UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated January 2021
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DIVISION 08 - OPENINGS

SECTION 08 71 00

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02/16, CHG 3: 08/20

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USACE / NAVFAC / AFCEC / NASA	**UFGS-08 71 00 (February 2016)** **Change 3 - 08/20**
Preparing Activity: NAVFAC	**Superseding** **UFGS-08 71 00 (August 2008)**

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SECTION 08 71 00

DOOR HARDWARE

02/16, CHG 3: 08/20

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NOTE: This guide specification covers the requirements for finish hardware for permanent structures. All items of finish hardware necessary for completion of the project and not specified in other sections should be included in this section.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable item(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).

****

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NOTE: On the drawings, show:

1. Location, class, and hourly rating of fire doors;

2. Location and installation details for blocking behind door stops (wall bumpers) mounted on wallboard partitions; and

3. Either hardware set numbers (e.g. HW-2) in the door schedule, or list doors by number in each hardware set.

****

PART 1 GENERAL

1.1 REFERENCES

****

NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a Reference Identifier (RID) outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

****

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM E283	(2019) Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
ASTM F883	(2013) Padlocks

BUILDERS HARDWARE MANUFACTURERS ASSOCIATION (BHMA)

ANSI/BHMA A156.1	(2016) Butts and Hinges
ANSI/BHMA A156.2	(2017) Bored and Preassembled Locks and Latches
ANSI/BHMA A156.3	(2014) Exit Devices
ANSI/BHMA A156.4	(2013) Door Controls - Closers
ANSI/BHMA A156.5	(2020) Cylinder and Input Devices for Locks
ANSI/BHMA A156.6	(2015) Architectural Door Trim
ANSI/BHMA A156.7	(2016) Template Hinge Dimensions
ANSI/BHMA A156.8	(2015) Door Controls - Overhead Stops and Holders

ANSI/BHMA A156.10	(2017) Power Operated Pedestrian Doors
ANSI/BHMA A156.12	(2013) Interconnected Locks & Latches
ANSI/BHMA A156.13	(2017) Mortise Locks & Latches Series 1000
ANSI/BHMA A156.14	(2013) Sliding and Folding Door Hardware
ANSI/BHMA A156.15	(2015) Release Devices Closer Holder, Electromagnetic and Electromechanical
ANSI/BHMA A156.16	(2018) Auxiliary Hardware
ANSI/BHMA A156.17	(2019) Self Closing Hinges & Pivots
ANSI/BHMA A156.18	(2016) Materials and Finishes
ANSI/BHMA A156.19	(2013) Power Assist & Low Energy Power Operated Doors
ANSI/BHMA A156.21	(2019) Thresholds
ANSI/BHMA A156.22	(2017) Door Gasketing and Edge Seal Systems
ANSI/BHMA A156.23	(2010) Electromagnetic Locks
ANSI/BHMA A156.24	(2012) Delayed Egress Locking Systems
ANSI/BHMA A156.25	(2013) Electrified Locking Devices
ANSI/BHMA A156.26	(2012) Continuous Hinges
ANSI/BHMA A156.27	(2011) Power and Manual Operated Revolving Pedestrian Doors
ANSI/BHMA A156.29	(2012) Exit Locks, Exit Alarms, Alarms for Exit Devices
ANSI/BHMA A156.30	(2014) High Security Cylinders
ANSI/BHMA A156.31	(2013) Electric Strikes and Frame Mounted Actuators
ANSI/BHMA A156.36	(2010) Auxiliary Locks

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2020; ERTA 20-1 2020; ERTA 20-2 2020; TIA 20-1; TIA 20-2; TIA 20-3; TIA 20-4) National Electrical Code
NFPA 72	(2019; TIA 19-1; ERTA 1 2019) National Fire Alarm and Signaling Code
NFPA 80	(2019) Standard for Fire Doors and Other Opening Protectives
NFPA 101	(2021) Life Safety Code

NFPA 252	(2017) Standard Methods of Fire Tests of Door Assemblies

STEEL DOOR INSTITUTE (SDI/DOOR)

SDI/DOOR A250.8	(2017) Specifications for Standard Steel Doors and Frames

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

36 CFR 1191	Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines

UNDERWRITERS LABORATORIES (UL)

UL 14C	(2006; Reprint Jul 2017) UL Standard for Safety Swinging Hardware for Standard Tin-Clad Fire Doors Mounted Singly and in Pairs
UL Bld Mat Dir	(updated continuously online) Building Materials Directory

1.2 SUBMITTALS

****

NOTE: Review Submittal Description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list, and corresponding submittal items in the text, to reflect only the submittals required for the project. The Guide Specification technical editors have classified those items that require Government approval, due to their complexity or criticality, with a "G." Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a "G" to an item if the submittal is sufficiently important or complex in context of the project.

For Army projects, fill in the empty brackets following the "G" classification, with a code of up to three characters to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

The "S" classification indicates submittals required as proof of compliance for sustainability Guiding Principles Validation or Third Party Certification and as described in Section 01 33 00 SUBMITTAL PROCEDURES.

Choose the first bracketed item for Navy, Air Force, and NASA projects, or choose the second bracketed item for Army projects.
****

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NOTE: If sustainable door hardware is available, choose bracketed option.
****

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are [for Contractor Quality Control approval.][for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Manufacturer's Detail Drawings; G[, [_____]]

Verification of Existing Conditions; G[, [_____]]

Hardware Schedule; G[, [_____]]

Keying System; G[, [_____]]

SD-03 Product Data

Hardware Items; G[, [_____]]

****
NOTE: For special hardware items requiring shop drawings, add submittal requirement for SD-04, Drawings. Do not require shop drawings for standard commercial hardware.
****

SD-08 Manufacturer's Instructions

Installation

SD-10 Operation and Maintenance Data

Hardware Schedule Items, Data Package 1; G[, [_____]]

SD-11 Closeout Submittals

Key Bitting

1.3 SHOP DRAWINGS

Submit manufacturer's detail drawings indicating all hardware assembly components and interface with adjacent construction.[Indicate power components and wiring coordination for electrified hardware.] Base shop drawings on verified field measurements and include verification of existing conditions.

1.4 PRODUCT DATA

Indicate fire-ratings at applicable components. Provide documentation of ABA/ADA accessibility compliance of applicable components, as required by 36 CFR 1191 Appendix D - Technical.

1.5 HARDWARE SCHEDULE

Prepare and submit hardware schedule in the following form:

Hardware Item	Quantity	Size	Reference Publi-cation Type No.	Finish	Mfr Name and Catalog No.	Key Control Symbols	UL Mark (If fire-rated and listed)	BHMA Finish Desig-nation

In addition, submit hardware schedule data package 1 in accordance with Section 01 78 23 OPERATION AND MAINTENANCE DATA.

