

SECTION 08 71 00
DOOR HARDWARE

PART 1 - GENERAL

1.1 DESCRIPTION

Door hardware and related items necessary for complete installation and operation of doors.

1.2 RELATED WORK

- A. Caulking: Section 07 92 00 JOINT SEALANTS.
- B. Application of Hardware: Section 08 14 00, WOOD DOORS, Section 08 11 13, HOLLOW METAL DOORS AND FRAMES, Section 08 33 00, COILING DOORS AND GRILLES, Section 08 71 13, AUTOMATIC DOOR OPERATORS.
- C. Finishes: Section 09 06 00, SCHEDULE FOR FINISHES.
- D. Painting: Section 09 91 00, PAINTING.
- E. Electrical: Division 26, ELECTRICAL
- F. Fire Detection: Section 28 31 00, FIRE DETECTION AND ALARM.

1.3 GENERAL

- A. All hardware shall comply with UFAS, (Uniform Federal Accessible Standards) unless specified otherwise.
- B. Hardware for Labeled Fire Doors and Exit Doors: Conform to requirements of NFPA 80 for labeled fire doors and to NFPA 101 for exit doors, as well as to other requirements specified. Provide hardware listed by UL, except where heavier materials, large size, or better grades are specified herein under paragraph HARDWARE SETS. In lieu of UL labeling and listing, test reports from a nationally recognized testing agency may be submitted showing that hardware has been tested in accordance with UL test methods and that it conforms to NFPA requirements.
- C. Hardware for application on metal and wood doors and frames shall be made to standard templates. Furnish templates to the fabricator of these items in sufficient time so as not to delay the construction.
- D. The following items shall be of the same manufacturer, if possible, except as otherwise specified:
 - 1. Mortise locksets.
 - 2. Hinges for hollow metal and wood doors.
 - 3. Surface applied overhead door closers.
 - 4. Exit devices.

C. Finish hardware required includes but is not limited to the following:

- 1) Hardware for all doors, except as otherwise specified.
- 2) Finish hardware schedule.
- 3) Required samples.
- 4) Templates.
- 5) Material guarantee.
- 6) All other materials and labor reasonably to be inferred as needed to make the work of this section complete.
- 7) Installation and adjustment of all door hardware.

1.03 - QUALITY ASSURANCE

- A. Manufacturer: Unless otherwise specified, all products of a similar nature shall be the product(s) of a single manufacturer.
- B. Supplier: All hardware items furnished as part of the work of this section is to be supplied by a firm which is regularly engaged in the distribution of contract hardware. This supplier shall be able to furnish to the Architect, upon demand, evidence of having supplied finish hardware for Class "A" construction for a minimum of 5 years. Such firm shall also have a full time Architectural Hardware Consultant who is a consultant member of the Door and Hardware Institute, who shall be readily available to the Architect and contractor to assist when so required.
- C. Fire-Rated Openings: Provide hardware for fire-rated openings in compliance with NFPA Standard No. 80 and N.Y.State building code requirements. Provide only hardware which has been tested and listed by UL or FM for types and sizes of doors required and complies with requirements of door and door frame labels.
 - 1) Where emergency exit devices are required on fire-rated doors (with supplementary marking on doors' UL, FM or other nationally recognized independent testing, inspection and labeling agencies acceptable to the Architect, labels indicating "Fire Door to be Equipped with Fire Exit Hardware") provide UL or FM label on exit devices indicating "Fire Exit Hardware."

1.4 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.

B. Hardware Schedule: Prepare and submit hardware schedule in the following form:

Hardware Item	Quantity	Size	Reference Publication Type No.	Finish	Mfr. Name and Catalog No.	Key Control Symbols	UL Mark (if fire rated and listed)	ANSI/BHMA Finish Designation

Submit final hardware schedule in manner indicated below. Coordinate hardware with doors, frames and related work to ensure proper size, thickness, hand, function and finish of hardware.

