

# **SECTION 087000 - HARDWARE**

## **PART I - GENERAL**

### **1.1 RELATED SECTIONS:**

Refer to Section 081000 for requirements regarding doors and frames.

Refer to Section 085000 for requirements regarding windows.

### **1.2 SCOPE OF SECTION:**

This section contains the requirements relating to hardware and gasketing for doors and windows. Includes electronic, magnetic, hydraulic, and pneumatic components for operating, controlling, and monitoring doors and windows. Also includes accessories for doors and windows not specifically covered in other sections. Door hardware covers hinges, pivots, sliding and folding door hardware, and other hanging hardware; locks, keys, exit devices, cylinders and other latching hardware; closers, holders, self closing hinges and other controlling hardware; and push plates, pulls, kick plates, weatherstripping, gaskets, thresholds, and other door trim.

### **1.3 GENERAL:**

On partial renovation projects, all door hardware shall match existing and be ADA compliant.

Standard keys are 6 pin unless otherwise specified.

### **1.4 QUALITY ASSURANCE:**

#### **A. MANUFACTURER:**

Obtain all hardware of each type (latch and lock sets, hinges, closers) from one manufacturer of that item type, (e.g., hinges from one manufacturer, closers from one manufacturer), although several may be indicated as offering products complying with requirements.

#### **B. SUPPLIER:**

A builders hardware supplier who has been furnishing hardware for a period of not less than 2 years, and who is, or has in employment, an experienced hardware consultant who is available for consultation about project's hardware requirements to Architect and Contractor.

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### C. FIRE-RATED OPENINGS:

Provide hardware for fire-rated openings in compliance with NFPA. Provide only hardware which has been tested and listed by UL or other third party listing agency for types and sizes of door scheduled and complies with requirements of door and door frame labels.

## 1.5 SUBMITTALS:

### A. PRODUCT DATA:

Submit manufacturer's technical information for each item of hardware. Include information to show compliance with requirements, and include instructions for installation and for maintenance of operating parts and finish.

### B. HARDWARE SCHEDULE:

Submit final hardware schedule in the format of this specification, complying with the construction progress schedule requirements. Hardware schedules are intended for coordination of work. Include the following information:

1. Type, style, function, size and finish of each hardware item.
2. Name and manufacturer of each item.
3. Fastenings.
4. Location of hardware set cross-referenced to indications on Drawings both on floor plans and in door and frame schedule.
5. Explanation of abbreviations, symbols, and codes contained in schedule.
6. Mounting locations for hardware.
7. Door and frame sizes and materials.

### C. SUBMITTAL SEQUENCE:

1. Submit schedule where acceptance of hardware schedule must precede fabrication of other work (e.g., hollow metal frames) which is critical in the project construction schedule. Include with schedule the product data, samples, shop drawings of work affected by hardware, and information essential to the coordinated review of hardware schedule.
2. The Contractor's attention shall be drawn to the lead time required for

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delivery of certain hardware items and the required date of Completion.

### **D. OPERATIONS AND MAINTENANCE MANUALS:**

Refer to Division 1 section for Operations and Maintenance Manuals; include technical information, templates, installation instructions, as-installed wiring diagrams, and any special details.

### **1.6 KEYING:**

#### **A. GENERAL:**

1. All door lock installations shall be compatible with the building master and keyways unless otherwise specified. All other door hardware shall be compatible with these cylinders with the following exception. The Owner's restricted keyways shall be installed on specified doors including mechanical rooms, electrical rooms, telecommunication rooms, etc.
2. All non-standard door locking mechanisms shall have key-operated bypass.

#### **B. DOOR KEYING:**

1. Health Sciences Campus

The Facilities Services Locksmith shall provide a bitting list to Contractor. Contractor shall make up a keying schedule and shall provide the keying schedule to the Owner. The Contractor shall provide and install keyed cylinders and provide 2 file keys and 3 user keys for each cylinder to the Locksmith through Project Manager and Facilities Service Center via signed transmittal. Tag keys with appropriate room numbers. For major renovations and new construction, supply adequate key cabinet for storage to Owner.

For Owner's proprietary cylinders, the Contractor shall purchase the cylinders directly from the manufacturer, with authorization from the Facilities Services Locksmith.

Construction cores shall be used during construction and shall be replaced with permanent cylinder cores at project completion. All work shall be done by Contractor.

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### 2. Main Campus

Hardware Supplier shall make up a keying schedule and shall provide the keying schedule to the Contractor and Owner. For major renovations or new construction, Designer shall consult with Buildings Department via Project Manager for number of additional master keyed bittings to be provided for future expansion. The Contractor shall provide and install keyed cylinders and provide 2 file keys and 3 user keys for each cylinder to the Locksmith through Project Manager and Facilities Service Center via signed transmittal. Tag keys with appropriate room numbers. For major renovations and new construction, supply adequate key cabinet for storage to Owner.

For Owner's proprietary cylinders, the Contractor shall purchase the cylinders directly from the manufacturer, with authorization from the Facilities Services Locksmith. Core bittings shall be supplied by Facilities Services Locksmith.

Construction cores shall be used during construction and shall be replaced with permanent cylinder cores at project completion. All work shall be done by Contractor.

### 1.7 **PRODUCT HANDLING:**

### 1.8 **JOB CONDITIONS:**

### 1.9 **WARRANTIES:**

#### A. **DOOR CLOSERS:**

Provide warranty on door closers against failure due to defective materials and workmanship for a period of one (1) year, beginning on date of Certificate of Completion. Closers judged defective during this period shall be replaced or repaired at no cost to the Owner.

