

SECTION 087111 – DOOR HARDWARE (DESCRIPTIVE SPECIFICATION)

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Mechanical and/or electrical door hardware for the following:
 - a. Swinging doors, except for aluminum-framed building entrances and vestibules.
 - b. Folding doors.
2. Cylinders for door hardware specified in other Sections.

B. Related Sections:

1. Section 079200 – Joint Sealants
2. Section 081113 – Hollow Metal Doors and Frames.
3. Section 081416 – Flush Wood Doors.
4. Section 083113 – Access Doors and Frames.

C. Reference and Industry Standards

1. The following reference standards shall be applicable to this Section:
 - a. New York City Building Code, current edition, as amended, inclusive of:
 - Chapter 10 - Means of Egress
 - b. ICC A117.1 Accessible and Usable Buildings and Facilities
 - c. Industry Standards
 - ASTM (American Society for Testing and Materials)
 - BHMA (Builders Hardware Manufacturers Association)
 - DHI (Door Hardware Institute)
 - ICC (International Code Council)
 - NFPA (National Fire Protection Association)
 - UL (Underwriters Laboratories)

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- B. Shop Drawings: For electrified door hardware.
 - 1. Include diagrams for power, signal, and control wiring.
 - 2. Include details of interface of electrified door hardware and building safety and security systems.
- C. Samples: For each exposed product in each finish specified.
- D. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - a. Content: Include the following information:
 - 1) Identification number, location, hand, fire rating, size, and material of each door and frame.
 - 2) Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
 - 3) Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
 - 4) Description of electrified door hardware sequences of operation and interfaces with other building control systems.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and of an Architectural Hardware Consultant who is available during the course of the Work to consult Contractor, Architect, and Owner about door hardware and keying.
 - 1. Scheduling Responsibility: Preparation of door hardware and keying schedule.
 - 2. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
- B. Architectural Hardware Consultant Qualifications: A person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and who is currently certified by DHI as an Architectural Hardware Consultant (AHC).

1.6 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Three (3) years from date of Substantial Completion unless otherwise indicated below:
 - a. Electromagnetic and Delayed-Egress Locks: Five (5) years from date of Substantial Completion.
 - b. Exit Devices: Two (2) years from date of Substantial Completion.
 - c. Manual Closers: Ten (10) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Door Assemblies: Where fire-rated doors are indicated, provide door hardware complying with NFPA 80 that is listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.
- B. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.
- D. Accessibility Requirements: For door hardware on doors in an accessible route, comply with ICC A117.1.

2.2 HINGES

- A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames.
- B. Antifriction-Bearing Hinges:
 - 1. Mounting: [**Full mortise (butts)**] [**Half mortise**] [**Full surface**] [**Half surface**].
 - 2. Bearing Material: [**Manufacturer's standard antifriction bearing**] [**Ball bearing**] **<Insert material>**.
 - 3. Grade: 2 (standard weight).
 - 4. Base and Pin Metal:
 - a. Exterior Hinges: Brass with stainless steel pin body and brass protruding heads.
 - b. Interior Hinges: Steel with steel pin.
 - c. Hinges for Fire-Rated Assemblies: Steel with steel pin.
 - 5. Pins: Non-rising loose unless otherwise indicated.

6. Tips: Flat button.
7. Corners: Square.
8. Bearing Material: [**Manufacturer's standard antifriction bearing**] [**Ball bearing**] **<Insert material>**.
9. Grade: 2 (standard weight).
10. Base and Pin Metal:
 - a. Exterior Hinges: Brass with stainless steel pin body and brass protruding heads.
 - b. Interior Hinges: Steel with steel pin.
 - c. Hinges for Fire-Rated Assemblies: Steel with steel pin.
11. Pins: Non-rising loose unless otherwise indicated.
12. Tips: Flat button.
13. Corners: Square.
14. Features: Raised barrel.

C. Plain-Bearing Hinges: Grade 3 (standard weight).

1. Mounting: [**Full mortise (butts)**] [**Half mortise**] [**Full surface**] [**Half surface**].
2. Base and Pin Metal: Steel with steel pin.
3. Pins: Non-rising loose unless otherwise indicated.
4. Tips: Flat button.
5. Corners: Square.
6. Features: Raised barrel.

D. Swing-Clear Hinges: Reversible.

1. Mounting: [**Full mortise (butts)**] [**Half mortise**] [**Full surface**] [**Half surface**].
2. Bearing and Grade: [**Antifriction bearing, Grade 1 (heavy weight)**] [**Antifriction bearing, Grade 2 (standard weight)**] [**Plain bearing, Grade 3 (standard weight)**].
3. Base Metal: [**Wrought brass or bronze**] [**Wrought, forged, or cast steel, or malleable iron**].
4. Pins: Non-rising loose unless otherwise indicated.
 - a. Outswinging Corridor Doors with Locks: Nonremovable.
5. Tips: Flat button.
6. Corners: Square.
7. Features: Raised barrel.

2.3 SELF-CLOSING HINGES AND PIVOTS

A. Self-Closing Hinges and Pivots: BHMA A156.17.

B. Spring Hinges: Grade 1; wrought steel, with torsion spring.

1. Type: [**Single**] [**Double**] acting.
2. Mounting: [**Full mortise (butts)**] [**Half mortise**] [**Full surface**] [**Half surface**].

