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SECTION 28 10 00
ACCESS CONTROL SYSTEM
BASED ON DFD MASTER SPECIFICATION DATED 03/01/23

PART 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 Software House I-Star Access Control System.

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

- I-Star Edge 4-reader panel with 2RM4
- Power supply
- 12V7AH Sealed Lead Acid Battery F1 Terminal
- Signo 20 Mullion Standard Profile with Pigtail
- REX
- Door Window Contact

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:

- I-Star Edge 4-reader panel with 2 RM4

Included are the following topics:

PART 1 - GENERAL

- Scope
- Related Work
- Quality Assurance
- References
- Inspections and Permits
- Submittals

PART 2 - PRODUCTS

- General
- Control Panel (Controller)
- Credential Readers and Keypads
- Miscellaneous Field Devices
- Key switch (Fire Department Override)
- Cabling

PART 3 - EXECUTION

- General
- Coordination
- Continuity of Existing Services and Systems
- Installation
- Identification and Labeling
- Acceptance Testing
- Documentation
- Warranty

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

3
4 Division 08 contractor-furnished, Division 08 contractor-installed

- 5 - Electric Latches and Strikes

6
7 Division 28 contractor-furnished, Division 28 contractor installed

- 8 - Cabling:
9 Field Device to Controller (incl. signal and power)
10 Network Cabling (Controller to Network Switch)
11 Cable Termination at Field Devices
12 Cable Termination at Controller
13 Electric strike wire – 18/2
14 Card reader wire – 18/6
15 Door contact wire – 22/4
16 - Credential Readers
17 - Door lock Power Supplies
18 - Key Switch (Fire Department Override)
19 - Request-to-Exit Devices
20 Coordinate with Capitol police for programming.

21
22
23 All raceways and pull boxes, conduit and cables supports, grounding hardware, and bonding as required for
24 a full and functioning system shall be installed and documented by this Division 28 Contractor, as detailed
25 in this and related section(s).

26
27 **RELATED WORK**

28 Applicable provisions of Division 1 govern work under this Section.

- 29
30 Section 01 91 02 – Commissioning Process
31 Section 08 71 00 – Door Hardware
32 Section 26 05 26 – Grounding and Bonding for Electrical Systems
33 Section 26 05 29 – Hangers and Supports for Electrical Systems
34 Section 26 05 33 – Raceway and Boxes for Electrical Systems
35 Section 26 05 53 – Identification for Electrical Systems
36 Section 27 05 53 – Identification for Communications Systems

37
38 **QUALITY ASSURANCE**

39 **Bidder Qualifications**

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

42
43 Installing contractor must be a firm specializing and experienced in Access Control system installation for
44 no less than 3 years.

45
46 Installing contractor must be a branch office or an authorized representative of the manufacturer of the
47 specified Access Control System” as required to support the warranty stated herein. Such authorization must
48 have been in effect for a period of not less than three years at the time of Bidding and remain so throughout
49 project.

50
51 Installation of equipment and cabling shall be done by qualified staff in the direct employ or directly
52 subcontracted and under the supervision of the manufacturer or Authorized Representative.

53
54 **REFERENCES**

55 All work and materials are to conform to applicable rules and requirements of the Wisconsin State Electrical
56 Code (SPS 316), the National Electrical Code (NFPA 70), other applicable National Fire Protection

1 Association codes, the National Electrical Safety Code, Federal Communications Commission (FCC) rules,
2 and present manufacturing standards (including NEMA).
3

4 All materials shall be listed by UL and shall bear the UL label. If UL has no published standards for a
5 particular item, then other national independent testing standards shall apply, and such items shall bear those
6 labels. Where UL has an applicable system listing and label, the entire system shall be so labeled.
7

8 Other applicable standards are as follows:
9 FCC Part 15 as applicable to the equipment type(s) included
10 UL 294 Standard for Access Control System Units
11