#### B. **EXIT DEVICES:**

Provide warranty on exit devices against failure due to defective materials and workmanship for a period of three (3) years, beginning on date of Certificate of Completion.

## **PART 2 - PRODUCTS**

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### 2.1 SCHEDULED HARDWARE:

Requirements for design, grade, function, finish, size and other distinctive qualities of each type of hardware is indicated below:

A. FINISHES:

Preferred standard finish is stainless steel (US32D).

B. HINGES:

4-1/2" x 4-1/2", ball-bearing hinges. Exterior hinges shall have non-removable pins. Continuous hinges shall be used in heavy traffic areas and storefronts as specified by Owner.

C. LOCKSETS:

1. Locks shall be the function and design given below. Provide solid cast bronze or brass levers. Provide tactile warning at mechanical and hazardous spaces. On Main Campus, acceptable manufacturers are Corbin-Russwin ML2000 Series and Sargent 8200 Series except for Residence Halls. In Residence Halls, the acceptable manufacturer is Best and shall match existing. On Health Sciences Campus, the acceptable manufacturer is Corbin-Russwin ML2000 Series.
2. Double-keyed locksets are strictly forbidden from all doors used for egress, and providing two separate locks on any door is also forbidden.
3. A key-operated by-pass must be installed with all non-standard door locking mechanisms.
4. Keys shall be embossed "Property of State of North Carolina, Do not Duplicate". Do not include company identification or logo on keys. File keys shall be stamped with bitting number. User keys shall be stamped with room number.
5. Punch code locks are not preferred on Main Campus.

D. EXIT DEVICES:

1. Provide devices of the type and functions as listed. Provide UL label devices at label fire doors. Double doors shall have rim devices with removable keyed mullions. If required, surface mounted vertical rods with guards shall be used. All panic devices shall be capable of being locked and unlocked by a control cylinder or hex-key on the inside of the door.

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2. Acceptable Manufacturer: Von Duprin 99 Series. Von Duprin CX98/99 Chexit Device type hardware shall only be used where specified by Owner.

### E. DOOR CLOSERS:

1. Closers shall be the type as specified herein. Closers shall be set presized #3; Contractor shall adjust to meet field conditions. Provide arms and brackets to operate with conditions as detailed on the drawings. Parallel arm type is preferred. All closers shall be installed with sex bolts. Mount closers on room side of door. Do not provide hold-open feature unless specified. Operation shall comply with ADA guidelines.
2. Acceptable Manufacturers: LCN
3. As circumstances allow, be consistent in the "handing" of door closers. For renovations and additions, be consistent with "handing" in existing building(s).

### F. THRESHOLDS:

Provide design and materials as listed. Provide proper fasteners to meet job conditions.

1. Provide flat, single piece thresholds. If saddle type is required, rise shall be no more than 1/2", or per ADA guidelines.
2. Set exterior thresholds on a bed of sealant.

### G. AUTOMATIC DOOR OPENERS:

1. Standard Applications: LCN Auto-Equalizer. Pneumatic is preferred, otherwise electric.
2. Operators are to be hardwired wherever possible.
3. Pneumatic compressors shall be installed in an accessible location such as concealed ceiling spaces or adjacent mechanical and electrical rooms. Provide suitable mounting surface to limit transmission of noise and vibration.

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4. Where automatic doors are installed on the exterior of Residence Halls, the operator shall be actuated from a remote operator. The remote operator shall be a Linear Model D-22A.

### **H. HOLD-OPEN DEVICES:**

Magnetic hold-open devices shall be specified in areas where automatic door closers are required, but traffic patterns force the doors to be normally open. The hold-open devices shall automatically release the doors upon activation of the fire alarm system. Wall mounted type preferred with appropriate blocking.

## **2.2 MATERIALS AND FABRICATION:**

### **A. HAND OF DOOR:**

The drawings shall show the direction of swing or hand of each door leaf. Furnish each item of hardware for installation and operation of the door movement as shown on the drawings and specified herein.

### **B. FASTENERS:**

Manufacture hardware to conform to published templates, prepared for machine screw installation.

- C. Furnish screws for installation with each hardware item. Provide phillips flat-head screws except as otherwise specified herein. Finish exposed screws to match the hardware finish or, if exposed in surfaces of other work, to match the finish of such work, including "prepared for paint" in surfaces to receive painted finish.

- D. Provide concealed fasteners for hardware units which are exposed when the door is closed, except to the extent no standard units of the type specified are available with concealed fasteners.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION:**

- A. Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames", by the most recent edition of Door and Hardware Institute and in conformance with ADA guidelines.
- B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. For cutting and fitting to install hardware onto or into surfaces which are later to be painted or finished in another way, coordinate

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removal, storage and reinstallation or application of surface protections with finishing work specified in the Division 9 sections. Do not install surface-mounted items until finishes have been completed on the substrate.

- C. Set units level, plumb and true to line and locations. Adjust and reinforce the attachment substrate for installation and operation.
- D. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

### **3.2 ADJUST AND CHECK:**

- A. Adjust and check each operating item of hardware and each door for operation or function of every unit. Replace items which cannot be adjusted to operate as intended for the application made.

- B. **FINAL ADJUSTMENT:**

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

END OF SECTION

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