



Specification Section 08710 Door Hardware

July 13, 2010

Revision 2

SAND 2010-2598 P

This document has been reviewed by a Derivative Classifier, and its contents have been deemed unclassified/unlimited release.



Table of Contents

	Page
PART 1 – GENERAL	3
1.01 Summary	3
1.02 References	3
1.03 Submittals.....	3
1.04 Quality Assurance	3
1.05 Delivery, Storage, and Handling	3
1.06 Warranty	3
PART 2 – PRODUCTS.....	3
2.01 Acceptable Manufacturers	3
2.02 General Hardware Schedule.....	3
2.03 Butt Hinges	3
2.04 Electrical–Power Transfer	3
2.05 Cylindrical Lever Locksets	3
2.06 Combination Locksets.....	3
2.07 Exit Devices	3
2.08 Door Coordinator.....	3
2.09 Closers	3
2.10 Door Trim.....	3
2.11 Electromagnetic Door Holders	3
2.12 Manual Flush Bolts	3
2.13 Electric Strike	3
2.14 Low–Energy Power–Operated Door Openers	3
2.15 Auxiliary Hardware.....	3
2.16 Finishes	3
PART 3 – EXECUTION.....	3
3.01 Inspection.....	3
3.02 Preparation	3
3.03 Installation.....	3
3.04 Schedule	3

Change Log

Rev. No.	Changed By	Date	Change Description	Pages Changed
1	DBH/JCG	6/14/10	Placed specification in standard FMOC format, and edited it for punctuation and grammar. Updated content for hardware related to security applications.	All
2	DBH/JCG	7/13/10	Updated requirements for Preliminary Hardware Submittal Conference and made further format improvements.	Chapter 1.03.d and 1.03.e

NOTICE

Edit this document before use.

Use this section 08710 as a guide for preparing door hardware specifications and hardware schedules for construction projects at Sandia National Laboratories (SNL). Acceptable hardware manufacturers and specific hardware items are included in this guide. SNL has standardized on Sargent® locksets for general applications. Other hardware items are described generically referencing American National Standards Institute (ANSI) standards developed by Builders Hardware Manufacturers Association (BHMA). Edit this section for a specific project, and generate a hardware schedule listing hardware items required for each door opening. Additional hardware items need to be added and nonapplicable items deleted. Select the applicable options listed between the symbols []. Notes to assist the Construction Specifier in editing of the specification guide and selecting options is emphasized in bold text and indicated with the symbols ***** .

Throughout this section, there is reference to other specification sections that might be contained in the project manual. These references are examples and coordination reminders.

For the final document, delete all brackets, notes, and text in light blue boxes.

Part 1 - General

1.01 Summary

A. This section includes hardware for doors.

B. Related sections:

1. Section 06400, *Interior Architectural Woodwork* for cabinet hardware
2. Section 08110, *Steel Doors and Frames*
3. Section 08210, *Wood Doors*
4. Section 08361, *Overhead Sectional Steel Doors* for hardware provided by overhead-door manufacturers

1.02 References

A. American National Standards Institute (ANSI)

Number	Title
ANSI A115 Set Steel	Steel Door and Frame Preparation for Hardware
ANSI A115 Set Wood	Wood Door Hardware Standard
ANSI A156.1	Butts and Hinges
ANSI A156.3	Exit Devices
ANSI A156.4	Door Controls - Closers
ANSI A156.6	Architectural Door Trim
ANSI A156.7	Template Hinge Dimensions
ANSI A156.15	Closer Holder Release Devices
ANSI A156.16	Auxiliary Hardware
ANSI A156.21	Thresholds
ANSI A156.22	Door Gasketing Systems
ANSI A156.26	Continuous Hinges
ANSI A612	Pressure Vessel Plates, Carbon Steel, High Strength, for Moderate and Lower Temperature Service
ANSI A250.6	Hardware on Steel (Reinforcement-Application)
ANSI J405	Push/Pull/Kick Plates

B. American National Standards Institute/Builders Hardware Manufacturer's Association (ANSI/BHMA)

Number	Title
ANSI A156.2	Bored and Preassembled Lock and Latches. Same as BHMA 601.
ANSI A156.19	Power Assist and Low-Energy Power-Operated Doors

C. American Society of Testing and Materials (ASTM)

Number	Title
ASTM E90	Laboratory Measurement of the Sound Transmission Loss of Door Panels and Door Systems
ASTM E413	Classification for Rating Sound Insulation

D. Architectural Hardware Consultant (AHC)

E. Builder Hardware Manufacturers Association (BHMA)

F. Door and Hardware Institute (DHI)

- Sequence and format for the Hardware Schedule

G. Factory Mutual (FM)

H. International Code Council (ICC)

Number	Title
IBC 2006	Positive Pressure Fire Tests of Door Assemblies.
IBC 2006	Standard for Fire Doors and Other Opening Protectives