2.4 CONTINUOUS HINGES

- A. Continuous Hinges: BHMA A156.26; minimum 0.120-inch-thick, hinge leaves with minimum overall width of 4 inches; fabricated to full height of door and frame and to template screw locations; with components finished after milling and drilling are complete.
- B. Pin-and-Barrel-Type Hinges:
 - 1. Grade: [1-150] [1-300] [1-600] [2-150] [2-300] [2-600] [3-150] [3-300] <Insert grade>.
 - 2. Exterior Hinges: Stainless steel.
 - 3. Interior Hinges: [Steel] [Aluminum].
 - 4. Hinges for Fire-Rated Assemblies: Steel.
 - 5. Type: [Concealed leaf] [Swing clear] [Full surface with removable continuous caps over fasteners] [Half mortise, concealed door leaf and with removable continuous cap over fasteners on jamb leaf] [Half surface, concealed jamb leaf and with removable continuous cap over fasteners on door leaf].
- C. Continuous, Gear-Type Hinges: Extruded-aluminum, pinless, geared hinge leaves joined by a continuous extruded-aluminum channel cap; with concealed, self-lubricating thrust bearings.
 - 1. Grade: [1-150] [1-300] [1-600] [2-150] [2-300] [2-600] [3-150] [3-300] <Insert grade>.
 - 2. Hinges for Fire-Rated Assemblies: With steel fire pins to hold fire-rated doors in place if required by tested listing.
 - 3. Mounting: [Concealed leaf] [Swing clear] [Full surface, with removable continuous caps over fasteners] [Half surface, concealed jamb leaf and with removable continuous cap over fasteners on door leaf].

2.5 MECHANICAL LOCKS AND LATCHES

- A. Lock Functions: (Insert)
- B. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:
 - 1. Bored Locks: Minimum 1/2-inch latchbolt throw.
 - 2. Mortise Locks: Minimum 3/4-inch latchbolt throw.
 - 3. Deadbolts: Minimum [1-inch] [1.25-inch] <Insert dimension> bolt throw.
- C. Lock Backset: 2-3/4 inches unless otherwise indicated.
- D. Lock Trim:
 - 1. Description: <Insert description or manufacturer's design designation>.
 - 2. Levers: [Wrought] [Forged] [Cast].
 - a. Construction: [Solid] [Tube] [Freewheeling vandal resistant] [Breakaway vandal resistant].
 - 3. Escutcheons (Roses): [Wrought] [Forged] [Cast].

4. Dummy Trim: Match lever lock trim and escutcheons.
- E. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.
 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
 3. Aluminum-Frame Strike Box: Manufacturer's special strike box fabricated for aluminum framing.
 4. Rabbet Front and Strike: Provide on locksets for rabbeted meeting stiles.
- F. Bored Locks: BHMA A156.2; **[Grade 1]** **[Grade 2]**; Series 4000.
- G. Mortise Locks: BHMA A156.13; **[Operational Grade 1]** **[Operational Grade 2]**; stamped steel case with steel or brass parts; Series 1000.

2.6 AUXILIARY LOCKS

- A. Bored Auxiliary Locks: BHMA A156.36; **[Grade 1]** **[Grade 2]**; with strike that suits frame.
 1. Backset: **[2-3/8 inches]** **[2-3/4 inches]**.
 2. Material: **[Aluminum]** **[Brass]** **[Bronze]** **[Stainless steel]** **[Zinc alloy]**.
 3. Deadlatches: Deadlocking latchbolt operated by **[key either side]** **[key outside and turn inside]** **[turn inside with no cylinder]**.
 4. Deadlocks: Deadbolt operated by **[key either side]** **[key outside and turn inside]** **[turn inside with no cylinder]** **[key outside, no trim inside]**.
- B. Mortise Auxiliary Locks: BHMA A156.36; **[Grade 1]** **[Grade 2]**; with strike that suits frame.
 1. Backset: **[2-3/4 inches]** **<Insert dimension>**.
 2. Material: **[Aluminum]** **[Brass]** **[Bronze]**.
 3. Deadlocks: Deadbolt operated by key **[either side]** **[outside and turn inside]** **[one side]**.
 4. Deadlatches: Latchbolt and auxiliary deadlatch operated by key **[either side]** **[outside and turn inside]**.
- C. Narrow Stile Auxiliary Locks: BHMA A156.36; **[Grade 1]** **[Grade 2]**; with strike that suits frame.
 1. Backset: **[0.98 inch]** **[1.125 inches]** **[1.25 inches]** **[1.5 inches]** **[1.75 inches]** **[2 inches]** **[2.25 inches]** **[2.5 inches]** **<Insert dimension>**.
 2. Strike: **[Flat]** **[Flat with extra-long lip]** **[Radius]** **[Radius with weatherstrip]** **[Bevel]**.
 3. Case Material: Steel.
 4. Armored Front and Strike Material: **[Aluminum]** **[Brass]** **[Bronze]**.
 5. Deadlock: Deadlocking bolt.
 - a. Operation: Key outside and operating trim inside.
 - b. Door Application: Swinging door.

6. Deadlatch: Latchbolt with auxiliary deadlatch operated by key outside and paddle or lever inside; for single swinging doors.
7. Multipoint Lock: Deadlocking bolt for pairs of swinging doors.
 - a. Operation: Key outside and turn, lever, or knob inside.
 - b. Type: [**Two**] [**Three**] point.
8. Latch/Lock: Deadbolt and latchbolt; both operated by key both sides; inside handle operates only latchbolt.

2.7 ELECTRIC STRIKES

- A. Electric Strikes: BHMA A156.31; [**Grade 1**] [**Grade 2**]; with faceplate to suit lock and frame.
 1. Material: Steel.
 2. Mounting: [**Mortised**] [**Semi-rim mounted**] [**Rim-mounted**].
 3. Fire-Rated Door Assemblies: Use fail-secure electric strikes with fire-rated devices.

