

DESIGN AND CONSTRUCTION GUIDELINES AND STANDARDS

DIVISION 8 • OPENINGS

08 70 00 • HARDWARE

SECTION INCLUDES

Exterior Door Hardware Items
Electric Assist Door Operator
Interior Door Hardware

RELATED SECTIONS

06 10 00 Rough Carpentry
08 10 00 Doors and Frames
08 40 00 Entrances and Storefronts
26 00 00 Electrical
28 00 00 Electronic Safety and Security

INVESTIGATION AND RESEARCH

Review keying needs with LHA prior to preparing the specifications and again prior to bidding. New hardware must be compatible with the hardware serving existing facilities. A proprietary spec may be necessary to ensure compatibility.

Identify the level of use anticipated and specify accordingly. The hardware sets for most elderly unit doors are not subject to the same use as doors into family units. For example, lever handles are more suitable for elderly units, but not necessarily in family units where they are subjected to overuse and should be used selectively.

REFERENCE STANDARDS

521 CMR Regulations - designed to make public buildings and facilities accessible to, functional for, and safe for use by persons with disabilities.

ANSI/BHMA standards - BHMA Builders Hardware Manufacturers Association <http://www.buildershardware.com/> is the trade association for North American manufacturers of commercial builders hardware, founded in 1925.

Door and Hardware Institute <http://www.dhi.org/> is a professional organization that serves as a resource for information on doors, hardware, security and specialty products for the architectural openings industry.

American Association of Automatic Door Manufacturers (AAADM) <http://www.aaadm.com/> is a trade association of power-operated automatic door manufacturers established in 1994 to raise public awareness about automatic doors and administer a program to certify automatic door inspectors.

National Fire Protection Association (NFPA) <http://www.nfpa.org/> develops, publishes and disseminates consensus codes relating to fire, electrical and building safety.



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MAJOR COMPONENTS FOR EXTERIOR DOORS

LOCKSETS

Equip residential exterior entry doors with high quality light commercial locksets: use a standard 2-3/4 inch backset on all entry doors.

Equip penthouse doors with heavy duty commercial hardware.

Specify lever handles for all exterior entry doors. Knob handles may be used for utility and maintenance doors. Levers with end returns are preferred to straight levers.

Building entry doors require heavy duty commercial locksets such as Schlage L9000 (lever) or Schlage H9000 (knob)

Verify that the door thickness is adequate to install the hardware. In general, mortise locks are not preferred. However, where mortise locks are used, note that the latch bolt of a heavy duty mortise lockset will damage the trim unless the strike plate has an extended lip.

The preferred cylindrical locksets should be specified with removable core.

WEATHER STRIPPING AND DOOR SWEEPS

Compressive weather stripping is preferred over magnetic. Specify extra heavy duty exterior door sweeps for all exterior doors.



MANUAL CLOSERS

In general, avoid closers except where required by code and at multi-unit buildings.

Avoid using closers on steel entry doors when possible because they stress the hinges and can damage the door itself.

Only in certain low use applications, such as screen doors, use spring hinges or pneumatic closers provided by the door manufacturer.

When closers are absolutely necessary consider heavier ball bearing hinges.

Specify surface mounted door closers that have pressure adjustments and delayed closing action.

Meet ADA and MAAB requirements for operating pressure.

Closers should not require seasonal adjustments for temperatures between 120 degrees F to -30 degrees F. Hydraulic fluid shall be fireproof.



SILENCERS

Specify silencers at all interior metal door frames where weather-stripping is not used.

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KICK PLATES

To minimize wear and tear from wheelchair footrests in barrier free units, install kick plates on the push side of doors.

Mount a 10 inch high kick plate so that the top is 14 inches (16 inches in DMR units) above finished floor.

The door design should accommodate the installation of the kick plate. Kick plates look better when mounted on flush face rather than panel doors.

Do not install kick plates on exterior side of metal doors.

Kick plates should be constructed of metal.

DOOR STOPS

Wall- or floor-mounted door stops are preferred.

Provide blocking and use recessed stops if the wall-mounted type will be used with push button locks.

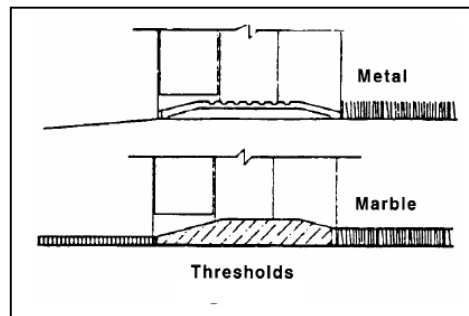
Coordinate with Rough Carpentry section to include blocking.