- 1) Final Hardware Schedule Content: Based on finish hardware indicated, organize hardware schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:
 - a) Type, style, function, size and finish of each hardware item.
 - b) Name and manufacturer of each item.
 - c) Fastenings and other pertinent information.
 - d) Location of hardware set cross-referenced to indications on Drawings both on floor plans and in door and frame schedule.
 - e) Explanation of all abbreviations, symbols, codes, etc. contained in schedule.
 - f) Mounting locations for hardware.
 - g) Door and frame sizes and materials.
 - h) Keying information.
- 2) Submittal Sequence: Submit schedule at earliest possible date particularly 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 other work affected by finish hardware, and other information essential to the coordinated review of hardware schedule.

- C. Notify the Architect prior to submission of the required schedule, of any apparent discrepancies between the hardware specification, details or contract drawings.
 - D. Review of the schedule by the Architect is for compliance with design intent only and shall not relieve this supplier from his responsibility to furnish all finish hardware required by the contract documents whether included in the reviewed schedules or not. After the schedule has been reviewed, no items therein shall be changed without written approval of the Architect.
- C. Samples and Manufacturers' Literature:
- 1. Samples: All hardware items (proposed for the project) that have not been previously approved by Builders Hardware Manufacturers Association shall be submitted for approval. Tag and mark all items with manufacturer's name, catalog number and project number.
 - 2. Samples are not required for hardware listed in the specifications by manufacturer's catalog number, if the contractor proposes to use the manufacturer's product specified.
- D. Certificate of Compliance and Test Reports: Submit certificates that hardware conforms to the requirements specified herein. Certificates shall be accompanied by copies of reports as referenced. The testing shall have been conducted either in the manufacturer's plant and certified by an independent testing laboratory or conducted in an independent laboratory, within four years of submittal of reports for approval.

1.5 DELIVERY AND MARKING

Deliver items of hardware to job site in their original containers, complete with necessary appurtenances including screws, keys, and instructions. Tag one of each different item of hardware and deliver to Resident Engineer for reference purposes. Tag shall identify items by Project Specification number and manufacturer's catalog number. These items shall remain on file in Resident Engineer's office until all other similar items have been installed in project, at which time the Resident Engineer will deliver items on file to Contractor for installation in predetermined locations on the project.

1.6 INSTRUCTIONS

- A. Hardware Set Symbols on Drawings: Except for protective plates, door stops, mates, thresholds and the like specified herein, hardware requirements for each door are indicated on drawings by symbols. Symbols for hardware sets consist of letters "HW" followed by a number. Each number designates a set of hardware items applicable to a door type.
- B. Manufacturers' Catalog Number References: Where manufacturers' products are specified herein, products of other manufacturers which are considered equivalent to those specified may be used. Manufacturers whose products are specified are identified by abbreviations as follows:

Adams-Rite	Adams Rite Mfg. Co.	Glendale, CA
Best	Best Access Systems	Indianapolis, IN
Haefle	Haefle America Co.	Archdale, NC
Hager	Hager Hinge Company	Saint Louis, MO
Pemko	Pemko Mfg. Co.	Memphis, TN
Sargent	Sargent Mfg. Co.	New Haven, CT

- C. Tenant Keying Conformance with Existing VAMC - At Main Access Points: All cylinders shall be keyed into existing Grand Master Key System. Provide removable core cylinders that are removable only with a special key or tool without disassembly of knob or lockset. Cylinders shall be 6 pin type. Keying information shall be furnished at a later date by the Resident Engineer.

1.7 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only. In text, hardware items are referred to by series, types, etc., listed in such specifications and standards, except as otherwise specified.
- B. American Society for Testing and Materials (ASTM):
F883-04.....Padlocks

