

SECTION 28 13 00– Access Control Systems

PART 1: GENERAL

1.01 Summary

- A. Section Includes:
 - 1. Access control.
 - 2. Stranded power and control cable.
 - 3. Cable connecting hardware, patch panels, and cross-connects.
 - 4. Cable management system.
 - 5. Cabling identification products.
 - 6. Grounding
 - 7. Pathways
- B. Related Specifications:
 - 1. Communications Specification Standards – 27 00 00
 - 2. Building Hardware Specification Standards – 08 71 00
- C. System Requirements:
 - 1. Install and integrate Access Control, CCTV and related security hardware.
 - 2. Configure local access panels in various telecommunication room (TR) and the Server’s computer system to communicate with one another.
 - 3. Enter security system databases hardware configuration.
 - 4. Test security system communication and operation in accordance with the specifications.
 - 5. Train operators and the system managers.
- D. Bidding Requirements:
 - 1. Submit complete detailed proposals with line item cost representation for components and associated installation labor. Lump sum bids will not be accepted.
 - 2. Include as part of the bid response the following item:
 - a. Installation schedule with proposed manpower assignments,
 - b. Resumes for project manager and lead engineer for this project.
 - 3. Review associated “E” and “TA” Series electrical, low voltage infrastructure drawings to verify that necessary conduit and floor boxes will be provided by others. The Owner will provide no additional infrastructure to support the Access Control System. Any discrepancies

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with the identified infrastructure to support these systems should be questioned in the form of a request for information (RFI) during the bidding process. Be responsible for any additional infrastructure requirements after receipt of contract for this project.

4. Unspecified Equipment and Material: Any item of equipment or material not specifically addressed on the drawings or in this document and required to provide complete and functional Access Control systems shall be provided in a level of quality consistent with other specified items.

1.02 References

- A. The Codes and Regulations listed below from a part of this specification to the extent referenced. Work shall be performed in accordance with the applicable international, federal, state, and local codes or standards current at the commencement of installation. The following list summarizes applicable standards:
 1. UL 294, UL 1076, ULC
 2. CE
 3. FCC-Part 15, Part 68
 4. NFPA 70, NEC
 5. IEEE, RS 170 variable standard
 6. RoHS
- B. Where more than one code or regulations is applicable, the more stringent shall apply.
- C. Cable and equipment installation, identification and termination shall be performed in accordance to the applicable codes above.

1.03 System Description

- A. Complete engineering, installation and operation of the ACS.

1.04 Definitions

- A. ACS – Access Control System – Cbord CS Gold/CS Access

1.05 ACS Description

- A. Texas State University currently uses the CS Gold/CS Access system by the Cbord Group, Inc. 61 Brown Road, Ithaca, New York, 14850 607.257.2410 www.cbord.com
- B. All building and room access control systems shall be systems, equipment, and accessories compatible with the current ACS. All auxiliary accessories or

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supporting devices shall be fully compatible with and able to integrate with existing campus system.

- C. The ACS System outlined in this section and detailed in Part 2 of this document is the key central component for managing physical security and the bridge between physical and logical security for this project. The system shall provide a variety of integral functions including the ability to regulate access and egress; provide identification credentials; monitor, track and interface alarms; and view, record and store digital surveillance video linked to ACS events.
- D. Upgrades or expansion of the ACS to a larger size system in scale shall not require installation of a different and or new ACS application or require the administrator/operator to learn a different and or new interface from the previous version.

1.06 Performance Requirements

- A. All programming of all system’s hardware is by the Access Services. A one year full parts and labor warranty is specified. Note that the full one year parts and labor warranty is unconditional and covers all portions of this system from failure, except for acts of God or misuse by the owner. During this one-year period, the security contractor must meet the following performance requirements.
 - 1. Respond Onsite Within Two to Four Hours
 - 2. Advanced Loaners
 - 3. Computerized Dispatch
 - 4. Service technicians certified on system components and products.
 - 5. Available 7 days a week, 24 hours a day.

