University of Colorado Boulder

Housing & Dining Services

Security System Standards & Design Guidelines

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General

The following document is the UCB Housing & Dining Services Security System Standards & Design Guide and is meant to address issues and questions that relate directly to the specification & installation of physical security, door hardware, access control and video surveillance systems.

Housing and Dining Services (HDS) is a unique auxiliary campus operation responsible for providing safe and secure residential facilities and dining services to over 8,500 students, faculty and staff. Our 24/7 service model requires that buildings and facilities are safe, secure and well maintained year round. Our systems and materials need to be easy to maintain and have a durability that matches up well to the harsh use, and sometime abuse, of our customers. Doors, locks, door hardware, video, security and access control systems all need to be designed with the knowledge that Housing and Dining facilities see heavy use and even vandalism on a regular basis and is generally greater than that seen in other campus buildings or facilities. In order to be able to manage and maintain our facilities and systems efficiently and effectively, Housing and Dining Services requires contractors to design to, build with and follow a number of additions and modifications to the University of Colorado Boulder materials, construction and IT standards. All projects done on behalf of Housing and Dining Services must follow and adhere to these additional HDS standards & guidelines.

Door and security hardware selection is to be carefully coordinated using this document in conjunction with UCB Design Guidelines, HDS Technical Criteria and design meetings with the HDS Integrated Security Manager. The responsibility for wiring of the hardware and Card Access System components needs to be carefully and specifically defined for hardware, electrical, and security system contractors.

Several areas within this document may indicate that any questions, substitutions or approvals should be directed to the architect. Depending on the overall scope and design approach on any given project, the “UCB Project Manager” may need to be substituted as the primary point of contact, where applicable.

All of the information contained within is subject to change without notice; all reasonable efforts are made to keep this manual up-to-date.

Related documents:
http://www.colorado.edu/fm/planning-design-construction/design-construction/building-construction-standards
Division 8 Doors and Windows
Division 27 ITS & Communications Standards

Online Access Control System

Housing & Dining Services utilizes an existing electronic access control system that operates with our Campus OneCard. This system should be incorporated into the project. Hardware schedules will need to be created/revised in order to accommodate hardware integration. The campus standard system is the Software House CCURE 9000 and only factory certified dealers are authorized to purchase and install such equipment. HDS Integrated Security can provide the names of at least three such dealers for competitive bidding purposes. Further discussions with the Owner (Project Manager and HDS Integrated Security) will be required for proper specification and installation of access control and CCTV systems. The Owner is the Security Consultant for campus security systems.

The University's campus-wide Access Control System is designed to provide access control to campus buildings via the Campus OneCard. It can also provide access control to building offices, classrooms, computer labs, high-security areas, etc. In the case of perimeter control, *each* exterior door must be equipped with the following hardware:

- Fail-secure (locked when unpowered) electric locking device (electric strike or electric panic device)
- Door contact/switch (to monitor the status of the door open/closed)append
- Motion/Request-To-Exit Sensor (REX) (shunts the door contact when the door is opened from the inside)

Designated exterior and interior security doors will also be equipped with a magnetic stripe card reader. At these locations, spare wiring should also be provided to accommodate a future proximity/smart card reader. One (1) exterior door will be designated to be equipped with a key-override for emergency and maintenance personnel use in the event that the Card Access System is not available (e.g. system failure) and ***no*** other exterior doors are to have key accessibility unless specifically called for. The location of the key-override exterior door is typically determined either by the location where emergency vehicles would most commonly respond to, or by the location of the fire alarm annunciator panel.

1. The design team will be responsible for a total turn-key installation that is compatible with existing security system and utilizes equipment by the same manufacturer (Software House CCURE 9000 and Salto). Provide all system design, wiring, device installation and termination, system testing and system certification.
2. All CCURE locations require a local RM-DCM-CAN (junction box), door contacts and request-to-exit sensors. Refer to card reader section.
3. The security integrator shall provide a turn-key installation including all CCURE low voltage wiring.
4. The electrical contractor shall furnish and install a dedicated conduit raceway system as specified by the security system design and coordinated with the security integrator. The CCURE pathway must be independent of, and cannot share or be attached to, any IT raceway, cable tray, etc. Use of flexible conduit shall be minimized wherever possible and is **only** approved between the door frame/hardware and the local RM-DCM-CAN consolidation box.
5. Provide wiring for IP based surveillance cameras at all CCURE locations. Refer to Video Surveillance section.
6. Existing devices or equipment may not be re-used.
7. In locations where existing devices are to remain, the conduits that serve them must be concealed (i.e., replace existing conduit as necessary to accomplish this).
8. All database programming is performed by owner.
9. CCURE system shall be fully integrated with ADA devices on all doors wherever applicable.

Qualifications

The CCURE system must be furnished and installed by a factory authorized security integrator who also meets the following minimum requirements:

1. Physical offices located within 100 miles of the Boulder campus.
2. Firm has achieved the status of Advanced Integrator (or higher certification) from a Tyco/Software House approved training center. Certified technicians shall be at the **local level.**
   a. The project manager and/or lead technician assigned to the project shall be **personally** certified at the Installer/Maintainer level (or higher).
   b. Photocopies of certifications should be included in the security system submittals.

3. A "parts & smarts" installation approach is not permissible. Unless otherwise approved, the security integrator shall provide a turn-key installation including but not limited to all low voltage wiring, installation, termination of field devices and control panels, system programming, provisioning, testing and certification.

Controllers

HDS Standard: Software House iSTAR Pro (8 or 16 reader configuration)
Special applications: Software House iSTAR Edge (2-4 doors) - must be approved by HDS

Card Readers

Confirm the desired card reader technology and model with Owner.

Recessed j-boxes are required for all CCURE card reader locations and must be sized accordingly (single or double gang). iStar panel outputs shall be used to control all door locks. **Do not use RM4 relay outputs to control door locks.**

Software House RM-DCM-CAN (junction box): to be located on the secure side of each door with a fifty (50) foot limit for any conduits feeding the card reader and other door/security peripherals. If other door peripherals (Locks, DSM, REX, power transfer hinges, ADA interfaces, etc.) require their own conduit pathway, these should also route directly to this j-box with no intermediate pull boxes. The RM-DCM-CAN shall be used to consolidate all security wiring at each door and is required for the planned deployment of smart card readers. Locate this jbox above accessible ceiling space or within a secure serviceable location (i.e. a nearby locked office or closet); mounted no higher than 12' A.F.F. unless coordinated with and approved by owner. The RM-DCM-CAN shall be secured with the manufacturer's standard cam lock.

Door Hardware

Existing devices or equipment (where applicable) may not be re-used.

Maglocks and shear-locks are not permitted unless written approval has been obtained from the HDS Integrated Security Manager.

Door Contacts: Sentrol 1078C (typical)
Locate all door position switches on top of door and recessed in the top door frame rail between 3"- 6" of the latch side of the frame. Do not locate door contacts in the vertical section or stile.

Request To Exit Device: Software House/Kantech TREX or Bosch DS160 (unless incorporated into exit device)

Refer to section 087100 for detailed door hardware specifications & requirements

Wire & Cable Requirements

All CCURE cabling shall be furnished purple/violet in color and plenum rated where required by code. All card reader wiring must be "home run". Daisy-chain wiring configuration of card readers & any RM bus devices is not permitted.

Contact HDS Integrated Security for CCURE specific wiring diagrams and typicals prior to system design and/or bidding.

Refer to appendices for additional information & typical wiring requirements

Power Supplies

LifeSafety Power, Inc.
Typical: FlexPower System Part #: FPO150/250-2D82M8NL4E8S (SClass Integrated Power System)
* coordinate exact power supply requirements & model numbers with HDS Integrated Security *

Intent: One single power supply located at ACS head-end to supply ALL low voltage ACS system power. This unit will also furnish power to the CCURE iSTAR control panel.

Peripherals

Software House addressable I-8 and R-8 input/output modules with DCM enclosures.
Altronix RBST relays where required.
GRI 6644 End-Of-Line resistor packs shall be used to supervise all inputs on the system.

Physical Location Requirements

The CCURE security system "head-end equipment" (control panels and power supplies) should reside and terminate in the MDF Room unless otherwise indicated. Ensure that adequate wall space is reserved for this equipment during the initial design stage. Coordinate with the HDS Project Manager and Integrated Security Manager.

Fail-Safe Hardware

On rare circumstances, building code may require certain doors to be "fail-safe". In these scenarios, a single fire-alarm relay shall be provided at the CCURE panel head-end (MDF) for this purpose. Connect the fire alarm relay as a trigger to the central ACS power supply. **Do not use individual fire alarm relays located at each door.**

Offline Access Control System

Housing & Dining Services utilizes an existing standalone (battery powered) electronic access control system that operates with our Campus OneCard. The standard product is the Salto Systems XS4 series locksets and this system should be incorporated into the project.

1. Salto locks must be furnished and field installed by a factory authorized dealer with physical offices located within 100 miles of the Boulder campus. Due to warranty concerns, it is not acceptable for the general contract to purchase locks or equipment thru a dealer and then perform the installation themselves.