1.6 KEY BITTING CHART REQUIREMENTS

1.6.1 Requirements

Submit key bitting charts to the Contracting Officer prior to completion of the work. Include:

a. Complete listing of all keys (e.g. AA1 and AA2).

b. Complete listing of all key cuts (AA1-123456, AA2-123458).

c. Tabulation showing which key fits which door.

d. Copy of floor plan showing doors and door numbers.

e. Listing of 20 percent more key cuts than are presently required in each master system.

1.7 QUALITY ASSURANCE

1.7.1 Hardware Manufacturers and Modifications

Provide, as far as feasible, locks, hinges,[pivots,] and closers of one lock, hinge,[pivot,] or closer manufacturer's make. Modify hardware as necessary to provide features indicated or specified.

1.7.2 Key Shop Drawings Coordination Meeting

Prior to the submission of the key shop drawing, the Contracting Officer, Contractor, Door Hardware Subcontractor, using Activity and Base Locksmith must meet to discuss and coordinate key requirements for the facility.

1.8 DELIVERY, STORAGE, AND HANDLING

****

NOTE: Whenever construction master keying is

required, permanent keys (and removable cores) should be sent directly to the Contracting Officer.
****

Deliver hardware in original individual containers, complete with necessary appurtenances including fasteners and instructions. Mark each individual container with item number as shown on hardware schedule.[Deliver permanent keys[and removable cores] to the Contracting Officer, either directly or by certified mail. Deliver construction master keys with the locks.]

PART 2 PRODUCTS

2.1 TEMPLATE HARDWARE

Hardware applied to metal [or to prefinished]doors must be manufactured using a template. Provide templates to door and frame manufacturers in accordance with ANSI/BHMA A156.7 for template hinges. Coordinate hardware items to prevent interference with other hardware.

2.2 HARDWARE FOR FIRE DOORS AND EXIT DOORS

Provide all hardware necessary to meet the requirements of NFPA 72 for door alarms, NFPA 80 for fire doors, NFPA 101 for exit doors, NFPA 252 for fire tests of door assemblies, ABA/ADA accessibility requirements, and all other requirements indicated, even if such hardware is not specifically mentioned in paragraph HARDWARE SCHEDULE.[Provide swinging hardware for tin-clad fire doors in accordance with UL 14C.] Provide Underwriters Laboratories, Inc. labels for such hardware in accordance with UL Bld Mat Dir or equivalent labels in accordance with another testing laboratory approved in writing by the Contracting Officer.

2.3 HARDWARE ITEMS

****
NOTE: It is essential for the specifier to have current editions of the ANSI/BHMA A156 series standards, available online at http://www.buildershardware.com from Builders Hardware Manufacturers Association, 355 Lexington Avenue, 15th Floor, New York, New York, 10017. For Department of Defense (DoD) employees, these standards are available through the Whole Building Design Guide (WBDG) / IHS. The specifier should also have publications of the ANSI/BHMA A156 series Standards, for guidance in selecting and scheduling finish hardware.

Levels of quality are standardized for particular hardware items in the ANSI/BHMA A156 Standards. These product grades (grade 1, 2, or 3 - with grade 1 being the highest) are defined by progressive levels of performance benchmarks in each applicable ANSI/BHMA standard. The grade of any particular architectural hardware item can also be ascertained by looking at its BHMA product number. This standardized BHMA numbering system also delineates other important classification information, such as the predominant material used, product category, and

function of a specific hardware item.
****

****
NOTE: For projects at Camp Lejeune and New River:

1. Specify Series 4000, Grade 1, locks and latches with 70 mm 2-3/4 inch backset.

2. Specify interchangeable cores with seven pin tumblers.

3. Specify "All locks must have interchangeable cores of Grade 1 products from one manufacturer. Verify manufacturer compliance with existing Base hardware systems."

4. For offices, entrances, classrooms, and maintenance shops, specify lock function F81, unless F82 or F84 is more appropriate.

5. For mechanical rooms and pipe chases, specify lock function F86 (storeroom lock, outside knob always rigid).

6. For sleeping room doors, specify one deadbolt, E2151, with concealed mounting screws, and one latch set, F75.

7. For Bachelor Enlisted Quarters (BEQs), require a separate master keying system for each floor of each building.
****

Clearly and permanently mark with the manufacturer's name or trademark, hinges, pivots, locks, latches, exit devices, bolts and closers where the identifying mark is visible after the item is installed. For closers with covers, the name or trademark may be beneath the cover. Coordinate electrified door hardware components with corresponding components specified in Division 28 ELECTRONIC SECURITY SYSTEMS (ESS).

2.3.1 Hinges

Provide in accordance with ANSI/BHMA A156.1. Provide hinges that are 114 by 114 mm 4-1/2 by 4-1/2 inch unless otherwise indicated. Construct loose pin hinges for interior doors and reverse-bevel exterior doors so that pins are non-removable when door is closed. Other anti-friction bearing hinges may be provided in lieu of ball bearing hinges.

****
NOTE: Use full-mortise (butt) hinges except where special types are required. Use swing-clear hinges where necessary to keep door opening completely clear when door is opened 90 to 95 degrees. Use wide-throw hinges where necessary to keep door leaf clear of wall, casings, jambs, or reveals. Use antifriction-bearing hinges on high-frequency or extra-heavy doors, and on doors equipped with closers. Use plain-bearing hinges on low-frequency

doors up to 900 mm 3 feet wide and without closers. Use hospital tips in neuropsychiatric areas of medical facilities. In general, full-mortise hinges for interior doors should be steel with BHMA 600 finish (primed for painting). Hinges on natural wood or plastic surfaced interior doors should be steel with BHMA 652 finish (satin chromium plated) or BHMA 639 finish (satin bronze plated) to match finish of other door hardware. Hinges for exterior doors should be stainless steel with BHMA 630 finish or solid brass or bronze with BHMA 626 finish. Use stainless steel with BHMA 630 finish on all exterior hinges in humid conditions or project locations with Environmental Severity Classifications (ESC) of C3 thru C5. Humid locations are those in ASHRAE climate zones 0A, 1A, 2A, 3A, 3C, 4C and 5C (as identified in ASHRAE 90.1). See UFC 1-200-01 for determination of ESC for project locations. Provide interior hinges at project locations with ESC classifications of C3 thru C5 of cast or forged bronze or stainless steel, Type 302 or 304. Fire rated doors must have base metal of steel or stainless steel. Plated steel hinges may rust if used on exterior doors. Use two hinges for doors 1500 mm 60 inch or less in height and one additional hinge for each additional 750 mm 30 inches (or fraction thereof) of door height.

