SECTION 08 71 00

FINISH HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes new door hardware for new wood and hollow metal doors and for existing wood and metal doors to be re-installed.

B. Door hardware shall match hardware on existing doors at floors 2 and 8. Provide compatible hardware in all other locations.

C. Related Sections:

1. Hollow metal doors and frames are specified in Section 08 11 13.

2. Flush wood doors are specified in Section 08 14 16.

3. Stile and rail wood doors are specified in Section 08 14 33.

1.02 REFERENCES

A. American National Standards Institute – ANSI 156.18 – Materials and Finishes.

B. ICC/ANSI A117.1 - 1998 – Specifications for making buildings and facilities usable by physically handicapped people.

C. ADA – Americans with Disabilities Act of 1990

D. BHMA – Builders Hardware Manufacturers Association

E. DHI – Door and Hardware Institute

F. NFPA – National Fire Protection Association

1. NFPA 80 – Fire Doors and Windows

2. NFPA 101 – Life Safety Code

3. NFPA 105 – Smoke and Draft Control Door Assemblies

4. NFPA 252 – Fire Tests of Door Assemblies

G. UL – Underwriters Laboratories

1. UL10B – Fire Tests of Door Assemblies as amended to incorporate positive pressure testing.

2. UL 305 – Panic Hardware

H. WHI – Warnock Hersey Incorporated State of California Building Code

I. Local applicable codes

J. SDI – Steel Door Institute

K. AWS – Architectural Woodwork Standards

L. NAAMM – National Association of Architectural Metal Manufacturers

1.03 QUALITY ASSURANCE

A. Qualifications:

1. Hardware Supplier: Direct factory contract supplier who employs a certified Architectural Hardware Consultant (AHC), available at reasonable times during course of work for project hardware consultation to County's Representative and Developer Design/Builder.

a. Responsible for detailing, scheduling and ordering of finish hardware.

B. Hardware: New, free of defects, blemishes and excessive play. Obtain each kind of hardware (latch and locksets, exit devices, hinges and closers) from one manufacturer.

C. Exit Doors: Operable from inside with single motion without the use of a key or special knowledge or effort.

D. Fire-Rated Openings: NFPA 80 compliant. Hardware UL10C / UBC Standard 7-2 (positive pressure) compliant for given type/size opening and degree of label. Provide proper latching hardware, non-flaming door closers, approved-bearing hinges, and resilient seals. Coordinate with wood door Section for required intumescent seals. Furnish openings complete.

E. Furnish hardware items required to complete the work in accordance with specified performance level and design intent, complying with manufacturers' instructions.

F. Pre-Installation Meetings: Initiate and conduct with supplier, installer and related trades, coordinate materials and techniques, and sequence complex hardware items and systems installation. Include manufacturers' representatives of locks, panic hardware and door closers in the meetings. Convene at least one week prior to commencement of related work.

1.04 DELIVERY, STORAGE AND HANDLING

A. Delivery: Coordinate delivery to appropriate locations (shop or field).

1. Permanent Keys: Secured delivery direct to County's Representative.

B. Acceptance at Site: Items individually packaged in manufacturers' original containers, complete with proper fasteners and related pieces. Clearly mark packages to indicate contents, locations in hardware schedule and door numbers.

C. Storage: Provide securely locked storage area for hardware, protect from moisture, sunlight, paint, chemicals, dust, excessive heat and cold, etc.

1.05 SEQUENCING AND COORDINATION

A. Reinforce walls for wall-mounted hardware, including wall stops.

B. Coordinate finish floor materials and floor-mounted hardware.

C. Conduit and raceways as needed for electrical, electronic hardware items. Fire/life-safety system interfacing.

D. Furnish manufacturer templates to door and frame fabricators.

1. Ensure proper blocking in wood doors to support wood screws for panic hardware and door closers.

2. Ensure proper reinforcement in metal doors and frames to support machine screws for panic hardware and door closers.

1.06 WARRANTY

A. Part of respective manufacturers' regular terms of sale. Provide manufacturers' warranties:

1. Locksets: Three years.

2. Exit Devices: Three years mechanical, one year electrical.

3. Closers: Ten years mechanical.

4. Hinges: Two Years.

5. Other Hardware: Two years.

1.07 COMMISSIONING

A. Conduct these tests three weeks prior to request for certificate of substantial completion:

1. Test door hardware operation with climate control system and stairwell pressurization system both at rest and while in full operation.