12 **INSPECTIONS AND PERMITS**

13 Refer also to Division 1, General Conditions, Permits, Regulations, Utilities and Taxes.
14

15 Obtain and pay for all required state or local installation inspections and permits except those provided by
16 the Architect/Engineer. Deliver originals of required certificates DFD Construction Representative. Include
17 copies of the certificates and reports in the Operating and Maintenance Manuals.
18

19 **SUBMITTALS**

20 **General**

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

- 22 • Bidder Qualifications
 - 23 • Shop Drawings
- 24

25 Group Submittals to include complete documentation of related systems, products, and accessories in a single
26 submittal.
27

28 Submittals shall be electronic format (ADOBE Portable Document format “.pdf”) thereof.
29

30 **Bidder Qualifications**

31 Furnish documentation of contractor capabilities as identified under “Quality Assurance / Bidder
32 Qualifications” above.
33

34 Where installing contractor is an authorized representative of the Card Access System manufacturer, submit
35 written confirmation of such authorization from the manufacturer. Indicate in letter of authorization that
36 installing contractor has successfully completed all necessary training required for engineering, installation,
37 and commissioning of equipment. Letter should indicate the start date of such authorization.
38

39 **Shop Drawings**

- 40 • Product data for all equipment, hardware cabling and miscellaneous components proposed.
- 41 • Schematic drawings - specific to project - of all circuits from the field devices to the required
42 connection points. The diagrams shall show schematic wiring of equipment and all connections to be
43 made to devices. Terminal connections in the equipment shall be numbered to correspond to the
44 diagrams for use in making connections. Wiring diagrams shall be coordinated so that terminal
45 numbering, circuit designation and equipment or device designations are the same on all drawings. All
46 drawings must be submitted and approved by the Engineer before installation starts, but such approval
47 will not waive specification requirements unless specifically stated.
48

49 Mark submittal package with specification section number. Do not mix sections in a single submittal.
50

51 Work shall not proceed without Engineer approval of the submitted items.
52

53 No substituted materials shall be installed except by written approval from the Engineer.
54

55 **Test Plan**

56 Submit Test Plan during construction. See Part 3.
57

1 **Work Permit**

2 **None required.**

3
4 **Mock-ups**

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

7
8
9 **PART 2 - PRODUCTS**

10
11 **GENERAL**

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

13
14 New system devices installed as part of this project will integrate into the existing campus-wide system. No
15 substitutions will be allowed unless otherwise noted.

16
17 Licensing where applicable will be provided by the owner.

18
19 **CONTROL PANEL (CONTROLLER)**

20 **Control Panel and Enclosure**

21 Control Panel:

- 22 • I-Star Edge 4-reader panel with 2RM4
- 23 • Power supply
- 24 • 12V7AH Sealed Lead Acid Battery F1 Terminal
- 25 • Signo 20 Mullion Standard Profile with Pigtail
- 26 • REX
- 27 • Door Window Contact

28
29
30 **CREDENTIAL READERS**

31 **Proximity Card Reader**

32 Signo 20 Mullion Standard Profile w/Pigtail

33
34 Read Range: up to 6.0 inches (Mullion-mount). Dependent upon installation conditions and credential type.

35
36 Power: 5-16 VDC

37
38 Polycarbonate housing, IP55 rated for indoor and outdoor use, operating temperature of -22 to 150 degrees
39 Fahrenheit.

40
41 Reader provides visual – typically a change in color of LED from red to green – and an audible indication of
42 acceptance or denial of credentials when card is presented to the reader.

43
44 Proximity Card Readers manufactured by others shall be considered equals provided they meet or exceed
45 in performance and quality as specified.

46
47 Color: Architect to select standard color option. Confirm during shop drawing review.

48
49
50 **MISCELLANEOUS FIELD DEVICES**

51 **Request-to-Exit (REX)**

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

53
54 Integral to Door Hardware type: By Division 08 Contractor.