2.8 ELECTROMAGNETIC LOCKS

- A. Electromagnetic Locks: BHMA A156.23; electrically powered; with electromagnet attached to frame and armature plate attached to door; full-exterior or full-interior type, as required by application indicated.
 1. Direct-Hold Type: Lock mounted on [**bottom of header; strike flush mounted on door push side**] [**face of header; strike angle mounted on door pull side**] [**side of jamb; strike flush mounted on door push side**].
 2. Shear Type: Lock [**mounted on face of header; strike angle mounted on door**] [**mortised in header; strike mortised in top of door**] [**mortised in jamb; strike mortised in edge of door**] [**mortised in bottom of door; strike mortised in floor**] [**mortised in floor; strike mortised in bottom of door**].
 3. Strength Ranking: [**1500 lbf**] [**1000 lbf**] [**500 lbf**].
 4. Features:
 - a. Magnetic bond sensor.
 - b. Continuous housing for full width of door.
 - c. Continuous housing for full height of door.
 - d. Single LED indicators.
 - e. Double LED indicators.
 - f. Adjustable time delay with automatic relock.
 - g. Integral door position switch.
 - h. **<Insert feature>**.
- B. Delayed-Egress Electromagnetic Locks: BHMA A156.24, electrically powered, with electromagnet attached to frame and armature plate attached to door; depressing push bar for more than three seconds initiates irreversible alarm and adjustable time delay for egress. When integrated with fire alarm, fire alarm voids time delay.

1. Grade: [**Security grade, activated from secure side of door by initiating device**] [**Movement grade, activated by door movement as initiating device**].

2.9 ELECTROMECHANICAL LOCKS

- A. Electromechanical Locks: BHMA A156.25; [**Grade 1**] [**Grade 2**]; motor or solenoid driven; with strike that suits frame.

1. Type: [**Bored**] [**Mortise latchbolt**] [**Mortise deadlocking latchbolt**].

2.10 EXIT LOCKS AND EXIT ALARMS

- A. Exit Locks and Alarms: BHMA A156.29, Grade 1.

- B. Exit Locks: Surface mounted; battery powered, housed in metal case; with manufacturer's standard strike that suits frame; with red-and-white lettering reading "EMERGENCY EXIT PUSH TO OPEN - ALARM WILL SOUND."

1. Single-Door Type: Activated by [**arm, push plate, or paddle**] [**horizontal bar**].
2. Features:
 - a. Low-battery alert.
 - b. Outside key control.
 - c. Audible alarm that sounds when unauthorized use of door occurs.
 - d. Silent alarm with remote signal capability for connection to remote indicating panel.
 - e. Strike: [**Surface**] [**Mortise**].
 - f. <**Insert feature**>.

- C. Standalone Exit Alarms: [**Surface mounted on door**] [**Mounted separate from door and activated by door movement switch**].

1. Features:
 - a. Low-battery alert.
 - b. Outside key control.
 - c. Audible alarm that sounds when unauthorized use of door occurs.
 - d. Automatic rearming after authorized use[, **with adjustable time delay**].
 - e. Remote signal capability for connection to remote indicating panel.
 - f. <**Insert feature**>.

2.11 SURFACE BOLTS

- A. Surface Bolts: BHMA A156.16.

- B. Half-Round Surface Bolts: [**Grade 1**] [**Grade 2**], 6-inch polished-brass or burnished-steel, half-round rod and knob; minimum 7/8-inch throw; with universal strike.

- C. Interlocking Surface Bolts: [**Grade 1**] [**Grade 2**], 6-inch extruded-brass or aluminum, interlocking track and rod; minimum 15/16-inch throw; with universal or mortise strike.

- D. Fire-Rated Surface Bolts: [**Grade 1**] [**Grade 2**], 8-inch steel bolt with 2 steel guides; minimum 1-inch throw; listed and labeled for use in fire-rated assemblies; with universal strike.

2.12 EXIT DEVICES AND AUXILIARY ITEMS

- A. Exit Devices and Auxiliary Items: BHMA A156.3.
- B. Panic Exit Devices: Listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing in accordance with UL 305.
- C. Fire Exit Devices: Devices complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing in accordance with UL 305 and NFPA 252.
- D. Rim Exit Devices: [**Grade 1**] [**Grade 2**].
 - 1. Type: [**1, rim**] [**4, narrow stile**] [**28, incorporating a deadbolt**].
 - 2. Actuating Bar: [**Cross bar**] [**Push pad**] [**Narrow-stile push pad**].
 - 3. Material: [**Brass**] [**Bronze**] [**Aluminum**] [**Wrought steel**].
 - 4. Electrified Features:
 - a. Push pad monitor switch.
 - b. Double push pad monitor switch.
 - c. Electric locking and unlocking.
 - d. Fail-secure electric latch retraction (dogging) that engages latch when fire-alarm system is activated.
 - e. Delayed egress.
 - f. Alarm.
 - g. <**Insert feature**>.
- E. Mortise Exit Devices: [**Grade 1**] [**Grade 2**].
 - 1. Type: [**3**] [**10, narrow stile**].
 - 2. Actuating Bar: [**Cross bar**] [**Push pad**] [**Narrow-stile push pad**].
 - 3. Material: [**Brass**] [**Bronze**] [**Aluminum**] [**Wrought steel**].
 - 4. Electrified Features:
 - a. Push pad monitor switch.
 - b. Double push pad monitor switch.
 - c. Electric locking and unlocking.
 - d. Fail-secure electric latch retraction (dogging) that engages latch when fire-alarm system is activated.
 - e. Delayed egress.
 - f. Alarm.
 - g. <**Insert feature**>.
- F. Surface Vertical-Rod Exit Devices: [**Grade 1**] [**Grade 2**].
 - 1. Type: [**2**] [**5, narrow stile**].
 - 2. Actuating Bar: [**Cross bar**] [**Push pad**] [**Narrow-stile push pad**].
 - 3. Material: [**Brass**] [**Bronze**] [**Aluminum**] [**Wrought steel**].