1.07 Submittals

- A. Comply with requirements of submittal procedures by A/E specifications.
- B. Informational Submittal: Submit a detailed bill-of materials listing all part numbers and quantities for this project.
- C. Qualification data:
 - 1. List all technical personnel
 - 2. List of all technical personnel, that are certified on factory components

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3. Identification in both quantity and dollars of the amount of service inventory maintained locally on both services vehicles and your warehouse.
 4. Resume of key project manager, and lead technician.
 5. Three (3) references from universities using complex access control systems (more than 50 card readers).
- D. Pre-Qualification Certificate as part of this proposal: Submit a letter of approval from the manufactures indicating ~~on~~ compliance with qualifications requirements. Training certificates for design, engineering and installation of the proposed products shall be submitted with the proposal.
- E. Service Dispatch: Submit as part of this proposal an outline containing the type of service program used for dispatching and tracking service calls.
- F. Shop Drawings: Required before work can begin. Shop drawings will clearly indicate how work will be performed.
- G. Product Literature Sheets: Provide a manufacturer’s product cut sheet for each component of the system including each data gathering panel, computer, computer peripheral, alarm contacts, UPS, power supply, electronic locking device, delay locking device, or other device on the device schedule.
- H. Detail Drawings. Provide a detail drawing for each type of door. This should also include device location on floor plans, wiring diagrams and point-to-point charts, riser diagrams for each major subsystem, etc. Show each input and output terminal on each panel and identity its use. If it is a spare, indicate this accordingly. Include on shop drawings the reader locations and show the reader controller to which they are assigned. Show the devices they work with such as electric locks, local audible alarms, door contacts, etc.
- I. Project Directory. Provide a job directory of your company engineering and installation team including phone, fax, email or mail to each manager, engineer, sales rep, or installer involved in this project.
- J. Block Diagrams. Submit block diagrams for each system indicating connections of equipment and indicating equipment types and model numbers.
- K. Riser Diagram. Provide riser diagrams of the access control systems and any other system specified herein.
- L. Field Devices. Submit details on items such as alarm detectors and contacts and card readers including their appearance and performance, specifications, and

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exact locations. Include on shop drawings the reader locations and show the reader controller to which they are assigned. Show the devices they work with such as electric locks, local audible alarms, door contacts, etc.

- M. Manuals: Final copies of the manuals shall be delivered within fourteen (14) days after completing the installation test. Each manual's contents shall be identified on the cover. The manual shall include names, addresses, and telephone numbers of the contractor responsible for the installation and maintenance of the system and the factory representatives for each item of equipment for each system. The manuals shall have a table of contents and labeled sections. The final copies delivered after completion of the installation test shall include all modifications made during installation, checkout, and acceptance testing. The manuals shall consist of the following available from the manufacturing:
1. Functional Design Manual: The functional design manual shall identify the operational requirements for the system and explain the theory of operation, design philosophy, and specific functions. A description of hardware and software functions, interfaces, and requirements shall be included.
 2. Hardware Manual: The manual shall describe all equipment furnished including:
 - a. General description and specifications
 - b. Installation and check out procedures
 - c. Equipment layout and electrical schematics to the component level
 - d. System layout drawings and schematics
 - e. Alignment and calibration procedures
 - f. Manufacturers repair parts list indicating sources of supply
 3. Software Manual: The software manual shall describe the functions of all software and shall include all other information necessary to enable proper loading, testing, and operations. The manual shall include.
 - a. Definition of terms and functions
 - b. System use and application software
 - c. Initialization, startup, and shut down
 - d. Reports generations
 - e. Details on forms customization and field parameters
 4. Operators Manual: The operators manual shall fully explain all procedures and instructions for the operation of the system including:
 - a. Computers and peripherals
 - b. System's startup and shut down procedures

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- c. Use of system, command, and applications software
 - d. Recovery and restart procedures
 - e. Graphic alarm presentation
 - f. Use of report generator and generation of reports
 - g. Data entry
 - h. Operator commands
 - i. Alarm messages and reprinting formats
 - j. System permissions functions and requirements
5. Maintenance Manual: The maintenance manual shall include descriptions of maintenance for all equipment including inspection, periodic preventive maintenance, fault diagnosis, and repair or replacement of defective components.
6. Manuals shall be delivered on CD/DVD in an organized fashion based on manufacturer and product.
- N. As-Built Drawings: During system installation, maintain a separate hard copy of drawings, elementary diagrams, and wiring diagrams of the ACS to be used for record drawings. This set shall be accurately kept up to date by the Contractor with all changes and additions to the ACS. Copies of the final as-built drawings shall be provided to the end user in DXF format.

