
SECTION 08 71 00 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions, Division 1 - GENERAL REQUIREMENTS, and other applicable specification sections in the Project Manual apply to the work specified in this Section.

1.2 SUMMARY

- A. Scope: Provide hardware and material as per the following specification.
- B. Section Includes: The work specified in this Section includes, but shall not be limited to, items known commercially as door hardware that are required for swing doors.
- C. Related Sections:
 - 1. Division 01 Section "Sustainable Design Requirements" for additional LEED requirements that affect door hardware and related products.
 - 2. Division 08 Section "Hollow Metal Doors and Frames" for steel doors and frames including insulated, rated applications and pairs of doors.
 - 3. Division 08 Section "Flush Composite/Molded Fiberglass Reinforced Plastic (MFRP) Doors" for chemical wash down and vandalism control applications.
 - 4. Division 26 Sections for all electrical power system and for connections to building fire alarm system.

1.3 REFERENCES

- A. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only.
- B. The edition/revision of the referenced publications shall be the latest date, as of the Contract Documents date, unless otherwise specified.
- C. Builders Hardware Manufacturers Association, Inc. (BHMA):
 - 1. ANSI/BHMA A156.1, "Butts and Hinges" (copyrighted by BHMA, ANSI approved).
 - 2. ANSI/BHMA A156.3, "Exit Devices" (copyrighted by BHMA, ANSI approved).
 - 3. ANSI/BHMA A156.4, "Door Controls - Closers" (copyrighted by BHMA, ANSI approved).
 - 4. ANSI/BHMA A156.5, "Auxiliary Locks and Associated Products" (copyrighted by BHMA, ANSI approved).
 - 5. ANSI/BHMA A156.6, "Architectural Door Trim" (copyrighted by BHMA, ANSI approved).
 - 6. ANSI/BHMA A156.7, "Template Hinge Dimensions" (copyrighted by BHMA, ANSI approved).
 - 7. ANSI/BHMA A156.8, "Door Controls - Overhead Stops and Holders" (copyrighted by BHMA, ANSI approved).

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8. ANSI/BHMA A156.13, "Mortise Locks and Latches" (copyrighted by BHMA, ANSI approved).
 9. ANSI/BHMA A156.15, "Life Safety Closer/Holder/Release Devices" (copyrighted by BHMA, ANSI approved).
 10. ANSI/BHMA A156.16, "Auxiliary Hardware" (copyrighted by BHMA, ANSI approved).
 11. ANSI/BHMA A156.18, "Materials and Finishes" (copyrighted by BHMA, ANSI approved).
 12. ANSI/BHMA A156.19, "Power Assist and Low Energy Power Operated Doors" (copyrighted by BHMA, ANSI approved).
 13. ANSI/BHMA A156.21, "Thresholds" (copyrighted by BHMA, ANSI approved).
 14. ANSI/BHMA A156.22, "Door Gasketing and Edge Seal Systems" (copyrighted by BHMA, ANSI approved).
 15. ANSI/BHMA A156.23, "Electromagnetic Locks" (copyrighted by BHMA, ANSI approved).
 16. ANSI/BHMA A156.24, "Delayed Egress Locking Systems" (copyrighted by BHMA, ANSI approved).
 17. ANSI/BHMA A156.25, "Electrified Locking Devices" (copyrighted by BHMA, ANSI approved).
 18. ANSI/BHMA A156.26, "Continuous Hinges" (copyrighted by BHMA, ANSI approved).
 19. ANSI/BHMA A156.31, "Electric Strikes and Frame Mounted Actuators" (copyrighted by BHMA, ANSI approved).
- D. National Fire Protection Association (NFPA):
1. NFPA 70, "National Electric Code".
 2. NFPA 80, "Standard for Fire Doors and Windows".
 3. NFPA 101, "Life Safety Code".
 4. NFPA 252, "Standard Methods of Fire Tests of Door Assemblies".
- E. Underwriters Laboratories, Inc. (UL):
1. UL 305, "Standard for Panic Hardware."