1. Select and size hinges for lead lined, unusually heavy, and high-frequency doors on an individual basis.

2. The 114 by 114 mm 4-1/2 by 4-1/2 inch listed is for 44 mm 1-3/4 inch doors up to 915 mm 3 feet wide and with up to 20 mm 3/4 inch trim projection, and covers the majority of openings. For other doors, determine hinge width in accordance with:

Twice the door thickness plus trim projection, minus 13 mm 1/2 inch, or 2(t plus p) minus 1/2. If answer falls between regular hinge sizes, use nearest larger size. Formula is for hinges set back 6 mm 1/4 inch from edge of door.

Hinge Sizes Chart		
Thickness of Doors in mm	Width of Doors in mm	Height of Hinges (Length of Joint) in mm
22 to 29 screen	To 915	76
35	To 815	89
35	Over 815 to 940	102

Hinge Sizes Chart		
Thickness of Doors in mm	Width of Doors in mm	Height of Hinges (Length of Joint) in mm
44	To 915	114
44	Over 915 to 1220	127 Heavy Weight
44	Over 1220	152 Heavy Weight
51, 57, and 64	To 1065	127 Heavy Weight
51, 57, and 64	Over 1065	152 Heavy Weight

Hinge Sizes Chart		
Thickness of Doors in inches	Width of Doors in inches	Height of Hinges (Length of Joint) in inches
7/8 to 1-1/8 screen	To 36	3
1-3/8	To 32	3-1/2
1-3/8	Over 32 to 37	4
1-3/4	To 36	4-1/2
1-3/4	Over 36 to 48	5 Heavy Weight
1-3/4	Over 48	6 Heavy Weight
2, 2-1/4 and 2-1/2	To 42	5 Heavy Weight
2, 2-1/4 and 2-1/2	Over 42	6 Heavy Weight

****

[2.3.1.1 Protection Devices

****
NOTE: In accordance with UFC 4-740-14 Design: Child Development Centers provide finger guards to protect children's fingers from being crushed or injured in the hinge space of a door or gate.
****

Provide full height hand and finger protection device at the hinge-side area opening of doors and gates. Provide hinge-side protection devices on both sides of doors and gates, covering hinges and space between door and frame when doors are in the open position. The installed device must push hand and fingers out of the opening and away from a crushing hazard.

]2.3.2 Continuous Hinges

****

NOTE: For heavy duty doors, where required. See ANSI/BHMA A156.26 and manufacturers' literature for types available. Coordinate with security door specifications.

****

Where continuous hinges are required, provide in accordance with ANSI/BHMA A156.26.

2.3.3 Pivots

****

NOTE: For extra heavy doors, pivots are sometimes preferable to hinges, particularly on entrance doors and lead-lined doors. See ANSI/BHMA A156.4 and manufacturers' literature for types available.

****

Provide in accordance with ANSI/BHMA A156.17.

2.3.4 Spring Hinges

****

NOTE: Use spring hinges only where closers are not practicable and for gates at counters. Ensure that specified spring hinges are large enough and strong enough to serve their purpose adequately. See ANSI/BHMA A156.17 for types available. See manufacturers catalogs for recommendations on sizes, quantities, and styles of spring hinges.

****

Provide in accordance with ANSI/BHMA A156.17.

2.3.5 Locks and Latches

****

NOTE: Specify Series 1000, in paragraph MORTISE LOCKS AND LATCHES, for hollow metal doors where security is a major factor. See ANSI/BHMA A156.13, Appendix A, Users' Guide, for guidance on Security Grades.

For Unaccompanied Housing UH/BEQ sleeping room doors, specify electronic key card locks used in current industry standards. For Navy and Marine Corps UH spec writer should also confirm this locking requirement with FC 4-721-10N to ensure the sleeping room locking requirement has not changed. Check with activity housing managers to determine preference.

For doors between sleeping room and shared bath, use a privacy lock, F76, Grade 1, and a deadlock, E0151 (key by thumb turn) keyed like the sleeping room entrance door and with the key on the bathroom side.

****

****

NOTE: Choose the applicable paragraph(s) from the following.

****

****

NOTE: Insert this paragraph into all locks and locksets in humid conditions or project locations with Environmental Severity Classifications (ESC) of C3 thru C5. Humid locations are those in ASHRAE climate zones 0A, 1A, 2A, 3A, 3C, 4C and 5C (as identified in ASHRAE 90.1). See UFC 1-200-01 for determination of ESC for project locations.

****

[a. At exterior locations provide locksets of full stainless steel type 302 or 304 construction including fronts, strike, escutcheons, knobs, bolts and all interior working parts. Marine Grade I, fully non-ferrous.

b. In non-air-conditioned interior environments or humid interior environments, provide interior locksets on the same Marine Grade I, fully non-ferrous as exterior locksets.

]2.3.5.1 Mortise Locks and Latches

Provide in accordance with ANSI/BHMA A156.13, Series 1000, Operational Grade 1, Security Grade 2.[Provide factory installed lead lining in locks for lead shielded doors.][Provide mortise locks with escutcheons not less than 178 by 57 mm 7 by 2-1/4 inch with a bushing at least 6 mm 1/4 inch long. Cut escutcheons to fit cylinders and provide trim items with straight, beveled, or smoothly rounded sides, corners, and edges.] Provide knobs and roses of mortise locks with screwless shanks and no exposed screws.

2.3.5.2 Bored Locks and Latches

Provide in accordance with ANSI/BHMA A156.2, Series 4000, Grade 1.[Provide factory installed lead lining in locks for lead -shielded doors.]

2.3.5.3 Residential Bored Locks and Latches

****

NOTE: For temporary buildings and family housing only. Delete if not applicable. See ANSI/BHMA A156.2 for types available.

****

Provide in accordance with ANSI/BHMA A156.2, Series 4000, Grade 2. Install locks for exterior doors with threaded roses or concealed machine screws.

[2.3.5.4 Interconnected Locks and Latches

****

NOTE: For exterior doors in family housing units only. See BHMA A156.12 and manufacturers'

literature for types available.
****

Provide in accordance with ANSI/BHMA A156.12. Provide F96 or F97, unless otherwise specified.