1.08 Quality Assurance

- A. Installing company must be on a pre-approved list furnished by the owner for installation services for this project.
- B. Providers of manufactured components, installation, wiring and testing shall be the responsibility of a single contractor who is an authorized dealer for the product supplied and who has been continuously in business for a period of not less than five (5) years and is licensed as required by the jurisdictions where the work will occur to perform the work specified. The security contractor shall meet the following performance requirements:
- 1. The security firm shall be licensed by the State of Texas and in good standing.
 - 2. Technician Certification:
 - a. Technical personnel shall be certified by the factory for the installation and service of all components.
 - 3. Security License Requirements: The security contractor and “all” personnel at the company (including technical and administrative staff)

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shall be licensed by the State of Texas for a security license with the appropriate background checks.

- C. Service Support: Provide post-sales service support for all components in the system design that meets requirements:
 - 1. Availability: 7 days a week, 24 hours a day.
 - 2. Response Time: Two to four hours on-site.
 - 3. Advance Replacement:
 - a. Contractor shall provide advance replacements for any component whenever it is required.
 - b. The contractor shall be able to provide advance loaners.

1.09 Contractor Performance Requirements

- A. Technical Personnel: The contractor shall have adequate technical staff located within sixty (60) miles of the university.
- B. Working Hours Response: During normal working hours, all telephone calls placed to the contractor shall be answered by a live person, not an auto-attendant.
- C. Service Dispatch: The contractor shall use a computerized service dispatch system that is a commercial off-the-shelf product used for dispatching service companies. At the end of every week, the contractor will be required to email Texas State University a list of all service calls and their status on an automatic basis. Excel spreadsheets are not acceptable for a service dispatch program.
- D. The contractor shall have a dedicated position specifically for managing and dispatching service call for their clients. This position shall perform no other functions except service-related dispatch functions and service.
- E. Engineering: The contractor must have field-trained engineers on staff that are 100% conversant in AutoCAD and are able to provide the necessary electronic drawings and submittals required for a project of this size.
- F. Contractor must meet all security clearance requirements to meet NBHPP CHEMPAK standards.

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1.10 Substitutions and Quality

- A. Where products are specified by name, provide and install that product. Substitutions will not be accepted for the access control system or their sub-system.

1.11 Delivery, Storage, and Handling

Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly indicating manufacturer and materials.

1.12 Project Conditions

- A. Environmental Limitations: Do not deliver or install cables, equipment, and connecting materials until wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.13 Coordination

- A. Coordinate layout and installation of ACS equipment with Owner's security representative.
 - 1. Meet jointly with FPDC and Access Services to exchange information and agree on details of equipment arrangements and installation interfaces.
 - 2. Record agreements reached in meetings and distribute them to other participants.
- B. Coordinate layout and installation of the ACS cable pathways with telecommunications contractor.

1.14 Warranty

- A. During the first year, provide a full service warranty program that guarantees a two to four hour on-site response, include all parts and labor, and provides advance replacements for any defective components. The installation contractor must qualify as the service organization and provide the on-site warranty service. The contractor recognizes that in emergent situations, Texas State University-Access Services personnel may have to respond before the contractor. In the event that Texas State University-Access Services initially responds, the contractor accepts the work and agrees that the Warranty is still in full force and effect. The contractor will reimburse Texas State University for all expenses.

