

## SECTION 087100 – DOOR HARDWARE

### PART I – GENERAL

#### 1.01 SUMMARY

##### A. SECTION INCLUDES

1. The work in this section includes furnishing all items of finish hardware as hereinafter specified or obviously necessary for all swinging, sliding, folding and other doors. Except items, which are specifically excluded from this section of the specification or of unique hardware, specified in the same sections as the doors and frames on which they are installed.

##### B. RELATED DOCUMENTS

1. Related documents, drawings and general provisions of contract, including General and Supplementary Conditions and Division 1 specification sections apply to this section.

#### 1.02 REFERENCES

##### A. STANDARDS

1. ANSI A156.1 – Butts and Hinges
2. ANSI A156.2 – Bored Locks and Latches
3. ANSI A156.3 – Exit Devices
4. ANSI A156.4 – Door Controls – Door Closers
5. ANSI A156.5 – Auxiliary Locks and Associated Products
6. ANSI A156.6 – Architectural Door Trim
7. ANSI A156.7 – Template Hinge Dimensions
8. ANSI A156.8 – Door Controls – Overhead Holders
9. ANSI A156.13 – Mortise Locks and Latches
10. ANSI A156.15 – Closer Holder Release Devices
11. ANSI A156.16 – Auxiliary Hardware
12. ANSI A156.18 – Material and Finishes
13. NFPA 80 – Fire Doors and Windows
14. UL10C – Positive Pressure Fire Tests of Door Assemblies

##### B. CODES

1. IBC 2006 – International Building Code
2. ANSI A117.1 – Accessible and Usable Buildings and Facilities
3. ADA – Americans with Disabilities Act

#### 1.03 SUBMITTALS

##### A. GENERAL REQUIREMENTS

1. Submit copies of finish hardware schedule in accordance with Division 1, General Requirements.

##### B. SCHEDULES AND PRODUCT DATA

1. Schedules to be in vertical format, listing each door opening, and organized into “hardware sets” indicating complete designations of every item required for each door opening to function as intended. Hardware schedule shall be submitted within two (2) weeks from date the purchase order is received by the finish hardware supplier. Furnish four (4) copies of revised schedules after approval for field and file use. Note any special mounting instructions or requirements with the hardware schedule. Schedules to include the following information:
  - a. Location of each hardware set cross-referenced to indications on drawings, both on floor plans and in door and frame schedule.
  - b. Handing and degree of swing of each door.
  - c. Door and frame sizes and materials.
  - d. Keying information.
  - e. Type, style, function, size, and finish of each hardware item.
  - f. Elevation drawings and operational descriptions for all electronic openings.
  - g. Name and manufacturer of each hardware item.
  - h. Fastenings and other pertinent information.
  - i. Explanation of all abbreviations, symbols and codes contained in schedule
  - j. Mounting locations for hardware when varies from standard.
2. Submit catalog cuts and/or product data sheets for all scheduled finish hardware.
3. Submit separate detailed keying schedule for approval indicating clearly how the owner’s final instructions on keying of locks has been fulfilled.

#### C. SAMPLES

1. Upon request, samples of each type of hardware in finish indicated shall be submitted. Samples are to remain undamaged and in working condition through submittal and review process. Items will be returned to the supplier or incorporated into the work within limitations of keying coordination requirements.

#### D. TEMPLATES

1. 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.

#### E. 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 and catalog cuts
  - b. Hardware installation and adjustment instructions.
  - c. Manufacturer’s written warranty information.
  - d. Wiring diagrams, elevation drawings and operational descriptions for all electronic openings.

## 1.04 QUALITY ASSURANCE

### A. SUBSTITUTIONS

1. All substitution requests must be submitted before bidding and within the procedures and time frame as outlined in Division 1, General Requirements. Approval of products is at the discretion of the architect and his hardware consultant.

### B. SUPPLIER QUALIFICATIONS

1. A recognized architectural door hardware supplier who has maintained an office and has been furnishing hardware in the project's vicinity for a period of at least two (2) years.
2. Hardware supplier shall have office and warehouse facilities to accommodate this project.
3. Hardware supplier shall have in his employment at least one (1) Architectural Hardware Consultant (AHC) who is available at reasonable times during business hours for consultation about the project's hardware and requirements to the owner, architect and contractor.
4. Hardware supplier must be an authorized factory distributor of all products specified herein.

## 1.05 FIRE-RATED OPENINGS

1. Provide door hardware for fire-rated openings that comply with NFPA 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed by Underwriter's Laboratories (UL) or Warnock Hersey (WH) for use on types and sizes of doors indicated.
2. 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.
  - a. Hardware required for fire doors shall be listed with Underwriters Laboratories for ratings specified.
  - b. Certification(s) of compliance shall be made available upon request by the Authority Having Jurisdiction.