C. American National Standards Institute/Builders Hardware Manufacturers Association (ANSI/BHMA):

A156.1-00.....Butts and Hinges
 A156.3-01.....Exit Devices
 A156.4-00.....Door Controls (Closers)
 A156.5-01.....Auxiliary Locks and Associated Products
 A156.6-05.....Architectural Door Trim
 A156.8-05.....Door Controls-Overhead Stops and Holders
 A156.13-05.....Mortise Locks and Latches Series 1000
 A156.14-07.....Sliding and Folding Door Hardware
 A156.16-02.....Auxiliary Hardware
 A156.18-00.....Materials and Finishes
 A156.22-05.....Door Gasketing and Edge Seal Systems
 A156.25-07.....Electrified Locking Devices
 A156.26-00.....Continuous Hinges
 A156.28-07Master Keying Systems
 A250.8-03.....Standard Steel Doors and Frames

D. National Fire Protection Association (NFPA):

80-06.....Fire Doors and Fire Windows
 101-05.....Life Safety Code

E. Underwriters Laboratories, Inc. (UL):

Building Materials Directory (2007)

PART 2 - PRODUCTS

2.1 SCHEDULED HARDWARE

A. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware is indicated in the Finish Hardware Data Sheet and Hardware Schedule at the end of this section.

- 1) Manufacturer's Product Designations: One or more manufacturers are listed for each hardware type required. An asterisk (*) after a manufacturer's name indicates whose product designation is used in the Hardware Schedule for purposes of establishing minimum requirements. Provide either the product designated, or, where more than one manufacturer is listed, the comparable product of one of

the other manufacturers which comply with requirements including those specified elsewhere in this section.

2.2 - MATERIALS AND FABRICATION

- A. Hand of door: Drawings show direction of swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.
- B. Base Metals: Produce hardware units of basic metal and forming method indicated, using a 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 indicated.
- C. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping sheet metal screws, except as specifically indicated.
- D. Furnish screws for installation, with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of such other work as closely as possible, including "prepared for paint" in surfaces to receive painted finish.
- E. Provide concealed fasteners for hardware units which are exposed when door is closed, except to extent no standard units of type specified are available with concealed fasteners. Do not use thru-bolts where bolt head or nut on opposite face is exposed in other work, except where it is not feasible to adequately reinforce the work. In such cases, provide sleeves for each thru-bolt or use sex screw fasteners.
- F. Tools and Maintenance Instructions for Maintenance: Furnish two (2) complete sets of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of finish hardware.

2.3 BUTT HINGES

- A. ANSI A156.1. The following types of butt hinges shall be used for the types of doors listed, except where otherwise specified:
 - 1. Interior Doors: Type 8112 for doors 900 mm (3 feet) wide or less and Type A8111 for doors over 900 mm (3 feet) wide.
- B. See Articles "MISCELLANEOUS HARDWARE" and "HARDWARE SETS" for pivots and hinges other than butts specified above and continuous hinges specified below.
- C. Hinges shall be of the type and size as specified, and shall conform to the American National Standards Institute (ANSI). All hinges shall have template screw hole locations for use on either wood or hollow metal doors and frames. Hinges shall be of flush ball bearing design with button tips and non-rising pins.
- D. All hinges shall have the class number marked on the back face of the hinge. Furnish two (2) hinges for doors up to and including 5'0" in height. Furnish one additional hinge for each additional 2'6" in door height or fraction thereof. Furnish standard weight ball bearing hinges for doors up to and including 3'0" in width. Furnish heavy weight ball bearing hinges for doors over 3'0" in width.

- Furnish wide throw hinges where required by conditions.

2.4 CONTINUOUS HINGES

- A. ANSI/BHMA A156.26.
 - 1. Listed under Category N in BHMA's "Certified Product Directory."
- B. General: Minimum 14 GA. thick, hinge leaves with minimum overall width of 4 inches (102 mm); fabricated to full height of door and frame and to template screw locations; with components finished after milling and drilling are complete:
 - 1. Fire Pins: Steel pins to hold labeled fire doors in place if required by tested listing.
- C. Continuous, Barrel-Type Hinges: Hinge with knuckles formed around a pin that extends entire length of hinge.
 - 1. Base Metal for Interior Hinges: Stainless Steel
 - 2. Base Metal for Hinges for Fire-Rated Assemblies: Stainless Steel

3. Where required to clear adjacent casing, trim, and wall conditions and allow full door swing, provide wide throw hinges of minimum width required.
4. Where thru-wire power transfers are integral to the hinge, provide hinge with easily removable portion to allow easy access to wiring connections.
5. Where models are specified that provide integral wrap-around edge guard for the hinge edge of the door, provide manufacturer's adjustable threaded stud and machine screw mechanism to allow the door to be adjusted within wrap-around edge guard.