]2.3.5.5 Hospital Latches

Push-pull latch set similar and equal to Glynn-Johnson HL6, 13 mm 1/2 inch throw, [70 mm2-3/4 inch] [127 mm5 inch] backset, to fit 161 cutout. Cover approximately 64 by 140 mm 2-1/2 by 5-1/2 inch, handle approximately 38 by 114 mm 1-1/2 by 4-1/2 inch, projection approximately 64 mm 2-1/2 inch, covers and handles of stainless steel, BHMA 630 finish, engraved "PUSH" and "PULL" on handles, push handle pointing up, pull handle pointing down.

2.3.5.6 Auxiliary Locks

****
NOTE: Delete if not applicable. See ANSI/BHMA A156.36 for types available.
****

Provide in accordance with ANSI/BHMA A156.36, Grade 1.

2.3.5.7 Combination Locks

****
NOTE: For medical projects only, include the first bracketed option.
****

[Key pharmacy door locks separately from building master key system.]Heavy-duty, mechanical combination lockset with five push buttons, standard sized knobs, 20 mm 3/4 inch deadlocking latch, 70 mm 2-3/4 inch backset. Locks to operate by pressing two or more of the buttons in unison or individually in the proper sequence. Inside knob operates the latch. Provide a keyed cylinder on the interior to permit setting the combination.[Provide a keyed [removable core]cylinder on the exterior to permit bypassing the combination.][Provide a thumb turn on the interior to activate passage set function so that outside knob operates latch without using the combination.]

2.3.6 Exit Devices

****
NOTE: Due to the difficulty in securing exit devices against unauthorized use, they should only be specified where required by NFPA 101. Use single exit doors with locksets in preference to pairs of doors. When pairs are required, specify removable mullions and rim type devices. Vertical rod devices require use of an overlapping astragal and door coordinator for security and fire protection. They should be used only where mullions are not feasible.
****

****
NOTE: Insert the last bracketed paragraph for all exit devices in humid conditions or project

locations with Environmnental Severity Classifications (ESC) of C3 thru C5. Humid locations are those in ASHRAE climate zones 0A, 1A, 2A, 3A, 3C, 4C and 5C (as identified in ASHRAE 90.1). See UFC 1-200-01 for determination of ESC for project locations.
****

Provide in accordance with ANSI/BHMA A156.3, Grade 1. Provide adjustable strikes for rim type and vertical rod devices. Provide open back strikes for pairs of doors with mortise and vertical rod devices. Provide [touch bars in lieu of conventional crossbars and arms.][Provide escutcheons not less than 178 by 57 mm 7 by 2-1/4 inch.]

[Use stainless steel or bronze base metal with plated finishes. Also include stainless steel fasteners and screws.

]2.3.7 Exit Locks With Alarm

Provide in accordance with ANSI/BHMA A156.3 and ANSI/BHMA A156.29, Type E0431 (with full width horizontal actuating bar) for single doors; Type E0431 (with actuating bar) or E0471 (with actuating bar and top and bottom bolts, both leaves active) for pairs of doors, unless otherwise specified.[Provide terminals for connection to remote indicating panel.][Provide outside control key.] Provide door alarms integrated with the fire alarm system in accordance with NFPA 72.

2.3.8 Cylinders and Cores

****
NOTE: When an extension of an existing system is required, the manufacturer's name and type of locks should be indicated. Confirm existing hardware requirements with Contracting Officer's Representative (COR). Requirements may include but are not limited to interchangeable cores, product level of quality, compatibility, if any, with other manufacturers' hardware components.

Specify the system which will best meet the activity's needs without restricting competition.

For projects at Lajes Field, Azores, delete first paragraph; use second paragraph.
****

[Provide cylinders and cores for new locks, including locks provided under other sections of this specification.]Provide cylinders and cores with [six] [seven] pin tumblers. Provide cylinders from the products of one manufacturer, and provide cores from the products of one manufacturer.[Rim cylinders, mortise cylinders, and knobs of bored locksets have interchangeable cores which are removable by special control keys. Stamp each interchangeable core with a key control symbol in a concealed place on the core.]

[Provide cylinders for new locks, including locks provided under other sections of this specification. Provide fully compatible cylinders of Grade 1 products from products of one manufacturer with interchangeable cores that are removable by a special control key. Factory set the cores

with [six] [seven] pin tumblers using the A4 system and F keyway. Submit a core code sheet with the cores. Provide master keyed cores in one system for this project. Provide construction interchangeable cores.

][For medical projects, key pharmacy door locks separately from building master key system.

]2.3.8.1 High Security Cylinders

Provide in accordance with ANSI/BHMA A156.30, security level [A][B][C] for all high security cylinder components.

2.3.9 Push Button Mechanisms

Provide in accordance with ANSI/BHMA A156.5, Grade 1.

2.3.10 Electrified Hardware

****
NOTE: Coordinate electrified hardware operation and specific backup power requirements with site safety personnel, site fire authority, and applicable life safety codes. Determine whether signal switches are required for the particular site application.
****

Comply with the requirements of NFPA 70 for wiring of electrified hardware.

2.3.10.1 Electric Strikes and Frame Mounted Actuators

****
NOTE: Specify electric strikes and lock functionality when power fails. Choose one of three bracketed choices (release automatically, remain secure or remain maintained).
****

Provide in accordance with ANSI/BHMA A156.31, Grade 1. Provide electric strikes and actuators as required to meet operational requirements. Provide electric strikes that [release automatically] [remain secure] [remain maintained] during power failure.[Provide a separate power supply for electric strikes, other locking devices and ancillary parts.][Provide battery backup for continued operation during power failure.] Provide strikes and actuators with a minimum opening force of 101 kilonewtons (kN) 2300 pounds.

Provide facility interface devices that use direct current (dc) power to energize the solenoids. Provide electric strikes and actuators that incorporate end-of-line resistors to facilitate line supervision by the system. If not incorporated into the electric strike or local controller, provide metal oxide resistors (MOVs) to protect the controller from reverse current surges.

2.3.10.1.1 Solenoid

Provide actuating solenoid for strikes and actuators that are rated for continuous duty, cannot dissipate more than 12 Watts and must operate on 12 or 24 Volts dc. Inrush current cannot exceed 1 ampere and the holding current cannot be greater than 500 milliamperes. Actuating solenoid must

move from fully secure to fully open positions in less than 500 milliseconds.

2.3.10.1.2 Signal Switches

Provide strikes and actuators with signal switches to indicate to the system when the bolt is not engaged or the strike mechanism is unlocked. Signal switches must report a forced entry to the system.