1.4 SUBMITTALS

- A. LEED Submittals:
1. Product Data for Credit MR 4.1 and Credit MR 4.2: For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.
 - a. Include statement indicating costs for each product having recycled content.
 2. Credit MR 5.1 and 5.2: List of proposed regionally manufactured materials and regionally extracted, harvested, or recovered materials.
 - a. Identify each regionally manufactured material, its source, and cost.
 - b. Identify each regionally extracted, harvested or recovered material, its source, and cost.
 - c. Include map or other similar documentation, confirming the following:
 - 1) Driving distance between location of manufacturer and project site.
 - 2) Driving distances between location of extraction, harvesting, or recovery; and project site.
- B. Templates: Furnish hardware templates to each fabricator of doors, frames, and other work to be factory-prepared for the installation of hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements. If manufacturer requires physical hardware, ship the hardware to them via prepaid freight in sufficient time to prevent any delay in the execution of their work.
- C. Qualification Data: Submit qualification data for firms and persons specified in Quality Assurance Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names of architects and owners, date, reference names and phone number, and other information specified.
- D. Custom Wiring Diagrams: Furnish custom wiring diagrams for each opening with electrified hardware. Include riser diagrams, point-to-point hookup wiring diagrams, and function statements (operational narratives) for each opening. Include fire alarm and/or access control system interface where applicable.
- E. Keying Schedule: Submit detailed keying schedule, indicating Owner's approved keying system, for Owner's review and approval. Include a schematic keying diagram and index identifying each key set to unique door designations.

1.5 QUALITY ASSURANCE

- A. Qualifications:
1. Hardware Manufacturer Qualifications:
 - a. Exit device Manufacturer shall be a firm with over 50 years' experience in the manufacture of door hardware of types and sizes required. Only Commercial Grade 1 hardware shall be acceptable.
 - b. Ancillary hardware shall meet Commercial Grade 1 specifications and comply with laws, codes and ordinances as applicable.
 2. Installer Qualifications: Installer shall be a firm that shall have a minimum of five years of successful installation experience with projects utilizing door hardware similar in type and scope to that required for this Project.
- B. Regulatory Requirements: Comply with applicable requirements of the laws, codes, ordinances, and regulations of Federal, State, and local authorities having jurisdiction. Obtain necessary approvals from such authorities.
- C. Fire-Rated Openings and Exit Doors: Provide door hardware for fire-rated openings in compliance with NFPA 80. Provide only hardware which has been tested and listed by UL for the types and sizes of doors required, and complies with the requirements of the door and door frame labels. Provide door hardware for exit doors in compliance with NFPA 101. Hardware shall comply with applicable UL standards for the intended use specified, and be listed in UL, or be labeled and listed by another testing laboratory deemed acceptable by the Owner and Architect.
1. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL10C or NFPA 252.
 - a. Test Pressure: After five minutes into the test, the neutral pressure level in the furnace shall be established at 40-inches above the sill.
 2. Smoke-Rated Door Assemblies: Assemblies located in smoke partitions or smoke barriers shall comply with UL1784.
- D. Single Source Responsibility: Obtain each kind of hardware (hinges, locksets and latch sets, closers, etc.) from only door manufacturer, even though several may be specified as acceptable. Door manufacturer shall pre-install hardware as specified in the quote and/submittal drawings. NOTE: Typically does not include closers or overhead stops.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Acceptance at Site: Package hardware on a set-by-set basis. Two or more identical sets may be packaged in the same container. Tag each item or package separately with identification related to the final hardware schedule. Include basic installation instructions in the package.
- B. Storage and Protection: Provide secure lock-up for hardware. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses, either before or after installation.

1.7 MAINTENANCE

- A. Maintenance Tools and Instructions: Furnish a complete set of maintenance instructions as needed for the Owner's continued maintenance and adjustment of hardware.

1.8 OWNER'S MANUAL: Furnish one complete set of installation and maintenance instructions listing routine maintenance procedures, possible breakdown and repairs, and troubleshooting guides to the owner.

1.9 WARRANTIES

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fails in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including excessive deflection, cracking or breakage.
 - b. Faulty operation of operators and door hardware.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
 - 2. Warranty Periods:
 - a. Manual Closers: Minimum of 25 years from date of Substantial Completion.
 - b. Exit Devices: Minimum of 10 years from date of Substantial Completion.
 - c. Hinges and all other hardware shall be Commercial Grade 1 and shall have at least a 1 year manufactures warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS: All hardware for each item shall be by one manufacturer unless otherwise specified. Items indicated with an asterisk (*) are the basis of design products used in the hardware schedule.