2. Typical approved model numbers:

Student rooms & staff apartments:

AB6 58 AL 62 IM 38 C K	DesFire Trim, BLE with Keypad+Deadbolt, Wireless Ready
LA1T1570A20IM8-R or L	Mortise Lock Body Keypad+Deadbolt [handing]

Furnish trim with 'A' lever on exterior, 'L' lever on interior

Entry function locks – all non-student rooms (offices, closets, etc.):

AB6 50 AL 00 IM 38 C	DesFire Trim No Keypad/No Deadbolt, Wireless Ready
LA1T0570A21IM8-R or L	Mortise Lock Body Latch Only [handing]

Furnish trim with 'A' lever on exterior, 'L' lever on interior

Exit Devices - where approved (very uncommon – sometimes required on main electrical rooms)

AB6 50 A 00 IM H 8 W	Desfire Exit Trim for Von Duprin
KPB03IMC	Panic Bar Kit

3. All locks shall be full mortise style unless otherwise approved. Cylindrical bore Salto locks are not permitted unless written approval is obtained from the HDS Integrated Security Manager.
4. A dedicated data jack and 110VAC quad receptacle is required for the front desk security workstation.
5. All new doors must be factory prepped according to Salto installation templates.
6. General contractor shall coordinate any required adjustment or alignment required between doors & frames with the door supplier and security contractor to ensure proper operation.
7. There is typically a 4-6 week lead time for Salto locks.
8. Salto locks shall be left programmed in "construction mode". Final programming is by owner.
9. Spares: A quantity of 8% spare Salto locks shall be furnished by the project and turned over to HDS prior to project completion.
10. Refer to section 087413 for additional information & requirements.

Mechanical Hardware, Locksets & Conventional Keys

The intent of combining the use of both CCURE & Salto access control systems on HDS projects is to ensure that all lockable doors are equipped with a card reader. Use of traditional key cylinders should be minimized to the greatest extent possible, as coordinated with HDS during the design stage.

1. Installation & Fasteners:
   USE OF SELF-TAPPING SCREWS IS PROHIBITED ON ALL LOCKSETS, PANIC DEVICES, DOOR CLOSERS/ADA OPERATORS, ETC. USE THREADED MACHINE SCREWS OR THROUGH BOLTS. NO POWER DRIVEN TOOLS SHALL BE USED FOR INSTALLATION OF LOCKSETS AND HARDWARE ON DOORS. REFER TO SECTION 087100.

   a. Drill and tap steel and aluminum doors/frames for machine screws where applicable.
   b. AHC is to ensure that all door hardware is specified when applicable machine screw packages are necessary (to eliminate self-tapping screws).
   c. Wood doors: Use through-bolts for surface applied hardware (panic devices and door closers).

2. Mechanical key cylinders are allowed only where they have been approved in advance by the HDS Integrated Security Manager. Examples may include keyed removable mullions, panic exit alarms, padlocks, etc.
3. HDS utilizes a patented BEST Cormax™ keyway system. Refer to section 087100 for specific

requirements.

4. Standard finish for all HDS door hardware shall be 626 / US32D or equivalent. Note that this differs from the published campus standards.
5. Vertical rod exit devices are not permitted unless approval has been obtained from HDS Integrated Security Manager. Concealed vertical rods are not permitted under any circumstances.
6. Flush bolts & automatic flush bolts are not permitted unless required by code **and** coordinated with HDS Integrated Security.
7. ALL keys from the project must be properly labeled with their key code along with a tag describing the device(s) they operate. Keys are to be transmitted directly to HDS Integrated Security thru the HDS project manager. This includes but is not limited to keys furnished with office fixtures, elevators, bathroom fixtures, fire extinguisher cabinets & pull stations, display cases, millwork, access panels, mechanical equipment & controls, etc.

Elevator Security Provisions

On all renovation and new construction projects, all elevators (new and existing) shall be provisioned to accommodate future access control and surveillance camera systems. Minimum requirements are as follows:

1. Pre-wiring for card reader (reader should reside within the cab/car station)
2. Pre-wiring for surveillance camera
3. Wiring requirements specific for security systems:
   a. Traveler cable requirements:
      i. Four (4) pairs of 18 gauge, stranded, shielded conductors for access control communications and power. These cables shall terminate in the car station panel. ii. Two (2) coaxial cables. One coax cable shall terminate in the car station panel and the second coax shall terminate on the top of cab for connection to security camera.
      iii. Provide dedicated 110VAC power outlet on top of cab for local camera power. b.
   Machine room requirements:
      i. Provide a standard data drop with two (2) CAT5E jacks dedicated for security controls.

Additional Requirements for Residence Halls

1. Existing devices or equipment may not be re-used.
2. Maintain location of all existing card readers/electric strikes and motion sensors where they are presently located.
   a. In locations where existing devices are to remain, the conduits that serve them must be concealed (i.e., replace existing conduit as necessary to accomplish this).
3. Add CCURE card readers and all peripherals at the Great Room area.
4. Provide CCURE card readers on corridor doors within the building that separate public or common areas from bedroom areas.
5. Provide CCURE or Salto card readers on all RAP classrooms (verify requirements with Owner).
6. ADA Door Operators:
   a. Provide LCN low energy electric door operator(s) on entry doors at the entry plazas (only one operator at pairs of doors). The operator shall be fully integrated with the CCURE system where applicable. Any substitutions shall be coordinated with HDS Integrated Security.
7. Provide all bedroom entry doors from corridors with a wide-angle, one-way door viewer. Install door viewers using Loctite Threadlocker Blue sealant.
8. Provide Rockwood kick plates on doors in the following locations:
   a. All exterior doors
   b. Common Bathroom doors
   c. Stairway doors

   d. Custodial closets
   e. Mechanical rooms
   f. IT Room and Closets
   g. Corridors
9. Provide floor or wall-mounted door stops. Verify with Owner. Overhead door stops (surface mounted) may be required wherever floor stops pose a hazard; or wall stops cannot be accommodated.
   a. Example: a closet door is located directly behind the swing of a student room hallway door.
10. Closet doors in student rooms, where provided, shall have pull handles & roller latches.
11. Provide Rockwood push/pulls.
12. Provide magnetic hold-open devices on the doors at the following locations:
   a. Main entry doors to each wing unless part of security system
   b. Kitchen & Vending
   c. Stairways unless part of security system
   d. Laundry Rooms
13. Student room hinges / spring hinges:
   a. Top hinge: IVES 5BB1 4 ½" x 4 ½"
   b. Middle & bottom hinges: IVES 3SP1 4 ½" x 4 ½" (Spring Hinges) c. No substitutions.
   d. Adjust the (2) spring hinges so that door positively latches but does not slam. Contact HDS Integrated Security for specific requirements.

Video Surveillance System

Housing & Dining Services utilizes an existing IP network video management system. The NVR management software is Milestone Systems - Corporate Edition v2016. Cameras furnished as part of the project will be integrated into this system.

All servers, workstations, data storage, software licensing and active network connectivity will be provided by owner. Cameras and related peripherals (mounts, patch cords, etc.) shall be provided by the security integrator and incorporated into the existing infrastructure.

With few exceptions, HDS solely utilizes IP network cameras manufactured by Axis Communications. The cameras shall be powered via PoE (provided via UCB furnished network switches).

The video surveillance system shall be furnished & installed by a factory authorized security integrator with physical offices located within 100 miles of the Boulder campus. The security integrator shall employ staff with current certifications for both the Milestone Corporate software platform and Axis Network Cameras.

1. The cameras, as sighted by the owner, are required at all exterior door locations, the reception desk and within the elevator cabs. At exterior doors, the cameras are typically installed on the interior of the building. Outdoor cameras are rarely specified and must be carefully coordinated with the owner.
2. Additional camera locations may be required (e.g. public lobbies, elevators, point of sale areas, classrooms, loading docks, etc.). Specific requirements will be determined during the design meetings.
3. All camera locations require CAT6 cabling, RED in color.
4. The CAT6 cabling shall be furnished & installed by the datacom contractor (not the security integrator). The CAT6 cabling may reside within the normal data raceways. Low voltage power cabling (exterior cameras) may not reside within the data raceway.
5. Contact the UCB project manager to arrange a site walk for locations prior to electrical rough-in.
6. The security integrator shall program, install & focus all cameras. Owner will provide IP addressing information and will be available to assist the integrator during the provisioning phase.

7. Necessary cameras mounting brackets and adapter plates are to be furnished & installed by security integrator.
8. Refer to the equipment schedule (or contact HDS Integrated Security) for a current list of approved Axis camera models, mounts and peripherals suitable for the project.

Security System Commissioning

Adhere strictly to 087100 sections 1.12 (commissioning) and 3.11 (acceptance). Inspection & testing is required by G C, lock manufacturer' s representative and supplying distributor. Warranty shall not start until Owner acceptance. Acceptance shall be withheld until these requirements have been satisfied.

At least four weeks prior to project completion, building turnover or occupancy:

1. Fiber feeds & data network must be fully installed, tested, online and operational with UCB OIT.
2. Security Integrator shall provide Owner with port charts/spreadsheets to facilitate database & panel programming. This shall include both CCURE and a complete door schedule for Salto programming.
3. A punch list walkthrough inspection, system testing & acceptance for all systems (door hardware, access control and video surveillance) shall be scheduled with Owner.