2.3.10.1.3 Tamper Resistance

[Provide strike guards that prevent tampering with the latch bolt of the locking hardware or the latch bolt keeper of the electric strike. Strike guards to bolt through the door using tamper resistant screws. Provide strike guards made of 3 mm 1/8 inch thick brass and that are 286 mm 11-1/14 inch high by 41 mm 1-5/8 inch wide, with a minimum 4 mm 5/32 inch wide offset.

]2.3.10.1.4 Coordination

Provide electric strikes and actuators of a size, weight and profile compatible with each specified door frame. Field verify installation clearances prior to procurement.

2.3.10.1.5 Mounting Method

Provide electric strikes and actuators suitable for use with single and double doors, with mortise or rim type hardware specified, and for right or left hand mounting as specified. In double door installations, locate the lock in the active leaf and monitor the fixed leaf.

2.3.10.2 Electrified Mortise Locks

****

NOTE: Electrified mortise locks provide an excellent solution for stairwell doors that require positive latching when unlocked. A power transfer hinge or raceway is required to get power and signal wire from the door to the doorframe for a secure and fully enclosed connection to the access control system. Specify power transfer hinges for doors with electrified hardware.

****

Provide in accordance with ANSI/BHMA A156.25, Grade 1. Provide electrified mortise locks that [release automatically] [remain secure] [remain maintained] during power failure. Provide facility interface devices that use dc power to energize solenoids. Provide solenoids, resisters, and signal switches in accordance with paragraph ELECTRIC STRIKES AND FRAME MOUNTED ACTUATORS.

2.3.10.2.1 Power Transfer Hinges

Provide power transfer hinges with each electrified lock that route power and monitoring signals from the lockset to the door frame. Coordinate power transfer hinges with door frames.

2.3.10.3 Card Readers and Keypad Access Control Hardware

****
NOTE: Verify card readers are compatible with card type. Coordinate this section with Division 28 ELECTRONIC SECURITY SYSTEMS (ESS) requirements.
****

Provide in accordance with ANSI/BHMA A156.5 and ANSI/BHMA A156.25, Grade 1 components. Provide devices that are tamper alarmed, tamper and vandal resistant, solid state, and do not contain electronics which could compromise the access control subsystem should the subsystem be attacked. Provide surface, semi-flush, pedestal, or weatherproof mountable devices as specified for each individual location.[Each device to contain a visual display, either mounted on the face, or on an integral part of the device, to indicate access or exit request processing, request approval, and request denial.] Provide [proximity] [insertion] [swipe through] type card readers capable of reading [magnetic stripe] [high coercivity magnetic stripe] [Wiegand] [Hollerith] [proximity] [Transmissive Infrared] [Keypad] [[_____]/Keypad] [Smart Card] [Biometric] [_____] type access control cards. Provide keypads that contain an integral 12-digit tactile keyboard with digits [arranged in numerical order]. Provide keypads that are [a standalone device] [or] [integrated into the card reader]. Coordinate access control hardware with corresponding devices and systems specified in Division 28 ELECTRONIC SECURITY SYSTEMS (ESS).

2.3.10.4 Power Operated Pedestrian Door Hardware

Provide in accordance with ANSI/BHMA A156.10, Grade 1.

2.3.10.5 Release Devices

In accordance with ANSI/BHMA A156.15, Grade 1.

2.3.10.5.1 Closer Holders

Provide [floor] [door] [header] mounted closer holder devices connected by [separate releasing] [integral releasing] to [fire] [smoke] detecting devices.

2.3.10.5.2 Release Devices

Provide [wall] [floor] [door] mounted [Electromagnetic] [electromechanical] [free swinging] release devices connected to [fire] [smoke] detecting devices.

2.3.10.6 Power Assist and Low Energy Power Operated Doors

Provide in accordance with ANSI/BHMA A156.19, Grade 1.

2.3.10.7 Electromagnetic Locks

Provide in accordance with ANSI/BHMA A156.23, Grade 1. Provide electromagnetic locks that do not contain any moving parts and depend solely upon electromagnetism to secure a portal by generating at least 5.3 kN 1200 pounds of holding force. The lock must interface with the local processors without external, internal or functional alteration of the local processor. The electromagnetic lock must incorporate an end of line resistor to facilitate line supervision by the system. Provide

metal-oxide resistors (MOVs) to protect controllers from reverse current surges, if not incorporated into the electromagnetic lock or local controller.

2.3.10.7.1 Armature

Provide electromagnetic locks with internal circuitry to eliminate residual magnetism and inductive kickback. Provide atuating armature that operates on 12 or 24 Volts dc and cannot dissipate more than 12 Watts. Holding current must be less than 500 milliamperes. Actuating armature must take less than 300 milliseconds to change the status of the lock from fully secure to fully open or fully open to fully secure.

2.3.10.7.2 Tamper Resistance

Provide lock mechanism encased in hardened guard barriers to deter forced entry.

2.3.10.7.3 Mounting Method

Provide electromagnetic lock suitable for use with single and double door with mortise or rim type hardware and compatible with right or left hand mounting.

2.3.10.8 Delayed Egress Locking System

Provide in accordance with ANSI/BHMA A156.24, Grade 1.

2.3.10.9 Power and Manual Operated Revolving Pedestrian Doors

Provide in accordance with ANSI/BHMA A156.27, Grade 1.

2.3.11 Keying System

****
NOTE: Do not require higher levels of master keying than necessary because each level decreases the security of the locks. Specify a construction system where necessary to ensure security after construction is complete.
****

Provide[a [great][grand] master keying system][an extension of the existing keying system. Existing locks were manufactured by [_____] and [do not] have interchangeable cores.][Provide[a construction master keying system][construction interchangeable cores].][Provide key cabinet as specified.]

****
NOTE: Add the following for Naval Submarine Base, Kings Bay, Georgia. Coordinate with the lead paragraph.
****

[The Government will provide permanent cylinders with cores and keys for mortise locksets, auxiliary locks, and exit devices.][Provide cylinders of Grade 1 products from one manufacturer. Notify the Contracting Officer 90 days prior to the required delivery of the cylinders. Provide temporary cores and keys for the Contractor's use during construction, and

for testing of locksets.]

2.3.12 Lock Trim

****
NOTE: For facilities that have not been certified as accessible only to able-bodied personnel, specify lever handles for doors that will be accessible to disabled persons and knurled or abrasive coated knobs and lever handles for doors that are accessible to the visually impaired and that lead to dangerous areas. When only lever handles will be required, delete the paragraph KNOBS AND ROSES and the first bracket statement in the paragraph LEVER HANDLES.
****

Provide cast, forged, or heavy wrought construction and commercial plain design for lock trim.