2.2 MATERIALS

- A. Fasteners: Where through bolts are specified for composite filled wood faced fire doors, furnish six bolts sized to the thickness of the door so that when tightened, compression of the door will not occur. Wood screws shall be full threaded. Expansion screws shall be of the double cinch anchor type. All screw heads shall be countersunk oval or flat head as appropriate and, when necessary to accommodate the thickness of material, undercut. Material of fasteners shall be ferrous or non-ferrous compatible with the product being applied. Length of fasteners shall be sufficient to afford adequate thread engagement. Finish of exposed fasteners shall match item being fastened.
- B. Base Metals: As much as possible or practical materials shall be Stainless Steel. Produce hardware units of basic metal and forming method indicated, using manufacturer's standard metal alloy, composition, temper and hardness, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units by applicable ANSI A156 series standard for each type hardware item and with ANSI A156.18 for finish designations indicated. Do not furnish "optional" materials or forming methods for those indicated, except as otherwise specified.
- C. Butt Hinges: Provide 4-1/2 inch by 4-1/2 inch size with non-removable pins for out swinging doors with locks unless otherwise specified. Provide non-rising pins elsewhere. Provide number of hinges indicated but not less than three hinges per door leaf for doors 90 inches or less in height and one additional hinge for each 30 inches of additional height. Provide 5 inch by 4-1/2 inch hinges on doors greater than 3'0" in width. Where wide throw hinges are specified in the hardware sets, provide proper hinge width for necessary clearance required.
1. Standard Weight, Full Mortise, Ball Bearing, Stainless Steel:
 - a. "BB51", PBB, Inc.*
 - b. "MPB91", McKinney Products Co. ; Division of Assa-Abloy
 - c. "FBB191", Stanley; Division of Stanley Security Solutions
 2. Heavy Weight, Full Mortise, Ball Bearing, Stainless Steel:
 - a. "4B51", PBB, Inc.*
 - b. "T4B3386", McKinney Products Co. ; Division of Assa-Abloy
 - c. "FBB199"; Stanley; Division of Stanley Security Solutions

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- D. Full Mortise, Continuous, Ball Bearing, Hinges: Provide ANSI Grade 1, 14 gauge, type 304 stainless steel barrel type continuous hinges. Hinges to be fire rated up to 3 hours.
1. Size of hinges: 1" less than door height.
 2. Full Concealed Continuous Hinges:
 - a. "CH51", PBB*
 - b. "FM300", Markar; Division of Assa-Abloy
 - c. "Unipin 919 STST", ZERO International
- E. Locksets and Latchsets: Provide 2-3/4 inch backset, strikes with 1-1/4 inch lip, and wrought strike boxes.
1. Grade 1-Cylindrical Locksets and Latchsets. Lever Design Dorma LRE
 - a. "C800 Series x LRE", DORMA USA, Inc.*
 2. Grade 1 – Mortise Locksets and Latchsets: Provide 5/8" minimum throw of latch on pairs of doors. Comply with UL requirements for throw of latch bolts on fire rated openings. Furnish strike with curved lip extended to protect frame.
 - a. "M9000 Series x LRB", DORMA USA, Inc.*
- F. Electric Strikes – Provide Stainless Steel Strikes
1. Grade 1 Multi-function strike to work for Mortise, Cylindrical, and Deadbolt devices in either 12v or 24v
 - a. "ES96(F)"; Dorma, Inc – F for Fire Rated devices
 2. Grade 1 Rim Panic strike in either 12v or 24v
 - a. "ES62(F)"; Dorma, Inc – F for Fire Rated devices
- G. Interchangeable Core Cylinders: Provide small format interchangeable core cylinders with appropriate cam or tailpiece. Stamp key control symbol in concealed place on each permanent core. Provide one of the following manufacturers' of cylinders:
1. DORMA USA, Inc.*
- H. Standard Cylinders: Construction master key all cylinders. Stamp key control symbol in concealed place on each core. Equip locks with manufacturer's special pin tumbler cylinders that permit voiding construction keys without removal of the cylinder. Provide one of the following manufacturers' of cylinders:
1. DORMA USA, Inc.*
- I. Surface Bolts: Furnish in 626 or 630 unless otherwise noted
1. "598", Burns Mfg.
 2. "580"; Rockwood Mfg.; Division of Assa-Abloy
- J. Exit Devices: Exit devices shall be type and function as listed in hardware sets. Use fire exit hardware where exit devices are scheduled for fire door assemblies. Where lever handle trim is specified, match lever trim on locksets. Furnish freewheeling lever trim as standard. Provide cylinder dogging on all non-rated devices. Furnish all devices with 3/4" throw deadlocking latch bolts.
1. Wide Stile Devices: Provide heavy duty touch bar devices
 - a. "9000 Series", DORMA USA, Inc.*