1 Time delay to relock shall be adjusted for 30 second

2

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

4

5 **Local Locking/Unlocking Switch**

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

7

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

9

10 **Door Position Switches**

11 Magnetic-type contacts.

12

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

15

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

17

18 Surface-mounted contacts: Magnetic contacts with a maximum gap range of 38 mm for standard
19 applications and 64 mm for wide-gap applications. Honeywell 950 or 7945 (wide-gap), SENTROL
20 1085T series, or approved equal.

21

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

23

24 **CABLING**

25 **General**

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

27

28 Any cabling installed unenclosed shall meet CMP rating (or approved substitutes as defined by the referenced
29 NEC).

30

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

33

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

35

36 **Field Device to Controller**

37 Per manufacturer's recommendations.

38

39 **Horizontal (Telecom) Cabling**

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

42

43

44

PART 3 - EXECUTION

45

46 **GENERAL**

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

49

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

52

53

54

55

1 **COORDINATION**

2
3 Coordinate with the Division 08 contractor regarding the doorframes and hardware equipment which is
4 associated with the Access Control System. Verify rough-in and installation requirements for all door frame
5 mounted and/or door mounted control and monitoring equipment.
6

7 Prior to start of construction, confirm installation requirements with the Agency. The coordination shall
8 include, but not be limited to, hardware, cabling and wiring requirements including types, sizes, color-coding
9 schemes, labeling, wire way requirements, termination responsibilities, and cable identification requirements.
10

11 Prior to the start of system installation, schedule and facilitate a pre-installation meeting with the pertinent
12 hardware, lock, exit device, and door closer manufacturers' representative(s), and related trades to coordinate
13 materials, techniques, and to sequence complex hardware items and system installation. Proper installation
14 and adjustment of hardware is to be reviewed. Convene at least one week prior to commencement of access
15 control installation. Provide written documentation of the meeting including date, attendee/participant list
16 and minutes. Distribute to A/E, Agency and DFD within seven (7) days of the meeting date.
17

18 Coordinate with Division 26 installer to confirm required cabling pathways, device rough-ins, and line-
19 voltage power requirements.
20

21 Coordinate hardware placement, cabling, and interface requirements relating to elevator cab-mounted
22 credential readers (if applicable) with the elevator contractor.
23

24 Prior to system start-up, provide support to agency for updates to central equipment and software as required
25 to add the new components to the overall system. Consider field device locations, controller addresses and
26 other information, network links, etc. as applicable.
27

28 **CONTINUITY OF EXISTING SERVICES AND SYSTEMS**

29 No outages shall be permitted on existing systems except at the time and during the interval specified by
30 Agency and site representatives. Obtain written approval for any outages.
31

32 Schedule any outage when the interruption causes the least interference with normal site schedules and
33 business routines. No extra costs will be paid to the Contractor for such outages which must occur outside
34 of regular weekly working hours.
35

36 Refer to General Requirements.
37

38 Restore any service interrupted as a result of this work to proper operation as soon as possible.
39

40 **INSTALLATION**

41 **General**

42 Receive, store and install Access Control System equipment and cabling as specified.
43

44 Comply with the manufacturer's instructions and recommendations for installation of all products.
45

46 Provide all system wiring between all components in accordance with manufacturer's guidelines. Each cable
47 for each device shall be home run. No splices are allowed unless otherwise noted.
48

49 Intermediate termination points within a wire run would be considered a splice. If intermediate
50 termination points are allowed, with prior approval of the Agency and the Engineer, provide pull boxes
51 and terminal strips permanently labeled with the numbering scheme per Agency's requirements.
52

53 Mount all credential readers where shown on plans. Placement shall be in accordance with Americans with
54 Disabilities Act (ADA) requirements.
55

1 Locate all request-to-exit motion detectors directly above the door frame, centered on the door opening (as
2 applicable). Adjust sensitivity to permit operation on motion of persons within 2'-0" of door. Avoid false
3 activation by persons passing by where possible.
4