2.3.12.1 Knobs and Roses

Provide in accordance with ANSI/BHMA A156.2 and ANSI/BHMA A156.13 for knobs, roses, and escutcheons. For unreinforced knobs, roses, and escutcheons, provide a 1.25 mm 0.050 inch thickness. For reinforced knobs, roses, and escutcheons, provide an outer shell thickness of 0.89 mm 0.035 inch and a combined total thickness of 1.78 mm 0.070 inch, except at knob shanks. Provide knob shanks 1.52 mm 0.060 inch thick.

2.3.12.2 Lever Handles

Provide lever handles [where indicated in the Hardware Schedule]. Provide in accordance with ANSI/BHMA A156.3 for mortise locks of lever handles for exit devices. Provide lever handle locks with a breakaway feature (such as a weakened spindle or a shear key) to prevent irreparable damage to the lock when force in excess of that specified in ANSI/BHMA A156.13 is applied to the lever handle. Provide lever handles return to within 13 mm 1/2 inch of the door face.

2.3.12.3 Texture

Provide knurled or abrasive coated knobs or lever handles for doors which are accessible to blind persons and which lead to dangerous areas.

2.3.13 Keys

****
NOTE: For projects at Lejes Field, Azores, delete first paragraph; use second paragraph.
****

[Furnish][Provide] one file key, one duplicate key, and one working key for each key change [and for each master [and grand master] keying system]. [Furnish][Provide] one additional working key for each lock of each keyed-alike group.[[Furnish][Provide] two additional keys for each sleeping room.][[Furnish][Provide] [[_____] great grand master keys,] [[_____] construction master keys,] [and [_____] control keys for removable cores].][[Furnish][Provide] a quantity of key blanks equal to 20 percent of the total number of file keys.] Stamp each key with

appropriate key control symbol and "U.S. property - do not duplicate." Do not place room number on keys.

[[Furnish][Provide] seven change keys for each interchangeable core, [furnish][provide] two control keys, six maters keys, and six construction master keys.[[Furnish][Provide] a quantity of key blanks equal to 20 percent of the total number of change keys.] Stamp each key with appropriate key control symbol and "U.S. property - do not duplicate." Do not place room numbers on keys.

]2.3.14 Door Bolts

****

NOTE: Use chain and foot bolts for exceptionally high doors and where use of flush bolts is impracticable.

****

Provide in accordance with ANSI/BHMA A156.16. Provide dustproof strikes for bottom bolts, except at doors having metal thresholds. Provide automatic latching flush bolts in accordance with ANSI/BHMA A156.3, Type 25.

2.3.15 Closers

****

NOTE: Use closers Type C02011 with o.f. PT 4C for surface applications, except use parallel arm closers, C02021, on outswinging exterior doors. Specify holder arms, C02051 and C02061, where doors must be held open from 90 degrees to 135 degrees, or to 180 degrees where desired. Do not use holder arms for fire-rated doors. Use overhead concealed closers on main entrance doors of monumental buildings, double-acting doors, and for other openings where concealment is necessary. Avoid overhead concealed closers with wood doors. Where they cannot be avoided, modify section on wood doors to require a 125 mm 5 inch head rail. Avoid use of floor-concealed closers, but where required, ascertain that floor slab design will not interfere with closer case.

****

****

NOTE: Insert the bracketed paragraph for all doors in humid conditions or project locations with Environmnental Severity Classifications (ESC) of C3 thru C5. Humid locations are those in ASHRAE climate zones 0A, 1A, 2A, 3A, 3C, 4C and 5C (as identified in ASHRAE 90.1). See UFC 1-200-01 for determination of ESC for project locations.

****

Provide in accordance with ANSI/BHMA A156.4, Series C02000, Grade 1, with PT 4C. Provide with brackets, arms, mounting devices, fasteners, [full size covers, except at storefront mounting,] [pivots,] [cement cases,] and other features necessary for the particular application. Size closers in accordance with manufacturer's printed recommendations, or provide

multi-size closers, Sizes 1 through 6, and list sizes in the Hardware Schedule. Provide manufacturer's 10 year warranty.

[Use stainless steel inside bracketed or door mounted closers on exterior doors. Non-ferrous closers, such as aluminum or cast bronze, are permissible where door utilization is minimal. On interior doors use closers of 302 or 304 stainless steel or non-ferrous materials. On surface-mounted closers use or apply rust inhibiting finish on all ferrous parts. Also apply this finish on concealed closers.

]2.3.15.1 Identification Marking

Engrave each closer with manufacturer's name or trademark, date of manufacture, and manufacturer's size designation in locations that will be visible after installation.

2.3.16 Overhead Holders

****
NOTE: Use overhead holders for doors which will not swing 180 degrees and where there is no adjacent wall to accommodate wall type holder and stop. If holder must be on outside of doors, specify bronze (C12511) with satin chrome finish (626). Overhead holders can be specified as "Stop Only" where the hold open feature is not desirable.
****

Provide in accordance with ANSI/BHMA A156.8.

2.3.17 Door Protection Plates

****
NOTE: Use pulls attached to plates. Use 200 by 400 mm 8 by 16 inch push plates where door design permits. Use push bars or push and pull bars on all-glass doors. Use kick plates for push sides of doors equipped with closers. Use door plates in high traffic areas and where damage from rolling carts, shoe scuffs, and other potential damage to the bottom of doors is likely. Use door plates for hospital and clinic environments. Use armor plates on heavy-duty doors where hand trucks or other heavy objects regularly passing through the door could cause damage.
****

Provide in accordance with ANSI/BHMA A156.6.

2.3.17.1 Sizes of [Armor] [Mop] [and] Kick Plates

****
NOTE: NFPA 80 requires that door plates be not more than 400 mm 16 inch high. Where wheelchair traffic is anticipated, kick plates should be 400 mm 16 inch high.
****

50 mm2 inch less than door width for single doors; 25 mm 1 inch less than

door width for pairs of doors. Provide [[200] [1200] mm [8] [10] inch kick plates for flush doors] [and] [125 mm1 inch less than height of bottom rail for panel doors]. Provide a minimum [900] [1200] [_____] mm [36] [48] [_____] inch armor plates for flush doors [and] completely cover lower panels of panel doors, except 400 mm 16 inch high armor plates on fire doors. Provide [100] [150] mm [4] [6] inch mop plates.

2.3.17.2 Edge Guards

****

NOTE: Edge guards should be detailed on drawings; stipulate items such as material, gauge, and dimensions. Use edge guards in addition to armor plates on heavy-duty doors where hand trucks or other heavy objects passing through could damage doors. They are not required at hinge stiles on doors equipped with "swing clear" hinges.