2. Test electrical hardware systems for satisfactory operation.

3. Test hardware interfaced with fire/life-safety system for proper operation and release.

PART 2 - PRODUCTS

2.01 HINGING METHODS

A. Conventional Hinges: Steel or stainless steel pins and concealed bearings. Hinge open widths minimum, but of sufficient throw to permit maximum door swing.

1. Three hinges per leaf to 7-foot, 6-inch height. Add one for each additional 30-inches in height or any fraction thereof.

2. Extra heavy weight hinges on doors over 3-foot, 5-inches in width.

3. Extra-heavy weight hinges on doors with panic hardware or fire exit devices.

4. Outswinging exterior doors: non-removable (NRP) pins.

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

2.02 LOCKSETS, LATCHSETS, DEADBOLTS

A. Extra Heavy Duty Cylindrical Locks and Latches:

1. Chassis: Cylindrical design, corrosion-resistant plated cold-rolled steel, through-bolted.

2. Locking Spindle: Stainless steel, interlocking design.

3. Latch Retractors: Forged steel. Balance of inner parts: corrosion-resistant plated steel, or stainless steel.

4. Backset: 2-3/4" typically, more or less as needed to accommodate frame, door or other hardware.

5. Lever Trim: Accessible design, independent operation, spring-cage supported, minimum 2" clearance from lever mid-point to door face.

6. Electric Operation: Manufacturer-installed continuous duty solenoid.

7. Strikes: 16 gage curved steel, bronze or brass with 1” deep box construction, lips of sufficient length to clear trim and protect clothing.

8. Certifications:

a. ANSI A156.2, 1994, Series 4000, Grade 1.

b. UL listed for A label and lesser class single doors up to 4ft x 8ft.

B. Standard Duty Cylindrical Locks and Latches:

1. Chassis: Cylindrical design, corrosion-resistant plated cold-rolled steel, through-bolted.

2. Locking Spindle: Stainless steel, interlocking design.

3. Latch Retractors: Forged steel. Balance of inner parts: corrosion-resistant plated steel or stainless steel.

4. Backset: 2-3/4" typically, more or less as needed to accommodate frame, door or other hardware.

5. Lever Trim: Accessible design, independent operation, spring-cage supported, minimum 2” clearance from lever mid-point to face of door.

6. Certifications:

a. ANSI A156.2, 1994, Series 4000, Grade 2.

b. UL listed for A label and lesser class single doors up to 4ft x 8ft.

2.03 EXIT DEVICES / PANIC HARDWARE

A. General Features:

1. Independent lab-tested 1,000,000 cycles.

2. Push-through push-pad design. No exposed push-pad fasteners, no exposed cavities when operated. Return stroke fluid dampeners and rubber bottoming dampeners, plus anti-rattle devices.

3. End Caps: Impact-resistant, flush-mounted. No raised edges or lips to catch carts or other equipment.

4. No exposed screws to show through glass doors.

5. Non-handed basic device design with center case interchangeable with all functions, no extra parts required to effect change of function.

6. Releasable in normal operation with 15-lb. maximum operating force per UBC Standard 10-4, and with 32 lb. maximum pressure under 250-lb. load to the door.

7. Flush end cap design as opposed to typical "bottle-cap" design end cap.

8. Comply with CBC Section 1003.3.1.9.

B. Specific Features:

1. Non-Fire Rated Devices: Cylinder dogging.

2. Lever Trim: Breakaway type, forged brass or bronze escutcheon min .130" thickness, compression spring drive, match lockset lever design.

3. Fire-Labeled Devices: UL label indicating "Fire Exit Hardware". Vertical rod devices less bottom rod (LBR) unless otherwise scheduled.

4. Impact Recessed Devices: 1-1/4inch projection when push-pad is depressed. Sloped metal end caps to deflect carts, etc. No pinch points to catch skin between touchbar and door.

5. Electrically Operated Devices: Single manufacturer source for electric latch retraction devices, electrically controlled trim, power transfers, power supplies, monitoring switches and controls.

2.04 CLOSERS

A. Surface Closers:

1. Full rack-and-pinion type cylinder with removable non-ferrous cover and cast iron body. Double heat-treated pinion shaft, single piece forged piston, chrome-silicon steel spring.

2. ISO 2000 certified. Units stamped with date-of-manufacture code.

3. Independent lab-tested 5,000,000 cycles.

4. Non-sized, non-handed and adjustable. Place closers inside building, stairs and rooms.

5. Plates, brackets and special templating when needed for interface with particular header, door and wall conditions and neighboring hardware.

