**SECTION 08 71 00**

**DOOR HARDWARE**

## PART 1 – GENERAL

1.01 SUMMARY:

A. Section includes the supply and installation of the Finish Hardware.
1. Include the termination of all Electrified Hardware.
2. Include field verification of any existing doors, frames or hardware.

B. Related Sections
1. Division 1
2. Sealants –Division 7
3. Openings –Division 8
4. Finishes –Division 9

1.02 REFERENCES:

A. UL LLC

1. UL 10B - Fire Test of Door Assemblies
2. UL 10C - Positive Pressure Test of Fire Door Assemblies
3. UL 1784 - Air Leakage Tests of Door Assemblies
4. UL 305 - Panic Hardware

B. DHI - Door and Hardware Institute

1. Sequence and Format for the Hardware Schedule
2. Recommended Locations for Builders Hardware
3. Keying Systems and Nomenclature
4. Installation Guide for Doors and Hardware

C. NFPA – National Fire Protection Association

1. NFPA 70 – National Electric Code
2. NFPA 80 – 2016 Edition – Standard for Fire Doors and Other Opening Protectives
3. NFPA 101 – Life Safety Code
4. NFPA 105 – Smoke and Draft Control Door Assemblies
5. NFPA 252 – Fire Tests of Door Assemblies

D. ANSI - American National Standards Institute

1. ANSI A117.1 – 2017 Edition – Accessible and Usable Buildings and Facilities
2. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties
3. ANSI/BHMA A156.28 - Recommended Practices for Keying Systems
4. ANSI/WDMA I.S. 1A - Interior Architectural Wood Flush Doors
5. ANSI/SDI A250.8 - Standard Steel Doors and Frames

1.03 SUBMITTALS

A. Comply with pertinent provisions of Division 01.

B. Finish Hardware Schedule to be in vertical format to include:
   1. Heading number and/or Hardware Set number.
   2. Door number, Location, Hand, Degree of Opening, Door Size and Type, Frame Size and Type, Fire Rating
   3. Quantity, type, style, function, product, product number, size, fasteners, finish and manufacturer of each hardware item.
   4. Title Sheet, Index, Abbreviations, Manufacturers List, Template List and Templates.
   5. Mounting locations for hardware.
   6. Explanation of abbreviations, symbols, and codes contained in schedule.
   7. Date of the Finish Hardware Specification and Drawing / Door Schedule used in completing the Finish Hardware Schedule.
   8. Name, Company and Date of Field Verification if required.
   9. Door Index; include door number, heading number, and hardware group.
   10. Operation Description of openings with electrified hardware.

C. Product Data: Provide product data in the form of a binder, manufacturer's technical product fact sheets for each item of hardware. Include whatever information may be necessary to show compliance with requirements, including instructions for installation and for maintenance of operating parts and finish.

D. Samples: Provide samples as requested by Owner or Architect. All samples will be returned to the contractor and used on doors for which they were marked.

E. Templates: Provide templates of finish hardware items to each fabricator of doors, frames and other work to be factory or shop prepared for the installation of hardware.

F. Operations and maintenance data: At the completion of the job, provide to the Owner one hard copy or one electronic copy of an Owner's operation and maintenance manual. The manual shall consist of a labeled hardcover three ring binder with the following technical information:
   1. Title page containing: Project name, address and phone numbers. Supplier's name, address and phone numbers.
   2. Table of Contents.
   3. Copy of final (file and field use/as-installed) Finish Hardware Schedule.
   4. Maintenance instruction, adjustment, and preservation of finishes for each item of hardware.
   5. Catalog pages for each items of hardware.
   6. Installation Instructions for each item of hardware
   7. Warranties include Order #.

1.04 QUALITY ASSURANCES

A. Substitutions: Request for substitutions shall not be accepted within this project. Architect, Owner and Finish Hardware Consultant have selected one (1) specified and two (2) equals listed hereinafter in the Hardware Schedule. By this selection process they have established three (3) equal products for competitive pricing, while insuring no unnecessary delays by a substitution process. If any specified product is listed as a "No Substitution" product, this product will be supplied as specified, with no alteration or request of substitution. The reason for this is to comply with the uniformity established at this project. Parts and supplies are inventoried for these products for ease and standardization of replacement.