All deficiencies and punch list items shall be fully rectified and accepted by the owner at least two weeks prior to turnover or occupancy.

Questions / Contacts

UCB Project Manager:

HDS Integrated Security
University of Colorado Boulder
Housing & Dining Services - IT
3500 Marine Street, Room 110
Boulder, CO 80309
(303) 492-1404

HDS Integrated Security can provide the names of at least three authorized local dealers for competitive bidding purposes.

Appendices

The following reference documents have been included at the end of this manual:

1. Section 087100 (Door Hardware & Access Control) – Typical Spec
2. Section 087413 (Offline Card Key Locks) – Typical Spec
3. Software House CCURE Equipment, Power Supplies & Peripherals
4. Salto Battery Powered Locks
5. Wiring Diagrams & Elevations: Contact HDS Integrated Security for further information

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install all commercial door hardware and electrified door hardware as shown on the Drawings or specified herein, or as required to complete the Work.

B. Intent of Hardware Groups
   1. The following schedule of hardware sets shall be considered a guide only, and the supplier is cautioned to refer to general conditions, special conditions, and the preamble of this section. It shall be the hardware supplier's responsibility to furnish all required hardware.
   2. Where items of hardware aren't definitely or correctly specified and are required for completion of the Work, a written statement of such omission, error, or other discrepancy shall be sent to the Architect, prior to date specified for receipt of bids for clarification by addendum; or, furnish such items in the type and quality established by this specification, and appropriate to the service intended.
   3. Adjustments to the Contract Sum will not be allowed for omissions or items of hardware not clarified prior to bid opening.

C. Related sections:
   1. Division 1 – General Requirements
   2. Division 6 – Finish Carpentry: Installation of Finish Hardware
   3. Division 7 – Joint Sealants.
   4. Division 8 – Hollow Metal Doors and Frames
   5. Division 8 – Flush Wood Doors
   6. Division 8 – Aluminum Doors and Frames
   7. Division 8 – Special Doors
   8. Division 26 – Sections for connections to electrical power system.
   9. Division 28 – Electronic Safety and Security, Sections for low-voltage wiring work and for access control devices installed at door openings and provided as part of a security access system.

1.3 REFERENCES

A. Use date of standard or code in effect as of Bid date.

B. State and Local Codes including Authority Having Jurisdiction.

C. ANSI/BHMA A156 – Builders Hardware Manufacturers Association Builders Hardware Standards

D. NFPA – National Fire Protection Association

1. NFPA 80 – Fire Doors and Windows
2. NFPA 105 – Smoke and Draft Control Door Assemblies 3. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.
4. NFPA 101 – Life Safety Code.

E. UL – Underwriters Laboratories
1. UL 10C – Fire Tests of Door Assemblies (Positive Pressure)
2. UL 1784 - Air Leakage Tests of Door Assemblies
3. UL 294 – Access Control System Units

F. ANSI A117.1 – Accessible and Usable Buildings and Facilities

G. ADA – Americans with Disabilities Act

H. DHI – Door and Hardware Institute

I. SDI – Steel Door Institute

J. WDMA – Window and Door Manufacturers Association

1.4 LEED SUBMITTALS:

A. Credit MR 4.1 and Credit MR 4.2: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating costs for each product having recycled content.

B. Credit MR 5.1 and 5.2: List of proposed regional materials. Identify each regional material along with the location of its manufacture, processing and raw material source, and cost.

1.5 SUBMITTALS

A. Submit copies of the finish hardware shop drawings in accordance with Division 01.

B. Product Data: Submit manufacturer's complete product literature for specified hardware items, detailed installation diagrams and instructions, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

C. Door Hardware Schedule: Prepared by or under the supervision of the supplier's Architectural Hardware Consultant, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
1. Check specified hardware for suitability and adaptability to details and surrounding conditions. Indicate unsuitable or incompatible items and proposed substitutions in hardware schedule.
2. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
3. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening.

4. Organize door hardware sets in same order as in the Door Hardware Schedule at the end of Part 3.
5. Content: Include the following information:
   a. Type, style, function, size, label, hand, degree of swing, and finish of each door hardware item.
   b. Manufacturer of each item.
   c. Fastenings and other pertinent information.
   d. Location of each door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
   e. Explanation of abbreviations, symbols, and codes contained in schedule.
   f. Mounting locations for door hardware.
   g. Door and frame sizes and materials.

D. Electrified Hardware Drawings:
1. Submit elevation drawings showing relationship of all electrical hardware components to door and frame prior to electrical rough-in. Indicate number and gage of wires required.
2. Include wiring drawing showing point to point wire hook up for all components.
3. Include system operations descriptions for each type of opening; describe each possible condition.

E. Samples:
1. Upon request submit the following samples:
   a. Samples: Prior to submittal of the final hardware schedule and prior to final ordering of finish hardware, submit one sample of each type of exposed hardware unit, finished as required and tagged with full description for coordination with schedule. Samples will be returned to the supplier. Units, which are acceptable and remain undamaged through submittal, review and field comparison procedures, may, after final check of operation, be used in the work, within limitations of keying coordination requirements.

F. Qualification Data: For Installer, Supplier, and Architectural Hardware Consultant. Compliance with this Section shall include letters of certification. Certifications shall be submitted for approval with and be incorporated with hardware schedule submittal. SUBMITTALS WILL NOT BE CONSIDERED WITHOUT THE CERTIFICATIONS.

G. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule. **All Door Hardware Schedules must be submitted to Owner in a searchable electronic format (such as PDF, Word or Excel). Scanned documents that are not searchable will be rejected.**

H. Operations and maintenance manuals:
1. Upon completion of construction and building turnover, furnish two (2) complete maintenance manuals to the owner. Manuals to include the following items: a. Approved hardware schedule, catalog cuts and keying schedule.
   b. Hardware installation and adjustment instructions.
   c. Manufacturer's written warranty information.
   d. As installed "Wiring Diagrams" for each opening connected to power, both low voltage and 110 volts.
   e. One complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

1.6 QUALITY ASSURANCE

A. Substitutions:
   1. All substitution requests must be submitted within the procedures and time frame as outlined in Section 01. Approval of products is at the discretion of the architect and their consultant.
   2. Items listed with no substitute manufacturers have been requested by Owner to meet existing standards.

B. Requirements of Regulatory Agencies:
   1. Furnish finish hardware to comply with the requirements of laws, codes, ordinances, and regulations of the governmental authorities having jurisdiction where such requirements exceed the requirements of the Specifications. Furnish finish hardware to comply with the requirements of the American National Standards for Making Buildings and Facilities Accessible and Usable by Physically Handicapped People ICC/ANSI A117.1) and to comply with Americans with Disabilities Act (ADA).
   2. Doors to stairs (other than exit stairs), loading platforms, boiler rooms, stages and doors serving other hazardous locations shall have knurled or other similar approved marking of door lever handles or cross bars in accordance with local building codes.

C. Installer Qualifications: An experienced installer with five (5) years documented experience who has completed door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance. Factory trained and certified by the lock, closer and panic hardware manufacturers. Alternative: can demonstrate suitably equivalent competence and experience.

D. Supplier Qualifications: Company specializing in the supply of door hardware with five (5) years documented experience and an Architectural Hardware Consultant (AHC) to properly handle, detail and service hardware in a satisfactory manner. Architectural Hardware Consultant shall be available during the course of the Work to consult with Contractor, Architect, Hardware Consultant, and Owner about door hardware and keying.
   1. Scheduling Responsibility: Preparation of door hardware and keying schedules.
   2. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
   3. Hardware supplier shall be a certified direct distributor and be a full sales and service organization for the manufacturer’s listed. Compliance with this Section shall include letters of certification from the manufacturers stating the hardware supplier is a factory direct authorized distributor. Certifications shall be submitted for approval with and be incorporated with hardware schedule submittal. Submittals will not be considered without the certifications.
   4. Supplier shall have warehousing facilities in Project's vicinity.

E. Architectural Hardware Consultant Qualifications: A person who is currently certified by the Door and Hardware Institute as an Architectural Hardware Consultant and who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project.

1. Electrified Door Hardware Consultant Qualifications: A qualified Architectural Hardware Consultant who is experienced in providing consulting services for electrified door hardware installations.

F. Source Limitations: Obtain each type and variety of door hardware from a single manufacturer, unless otherwise indicated.
1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

G. Fire-Rated Door Assemblies: Provide door hardware for assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252 and UL10C. Project requires door assemblies and components that are compliant with positive pressure and S-label requirements. Specifications must be cross-referenced and coordinated with door manufacturers to ensure that total opening engineering is compatible with UL10C Standard for Positive Pressure Fire Tests of Door Assemblies. Provide proper latching hardware, nonflaming door closers, approved-bearing hinges, plus resilient and required intumescent seals if not furnished with wood door.

H. Templates: Furnish a complete list and suitable templates, together with finish hardware schedule to contractor, for distribution to necessary trades supplying materials to be prepped for finish hardware.

I. Keying Conference: All permanent cores shall be provided by the Owner. This supplier shall assist, if requested, in preparing the key schedule with the Owner.