4. Configuration: [**Top and bottom rods**] [**Top rod**].
 5. Electrified Features:
 - a. Push pad monitor switch.
 - b. Double push pad monitor switch.
 - c. Electric locking and unlocking.
 - d. Fail-secure electric latch retraction (dogging) that engages latch when fire-alarm system is activated.
 - e. Delayed egress.
 - f. Alarm.
 - g. <**Insert feature**>.
- G. Concealed Vertical-Rod Exit Devices: [**Grade 1**] [**Grade 2**].
1. Type: [**6, narrow stile**] [**7, for wood doors**] [**8, for metal doors**].
 2. Actuating Bar: [**Cross bar**] [**Push pad**] [**Narrow-stile push pad**].
 3. Material: [**Brass**] [**Bronze**] [**Stainless steel**] [**Aluminum**] [**Wrought steel**].
 4. Configuration: [**Top and bottom rods**] [**Top rod**].
 5. Electrified Features:
 - a. Push pad monitor switch.
 - b. Double push pad monitor switch.
 - c. Electric locking and unlocking.
 - d. Fail-secure electric latch retraction (dogging) that engages latch when fire-alarm system is activated.
 - e. Delayed egress.
 - f. Alarm.
 - g. <**Insert feature**>.
- H. Combination Exit Devices: [**Grade 1**] [**Grade 2**].
1. Type: [**9, rim and surface vertical rod**] [**11, mortise and surface vertical rod**] [**12, mortise and concealed vertical rod**].
 2. Actuating Bar: [**Cross bar**] [**Push pad**] [**Narrow-stile push pad**].
 3. Material: [**Brass**] [**Bronze**] [**Aluminum**] [**Wrought steel**].
 4. Electrified Features:
 - a. Push pad monitor switch.
 - b. Double push pad monitor switch.
 - c. Electric locking and unlocking.
 - d. Fail-secure electric latch retraction (dogging) that engages latch when fire-alarm system is activated.
 - e. Delayed egress.
 - f. Alarm.
 - g. <**Insert feature**>.
- I. Automatic Latching Two-Point Bolts: Grade 1.
1. Type: [**23, concealed**] [**24, surface**].
 2. Material: [**Brass**] [**Bronze**].

- J. Extension Flush Bolt Sets: BHMA A156.3; Grade 1.
 - 1. Type: **[25, automatic]** **[27, self-latching]**.
 - 2. Material: **[Brass]** **[Bronze]**.
- K. Exit Device Outside Trim: **[Lever]** **[Lever with cylinder]** **[Knob]** **[Knob with cylinder]** **[Pull]** **[Pull with cylinder]** **[Thumb turn with cylinder]**; material and finish to match locksets unless otherwise indicated.
 - 1. Match design for lock trim unless otherwise indicated.
- L. Through-Bolt Fasteners: For exit devices and trim on **[metal doors]** **[non-fire-rated wood doors]** **[fire-rated wood doors]**.

2.13 LOCK CYLINDERS

- A. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver. **[Provide cylinder from same manufacturer of locking devices.]**
- B. Standard Lock Cylinders: BHMA A156.5; **[Grade 1]** **[Grade 1A]** **[Grade 2]** permanent cores; face finished to match lockset.
 - 1. Core Type: Removable.
 - 2. Number of Pins: Six.
 - 3. Lock Type: **[Mortise]** **[Rim]** **[Bored-lock]** type.

2.14 OPERATING TRIM

- A. Operating Trim: BHMA A156.6; **[aluminum]** **[brass]** **[bronze]** unless otherwise indicated.
- B. Flat Push Plates: With square corners and beveled edges; secured with exposed screws.
 - 1. Thickness: **[0.050 inch]** **[1/8 inch]** **<Insert dimension>**.
 - 2. Size: 4 inches wide by 16 inches high.
- C. Push-Pull Plates: With square corners, beveled edges, and raised integral lip; secured with exposed screws.
 - 1. Thickness: **[1/8 inch]** **<Insert dimension>**.
 - 2. Size: 3-1/2 inches wide by 15-3/4 inches high.
- D. Straight Door Pulls:
 - 1. Type: **[3/4-inch constant-diameter]** **[variable-diameter]** **[flattened-round]** **[hospital-type]** pull.
 - 2. Mounting: **[Surface applied with concealed fasteners]** **[Through bolted with oval-head machine screws and countersunk washers]** **[Back to back with threaded sleeves]**.
 - 3. Minimum Clearance: 1-1/2 inches from face of door.
 - 4. Overall Length: 9 inches.
- E. Offset Door Pulls: 1-inch constant-diameter pull.

1. Mounting: [**Surface applied with concealed fasteners**] [**Through bolted with oval-head machine screws and countersunk washers**] [**Back to back with threaded sleeves**].
2. Offset: [**2 inches**] <Insert dimension>.
3. Minimum Clearance: 2-1/4 inches from face of door.
4. Overall Length: 9 inches.

F. Single Push Bar: Horizontal-bar type.

1. Mounting: [**Surface applied with concealed fasteners**] [**Through bolted with oval-head machine screws and countersunk washers**].
2. Shape and Size: [**1-inch constant-diameter round bar**] [**Minimum 3/8-by-1-1/4-inch flat bar**] <Insert shape and size>.
3. Minimum Clearance: 1-1/2 inches from face of door.

G. Double Pull Bar: Two horizontal bars connected by matching vertical pull bar and spaced at 8 inches o.c.

1. Mounting: [**Surface applied with concealed fasteners**] [**Through bolted with oval-head machine screws and countersunk washers**].
2. Shape and Size: [**1-inch constant-diameter round bars**] [**Minimum 3/8-by- 1-1/4-inch flat bars**] <Insert shape and size>.
3. Minimum Clearance: 1-1/2 inches from face of door.

2.15 SURFACE CLOSERS

A. Surface Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written instructions for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

B. Cast-Aluminum Surface Closers: [**Grade 1**] [**Grade 2**]; Traditional type with mechanism enclosed in cast-aluminum alloy shell.