B. Supplier Qualifications: Supplier shall be recognized architectural finish hardware supplier, with warehousing facilities in the project vicinity and who is or employs a DHI Certified AHC, DHC, DHSC or person with a minimum of 10 years of experience as a hardware supplier. This person shall be available at reasonable times during the work for consultation about products hardware requirements, to the Owner, Architect and General Contractor.

C. Installer Qualifications (Mechanical Hardware): All finish hardware shall be installed by a qualified Finish Hardware Installer. Installer shall attend a pre-installation meeting between the General Contractor, Finish Hardware Supplier/s, hardware manufacturer's representative for locks, closers and exit devices, and all door / frame suppliers. The Finish Hardware Installer shall be responsible for the proper installation and function of all doors and hardware.

1.05 DELIVERY, STORAGE AND HANDLING

A. Marking and packaging: Mark each item or package separately, with identification related to hardware set number, door number and keyset symbol.

B. Delivery:
1. Deliver individually packaged and properly marked finish hardware at the proper time and location to avoid any delays in construction or installation.
2. At time of delivery, inventory hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.

C. Storage: Store hardware in enclosed, dry and locked area.

1.06 WARRANTY

A. All finish hardware products shall be covered by a 1 year factory warranty from the date of substantial completion of the project.

B. Supply warranty verification to the owner for all products that provide factory warranty. Warranty should include Factory Order # and date.

1.07 MAINTENANCE

A. Maintenance Service
1. None

B. Extra Materials:
1. All extra screws, fasteners, and all special installation tools furnished with the hardware shall be turned over to the owner at the completion of the job.

**PART 2 – PRODUCTS**

2.01 MATERIALS

A. Screws and Fasteners:
1. Coordinate with door supplier and manufacturer to ensure proper blocking and reinforcement is provided to support wood or machine screws when mounting panic hardware and door closers. If proper blocking and reinforcement is not included provide through bolts sized to the thickness of the door. All fasteners should be the proper type and length for the product being supplied.

2. All finish hardware shall be installed to manufacturer's recommendations, using screws, attachments and installation tools provided with the hardware. No other screws or attachments are acceptable.
3. All other products to meet door and frame conditions.

B. Hinges:
1. Template: Provide templated units only.
2. All hinges on doors over 36" wide be heavy weight.
3. Electric Hinge: Provide minimum 8 wire.
4. Provide non-removable pins for out swinging doors that are locked or are lockable.
5. All hinges on doors with door closers shall be ball bearing.
6. All hinges shall be full mortise.
7. Size: Provide 4 ½ x 4 ½ hinges on doors up to 3'0" in width. Provide 5 x 4 ½ hinges over 3'0" to 4'0" in width. Reference manufacturers catalog for all other sizes.
8. Number of Hinges: Provide number of hinges indicated but not less than 3 hinges for door leaf for doors 90" or less in height and one additional hinge for each 30" of additional height.
9. Adjust hinge width as required for door, frame, trim and wall conditions to allow proper degree of opening.
10. Provide hinges conforming to ANSI/BHMA A156.1.
11. Provide spring hinges where specified. Provide two spring hinges and one bearing hinge per door leaf for doors 90 inches (2286 mm) or less in height. Provide one additional bearing hinge for each 30 inches (762 mm) of additional door height.
12. Supply from the following list of manufacturers:

| | | |
|---|---|---|
| Ives | IVE | 5BB Series |
| Hager | HAG | BB1191/1279 Series |
| Stanley | STA | FBB Series |

C. Continuous Hinges:
1. Continuous hinges to be manufactured of 6063-T6 aluminum.
2. Continuous hinge shall be certified to ANSI 156.26, Grade 1
3. Continuous hinge should be tested an approved UL10C.
4. Electrified – Provide minimum 8 wire with removable panel.
5. Provide hinges 1 inch shorter in length than nominal height of door, unless otherwise noted.
6. Provide reinforcing for doors weighing over 450 pounds and up to 600 pounds.
7. Supply from the following list of manufacturers:

| | |
|---|---|
| Ives | IVE |
| Select | SEL |
| Hager | HAG |

D. Cylindrical Locks
1. All locks on this project should be manufacturer by the same manufacturer.
2. All locks shall meet the new ANSI/BHMA A156.2, Series 4000, Grade 1.
3. All cylindrical locks shall be UL Listed for 3 hour fire door. Review lock for any height restriction.
4. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with a 1/2 inch (13 mm) latch throw. Provide proper latch throw for UL listing at pairs.
5. Provide standard ASA strikes unless extended lip strike is necessary for frame/trim or 7/8" lip strike is necessary at pair with overlapping astragal.
6. Provide dust box.