J. Mandatory Pre-installation Meeting:
1. Before hardware installation, General Contractor/Construction Manager will request seminar be conducted on the installation of hardware; specifically that of locksets, closers, and exit devices. Conduct conference at Project site to comply with requirements in Division 01. The hardware supplier and the representative of the lock, closer and exit device manufacturers shall present the seminar. Seminar to be held at job site and attended by installers of hardware for aluminum, hollow metal and wood doors. Seminar to address proper coordination and installation of hardware, per finish hardware schedule for this specific project, by using installation manuals, hardware schedule, templates, physical product samples and installation videos.
2. When any electrical hardware is specified this meeting shall also include the following trades/installers: Electrical and Security Contractors.
   a. Inspect and discuss electrical roughing-in and other preparatory work performed by other trades.
   b. Review sequence of operation for each type of electrified door hardware.
3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Supplier shall notify participants at least five (5) working days before meeting.
5. Failure to hold the pre-installation conference may affect the product warranty.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Marking and packaging:

1. Properly package and mark items according to the approved hardware schedule, complete with necessary screws and accessories, instructions and installation templates for spotting mortising tools.
2. Packaging of door hardware is the responsibility of the supplier. As hardware supplier receives material from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set and door numbers to match the approved hardware schedule. Two or more identical sets may be packed in same container.

B. Delivery:
1. The supplier shall deliver all hardware to the project site; direct factory shipments are not allowed unless agreed upon beforehand. Hardware supplier shall coordinate delivery times and schedules with the contractor. Inventory door hardware jointly with representatives of hardware supplier and hardware installer/contractor until each is satisfied that count is correct.
2. No keys, other than construction master keys and/or temporary keys are to be packed in boxes with the locks.
3. Contractor shall check deliveries against accepted list and provide receipt for them, after which he is responsible for storage and care. Any shortage or damaged good shall be made without cost to the owner.

C. Storage:
1. Provide secure lock-up for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable so that completion of work will not be delayed by hardware losses both before and after installation.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 COORDINATION

A. Supplier shall coordinate the following items with the General Contractor and related trades.
1. Coordinate work of this Section with other directly affected Sections involving manufacture of any internal reinforcement for door hardware. Furnish hardware templates to door fabricators for factory preparation to receive hardware.
2. Furnish hardware items of proper design for use on doors and frames of thicknesses, profile, swing, security, and other indicated requirements as necessary for proper function.
3. Coordinate solid blocking between studs of frame construction to support wall mounted items such as stops.
   a. Electrical System Roughing-in: Coordinate layout and installation of electrified door hardware with connections to power supplies, fire alarm system and detection devices and access control system.

B. A hardware conference is mandatory within 30 days of contract award.

C. Use hardware consultant to check Shop Drawings for doors and entrances to confirm that adequate provisions will be made for proper hardware installation.

1.10 WARRANTY:

A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:
   1. Structural failures including excessive deflection, cracking, or breakage.
   2. Faulty operation of operators and door hardware.
   3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

C. Warranty Period: Two (2) years from date of Substantial Completion, unless otherwise indicated.
   1. Warranty Period for Manual Closers: Ten (10) years from date of Substantial Completion.
   2. Warranty Period for Locksets: Seven (7) years from date of Substantial Completion.
   3. Warranty Period for Salto Locksets: Three (3) years from date of Substantial Completion.
   4. Warranty Period for Exit Devices: Three (3) years from date of Substantial Completion.

1.11 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

1.12 COMMISSIONING:

A. The General Contractor in conjunction with the lock manufacturer’s representative, hardware installer and supplying distributor shall commission hardware. Comply with Division 01 and as follows.
   1. Test door hardware operation with climate control system both at rest and while in full operation.
   2. Test electrical and electronic hardware systems for satisfactory operation.
   3. Test hardware interfaced with fire/life-safety system for proper operation and release.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Provide the products of manufacturer designated or if more than one manufacturer is listed, the comparable product of one of the other manufacturers listed. Where only one manufacturer or product is listed, it is understood that this is the owner’s Building Standard and "no substitution" is allowed.

2.2 GENERAL HARDWARE REQUIREMENTS:

A. Provide hardware materials and products of the best quality, free from imperfections and flaws in appearance, finish, or operational function.

B. Refer to Hardware Schedule below for specific hardware items, designs, functions, and finishes.

2.3 HINGES

A. Manufacturers:
   1. Ives
   2. McKinney
   3. Stanley

B. General: Provide only template-produced units.

C. Hinges shall be five-knuckle design, ball bearing as specified.

D. Hinge Base Metal: Unless otherwise indicated, provide the following:
   1. Exterior Hinges: Stainless steel with stainless-steel non-removable pin.
   2. Interior Hinges: Steel, with steel pin
   3. Hinges for Fire-Rated Assemblies: Steel, with steel pin.

E. Quantity, regardless of quantities specified in the hardware schedule provide the following:
   1. 3 - hinges per leaf for openings through 84 inches (1524 mm) high.
   2. 1 - additional hinge per leaf for each additional 24 inches (762 mm) in height or fraction thereof.

F. Size, regardless of size specified in the hardware schedule provide the following:
   1. Doors up to 3’6”: 2 ball bearing, standard weight, 0.134 gage, 4-1/2 inch by 4-1/2 inch (114 mm by 114 mm).
   2. Doors 3’-6” and over: four ball bearing, heavy weight, 0.190 gage, 5 inches x 4-1/2 inches (127 mm by 114 mm).

G. Options: NRP (non-removable pin) feature, furnish at all reverse bevel doors with locksets.

H. Provide shims and shimming instructions for proper door adjustment.

I. Electric Hinges:
   1. Manufacturers:
      a. Command Access
   2. Full Mortise electric Hinge:
      a. Transfer power from door frame to edge of door.
      b. Provide number and gage of concealed wires as specified.
      c. Locate electric hinges at second hinge from bottom.
      d. Provide mortar guard for each electric hinge scheduled.

J. Electric Power Transfer:
   1. Manufacturers:
      a. Von Duprin
   2. Transfer power from door frame to edge of door.
   3. Provide sufficient number of concealed wires to accommodate electric function of specified hardware.

2.4 CONTINUOUS HINGES

1. Ives
2. Markar
3. Stanley

B. Continuous, Gear-Type Hinges: Extruded-aluminum, pinless, geared hinge leaves; joined by a continuous extruded-aluminum channel cap; with concealed, self-lubricating thrust bearings. C. Furnish the Ives 112HD hinge or equal at 2" thick doors.

D. Manufacture units for proper door thickness, height, custom screw patterns and electrical and pneumatic modifications.

2.5 PIVOT SETS

A. Manufacturers:
1. Ives
2. Stanley
3. Rixson

B. Pivot sets shall be high-strength forged bronze or stainless steel, tilt-on precision bearing and bearing pin.

C. Vertical adjustment range of 3/16" which includes a positive locking feature.

D. Provide pivot sets as specified in Hardware Groups.

2.6 DOOR BOLTS

A. Manufacturers:
1. Ives
2. Rockwood
3. Trimco

B. Bolt Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:
1. Mortise Flush Bolts: Minimum 3/4-inch (19-mm) throw. C. Manual Flush Bolts: designed for mortising into door edge.

D. Automatic and Self-Latching Flush Bolts: designed for mortising into door edge.
1. Owner approval is required before automatic flush bolts are to be specified.

E. Locate centerline of manual top bolt not more than 78 inches (1981 mm) from finished floor.

F. Dust Proof Strikes - furnish with all flush bolts.

2.7 COORDINATORS

A. Manufacturers:
1. Ives
2. Rockwood
3. Trimco

B. Provide coordinator for labeled pairs of doors equipped with automatic or constant latching flush bolts.
.

C. Provide filler bars for total opening width and closer mounting brackets.

2.8 LOCKSETS AND LATCHSETS

A. Manufacturers:
   1. Salto standalone card reader locks for all secured doors – see section 087413
   2. Sargent mortise locksets at all non-locking doors and/or where approved by HDS

B. Latches and Locks for Means of Egress Doors: Comply with NFPA 101. Doors shall not exceed 15 lbf (67 N) to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation from the egress side. C. Function numbers as listed in sets.

D. Mortise type:
   1. Latchbolts to have a standard 2 ¾" backset with a full ¾" throw.
   2. Latchbolts to be non-handed, field reversible without opening the lock case.
   3. Strikes to be non-handed and bridged to ensure dead latching.
   4. Thumbturn and back-plate to be manufactured from castings and comply with ANSI 117 accessibility standard.
   5. Electric operation: Manufacturer-installed continuous duty solenoid.

E. Strikes:
   1. Provide strikes with extended lips where required to protect trim from being marred by latch bolt. Provide strike lips that do not project more than 1/8" beyond doorframe trim at single doors and have 7/8" lip to center at pairs of 1-3/4" doors. Provide wrought box strikes on all locks.

F. Hardware supplier shall schedule a meeting with the Owner to review and confirm that all lock functions specified are accurate prior to ordering material.

2.9 MAGNETIC LOCKS

A. Manufacturers:
   1. Rutherford Controls (RCI)

B. Magnetic locks shall meet ANSI/BHMA A156.23-1992 classification criteria including a minimum holding force of 1500 LBF.