I. International Code Council/American National Standards Institute (ICC/ANSI)

J. ADA and ABA Accessibility Guidelines for Buildings and Facilities, Part II: ABA Application and Scoping

K. Underwriters Laboratories (UL)

- UL 10C Standard for Positive Pressure Fire Tests of Door Assemblies

1.03 Submittals

A. Submit in accordance with Section 01330, *Submittal Procedures*:

1. Product data for each hardware item, including function descriptions, materials, finishes, dimensions, power requirements for electrified items, and installation and interface requirements.
2. Shop drawings illustrating special installation requirements and diagrams for wiring electrified items and interface with fire alarm, security, and access-control system.
3. Hardware Schedule: Format in accordance with the DHI Sequence. Organize hardware sets in the same sequence as the Hardware Schedule in Part 3.
4. Keying: Provide schedule detailing final keying and indexing key sets to designated doors.
5. Certificates documenting:
 - a. Hardware items comply with ANSI 156, Grade 1 in accordance with Paragraph [1.04.B].

***** Include the following paragraph if fire-rated doors are required. *****
 - b. Items being provided for fire-rated assemblies have been successfully tested in accordance with Paragraph [1.04.E].

***** Include the following paragraph if sound-rated door assemblies are required. *****
 - c. Sound-Transmission Class: Showing compliance with Paragraph [1.4.F].
6. Manufacturer's instructions for preparing doors and frames to receive hardware and for hardware installation, adjustment, and maintenance.
7. Copy of warranties required by Paragraph [1.06] for review by Contracting Officer.

B. Submit in accordance with Special Construction Specification Section 01780, *Closeout Submittals*:

1. Operation and maintenance manuals.
2. Special wrenches, maintenance tools, and accessories as applicable to hardware items and as supplied by hardware manufacturer.

C. Preliminary Hardware Submittal Conference

1. Meet with the Architect, SNL Project Manager, SNL Architect, and the SNL Locksmith to review the Hardware Schedule submittal.
 - a. Review each room function and door operation required for that room and occupancy.
 - b. Confirm manufacturer and model number of hardware proposed to meet current SNL standards.
 - c. Identify any conflicts, changes, or modifications to the original layout that might modify the Hardware Schedule.
 - d. Discuss any security issues for the building and the impact that may have on the hardware and how it relates to access control, exiting requirements, or alarm considerations. Discuss

- the importance of proper accountability of security locks and cylinders and convey the information to subcontractors involved.
- e. The Contractor must consider all door locking devices, including locksets, internal lockset cylinders, and padlocks as Security Locks pending review by the SNL Security Locksmith. This includes but is not limited to work involving door removals, modifications, and replacements of existing security keys, padlocks, locksets, and internal lockset cylinders associated with the renovation or installation of rooms, doors, bunkers, fences, and transportainers. The Contractor must coordinate with the SNL Physical Security Lock and Key Program to conduct an evaluation to determine whether the Security Locksmith needs to remove and safeguard any locking devices, including the internal lockset cylinders. Security keys, padlocks, locks, and internal cylinders are to remain in the control of SNL Physical Security Lock and Key program and **are not** to be removed under any circumstances.
2. All participants at the conference must be familiar with the project and authorized to conclude matters relating to the Work.
 3. Record all significant conference discussions, agreements, and disagreements, including required corrective measures and actions.

1.04 Quality Assurance

A. Supplier Qualifications

Hardware must be scheduled and detailed by an Architectural Hardware Consultant (AHC) certified by the Door and Hardware Institute (DHI) or have 10 years of experience in the commercial finish hardware business. Hardware Consultant must be available to consult with Contracting Officer about the hardware submittal, the items provided, and the keying schedule.

B. Hardware must meet minimum requirements of ANSI A156, Grade 1.

C. The Sargent® Line 11 installation instructions and direction from the SNL Locksmith on specific installation requirements are provided in a one-hour training session to those individuals identified by the Contractor as responsible for the installation of door hardware. Attendance is mandatory for this training unless the Contractor is providing certified hardware installers for this project.

D. Handicapped Access

Door hardware on doors accessible to the handicapped must comply with ADA and ABA Accessibility Guidelines for Buildings and Facilities, Part II: ABA Application and Scoping.

E. Adjust hardware, and demonstrate that it functions properly. Replace damaged or defective hardware at no cost to Sandia National Laboratories (SNL).

**** Include and edit the following paragraph if fire-rated doors are required. ****

F. Fire-Rated Doors

Provide hardware complying with NFPA 80, identical to items tested and listed by Underwriters Laboratories (UL), or other nationally recognized testing agencies acceptable to SNL Site Fire Marshal. Include positive pressure testing. Units must bear testing agency labels.