2.5 SLIDING DOOR HARDWARE

- A. Pocket door sets shall consist of length of track for twice the width of the opening and with all necessary components and accessories for a complete installation and proper operation. Units shall be rated for a minimum of 150 pounds per door leaf.
- B. Bypassing door sets shall consist of two lengths of track, lengths as required. Doors shall be telescopic in nature, allowing the leading door leaf to move the trailing door leaf in both the open and closed positions. Furnish units with necessary components and accessories for a complete installation and proper operation. Include stops for the open and closed positions. Units shall be rated for a minimum of 150 pounds per door leaf.

2.6 DOOR CLOSING DEVICES

- A. Closing devices shall be products of one manufacturer for each type specified.

2.7 OVERHEAD CLOSERS

- A. Conform to ANSI A156.4, Grade 1.
- B. Closers shall conform to the following:
 1. The closer shall have 50 percent adjustable closing force over minimum value for that closer and have adjustable hydraulic back check effective between 60 degrees and 85 degrees of door opening.
 2. Where specified, closer shall have hold-open feature.
 3. Size Requirements: Size closers in accordance with manufacturer's recommendations or provide multi-size closers, sizes 1 through 6.
 4. Material of closer shall be forged or cast.

5. Arm and brackets for closers shall be steel, malleable iron or high strength ductile cast iron.
6. Closers shall have full size metal cover.
7. Closers shall have adjustable hydraulic back-check, separate valves for closing and latching speed, and adjustable back-check positioning valve.
8. Provide closers with any accessories required for the mounting application, including (but not limited to) drop plates, special soffit plates, spacers for heavy duty parallel fifth screw, bull-nose or other regular arm brackets, longer or shorter arm assemblies, and special factory templating. Provide special arms, drop plates, and templating as needed to allow mounting at doors with overhead stops and/or holders.
9. Closer arms or back-check valve shall not be used to stop the door from overswing, except in applications where a separate wall, floor or overhead stop cannot be used.
10. Provide parallel arm closers with heavy duty rigid arm.
11. Where closers are to be installed on the push side of the door, provide parallel arm type except where conditions require use of the top jamb arm.
12. Provide all surface closers with the same body attachment screw pattern for ease of replacement and maintenance.
13. All closers shall have a 1½" (38mm) minimum piston diameter.

2.8 DOOR STOPS AND BUMPERS

- A. Conform to ANSI A156.16.
- B. Provide door stops wherever an opened door or any item of hardware thereon would strike a wall, column, equipment or other parts of building construction. For concrete, masonry or quarry tile construction, use lead expansion shields for mounting door stops.
- C. Substitute floor stops Type L02141 or L02161 as appropriate, when wall bumpers would not provide an effective door stop.
- D. Where drywall partitions occur, use floor stops, Type L02141 or L02161.
- E. Omit stops where floor mounted door holders are required and where automatic operated doors occur.

- F. Provide appropriate roller bumper for each set of doors (except where closet doors occur) where two doors would interfere with each other in swinging.

2.9 OVERHEAD DOOR STOPS AND HOLDERS

Conform to ANSI Standard A156.8. Overhead holders shall be of sizes recommended by holder manufacturer for each width of door. Set overhead holders for 110 degree opening, unless limited by building construction or equipment.