## 1.06 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. 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.

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. At time of hardware delivery, door openings supplier in conjunction with the contractor shall check in all hardware and set up a hardware storage location.

#### 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.

### 1.07 WARRANTY

- A. All items, except as noted below, shall be warranted in writing by the manufacturer against failure due to defective materials and workmanship for a minimum period of two (2) years commencing on the date of the Letter of Acceptance. In the event of product failure, promptly repair or replace item with no additional cost to the owner.
  1. Mortise locksets: Five (5) years
  2. Exit Devices: Five (5) years
  3. Door closers: Ten (10) years

## PART II – PRODUCTS

### 2.01 MANUFACTURERS

- A. Only manufacturers as listed below shall be accepted. Obtain each type of finish hardware (hinges, latch and locksets, exit devices, door closers, etc.) from a single manufacturer.

## 2.02 MATERIALS

### A. SCREWS AND FASTENERS

1. All required screws shall be supplied as necessary for securing finish hardware in the appropriate manner. Thru-bolts shall be supplied for exit devices and door closers where required by code and the appropriate blocking or reinforcing is not present in the door to preclude their use.

### B. HANGING DEVICES

#### 1. HINGES

- a. Hinges shall conform to ANSI A156.1 and have the number of knuckles as specified, oil-impregnated bearings as specified with NRP (non-removable pin) feature, at all exterior reverse bevel doors. Unless otherwise scheduled, supply one (1) hinge for every 30" of door height. Hinges shall be a minimum of 4 1/2" high and 4" wide; heavy weight hinges (.180) shall be supplied at all doors where specified.

- 1) Specified Manufacturer: McKinney
- 2) Approved Substitutes: Hager, Stanley

### C. FLUSH BOLTS AND ACCESSORIES

1. All manual and automatic flush bolts to be furnished as specified.

- a. Specified Manufacturer: McKinney
- b. Approved Substitutes: Rockwood, Trimco

### D. CYLINDERS AND KEYING

#### 1. CYLINDERS

- a. APS will provide, key and install.

### E. LOCKING DEVICES

#### 1. MORTISE LOCKSETS

- a. All locksets shall be ANSI 156.13 Series 1000, Grade 1 Certified. All functions shall be manufactured in a single sized case formed from 12 gauge steel minimum. The lockset shall have a field-adjustable, beveled armored front, with a .125" minimum thickness and shall be reversible without opening the lock body. The lockset shall be 2 3/4" backset with a one-piece 3/4" anti-friction stainless steel latchbolt. The deadbolt shall be a full 1" throw made of stainless steel and have 2 hardened steel roller inserts. All strikes shall be non-handed with a curved lip. To insure proper alignment, all trim, shall be thru-bolted and fully interchangeable between rose and escutcheon designs.

- 1) Specified Manufacturer: Schlage L9000 Series
- 2) Approved Substitutes: Per APS approval.

## 2. LOCKSET STRIKES

- a. Strikes shall be non-handed and available with curved lip, full lip or ASA type strikes as required. Provide strikes with lip-length required to accommodate jamb and/or trim detail and projection.

## F. EXIT DEVICES

### 1. CONVENTIONAL DEVICES – PUSH RAIL

- a. All exit devices shall be ANSI A156.3, Grade 1 Certified and shall be listed by Underwriters Laboratories and bear the UL label for life safety in full compliance with NFPA 80 and NFPA 101. Mounting rails shall be formed from a solid single piece of stainless steel, brass or bronze no less than 0.072” thick. Push rails shall be constructed of 0.062” thick material. Lever trim shall be available in finishes and designs to match that of the specified locksets.
  - 1) Specified Manufacturer: Von Duprin 99 Series
  - 2) Approved Substitutes: Precision 2100 and 1100 Series

## G.

## H. DOOR CLOSERS

### 1. SURFACE MOUNTED CLOSERS – HEAVY DUTY

- a. All door closers shall be ANSI 156.4, Grade 1 Certified. All closers shall have aluminum alloy bodies, forged steel arms, and separate valves for adjusting backcheck, closing and latching cycles and adjustable spring to provide up to 50% increase in spring power. Closers shall be furnished with parallel arms mounting on all doors opening into corridors or other public spaces and shall be mounted to permit 180 degrees door swing wherever wall conditions permit. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
  - 1) Specified Manufacturer: LCN 4111 Series
  - 2) Approved Substitutes: Per APS Approval

## I. DOOR TRIM AND PROTECTIVE PLATES

1. Kick plates shall be .050 gauges and two (2) inches less full width of door, or as specified. Push plates, pull plates, door pulls and miscellaneous door trim shall be as shown in the hardware schedule.
  - a. Specified Manufacturer: McKinney
  - b. Approved Substitutes: Rockwood, Trimco

## J. DOOR STOPS AND HOLDERS

### 1. WALL MOUNTED DOOR STOPS

- a. Where a door is indicated on the plans to strike flush against a wall, wall bumpers shall be provided. Provide convex or concave design as indicated.