**** Include the following paragraph if sound-rated door assemblies including door panel, frame, and hardware are required. ****

G. Sound-Transmission Class

Provide certificate that door assemblies, including door panel, frame, and hardware, have been tested in accordance with ASTM E90 and ASTM E413 to achieve sound-transmission class of STC [33] [45] [50] [_____].

1.05 Delivery, Storage, and Handling

- A. Ship door hardware to site in unopened boxes, clearly labeled with manufacturer's name and item description.
- B. Store and protect hardware until needed for installation.

1.06 Warranty

A. Provide under provisions of Section 01700, *Contract Closeout*:

1. Closers: Ten-year warranty against mechanical failure
2. Exit Devices: Five-year warranty against mechanical failure
3. Cylindrical Locks and Latch Sets: Seven-year warranty against mechanical failure
4. All Other Hardware: One-year warranty

Part 2 - Products

2.01 Acceptable Manufacturers

***** Only approved products may be substituted, except where noted.*****

- A. Exit Devices, Electrified Exit Devices, and Electrical-Power Transfers**
- Von Duprin; Indianapolis, In.; (www.vonduprin.com)
- B. Mechanical Pushbutton Combination Locks**
- Simplex, by Kaba-Ilco, Winston-Salem, NC (www.kaba-ilco.com)
- C. Butt Hinges**
1. Stanley; New Britain, CT; (www.stanleyworks.com)
 2. McKinney; McKinney Products Company; Scranton, PA
- D. Silencers, Door Bumpers, Mop Plates, Kick Plates, Stops/ HOLDERS, Flush Bolts, Push/Pull Latches**
- Trimco; Los Angeles, CA; (www.trimcobbw.com)
- E. Electrical Pushbutton Combination Lockset**
- Hirsch Electronics Corporation; Santa Ana, CA (www.hirshelectronics.com)
- F. Spin-Dial Combination Locks**
- Kaba Mas; Lexington, KY; (www.kaba-mas.com)
- G. High-Security Locks, Electric Exit Device Trim, and Electric Locking Hardware**
1. Lockmasters Incorporated; Nicholasville, KY; LMK 7003 w/ KABA MAS X-09
 2. Securitech; (www.securitech.com)
- H. Key-Removable Mullions: (Precision Exit Devices recommended for use with Securitech Electrified Trim products)**
- Precision Hardware, Inc.; Romulus, MI; (www.precisionhardware.com)
- I. Exit Devices with Electrical-Latch Retraction, Locksets, Padlocks, Door Closers, Mullions, and Latch Sets: (No substitutions allowed, except for Door Closers.)**
1. Sargent Manufacturing Company (ASSA Abloy, Inc.); New Haven, CT; (www.sargentlock.com).

2. Lockmasters Incorporated; Nicholasville, KY; LMK 7003 w/ KABA MAS X-09 for VTRs with fewer than 50 occupants

J. Electro-Magnetic Door Holders

1. Honeywell; (www.honeywell.com).
2. LCN; (www.lcnclosers.com).

K. Thresholds, Door-Gasketing Systems, and Astragals

- National Guard Products, Inc; Memphis, Tennessee; (www.ngpinc.com).

L. Low-Energy, Power-Operated Interior Door Openers: (No substitutions allowed.)

1. Horton Automatics; Corpus Christi, Texas; (www.hortondoors.com).
2. Lewis C. Norton (LCN), (www.lcnclosers.com).
3. Sargent Manufacturing Company (ASSA Abloy, Inc.); New Haven, CT; (www.sargentlock.com).
4. Wikk Industries, Inc.; Glendale, WI. (Switch only, not the operator.)

2.02 General Hardware Schedule

A. General

Hardware must be identified by ANSI as Grade One hardware where applicable. Where applicable, function must be as noted on Contract Documents or as chosen at time of submittals.

B. Opening Force

Maximum force for pushing or pulling open door must be 8.5 pounds (3.9kg) for exterior and 5 pounds (2.3kg) for interior doors.

C. Hand of Door

Refer to drawings for swing of each door leaf. Furnish hardware items suitable for indicated door movement.

D. Base Metals

Produce hardware units of basic metal and forming method indicated using the manufacturer's standard alloy, composition, temper, and hardness.

E. Hardware to conform to templates prepared for screw installation.

F. Furnish installation screws with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish of screws to match hardware finish.

G. Hex Bolts

Install door closers, door holders, and exit devices on wood doors with through bolts and hex nuts.

- H. Where possible, provide concealed fasteners for hardware items that are exposed when the door is closed. Do not use through bolts for installation where bolt head or nut is exposed on opposite face, except where it is not feasible to reinforce the work.**

I. Finishes

Finish for all hardware must be US26D, Plated, Satin Chrome, unless otherwise specified in Construction Documents.