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- B. The system components shall be guaranteed against all defective materials, design and workmanship for a period of one-year from the date of acceptance by the client after final testing. New replacement parts shall be furnished promptly and defects in design and workmanship shall be corrected, without cost to the Owner, promptly upon receipt of notice from the Owner of failure of any part of the system during the guarantee period. This is a one year full parts and labor warranty and no alternative will be acceptable.

- C. Personnel: Service personnel shall be factory certified in the maintenance and repair of the equipment installed under this section of the specification. The owner shall be advised in writing of the name of the designated service representative, and of any change in personnel.

- D. Schedule of Work: This work shall be performed during regular working hours (8-5), Monday through Friday, excluding federal holidays.
 - 1. Inspections: The Contractor shall perform two minor inspections at six (6) month intervals (or more often if required by the manufacturer), and two major inspections offset equally between the minor inspections to effect quarterly inspection of alternating magnitude.
 - 2. Minor Inspections: These inspections shall include:
 - a. Visual checks and operational tests of all console equipment, peripheral equipment, field hardware, sensors, and electrical and mechanical controls.
 - b. Mechanical adjustments if required on any mechanical or electromechanical devices.
 - 3. Major inspections: These inspections shall include all work described under paragraph Minor Inspections and the following work:
 - a. Clean all ACS equipment, including interior and exterior surfaces.
 - b. Perform diagnostics on all equipment
 - c. Check, physically test, and if required by the manufacturer's maintenance procedures, calibrate each sensor.
 - d. Run all system software diagnostics and correct all diagnosed problem.

- E. Operations: Performance of scheduled adjustments and repair shall verify operation of the ACS as demonstrated by the applicable tests of the performance verification test.

- F. Emergency Service: The owner will initiate service calls when the ACS is not functioning properly and hinders critical operation of the facility. Qualified personnel shall be available to provide repairs to the ACS. The owner shall be

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furnished with a telephone number where the service supervisor can be reached at all times. Service personnel shall be at site within four (4) hours after receiving a request for service. The ACS shall be restored to proper operating condition within eight (8) hours after service personnel arrive on site.

Records and Logs: Keep records and logs of each task, and organize cumulative records for each component, and for the complete system chronologically. A continuous log shall be maintained for all devices. The log shall contain all initial settings. Complete logs shall be kept and shall be available for inspection on site, demonstrating that planned systematic repairs have been accomplished for the ACS.

- G. Work Requests: Separately record each service call request on a service request form. The form shall include the model and serial number identifying the component involved, its location, date and time the call was received, specific nature of trouble, name of services personnel assigned to the task, instructions describing what has to be done, the amount and nature of the materials used, the time and date work started, and the time and date of completion. Deliver a record of the work performed within five (5) days after work is accomplished.
- H. System Modifications: Make any recommendations for system modification in writing to the Owner. No system modifications shall be made without prior written approval of the Owner. Any modifications made to the system shall be incorporated into the operations and maintenance manuals, and other documentation affected.
- I. Software: Provide all software updates during the period of the warranty and verify operation in the system. These updates shall be accomplished in a timely manner, fully coordinated with ACS operators, shall include training for the new changes/features enabled, and shall be incorporated into the operations and maintenance manuals, and software documentation.

1.15 Commissioning and Startup

- A. Provide Access Services with programming sheets in excel format showing equipment locations, model numbers, cabling, controller panel MAC addresses, physical addressing for and cable termination points on controller panels, door interface , input, and output panels.
- B. Conduct formal inspection of ACS with Access Services and Network Operations staff. Demonstrate every device location is providing proper signals and indicators showing door functions (open/closed, forced/rex, propped, card read, and manual unlock).

