Longwood University Door Hardware Design Guidelines

This document is provided to ensure that construction and renovation projects at Longwood University utilize hardware that is compatible with existing campus systems, operates in accordance with established campus operational methods, and meets university emergency egress and shelter-in-place requirements.

Part 1 Door Hardware

1. Hinges

1. Mortise Hinges
    a. Preferred – Stanley
    b. Acceptable
        i. Bommer
        ii. Heger
        iii. McKinney
        iv. 5 Knuckle bearing or 5 Knuckle concealed bearing. Application as required.
    c. Heavy duty for high traffic or high abuse doors. Standard duty for others.
    d. Size to Manufacturer's recommendations and industry standard for quantity based on height of door.
2. Continuous Hinges
    a. Preferred – Select
    b. Acceptable
        i. Stanley
        ii. ABH
        iii. Pemko
    c. For heavy use, high-traffic applications.
    d. Continuous gear type aluminum heavy duty. Barrel type shall not be used.

2. Locks and Cylinders

1. Mortise locksets shall not be installed.
2. Cormax 7 pin SFIC or equal
3. Cylindrical Campus Standard
    a. Best 9K Series 15 lever, D rose
    b. Sargent 28-70-10 Line-LL
    c. Any Grade 2 including 7K series is unacceptable.
4. Functions
    a. Dormitory - (F90) Best T preferred, Sargent 25 acceptable:
        i. Test rooms
        ii. Resource rooms
        iii. Conference rooms
        iv. Work rooms
        v. Residence hall chapter rooms
    b. Storeroom (never unlocked) – lock with key
        i. Interior closets inside classroom
        ii. Lab interconnecting doors

c. Proximity Reader (storeroom type) depending on design determination for access control
    i. Housekeeping
    ii. Mechanical
    iii. IT and data
    iv. Electrical
    v. Elevator equipment
    vi. Dining services
d. Exterior doors must fail in the secure mode. The panic bar must still function.
e. ADA Rooms
    i. Electronic strike, auto operators with portable fob, and push button or wave actuators
    ii. Storeroom function lock

3. Electric Access Control Locks

1. General
    a. HID Signo 20 / Signo 40 readers, Sargent IN100 / IN120 / IN220 Series with integral reader, or equal
    b. Multi-Class proximity multi-tech reader with key override
    c. Locations determined in design phase
    d. Hardware sets IN100 / IN120 / IN220 are installed by Owner's Representative
2. Wall-mounted readers
    a. HID Signo Series or equal
    b. Multi-Class proximity
    c. Compatible with RS2 Access It! Univeresal.NET system
    d. Locations determines in design phase
    e. Installed by Owner's Representative
3. Exterior doors must fail in the secure mode. The panic bar must still function.
4. Knox Box for each project, recessed type in new construction, electronically monitored.

4. Exit Devices

1. Preferred – Von Duprin 99 Series
2. Acceptable
    a. Sargent 80 Series
    b. Corbin Russwin FD 5000 (data sheet available from Longwood Facilities Department)
3. Electric latch retraction to be motorized latch retraction, gear driven, with request to exit and latch bolt monitoring
4. Functional preferences
    a. Exterior
        i. Preferred application at exterior pairs is 2 surface rim exit devices with Key Removable Mullion and appropriate cylinder for mullion. Trim on one leaf only, with storeroom function for key override. Active leaf standard is Right Hand Reverse (RHR). Thresholds will not have protrusions above the floor.
        ii. Recessed pulls preferred. Recessed Pulls must be specified in Door Specification integral with door. Where not specified as recessed pulls in door specification, schedule offset pulls or levers, depending on application (generally pulls). Pulls to be heavy duty with heavy duty thru bolted mounting screws.
        iii. Concealed vertical rods shall not be used.