- 1) Specified Manufacturers: McKinney
- 2) Approved Substitutes: Rockwood, Trimco

### 2. OVERHEAD STOPS/HOLDERS

- a. Where specified, overhead stops/holders as shown in the hardware sets are to be provided. Track, slide, arm and jamb bracket shall be constructed of extruded bronze and shock absorber spring shall be of heavy tempered steel. Overhead stops shall be of non-handed design.

- 1) Specified Manufacturers: Rixson 1/2/9/10 Series

## K. GASKETING AND THRESHOLDS

1. Provide continuous weatherseal on exterior doors and smoke, light, or sound seals on interior doors where indicated or scheduled. Provide intumescent seals as required to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies. Provide only those units where resilient or flexible seal strip is easily replaceable and readily available from stocks maintained by manufacturer.

2. Provide threshold units not less than 4" wide, formed to accommodate change in floor elevation where indicated, fabricated to accommodate door hardware and to fit door frames. All threshold units shall comply with the Americans with Disabilities Act (ADA).

- a. Specified Manufacturers: McKinney
- b. Approved Substitutes: National Guard, Pemko

## L. SILENCERS

1. Furnish rubber door silencers all hollow metal frames; two (2) per pair and three (3) per single door frame.

## 2.03 FINISHES

- A. The designations used in schedules and elsewhere to indicate hardware finishes are those listed in ANSI/BHMA A156.18 or traditional U.S. finishes shown by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.

- C. Where specified hardware shall have an antimicrobial coating which permanently suppresses the growth of bacteria, algae, fungus, mold and mildew applied. The finish shall control the spread and growth of bacteria, mold and mildew and shall be FDA listed for use in medical and food preparation equipment.

## PART III – EXECUTION

### 3.01 EXAMINATION

- A. Contractor shall ensure that the building is secured and free from weather elements prior to installing interior door hardware. Examine hardware before installation to ensure it is free of defects.

### 3.02 INSTALLATION

- A. Mount hardware units at heights indicated in the following applicable publications, except as specifically indicated or required to comply with the governing regulations.
  - 1. “Recommended Locations for Builders Hardware for Standard Steel Doors and Frames” by the Door and Hardware Institute (DHI.)
  - 2. NWWDA Industry Standard I.S.1.7, “Hardware Locations for Wood Flush Doors.”
- B. All hardware shall be applied and installed in accordance with best trade practice by an experienced hardware installer. Care shall be exercised not to mar or damage adjacent work.
- C. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation or application of surface protection with finishing work specified in the Division 9 Sections. Do not install surface-mounted items until finishes have been completed on the substrates involved.
- D. Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

### 3.03 FIELD QUALITY CONTROL

- A. The hardware supplier shall do a final inspection prior to building completion to ensure that all hardware was correctly installed and is in proper working order.

### 3.04 ADJUSTING, CLEANING, AND DEMONSTRATING

- A. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate freely and smoothly or as intended for the application made.



- B. Where door hardware is installed more than one month prior to acceptance or occupancy of a space or area, return to the installation 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 to proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- C. Instruct owner's personnel in the proper adjustment and maintenance of door hardware and hardware finishes and usage of any electronic devices.

3.05 PROTECTION

- A. Contractor shall protect all hardware, as it is stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

3.06 HARDWARE SCHEDULE

- A. The following schedule is furnished for whatever assistance it may afford the Contractor; do not consider it as entirely inclusive. Should any particular door or item be omitted in any scheduled hardware heading, provide door or item with hardware same as required for similar purposes. 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. Manufacturer's Abbreviations:

- 1. BO - By Others
- 2. LC - LCN
- 3. MC- McKinney
- 4. RX - Rixson
- 5. SC - Schlage
- 6. VO - Von Duprin

Heading 1.0

Doors: 42A

3	Hinges	TA2714 4 1/2 X 4 1/2	26D	MC
1	Storeroom Lockset	L9080L 03A	626	SC
1	Armor Plate	KP50 40" x 34" HB4E CSK	US32D	MC
1	Wall Stop	WS02		

## Heading 2.0

Doors: 45

3	Hinges	TA2714 4 1/2 X 4 1/2	26D	MC
1	Privacy Set	L9040 03A	626	SC
1	Closer	4111 EDA	AL	LC
1	Kick Plate	KP50 12" x 2" L.D.W. HB4E CSK	US32D	MC
1	Mop Plate	KP50 6" x 1" L.D.W. HB4E CSK	US32D	MC
1	Wall Stop	WS02		