PART 2: PRODUCTS

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2.01 Access Control Cable

- A. Yellow Plenum overall jacket, components listed below:
 - 1. SHLD 18 awg-4/c (printed: lock power) plenum jacket
 - a. Larger gauge wire may be required to compensate for voltage drop over longer distances.
 - 2. SHLD 22 awg-3/PR (card reader) plenum jacket
 - 3. SHLD 22 awg-2/c (door contact) plenum jacket
 - 4. SHLD 22awg-4/c (rex/spare) plenum jacket
 - 5. Door monitor cable-SHLD 22awg-2/c Plenum (door contact) plenum jacket
- B. ADA/Spare Cable
 - 1. 22awg-4/c plenum jacket
- C. Von Duprin Latch Retraction/ Delayed Egress
 - 1. 12 awg-2/c plenum jacket up to 200ft
- D. Delayed Egress Monitoring Cable
 - 1. 22awg -8/c plenum jacket

2.02 Readers

- A. Exterior Door
 - 1. HID Corp (www.hidcorp.com) R40 I-Class card reader (Wiegand) (R40 is preferred default card reader).
 - 2. HID Corp R10 I-Class card reader (requires Access Services approval).
 - 3. HID Corp. RK40 I-Class card reader with keypad (requires Access Services approval).

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4. HID Corp ER40 I-Class card reader and single door controller (requires Access Services approval).
 5. HID Corp ER40K I-Class card reader with keypad and single door controller (requires Access Services approval).
 6. HID Corp. R90 I-Class long range card reader for Handicap equipped entrances (Wiegand).
 - 7.
- B. Interior Door
1. HID Corp. R 40 I-Class card reader (Wiegand).
- C. Disable/Handicap Enabled Doors
1. HID Corp. R90 I-Class long range card reader for Handicap equipped entrances (Wiegand).
- D. Parking Vehicle Entrances
1. HID Corp. R90 I-Class long range card reader (Wiegand).
- E. Elevators
1. HID Corp. R40 I-Class card reader (Wiegand).
- F. Biometric
1. Schlage Handkey II Biometric Reader
 2. All other readers must be compatible and supported by CS Access system software. (www.cbord.com)
- G. Wireless
1. Schlage Wireless I-Class. (requires prior written approval by Access Services).

2.03 Power Supplies

- A. Altronix Corp. Maximal 75 power supplies shall be used for all controllers, card readers, locks, and sensors unless otherwise specified by these university construction standards or Access Services.

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1. Maximum of sixteen (16) card readers per Maximal 75 power supply.
 2. Altronix Corp PD8 distribution board to be used for card reader and control panel power distribution.
 3. Altronix Corp. ACM8 distribution board(s) to be used for lock power distribution.
 4. Each Maximal 75 power supply will be equipped with four (4) 12 amp/hour back-up batteries.
 5. 5. Monitor power supply AC power fail and battery fail outputs using ACS.
- B. Von Duprin PS 914-BB power supplies, when required by electric latch retraction and/or delayed egress devices, shall be mounted in a way to be accessible from the ground (preference is for Von Duprin power supplies to be centrally mounted with the access equipment being optimal).
1. Each PS914-BB power supply to be equipped with appropriate option board(s).
 2. Each PS914-BB power supply will be equipped with two (2) 12 amp/hour back-up batteries.
 3. Monitor power supply AC power fail and battery fail outputs using ACS

2.04 Access controller Devices

- A. Cbord V1000 Squadron Control Panel. (www.cbord.com)
- B. Chord V100 door controller.
- C. Cbord V200 Input controller
- D. Cbord V300 Output controller
- E. Cbord V2000 two door Squadron controller
- F. Cbord Panel Interface Module (PIM)

2.05 Attic / Spare Stock

- A. Equal to five percent (5%) of each type of card reader (1 each type minimum but not to exceed 10 readers per project).
- B. Equal to five percent (5%) of each type of power supply transformer board (1 each type minimum but not to exceed 5 per project).
- C. Equal to five percent (5%) of each type of Cbord controller panels (1 each type minimum but not to exceed 5 per project)

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2.06 Delayed Egress Monitoring

A. Monitor delay egress door hardware for the following functions:

1. Device power supply status.
2. Fire alarm relay status.
3. Device activation/arm status.
4. Device alarm status.
5. Door position status.

B. Devices

1. Von Duprin-Chexit-98-Delayed Egress
2. GE Type 1076DPDT Door Position Switch.
3. Minimum two (2) Altronix 24volt SPDT relay for monitoring with ACS.