C. Magnetic locks shall have a Door Status Sensor (DSS) and a Security Condition Sensor (SCS).

D. Provide filler and plate(s) and bracket(s) as required for door and frame construction.

2.10 CYLINDERS AND KEYING

1. BEST CORMAX™ Patented System; permanent cylinder cores furnished by Owner
2. Salto – electronic GEO cylinders; only for unique applications as specified by Owner

B. Cores & Cylinder Housings:
1. Manufacturer's small format interchangeable core type, constructed from brass or bronze, stainless steel, or nickel silver.
2. Number of Pins: Seven.
3. Mortise Type: Threaded cylinders with required cam and trim ring(s).
4. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
5. Bored-Lock Type: Cylinders with tailpieces to suit locks.

C. Construction Cores: Supplier shall provide construction cores that are replaceable by permanent cores.
1. The Owner or Owner's Security Agent in conjunction with the supplier shall remove construction cores and install final cores.

D. Keys: Furnish keys in the following quantities:
1. Temporary construction keys: Twenty.
2. Construction control keys: Two.

2.11 EXIT DEVICES AND MULLIONS

A. Exit devices for Means of Egress Doors: Comply with NFPA 101. Doors shall not exceed 15 lbf (67 N) to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation from the egress side.

B. Manufacturers:
1. Von Duprin

C. Rim and Vertical Rod devices:
1. Touchpad shall extend a minimum of one half of the door width.
2. Exit devices shall be touchpad style plated to the standard architectural finishes to match the balance of the door hardware.
3. Trim: as specified in sets, function numbers as listed in sets. Levers to match lockset design.
4. Exit devices shall be UL listed panic exit hardware. All exit devices for fire rated openings shall be UL labeled fire exit hardware.
5. Electrically Operated Devices: Single manufacturer source for electric latch retraction devices, electrically controlled trim, power transfers, power supplies, monitoring switches and controls.
6. Provide cylinder dogging on panic exit hardware where specified in the hardware sets. .
7. Furnish glass bead kits for exit devices as required.
8. Through Bolts: For exit devices and trim on metal doors, non-fire-rated wood doors, firerated wood doors and fire-rated metal doors.
9. After installation of all exit devices, General Contractor to have Manufacturer's representative inspect installation. Representative shall submit a written report to the Architect with copies to the General Contractor, hardware supplier and Owner upon completion of service. This report shall include any installation errors, noting door.

D. Removable Mullion:

. 1. Interior/Exterior, hollow metal or wood, mullion is removable only through the use of building keys. Mullions shall self-lock when re-installed without the use of the cylinder key.
2. Provide two-piece interlocking stabilizer set. One piece shall be installed on the mullion and the other piece installed on the door. Provide shims to adjust for door misalignment.
3. Furnish storage brackets for securely stowing the mullion away from the door when removed.
4. Fire-Exit Removable Mullions: Provide removable mullions for use with fire exit devices complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection. Mullions shall be used only with exit devices for which they have been tested.

E. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.

2.12 ELECTRIC STRIKE

A. Manufacturers:
1. RCI F2164
2. Von Duprin 6000 series
3. Others as approved by HDS Integrated Security

B. Electric strikes shall provide remote release of latchbolts. They shall be designed for use with the type locks shown at each opening where required. Strikes will be UL Listed for Burglary-Resistant Electric Door Strike, and where required, shall be UL listed as electric strikes for Fire Doors or Frames. Faceplates shall be stainless steel with finish as specified for each opening.

C. Solenoids shall be of the continuous duty type for the voltage specified. Plug connectors will be furnished. Strikes shall have an adjustable backbox to compensate for misalignment of door and frame.

2.13 PUSH AND PULL HARDWARE

A. Manufacturers:
1. Ives
2. Rockwood
3. Trimco

B. Push-Pull Design: As scheduled.

2.14 CLOSERS

A. Manufacturers:
1. LCN

B. Surface Door Closers:
1. Closers shall have fully hydraulic, full rack and pinion action with a high strength cast iron cylinder and one piece forged steel piston. Cylinder body to have 1½" piston diameter with 11/16" journal double heat treated shaft, 5/8" full complement bearing, chrome silicon steel spring.
2. Hydraulic fluid of a type requires no seasonal adjustments; fluid has constant temperature control from 49° C to –35° C.

3. Spring power shall be continuously adjustable over the full range of closer sizes, and allow for reduced opening force for the physically handicapped.
4. Hydraulic regulation shall be by tamper-proof, non-critical valves, adjustable with a hex wrench. Closers shall have separate adjustment for latch speed, general speed, and backcheck.
5. Refer to door and frame details, furnish accessories such as drop plates, special templates, spacers and supports as required to correctly install door closers. Install closers to allow maximum degree of opening, position backcheck to activate well in advance of the stop position to cushion the opening swing and prevent door and frame damage. Do not us the door closer to stop door travel.
6. Through Bolts: For surface closers at metal doors, fire-rated metal doors, non-fire-rated wood doors, and fire-rated wood doors.
7. Coordinate with door manufacturer that the top rail of the door is sized appropriately for the surface closer.
8. Doors swinging into exit corridors should provide for corridor clear width as required by applicable codes.
9. Install closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.

C. Surface automatic operators (Electric and/or Pneumatic)
1. Where “Low Energy Power Operated Door” are indicated for doors required to be accessible to the disabled, provide LCN powered operators complying with the ADA and A156.19 requirements. See page 23 for approved model numbers.
2. Full closing force shall be provided when the power or assist cycle ends.
3. Locate power unit, control box and exhaust away from door to minimize noise and vibration in pedestrian areas. Maximum distance from control box to operator is 50’. Control box shall be accessible to allow for adjustments in operator performance.
4. The operator will be designed to prevent damage to the mechanism if the system is actuated while the door is latched or if the door is forced closed during the opening cycle.
5. Provide complete with drop plates, brackets, or adapters for arms as required to suit details.
6. Provide plenum-rated type cable or tubing where required & applicable.
7. Hardware supplier shall provide point-to-point wiring diagrams for automatic operator(s) to general and electrical contractor prior to electrical rough in. Electrical contractor shall provide 120VAC power to control box and provide and install wiring from control box to actuators. General contractor shall install pneumatic tubing from control box to operator.
8. Furnish actuator, control box and tubing as shown in Hardware Sets.
9. Actuator buttons shall be hardwired. Wireless / battery operated transmitters are not allowed.
10. ADA operator functionality shall be fully integrated with access control system where applicable.
11. Supplier shall include an AC disconnect switch. Furnish either a standard toggle switch or toggle-less key switch manufactured by either Leviton or Hubble, install adjacent to the control box. Coordinate with electrical contractor.

D. Markings:
1. Decals: Visible from either side, instructing the user as to the operation and function of the door.

2.15 STOPS AND HOLDERS

A. Manufacturers:

1. Ives
2. Rockwood
3. Trimco

B. Provide wall stops for doors, unless other type stops are scheduled or indicated. Where wall stops are not appropriate, provide overhead stops.

C. Wrought, forged, or cast, approximately 2-1/2 inch diameter, convex rubber center and concealed fasteners.

D. Silencers for Door Frames: Neoprene or rubber; fabricated for drilled-in application to frame.

2.16 MAGNETIC HOLDERS

A. Manufacturers:
1. LCN
2. Rixson
3. ABH

B. Electromagnetic Door Holders: Coordinate with fire detectors and interface with fire alarm system for labeled fire door assemblies. Tri-voltage design, 24VAC/DC and 120VAC, with a minimum of 35 pounds of holding force. Provide extensions and coupler where required.

2.17 OVERHEAD HOLDERS AND STOPS

A. Manufacturers:
1. Glynn Johnson
2. Rixson
3. ABH

B. Type, function and fasteners shall be as specified. Size per manufacturer's selector chart. Plastic end caps, hold open mechanisms and shock blocks are not allowed. End caps must be finished same as balance of unit.

C. When the overhead holder or stop is installed with a surface closer, template closer to work with the stop or holder. Provide mounting plates with closer as required.

2.18 KICK PLATES

A. Manufacturers:
1. Ives
2. Rockwood
3. Trimco

B. Furnish .050 inches thick, 12" high x door width less 2", beveled top and 2 sides with counter sink holes for fasteners. Where glass or louvers prevent this height, supply with height equal to height of bottom rail less 2”.

C. Fasteners: Manufacturer's standard machine or self-tapping screws.

2.19 THRESHOLDS

A. Manufacturers:
1. National Guard Products
2. Pemko
3. Zero International

B. Accessibility Requirements: Where thresholds are indicated to comply with accessibility requirements, comply with the Accessibility Guidelines for Buildings and Facilities ANSI A117.1
1. Bevel raised thresholds with a slope of not more than 1:2. C. Type as listed in sets.

D. Cope at jambs.
E. Where thresholds occur at openings with one or more mullions, they shall be cut for the mullions and extended continuously for the entire opening.

F. Furnish with non-ferrous Stainless Steel Screws and Lead Anchors.

2.20 DOOR BOTTOMS

A. Manufacturers:
1. National Guard Products
2. Pemko
3. Zero International B. Type as listed in sets.

C. Supplier shall provide door bottoms where smoke door assemblies are installed where pressurization is provided to restrict smoke movement.

