

Horizontal (Telecom) Cabling

Coordinate with Division 27 designer to ensure that content of specification Section 27 10 00 and drawings match stated requirements for the Access Control System.

Refer to specification Section 27 10 00 – Structured Cabling for cable and termination requirements for horizontal links designated for Access Control System locations.

1. EXECUTION

General

The complete installation shall be done in a neat, workmanlike manner in accordance with Division 26 of these documents and manufacturer's recommendations.

Coordinate content of the project drawings to identify all controlled and monitored doors. Include even doors equipped with only status monitor. Edit drawings to include rough-in, cabling and device requirements for all door types and configurations.

Review the project drawings to identify rough-in, cabling and device requirements all controlled and monitored doors.

Coordination

For projects where Central Equipment, Credential Data Base, Badging, etc. is administered in Madison by the State Capitol Police, include the following paragraph. Otherwise, delete.

Coordinate with the agency to ensure that the required communications link(s) to the State Capitol Police (Capitol PD) are provided for by the agency. Confirm the documentation required by the agency to support updates to the in-place system.

Coordinate with the Division 08 contractor regarding the doorframes and hardware equipment which is associated with the Access Control System. Verify rough-in and installation requirements for all door frame mounted and/or door mounted control and monitoring equipment.

Prior to start of construction, confirm installation requirements with the Agency. The coordination shall include, but not be limited to, hardware, cabling and wiring requirements including types, sizes, color-coding schemes, labeling, wire way requirements, termination responsibilities, and cable identification requirements.

UW-Madison project meetings shall include representative(s) of the UW Police Department (UWPD).

Prior to the start of system installation, schedule and facilitate a pre-installation meeting with the pertinent hardware, lock, exit device, and door closer manufacturers’ representative(s), [UW Police Department representative,] and related trades to coordinate materials, techniques, and to sequence complex hardware items and system installation. Proper installation and adjustment of hardware is to be reviewed. Convene at least one week prior to commencement of access control installation. Provide written documentation of the meeting including date, attendee/participant list and minutes. Distribute to A/E, Agency and DFD within seven (7) days of the meeting date.

Coordinate with Division 26 installer to confirm required cabling pathways, device rough-ins, and line-voltage power requirements.

Coordinate hardware placement, cabling, and interface requirements relating to elevator cab-mounted credential readers (if applicable) with the elevator contractor.

Prior to system start-up, provide support to agency for updates to central equipment and software as required to add the new components to the overall system. Consider field device locations, controller addresses and other information, network links, etc. as applicable.

Continuity of Existing Services and Systems

No outages shall be permitted on existing systems except at the time and during the interval specified by Agency and site representatives. Obtain written approval for any outages.

Schedule any outage when the interruption causes the least interference with normal site schedules and business routines. No extra costs will be paid to the Contractor for such outages which must occur outside of regular weekly working hours.

Choose reference to General Requirements below for small projects using Simplified Procedures. Choose reference to Supplementary General Conditions for major projects.

Refer to [General Requirements] [Supplementary General Conditions].

Restore any service interrupted as a result of this work to proper operation as soon as possible.

Installation

General

Receive, store and install Access Control System equipment and cabling as specified.

Comply with the manufacturer’s instructions and recommendations for installation of all products.

Provide all system wiring between all components in accordance with manufacturer’s guidelines. Each cable for each device shall be home run. No splices are allowed unless otherwise noted.

Intermediate termination points within a wire run would be considered a splice. If intermediate termination points are allowed, with prior approval of the Agency and the Engineer, provide pull boxes and terminal strips permanently labeled with the numbering scheme per Agency’s requirements.

Mount all credential readers where shown on plans. Placement shall be in accordance with Americans with Disabilities Act (ADA) requirements.

Locate all request-to-exit motion detectors directly above the door frame, centered on the door opening (as applicable). Adjust sensitivity to permit operation on motion of persons within 2'‑0" of door. Avoid false activation by persons passing by where possible.

Provide wiring to request-to-exit devices located in electrified door hardware.

Controller Installation - General

Install, wire, and power per manufacturer’s recommendations.

Cable Installation - General

Route Cable for field devices in raceway unless otherwise noted.

Route system cabling to equipment per the Access Control System installation diagrams. Provide all interconnecting cabling from the head-end, between controllers, and between peripheral devices.

Route cabling/conduit on secure side of door.