****

Stainless steel, of same height as armor plates. Apply to [hinge stile] [lock stile] [meeting stiles].

2.3.18 Door Stops and Silencers

****

NOTE: Specify wall bumpers Type L02251 wherever practical, except where they would be mounted on stud walls or partitions. Use floor stops only where necessary to prevent doors from hitting towel bars or similar items, as they create stumbling hazards and interfere with floor cleaning equipment.

****

Provide in accordance with ANSI/BHMA A156.16. Silencers Type L03011. Provide three silencers for each single door, two for each pair.

2.3.19 Padlocks

****

NOTE: See referenced specification for types, grades and options available.

****

Provide in accordance with ASTM F883.

2.3.20 Thresholds

****

NOTE: Where vertical rod exit devices are used, and for other outswinging exterior doors, ANSI/BHMA A156.21, type J35100, is recommended.

****

Provide in accordance with ANSI/BHMA A156.21. Use J35100, with vinyl or silicone rubber insert in face of stop, for exterior doors opening out, unless specified otherwise.

2.3.21 Weatherstripping Gasketing

****
NOTE: Weatherstripping is also specified in Section 08 11 13 STEEL DOORS AND FRAMES Section 08 11 16 ALUMINUM DOORS AND FRAMES and Section 08 14 00 WOOD DOORS. Coordinate requirements to avoid conflict and duplication. Do not use interlocking type or spring tension type on metal doors and frames.
****

****
NOTE: Maximum air leakage rates are 2.19 by 10-5 cms per sq m 0.5 cfm per sq. ft. of door area for residential swinging doors and 5.48 by 10-5 cms per sq m 1.25 cfm per sq. ft. of door area for non-residential swinging doors.
****

Provide in accordance with ANSI/BHMA A156.22. Provide the type and function designation where specified in paragraph HARDWARE SCHEDULE. Provide a set to include head and jamb seals[, sweep strips,] [and, for pairs of doors, astragals]. Air leakage of weatherstripped doors not to exceed [2.19 by 10-5] [5.48 by 10-5] cms [0.5] [1.25] cubic feet per minute of air per square meter foot of door area when tested in accordance with ASTM E283. Provide weatherstripping with one of the following:

****
NOTE: At exterior doors, retainers at sills are necessary for air leakage and for weather and vermin protection.
****

2.3.21.1 Extruded Aluminum Retainers

Extruded aluminum retainers not less than 1.25 mm 0.050 inch wall thickness with vinyl, neoprene, silicone rubber, or polyurethane inserts. Provide [clear (natural)] [bronze] anodized aluminum.

2.3.21.2 Interlocking Type

Zinc or bronze not less than 0.45 mm 0.018 inch thick.

2.3.21.3 Spring Tension Type

Spring bronze or stainless steel not less than 0.20 mm 0.008 inch thick.

2.3.22 [Lightproofing] [and] [Soundproofing] Gasketing

Provide in accordance with ANSI/BHMA A156.22. Provide adjustable doorstops at heads,jambs and automatic door bottoms in accordance with the hardware set, of extruded aluminum, [clear (natural)] [bronze] anodized, surface applied, with vinyl fin seals between plunger and housing. Provide doorstops with solid neoprene tube, silicone rubber, or closed cell sponge gasket. Provide door bottoms with adjustable operating rod and silicone rubber or closed cell sponge neoprene gasket. Provide doorstops that are mitered at corners. Provide type and function designation where specified in paragraph HARDWARE SETS.

****

NOTE: At exterior doors that are not protected by a horizontal projection such as an awning, roof, or eave, specify rain drips that overlap each side of each door at the head of such exposed doors by choosing the bracketed item below.

****

2.3.23 Rain Drips

Provide in accordance with ANSI/BHMA A156.22. Provide extruded aluminum rain drips, not less than 2.03 mm 0.08 inch thick, [clear anodized] [bronze anodized] [factory painted] [factory primed] finish. Provide the manufacturer's full range of color choices to the Contracting Officer for color selection.[Provide rain drips with a 102 mm 4 inch overlap on each side of each exterior door that is not protected by an awning, roof, eave or other horizontal projection.] Set drips in sealant and fasten with stainless steel screws.

2.3.23.1 Door Rain Drips

Approximately 38 mm high by 16 mm 1-1/2 inch high by 5/8 inch projection. Align bottom with bottom edge of door.

2.3.23.2 Overhead Rain Drips

Approximately 38 mm high by 64 mm 1-1/2 inch high by 2-1/2 inch projection. Align bottom with door frame rabbet.

2.3.24 Auxiliary Hardware (Other than locks)

Provide in accordance with ANSI/BHMA A156.16, Grade 1.

2.3.25 Sliding and Folding Door Hardware

Provide in accordance with ANSI/BHMA A156.14, Grade 1. Finishes to match other hardware specified herein.

2.3.26 Special Tools

Provide special tools, such as spanner and socket wrenches and dogging keys, as required to service and adjust hardware items.

2.4 FASTENERS

Provide fasteners of type, quality, size, and quantity appropriate to the specific application. Fastener finish to match hardware. Provide stainless steel or nonferrous metal fasteners in locations exposed to weather. Verify metals in contact with one another are compatible and will avoid galvanic corrosion when exposed to weather.

2.5 FINISHES

****

NOTE: Choose one of the following options. Choose the first option for new buildings. Choose the second option only where necessary to match the finish on existing hardware.

****

****

NOTE: Use stainless steel in bathroom and toilet locations and in project locations with Environmental Severity Classifications (ESC) of C3 through C5. See UFC 1-200-01 for determination of ESC for project locations.

****

[Provide in accordance with ANSI/BHMA A156.18. Provide hardware in BHMA 630 finish (satin stainless steel), unless specified otherwise. Provide items not manufactured in stainless steel in BHMA 626 finish (satin chromium plated) over brass or bronze, except [aluminum paint] [prime coat] finish for surface door closers, and except [BHMA 652 finish (satin chromium plated)] [BHMA 600 finish (primed for painting)] for steel hinges. Provide hinges for exterior doors in stainless steel with BHMA 630 finish[or chromium plated brass or bronze with BHMA 626 finish]. Furnish exit devices in BHMA 626 finish in lieu of BHMA 630 finish [except where BHMA 630 is specified under paragraph HARDWARE SETS]. Match exposed parts of concealed closers to lock and door trim. Match hardware finish for aluminum doors to the doors.