2.21 WEATHER-STRIPPING

A. Manufacturers:
1. National Guard Products
2. Pemko
3. Zero International

B. Door Gasketing: Provide continuous weather-strip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated or scheduled. Provide noncorrosive fasteners for exterior applications and elsewhere as indicated. Type as listed in sets.
1. Apply to head and jamb stops.

C. Fire, Smoke and Draft Control Seals:
1. Smoke-Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled based on testing according to UL 1784.
2. Fire-Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled based on testing according to UL 10C.
3. Gaskets must comply with UL10C.
4. Intumescent seals shall be provided by the wood door manufacturer.

D. Where rain drips are specified in hardware groups, provide NGP 16A x full frame width, unless detailed otherwise.

2.22 LATCH PROTECTORS

A. Manufacturers:
   1. To Be Determined
   2. Trimco

B. Latch protectors shall be the CU standard, contact HDS Integrated Security for product number prior to submittal.

2.23 MISCELLANEOUS

A. Boxed Power Supplies: Modular unit in NEMA enclosure; filtered and regulated; voltage rating and type matching requirements of door hardware served; and listed and labeled for use with fire alarm systems. All Von Duprin PS914 power supplies shall include an AC disconnect switch. Supplier shall furnish either a standard toggle switch or toggle-less key switch manufactured by either Leviton or Hubble, install adjacent to the power supply. Coordinate with electrical contractor.

B. Furnish items not categorized in the above descriptions but specified by manufacturer's names in Hardware Sets.

C. Supplier shall review Security/Electrical Plan for locations of security equipment provided by others.

2.24 FABRICATION

A. Base Metals: Produce door hardware units of base metal, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18. Do not furnish manufacturer's standard materials or forming methods if different from specified standard.

2.25 FASTENERS

A. Including, but not limited to, wood or machine screws, bolts, bolts, nuts, anchors, etc. of proper type, material, and finish required for installation of hardware.

B. Use Phillips head for exposed screws. Do not use aluminum screws to attach hardware.

C. **Use of self-tapping (TEC) screws is NOT permitted on any door hardware including but not limited to locksets, panic devices, door closers/ADA operators, etc. Use machine screws and/or through bolts as applicable. Drill and tap for all machine screws.**

D. Provide self-tapping (TEC) screws **ONLY** for attachment of kick plates, sweeps and stop applied weather-stripping only.

E. Through Bolts: For exit devices and surface closers on non-rated metal doors, fire-rated metal doors non-fire-rated wood doors, and fire-rated wood doors unless door blocking is provided:

2.26 FINISHES

A. Finish of hardware at aluminum doors and frames shall match door and frame, coordinate with Architect.

B. Generally, Dull Chrome, US26D / BHMA 626/652. Thresholds and Weatherstrip shall be Mill Finish Aluminum. Closers shall be Powder Coated Aluminum (BHMA 689). Trim and Flat Goods may be furnished in US32D (BHMA 630), Satin Stainless Steel.

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

D. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 ACCEPTABLE INSTALLERS:

A. Factory trained and certified by the lock, closer and panic hardware manufacturers.

B. Automatic operator installer shall be factory trained, certified by AAADM, and experienced to perform the work.

3.2 EXAMINATION

A. The General Contractor in conjunction with the hardware installer and supplying distributor shall examine doors and frames as follows.
   1. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance. Ensure that walls and frames are square and plumb before hardware installation.
   2. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. Beginning of installation means acceptance of existing conditions.

3.3 PREPARATION

A. Wood Doors: Comply with DHI A115-W series.

B. Steel Doors and Frames: Comply with DHI A115 series.
   1. Surface-Applied Door Hardware: Drill and tap doors and frames according to ANSI/SDI A250.6-97.

C. Process hardware for aluminum doors in accordance with DHI handbook, Processing Hardware for Custom Aluminum Doors and Frames.

D. Door and Frame Manufacturer(s) to prepare doors and frames for electronic hardware furnished by Security Contractor.

3.4 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and applicable requirements of SDI, WDMA, NFPA 80, BHMA, and DHI.

B. Install each door hardware item to comply with manufacturer's written instructions. **NOTE: NO POWER DRIVEN TOOLS SHALL BE USED FOR INSTALLATION OF LOCKSETS AND HARDWARE ON DOORS.**

C. Use the templates provided by hardware item manufacturer.

D. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
3. Conform to ANSI A117.1 for positioning requirements for the handicapped.
4. Where new hardware is to be installed near existing doors/hardware scheduled to remain, match locations of existing hardware.

E. Wherever cutting and fitting are required to install hardware on surfaces which are to be painted or finished by others, coordinate removal, storage, and reinstallation or application of surface protections with finishing work specified in other Sections. Do not install surface-mounted items until finishes have been completed on the substrate. Set units level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as required for proper installation and operation.

F. Drill and countersink units, which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with referenced standards. G. Drill pilot holes for fasteners in wood doors and/or frames.

H. Drawings typically depict doors at 90 degrees; doors will actually swing to maximum allowable. Template hardware for maximum allowable degree of swing.

I. Gaskets: install jamb-applied gaskets before closers, overhead stops, rim strikes, etc., template other hardware accordingly. Install sweeps across bottoms of doors before astragals, cope sweeps around bottom pivots, trim astragals to tops of sweeps. Door Jambs must be cleaned of all dirt, grease, oil, solvents or solvent residue and dust before applying Pressure-Sensitive Adhesive backed Gasketing, Smoke Seal or Weatherstripping.

J. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."

K. Locate floor stops where they do not impede traffic

L. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings. Verify location with Architect.
   1. Configuration: Provide one power supply for each door opening.
   2. Configuration: Provide the least number of power supplies required to adequately serve doors with electrified door hardware.

M. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 09 Sections. Do not install surface mounted items until finishes have been completed on substrates involved.

N. Automatic operator installation:
   1. Installer shall have in their employment a certified American Association of Automatic Door Manufacturers (AAADM) inspector.
   2. Do not install damaged components. Fit joints to produce hairline joints free of burrs and distortion. Rigidly secure non-movement joints.
   3. Mounting: Install automatic door operators/headers plumb and true in alignment with established lines and grades. Anchor securely in place.
      a. Install surface-mounted hardware using concealed fasteners to greatest extent possible.
      b. Set headers and arms level and true to location with anchorage for permanent support.
      c. Install actuators where indicated, wire to operator(s) as required.
   4. Door Operators: Connect door operators to electrical power distribution system as specified in Division 26 Sections.
   5. Sealants: Comply with requirements specified in Division 7 Section "Joint Sealants" to provide weather tight installation.

3.5 ADJUSTING

A. Adjust and check each operating hardware item, and each door assembly to ensure proper operation and function. Lubricate moving parts with lubrication type recommended by manufacturer.

B. Replace units, which cannot be adjusted and lubricated to operate freely and smoothly.

C. Hardware damaged by improper installation or adjustment methods to be repaired or replaced to Owner’s satisfaction.

D. Make final adjustments and lubrication immediately prior to final acceptance.
   1. Door Closers: Closers shall be adjusted so that from an open position of 90 degrees, the time required to move the door to an open position of 12 degrees shall be 5 seconds minimum.
   2. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
   3. Door control devices backcheck shall be properly located for protection of the door, frame, and applied hardware.
   4. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees. Adjust so that from the open position of 70 degrees, the door shall move to the closed position in 1.5 seconds minimum.

5. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.

3.6 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.7 FINAL ADJUSTMENT

A. Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

3.8 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes.

B. Operator Training: Instruct operating staff in proper operation of access control system, including hands-on training. Minimum of eight (8) man-hours covering the operations for each system installed.

3.9 CLEANUP

A. Remove protective material from hardware where present.

B. Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

3.10 CONTINUED MAINTENANCE SERVICE

A. Approximately six months after the acceptance of hardware in each area, the Installer, accompanied by the representative of the latch and lock manufacturer, shall return to the project and re-adjust every item of hardware to restore proper function of doors and hardware. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures. Replace hardware items that have deteriorated or failed due to faulty design, materials or installation of hardware units. Prepare a written report of current and predictable problems in the performance of the hardware.

3.11 ACCEPTANCE

A. Warranty shall not start until Owner Acceptance. Acceptance shall be withheld until the following activities have been successfully completed:
   1. Commissioning per paragraph 1.12.
   2. Delivery and Acceptance of all Operations and maintenance manuals.
   3. Successful Final Test and Inspection of Security System.

3.12 DOOR HARDWARE SCHEDULE

A. Hardware supplier is responsible for handing and sizing all products as listed in the hardware heading. Quantities listed are for each pair of doors, or for each single door.

B. All Door Hardware Schedules must be submitted to Owner in a searchable electronic format (such as PDF, Word or Excel). Scanned documents that are not searchable will be rejected. C. Schedule to be developed.