7. Lockset shall adjust to fit door thickness from 1 ¾" to 2 1/8".
8. Supply from the following list of manufacturers:

| | | |
|---|---|---|
| Falcon | FAL | B-series |
| Sargent | SAR | 7-Line |
| Best | BES | 73KC |
| Cal-Royal | CAL | SL |

E. Exit Devices
1. All exit device types on this project should be manufactured by the same manufacturer.
2. Exit devices are to be architectural grade touch bar type. Touchpad to extend one half of door width.
3. Mechanism case to be smooth.
4. Exit devices shall meet ANSI A156.3, Grade 1.
5. All exit devices are UL listed Panic Exit or Fire Exit Hardware.
6. All lever trim to match lock trim in design and finish.
7. Dogging: Non-rated devices are to be provided with dogging. Less dogging where shown in Hardware Sets (some exterior, electrical rooms, electrified) Cylinder dogging as shown in hardware sets.
8. Exit devices are to be supplied and installed with thru-bolts for exterior, hollow metal doors, or as required for application.
9. Exit devices shall have a flush end cap.
10. Exit devices shall be ordered with the correct strike for application.
11. Exit devices shall be order in the proper length to meet door width.
12. Exit devices shall have dead latching.
13. Exit device shall be provided in width/height required based on door size.
14. Install exit devices with fasteners supplied by exit device manufacturer.
15. Mount mechanism case flush on face of doors or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits as required.
16. Provide proper concealed vertical rods for wood or hollow metal doors as required.
17. Factory or field drill weep holes for exit devices used in full exterior applications, highly corrosive areas, and where noted in the hardware sets.
18. Supply from the following list of manufacturers:

| | | |
|---|---|---|
| Falcon | FAL | 24/25 Series |
| Sargent | SAR | 80 Series |
| Precision | PRE | Apex series |
| Cal Royal | CAL | GLS7700 series |

F. Flush Bolts
1. Provide automatic, constant latching, and manual flush bolts with forged bronze or stainless steel face plates, extruded brass levers, and with wrought brass guides and strikes. Provide 12 inch (305 mm) steel or brass rods at doors up to 90 inches (2286 mm) in height. For doors over 90 inches (2286 mm) in height increase top rods by 6 inches (152 mm) for each additional 6 inches (152 mm) of door height. Provide dust-proof strikes at each bottom flush bolt.
2. Supply from the following list of manufacturers:

| | |
|---|---|
| Ives | IVE |
| Trimco | TRI |
| Rockwood | ROC |

G. Coordinators

1. Where pairs of doors are equipped with automatic flush bolts, an astragal, or other hardware that requires synchronized closing of the doors, provide bar-type coordinating device, surface applied to underside of stop at frame head.
2. Provide filler bar of correct length for unit to span entire width of opening, and appropriate brackets for parallel arm door closers and surface vertical rod exit device strikes. Factory-prep coordinators for vertical rod devices and hardware as required.
3. Supply from the following list of manufacturers:

| | |
|---|---|
| Ives | IVE |
| Trimco | TRI |
| Rockwood | ROC |

H. Pull Plates/Pulls/Push Plate
1. Pull and Push Plates to meet ANSI 156.6 for .050” thickness.
2. Pull and Push Plate size to 4” x 16”.
3. Pull Plate to have 10” center and 1” round on pull plate with concealed fasteners.
4. Provide straight and offset pulls with fasteners as required
5. Provide concealed fasteners for all applications.
6. Prep plate for cylinder/lock as required.
7. Supply from the following list of manufacturers

| | |
|---|---|
| Ives | IVE |
| Trimco | TRI |
| Rockwood | ROC |

I. Door Closers
1. All door closers on this project should be manufactured by the same manufacturer.
2. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. Stamp units with date of manufacture code.
3. Door closers shall be furnished with standard cover. Provide full cover as shown in hardware sets.
4. Size in accordance with the manufacturer’s recommendations for door size and condition.
5. Door closers shall be furnished with delayed action, hold-open as listed in the Hardware Sets.
6. Door closers shall be mounted out of the line of sight wherever possible (i.e., room side of corridor doors, etc.) with parallel arm mounting on out swinging doors.
7. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.
8. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
9. Spring Power: Continuously adjustable over full range of closer sizes and providing reduced opening force as required by accessibility codes and standards.
10. Supply from the following list of manufacturers

| | | |
|---|---|---|
| Falcon | FAL | SC80A Series |
| Sargent | SAR | 1331 Series |
| Norton | NOR | 8000 Series |