2.10 LOCKS AND LATCHES

- A. Conform to ANSI A156.2. Locks and latches for doors 45 mm (1-3/4 inch) thick or over shall have beveled fronts. Lock cylinders shall have not less than six pins (GC to verify with VAMC verses 7 pin). Cylinders for all locksets shall be removable core type. Cylinders shall be furnished with construction removable cores and construction master keys. Cylinder shall be removable by special key or tool. Construct all cores so that they will be interchangeable into the core housings of all mortise locks, rim locks, cylindrical locks, and any other type lock included in the Great Grand Master Key System. Disassembly of lever or lockset shall not be required to remove core from lockset. All locksets or latches on double doors with fire label shall have latch bolt with 19 mm (3/4 inch) throw. Provide temporary keying device or construction core to allow opening and closing during construction and prior to the installation of final cores.
- B. In addition to above requirements, locks and latches shall comply with following requirements:
 - 1. Mortise Lock and Latch Sets: Conform to ANSI/BHMA A156.13. Mortise locksets shall be series 1000, minimum Grade 2. All locksets and latchsets, except on designated doors in Psychiatric (Mental Health) areas, shall have lever handles similar to Falcon S-lever Design. Lever handle shall be fabricated from wrought stainless steel. No substitute lever design or material shall be accepted. All locks and latchsets shall be furnished with curved lip strike and wrought box. Lock function F02 shall be furnished with key plates similar to Russwin's No. A70. All lock cases installed on lead lined doors shall be lead lined before applying final hardware finish. Furnish armored fronts for all mortise locks.

2. Auxiliary locks shall be as specified under hardware sets and conform to ANSI A156.5.

2.11 KEYS

- A. Stamp all keys with change number and key set symbol. Furnish keys in quantities as follows:

Locks/Keys	Quantity
Cylinder locks	2 keys each
Master-keyed sets	6 keys each
Control key	1 key

2.12 ARMOR PLATES, KICK PLATES AND MOP PLATES

- A. Conform to ANSI Standard A156.6.
- B. Provide protective plates and door edging as specified below:
- Kick-mop plates and armor plates plastic or metal, Type J100 series, color as required. When wood grain plastic plates are specified in Section 09 06 00, SCHEDULE FOR FINISHES, grain plates shall run in same direction as grain of face veneer of wood doors.
 - Provide kick-mop plates for both sides of each door, except where noted as not required. Kick-mop plates shall be 200 mm (8 inches) high. On push side of doors where jamb stop extends to floor, make combination kick-mop plates 38 mm (1-1/2 inches) less than width of door, except pairs of metal doors which shall have plates 25 mm (1 inch) less than width of each door. Extend all other combination kick-mop plates to within 6 mm (1/4 inch) of each edge of doors. Kick mop plates shall butt astragals. For jamb stop requirements, see specification sections pertaining to door frames.
 - Kick-mop plates are not required on following door sides:
 - Armor plate side of doors;
 - Closet side of closet doors;
 - Storage side of doors to or from storage spaces; and
 - Armor plates for doors are listed under Article "Hardware Sets". Armor plates shall be 875 mm (35 inches) high and 38 mm (1-1/2 inches) less than width of doors, except on pairs of metal doors. Plates on pairs of metal doors shall be 25 mm (1 inch) less than width of each door. Where top of intermediate rail of door is less than 875 mm (35 inches) from door bottom, extend armor plates to within 13 mm (1/2 inch) of top rail. On doors equipped with panic

devices, extend armor plates to within 13 mm (1/2 inch) of panic bolt cross bar.

5. Where louver or grille occurs in lower portion of doors, substitute stretcher plate and kick-mop plate in place of armor plate. Size of stretcher plate and kick-mop plate shall be 200 mm (8 inches) high.

2.13 EXIT DEVICES

- A. Conform to ANSI Standard A156.3. Exit devices shall be Grade 1; type and function are specified in hardware sets. Provide flush with finished floor strikes for vertical rod exit devices in interior of building. Trim shall have lever handles similar to locksets, unless otherwise specified.
- B. Exit devices for fire doors shall comply with Underwriters Laboratories, Inc., requirements for Fire Exit Hardware. Submit proof of compliance.

