



**ALBUQUERQUE
PUBLIC SCHOOLS**

**FACILITIES DESIGN + CONSTRUCTION
/ MAINTENANCE & OPERATIONS**

***DOORS & HARDWARE
DESIGN GUIDELINES & SPECIFICATIONS***

Devin Cannady
Bob Kane
Noel Garza
Anthony Montoya
Richard Torres
Benny Baca

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GENERAL DOOR & HARDWARE DESIGN CRITERIA

1. Design to meet current International Building Code (IBC) standards and all other applicable state/local building codes.
2. Coordinate specifications section with LEED requirements.
3. Knox-box location to be verified with Fire Marshal's office. If working on multiple buildings, coordinate knox-box locations appropriate to allow entry to main system fire alarm panel as applicable.
4. **Doors:**
 - A. Doors shall be commercial grade appropriate to its application.
 - a. 120 deg. swing position is optimal. Doors may swing wider or shorter as per design consideration, however 90 deg. door operation is discouraged.
 - b. Double or Multiple door configuration should be thought of as right in / left out as applicable to design.
 - B. Cognizant design of out-swing doors is important. Doors are encouraged to swing adjacent to exterior walls and not impede sidewalk or pedestrian flows.
 - C. Glass shall only be allowable on upper portions of doors.

*Exemption may be granted by FD+C for special circumstances.
 - D. Coiling or Overhead coiling doors shall have appropriate accessibility for maintenance or replacement when required.
 - a. Provide motorized operation when door weights support requirement.
 - b. Coordinate locking requirements and design detailing with FD+C.
 - E. Automatic door coordinators are highly discouraged.
 - F. Doors taller than 7'-0" are highly discourage. Prior authorization by FD+C required.
 - G. Sliding and Track doors are highly discouraged. Prior authorization by FD+C required.
 - H. Dutch doors are highly discouraged. Prior authorization by FD+C required.

Hairpins:

- A. Provide hairpins at all exterior (and vestibule) door locations that cannot otherwise be supported by wall mounted doorstops.
 - a. It is recommended that hairpins be installed after doors installation to ensure proper field alignment.
- B. Hairpins are encouraged to contact door at handle location typical to wall bump stops.
 - a. Rubber bump-stops shall be installed on hairpins just as in a wall configuration.

Hollow Metal Door Frames:

- A. Hollow Metal Frames should be foamed in lieu of grouting. QuadFoam 500 RetroSeal to be utilized.
 - a. If grouting is required, frames shall not be grouted with plaster materials such as Structo-Lite.

Hardware:

- A. Hardware shall be commercial grade, specified and detailed for heavy use.
 - a. Continuous hinges are highly discouraged. Prior authorization by FD+C required.
- B. Door closures to be provided at all exterior doors and at interior locations where appropriate.
 - a. For interior doors, use LCN 1250 (instead of Norton 1601). Provide parallel arm configuration.
 - b. For exterior doors, use LCN 1450 (instead of Norton 8501). Provide parallel arm configuration.

- c. For wider or heavier doors, use LCN 4050 (instead of Norton 7500). Provide parallel arm configuration.
 - i. Door closers back-check to be adjusted to begin at 90 deg., then continue to open position.
- C. Accessible Door Operators shall be Horton or DC Controls.
 - a. Coordinate operators to the 120 deg. opening requirement.
 - b. Vestibules shall incorporate door operators at both interior and exterior door locations.
 - c. Accessible buttons shall be located close to the accessible door.
 - d. Operators shall incorporate a Horton Relay Board for card access integration.
- E. Doors bump-stops shall be provided at all doors throughout a facility.
 - a. Frame wall mounted doorstops shall have 2x solid wood backing installed in wall for durability.
 - b. Doorstops to be designed / located so as not to apply pressure to the door hinge or apply uneven (twisting) pressure to door top or bottom.
 - c. Floor mounted doorstops to have appropriate profile for condition (i.e. exterior doors need taller stop due to sloping sidewalk).
 - d. Doorstops to be coordinated to strike the door handle when possible. Where stops are required at alternate conditions, be mindful of tripping conditions.
- F. Flush bolts shall only be utilized with a threshold or other appropriate mechanical means of securing the flush bolt mechanism so as to allow for proper function and alignment.
 - * Flush bolts are not appropriately secured when installed into a hole in the flooring.
 - a. Flush bolt conditions to be detailed and approved by FD+C prior to installation.
- G. Provide kick-down door openers at all classroom doors and as applicable at other locations. Kick-downs shall be located at locations where doors will be propped open by users. Locations to consider include: Classrooms, Storage Rooms, Workrooms, Break Rooms, etc. Architect to coordinate non-use at rated corridors as per governmental regulations.
- H. Double door auto door coordinators shall not be allowed.
- I. Keyways are coordinated per location. Contact FD+C Construction Manager to request keyway to be utilized.
- J. Keypad style access is not allowable.
- K. Exterior door cylinders to be Primus Core. Coordinate specifics with FD+C.