## Heading 3.0

Doors: 47

3	Hinges	TA2714 4 1/2 X 4 1/2	26D	MC
1	Office Lockset	L9050L 03A	626	SC
1	Kick Plate	KP50 12" x 2" L.D.W. HB4E CSK	US32D	MC
1	Wall Stop	WS02		

## Heading 4.0

Door: 48A

4	Hinges	TA2314 5 X 4 1/2	26D	MC
1	Entrance Lockset	L9080L 03A	626	SC
1	Kick Plate	KP50 12" x 2" L.D.W. HB4E CSK	US32D	MC
1	Wall Stop	WS02	US32D	MC
1	Threshold	MCK-272A L.A.R. *		MC
1	Weatherstrip	MCK-45041CNB @ Head & Jambs		MC
1	Door Sweep	MCK-315CN L.A.R.		MC

NOTE: Confirm jamb width at openings 48A & 48B. Coordinate appropriate threshold width.

### Heading 5.0

Doors: 48B

4	Hinges	TA2314 5 X 4 1/2 NRP	26D	MC
1	Entrance Lockset	L9080L 03A	626	SC
1	Relocated Electric Strike			
1	Relocated Strike Power Supply			
1	Relocated Access Hardware			
1	Closer	4111 EDA	AL	LC
1	Kick Plate	KP50 12" x 2" L.D.W. HB4E CSK	US32D	MC
1	Overhead Stop	1-036	630	RX
1	Threshold	MCK-272A L.A.R. *		MC
1	Weatherstrip	MCK-45041CNB @ Head & Jambs		MC
1	Door Bottom	MCK-345ANB L.A.R.		MC
1	Latch Protector	LP01	US32D	MC

NOTE: Confirm jamb width at openings 48A & 48B Coordinate appropriate threshold width.

### Heading 6.0

Doors: 51

3	Hinges	TA2714 4 1/2 X 4 1/2	26D	MC
1	Storeroom Lockset	L9080L 03A	626	SC
1	Closer	4111 EDA	AL	LC
1	Armor Plate	KP50 40" x 34" HB4E CSK	US32D	MC
1	Wall Stop	WS02	US26D	MC
1	Gasketing	MCK-S88D @ Head & Jambs		MC

### Heading 7.0

Doors: 43

3	Hinges	T4A3786 4 1/2 X 4 1/2 NRP	26D	MC
1	Exit Device (Classroom)	98L-F x 996L-R&V 03	US32D	VO
1	Closer	4111 EDA	AL	LC
1	Kick Plate	KP50 12" x 2" L.D.W. HB4E CSK	US32D	MC
1	Wall Stop	WS02	US26D	MC
1	Gasketing	MCK-S88D @ Head & Jambs		MC

### Heading 8.0

Doors: 39D (Bid Alternate re: 012300)

6	Hinges	TA2714 4 1/2 X 4 1/2	26D	MC
1	Auto Flush Bolt Set	FB06M	US26D	MC
1	Dust Proof Strike	DPS3	US26D	MC
1	Storeroom Lockset	L9080L 03A	626	SC
2	Armor Plate	KP50 32" x 2" L.D.W. HB4E CSK	US32D	MC
2	Overhead Stop	1-036	630	RX
1	Wall Stop	WS02	US32D	MC
1	Threshold	MCK-272A L.A.R.		MC
1	Weatherstrip	MCK-45041CNB @ Head & Jambs		MC
2	Door Sweep	MCK-315CN L.A.R.		MC
1	Astragal	MCK-357SP X S88D L.A.R.		MC

### Heading 9.0

Doors: 44A

3	Hinges	TA2714 4 1/2 X 4 1/2	26D	MC
1	Storeroom Lockset	L9080L 03A	626	SC
1	Kick Plate	KP50 12" x 2" L.D.W. HB4E CSK	US32D	MC
1	Overhead Stop	1-036	630	RX

### Heading 10.0

Doors: 40C, 39A (Bid Alternate re: 012300)

3	Hinges	TA2714 4 1/2 X 4 1/2	26D	MC
1	Classroom Lockset	L9070L 03A	626	SC
1	Kick Plate	KP50 12" x 2" L.D.W. HB4E CSK	US32D	MC
1	Overhead Stop (at 39A & 44A)	1-036	630	RX
1	Wall Stop (at 40C)	WS02		

### Heading 11.0

Doors: 39B (Bid Alternate re: 012300)

6	Hinges	TA2714 4 1/2 X 4 1/2	26D	MC
1	Auto Flush Bolt Set	FB06M	US26D	MC
1	Dust Proof Strike	DPS3	US26D	MC
1	Storeroom Lockset	L9080L 03A	626	SC
2	Overhead Stop	1-036	630	RX

END OF SECTION 087100