2.14 FLUSH BOLTS (LEVER EXTENSION)

- A. Conform to ANSI A156.16. Flush bolts shall be Type L24081 unless otherwise specified. Furnish proper dustproof strikes conforming to ANSI A156.16, for flush bolts required on lower part of doors.
- B. Face plates for dustproof strikes shall be rectangular and not less than 25 mm by 63 mm (1 inch by 2-1/2 inches).
- C. Friction-fit cylindrical dustproof strikes with circular face plate may be used only where metal thresholds occur.

2.15 DOOR PULLS

- A. Conform to ANSI A156.6 Pull type J401, 152 mm (6 inches) high by 19 mm (3/4 inches) diameter, unless otherwise specified. Provide pull with projection of 70 mm (2 3/4 inches) and a clearance of 51 mm (2 inches).

2.16 WEATHERSTRIP (FOR INTERIOR DOORS)

- A. Conform to ANSI A156.22.

2.17 MISCELLANEOUS HARDWARE

- A. Cylinders for Various Partitions and Doors: Key cylinders same as entrance doors of area in which partitions and door occur, except as otherwise specified.
- B. Mutes: Conform to ANSI A156.16. Provide door mutes or door silencers Type L03011, of white or light gray color, on each steel door frame, except lead-lined frames and frames for sound-resistant, lightproof and electromagnetically shielded doors. Furnish 3 mutes for single doors and 2 mutes for each pair of doors, except double-acting doors. Provide 4 mutes or silencers for frames for each Dutch type door. Provide 2 mutes for each edge of sliding door which would contact door frame.

2.18 FINISHES

- A. Exposed surfaces of hardware shall have ANSI A156.18, finishes as specified below. Finishes on all hinges, pivots, closers, thresholds, etc., shall be as specified below under "Miscellaneous Finishes." For field painting (final coat) of ferrous hardware, see Section 09 91 00, PAINTING.
- B. 626 or 630: All surfaces on exterior and interior of buildings, except where other finishes are specified.
- C. Miscellaneous Finishes:
 - 1. Hinges --interior doors: 652.
 - 2. Pivots: Match door trim.
 - 3. Door Closers: Factory applied paint finish. Satin Aluminum color
 - 4. Continuous Hinges: 630
- D. Hardware Finishes for Existing Buildings: U.S. Standard finishes shall match finishes of hardware in (similar) existing spaces except where otherwise specified.
- E. Color of Plastic Items: See Section 09 06 00, SCHEDULE FOR FINISHES. Where colors other than chocolate brown or black are specified, color of core material may be different than color of face.

2.19 BASE METALS

Apply specified U.S. Standard finishes on different base metals as following:

Finish	Base Metal
652	Steel
626	Brass or bronze
630	Stainless steel

PART 3 - EXECUTION

3.1 HARDWARE HEIGHTS

- A. For existing buildings locate hardware on doors at heights to match existing hardware. The Contractor shall visit the site, verify location of existing hardware and submit locations to Resident Engineer for approval.
- B. Hardware Heights from Finished Floor:
1. Exit devices centerline of strike (where applicable) 1000 mm (40-5/16 inches).
 2. Locksets and latch sets centerline of strike 1000 mm (40-5/16 inches).
 3. Deadlocks centerline of strike 1200 mm (48 inches).
 5. Centerline of door pulls to be 1000 mm (40 inches).
 6. Locate other hardware at standard commercial heights. Locate push and pull plates to prevent conflict with other hardware.

3.2 INSTALLATION

- A. Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute, except as specifically indicated or required to comply with governing regulations, and except as may be otherwise directed by the Architect.
- B. Install each hardware item in compliance with the manufacturer's 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 another way, coordinate 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, true to line and location. Adjust and reinforce the attachment substrate as necessary for proper 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.
- E. Closer devices, including those with hold-open features, shall be equipped and mounted to provide maximum door opening permitted by building construction or equipment. Closers shall be mounted regular arm. Where closers are mounted on doors they shall be mounted with sex nuts and bolts; foot shall be fastened to frame with machine screws.
- F. Substitute parallel arm or top jamb mounting for regular arm mounting where the following conditions occur:
1. Where door swing, in full open position, would be limited to less than 90 degrees due to partition construction and closer location.
 2. Where door to room opens outward into corridor, // except security bedroom, bathroom and anteroom doors which shall have closer installed parallel arm on exterior side of doors. //