K. Push/Pulls:

1. Push Plates: 16-gauge, Stainless Steel square corners beveled four sides, 3.5 inch x 15 inch unless otherwise noted.
 - a. "53", Burns Mfg. *
 - b. "70B", Rockwood Mfg.; Division of Assa-Abloy
 - c. "70"; DonJo
2. Pulls: 3/8" x 1-1/4 inch pull, 6 inch center to center. Where pull plates are specified, mount pulls below onto plates above.
 - a. "5320A", Burns Mfg. *
 - b. "122"; Rockwood Mfg.; Division of Assa-Abloy
 - c. "7030"; DonJo

L. Surface Closers: All closers shall be DORMA STA 8900 series corrosion resistant units with adjustable spring power from sizes 1 through 6. Opening force shall comply with ADA and ANSI A117.1 where indicated with "Barrier Free" closers in the hardware sets. Closers must have separate adjustments for latch speed, sweep speed and back check. Provide full metal covers made of 304 stainless steel. The closer arm assembly and pinion shall be stainless steel. Provide all closers with delayed action. Closers installed parallel arm to be supplied with heavy-duty rigid arms. Furnish non-handed closers with full metal stainless steel cover unless otherwise noted in the hardware sets. Where "IS" or "S-IS" arms are specified in hardware sets, if manufacturer does not offer this arm provide a regular arm mount closer in conjunction with a heavy-duty overhead stop equal to a DORMA 8900 Series. Provide brackets, drop plates, spacer blocks and accessories to ensure proper installation. Closers, covers, brackets and other components shall not extend below bottom of top horizontal rail of door. Use manufacturer's chart for recommended sizes when adjusting closers. Provide one of the following heavy duty closers:

1. "STA 8916", DORMA USA, Inc.*
2. And no others

M. Power-Assist Low Energy Operators: Provide low energy operators that operate manually unless power-assist is activated and when power is lost. Operators shall comply with ANSI A156.19. Activation of power-assist will open the door to 90 degrees. Provide actuators as specified in hardware sets. Coordinate electrical connection and installation with Division 26. Provide operators with the following:

1. Heavy-duty commercial construction with electromechanical power-assist operation.
2. Micro-processor controlled
3. Adjustable opening speed, adjustable closing speed, and adjustable hold-open period.
4. Safety-stop feature: If object or obstruction is encountered during opening and/or closing cycles, door operator stops and slowly returns to closed or open position respectively.
5. Safety circuit: If actuator switch is activated when door is latched or locked, operator resets without damage to door or operator
6. Full continuous cover for pair of operators on pair of doors, or for single operator and hydraulic closer on pair of doors.
7. Detailed wiring diagrams including point-to-point hookup of all affected components.
8. Provide one of the following operators:
 - a. "ED900"; DORMA USA, Inc.

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- N. Overhead Stops/holders: No overhead stops or holders with plastic parts will be acceptable. Overhead stops shall not be paired with Dorma 8916
1. Heavy Duty:
 - a. "900 Series", Glynn Johnson.
 2. Standard Duty:
 - a. "700 Series", Glynn Johnson.
- O. Door Control Devices:
1. Coordinator: Provide integral device mounted at header, complete with closer brackets as required. Provide with filler brackets as required for full opening width.
 - a. "COR Series x Filler"; Ives; Division of Ingersoll-Rand*
 - b. "3700 Series x Filler", ABH Manufacturing
 - c. "2000 Series x Filler", Don-Jo Manufacturing.
 - d. "1600 Series x Filler"; Rockwood Mfg.; Division of Assa-Abloy
 - e. "3094 Series x Filler"; Trimco
 2. Wall Bumpers:
 - a. "WS407 CVX", Ives*
 - b. "570", Burns Mfg.
 3. Silencers:
 - a. No specific manufacturer
- P. Door Trim Units:
1. Kick Plates: 18 GA. (minimum) Stainless Steel, 9 inches high by 2 inches less than door width on single doors, 1 inch less than door width on pairs of doors, deburred four sides. Kick plates shall be installed on doors and shall not riveted, screwed or bolted to the face of the door to eliminate penetrating the door skin.
 - a. "Weiland SS Kick plate", Weiland, Inc.
 2. Armor Plates: 18 GA. (minimum) Stainless Steel, 34 inches high by 2 inches less than door width on single doors, 1 inch less than door width on pairs of doors, deburred four sides. Provide UL or WH listed plates on fire rated doors in accordance with NFPA 80. Kick plates shall be installed on doors and shall not riveted, screwed or bolted to the face of the door to eliminate penetrating the door skin.
 - a. "Weiland SS Armor Plate", Weiland, Inc.*
- Q. Weather Stripping:
1. Gasket: Silicone door gasket, UL-listed – Perimeter seals: Any surface of the door that touches the frame shall have silencers or perimeter weather stripping/smoke seal
 - a. "5050C", National Guard Products, Inc.*
 - b. "S88", PEMKO Manufacturing
 - c. "W22"; K.N. Crowder Mfg.
 - d. "DSS66", DraftSeal
 - e. "188S"; Zero International, Inc.
 2. Automatic Door Bottom:
 - a. "420N", National Guard Products, Inc.*