J. Fire-Rated Door Hardware

Fire-rated door hardware must be listed and labeled by Underwriters Laboratories (UL) and Factory Mutual (FM) as "Fire Exit Hardware." Exit devices on fire-rated doors must not have dog-down capacity.

2.03 Butt Hinges

***** Electrical Hinges are not allowed.*****

A. Full-Mortise Hinges

1. Comply with ANSI A156.1 and ANSI A156.7.
2. Type: Full-mortise, antifriction, ball bearing, flat tip, five knuckles, ANSI Grade 1
3. Hinge weight:
 - a. Exterior, airlock entry doors, toilet-room entry door, and other doors with closers: Heavy weight. Use Stanley FBB168.
 - b. All other doors: Standard weight. Use Stanley FBB179.
4. Pins:
 - a. Nonremovable: Provide set screw to prevent pin removal when door is closed for the following:
 1. Out-swinging exterior doors
 2. Out-swinging interior doors with locks
 3. Vault-Type Room (VTR) doors
 - b. Provide all other doors with nonrising loose pins.
5. Pin tip: Flat button
6. Minimum number of hinges per door:
 - a. Door height to 59 inches: 2
 - b. Door height from 60 to 89 inches: 3

- c. Door height from 90 to 120 inches: 4
 - d. Door height above 120 inches: 4, plus one additional hinge per 30 inches
7. Minimum hinge height for 1-3/4-inch-thick door:
- a. Door width up to 42 inches: 4-1/2 inches
 - b. Door width over inches: 5 inches

**** Include the following paragraph if concealed monitoring switch is required. ****

8. Concealed switch: To monitor door position and interface with alarm or other security device, a concealed switch must be installed.

**** Include the following paragraph if geared continuous hinges are required. ****

B. Continuous Hinges

1. Comply with ANSI A156.26.
2. Type: Pin-less assembly of three interlocking aluminum extrusions applied to full height of door and frame without mortising. Gear together the door leaf and jamb leaf for the entire length of the hinge and join by a channel extrusion. Carry vertical loads by multiple thrust bearings. Coat the surfaces of working metal with dry lubricant.
3. Minimum weight capacity for 84-inch-high door:
 - a. Standard duty: 280 pounds
 - b. Heavy duty: 540 pounds

2.04 Electrical-Power Transfer

- A. Provide one each Electrical-Power Transfer on doors where electrified exit devices or other electrified locking hardware is specified elsewhere in the Construction Documents. Use only Von Duprin EPT-2.

2.05 Cylindrical Lever Locksets

A. Keyed Function Locksets and Nonkeyed Function Latch Sets

Keyed function locksets must remain secure after withstanding 2,400 inch-pounds of torque applied to the locked lever. All locksets must maintain horizontal lever position after two million cycles per ANSI A156.2. All locksets must be mountable without the use of through bolts and must fit in a standard 2-1/8-inch (55MM) bore. Locksets must fit a minimum door stile width of 4-1/4 inches (108mm). Lockset levers must not contain any plastic fillers and must be made of a solid material. Locksets must have 2-3/4-inch (70mm) backset, standard. Latch-bolt heads must be one-piece stainless steel, 7/8-inch (22mm) diameter x 1/2-inch (13mm) throw, 3/4-inch (19mm) throw for pairs of doors. Provide all keyed locksets with six-pin lock cylinders manufactured by Sargent Manufacturing Company; New Haven, CT. Provide lock cylinders in the Sargent "LA" keyway and

must be 1-bitted. SNL/NM Locksmiths provide proper restricted lock cylinder plugs and keying into the SNL/NM master key system.

***** SNL has standardized on Sargent® locksets for general applications. Sargent® has several "Lockset Lines," and SNL has most frequently used Lines 10 and 11 over the years, and currently requires the 11 Line series of locksets. Select the lockset that appropriately matches the performance of the door, and take into consideration requirements for security, life safety, and maintenance. Select various lock functions required for the project, and indicate function in appropriate hardware sets scheduled in Part 3. Add additional functions as required, and delete nonapplicable functions. *****

***** Standard Staff Offices (Single or Double) where locking devices are not required by the operational or programmatic needs of the building occupants: Schedule a latch set with the office passage function –11U15 latch-bolt-operated by lever from either side.

***** Schedule the following function for Privacy Bathroom Function Single-Occupant Bathrooms and Passage Functions. The latch set most frequency used in this application is Sargent 11 Line Series with following functions, but must be matched with the performance requirements of the door: *****

1. Passage-Function Latch Set; 28-11U15-LL. Latch-bolt-operated by lever from either side at all times. For all doors, including utility rooms, where keyed locksets, exit devices or other auxiliary locking devices are not specified. Outside lever is locked by pushbutton inside and unlocked by emergency release on outside, by rotating inside lever, or by closing door. Inside lever is always active.
2. Privacy-Bathroom Function for Single-Occupant Bathrooms; 28-11U65-LL. Outside lever is locked by pushbutton inside and unlocked by emergency release on outside, by rotating inside lever, or by closing door. Inside lever is always active.