b. Interior
    i. Preferred application at interior pairs: 2 surface rim devices with Key Removable Mullion and appropriate cylinder for mullion. Trim on one leaf only, with storeroom function for key over ride. Active leaf standard is Right Hand Reverse (RHR). Thresholds will not have protrusions above the floor.
    ii. Surface vertical rods
        1. Corridors, less bottom rod where security is not a concern
        2. Only one active leaf to receive lever or pull trim
        3. No lockdown feature on exit devices
        4. Where dogging is specified by Owner, only Allen key lock will be used. Inactive leaf with no trim will not have dogging.
c. No dogging feature on residence hall doors

5. Closers

1. Preferred – LCN XP4040 Series
2. Acceptable
    a. Norton 410 Series
    b. Sargent 351
    c. Stanley QDC100
3. 90 degree stop arms at outswing exterior doors
4. No thumb-turn hold-open types
5. Extra-duty arms on all push side doors

6. Auto Operators

1. Preferred
    a. Exterior - Horton 4000 Series
    b. Interior - Horton 7000 Series
2. Acceptable
    a. Exterior
        i. PHI D-4990 Series
        ii. Assa Abloy SW 100
    b. Interior
        i. PHI D-4990 Series
        ii. Assa Abloy SW 200

7. Sliding Door Operators

1. Preferred Horton 3150
2. Acceptable
    a. Assa Abloy SL500
    b. Record 8100

8. Other Items

1. Flush bolts. Furnish with Dust Proof Strikes
2. Overhead stops. Heavy duty surface type, not concealed; use minimally
3. Wall stops. Not to be used, unless no other application is suitable
4. Floor stops. Preferred
5. Electric magnetic holders. Surface mounted, not recessed

6. Kick plates
    a. All exterior, janitor, housekeeping doors. Do not use on classroom doors or aluminum doors.
    b. Stainless steel, .050 thick
    c. General size: 8" x 2" (LDW) less door width on singles. 1" less door width on pairs.
    d. Counter sunk screws
7. Mop plates. Not to be used
8. Gasketing
    a. Screw type on exterior doors or sound-rated doors and residence hall rooms
    b. Furnish type that does not require notching for closers or strikes
    c. Do not use stick-on type
9. Auto door bottoms
    a. Concealed
    b. Use only when required, generally on music and sound-rated doors
    c. Furnish narrow flat 3" to 4" thresholds for auto door bottoms where conditions permit
10. Thresholds
    a. Generally latch track for outswing, except at main entries where saddle type with door sweeps to be used
    b. Indicate proper screw fastenings in hardware sets and specification section
11. Door sweeps. Use with saddle-type thresholds
12. Rain drips. Furnish 4" over door width where there is no roof overhang
13. Key cabinet
    a. One electronic cabinet shall be installed in each new or renovated building
        i. Wall-mounted
        ii. See item 14 Key Cabinet for details
        iii. Owner-furnished, Owner-installed
    b. One non-electronic key cabinet shall also be installed in each residence hall project
        i. Wall-mounted
        ii. Contractor-furnished, Contractor-installed

9. Materials

1. Hardware units will of first quality metal and forming method using metal alloy, composition, temper, and hardness as required for each unit selected, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units for finished designations indicated.
2. Fasteners
    a. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware that has been prepared for self-tapping sheet metal screws, except as specifically indicated.
    b. Furnish screws for installation with each hardware item. Provide Phillips flat-head screws, except as otherwise indicated. Furnish exposed screws to match hardware finish or, if exposed in surfaces of other work, to match finish of this work as closely as possible, including "prepared for paint" surfaces to receive painted finish.
    c. Provide concealed fasteners for hardware units that are exposed when door is closed except to the extent no standard units of type specified are available with concealed fasteners. Do no use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless their use is the only means of reinforcing the work adequately to fasten the hardware securely. Where thru-bolts are used as a means of reinforcing the work, provide sleeves for each thru-bolt or use sex screw fasteners.