Description	Manufacturer	Model/Series
Hanging Devices		
Continuous Hinges	Ives	224HD or 112HD
Standard Weight Butt Hinge	Ives	5BB1
Heavy Weight Butt Hinge	Ives	5BB1HW
Spring Hinge ***(Spring Hinges only permitted f r use on student rooms)***	Ives	3SP1
Electric Hinge	Command Access	ETH2WH - 2/18GA
Electric Power Transfer	VON	EPT
Locksets and Latchsets		
Use of keyed functions shall be carefully reviewed and coordinated with the HDS Integrated Security Manager. See also section 087413 Battery Operated Locksets.		
Heavy Duty Mortise Locksets and Latchsets		
Passage	Sargent	8215 LE1J
Privacy	Sargent	**Confirm with Owner**
Office / Entry	Salto	See 087413
Classroom	**CCURE or SALTO**	**Confirm with Owner**
Storeroom (at CCURE doors)	Sargent	8204 FEJ
Storeroom (not at CCURE doors)	Salto	See 087413
Student Rooms	Salto	See 087413
HD/Faculty Apartments	Salto	See 087413
Exit Devices - Rim		
Single Door – Exterior	Von Duprin	99NL – 990NL

Pair of Doors – Exterior	Von Duprin	99NL – 990DT
Fire Rated Single Door	Von Duprin	99L-F – 996L - 03
Fire Rated Pair of Doors	Von Duprin	99L-F – 996L - 03

Exit Devices – Surface Vertical Rod

OWNER APPROVAL IS REQUIRED BEFORE VERTICAL ROD DEVICES ARE SPECIFIED.

Non Rated Pair of Doors	Von Duprin	9927 series
Fire Rated Pair of Doors	Von Duprin	9927-F series

Removable Mullion

Key Removable Mullion – Non-Rated Pair of Door	Von Duprin	KR4954
Key Removable Mullion – Fire Rated Pair of Door	Von Duprin	KR9954

Mullions shall accept small format interchangeable core cylinders only.

Coordinator

Coordinator	Ives	COR x FL X MB

Automatic Flush bolts – Hollow Metal Doors only

Metal Door	Ives	FB31P
	Ives (Top Bolt with Auxiliary Fire Latch)	FB32

Constant Latching Flush bolts

Wood Door	Ives	FB61P
	Ives (Top Bolt with Auxiliary Fire Latch)	FB62
Metal Door	Ives	FB51P
	Ives (Top Bolt with Auxiliary Fire Latch)	FB52

Manual Flush bolts

Fire Rated Wood Door	Ives	FB358
Wood Door	Ives	FB358 or FB458
Fire Rated Metal Door	Ives	FB458

Metal Door	Ives	FB458

Dust Proof Strike (at all doors with bottom bolt)

Dust Proof Strike	Ives	DP1 or DP2

Surface Closer

Exterior Outswing with Stop Arm	LCN	4040XP RW/PA SCUSH TBWMS
Exterior Doors	LCN	4040XP RW/PA TBWMS
Interior In swing	LCN	4040XP RW TBWMS
Interior Outswing	LCN	4040XP RW/PA TBWMS
HD & Faculty Apartments	LCN	4040XP RW/PA TBWMS

All closers shall be furnished with EDA arm (standard) and TBWMS screw pack option.

Low Energy Automatic Operator (preferred standard for all HDS projects)

Push/Pull side	LCN	4640/4642 Series

Furnish required actuators (hard-wired).

Pneumatic Automatic Operator (not permitted for use on HDS projects)

Overhead Stops and Holders

Heavy Duty Surface	Glynn Johnson	90 Series
Heavy Duty Concealed	Glynn Johnson	100 Series
Medium Duty Surface	Glynn Johnson	450 Series
Medium Duty Concealed	Glynn Johnson	410 Series

Door Stops

Wall	Ives	WS406CCV/CVX

Floor (Interior)	Ives	FS436 or FS438
Floor (Exterior)	Ives	FS18S or FS444

Magnetic Hold Open

Wall	LCN	SEM7850
Floor	LCN	SEM7820

Accessories

Push Plate	Ives	8200 6” x 16” Pull
Plate	Ives	8303-0 6” x 16”
Kick Plate (Single Door)	Ives	8200 10” x 2” LDW
Kick Plate (Pair of Doors)	Ives	8200 10” x 1” LDW
Mop Plate	Ives	8200 6” x 1” LDW
Lock Protector	Ives	LG12
Threshold Architect to coordinate with project conditions.	NGP	
Smoke Seal	NGP	5050 Head and Jambs
Weatherstrip at Head	NGP	700SA
Weatherstrip at Jambs	NGP	700ES
Door Sweep	NGP	198NA
Rain Drip	NGP	16A x Frame Width
Astragal	NGP	158SA
Metal Frame Silencer	Ives	SR64
Wood Frame Silencer	Ives	SR65

Access Control

Battery Operated Lockset	Salto Systems	See specification section 087413

Latch Retraction Panic Hardware:

Panic Device	VON	QEL 99 Series + Trim (Quiet motorized series)

- **EPT transfer hinge must also be specified**
- **The local PS914 / PS873 power supply at each door is NOT required when using the above hardware.**
- **EL99 series latch retraction devices (high current solenoid) are no longer authorized.**

Panic Device w/ electric trim	VON	E996L -03
Electric Strike	RCI VON HES	F2164 6000 Series 9600
Magnetic Lock	Rutherford Controls	8310 or 8320 - DSS/SCS

END OF SECTION 087100

SECTION 087413 – OFFLINE CARD KEY ACCESS CONTROL (Stand-Alone Locks)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. The contractor shall design, furnish and install a complete offline card key access system where necessary to ensure the proper operation of all specified doors in project areas.
2. Performance Requirements: to meet the minimum performance requirements, the Contractor shall be responsible for:

   a. Designing, furnishing and installing a fully operational system.
   b. Providing the design in the form of Shop Drawings to the Architect for approval prior to installation. The design data furnished shall be of sufficient detail to enable the Architect to determine whether the equipment, materials and installation the Contractor proposes to furnish comply with the requirements specified.
   c. Providing all software installation, configuration, and programming necessary for a fully operational system.
   d. Providing detailed control and checking for each item of equipment and materials provided, each portion of the installation, the final installation, and remedy of any and all defects therein.

3. Items not specifically mentioned herein but necessary for a fully operational system shall be furnished, matching in quality and finish the items described or specified.

B. Intent of Specification

1. The following specification shall be considered a guide only, and the contractor is cautioned to refer to general conditions, special conditions, and the preamble of this section. It shall be the contractor's responsibility to furnish and install all required hardware.
2. Where items of hardware aren't definitely or correctly specified and are required for completion of the Work, a written statement of such omission, error, or other discrepancy shall be sent to the Architect, prior to date specified for receipt of bids for clarification by addendum; or, furnish such items in the type and quality established by this specification, and appropriate to the service intended.
3. Adjustments to the Contract Sum will not be allowed for omissions of items not clarified prior to bid opening. C. Related sections:

1. Division 1 – General Requirements
2. Division 8 – Hollow Metal Doors and Frames
3. Division 8 – Flush Wood Doors
4. Division 8 – Aluminum Doors and Frames

5. Division 8 – Special Doors
6. Division 26 - Sections for connections to electrical power system.
7. Division 28 – Electronic Safety and Security, Sections for low-voltage wiring work and for access control devices installed at door openings and provided as part of a security access system.

1.3 SYSTEM DESCRIPTION

A. Furnish and install an electronic lock system, complete and including without limitation, the following components:

1. Connector package, card encoder and cable, as necessary, to interface with minimum recommended computer system.
2. Lock units.
3. Batteries.
4. Special tools.
5. Operating manuals.
6. On-site training of staff.

1.4 REFERENCES

A. Use date of standard or code in effect as of Bid date.

B. State and Local Codes including Authority Having Jurisdiction.

C. American National Standards Institute

1. ANSI A156.13 – Mortise Locks and Latches
2. ANSI A156.18 – Material and Finishes

D. NFPA – National Fire Protection Association

1. NFPA 80 – Fire Doors and Windows
2. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.

E. UL – Underwriters Laboratories

1. UL10C – Fire Tests of Door Assemblies (Positive Pressure) F. ANSI A117.1 –

Accessible and Usable Buildings and Facilities.

G. ADA – Americans with Disabilities Act.

H. BHMA – Builders Hardware Manufacturers Association

I. DHI – Door and Hardware Institute

J. SDI – Steel Door Institute

1.5 SUBMITTALS

A. Submit under provisions of Division 01.

B. Product Data: Manufacturer's data sheets on each product to be used.

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods. C. Shop Drawings:

1. Drawings showing layout, location, profiles and product components, including anchorage, accessories and finish colors.
2. Locksets as shown in Section 087100

D. Quality Assurance Submittals: Refer to Quality Assurance requirements for information description.

1. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria, and physical requirements.
2. Manufacturer's Field Reports: Manufacturer's field reports specified herein. E. Closeout

Submittals:

1. Operation and Maintenance Data.
2. Warranty documents.
3. Project record documents for installed materials.

F. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

G. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

1.6 Quality Assurance Submittals: Refer to Quality Assurance requirements for information description.

1. Qualification Data: For Manufacturer and Contractor, Compliance with this Section shall include letters of certification. Certifications shall be submitted for approval with and be incorporated with submittal. Submittals will not be considered without the certifications.
2. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria, and physical requirements.
3. Manufacturer's Field Reports: Manufacturer's field reports specified herein. B. Closeout

Submittals:

1. Operation and Maintenance Data.
2. Warranty documents.
3. Project record documents for installed materials.

C. Submittal Sequence: Submit shop drawings at earliest possible date, particularly where approval of the shop drawings must precede fabrication of other work that is critical in Project construction schedule.