1. Mounting: [**Hinge side**] [**Opposite hinge side**] [**Parallel arm**] [**Bracket**].
2. Type: [**Regular arm**] [**Fusible-link holder arm**] [**Two-point hold-open arm**] [**Delayed action closing**] <Insert type>.

C. Surface Closer without Cover: [**Grade 1**] [**Grade 2**]; Modern type.

1. Mounting: [**Hinge side**] [**Opposite hinge side**] [**Parallel arm**] [**Bracket**] [**Hinge side top jamb**] [**Opposite side top jamb**].
2. Type: [**Regular arm**] [**Hold open**] [**Fusible-link holder arm**] [**Slide track arm**] [**Dead stop**] [**Dead stop hold open**] [**Delayed action closing**] <Insert type>.
3. Closing Power Adjustment: At least [**50**] [**35**] [**15**] percent more than minimum tested value.

D. Surface Closer with Cover: [**Grade 1**] [**Grade 2**]; Modern type with mechanism enclosed in cover.

1. Mounting: [**Hinge side**] [**Opposite hinge side**] [**Parallel arm**] [**Bracket**] [**Hinge side, top jamb**] [**Opposite side, top jamb**].
2. Type: [**Regular arm**] [**Hold open**] [**Fusible-link holder arm**] [**Slide track arm**] [**Dead stop**] [**Dead stop hold open**] [**Delayed action closing**] <Insert type>.
3. Cover Material: [**Aluminum**] [**Plated steel**] [**Molded plastic**].
4. Closing Power Adjustment: At least [**50**] [**35**] [**15**] percent more than minimum tested value.

2.16 CONCEALED CLOSERS

- A. Concealed Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves. Comply with manufacturer's written instructions for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.
- B. Concealed-in-Door Closer: [**Grade 1**] [**Grade 2**]; mortised into top rail of minimum 1-3/4-inch-thick doors and track mortised into head frame; with double lever arm indicated.
 1. Type: [**Surface shoe**] [**Mortised soffit plate**].
 2. Arm: [**Regular**] [**Hold open**].
 3. Closing Power Adjustment: At least [**50**] [**35**] [**15**] percent more than minimum tested value.
- C. Concealed Overhead Closer: [**Grade 1**] [**Grade 2**]; mortised into head frame; with cast-metal body and exposed cover plate.
 1. Type: [**Exposed arm with surface shoe, single acting**] [**Concealed arm and track, butt or pivot hung, single acting**] [**Concealed arm and track, center pivoted, single acting**] [**Concealed arm and track, center pivoted, double acting**].
 2. Arm: [**Regular**] [**Automatic hold open**] [**Manually selected hold open**] [**Fusible-link holder arm**].
 3. Track: [**Regular**] [**Automatic hold open**] [**Manually selected hold open**].
 4. Cover Plate Material: [**Aluminum**] [**Plated steel**].
 5. Backcheck: [**Factory preset**] [**Adjustable**].
 6. Closing Power Adjustment: At least [**50**] [**35**] percent more than minimum tested value.
 7. Closer Type: [**Center pivoted; include top pivot**] [**Offset pivoted; include top pivot**] [**Independently hung**].
 8. Door-Swing Type: [**Single**] [**Double**] acting.
 9. Fire Rated: Listed for use in labeled fire-rated assemblies where indicated.
 10. Function: [**Regular**] [**Automatic hold open**] [**Manually selected hold open**] [**Delayed action closing**].
 11. Backcheck: [**Factory preset**] [**Adjustable**].
 12. Closing Power Adjustment: At least [**50**] [**35**] percent more than minimum tested value.
 13. Case Depth: [**Regular, 4 inches**] [**Shallow, 2 inches**].

2.17 CLOSER HOLDER RELEASE DEVICES

- A. Closer Holder Release Devices: BHMA A156.15; Grade 1; closer connected with separate or integral releasing and fire- or smoke-detecting devices. Door shall become self-closing on

interruption of signal to release device. Automatic release is activated by [**smoke detection system**] [**loss of power**].

1. Type: [**Single-point hold open**] [**Multiple-point hold open**] [**Free-swinging release**].
2. Mounting: [**Surface mounted on face of door**] [**Surface mounted on face of top jamb**] [**Surface mounted on stop**] [**Mortised into top rail of door**] [**Mortised into top jamb**] [**Recessed into floor**].
3. Features:
 - a. Adjustable backcheck.
 - b. Integral smoke detector.
 - c. Adjustable spring power.
 - d. Adjustable hold-open manual release force.
 - e. <**Insert feature**>.

2.18 MECHANICAL STOPS AND HOLDERS

- A. Wall- and Floor-Mounted Stops: BHMA A156.16; polished cast brass, bronze, or aluminum base metal.
- B. Rigid-Type Floor Stop: [**Grade 1**] [**Grade 2**]; with rubber bumper.
 1. Installation: [**Surface-screw**] [**Expansion-shield**] installation.
- C. Dome-Type Floor Stop: [**Grade 1**] [**Grade 2**]; with minimum 1-inch-high bumper for doors without threshold and 1-3/8-inch-high bumper for doors with threshold.
 1. Provide with extruded-aluminum riser for carpet installations.
- D. Combination Floor Stop and Holder: [**Grade 1**] [**Grade 2**].
 1. Installation: [**Surface-screw**] [**Expansion-shield**] installation.
 2. Hold Open: [**Semiautomatic**] [**Automatic with release by pushing door**].
- E. Manual Combination Floor Stop and Holder: [**Grade 1**] [**Grade 2**]; 3-1/2 inches long, with holder, keeper, and rubber bumper.
 1. Installation: [**Surface-screw**] [**Expansion-shield**] installation.
- F. Wall Bumpers: [**Grade 1**] [**Grade 2**]; with rubber bumper; 2-1/2-inch diameter, minimum 3/4-inch projection from wall; with backplate for concealed fastener installation.
 1. Bumper Configuration: [**Convex**] [**Concave**].
- G. Roller-Type Wall Bumpers: [**Grade 1**] [**Grade 2**]; minimum 4-3/8-inch projection from wall; for surface-screw application.