6. Opening Pressure: Exterior doors 5.0 lb., interior doors 5.0 lb., labeled fire doors 15 lb, per CBC 1133B.2.5. Note: The Authority, having jurisdiction, may increase the maximum effort to operate fire doors to achieve positive latching, but not to exceed 15 pounds maximum.

7. Separate adjusting valves for closing speed, latching speed and backcheck, fourth valve for delayed action where scheduled.

8. Extra-duty arms (EDA) at exterior doors scheduled with parallel arm units.

9. Exterior door closers: tested to 100 hours of ASTM B117 salt spray test, furnish data on request.

10. Exterior doors do not require seasonal adjustments in temperatures from 120 degrees F to 0 degrees F, furnish data on request.

11. Non-flaming fluid, will not fuel door or floor covering fires.

12. Pressure Relief Valves (PRV): unsafe, not permitted.

B. Overhead Concealed Closers: Power transmitted to door separately from hanging means. Closer spindle does not support the door. Cast iron cylinders with hydraulically checked rack and pinion construction and single piece forged pistons. Separate non-critical sweep and latch speed valves.

1. Concealed in 1-3/4inch x 4inch tube, single-lever arm & track power transmission, concealed-in-track bumpers where scheduled.

2.05 OTHER HARDWARE

A. Automatic Flush Bolts: Low operating force design, "LBR" type where required.

B. Overhead Stops: Stainless steel. Non-plastic mechanisms and finished metal end caps. Field-changeable hold-open, friction and stop-only functions.

C. Kick Plates: Four beveled edges, .050 inches minimum thickness, height and width as scheduled. Sheet-metal screws of bronze or stainless steel to match other hardware.

D. Door Stops: Provide stops to protect walls, casework or other hardware.

1. Provide wall type with appropriate fasteners. Where wall type cannot be used, provide floor type. If neither can be used, provide overhead type.

E. Seals: Finished to match adjacent frame color. Resilient seal material: polypropylene, nylon brush, or solid high-grade neoprene. UL label applied to seals on rated doors. Substitute products: certify that the products equal or exceed specified material's thickness and durability. Proposed substitutions: submit for approval.

1. Solid neoprene: MIL Spec. R6855-CL III, Grade 40.

2. Non-corroding fasteners at in-swinging exterior doors.

3. Fire-rated Doors, Resilient Seals: UL10C / UBC Standard 7-2 compliant. Coordinate with selected door manufacturers' and selected frame manufacturers' requirements. Where rigid housed resilient seals are scheduled in this section and the selected door manufacturer only requires an adhesive-mounted resilient seal, furnish rigid housed seal at minimum, or both the rigid housed seal plus the adhesive applied seal.

4. Fire-rated Doors, Intumescent Seals: Furnished by selected door manufacturer. Furnish fire-labeled opening assembly complete and in full compliance with UL10C / UBC Standard 7-2. Where required, intumescent seals vary in requirement by door type and door manufacture -- careful coordination required.

F. Thresholds: Comply with CBC Section 1133B.2.4.1.

1. Exteriors: Seal perimeter to exclude water and vermin. Use butyl-rubber or polyisobutylene sealant. Non-ferrous 1/4inch fasteners and lead expansion shield anchors.

2. Fire-rated Openings, 90 min or less Duration: Use thresholds to interrupt floor covering material under the door where that material has a critical radiant flux value less than 0.22 watts per square centimeter, per NFPA 253.

3. Fire-rated Openings, 3 hour Duration: Thresholds to extend full jamb depth.

G. Fasteners: Generally, exposed screws to be Phillips or Robertson drive. Pinned TORX drive at high security areas. Flat head sleeve anchors (FHSL) may be slotted drive. Sheet metal and wood screws: full-thread. Sleeve nuts: full length to prevent door compression.

H. Through-bolts: Do not use. Coordinate with wood doors; ensure provision of proper blocking to support wood screws for mounting panic hardware and door closers. Coordinate with metal doors and frames; ensure provision of proper reinforcement to support machine screws for mounting panic hardware and door closers.

I. Silencers: Interior hollow metal frames, 3 for single doors, 4 for pairs of doors. Omit where adhesive mounted seal occurs. Leave no unfilled/uncovered pre-punched silencer holes.