C. Cable

1. 22awg / 8c from panic device to access control panel
- 2.

2.07 Data/Network

A. One (1) accessible data port/connection shall be provided for each Cbord V1000 Squadron controller panel installed.

PART 3: EXECUTION

3.01 General Design Standards

A. ACS shall be designed and installed to not interfere with egress requirements for life safety nor interfere with intrusion or fire alarm systems.

B. All access controlled handicap entrances shall be fully integrated into the building ACS ensuring that while providing access to the disabled, that proper access control is maintained in both the unsecured and secured modes. ACS shall be installed to comply with Americans with Disabilities Act, Texas Accessibility Standards, and Texas State University-San Marcos policies.

C. All access control installations shall use housings and mountings which maintain or minimize disruption to architectural sensibilities or themes of the buildings and campus.

D. All access control installations shall use housings and mounting designed to provide sufficient protection against tampering and vandalism. Torx center pin security fasteners shall be in used on all devices installed in public areas.

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- E. All equipment and components to support ACS shall be installed to manufacture's specifications. Installation of components and hardware shall be in place prior to connection to the access control system.
- F. Installations of ACS equipment hardware shall comply with requirements found in Texas State University-San Marcos Construction Standards.
- G. All ACS shall be configured to provide a Fail Secure with mechanical manual egress from the secure side in the event of a loss of power, loss of network communications, or system failure.
- H. All access control equipped doors locking hardware shall include keyed locking mechanisms accessible from the unsecured side to allow keyed manual operation of the door.
- I. All access control equipped doors shall be equipped with door position monitors and request to exit devices to allow for configuration of door condition alarms.
- J. All ACS equipment, including controllers and power supplies, shall be located in accessible and secure rooms; with Telecommunications/IDF rooms being preferred.
- K. Electric power supplies and power converters for the ACS equipment and hardware shall be connected in the Telecommunications/IDF room. Power supplies located at the access equipped door should be avoided.
- L. Electrical service to ACS power supplies shall be on dedicated circuits. Where practicable, electric power for the access system should be provided through the building emergency power supply.
- M. All ACS equipment power supplies shall be equipped with battery back up to allow operation if electrical service and emergency generated power is lost.
- N. As a minimum, provide conduit from all access devices, hardware, and equipment to ceiling location to allow for convenient access to raceway for cabling.
- O. All new construction installation of ACS shall be hardwired. In renovation or retrofit installations hardwired installations are preferred; wireless systems may be considered with the approval of Access Services, ~~and~~ Project Manager, and building owner.
- P. Wiring Connection Requirements: All low voltage control, monitor, power, and other cables shall be connected using sealed crimp type lugs, no wire nuts will be allowed.

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- Q. Monitor Contacts: Door monitoring contacts, wiring, and conduits there to, shall be concealed and invisible when the door is closed. Externally applied door monitoring contacts, externally applied conduit or wire mold, and wire without conduit must be approved by Access Services, Project Manager, and building owner.
- R. Request to Exit Switches: Request to exit (RX) switches should be mechanical or magnetic hardware based devices. Passive infrared (PIR) or sonic detectors require prior approval of Access Services.
- S. All door position, request to exit, tamper, battery failure, and AC power failure switches shall be wired using GRI 2.2k resistor packs allowing for supervised monitoring by the Cbord CS Gold/CS Access system.
- T. Doorways or entrances having multiple doors or leafs shall be equipped with door position switches and request to exit devices on each leaf or door.
- U. All delayed egress equipped doors will be monitored by the ACS for device power supply status, fire alarm relay status, device arm/disarm status, device alarm status, and door position.

3.02 Conductors, Wire, Cables

- A. Data
 - 1. All ACS data wiring, cables, jumpers, and connectors will comply with requirements of Division 27 Construction Standards.
- B. Low Voltage Electrical
 - 1. All ACS low voltage electrical wiring, cables, and connectors will comply with the requirements of Division 27 Construction Standards.
 - 2. All ACS low voltage electrical wire shall be rated and adequate to supply the intended doors full functionality including but not limited to lock mechanisms, readers, and monitoring points without exceeding seventy-five percent (75%) of the wire's rated capacity.
 - 3. Distance from power supply to door lock should be examined to determine manufacturer's recommended wire gauge to support expected voltage drop over distance.