10. Shelter Lockdown Locks

1. Doors to occupiable spaces must be lockable from the inside, but the egress hardware must unlock the door and allow the occupants to leave.
2. Egress hardware
    a. Latches on egress doors must be unlatched simultaneously by one releasing operation from the egress side.
    b. Hardware used to release the latches must be mounted between 34 inches and 48 inches above the floor.
    c. Operation of the hardware for egress must be accomplished without tight grasping, pinching, or twisting of the wrist, and without using a key, tool, special knowledge, or effort. If electrified locks are remotely engaged, they must allow free egress from the room side of the door.
3. Door locks
    a. Doors must be lockable from within the room, without opening the door.
    b. Locked room doors must be able to be unlocked from the outside with a key or other approved means, to allow access for school staff and emergency responders.
4. System components
    a. IN100 (wireless) / IN220 (wired) System components include lockdown fob(s), repeater(s), gateway(s), power supplies and web-based software. Consult with manufacture for all necessary components required for a complete system.
    g. Momentary Cylinder Key Switch required to integrate with repeater for system re-set
    h. Power supplies required for gateways and repeaters. Furnish with battery back-up.

11. Hard Wired Electronic Access Control

1. Electronic PoE locks are furnished and installed by Owner‘s Security Integrator. Manufacturer is Sargent (SA) IN220 Series or equal.
2. RS2 Access It! Universal.NET access control system compatible
3. Exterior
    a. Hard wired HID Signo 40
    b. All exterior doors must be electronically controlled or monitored, and shall have individual audible alarms.
4. Interior
    a. Assa Abloy IN series (IN 220 POE preferred) with Sargent IN220 70-10G77 BIPS B LL (cylindrical lock body) or equal, installed by Owner’s Security Integrator
    b. Required on IT, mechanical, and housekeeping closets
    c. Other interior doors as designated
5. Prerequisites
    a. Exterior doors
        i. Hard wired HID Signo Series readers require Mercury LP-1502 or Mercury LP-4502 (for higher transaction volume sites) panels and MR-52 door connectors.
        ii. MR-16 IN/OUT for alarm capability
        iii. Data and power connections required for panel
    b. Interior doors
        i. Assa Abloy IN220 POE readers preferred
        ii. IN220 requires data connection to network switch

12. Wireless Access Control

1. Sargent cylindrical type locks and latchsets using IP or Aperio Technology, Sargent 10 Line IN100 or IN120 as applicable, or equal
2. Sargent IN100 and IN120 Exit Device Technology, Sargent IN100 or IN120 trim (as applicable) with Sargent 80 series exit devices
3. Miscellaneous hardware set with the following components
    a. Wireless Major Components
        i. Owner-provided HID Proximity Cards
        ii. Sargent Aperio Hubs
        iii. RS2 Access It! Universal.NET Software Licenses
    b. PoE Major Components
        i. Owner-provided HID Proximity Cards
        ii. Owner-provided PoE Switch
        iii. Sargent DHTA Test Adapter
        iv. RS2 Access It! Universal.NET Software Licenses
4. Provide all spare stock, additional, and accessory items required for a complete operating system, in accordance with Owner's requirements, to be included according to quantity of doors and wall-mounted access devices in building and installation or operational requirements.

13. Keys and Keying

1. Provide keyed brass construction cores and keys during the construction period. Construction control and operating keys and core shall not be part of the Owner's permanent keying system or furnished in the same keyway (or key section) as the Owner's permanent keying system.
2. Permanent keys and cores
    a. Cylinders, removable and interchangeable core patented system shall be Best Patented Cormax 7-pin--no substitutions.
    b. Permanent cores and keys (prepared according to the accepted keying schedule) will be installed by Owner's Representative.
    c. Permanent keys will be stamped with the applicable key mark for identification. These visual key control marks or codes will not include the actual key cuts.
    d. Permanent keys will also be stamped "Do Not Duplicate" if possible.
3. Furnish keys in the following quantities:
    a. 2 each Change Keys for each type of keyed core
    b. 2 each Construction Master Keys
    c. 2 each Construction Control Keys
    d. 5 each Master Level Keys
    e. Additional keys for residential halls depending on suite layout (quantity will be included in specification)
    f. Emergency cores for new construction and renovation projects in a quantity determined by the plan layout
4. A keying meeting shall be held with the Owner's Representative, contractor, hardware suppliers, and a Best Lock representative.