J. Door Protection Plates
1. Protective plates shall meet ANSI A156.6 requirements for .050 thickness.

2. Protection plates should be fabricated from stainless steel.
3. Protection plate shall be height as shown in Hardware Sets. Width shall be 10" by 2" less than door width on single door or pair with a mullion and 1" less than door width on pair of doors without a mullion.
4. Beveled 4 edges.
5. Provide kickplate on all doors with closers, unless not required for aesthetic reasons.
6. Prep protective plates for hardware as required.
7. Supply from the following list of manufacturers:

| | |
|---|---|
| Ives | IVE |
| Rockwood | ROC |
| Trimco | TRI |

K. Door Stops and Holders:
1. Supply wall stops at all openings to protect doors or door hardware. Install so lock does not lock unintentionally. Install blocking in wall where wall stop will be mounted.
2. When wall conditions do not permit use of wall stop provide floor stops with risers as needed to adjust for floor conditions.
3. When wall conditions do not permit use of wall stop provide overhead stops. Jamb mount where required to not be visible from Corridor.
4. Exterior Ground Level Doors: Provide security floor stop.
5. Exterior Roof Doors: Provide heavy duty overhead stop.
6. Supply from the following list of manufacturers:

| | |
|---|---|
| Glynn Johnson | GLY |
| Rockwood | ROC |
| Trimco | TRI |

L. Silencers
1. Provide silencers on all doors without seal. 3 for single doors and 2 for pairs.
2. Provide silencers as required for frame conditions. SR64 for hollow metal frames. SR65/SR66 for wood frames.
3. At wood frames, insure height of stop is compatible with silencer.
4. Supply from the following list of manufacturer's

| | |
|---|---|
| Ives | IVE |
| Rockwood | ROC |
| Trimco | TRI |

M. Thresholds/Weatherstripping

1. Thresholds on doors in the accessible path shall conform to accessibility codes.
2. Threshold should be based on sill detail.
3. Smoke seal shall be teardrop design bulb seal.
4. Exterior seal/thresholds shall be silicone or brush as shown in hardware sets.
5. Drip strips shall protrude 2 ½" and be 4" wider than opening.
6. At S Label single doors provide seals on frame to comply with UL1784
7. At S Label pair of doors provide seals on frame and as meeting stile to comply with UL1784.
8. Automatic Door Bottom shall be mortised to comply with accessibility codes.
9. Supply from the following list of manufacturer's

| | |
|---|---|
| Zero | ZER |
| National Guard | NGP |
| Pemko | PEM |

2.03 KEYING:

Keying to be done by owner.

**PART 3 – EXECUTION**

3.01 EXAMINATION:

A. Examine doors, frames and related items for conditions that would prevent the proper application of any finish hardware items. Do not proceed with installation until all defects are corrected.

B. Existing Door and Frame Compatibility: Field verify existing doors and frames receiving new hardware and existing conditions receiving new openings. Verify that new hardware is compatible with existing door and frame preparation and existing conditions.

C. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION:

A. Follow Door and Hardware Institute Publication:
Recommended Location for Architectural Hardware for Standard Steel Doors and Frames
Recommended Location for Builder's Hardware for Custom Steel Doors and Frames
Recommended Locations for Architectural Hardware for Wood Flush Door

B. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.

C. Follow ANSI A117.1-1998 Accessible and Usable Building and Facilities.

D. Review mounting locations with Architect where required.

E. Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Closers should not be visible in corridors, lobbies and other public spaces where possible.

F. Locate power supplies in accessible location and indicate in as-builts where located.

G. Set threshold in full bed of sealant complying with requirements specified in Division 07.

H. Pre Installation meeting required with attendees to include Architect, General Contractor, Mechanical Hardware Installer, Electrified Hardware Installer, Finish Hardware Supplier and Manufacturer's Representative for Exit Device, Locks and Closers and Door/Frame Suppliers before installation begins.

3.03 FIELD QUALITY CONTROL:

A. After installation has been completed, obtain the services of an Architectural Hardware Consultant to check for proper installation of finish hardware, according to the finish

hardware schedule and keying schedule. In addition, check all hardware for adjustments and proper operation.