3.03 Controllers

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A. Squadrons/Controllers

1. All access control system squadrons and/or controllers should be located in secure location with Telecommunication/IDF closets being preferred.
2. All access control system controllers and interface devices shall be housed in a metal case. Metal enclosure should provide surplus room to accommodate 20% expansion of the devices in the enclosure.
3. All access control system squadron and/or controller installations shall comply with requirements of Division 27 Construction Standards.

B. Wireless Controllers and Transceivers.

1. Prior to installation of wireless devices, testing of wireless transmissions and performance will be performed. A written report of the testing results will be provided to Access Services for approval.
2. All access control system wireless transceivers/PIM shall be mounted out of the public view with mounting in a secured room being preferred.
3. All access control system wireless transceivers/PIMs shall be housed in a case capable of being locked.
4. All access control system wireless transceivers/PINs installations shall comply with requirements of Division 27 Construction Standards. Attention should be given to avoid interference with other wireless devices.

3.04 Electrical Power Needs

- A. All ACS power supplies should be located in secure location with Telecommunication/IDF closets being preferred.
- B. Preferably, ACS power cables shall not be installed to be within the public view. However, if power cables cannot be properly concealed and must be in the public view, they shall be placed in conduit to prevent damage or tampering.
- C. All ACS power supplies shall be rated and adequate to supply all controllers, door locks, card readers, and monitor devices without exceeding seventy-five percent (75%) power supply. In selection of power supply output, special attention should be paid to expected distance from power supply to door installation and resulting voltage drop over distance. All power supply distribution terminations shall be individually fused.

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- D. ACS power supplies should be equipped with battery back up to insure operation in the event of power failure regardless of building emergency power supply.
- E. ACS power supplies should be connected to the building emergency power system to insure service in the event of AC power failure or battery failure.
- F. ACS power supplies shall be equipped to allow ACS to detect and report building electrical power feed failure.
- G. ACS power supplies shall provide a device or method to terminate building electrical power feed at the power supply by switch or plug.
- H. A four gang electrical outlet connected to dedicated 20 amp power supply shall be provided at each controller/power supply installation location.

3.05 Equipment Cabinets

- A. All ACS controllers and power supplies shall be housed in metal cabinets capable of being locked using a key. The cabinet shall be secured to the wall of the telecommunication /IDF closet in accordance with the requirements listed in Division 27 Construction Standards. The final mounting location in telecommunication closet/IDF closet requires prior approval by the Office of Technology Resources.
- B. All ACS controller and power supplies cabinets shall be equipped with monitors to allow remote determination of cabinet cover door status (open vs. closed). All access control system controller and power supply cabinets shall be equipped with keyed locks to secure cabinet.
- C. Conduit wire pathways shall be installed to house wiring passing from the power supply cabinets and the squadron/controller enclosures.

3.06 Electronic Access Control

- A. Administration of the electronic ACS infrastructure includes documentation of devices, cables, termination hardware, patching and cross-connection facilities, conduits, other cable pathways, and telecommunications closets. All Texas State facilities shall apply and maintain a system for documenting and administering the electronic ACS infrastructure.
- B. In order to create a consistent environment, Texas State maintains a campus wide numbering scheme for electronic access control. (Building name abbreviations published in Texas State Master List of Buildings <http://www.maps.txstae.edu/masterlist.html>/ Parking Lot numbers published in

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Parking Services Parking Regulations and Map
<http://www.parking.txstate.edu/AllColor.htm>).