2.19 ELECTROMAGNETIC STOPS AND HOLDERS

- A. Electromagnetic Door Holders: BHMA A156.15, Grade 1; [**wall-mounted electromagnetic single**] [**floor-mounted electromagnet single**] [**floor-mounted electromagnet double**] unit

with strike plate attached to swinging door; coordinated with fire detectors and interface with fire-alarm system for labeled fire-rated door assemblies.

2.20 OVERHEAD STOPS AND HOLDERS

- A. Overhead Stops and Holders: BHMA A156.8.
- B. Overhead Concealed Slide Holders: Type 1; [**Grade 1**] [**Grade 2**]; hold open and release by push and pull of door unless control is set in inactive position; with stop, shock absorber, and adjustable holding pressure; for doors opening 110 degrees.
 - 1. Door Swing Type: [**Single**] [**Double**] acting.
- C. Overhead Concealed Slide Stops: Type 1; [**Grade 1**] [**Grade 2**]; release by push and pull of door unless control is set in inactive position; with stop, shock absorber, and adjustable holding pressure; for doors opening 110 degrees.
 - 1. Door Swing Type: [**Single**] [**Double**] acting.
- D. Overhead Surface-Mounted Slide Holders: Type 2; [**Grade 1**] [**Grade 2**]; hold open and release by push and pull of door unless control is set in inactive position; with stop, shock absorber, and adjustable holding pressure; for single-acting doors opening 110 degrees.
- E. Overhead Surface-Mounted, Concealed Slide Stops: Type 2; [**Grade 1**] [**Grade 2**]; release by push and pull of door unless control is set in inactive position; with stop, shock absorber, and adjustable holding pressure; for single-acting doors opening 110 degrees.
- F. Overhead Concealed, Friction Slide Holders: Type 4; [**Grade 1**] [**Grade 2**]; with frictional element held under adjustable pressure, free-acting shoulder pivots, and shock absorber; for doors opening 110 degrees.
 - 1. Door Swing Type: [**Single**] [**Double**] acting.
- G. Overhead Concealed, Non-friction Slide Stops: Type 4; [**Grade 1**] [**Grade 2**]; with non-frictional element held under adjustable pressure and shock absorber; for [**single**] [**double**]-acting doors opening 110 degrees.
- H. Overhead Concealed, Non-friction Slide Holders: Type 4; [**Grade 1**] [**Grade 2**]; with non-frictional element held under adjustable pressure, automatic hold-open, and shock absorber; for doors opening 110 degrees.
 - 1. Door Swing Type: [**Single**] [**Double**] acting.
- I. Overhead Surface-Mounted, Friction Slide Holders: Type 5; [**Grade 1**] [**Grade 2**]; with frictional element held under adjustable pressure, free-acting shoulder pivots, and shock absorber; for single-acting doors opening 110 degrees.
- J. Overhead Surface-Mounted, Non-friction Slide Stops: Type 5; [**Grade 1**] [**Grade 2**]; with non-frictional element held under adjustable pressure and shock absorber; for single-acting doors opening 110 degrees.

- K. Overhead Surface-Mounted, Non-friction Slide Holders: Type 5; **[Grade 1]** **[Grade 2]**; with non-frictional element held under adjustable pressure, automatic hold-open, and shock absorber; for single-acting doors opening 110 degrees.

2.21 DOOR GASKETING

- A. Door Gasketing: BHMA A156.22; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.
- B. Maximum Air Leakage: When tested in accordance with ASTM E283 with tested pressure differential of 0.3-inch wg, as follows:
 - 1. Gasketing on Single Doors: 0.3 cfm/sq. ft. of door opening.
- C. Adhesive-Backed Perimeter Gasketing: **[Vinyl bulb]** **[Sponge silicone]** **[Silicone]** **[Neoprene bulb]** **[Sponge neoprene]** gasket material applied to frame rabbet with self-adhesive.
- D. Rigid, Housed, Perimeter Gasketing: **[Sponge silicone]** **[Sponge neoprene]** **[Silicone bulb]** **[Polyurethane bulb]** **[Vinyl bulb]** **[Vinyl brush]** **[Nylon brush]** **[Thermoplastic elastomer]** gasket material held in place by housing; fastened to frame stop with screws.
 - 1. Housing Material: **[Aluminum]** **[Brass or bronze]** **[Stainless steel]**.
- E. Adjustable, Housed, Perimeter Gasketing: Screw-adjustable, **[sponge silicone]** **[sponge neoprene]** **[silicone bulb]** **[polyurethane bulb]** **[vinyl bulb]** **[vinyl brush]** **[nylon brush]** **[thermoplastic elastomer]** gasket material held in place by housing; fastened to frame stop with screws.
 - 1. Housing Material: **[Aluminum]** **[Brass or bronze]** **[Stainless steel]**.
- F. Door Sweeps: **[Neoprene]** **[Vinyl]** **[Polyurethane]** **[Silicone]** gasket material held in place by flat housing or flange; surface mounted to face of door with screws.
 - 1. Housing or Flange Material: **[Aluminum]** **[Bronze]**.
- G. Rodent Proof Door Sweeps: Heavy-duty aluminum retainer and reinforced rubber weather-seal filled with a blend of coarse stainless steel wool and polyfiber that creates a barrier impenetrable to mice, rats and other pests; surface mounted with stainless steel screws.
 - 1. If floor is sloped or has an uneven surface, use an automatic door bottom, as described in Item I. of this sub-section.
- H. Door Shoes: **[Vinyl]** **[Thermoplastic elastomer]** **[Neoprene]** gasket material held in place by housing; mounted to bottom edge of door with screws.
 - 1. Housing Material: **[Aluminum]** **[Bronze]**.
- I. Automatic Door Bottoms: **[Sponge neoprene]** **[Sponge silicone]** **[Thermoplastic elastomer]** gasket material held in place by housing that automatically drops down to form seal when door is closed; mounted to bottom edge of door with screws.