3.04 ADJUST AND CLEAN:

A. Adjust, clean and inspect all hardware, to ensure proper operation and function of every opening. Replace items, which cannot be adjusted to operate freely and smoothly as intended for the application made.

3.05 PROTECTION:

A. The General Contractor shall use all means at his disposal to protect all finish hardware items from abuse, corrosion and other damage until the owner accepts the project as complete.

3.06 TRAINING

A. After installation has been completed, provide training to the Owner on the operation of the Finish Hardware and programming of any electrified hardware.

3.07 HARDWARE SCHEDULE

A. These hardware set shown below are for use as a guideline. Provide hardware as required to meet the requirements of the openings, security, and code requirements.

HARDWARE GROUP NO. 201C
FOR USE ON DOOR #(S):
203
PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | HINGE | 5BB1 4.5 X 4.5 NRP | 652 | IVE |
| 1 | EA | STOREROOM LOCK | B581H DAN | 626 | FAL |
| 1 | EA | PERMANENT SFIC | OWNER FURNISHED | 626 | |
| 1 | EA | SURFACE CLOSER | SC81A SS | 689 | FAL |
| 1 | EA | KICK PLATE | 8400 10" X 2" LDW B-CS | 630 | IVE |
| 3 | EA | SILENCER | SR64 | GRY | IVE |

HARDWARE GROUP NO. 201CH
FOR USE ON DOOR #(S):
106
PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | HINGE | 5BB1 4.5 X 4.5 NRP | 652 | IVE |
| 1 | EA | STOREROOM LOCK | B581H DAN | 626 | FAL |
| 1 | EA | PERMANENT SFIC | OWNER FURNISHED | 626 | |
| 1 | EA | SURFACE CLOSER | SC81A SSHO | 689 | FAL |
| 1 | EA | KICK PLATE | 8400 10" X 2" LDW B-CS | 630 | IVE |
| 3 | EA | SILENCER | SR64 | GRY | IVE |

HARDWARE GROUP NO. 801
FOR USE ON DOOR #(S):
103 104
PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | HINGE | 5BB1HW 4.5 X 4.5 | 652 | IVE |
| 1 | EA | PUSH PLATE | 8200 4" X 16" | 630 | IVE |
| 1 | EA | PULL PLATE | 8303 10" 4" X 16" F | 630 | IVE |
| 1 | EA | SURFACE CLOSER | SC81A REG | 689 | FAL |
| 1 | EA | KICK PLATE | 8400 10" X 2" LDW B-CS | 630 | IVE |
| 1 | EA | WALL STOP | WS406/407CCV | 630 | IVE |
| 3 | EA | SILENCER | SR64 | GRY | IVE |

HARDWARE GROUP NO. C715
FOR USE ON DOOR #(S):
101 102
PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 1 | EA | CONT. HINGE | 114XY EPT | 628 | IVE |
| 1 | EA | POWER TRANSFER | EPT10 CON | 689 | VON |
| 1 | EA | ELEC PANIC HARDWARE | RX-MEL-25-R-NL | 626 | FAL |
| 1 | EA | MORTISE CYLINDER | C987 X #5 | 626 | FAL |
| 1 | EA | PERMANENT SFIC | OWNER FURNISHED | 626 | |
| 1 | EA | SURFACE CLOSER | SC81A SS | 689 | FAL |
| 1 | EA | GASKETING | 188S HEAD & JAMB | BK | ZER |
| 1 | EA | DOOR SWEEP | 39A | A | ZER |
| 1 | EA | THRESHOLD | 655A | A | ZER |
| 1 | EA | WIRE HARNESS (IN DOOR) | ALLEGION CONNECT TYPE & LENGTH AS REQ | | SCH |
| 1 | EA | WIRE HARNESS (IN FRAME) | CON-6W | | SCH |
| 1 | EA | CREDENTIAL READER | BY SECURITY CONTRACTOR | | |
| 1 | EA | DOOR POSITION SWITCH | BY SECURITY CONTRACTOR | | |
| 1 | EA | POWER SUPPLY | PS902 900-2RS 900-BBK (OMIT 2RS BOARD WHERE NOT REQ) | | VON |

-INGRESS BY THE CARD READER OR KEY OVERRIDE.
-EGRESS BY THE ACTUATOR OR THE PANIC HARDWARE.

**END OF SECTION**