5 Provide wiring to request-to-exit devices located in electrified door hardware.
6

7 **Controller Installation - General**
8 Install, wire, and power per manufacturer's recommendations.
9

10 **Cable Installation - General**
11 Route Cable for field devices in raceway unless otherwise noted.
12

13 Route system cabling to equipment per the Access Control System installation diagrams. Provide all
14 interconnecting cabling from the head-end, between controllers, and between peripheral devices.
15

16 Route cabling/conduit on secure side of door.
17

18 Where cables are to be installed unenclosed (without raceway) the cable shall meet NEC requirements for
19 the application and installation environment. See Cable Installation - Unenclosed below.
20

21 Route in conduit, all exposed vertical cable extensions to devices located below the finished ceiling.
22

23 Install and terminate cable as required at each door location.
24

25 Observe cable manufacturers minimum bend radius in all instances. Take care in the use of cable ties to
26 secure and anchor the station cabling. Do not overtighten cable ties as to compress the cable jacket. No
27 sharp burrs should remain where excess length of the cable tie has been cut.
28

29 All cable shall be free of tension at both ends. Provide strain relief connectors at each device and junction
30 box where cables enter.
31

32 Use suitable cable fittings and connectors.
33

34 **Cable Installation – Unenclosed**
35 Where unenclosed cable installation is permitted and as designated on the plan drawings, route cabling to
36 avoid areas of high traffic (i.e., aisle way) and as close as possible to outlining walls. Cable route shall be a
37 minimum of ten (10) feet above finished floor. Provide protection for exposed cables where subject to
38 damage.
39

40 Route cabling neatly at right angles and be kept clear of other trades work.
41

42 Support cabling at a maximum of 4-foot intervals utilizing "J-Hook" or "Bridle Ring" supports anchored to
43 structure. Cable sag at mid-span shall not exceed 6-inches. Install supports to maintain cable bend to larger
44 than the minimum bend radius.
45

46 Do not attach-to or support cabling from existing cabling, plumbing or steam piping, ductwork, suspended
47 ceiling supports, or electrical or communications conduit. Do not place cable directly on the ceiling grid or
48 attach cable in any manner to the ceiling grid wires.
49

50 Provide 4-foot slack in each cable in accessible ceiling at each device location. Secure cable slack–coiled
51 from 100% to 200% of the cable recommended minimum bend radius– (wire tied) at the last cable support
52 before the cable reaches the device and shall be.
53

1 **Field Device Installation**

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

5
6 Multiple devices (i.e., intercoms, card readers, etc.) at door locations shall be mounted adjacent to each other.

7
8 Mount Credential Readers at 42" AFF to center unless noted otherwise on drawings.

9
10 Card reader stations shall not be mounted back-to-back on a common wall. Maintain separation to eliminate
11 one card reader reading through the wall to a card reader on the opposite side.

12
13 When mounting credential readers on a new surface-mounted box, match box dimensions to the dimensions
14 of the credential reader. (Example: For mounting HID ProxPro II 5455 or reader of similar dimension, a
15 Wiremold V5752 2-gang alarm device box, or equivalent, is appropriate.)

16
17 Coordinate with Division 26 all 120-volt connections to access control panels, and at remote and local door
18 power supply locations as indicated on the drawings.

19
20 **Door Control Interface Wiring**

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

23
24 Install door control wiring at each door location according to manufacturer's wiring instructions and as
25 provided by the hardware supplier, including standard locations and all special function controls for
26 interlocking doors and fire release door locations.

27
28 **Network**

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

32
33 **IDENTIFICATION AND LABELING**

34 Label all installed electronic access control cabling and equipment.

35
36 Prior to installation, the provide samples of all label types planned for the project. These samples shall include
37 examples of the lettering to be used.