Exterior Gates:

- A. Padlocks for chain link gates shall be provided and installed by M&O. Coordinate installation with FD+C Construction Manager.
- B. Panic devices utilized at exposed to elements conditions shall be weather resistant.

SECTION 087100 – FINISH HARDWARE**PART 1 – GENERAL****1.01 DESCRIPTION**

- A. Related Work:
 - 1. Door Operators: Section 08740 Automatic Door Operators.
 - 2. Threshold Caulking: Section 07920 Joint Sealants.
 - 3. Sustainable Design Requirements: Section 018133 LEED Requirements.

1.02 QUALITY ASSURANCE

- A. SUPPLIER QUALIFICATIONS: The hardware supplier must have in their employment a finish hardware consultant, with a minimum of ten years of commercial hardware experience, who shall be responsible for the detailing, scheduling, and ordering of the finish hardware for this project.
- B. DESIGN CRITERIA: Provide Underwriter’s Laboratory listed hardware for fire or accident hazard where scheduled or required to maintain rating of openings. Comply with requirements of door and door frame labels. Comply with NFPA No. 80 and local codes that are in effect in the area of the project.

1.03 SUBMITTALS

- A. Hardware Schedule: Within ten days after receipt of a contract for the finish hardware, prepare a complete schedule and submit seven copies of the hardware schedule with two copies of catalog cuts, highlighted to show each different hardware item to the Architect for review.
- B. Do not order hardware until an approved copy of the schedule is returned to the supplier bearing the approval of the Architect.

This schedule shall indicate the following details:

Door numbers	Frame materials
Location	Hand of door
Size and thickness of door	Degree of opening
Door material	Type of attachment

- C. Templates: After receipt of the approved corrected hardware schedule, upon request the hardware supplier shall send a set of templates and corrected hardware schedule to the wood door, metal door, and frame manufactures/suppliers.

1.04 DELIVERY, STORAGE & HANDLING

- A. Deliver hardware to the job-site only after proper provision for storage has been made.

NO DIRECT SHIPMENTS WILL BE ALLOWED.

- B. Properly package and clearly identify each item relative to the hardware schedule.

- C. The hardware supplier shall authorize their representative to be present when all finish hardware is delivered to the job-site and shall check-in each item and turn over to the General Trades Contractor for storage in a secure place under lock and key.

1.05 WARRANTY

Copies of warranties are not required. However, supplier shall provide standard manufacturers warranties with the following additional requirements where noted.

1. Warranty against mechanical failure of door closers for a ten year period.
2. Warranty against failure of parts of all hardware except door closers and exit devices for a period of one year.
3. Warranty shall include cylinder locks.
4. Warranty against mechanical failure of exit devices for a period of three years (plus lifetime parts replacement).

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

ALL HARDWARE TO BE 626,630,652 OR SPRAYED ALUMINUM (DULL CHROME)

A.	Butts:	Bommer, Hager, Stanley
B.	Continuous hinges:	Pemko, Roton, Select
C.	Exit Devices:	LCN (No Substitutes)
D.	Mullions:	Von Duprin (No Substitutes)
E.	Door Closers:	LCN (No Substitutes)
F.	Locksets:	Schlage (No Substitutes)
G.	Thresholds & Weather strip:	National Guard, Pemko, Reese, Zero
H.	Stops & Door Trim:	Don-Jo, Ives, Trimco, Rockwood
I.	O/H Stops:	Gynn Johnson, ABH, Rixson

OTHER MANUFACTURERS BY PRIOR APPROVAL OF THE ARCHITECT AND LISTED IN AN ADDENDUM.