1. Action: Drop-bar is activated by a plunger which contacts the jamb as the door is closing, forcing the drop-bar seal down against the floor/threshold creating a secure seal.
2. Housing Material: Aluminum.
3. Mounting to Solid Core Wood Door: [**Semi-mortised into bottom**] [**Mortised into bottom**] of door.
4. Mounting to Hollow Metal Door: Surface mounting.
5. Type: Low-closing-force type for doors required to meet accessibility requirements.

2.22 THRESHOLDS

- A. Solid marble with ½-inch beveled edges.
- B. Aluminum thresholds: BHMA A156.21; fabricated to full width of opening indicated.
- C. Compressing-Top Thresholds: Metal member with compressible vinyl seal on top of threshold that seals against bottom of door.
- D. Saddle Thresholds:
 1. Type: [**Smooth top**] [**Fluted top**] [**Fluted top and offset**] [**Thermal break and fluted top**] [**Applied gasketed stop and fluted top**] [**Fluted top, barrier free**].
- E. Half-Saddle Thresholds: Fluted-top metal member.
- F. Interlocking Thresholds: Fluted-top metal member with integral lip designed to engage a hook strip applied to door.
 1. Type: [**Single lip**] [**Double lip**] [**Double-lip water return**] [**Double-lip water return with aluminum pan**] [**Single lip with thermal barrier**].
- G. Latching/Rabbeted Thresholds:
 1. Type: [**Fluted**] [**Smooth**] [**Offset with fluted**] top.
- H. Latching/Rabbeted Thresholds with Gasket: Fluted-top metal member with gasket.
 1. Type: [**Offset**] [**Thermal barrier**].
 2. Gasket Material: [**Vinyl**] [**Silicone**] [**Neoprene**] [**Brush pile**] [**Closed-cell sponge neoprene**].
- I. Latching/Rabbeted Panic Thresholds:
 1. Type: [**Fluted, barrier free**] [**Fluted with gasket**] top.
- J. Plate Thresholds: Solid metal plate.
 1. Top Surface: Fluted with slip-resistant abrasive.
- K. Ramped Thresholds: Modular, interlocking, sloped, fluted-top metal assemblies with closed return ends; 1:12 slope.

1. Top Surface: Fluted with slip-resistant abrasive.

2.23 FOLDING DOOR HARDWARE

- A. General: BHMA A156.14; complete sets including overhead rails, hangers, supports, bumpers, floor guides, and accessories indicated.
- B. Bi-folding Door Hardware: Rated for door panels weighing up to **[50 lb Grade 1]** **[30 lb Grade 2]**; with rails and door hardware that allow horizontal and vertical adjustment.
 1. Rail Material: **[Galvanized wrought steel]** **[Extruded aluminum]**.
 2. Rail Configuration: **[V-grooved double leg]** **[V-grooved double leg with fascia]** **[I-beam]**.
 3. Mounting: **[Surface mounted overhead]** **[Top and bottom hung]**.
 4. Wheel Assembly: Two wheel or four wheel, with roller bearings.
- C. Multiple Folding Door Hardware: Rated for door panels weighing up to **[50 lb Grade 1]** **[30 lb Grade 2]**; with rails and door hardware that allows horizontal and vertical adjustment.
 1. Rail Material: **[Galvanized wrought steel]** **[Extruded aluminum]**.
 2. Rail Configuration: **[V-grooved double leg]** **[V-grooved double leg with fascia]** **[I-beam]**.
 3. Mounting: **[Surface mounted overhead]** **[Top and bottom hung]**.
 4. Wheel Assembly: Two wheel or four wheel, with roller bearing.

2.24 METAL PROTECTIVE TRIM UNITS

- A. Metal Protective Trim Units: BHMA A156.6; fabricated from 0.050-inch-thick **[aluminum]** **[brass]** **[bronze]**; with manufacturer's standard machine or self-tapping screw fasteners.
- B. Armor Plates: **[36 inches]** **[40 inches]** **[42 inches]** high by door width with allowance for frame stops.
- C. Kick Plates: **[8 inches]** **[10 inches]** **[12 inches]** high by door width with allowance for frame stops.
- D. Mop Plates: **[4 inches]** **[6 inches]** high by 1 inch less than door width.

2.25 AUXILIARY DOOR HARDWARE

- A. Auxiliary Hardware: BHMA A156.16.
- B. Chain Door Guards: **[Grade 1]** **[Grade 2]** **[Grade 3]**; polished cast brass or bronze or extruded brass; with plate slotted to receive 6-inch-long welded chain secured to an anchor plate. Guard allows door to be opened 3 inches with chain engaged in slotted plate. Equip with chain holder.
- C. Rod-Type Door Guards: **[Grade 1]** **[Grade 2]** **[Grade 3]**; straight door-mounted rod that engages U-shaped, jamb-mounted rod. U-shaped rod can swing 180 degrees away from door; rod limits door opening when engaged.