14. Key Cabinet

1. Key cabinets should be installed in all buildings. Longwood Facilities Department will work with TRAKA to provide a quote for the project and configure the cabinet on the network. They will work with the locksmiths to assign keys and key privileges to the key cabinet.
    a. M-Touch series preferred
    b. Communicates with TRAKA Web
    c. Dimensions: H 11.42" × W 32.24" × D 5.63"
    d. Weight: 37 lbs.
    e. Power Supply: Input: AC100-240V
    f. Output: DC15V
    g. Battery Backup: DC12V 3.2Ah (24 hours)
    h. Power Consumption: 30W max.
    i. Cabinet Material: Zintec Steel
    j. Color Options: Standard Black MNA03 (custom colors available)
    k. Door Material: Clear polycarbonate or metal
    l. Operating Temp: Ambient, for indoor use only.
    m. Mounting: Wall or cabinet stand mounted
    n. Key Positions: 10-20 (40 double density)
    o. Receptor Strip Support: Locking, Non locking, Double Density (20 positions), combination of both – all support tri-color LEDs
    p. Users Per System: 25,000
    q. Communications: Ethernet (AES-256 encryption optional),
    r. Wireless Ethernet: GPRS, RS485, RS232 modem
    s. Reader Interface: Wiegand, Clock/Data ABA Tk2, RS232, TTL, Wiegand Anti Pass-Back, PIN only
    t. Alarm Interface: Three 1A/24V relay contacts for connecting to alarms, access control systems, CCTV, etc.
    u. If additional licensing is required, the price must be included in the project budget.

Part 2 Electrified Hardware and Configuration for Access Control

1. Overview

1. Electronic access control is managed by the Longwood Facilities Department utilizing RS2 Access It! Universal.NET software through RS2 Technologies LLC. Electronic access control is managed by the Longwood Facilities Department utilizing RS2 Access It! Universal.NET software through RS2 Technologies LLC. Electronic access control equipment will be owner-provided and owner-installed. All hardware purchases will include software licenses for electronic access control equipment. Listed below are the minimum standards for electronic access to campus buildings. Some buildings may require additional devices which will be determined in the design phase by the Building Owner.
2. Standards
    a. RS2 Access It! Universal.NET access control system compatible
    b. Exterior
        i. Hard wired HID Signo Series (Signo 40)
        ii. All exterior doors must be electronically controlled or monitored.
    c. Interior
        i. Assa Abloy IN series (IN 220 POE preferred)
        ii. Minimum usage is all IT and mechanical closets.
        iii. Other interior doors as designated.
3. Prerequisites
    a. Exterior doors
        i. Hard wired HID Signo Series readers require Mercury LP-1502 & Mercury LP-4502 (for higher transaction volume sites) panels and MR-52 door connectors.
        ii. MR-16 IN/OUT for alarm capability.
        iii. Data and power connections required for panel.
    b. Interior doors
        i. Assa Abloy IN220 POE readers are preferred.
        ii. IN220 requires data connection back to network switch.