Where cables are to be installed unenclosed (without raceway) the cable shall meet NEC requirements for the application and installation environment. See Cable Installation - Unenclosed below.

Route in conduit, all exposed vertical cable extensions to devices located below the finished ceiling.

Install and terminate cable as required at each door location.

Observe cable manufacturers minimum bend radius in all instances. Take care in the use of cable ties to secure and anchor the station cabling. Do not overtighten cable ties as to compress the cable jacket. No sharp burrs should remain where excess length of the cable tie has been cut.

All cable shall be free of tension at both ends. Provide strain relief connectors at each device and junction box where cables enter.

Use suitable cable fittings and connectors.

Cable Installation – Unenclosed

When free-air cable installation is to be permitted in exposed ceiling areas, the A/E shall identify these areas on the plan drawings.

Where unenclosed cable installation is permitted and as designated on the plan drawings, route cabling to avoid areas of high traffic (i.e., aisle way) and as close as possible to outlining walls. Cable route shall be a minimum of ten (10) feet above finished floor. Provide protection for exposed cables where subject to damage.

Route cabling neatly at right angles and be kept clear of other trades work.

Support cabling at a maximum of 4-foot intervals utilizing “J-Hook” or “Bridle Ring” supports anchored to structure. Cable sag at mid-span shall not exceed 6-inches. Install supports to maintain cable bend to larger than the minimum bend radius.

Do not attach-to or support cabling from existing cabling, plumbing or steam piping, ductwork, suspended ceiling supports, or electrical or communications conduit. Do not place cable directly on the ceiling grid or attach cable in any manner to the ceiling grid wires.

Provide 4-feet slack in each cable in accessible ceiling at each device location. Secure cable slack–coiled from 100% to 200% of the cable recommended minimum bend radius– (wire tied) at the last cable support before the cable reaches the device and shall be.

Field Device Installation

Field devices are shown on the drawing locations diagrammatically and shall not be used for dimensioning of final location. The exact location of door control devices shall be determined by the Division 28 contractor and verified with the General and Division 08 contractors.

Multiple devices (i.e., intercoms, card readers, etc.) at door locations shall be mounted adjacent to each other.

Mount Credential Readers at 42" AFF to center unless noted otherwise on drawings.

Card reader stations shall not be mounted back-to-back on a common wall. Maintain separation to eliminate one card reader reading through the wall to a card reader on the opposite side.

When mounting credential readers on a new surface-mounted box, match box dimensions to the dimensions of the credential reader. (Example: For mounting HID ProxPro II 5455 or reader of similar dimension, a Wiremold V5752 2-gang alarm device box, or equivalent, is appropriate.)

Coordinate with Division 26 all 120-volt connections to access control panels, and at remote and local door power supply locations as indicated on the drawings.

Door Control Interface Wiring

Obtain from the Division 08 contractor all necessary cut sheets, wiring diagrams, and manufacturer’s installation instructions.

Install door control wiring at each door location according to manufacturer’s wiring instructions and as provided by the hardware supplier, including standard locations and all special function controls for interlocking doors and fire release door locations.

Emergency Door Release

There are two types of emergency door release events:

* Condition 1 – Emergency Fire Alarm

Doors that receive their lock power from centralized power supplies adjacent to the access control panels: This door type, which, when scheduled to be unlocked in a Condition 1 - Emergency Fire Alarm condition, shall unlock from a fire alarm interface control module at the centralized power supply. When activated, the fire alarm interface control module removes power to the power supply that feeds the locks.

Doors that are associated with crash bars and rim mounted electric locks: The electrical in-rush current of these devices makes it necessary to control these locks from a local power supply provided with the device. This door type, which, when scheduled to be unlocked in a Condition 1 - Emergency Fire Alarm condition, shall unlock from a fire alarm interface control module located at the door’s local power supply.

* Condition 2 – Emergency Response

Doors that receive their lock power from centralized power supplies adjacent to the access control panels: This door type, which, when scheduled to be unlocked in a Condition 2 - Emergency Response condition, shall unlock from the key switch control located per the drawings at the fire alarm control panel located in the lobby. When activated, the key switch removes power to the power supply that feeds the locks.