J. Wall- and Floor-mounted Electromagnetic Door Holders: LCN's SEM series or approved equal. Incorporate into U.L. listed fire & life-safety system, doors release to allow closure and latching when door's zone is in alarm state. Use minimum projection required to allow door to open as widely as allowed by wall conditions and projection of door hardware.

2.06 FINISH

A. Bronze finish to match existing and as directed by the County's Representative.

2.08 KEYING REQUIREMENTS

A. Key System: As directed by the County's Representative.

1. Provide new factory registered master key system.

2. Non-I.C. Construction Keying: Furnish inserted type partial key. At Substantial Completion, remove inserts in County's Representative's presence; demonstrate consequent non-operability of construction key. Give all removed inserts and all construction keys to the County's Representative.

B. Key Cylinders: Furnish utility patented, 6-pin solid brass construction.

C. Cylinders/Cylinder Cores: Furnish keyed at factory of lock manufacturer where permanent records are maintained. Locks and cylinders same manufacturer.

D. Permanent Keys: Furnish secured shipment direct from point of origination to County.

E. Bitting List: Furnish secured shipment direct from point of origination to County upon completion.

PART 3 - EXECUTION

3.01 PREPARATION

A. Ensure that walls and frames are square and plumb before hardware installation.

B. Locate hardware per SDI-100 and applicable building, fire, life-safety, accessibility, and security codes.

1. Notify County's Representative of any code conflicts before ordering material.

2. Locate levers, key cylinders, t-turn pieces, touchbars and other operable portions of latching hardware between 30-inches to 44-inches above the finished floor, per CBC Section 1133B.2.5.1.

3. Where new hardware is to be installed near existing doors/hardware scheduled to remain, match locations of existing hardware.

C. Overhead Stops: Before installing, determine proposed locations of furniture items, fixtures, and other items to be protected by the overhead stop's action.

3.02 INSTALLATION

A. Install hardware per manufacturer's instructions and recommendations. Do not install surface-mounted items until finishes have been completed on substrate. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate for proper installation and operation. Remove and reinstall or replace work deemed defective by the County's Representative.

1. Gaskets: Install jamb-applied gaskets before closers, overhead stops, rim strikes, etc; fasten hardware over and through these seals. Install sweeps across bottoms of doors before astragals, cope sweeps around bottom pivots, trim astragals to tops of sweeps.

2. When hardware is to be attached to existing metal surface and insufficient reinforcement exists, use RivNuts, NutSerts or similar anchoring device for screws.

3. Use manufacturers' fasteners furnished with hardware items.

4. Replace fasteners damaged by power-driven tools.

B. Locate floor stops no more that 4-inches from walls and not within paths of travel. Point of door contact no closer to the hinge edge than half the door width.

C. Locate overhead stops for minimum 90-degrees and maximum allowable degree of swing.

D. Drill pilot holes for fasteners in wood doors and/or frames.

E. At doors where a floor stop cannot be used provide a stop in the door closer arm or a separate overhead stop.

F. Where existing wall conditions will not allow door to swing desired degrees, provide swing clear hinges and if needed extended arms on the closers.

3.03 ADJUSTING

A. Adjust and check for proper operation and function. Replace units, which cannot be adjusted to operate freely and smoothly.

1. Hardware damaged by improper installation or adjustment methods to be repaired or replaced to County's satisfaction.

2. Adjust doors to fully latch with no more than 1-pound of pressure.

3. Adjust delayed-action closers on fire-rated doors to fully close from fully-opened position in no more than 10-seconds.

B. Inspection: Use hardware supplier. Include supplier's report with closeout documents.

C. Follow-up Inspection: Installer to furnish letter of agreement to County that approximately 6-months after Substantial Completion, installer will visit Project with representatives of the manufacturers of the locking devices and door closers to accomplish following:

1. Re-adjust hardware.

2. Evaluate maintenance procedures and recommend changes or additions, and instruct County's personnel.

3. Identify items that have deteriorated or failed.

4. Submit written report identifying problems and likely future problems.

3.04 DEMONSTRATION

A. Demonstrate electrical, electronic and pneumatic hardware systems, including adjustment and maintenance procedures.

3.05 PROTECTION/CLEANING

A. Cover installed hardware, protect from paint, cleaning agents, weathering, carts/barrows, etc. Remove covering materials and clean hardware just prior to substantial completion.

B. Clean adjacent wall, frame and door surfaces soiled from installation/reinstallation process.

END OF SECTION