2.02 SCHEDULED HARDWARE

- A. Requirements for design: grade, function, finish, size, and other distinctive qualities of each type of builders hardware are indicated in the hardware schedule at the end of this section. Products are identified by using manufacturers' hardware product numbers.
- B. Manufacturer's product designation: One or more manufacturers are listed for each hardware type required, provide either the product designated or where more than one manufacturer is listed, the comparable product of one of the other manufacturers which comply with requirements.

2.03 MATERIALS & FABRICATION

- A. Hand of Door: The drawings show the direction of slide, swing, or hand of each door leaf. Furnish each item of hardware for proper installation and operation of the door movement as shown.
- B. Base Metals: Produce hardware units of the basic metal and forming method indicated using the manufacturer's standard metal alloy, composition, temper, and hardness. Do not furnish "optional" materials or forming methods for those indicated except as otherwise specified.
- C. Fasteners: Manufacturer hardware to conform to published templates generally prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping screws except as specifically indicated.
 - 1. Furnish screws for installation with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match the hardware finish or if exposed in surfaces of other work to match the finish of such other work as closely as possible including "prepared for paint" in surfaces to receive painted finish.
 - a. Sex Bolts: Install door closer, door holders, and exit devices on mineral core filled rated wood doors by means of thru bolts and sex nuts.
 - b. Do not use thru bolts for installation where the bolt head or the nut on the opposite face is exposed in other work except where it is not feasible to adequately reinforce the work.

2.04 BUTTS & CONTINUOUS HINGES

- A. Templates: Provide only template-produced units.
- B. Screws: Furnish Phillips flat-head all purpose or machine screws for installation of units except furnish Phillips flat-head all purpose wood screws for installation of units into wood. Finish screw heads to match surface of hinges or pivots.
- C. Hinge Pins: Except as otherwise indicated provide hinge pins as follows:
 - 1. Steel Hinges: Steel Pins
 - 2. Non-ferrous Hinges: Stainless steel pins
 - 3. Exterior Doors: Non-removable pins (NRP)
 - 4. Interior Door: Non-rising pins
 - 5. Tips: Flat button and matching plug finished to match leaves
- D. Number of hinges: Provide number of hinges indicate but not fewer than three hinges per door leaf for doors 90" or less in height and one additional hinge for each 30" of additional height.
- E. Size of hinge leaves: 4.5" high, except 5" (when required) for doors over 3'6 wide.
- F. Width of hinges: Shall be sufficient to clear trim projection when door swings 180 degrees.
- G. Fire Rated doors over 8'0" shall have heavy weight hinges.
- H. All hinges SHALL be made of steel and have steel ball bearings where specified.

2.05 KEYING

- A. The hardware supplier shall contact the FD+C Construction Manager to determine keying requirements for this project.
- B. Proposed key plan shall include expansion potential for the Owner's future requirements (if needed).
- C. All locksets and cylinders SHALL be keyed to a Grand or Master key system and to the instructions as provided by the APS Lock Shop.
- D. Keys Required. Furnish three (3) keys per change. All new and replacement keys shall be stamped "DO NOT DUPLICATE" and with their respective key symbol (AA1, AA2, AA3 etc.). Supplier shall not cut any Master keys for contractor unless authorized by the APS Lock Shop. All Master keys provided to contractor will be from the APS Lock Shop.
- E. All keys shall be made of nickel silver.

2.06 CYLINDRICAL TYPE LOCKSETS AND CYLINDERS

- A. All locksets and latches shall be ND Series Schlage heavy duty. Use "Vandlgard" at exterior locations with standard "ND" Series at interior locations.
- B. All steel parts shall be bronze plated or coated with zinc-dichromate to resist rusting and corrosion.
- C. Locksets and cylinders shall have 6 pins.
- D. Provide $\frac{3}{4}$ " throw at all pairs of doors.
- E. Provide rim and mortise cylinders for exit devices and mullions with interchangeable cores.

2.07 DEADLOCKS

- A. Deadlocks shall be B663P (classroom function) unless otherwise required and approved.
- B. All steel parts shall be bronze plated or coated with zinc-dichromate to resist rusting and corrosion.