1.7 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies:

1. Furnish material to comply with the requirements of laws, codes, ordinances, and regulations of the governmental authorities having jurisdiction where such requirements exceed the requirements of the Specifications.

2. Furnish material to comply with the requirements of the regulations for public building accommodations for physically handicapped persons of the governmental authority having jurisdiction and to comply with Americans with Disabilities Act (ADA) and ANSI A117.1 Accessible and Usable Buildings and Facilities. B. Manufacturer Qualifications:

1. Manufacturer capable of providing field service representation during construction and operation.

C. Installer Qualifications:

1. Installer shall have had experience in the installing and servicing of electronic lock systems and shall be approved by the manufacturer of the system.
2. All installers must be manufacturer trained, certified and authorized for the applicable products being installed.

D. Fire-Rated Door Assemblies: Provide door hardware for assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252 and UL10C. Project requires door assemblies and components that are compliant with positive pressure and S-label requirements. Specifications must be cross-referenced and coordinated with door manufacturers to ensure that total opening engineering is compatible with UL10C Standard for Positive Pressure Fire Tests of Door Assemblies. Provide proper latching hardware, nonflaming door closers, approved-bearing hinges, plus resilient and required intumescent seals if not furnished with wood door.

E. Templates: Furnish a complete list and suitable templates, together with finish hardware schedule to contractor, for distribution to necessary trades supplying materials to be prepped for finish hardware.

F. Mandatory Pre-installation Meetings:

1. Installer shall conduct pre-installation meeting with General Contractor/Construction Manager to verify project requirements and substrate conditions.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Inventory material on receipt from manufacturer and provide secure lock-up for material delivered to Project site so that completion of work will not be delayed by losses both before and after installation.

B. System components, including locksets must be stored in a dry temperature controlled environment.

C. Any shortage or damaged good shall be made without cost to the owner.

1.9 COORDINATION

A. Templates: Distribute door hardware templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

1.10 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of material that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including excessive deflection, cracking, or breakage.
b. Faulty operation of material.
c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
d. Failure due to programming and embedded factory installed system information.

2. Warranty Period: Three (3) years from date of Substantial Completion.

3. Contractor/manufacturer/installer shall be notified immediately of defective products, and be given a reasonable opportunity to inspect the goods prior to return. Manufacturer will not assume responsibility, or compensation, for unauthorized repairs or labor.

1.11 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

1.12 EXTRA MATERIALS

A. Deliver to Owner extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels.

B. Quantity: Furnish quantity of items listed equal to 8 percent of amount installed not to exceed 30 of each item.

1. Locks.
2. Panic trim.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

Acceptable Manufacturer:
Salto Systems, Inc.

1780 Corporate Drive, Suite 400 Norcross,
GA 30093
866-GO-SALTO (866-467-2586)
Email: info@Salto.us Internet: www.Salto.us

2.2 Substitutions**: Not Permitted**

2.3 All modules shall be supplied by SALTO inclusive of:

1. Card Reader Units with and without Keypad
2. Door Locks – SVN, Wireless Ready and Full Wireless Versions
3. Control Units, Relay and Expansion Boards
4. Card Encoders or Enrollment Reader
5. Portable Programmer Devices

2.4 AUTHORIZED SUPPLIER AND INSTALLERS

A. Contact Salto Systems or HDS for a current list of local/authorized dealers.

2.5 MANUFACTURED UNITS

A. Electronic Locks:

1. Lock shall have a user capacity of up to 64,000 individual cardholders.
2. Lock shall have internal audit trail of up to 1000 entries in lock - must include time, date, door identification, card holder identification and function performed.
3. Programming of lock must be performed by hand held, portable programmer and must not require the use of a laptop or palmtop computer.
4. Lock shall have internal clock and calendar to provide for timed events and changes in modes of operation.
5. Lock shall operate off of three (3) standard AA alkaline batteries. These must not come in a proprietary package and must be available from any wholesale or retail source.
6. Lock shall retain a non-volatile transaction memory.
7. Lock shall operate by a motorized clutch.
8. Lock shall permit free egress.
9. Lock shall be applicable in interior or exterior applications.
10. Lock shall provide low battery indication.
11. Lock shall reset to operating mode immediately after release of handle or on a programmable time should the handle not be activated.
12. Batteries shall be accessible from the interior of the door.
13. Lock shall utilize freewheeling clutch operation.
14. Mechanical override models shall accept any ANSI standard mortise lock cylinder. B. Product:

1. Locksets shall be mortise type, anti-tamper trim handle with free moving clutch. Provide Grade 1, ANSI/BHMA 156.25, UL listed mortise lock equipped with adjustable armored front. Provide either standard mortise lockset with deadbolt or mortise lock latch only as required by Owner.

2. Product shall be the Sato XS4 series of electronic lock with "wireless ready" option included.

3. All Salto products shall be specified using the Mifare/Desfire RFID technology.

4. Typical Salto part numbers for HDS projects:

Student rooms & staff apartments:
(two out of three of these parts are needed for each door)
AB6 58 AL 62 IM 38 C K DesFire Trim, BLE with Keypad+Deadbolt, Wireless Ready
LA1T1570A21IM8-R or L Mortise Lock Body Keypad+Deadbolt [handing]
Furnish trim with 'A' lever on exterior, 'L' lever on interior

Entry function locks – all non-student rooms (offices, closets, etc.):
AB6 50 AL 00 IM 38 C DesFire Trim, BLE, No Keypad/No Deadbolt, Wireless Ready
LA1T0570A21IM8-R or L Mortise Lock Body Latch Only [handing]
Furnish trim with 'A' lever on exterior, 'L' lever on interior

Exit Devices - where approved (very rare - usually main electrical rooms)
AB6 50 A 00 IM H 8 C Desfire Exit Trim for Von Duprin
KPB03IMC Panic Bar Kit

5. Finish: Satin Dull Chrome, US26D / BHMA 626

2.6 SOFTWARE PACKAGE – Furnished by Owner.

2.7 PORTABLE PROGRAMMER – Furnished by Owner.

2.8 WORKSTATIONS & SERVER – Furnished by Owner.

2.9 FRONT DESK ENCODER UNIT – Furnished by Owner.

2.10 KEYCARDS

A. Locks shall use 13.56MHz RFID contactless reader technology which reads & writes information to a contactless smart card (RFID) compatible with ISO 14.443A, ISO 14.443B and ISO 15.693 standards, including but not limited to Mifare, Desfire and Desfire EV1.

B. Furnish a minimum of twenty (20) construction cards, additional if required by the general contractor.

C. Permanent keycards are provided by Owner.

EXECUTION

2.11 DESIGNING OF SYSTEM

A. Contractor shall design a complete offline Card Key Access system.

B. Doors to be served are as specified in Section 087100 Door Hardware.

2.12 EXAMINATION

A. Compliance: Comply with manufacturer's Product Data, including product technical bulletins, product catalog installation instructions and product carton instructions for installation.

B. Templates: After approval of shop drawings, furnish lock templates to door and frame manufacturer for fabrication.

C. Site Verification of Conditions: Verify substrate conditions are acceptable for product installation in accordance with manufacturer's instructions.

1. Verify doors and areas where equipment is to be installed are in compliance with electronic locking system manufacturer's requirements.

D. Do not begin installation until areas, supporting construction and substrates have been properly prepared.

E. If preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

2.13 PREPARATION

A. Steel Doors and Frames: Comply with DHI A115 Series.

1. Surface-Applied Door Hardware: Drill and tap doors and frames according to ANSI/SDI A250.6.

B. Wood Doors: Comply with DHI A115-W Series.

C. Clean surfaces thoroughly prior to installation.

D. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

2.14 INSTALLATION

A. Installation personnel shall be trained and approved by system manufacturer.

B. Mounting Heights: Mount door hardware units at heights as follows unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."

C. Install of system components shall comply with manufacturer’s instructions and recommendations. Where cutting and fitting are required to install material onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

D. Contractor shall install door hardware, head-end equipment (computer(s), system software, and

other equipment and materials as necessary to provide a complete and functional offline card key access system.

2.15 TRAINING OF OWNER'S PERSONNEL

A. Provide instruction of owner's personnel to ensure the security system is operated properly. All training shall be accomplished before owner's personnel are allowed to operate system. System's manufacturer to provide option for on site technical personnel to assist with final training and grand opening support.

B. Provide owner with software package, data files, lock mastering design and system manuals.

2.16 ADJUSTING

A. Installers shall adjust and check each lock to ensure proper operation or function of every unit, and replace that which cannot be adjusted to operate freely and smoothly as intended for the application made.

2.17 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

2.18 DEFECTIVE MATERIAL AND/OR DEFECTIVE INSTALLATION GUIDELINES

A. The following will be considered defective materials:

1. Unauthorized substitutes.
2. Items delivered with missing broken, damaged or defaced parts.
3. Items of incorrect function or finish.

B. The following will be considered as defective installation:

1. Items broken, damaged or defaced during installation.
2. Items incomplete, misaligned or incorrectly located.

END OF SECTION 087413