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- b. "4301CRL", PEMKO Manufacturing
 - c. "521"; Reese Enterprises
 - d. "361", Zero International, Inc.
3. Door Sweeps: Installed door sweeps constructed of 18 GA., 304 Stainless Steel or better with a 1/16" thick tear resistant nylon inserted neoprene that is adjustable.
- a. "Door Sweep"; Weiland, Inc.*
 - b. "199N/200NSS", National Guard Products, Inc.*
 - c. "3151NSS", PEMKO Manufacturing
4. Perimeter Seal: Sent loose. Shall be constructed of 18 GA. 304 Stainless Steel or better with a 1/4" thick EPDM adhesive backed rubber that extends from the retainer 3/8"
- a. "Exterior Perimeter Gasket", Weiland, Inc.*
 - b. "130NSS", National Guard Products, Inc. (with approval)
- R. Astragals: Solid astragals shall be 18 GA., 304 Stainless Steel or better and shall be fastened to edge of the in-active leaf of a double door with Stainless Steel fasteners. Brush style seals shall not be accepted. Sweep style Double EPDM astragal seals with 18 GA. 304 Stainless Steel retainers shall be accepted.
- 1. "Double EPDM Seal Set"; Weiland, Inc.*
 - 2. "305SSE", PEMKO Manufacturing
 - 3. "125NSS", National Guard Products, Inc.*
- S. Mullions shall be 16 GA. 304 Stainless Steel or better with floor and header mounting tabs ready to accept concrete anchors and frame fasteners, respectively.
- T. Thresholds: 16 GA., 304 Stainless Steel or better with a matte finish, 1/4" walled Extruded Fiberglass Reinforced Plastic (FRP), or Extruded aluminum, 1/2 inch x 5 inch.
- 1. "Weiland SS Threshold"; Weiland, Inc.*
 - 2. "Weiland FRP Threshold", Weiland, Inc.
 - 3. "425", National Guard Products, Inc.*
 - 4. "171A", PEMKO Manufacturing.
- U. Rain Drip Cap: Shall be 18 GA., 304 Stainless Steel or better welded to the door frame and shall be the full width of the frame.
- 1. "Weiland Rain Drip"; Weiland, Inc.*
- V. Electro-Magnetic Door Holders: Connect devices to fire or smoke/heat alarm system via dry contacts. When alarm is activated or power loss, electromagnetic holders will release allowing door to close. Provide units that will accept dual voltage, 24VDC or 120V. Provide units with rotating armature that pivots a full 360 degrees and will accept extensions. Provide extensions as required. Coordinate electrical connection and installation with Division 26. Provide one of the following products:
- 1. "EM-504"; DORMA USA, Inc.*
- W. Power Transfers: Provide one of the following products:
- 1. "ES-105"; DORMA USA, Inc.

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- X. Bollards: Provide 6 inch square, type 304, stainless steel tube bollard. Install bollard in-ground. Bollard to be 54 inches in height with 12 inches recessed in-ground. Prep bollard for ADA actuators, card readers and intercoms as required. Provide bollards by one of the following manufacturers:
1. WIKK Industries*
 2. BEA

2.3 FINISHES

- A. Except as otherwise noted in the hardware sets, provide the following finishes:
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|--------------------------------------|-----|---|
| 1. Hinges | 630 | (Stainless Steel) |
| 2. Cylindrical Locks, Latches | 626 | (Satin Chrome) |
| 3. Mortise Locks and Latches | 630 | (Stainless Steel) |
| 4. Exit Devices | 630 | (Stainless Steel) |
| 5. Closers and Brackets | 630 | (Stainless Steel) |
| 6. Push, Pull, Kick and Armor Plates | 630 | (Stainless Steel) |
| 7. Wall Stops | 630 | (Stainless Steel) |
| 8. Floor Stops | 630 | (Stainless Steel) |
| 9. Overhead Stops | 630 | (Stainless Steel) |
| 10. Thresholds, Weatherstrip, etc. | 630 | (Stainless Steel – as much as possible) |
- 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 for the applicable units of hardware by referenced standards.
- C. Provide finishes that match those established by BHMA or, if none established, match the Architect's sample.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions: Installer shall examine areas and conditions under which the work is to be installed, and notify the Contractor in writing, with a copy to the Owner and the Architect, of any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.
 - 1. Beginning of the work shall indicate acceptance of the areas and conditions as satisfactory by the Installer.