38
39 Label cables with the architectural door number for the opening served, the room number the opening is
40 located in, the type of door device they serve ("reader", "REX", "lock", etc.), a unique numerical
41 identification number for the control panel it originates in, and the room number the control panel is located
42 in, on both ends of the cable. Example: "DOOR 1234A / RM 1234 / READER / CP 1 / RM B123".

43
44 All system wiring shall be color coded as required by Agency. Maintain color coding and labeling throughout
45 the system at all accessible locations to the cabling.

46
47 **ACCEPTANCE TESTING**

48 **General**

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

50
51 Prior to testing, provide a summary of the proposed test plan. Test plan shall include – at minimum –
52 proposed schedule, list of tests to be performed, equipment to be used, set-up, expected results and
53 documentation format.

54
55 Testing shall not proceed without approval by the Engineer.

56

1 Schedule shall allow time for correction of defects and remedial work.
2
3 Representatives of the Owner may be in attendance to witness the test procedures. Provide a minimum of
4 one (1) week advance notice to allow for such participation.
5
6 Supply all equipment and personnel necessary to conduct the acceptance tests.
7
8 Perform tests related to connected equipment of others only with the permission and presence of Contractor
9 responsible for that equipment.
10
11 Assist the User Agency in the final system checkout and commissioning of the Access Control System.
12
13 Document all tests. Refer to the Article "DOCUMENTATION" below which details requirements.
14
15 **Cable Testing**
16 Visually inspect all cabling and termination points to ensure that they are complete and conform to the wiring
17 pattern defined herein. Provide the Engineer with written certification that this inspection has been made.
18
19 Test all cables to verify continuity in both door-open and door-closed conditions.
20
21 Test all cables for open circuits, ground faults or line-to-line short circuits.
22
23 **System Testing**
24 At minimum, verify the following are properly wired and labeled:
25 • Field Devices and Control Panels.
26 • Associated equipment such as Power Supplies.
27
28 Prior to the commencement of the Acceptance Tests, verify the installation and configuration of software
29 related to the operation and control of the Access Control System.
30
31 Assist User Agency in testing overall functionality of the Access Control System. The tests shall include
32 verification of the following:
33 • The functional operation of each controlled access door and circuit.
34 • Demonstrate normal and abnormal modes of operation and required responses to each.
35
36 **DOCUMENTATION**
37 **General**
38 Upon completion of the installation, provide documentation of controlled door locations, door-to-controller
39 port mapping, addresses, and other information as required to support agency updates to system database and
40 maintenance.
41
42 Provide additional system documentation as detailed in the sub-sections below.
43 Provide approved test results and documentation in Operating and Maintenance Manuals.
44
45 At the request of any of the parties listed above, provide copies of the original test results.
46
47 Provide chart listing test results for each controlled door.
48
49 Inform owner of any maintenance agreement(s) which applies to provided software, along with cost of future
50 updates or extensions.
51
52 All documentation, including hard copy and electronic forms shall become the property of the State.
53
54 **Operation and Maintenance Manuals**
55 Submit quantities required by Division 1 and Section 26 05 00.
56

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

2

3 At minimum, O&M Manuals shall include:

- 4 • Drawings annotated to show as-installed field device locations, cable routes, and major equipment
- 5 locations
- 6 • Cabling Schematics
- 7 • Approved Submittals
- 8 • Test plan and test report sheets

9

10 **WARRANTY**

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

12 of this work:

- 13 • All provided materials and equipment.
- 14 • Installation of all equipment, hardware, cabling and related components.

15

16 Warranties shall include labor, materials and travel time.

17

18 See Division 1, GENERAL CONDITIONS, and GENERAL REQUIREMENTS - Guarantee Documents and

19 the individual technical sections for further requirements.

20

21 If while fulfilling requirements of this warranty, the Contractor disturbs other work, the Contractor shall

22 arrange for such disturbed work to be restored to its original condition by the responsible Contractor. This

23 shall be at no cost to the State.

24

25

END OF SECTION