Never use hinge-mounted pin stops because they can force the hinge and damage the door.

Locate floor-mounted stops close to baseboards, out of the path of travel.

DOOR THRESHOLDS

Where required meet ADA and MAAB requirements for thresholds: not more than 1/2 inch high; bevel raised thresholds with a slope of not more than 1:2.



KEYS

Provide master key and 4 change keys for dwelling unit locks;

Provide large bow keys for building and dwelling unit entrances in elderly and barrier-free units for easier opening.

FIRE RATED DOOR HARDWARE

Specifying fire rated doors includes specifying the related fire rated door hardware. Among these hardware components are: gasketing to maintain positive pressure, electronic hold open devices, etc.

Refer to NFPA 80 and NFPA 101 for specific hardware requirements for fire rated doors.

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ELECTRIC ASSIST DOOR OPENERS

Power assist mechanisms reduce the opening resistance of a door upon activation of a switch or a continued force applied to the door itself.

Typical automatic door operator installations include the unit at the top of the door which operates the door closer, the interior and exterior door operators, and a remote power source.

The design of the system should allow for manual or automatic operation.

The door may be equipped with card key locks, remote pocket fob opening controls, or with standard keys. The operation may need to be tied into a buzzer system as well. Coordinate with LHA to determine any special operating and locking requirements.

Operating controls may be wall or jamb-mounted. Avoid bollard-mounted controls where possible.

Power assist mechanisms should be adjusted to permit doors to latch securely. Ensure that automatic door operators are compatible with the type and weight of door.

Investigate the need for supplemental interior climate controls at exterior doors where vestibules or airlocks are not present and access requires prolonged opening times. Heated air curtain systems or other localized conditioning devices may be considered. Make sure these are coordinated with building thermostats to ensure proper seasonal operation.

To avoid confusion in bidding, redundant or conflicting information within the specification sections must be avoided. Therefore, DHCD recommends specifying the electrical requirements for door openers in only one of the following sections: doors, door hardware, or electrical.

Coordinate technical and filed sub-bid requirements with the appropriate electrical and mechanical sub-trades.

PANIC BARS

Coordinate with size of structural members in the door. Von Duprin hardware is the preferred manufacturer as DHCD has found it withstands the overuse of most buildings.

An LHA board vote is required to specify a proprietary product.

CARD READERS

Appropriate for mid and high rise buildings with many units. Consider use of a proximity card reader system for locks to simplify and improve security. Lost keys can be electronically deleted from use. New keys are easily activated, similar to a hotel key system.

ELECTRIC STRIKE AND LOCKS

Used with a card reader or buzzer system, requires low voltage electricity. Coordinate with electrical specifications as well as door and doors frames. When retrofitting existing doors, investigate to determine if wiring can be configured through door frames. Avoid surface wiring. Doors with solid wood frames and sidelights may not be suitable for installing electric strikes, and complete replacement of the frame may be necessary.

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HINGES

Doors under 7'-6" in height require 3 hinges, 1 ½ pairs.

Doors over 7'-6" in height require 4 hinges, 2 pairs.

Geared continuous hinges may be used where required for doors in high traffic and/or high security situations.

All exterior outswing doors to have hinges with non-removable pins.

MAIL SLOTS

Avoid mail slots in exterior doors due to energy loss and security concerns. Utilize alternate mail delivery methods acceptable to LHA.

PEEPHOLES



Provide two peepholes in exterior doors at 60 inches and 42 inches above floor height in all accessible units to comply with 521 CMR.

Peepholes may be provided for entry doors to non-accessible units at the direction of the LHA.

LOCK AND LATCH SETS

MAJOR COMPONENTS FOR INTERIOR DOORS

Equip interior unit entry doors with high quality residential or light commercial locksets: use a standard 2-3/4 inch backset on all entry doors.

Specify lever handles for all unit entry doors. Levers with end returns are preferred to straight levers.

Provide privacy latch sets for all bathroom doors.

Provide passage latch sets for all other interior residential doors

Provide cylindrical or keypad lock sets for all Community Room and Office entry doors and interior doors that require them. Discuss requirements with LHA.

Verify that the door thickness is adequate to install the hardware. In general, mortise locks are not preferred. However, where mortise locks are used, note that the latch bolt of a heavy duty mortise lockset will damage the trim unless the strike plate has an extended lip.

Cylindrical locksets should be specified with removable core.

Non-latching hardware is acceptable for closets and other similar applications.

MANUAL CLOSERS

In general, avoid closers except where required by code and at multi-unit buildings.