1. All cables and components used on electronic access control equipped doors and controllers shall be clearly marked using permanent means. Equipped door and controllers shall use the following system of numbering:
 - a. Exterior Doors: Abbreviated building name + EXT + room number of door + decimal designator + abbreviated compass direction of door relative to the center of the building. Example: JCK EXT 27.1 NW.
 - b. Interior Doors: Abbreviated building name + INT + room number + decimal door number + decimal door number determination if more than one doorway to the room is present. Example: JCK INT 101.1.
 - c. Controllers: Abbreviated building name + room number of telecommunications room installed in + device model + decimal designation. Example JCK 202 1000.1.
 - d. Power Supply: PWR + Abbreviated building name + room number of telecommunications room installed in + decimal designation. Example PWR JCK 202.1
 - e. Door/Controller Terminator: Controllers shall be labeled with exterior or interior door numbering scheme indicating the doorway(s) attached to each controller.

3.07 Records

- A. A record is a collection of information about or related to a specific element of the ACS. Records must be maintained in a computer printable spreadsheet, or in a computer database. Submit proposed record format to Access Control for approval. Paper records are encouraged, but are optional. A device and cable record is prepared for each device/door installation. The record will show the device/door name, and must describe the components from origin point and destination point. The device and cable record will record what services and/or connections are assigned to each installed location based on Equipped Door Number. An equipment record is prepared for services distributed from a certain piece of equipment, such as an encoder, controller, or a system.

3.08 Drawings

- A. Drawings are used to illustrate different stages of ACS installation planning, installation and administration.

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B. Installation or Construction Drawings.

1. Installation or construction drawings are the plans that show the installer how the infrastructure and devices are to be installed. The quality of the installation can be directly impacted by the level of details in the installation drawings and written specifications. Installation drawings for Texas State projects shall, at a minimum, show device installation, show pathway locations and routing, show configuration of ACS including door hardware installation, device installation, infrastructure, backboard and equipment rack configurations, and wiring details including identifier assignments.

C. As-Built Drawings

1. The as-built drawings graphically document the installed ACS infrastructure through floor plan, elevation, and detail drawings. In many cases, these drawings will differ from the installation drawings because of changes made during construction and specific site conditions. In the as-built drawings, the identifiers for major infrastructure components must be recorded. The pathways, spaces, and wiring portions of the infrastructure each may have separate drawings if warranted by the complexity of the installation, or the scale of the drawings. As-built drawings are a vital component of the administration system, and must be kept current as adds, moves and changes take place. Texas State University requires the installer to provide a complete and accurate set of as-built drawings.

3.09 Labeling and Color Coding

- A. It is important that both labeling and color coding be applied to all ACS devices, wiring, and infrastructure components. Labeling with the unique identifier will identify a particular component. Proper color coding will quickly identify how that component is used in the overall systems infrastructure of the facility.

B. Labeling

1. Labels shall be applied to the wiring terminations and corresponding devices. Wiring and cable labels shall be applied at the doorway end and controller device side of cable and wiring runs.
2. Labels are generally of either the adhesive or insert type. All labels must be legible, resistant to defacement, and maintain adhesion.
3. Outside Plant labels shall be totally waterproof, even when submerged.

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4. All labels shall be machine printed.
5. Labels applied directly to a cable shall have a clear vinyl wrapping applied over the label and around the cable to permanently affix the label.
6. Other types of labels, such as tie-on labels, may be used. However, the label must be appropriate for the environment in which it is used, and must be used in the manner intended by the manufacture.

C. Color Coding – Cable Termination Fields

1. Color coding shall be applied to all cables and cable termination fields in Telecommunications Closets, Equipment Rooms, and Entrance Facilities. Color coding may also be used to identify specific cables in a pathway, or the function of specific equipment racks or equipment. The same color is always applied to both ends of any given cable. Cross-connections are generally made between termination fields of different colors. The color may be applied to the plywood backboard behind the termination block, may be the color of a plastic cover on a termination block, or may be the actual color of the insert label on a termination block or patch panel. See Division 27 05 28 1.01A Construction Standards.
2. The following color code shall be used in all Texas State facilities relative to the access control systems:
 - a. Yellow-Electronic Door Access.

END OF SECTION 28 13 00