2. IP Based Power-over-Ethernet Locks

1. IP Enabled Power-over-Ethernet (PoE) Integrated Card Reader Cylindrical Lock: IP enabled, PoE ANSI/BHMA A156.2 Grade 1 bored lockset with integrated credential reader and request-to-exit signaling in one complete unit. Motor driven locking/unlocking control of the lever handle trim with 1/2" deadlocking stainless steel latch. Lock is UL listed and labeled for use on up to 3 hour fire rated cylinder override.
2. General Requirements
    a. Completely intelligent and integrated locking unit with Ethernet power and communication connection capability directly from the locking unit back to the central system host server without additional access control interfaces or components (excluding PoE Endspan and Midspan devices) via an existing or newly installed IEEE 802.3af PoE enabled network.
    b. Energy Efficient Design: Provide lock bodies which have a holding current draw of 15mA maximum, and can operate on either 12 or 24 volts. Locks are to be field configurable for fail safe or fail secure operation.
    c. Communication between access control system and device is protected by AES 128 bit encryption via the SDK. Programmable for time zones, holidays, and automatic unlocking.
    d. Power and communication from one Ethernet (CAT5e or higher) cable. Compliant with 802.3af Class 1 device specifications requiring 3.84 watts for Power over Ethernet.

e. High security mechanical key provides emergency override retraction of latchbolt without need for electronic activation.
f. Ethernet system framework, network cabling, mounting boxes, PoE end-span/mid-span, electrical hard wiring, grounding, and connections are required for complete system functionality. All system components are by others and are specified elsewhere.
    i. Power Requirement: PoE Class 2, maximum 7 watts.
    ii. Network Cabling Requirements: Cat5e or higher meeting or exceeding ANSI/TIA/EIA-568-C. 24 AWG Plenum rated.
    iii. Bonding and Grounding: Meet or exceed TIA-607-B requirements. Connect device ground cable to building electrical earth ground.
    iv. Network Surface Mount Box: Meet or exceed ANSI/TIA/EIA-568-C requirements. Cat5e or higher (RJ45).

3. Submittals

1. Wiring Diagrams and Door Elevations: Provide the following for each opening having electric hardware, except doors with only magnetic holder/release units.
    a. Identify manufacturer-installed and field-installed wiring on wiring diagrams for scheduled items requiring power.
    b. Load calculations and requirements for each electro-mechanical locking device within +/-5% of 24 VDC. Size the conductors for each device appropriately to maintain this requirement.
    c. Cable type (as indicated on the Shop Drawings Wire Legend) that is used for each electro-mechanical locking device, the conductor size, the estimated total length of cable, the estimated line loss (voltage drop), and the percentage of estimated line loss (voltage drop).

4. Coordination

1. Coordinate the layout and installation of scheduled electrified door hardware, and related access control equipment with required connections to source power junction boxes, power supplies, detection and monitoring hardware, and fire alarm system.
2. Door Hardware Interface: The card key access control system will interface and be connected to electronic door control hardware (electromechanical locks, electric strikes, magnetic locks, door position switches, other monitoring contacts, and related auxiliary control devices) as described under Division 8 "Door Hardware". Coordinate the installation and configuration of specified door hardware being monitored or controlled with the controls, software, and access control hardware specified in this Section.
3. Access Control Hardware Sets: The hardware sets listed in the Schematic Design phase represent the design intent and direction of the owner and architect. All work must comply with the final Working Drawings. Final configurations should not be designed or equipment purchased without the Owner's approval.
    a. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing electrified door hardware and access control system components. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing access control system hardware to comply with indicated requirements.
    b. Door and Frame Preparation: Related Division 08 Sections (Steel, Aluminum and Wood) doors and corresponding frames are to be prepared, reinforced, and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling, and access control system hardware without field modifications.

Part 3 Field Quality Control and Inspection

1. Initial Field Quality Control

Upon completion of hardware, locks, and electronic access devices installation, and prior to final occupation by Owner, manufacturers' representatives will perform a complete walk-through inspection of all of hardware, locks, and devices. A consolidated inspection report will be prepared to include incorrect installation; omissions; improperly adjusted devices; and all equipment not functioning correctly. Items in the report are to be corrected prior to final occupancy by Owner.

2. Six-Month Inspection

Approximately six months after installation is complete, the manufacturers' representatives will perform a similar complete walk-through inspection to verify that devices are installed and properly functioning in accordance with the Contract Documents and final shop drawings. Representatives will report findings in writing to the Architect. The report will indicate corrective actions and recommendations if necessary for compliance.