***** Schedule the following function for Multioccupant Toilet Rooms, provide auxiliary latch sets. The latch set most frequency used in this application is Sargent 11 Line Series with following functions, but must be matched with the performance requirements of the door: *****

3. Multioccupant Toilet Room Door Latch Sets and Push/Pull: For fire-rated doors, use lever set + closer, 28-11U15-LL, passage-function latch set. Latch-bolt-operated by lever from either side. For nonfire-rated doors use _____. Push/pull plates 4' x 16".
4. Classroom-Function Lockset; 28-11G37-LL. Either lever operates latch-bolt, except when outside lever is locked from inside. Pushing button in inside lever locks outside lever. Lever automatically releases when inside lever is turned or key is rotated in locked outside lever. Pushbutton must be manually released. Latch-bolt is operated by key in outside lever or by rotating inside lever. Inside lever is always active.

***** Schedule the following function for exterior entrances requiring locked security at times while remaining open at other times. The latch set most frequency used in this application is Sargent 11 Line Series with the following functions, but must be matched with the performance requirements of the door. *****

5. Entrance-Function Lockset; 28-11G05-LL.

***** Schedule the following function for equipment, store room, and mechanical chase doors, and in electronic-access-control applications with jamb-mounted electric strikes. The latch set most frequency used in this application is Sargent 10 Line Series with following functions, but must be matched with the performance requirements of the door.

6. Store Room Function Lockset; 28-10G04-LL. Latch-bolt-operated by lever inside and by key in outside lever. Outside lever always locked, and inside lever always active.

***** Schedule the following function for use in Electronic-Access-Control application using through door circuit with electrical-power transfer, use only electronic door strike. The latch set most frequency used in this application is Sargent 10 Line Series with following functions, but must be matched with the performance requirements of the door.

7. Electromechanically (Fail-Secure) Function Lockset; 28-10G71-LL.
8. Electromechanically (Fail-Safe) Function Lockset; 28-10G70-LL.

***** Schedule the following function for use on roof-access doors. The latch set most frequently used in this application is Sargent 11 Line Series with the following functions, but must be matched with the performance requirements of the door. *****

9. Asylum-Function Lockset; 28-11G17-LL.

2.06 Combination Locksets

A. Spin-Dial Combination Lock

Must meet federal standard FF-L-2740A. Security lock must be resistant to X-ray imaging with spy-proof Centi-spline dial. Provide pedestrian door deadbolt with strike type 1, 2, 3, or 9 and a key override module. Procure from Defense Supply Center Philadelphia (DSCP), 700 Robbins Avenue, Philadelphia, PA 19111. Telephone 215-737-2218 National Stock Number (NSN) 5340-01-469-5906. If other than #1 strike is needed call DOD Lock Program Hotline at 800-290-7607. Refer to section 2.07.A.4 for exit devices in High-Security applications.

1. For single doors and double doors with removable or fixed center mullion, exit device must be Sargent 80 Series reversible rim device . The device must have appropriate strike and lever handle trim for application and function.
 - a. For hollow-metal or extruded-aluminum storefront nonfire-rated doors with a minimum stile width of 4 ¾-inch, provide Sargent Model 8888 x ETL with Model 641 strike. Doors with Vision Lite frames or moldings protruding at device-mounting location, provide Sargent 80 Series with appropriate strike. At double doors add Sargent steel-removable mullions. Where contract specifies key-removable mullion, provide Precision Model AKR822 head cap.
 - b. For fire-rated doors, provide Sargent Model 12-8888 x ETL with Model 649 strike. Doors with Vision Lite frames or moldings protruding at device-mounting location, provide Sargent 80 Series with appropriate strike. Add Sargent fire-rated steel-removable mullions at double doors.

B. Mechanical Pushbutton Combination Lock

Provide Simplex Unican Left-Hand LL1021B-26D-41, Right-Hand LR 1021B-26D-41 with key bypass.

1. Electrical Pushbutton Combination Lock: Provide electrical pushbutton combination locks activated by using keypad to enter personal identification number. Provide Infographics keypads and controllers per Contract Documents.
2. Provide mechanical override in event of power failure.
3. Provide system with computerized audit trail of usage and access.
4. Keypads and Controllers: Single keypad installed at door opening: Model manufactured by Infographics.

2.07 Exit Devices

A. Exit Devices

Provide exit device only where specified on Contract Documents. Exit-device latch-bolts must release by depressing actuating push pad.