][Provide in accordance with ANSI/BHMA A156.18. Provide hardware in BHMA 612 finish (satin bronze), unless specified otherwise. Finish surface door closers [bronze paint] [prime coat] finish. Provide steel hinges in [BHMA 639 finish (satin bronze plated)] [BHMA 600 finish (primed for painting)]. Provide exposed parts of concealed closers finish to match lock and door trim. Match hardware finish for aluminum doors to match the doors. Provide hardware showing on interior of [bathrooms] [shower rooms] [toilet rooms] [washrooms] [laundry rooms] [and kitchens] in BHMA 629 finish (bright stainless steel) or BHMA 625 finish (bright chromium plated).

]2.6 KEY CABINET AND CONTROL SYSTEM

****

NOTE: Key cabinets hold keys on panels. Systems include materials and devices for recording and cross-referencing data on use and location of locks and keys. See ANSI/BHMA A156.5 for description of cabinets and control systems.

****

Provide in accordance with ANSI/BHMA A156.5, [Type [E8331 (25 hooks)] [E8341 (125 hooks)] [E8351 (150 hooks)] [E8311 (600 hooks)] [E8321 (700 hooks)].] [Type required to yield a capacity (number of hooks) 50 percent greater than the number of key changes used for door locks.]

PART 3 EXECUTION

3.1 INSTALLATION

Provide hardware in accordance with manufacturers' printed installation instructions. Fasten hardware to wood surfaces with full-threaded wood screws or sheet metal screws. Provide machine screws set in expansion shields for fastening hardware to solid concrete and masonry surfaces. Provide toggle bolts where required for fastening to hollow core construction. Provide through bolts where necessary for satisfactory installation.

3.1.1 Weatherstripping Installation

Provide full contact, weathertight seals that allow operation of doors without binding the weatherstripping.

3.1.1.1 Stop Applied Weatherstripping

Fasten in place with color matched sheet metal screws not more than 225 mm 9 inch on center after doors and frames have been finish painted.

3.1.1.2 Interlocking Type Weatherstripping

Provide interlocking, self adjusting type on heads and jambs and flexible hook type at sills. Nail weatherstripping to door 25 mm 1 inch on center and to heads and jambs at 100 mm 4 inch on center.

3.1.1.3 Spring Tension Type Weatherstripping

Provide spring tension type on heads and jambs. Provide bronze nails with bronze. Provide stainless steel nails with stainless steel. Space nails not more than 38 mm 1-1/2 inch on center.

3.1.2 [Lightproofing] [and] [Soundproofing] Installation

Provide as specified for stop applied weatherstripping.

3.1.3 Threshold Installation

Extend thresholds the full width of the opening and notch end for jamb stops. Set thresholds in a full bed of sealant and anchor to floor with cadmium-plated, countersunk, steel screws[in expansion sleeves]. For aluminum thresholds placed on top of concrete surfaces, coat the underside surfaces that are in contact with the concrete with fluid applied waterproofing as a separation measure prior to placement.

3.2 FIRE DOORS AND EXIT DOORS

Provide hardware in accordance with NFPA 72 for door alarms, NFPA 80 for fire doors, NFPA 101 for exit doors, and NFPA 252 for fire tests of door assemblies. [Provide tin-clad fire doors in accordance with UL 14C].

3.3 HARDWARE LOCATIONS

Provide in accordance with SDI/DOOR A250.8, unless indicated or specified otherwise.

a. Kick and Armor Plates: Push side of single-acting doors. Both sides of double-acting doors.

b. Mop Plates: Bottom flush with bottom of door.

3.4 KEY CABINET AND CONTROL SYSTEM

Locate where [directed][indicated]. Tag one set of file keys and one set of duplicate keys. Place other keys in appropriately marked envelopes, or tag each key. Provide complete instructions for setup and use of key control system. On tags and envelopes, indicate door and room numbers or master or grand master key.

3.5 FIELD QUALITY CONTROL

After installation, protect hardware from paint, stains, blemishes, and other damage until acceptance of work. Submit notice of testing 15 days before scheduled, so that testing can be witnessed by the Contracting Officer. Adjust hinges, locks, latches, bolts, holders, closers, and other items to operate properly. Demonstrate that permanent keys operate respective locks, and give keys to the Contracting Officer. Correct, repair, and finish, errors in cutting and fitting and damage to adjoining work.

3.6 HARDWARE SETS

****

NOTE: Coordinate this section with Section 08 11 16 ALUMINUM DOORS AND FRAMES.

Either list hardware set numbers on the drawings or list doors by number in each hardware set. List hardware sets in the following format:

SAMPLE LIST OF HARDWARE SETS	
HW-1 (Doors 1 and 2, each pair)	
3 Pair Hinges	A2111 by 623 by NRP
1 Three-Point Lock	E8271
2 Closers	C02021
2 Wall Bumpers	L02251
2 Pulls	Extruded aluminum with decorative panels
2 Push Bars	Extruded aluminum with decorative panels
1 Threshold	Type 26
HW-2 (Doors 3 and 4, each pair)	
3 Pair Hinges	A2112 by 626 by NRP
2 Exit Devices	Type 1-05 by 630
1 Removable Mullion	Type 22
2 Closers	C02021
2 Kick Plates	J102 by 630

SAMPLE LIST OF HARDWARE SETS	
2 Wall Bumpers	L02251
1 Threshold	Type 26 by insert
1 Set Weatherstripping	R0D165
HW-3 (Doors 5, 7, 9, each leaf)	
1-1/2 Pair Hinges	A2112 by 626 by NRP
1 Lockset	F04 by 630
1 Closer	C02021
1 Kick Plate	J102 by 630
1 Wall Bumper	L02251
1 Threshold	Type 26 by insert
1 Set Weatherstripping	R0D165
HW-101 (Doors 6, 8, 10, each leaf)	
1-1/2 Pair Hinges	A8112 by 652
1 Lockset	F82
1 Closer	C02011
1 Kick Plate	J102 by 630
1 Wall Bumper	L02251
HW-102 (Doors 11 and 12, each leaf)	
1-1/2 Pair Hinges	A8112 by 652
1 Pull Plate	J405 by 630
1 Push Plate	J301 by 630
1 Closer	C02011
1 Kick Plate	J102 by 630
1 Wall Bumper	L02101
HW-103 (Doors 13 and 14, each leaf)	
1-1/2 Pair Hinges	A8133 by 652

SAMPLE LIST OF HARDWARE SETS	
1 Latch set	**F75**
1 Wall Bumper	**L02251**

****

Provide [hardware for aluminum doors under this section. Deliver Hardware templates and hardware, except field applied hardware, to the aluminum door and frame manufacturer for use in fabricating doors and frames.]

-- End of Section --