1. Material: [**Brass**] [**Bronze**] [**Aluminum**].
- D. Coat Hooks: [**Grade 1**] [**Grade 2**] [**Grade 3**]; two curved hooks with rounded ends; 3-inch projection from wall; for surface-screw application.
 1. Material: [**Polished cast brass**] [**Polished cast bronze**] [**Burnished cast aluminum**].
- E. Garment Hooks: [**Grade 1**] [**Grade 2**] [**Grade 3**]; one long hat hook and one small coat hook; 3-3/4-inch projection from wall with 7-inch overall height; for surface-screw application.
 1. Material: [**Polished cast brass**] [**Burnished cast aluminum**].
- F. Door Knockers: Grade 1; solid brass [**with engraved number and nameplates**].
- G. Fire-Rated Door Viewers: Solid brass with optical glass lenses; listed and labeled for use in fire-rated assemblies; adjustable to door thickness, and permitting one-way observation with minimum [**120**] [**150**] [**190**]-degree viewing angle.
- H. House Numbers: Grade 1; [**wrought, cast, or forged brass**] <Insert material>; 4 inches high; for screw application.
- I. Silencers for Metal Door Frames: Grade 1; neoprene or rubber; minimum diameter 1/2 inch; fabricated for drilled-in application to frame.

2.26 AUXILIARY ELECTRIFIED DOOR HARDWARE

- A. Auxiliary Electrified Door Hardware:
- B. Boxed Power Supplies: Modular unit in NEMA ICS 6, Type 4 enclosure; filtered and regulated; voltage rating and type matching requirements of door hardware served; listed and labeled for use with fire-alarm systems.
- C. Door Position Switches: Magnetically operated reed switch designed for concealed mounting.
- D. Door and Frame Transfer Devices: Steel housing for mortise in hinge stile of door, with flexible tube for wiring bundle; accommodating doors that swing open to 120 degrees.

2.27 FINISHES

- A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.
 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.

2. Wood Doors: DHI's Recommended Locations for Architectural Hardware for Wood Flush Doors.
 - B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work. Do not install surface-mounted items until finishes have been completed on substrates involved.
 - C. Hinges: Install types and in quantities indicated in door hardware schedule, but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
 - D. Intermediate Offset Pivots: Where offset pivots are indicated, provide intermediate offset pivots in quantities indicated in door hardware schedule, but not fewer than one intermediate offset pivot per door and one additional intermediate offset pivot for every 30 inches of door height greater than 90 inches.
 - E. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in *Section 079200 – Joint Sealants*.
 - F. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.
 - G. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
 1. Do not notch perimeter gasketing to install other surface-applied hardware.
 - H. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.2 ADJUSTING

- A. Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.3 DOOR HARDWARE SCHEDULE

A. **Hardware Set 1: Hollow-Metal Building Entrance and Vestibule Doors**

- One (1) pair full-mortise ball-bearing hinges
- One (1) heavy-duty mortise lockset with lever handle
- One (1) surface-mounted closer
- One (1) threshold
- Three (3) rubber silencers
- Continuous weatherstripping at head
- Continuous weatherstripping at jambs
- One (1) solid neoprene sweep

B. **Hardware Set 2: Apartment Entrance Door – All items to be 1-1/2 hr fire-rated.**

1-1/2 pair full-mortise spring hinges
One (1) heavy-duty mortise lockset with lever handle
One (1) chime interviewer or doorbell
One (1) multi-directional door viewer
One (1) chain or rod-type guard
One (1) base door stop or knob bumper
Three (3) rubber silencers
One (1) threshold

Continuous weatherstripping at head*
Continuous weatherstripping at jambs*
One automatic door bottom designed to prevent rodents from entering.

Note: Asterisk (*) denotes addition of intumescent material for fire & smoke protection.

C. **Hardware Set 3: Apartment Bathroom Doors**

One (1) pair full-mortise ball-bearing hinges
One (1) cylindrical lockset with knob or lever handle
One (1) base stop or handle bumper
Three (3) rubber silencers
One (1) door threshold

D. **Hardware Set 4: Apartment Bedroom Doors**

One (1) pair full-mortise ball-bearing hinges
One (1) cylindrical lockset* with knob or lever handle
One (1) base stop or handle bumper
Three (3) rubber silencers

Note for asterisk (*): If bedroom window provides access to fire escape, substitute latchset with passage function for lockset.

E. **Hardware Set 5: Apartment Closet, Single Door**

One (1) pair full-mortise ball-bearing hinges
One (1) single dummy trim, with knob or lever handle
One (1) magnetic catch
One (1) hinge pin door stop

F. **Hardware Set 6: Apartment Closet, Double Door (Each)**

One (1) pair full-mortise, ball-bearing hinges
One (1) single dummy trim, with knob or lever handle
One (1) magnetic catch
One (1) hinge pin door stop

G. **Hardware Set 7: Lobby/Cellar Door to Yard**

1-1/2 pair full-mortise spring hinges
One (1) heavy-duty mortise lockset with knob or lever handle
One (1) base door stop or wall-mounted handle bumper

- One (1) surface-mounted closer
- Three (3) rubber silencers
- One (1) aluminum threshold
- One automatic door bottom designed to prevent rodents from entering.

- Continuous weatherstripping at head
- Continuous weather stripping at jambs

H. **Hardware Set 8: Stair Bulkhead Door**

- 1-1/2 pair full-mortise spring hinges
- One (1) latchset with knob or lever handle
- Three (3) rubber silencers
- One (1) threshold
- One (1) exit alarm
- One (1) crash stop

I. **Hardware Set 9: Elevator Machine Rooms**

- 1-1/2 pair full-mortise spring hinges
- One (1) lockset with knob or lever handle
- Three (3) rubber silencers
- One (1) crash stop
- One (1) threshold
- One (1) kick plate
- One (1) kick-down door holder

J. **Hardware Set 10: Basement/Cellar Doors**

- 1-1/2 pair full-mortise spring hinges
- Three (3) rubber silencers
- One (1) threshold
- One (1) cylindrical lockset with knob or lever handle
- One (1) kick-down door holder
- One (1) kick plate
- One automatic door bottom designed to prevent rodents from entering.

END OF SECTION 087111