1. For single doors and double doors with removable or fixed center mullion, exit device must be Sargent 80 Series, Precision 1100 or Von Duprin 90 series reversible rim device. The device must have appropriate strike and lever handle trim for application and function.
 - a. For hollow-metal or extruded-aluminum storefront nonfire-rated doors with a minimum stile width of 4 ¾-inch, provide Sargent Model 8888 x ETL with Model 641 strike. Doors with Vision Lite frames or moldings protruding at device-mounting location, provide Precision Models 1100-1800, based on situation, Sargent 80 Series or Von Duprin 90 Series with appropriate strike. At double doors add Precision, Sargent, or Von Duprin steel-removable mullions. Where contract specifies key-removable mullion, provide Precision Model A-KR822 head cap.
 - b. For fire-rated doors, provide Sargent Model 12-8888 x ETL with Model 649 strike. Doors with Vision Lite frames or moldings protruding at device-mounting location, provide Precision Models 1100-1800, based on situation, Sargent 80 Series or Von Duprin 90 Series with appropriate strike. Add Precision, Sargent, or Von Duprin fire-rated steel-removable mullions at double doors.
 - c. For extruded-aluminum narrow-stile storefront doors with a minimum stile width of 1 ¾-inch, provide Sargent 8500 x ETL, Precision 1400 on standard hollow-metal door or on wood door, use narrow-mullion Von Duprin 33 Series rim device.
2. For pair of active doors without center mullion, exit devices on each leaf must be Sargent 8700 Series, Precision 1200 series or Von Duprin 90/33 Series surface vertical rod exit devices. The device must have appropriate strikes and lever-handle trim for application and function.
 - a. For hollow-metal or extruded-aluminum storefront nonfire-rated doors with a minimum stile width of 4 ¾-inch, provide Sargent Model 8713 x 713-8 ETL with Model 629 top strike and Model 624 bottom strike. Doors with Vision Lite frames or molding protruding at device-

- mounting location, provide Precision Model 1208 x 39LA with Model 1200-06 top strike and 020-97 bottom strike.
- b. For fire-rated doors, provide Sargent Model 12-8713 x ETL with Model 629 top strike and Model 624 bottom strike. Doors with Vision Lite frames or moldings protruding at device-mounting location, provide Precision Model FL-1208 x 39LA with Model 1200-06 top strike and 020-97 bottom strike.
 - c. For extruded-aluminum narrow storefront doors with a minimum stile width of 1 ¾-inch, provide Sargent 8413 x ETL concealed-rod device or Precision 1608 x 29LA concealed-rod device. For double doors, use Sargent 650A mullion or Precision 815 mullion.
3. For single doors and double doors with removable- or fixed-center mullion, and which are indicated to be unlocked using an electrical actuation device (for example, badge reader, keypad), provide Von Duprin EL99 Series exit device with electric-latch retraction, Precision EL 1100 Series exit device with electric-latch retraction or Sargent 80 Series with electric-latch retraction. The device must be provided with the manufacturer's specified power supply, appropriate strike, and lever handle trim. All electrical-actuated devices actuated using an electronic access-control systems must have outside lever trim, which remains in a locked position at all times. Key override retracts latch-bolt, but does not unlock lever.
 - a. For hollow-metal or extruded-aluminum storefront nonfire-rated doors with a minimum stile width of 4 ¾-inch, provide Von Duprin Model EL99NL x 992L-NL. Doors with Vision Lite frames or moldings protruding at device mounting location provide Precision Model ELR1103 x 39LA with Model 1200-06 strike. At double doors add Precision Model 822 steel removable mullions. Where contract specifies key removable mullion provide Precision Model A-KR822 head cap. Use device manufacturer's specified power supplies and Von Duprin Electric Power Transfer Model EPT or equal.
 - b. At fire-rated doors, provide Von Duprin Model 99-F-EL99NL x 992L-NL or Precision Model FL-ELR1103 x 39LA. At double doors, provide Precision Model FL-822 fire-rated steel-removable mullions. Where contract specifies key-removable mullion, provide Precision Model A-FL-KR822 head cap. Use device manufacturer's specified power supplies and Von Duprin Electric Power Transfer Model EPT or equal.
 - c. For extruded-aluminum narrow storefront doors with a minimum stile width of 1 ¾-inch, provide Von Duprin EL33NL x 370L or Precision ELR1403 x 29LA rim device. For double doors, use Sargent 650A mullion or Precision 815 mullion. Use device manufacturer's specified power supplies and Von Duprin Electric Power Transfer Model EPT-10.
 4. For Vault-Type Rooms (VTRs) and High-Security Buildings (HSBs): Provide a KABA MAS X-09 spin dial with electric strike (as specified in section 2.06) and the following:
 - a. On outward swinging doors, provide the LKM 7003 series lockset.
 - b. On inward swinging doors, provide the LKM 7003 series lockset and on the additional exit doors, provide standard door hardware on internal side and a blank face on the external side.
 - c. On inward swinging doors without an additional exit door and approved by the Site Fire Marshal, provide the lockset as indicated on the drawings.
 - d. Provide a Sargent Removable-Core Rim Cylinder housing satin chrome part # 6034-26D.