2.08 CLOSER AND DOOR CONTROL DEVICES

- A. Use LCN 1450 at all exterior locations and locations where high use is anticipated. UNI-8501 spring stop arms should be used at exterior doors where a wall stop cannot be utilized and a floor stop might become a tripping hazard. The LCN 1250 closer should be used on rooms such as storage, toilet, janitor and classrooms.
- B. Separate adjusting valves shall be provided for closing speed, latching speed and back check.

2.09 EXIT DEVICES

- A. Provide Precision 2100 Series “Apex” exit devices. Provide 1700A pull trim at exterior locations and V3908A lever trim at interior locations. At pairs of exterior doors the RHR leaf will be the active leaf with a pull and cylinder the LHR leaf will be the inactive leaf with dummy (blank) pull.
- B. All pairs of doors shall be equipped with center mullions behind the doors unless hollow metal mullions between the doors are specified. Vertical rod exit devices shall not be used unless approved by the APS Lock Shop or when double egress doors are utilized in the project. When vertical rod exit devices are required (2200 Series “Apex”) they shall be installed “less bottom rod”.

2.10 MISCELLANEOUS DOOR TRIM UNITS

- A. Material shall be stainless steel material to be 0.0050” minimum thickness.
- B. Width of plates shall be 2” less than door width.
- C. Push Plates: Plate shall be 3.5” x 15”.
- D. Pull Plates: Plate shall be 3.5” x 15”. Grip shall be stainless steel located on center of plate.

2.11 POWER TRANSFER DEVICES

- A. Concealed Quick Connect Electric Power Transfers: Provide concealed wiring pathway housing mortised into the door and frame for low voltage electrified door hardware. Furnish with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.
 - 1. Acceptable Manufacturers:
 - a. Securitron (SU) - EL-CEPT Series.
 - b. Von Duprin (VD) - EPT-10 Series.

2.12 ELECTRONIC ACCESSORIES

- A. Switching Power Supplies: Provide UL listed or recognized filtered and regulated power supplies. Provide single, dual, or multi-voltage units as shown in the hardware sets. Units must be expandable up to eight Class 2 power limited outputs. Units must include the capability to incorporate a battery backup option with integral battery charging capability in addition to operating the DC load in event of line voltage failure. Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.
 - 2. Acceptable Manufacturers:
 - c. Securitron (SU) - AQ Series.

PART 3 – EXECUTION**3.01 INSTALLATION**

- A. General: All finish hardware shall be installed by General Contractor.
- B. Furnish all items of hardware with attachment screws, bolts, nuts, etc., as required to attach hardware to type of material involved and with finish to match hardware with which they are to be used. Make all attachments to metal by template machine screws.
- C. Provide sex nuts and bolts for door closers, forearm shoes of closers, and holding devices.
- D. Attach hardware to masonry or concrete with expansion bolts or similar drilled anchors to develop full strength of attached device.
- E. Run weather-stripping or sound stripping full height of both jambs and full width of head. Run thresholds full width of opening. Run door bottoms full width of doors. Set expansion anchors in solid masonry, not mortar joints. Set thresholds in caulking by sealant contractor.

3.02 PROTECTION

- A. Do not install door silencers, kick plates, push plates, door bottoms, and wall stops until after painting is complete. Loosen locksets and panic hardware prior to painting and re-tighten after painting is complete. Mask all hardware or otherwise protect during painting operation.

3.03 ADJUST AND CLEAN

- A. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.
- B. Final Adjustment: 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 ventilation equipment.
- C. Instruct Owner's personnel in proper adjustment and maintenance of hardware and hardware finishes during the final adjustment of hardware.
- D. Adjust all closers to meet ADA Requirements for sweep time and opening force. Set the closer's back check valve to slow the doors opening from 85 degrees on.

3.04 HARDWARE SCHEDULE

- A. It is intended the following schedule include all items of finish hardware necessary to complete the work; if a discrepancy is found in the schedule, such as a missing item, improper hardware for frame, door, or fire codes, the preamble will be the deciding document.

B. All items shall be of proper type for attaching securely to type of material on which they occur.

C. The schedule of materials is as follows:

* INSERT HARDWARE SCHEDULE HERE*

End of Section