3.2 STORAGE AND HANDLING

- A. The door supplier shall maintain acceptable standards of storage of hardware prior to shipping. Hardware stored in door supplier's facilities shall be handled according to manufacturer's recommendations to avoid marring or damage.
- B. Door supplier shall make every reasonable effort to crate doors and hardware in secure packaging to avoid damage. Each package shall have a label that includes Contractor, City, State of delivery, PO# (if supplied), and door number.
- C. As hardware is pre-installed and/or already crated with each individual door job site sorting of hardware should be not required. However, it is the installer's responsibility to ensure all doors are properly secured and covered to prevent premature weathering or possible damage. The installer shall be responsible for conditions of door once the doors have been unloaded. If freight is rejected, the door supplier shall make every reasonable effort to replace damaged goods in an acceptable amount of time. Door supplier in that case will work with the freight company to reclaim losses to door supplier. Any losses of time and labor for installer will be installer's responsibility.

3.3 COORDINATION

- A. Coordinate Door Hardware Schedule submission and hardware ordering to insure delivery of all items as directed by the Contractor.
 - 1. Prior to ordering any hardware, examine the shop drawings and details of doors and frames and other substrate suppliers to determine that the proper type and size pieces of hardware are being provided. No extra material or labor will be allowed for any corrections that should have been eliminated by proper prior coordination.
- B. Templates: Distribute door hardware templates for doors, frames and other work specified to be factory prepared for installing door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Electrical System Rough-In: Coordinate layout and installation of electrified door hardware with connections to power supplies, fire alarm system and detection devices, and access control system.

3.4 INSTALLATION

- A. Installation shall be in accordance with the final approved hardware schedule and manufacturer's written instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in some other way, coordinate removal, storage, and installation or application of surface protections with finishing work specified in Division 9 - FINISHES. Do not install surface-mounted items until finishes have been completed on the substrate.
- B. Set units level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- C. Drill and countersink units that are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
- D. Align rain drips with the bottom edge of the door frame rabbet, spot weld to frame.
 - 1.
- E. Installers shall install the following items in the field, unless indicated
 - 1. Closers:
 - a. Do not cut weather stripping or seals for attachment of closer brackets or shoes.
 - b. Adjust closers to control door swing and to provide positive latching of doors.
 - 1) Adjust closers not to exceed the following manual opening forces:
 - a) Exterior Doors: As required to close and latch each leaf.
 - b) Interior Doors (Non-Fire Rated): Maximum 5-pound opening force.
 - c) Fire Rated Doors: As required to close and latch each leaf.
 - 2) After air handling system has been balanced, make final adjustment of all closers.
 - 2. Door Stops:
 - a. Install stops for maximum degree of door opening swing allowed by conditions of installation.
 - b. Locate floor stops so as not to create a tripping hazard.
 - c. Locate wall stops centered on spindle of lever handles.
 - 1) Verify adequate blocking is in wall behind wall stops.
 - 3. Thresholds:
 - a. Set thresholds for exterior doors in full bed of butyl rubber or polyisobutylene mastic sealant.
 - 4. Overhead Stops and/or Hold Opens:
 - a. Ensure glide arm is positioned to attain maximum swing for conditions.
 - 5. Coordinators and other accessories:
 - a. Install as per instructions
 - 6. Other hardware as per hardware manufacturer's recommendations. The door supplier shall make every effort to install hardware in all other cases.

3.5 ADJUSTING AND CLEANING

- A. Adjusting: 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 application made.
- B. The installer shall be responsible for hardware adjustments to make particular devices work in the field. Vertical Rod panic bars for example require a degree of adjusting that can only be done in the field. Adjustments required on pre-installed hardware due to poor hardware installation such as not following installation instructions or templates shall be the responsibility of the door supplier.
- C. Cleaning: Clean adjacent surfaces soiled by hardware installation.

END OF SECTION