G. Hinge Size Requirements:

Door Thickness	Door Width	Hinge Height
45 mm (1-3/4 inch)	900 mm (3 feet) and less	113 mm (4-1/2 inches)
45 mm (1-3/4 inch)	Over 900 mm (3 feet) but not more than 1200 mm (4 feet)	125 mm (5 inches)
35 mm (1-3/8 inch) (hollow core wood doors)	Not over 1200 mm (4 feet)	113 mm (4-1/2 inches)

- H. Hinge leaves shall be sufficiently wide to allow doors to swing clear of door frame trim.

I. Hinges Required Per Door:

Doors 1500 mm (5 ft) or less in height	2 butts
Doors over 1500 mm (5 ft) high and not over 2280 mm (7 ft 6 in) high	3 butts
Doors over 2280 mm (7 feet 6 inches) high	4 butts
Doors with spring hinges 1370 mm (4 feet 6 inches) high or less	2 butts
Doors with spring hinges over 1370 mm (4 feet 6 inches)	3 butts

- J. Fastenings: Suitable size and type and shall harmonize with hardware as to material and finish. Provide machine screws and lead expansion shields to secure hardware to concrete, ceramic or quarry floor tile, or solid masonry. Fiber or rawl plugs and adhesives are not permitted. All fastenings exposed to weather shall be of nonferrous metal.
- K. After locks have been installed; show in presence of Resident Engineer that keys operate their respective locks in accordance with keying requirements. (All keys, Master Key level and above shall be sent Registered Mail to the Medical Center Director along with the bitting list. Also a copy of the invoice shall be sent to the Resident Engineer for his records.) Installation of locks which do not meet specified keying requirements shall be considered sufficient justification for rejection and replacement of all locks installed on project.

3.3 ADJUST AND CLEAN

- A. 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 the application made.
- B. Clean adjacent surfaces soiled by hardware installation.
- C. Final adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work 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 proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- D. Instruct Owner's Personnel in proper adjustment and maintenance

3.4 HARDWARE SETS - REFER TO CONTRACT DRAWINGS

HW-1

Butt hinges, quantity, type & size as required
 Lock F07
 Closer C02021, with offset bracket
 Kick mop plates
 Overhead surface stop C05541
 Head and Jamb seal ROY154

HW-2

2 Continuous hinges, with integral hinge guard channel, adjustable screws & concealed current transfer.

2 Electric exit devices, Sargent 12-56-NB8710

1 Power supply, Sargent 3540

2 Armor plates

2 Mop plates

Head and jamb seal ROY154

Astragal, Pemko S77C

Note: For automatic door operators, see specification section 08 71 13.

HW-3

Pivot set A2742

Emergency stop A1882

Privacy set F19 MOD, with thumbturn both sides & occupancy indicator

Armor plate

Mop plate

Door stop

2 Sightproofing ROY734

HW-4

Continuous Hinge, with integral hinge guard channel & adjustable screws

Lock F13

Kick mop plates

Door stop

Door silencers L03011

HW-5

Continuous Hinge, with integral hinge guard channel & adjustable screws

Lock F04

Closer C02051

Armor plate

Mop plate

Door stop
Door silencers L03011

HW-6

Butt hinges, quantity, type & size as required
Lock F04
Kick mop plates
Door stop
Door silencers L03011

HW-7

2 Continuous hinges
Latch F01
2 Flush bolts L24081
Kick mop plates, both leaves
2 Door stops

HW-8

Pocket door set, Hager 9601 series with 9606 hanger
Lock, Adams rite MS1850SN & 4066 thumbturn
Cylinder, Best 1E74
2 Straight surface pulls J401, mounted back to back

HW-9

Bypass door set with upper tracks, Haefle Telescopic 80/2 - Hawa
Straight surface pull J401, thru-bolt mounted
Note: Mount pull on clear side of leading door leaf.

- - - E N D - - -