Doors that are associated with crash bars and rim mounted electric locks: The electrical in-rush current of these devices makes it necessary to control these locks from a local power supply provided with the device. This door type, which, when scheduled to be unlocked in a Condition 2 - Emergency Response condition, shall unlock from the same key switch control as noted above. When activated, the key switch removes power to the power supply that feeds the locks.

Elevator Control

Provide cabling for in-Cab or Elevator Call Credential Readers and elevator control (dry form C contacts) from Access Control System Control Panel to Elevator Controller location. Coordinate with Elevator Contractor.

Network

Where identified in PART 1, provide network electronics as required for links between Control Panels and to Central Equipment. Configure (IP address & other settings.) per agency direction. Otherwise, confirm network requirements to agency.

Identification and Labeling

Label all installed electronic access control cabling and equipment.

Prior to installation, the provide samples of all label types planned for the project. These samples shall include examples of the lettering to be used.

Label cables with the architectural door number for the opening served, the room number the opening is located in, the type of door device they serve (“reader”, “REX”, “lock”, etc.), a unique numerical identification number for the control panel it originates in, and the room number the control panel is located in, on both ends of the cable. Example: “DOOR 1234A / RM 1234 / READER / CP 1 / RM B123”.

All system wiring shall be color coded as required by Agency. Maintain color coding and labeling throughout the system at all accessible locations to the cabling.

Acceptance Testing

General

Conduct acceptance testing according to a schedule coordinated with the Agency and DFD.

Prior to testing, provide a summary of the proposed test plan. Test plan shall include – at minimum – proposed schedule, list of tests to be performed, equipment to be used, set-up, expected results and documentation format.

Testing shall not proceed without approval by the Engineer.

Schedule shall allow time for correction of defects and remedial work.

Representatives of the Owner may be in attendance to witness the test procedures. Provide a minimum of one (1) week advance notice to allow for such participation.

Supply all equipment and personnel necessary to conduct the acceptance tests.

Perform tests related to connected equipment of others only with the permission and presence of Contractor responsible for that equipment.

Assist the User Agency in the final system checkout and commissioning of the Access Control System.

Document all tests. Refer to the Article “DOCUMENTATION” below which details requirements.

Cable Testing

Visually inspect all cabling and termination points to ensure that they are complete and conform to the wiring pattern defined herein. Provide the Engineer with written certification that this inspection has been made.

Test all cables to verify continuity in both door-open and door-closed conditions.

Test all cables for open circuits, ground faults or line-to-line short circuits.

System Testing

At minimum, verify the following are properly wired and labeled:

* Field Devices [and Control Panels].
* Associated equipment such as Power Supplies.

Prior to the commencement of the Acceptance Tests, verify the installation and configuration of software related to the operation and control of the Access Control System.

Assist User Agency in testing overall functionality of the Access Control System. The tests shall include verification of the following:

* The functional operation of each controlled access door and circuit.
* Demonstrate normal and abnormal modes of operation and required responses to each.

Documentation

General

Upon completion of the installation, provide documentation of controlled door locations, door-to-controller port mapping, addresses, and other information as required to support agency updates to system database and maintenance.

Provide additional system documentation as detailed in the sub-sections below.

Provide approved test results and documentation in Operating and Maintenance Manuals.

At the request of any of the parties listed above, provide copies of the original test results.

Provide chart listing test results for each controlled door.

Inform owner of any maintenance agreement(s) which applies to provided software, along with cost of future updates or extensions.

All documentation, including hard copy and electronic forms shall become the property of the State.

Operation and Maintenance Manuals

Submit quantities required by Division 1 and Section 26 05 00.

Provide documents in electronic format (Adobe Acrobat .pdf) and (when requested) hard copy.

At minimum, O&M Manuals shall include:

* Drawings annotated to show as-installed field device locations, cable routes, and major equipment locations
* Cabling Schematics
* Approved Submittals
* Test plan and test report sheets

Warranty

This Contractor shall guarantee the following for a period of two (2) years from date of substantial completion of this work:

* All provided materials and equipment.
* Installation of all equipment, hardware, cabling and related components.

Warranties shall include labor, materials and travel time.

See Division 1, GENERAL CONDITIONS, and GENERAL REQUIREMENTS - Guarantee Documents and the individual technical sections for further requirements.

If while fulfilling requirements of this warranty, the Contractor disturbs other work, the Contractor shall arrange for such disturbed work to be restored to its original condition by the responsible Contractor. This shall be at no cost to the State.

END OF SECTION