- e. Coordinate installation of bypass cylinder with SNL Security Lock and Key service, by calling the FMOC Request Desk at 844-4571.

2.08 Door Coordinator

- A. Comply with ANSI A156.3, Grade 1.
- B. Provide coordinator at all pairs of active doors without center mullion. Use Sargent Model 3487 with Model 3497 carry-open bar.
- C. Underwriters Laboratory—Listed for fire-rated openings.

2.09 Closers

A. Closers

Closers must be surface-mount-type with parallel arms, back check, key control valves, and 50% percent power adjustments, and must facilitate automatic closure of door. Provide Sargent Model EN351 series closers on exterior doors, interior fire-rated doors, doors with electromagnetic door holders, interior doors with exit devices, push-pull devices, auxiliary latch sets, and additional doors indicated on Contract Documents.

B. Compliance

1. ANSI A156.4, Grade 1, and BHMA Directory of Certified Door Closers.
2. ADA and ABA Accessibility Guidelines for Buildings and Facilities for reduced-opening force requirements.
3. UL-listed for doors without hold-open.
4. IBC 2006 positive-pressure fire test.

C. Operation

One valve must control the closing speed and the second valve controls the latching speed. Must be equipped with a fully adjustable back-check and selector valve.

- D. Provide an adjustable hold-open arm where indicated in the Hardware Schedule or required functionally.
- E. Provide an auxiliary stop where the door cannot swing open 180 degrees or as indicated in Hardware Schedule.
- F. Provide brackets, drop plates, through bolts and grommet nuts, and other required accessories for mounting.

G. Cover

Must be plastic with painted finish.

2.10 Door Trim

A. Comply with ANSI A156.6.

B. Kick Plates

Heavy-Duty, 16-gauge (2mm) smooth-surface metal. Provide Trimco K-.050 – 12 inches x 34 inches (306 mm x 867 mm) US26D LDW on push side of doors scheduled for exit devices, on both side of doors with push-pull devices or auxiliary latch sets; ANSI J102.

C. Push-Pull Plates

Heavy-Duty, 4 inches x 16 inches (102 mm x 408 mm), straight loop pull; ANSI J405.

2.11 Electromagnetic Door Holders

A. Comply with ANSI A156.15, Grade 1.

B. Electromagnetic Door Holder

Provide electromagnetic door-holder device only when specified in contract documents. The device must be Underwriters Laboratory (UL)-listed and Factory Mutual (FM)-approved and must be fail-safe, conforming to NFPA 72, NFPA 80, and NFPA 101. Release device must automatically release by power interruption and manually release by some simple and readily obvious operation.

Provide Honeywell, NOTIFIER FM Series or equal for 120 VAC. Provide appropriate floor-mount pedestal where needed for floor-mount installation.

1. In new construction, flush-mount door holder where indicated to be installed on walls.
2. In renovation work, surface-mount door holder where indicated to be installed on walls.

Provide LCN 4040SE Series when wall- or floor-mounting device is not appropriate. The 4040SE or SE(L) is a heavy duty, nonhanded, nonsized closer/holder designed to provide single-point hold-open for fire and smoke barrier doors.

2.12 Manual Flush Bolts

A. Comply with ANSI 156.16.

B. Top and bottom manual flush bolts must be Trimco 3917.

2.13 Electric Strike

- A. Comply with ANSI 156.16.
- B. When noted elsewhere in contract documents, provide heavy-duty electric strikes fully compatible with door, frame, and hardware specified for intended application. Strike must have latch-bolt monitoring capability. Provide HES (ASSA ABLOY) 1006 series electric strike or equal.

2.14 Low-Energy Power-Operated Door Openers

A. Low-Energy Power-Operated Door Openers

On specified doors only, provide power-operated door openers. The power opener must be low-energy, self-contained electric-operating mechanism. It must be powered open with DC motor working through reduction gears.

1. The motor must be off when door is in closing mode.
2. The door must be capable of being manually opened or closed with power on or off without damage to mechanism.
3. The opener must include the following variable adjustments in compliance with ANSI/BHMA A156.19:
 - a. Opening Speed: Three to five seconds
 - b. Closing Speed: Three to five seconds
 - c. Time Delay Before Closing: Five to fifteen seconds
4. Opening and closing force, measured 2 inches (51 mm) out from lock stile of door, must not exceed 15 pounds (6.8 kg) of force to stop door when operating in either direction.
5. The opener must include means of turning off opening force when door is stopped for one second. After stopping door, it should then close, and opener must reset itself to accept another signal.
6. Mount the opener in an extruded aluminum cover.
7. Provide two 6-inch (152 mm) round stainless steel push plate control switches marked "Handicapped" on each side of opening, unless otherwise indicated in contract documents.