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MAGNETIC DOOR HOLDERS

Magnetic door holders require low voltage electricity. Coordinate with electrical and fire alarm specifications and filed sub-bid requirements. Specify the electrical requirements in only one section - doors, door hardware, electrical or fire alarm.

HANDLES

Provide lever handles in all accessible and elderly units; knobs are acceptable elsewhere.

SILENCERS

Provide 3 silencers for each single door frame, 2 for each pair frame.

FINISHES

Use BHMA/ANSI finish designations.

Consider exposure to the weather and climactic conditions when selecting hardware finishes. Avoid bright and mirror finishes. Make all finishes consistent throughout the project.

PACKAGING

Each lockset and hardware item should be packaged separately and delivered complete with all necessary fasteners, key instructions and required templates.

Containers should be marked with corresponding item number from the hardware schedule, identifying contents and location in the finished work.

DRAWINGS AND SPECIFICATIONS

Before preparing specifications for hardware, discuss the needs with the LHA management and maintenance staff.

Contract Documents shall include a full hardware schedule that lists, at a minimum, the following items for each hardware set, along with a minimum of three manufacturers for each:

- Hinges (butts)
- Latch set
- Bumpers, thresholds, closers, kick plates, push bars and other specialized hardware

The Contract Documents shall include specifications for:

- Keys and key control
- Locksets and latchsets
- Hinges (butts)
- Finishes
- Silencers
- Specialized hardware (bumpers, closers, etc.)

The specification of door hardware, particularly door hardware that requires electricity, is a specialized area of construction specification writing. Obtain the services of a hardware consultant to provide detailed information to the design team. Coordinate the hardware specifications with the electrical specifications and filed sub-bid requirements to make

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sure any required work is covered completely but only covered in one section.

Particular attention should be made to supplying the proper voltage to the specified electric openers, closers, or buzzers.

Most exterior doors are pre-hung, metal insulated or fiberglass insulated doors that come with weather stripping, hinges, and thresholds. The hardware specifications do not need to say anything about these items. Cross reference specification sections to avoid having redundant or conflicting requirements.

Locksets for metal insulated doors need to be carefully specified and coordinated with the door specification so that reinforcing can be located and holes can be cut in the factory. For example, a mortise lockset requires a longer block than a cylindrical lockset. (Another reason DHCD prefers cylindrical locksets.)

Coordinate installation of electric strikes with electrical work. Have the electric strikes installed by an experienced locksmith. Coordinate with the door and frame size.

Door closers are typically field installed but the designer needs to specify blocking to be installed in the door by the manufacturer.

Carefully coordinate the location of glazing, the door stile width, kickplates and the mounting height of the lockset and panic bar hardware.

Verify that the door is adequate thickness for the hardware set to be installed. Avoid the need for stainless steel wraps or metal jackets to reinforce the door.

Determine the need for extra dwelling unit entrance locksets and key sets with extra cylinders. As a rule of thumb, specify 2 extra lock/key sets for up to 25 units, 3 for up to 50 units, and 1 or 2 extra cylinders for building entrance locksets.

Specify locksets with interchangeable, removable cores.

Specify the finish of each hardware component in the project. The supplier cannot be expected to coordinate the colors and finishes of the finished project. Mixing brass and nickel, for example, is unattractive and not recommended.

Where necessary, specify the specific MAAB and ADA Requirements for door operating pressure. Note that MAAB requires power assist mechanisms on doors with an operating force greater than the maximum stipulated opening force. Automatic closers, power assist mechanisms or other door hardware must not project beyond the clear width limits of the door opening and must comply with maneuvering space requirements.

Specify specific models of hardware components, and coordinate where necessary to ensure compatibility with other components.



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PRODUCTS

Item	Preferred Manufacturer	Acceptable Manufacturers
Hinges	Ives (IVE)	McKinney, Hager
Continuous Hinges	Markar (MAR)	Stanley
Locksets & Deadlocks	Schlage (SCH)	Sargent, Best
Keypad Locks	Schlage (SCH)	User Standard
Cylinders & Keying	Schlage (SCH)	User Standard
Exit Devices & Mullions	Von Duprin (VON)	Precision, Sargent
Door Closers & Auto Operators	LCN (LCN)	Norton
Push & Pull Plates & Bars	Ives (IVE)	Rockwood, Burns
Flush Bolts & Coordinators	Ives (IVE)	Rockwood, Burns
Protection Plates	Ives (IVE)	Rockwood, Burns
Stops & Holders	Ives (IVE)	Rockwood, Burns
Overhead Stops	Glynn-Johnson (GLY)	Sargent, Rixson
Silencers	Ives (IVE)	Rockwood, Burns
Thresholds & Weatherstrip	National Guard (NGP)	Pemko, Reese