- OR -

8. (Preferred Alternative Switch) Provide a single-bar switch.

**** I-36 INGRESSOR 6 inches wide, 36 inches tall: Model # I36-5 clear anodized aluminum with blue logo ****

2.15 Auxiliary Hardware

A. Auxiliary Hardware

Provide auxiliary hardware only where specified herein or elsewhere on contract documents.

1. Combination-stop and holder device must be Trimco Model 1224-5, manually operated device.
2. Provide concave wall-mount door bumpers at doors opening onto adjacent walls. Provide Trimco Model W1270-W x CP x Pl Series with appropriate fasteners.
3. Provide floor-mount door bumpers on doors where wall-mount door bumpers are not required. Provide Trimco Model W1210ES Series.
4. Provide Trimco Model 1229A neoprene door silencers on nonfire-rated doors. Provide three per door.
5. Provide flexible-silicone-rubber smoke seal on fire-rated doors in compliance with ANSI A156.22. Use NGP 2525 x door size.
6. Provide weather-stripping, door sweeps, and threshold at exterior doors in compliance with ANSI A156.21 and A156.22.
 - a. Provide NGP 160 weather-stripping at all nonfire-rated exterior doors.
 - b. Provide NGP 200 NA door sweep at exterior doors.
 - c. Provide NGP 424E threshold at exterior doors.
7. Astragal:
 - a. Provide NGP 125 NGA astragal for all other fire-rated and nonfire-rated double doors without center mullion where security astragal is not specified.
 - b. Provide security astragal on exterior pairs of doors without center mullions and exit devices. Provide NGP 139 SP.
8. Automatic door bottoms for both fire-rated and nonfire-rated doors must be NGP 420NA. Comply with ANSI A156.22.

2.16 Finishes

- A. Finishes for all door hardware must comply with ANSI A612, US26D, Plated, Satin Chrome except otherwise scheduled.

Part 3 - Execution

3.01 Inspection

- A. Prior to installation, verify that doors and frames are ready to receive hardware. Verify that hardware is free of surface defects, warping, and other defects that might impede performance of hardware.

3.02 Preparation

- A. Prepare doors and frames to receive new hardware items.
 - 1. For steel doors and frames, comply with ANSI/DHI A115-Set Steel series.
 - 2. For wood doors, comply with ANSI/DHI A115-Set Wood series.
 - 3. Surface-applied door hardware: Drill and tap doors and frames according to ANSI A250.6.
- B. Use manufacturer-provided templates. Cuts must be straight and smooth without jagged edges. File and grind edges to provide smooth appearance.
- C. Reinforce cutouts as required to provide rigidity and support.

3.03 Installation

- A. Install hardware in accordance with manufacturer's instructions.
- B. Locate hardware from finished floor in accordance with DHI publications, unless shown otherwise on drawings.
 - 1. Butt Hinges: Install minimum of 1-1/2 pair per door on doors no taller than 7' and 2" (2.18 m), otherwise; install two pairs of butt hinges per door.
 - 2. Lock and Latches: Install locks and latches at 36 inches (914 mm) above bottom of door.
 - 3. Dial and Pushbutton Combination Locks: Contractor must coordinate and schedule the installation of combination locks in High-Security Areas. The SNL-designated Locksmith must install combination locks. Install per manufacturer's installation instructions at 42 inches (1.07 m) above finish floor.
 - 4. Push-Plate Control Switches: Install 6-inch (152 mm) round push-plate control switches at 9 inches (229 mm) and 39 inches (991 mm) above finish floor to center line of round plates. Two plates are required on each side of opening.
 - 5. Wikk I-36 INGRESS'R™ Control Switch: Install 6 inches above finished floor to bottom of switch. Provide side-to-side clearances that comply with the ADA and ABA Accessibility Guidelines for Buildings and Facilities, Part II: ABA Application and Scoping.

6. Thresholds: Set thresholds for exterior doors in full bed of sealant complying with requirements specified in Section 07900, *Joint Sealants*.
- C. Protect hardware finish until painting and other work is completed.
 - D. Adjust operating hardware, thoroughly clean, and polish in accordance with manufacturer's instructions.

3.04 Schedule

- A. Requirements for design, grade, function, finish, size, and other distinctive qualities are in the hardware schedule. Products are identified by [ANSI 156 reference numbers] [and] [using manufacturer's hardware model numbers].
- B. **Manufacturer's Product Designation**

Manufacturers are listed for hardware items to establish minimum requirements. Provide product designated in Paragraph 2.1 for specific hardware category.
- C. Items must be proper type for attaching securely to specific project substrate.

END OF SECTION