

FINISH HARDWARE

General

For University of Michigan Hospitals and Health Centers projects refer to Design Guideline 08710-H available at:

<http://www.med.umich.edu/facilities/planningdevelopment/ae/dg/doc/a/08720H.pdf>.

In general, follow the guidelines below when selecting and specifying finish hardware. Unless specifically indicated otherwise, these guidelines are not intended to restrict or replace professional judgment.

Related Sections

U-M Design Guideline Sections:

[SID-D Energy and Water Conservation](#)

[SID-F Codes and Regulatory Agencies](#)

[SID-Q Building Access Control](#)

[08410 Aluminum Entrances and Storefronts](#)

[Architectural Preferred Manufacturer List](#)

UM Master Specifications

[Section 08710 Finish Hardware](#)

[Section 16724 Security System General Requirements](#)

[Section 16727 Access Control & Monitoring System](#)

Design Requirements

General:

- Do not use cash allowance provisions for hardware.
- Include a hardware schedule on drawings or in specifications. Note key side on door schedule.
- Egress:
 - Do not specify locks of any type on fire egress stair doors without approval from Design Manager.
 - Configure doors and select hardware to mitigate the risk of chaining doors together, thus preventing egress and emergency responder access. (e.g. same handing of entrance door banks, flush mounted panic devices, etc...). Review approach with Design Manager.

- In areas of new construction, locate hardware in accordance with Door and Hardware Institute (DHI) "Recommended Locations for Architectural Hardware for Wood Flush Doors" and "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames." In renovated areas, obtain direction from Design Manager concerning whether to match existing hardware locations or whether to follow DHI recommendations for new construction.
- Do not specify floor checks and pivots.
- Trim Styles: Unless otherwise approved by the Design Manager, trim styles used in renovation work should match hardware currently in the building. Contact the Design Manager for information regarding existing hardware.
- Finishes: Unless otherwise approved by the Design Manager, comply with the following:
 - Specify standard uniform hardware finishes throughout the project. Obtain Design Manager approval for custom finishes.
 - For renovation work, match hardware finish of existing units.
 - For aluminum entrances, match the finish color of the door.
- Do not connect door hardware to fire alarm system unless required by code or UMHHC operating procedures.
- Where interconnection with building fire alarm system is required, comply with the following:
 - Provide interposing interlocks using fire alarm system control modules. Program the control modules to change state only when the fire alarm system actuates.
 - Fire door hold-open devices: Provide normal (non-battery backed) power from fire alarm system. Upon a fire alarm system actuation or upon the loss of normal power to the fire alarm system, the door hold-open devices will be de-energized and the doors will close. This means held-open doors will close during a fire alarm 24 hour battery test. Review operational impacts with Design Manager.
 - Electrically operated door hardware: Provide power from access control system or security system. When required by code, provide relay and access control system programming to interrupt power upon a fire alarm system actuation. This means the status of door hardware devices will remain unchanged during a fire alarm 24 hour battery test, but will change upon a fire alarm system actuation. The sequences of operation for door hardware devices upon fire alarm system actuation will be defined and executed by the door access control system.

Hinges:

- Specify hinges with non-removable pins with set screw, not merely non-rising type with knurled pin.
- Specify 5 knuckle ball bearing hinges, except at aluminum entrances or where otherwise needed for increased durability as confirmed by the Design Manager.
- For aluminum entrances, specify ball bearing butt hinges or heavy-duty continuous gear hinges.

Closers:

- Specify surface mounted units only; concealed closers are not permitted (including aluminum entrance doors).
- Require closers to be mounted on least public room side of doors.
- Never specify hold-open function in conjunction with exterior building entrances and vestibules.
- Provide factory-sized closers, adjustable to meet field conditions and barrier free requirements for opening force. Installation requirements shall require that closers be installed and adjusted to meet barrier free opening force requirements.

Pulls: Through-bolt all pulls. Do not specify offset pulls on doors unless needed to match existing.

Locksets:

- Specify lever handles on each new lockset.
- Specify the following standard functions by space type:
 - Offices, laboratories, small conference rooms and other non-classrooms occupied spaces: Office lockset with thumb turn inside (ANSI F04). Specify thumb turn installation that provides vertical orientation for locked / horizontal for unlocked.
 - Classrooms: All classrooms should be lockable from inside the room and provide visual indication of door status on classroom side. Review required function with Design Manager.
 - Mortise lockset type M1 (When locked, door remains locked except by key outside or thumb turn inside): Schlage L9056 with indicator: 09-611 x XL11-986.
 - Mortise lockset type M2 (When locked, door reverts to unlocked when door is opened): Schlage L9050 with indicator: 09-611 x XL11-986.

- Unisex restrooms: Privacy lockset with "Occupied" indicator and keyed override. Schlage L9496
- Service areas: Service/store lockset (ANSI F07)
- Provide knurled handle surfaces on doors to hazardous areas. Hazardous areas include mechanical rooms, elevator machine rooms, electrical closets and substation rooms, and stairways.
- Attic Stock: Require attic stock to be delivered to Owner's Key Office in manufacturer's original packaging, with Project title, including building and description, and University of Michigan Project Number marked on each box. Require attic stock for each individual lock function type, provide additional locksets of the same function in the following quantities:
 - For less than 20 locksets: No attic stock.
 - For 20 locksets or more, but less than 100 locksets: 2 additional units.
 - For 100 locksets or more: 4 additional units.
 - For each 50 additional locksets over 100 units: 1 additional unit.
 - When 20 or more locksets of all function types are scheduled, but less than 20 are of a single function, provide 2 additional locksets of functions selected by the Design Manager from the range of function types included in the Project.
- Strikes: Specify curved-lip strikes; flat (reversible) strikes are not acceptable. Require extended lip strikes where required to protect door frame from being marred by latch bolt (frequently needed at wood door frames).
- Cores: Specify 7-pin small format interchangeable cores (SFIC). Refer to "Architectural Preferred Manufacturers List" for manufacturers. In existing buildings, match existing core type.
- Construction Keying: For project security, provide a construction core as determined by the Design Manager. Always include construction cores for building entrance doors with cylinders.
- Keying: Include keying and master keying. Specify that keying and master keying will be coordinated with the University Key Office. Indicate keyed side on door schedule.

Panic Hardware: Either tube-or pad type crash bars are acceptable, provided the type selected will meet the requirements of the application. Dogging, where provided, should be hex-key wrench type as opposed to key cylinder type. Exit devices with concealed vertical rods are not permitted in any application. In addition, comply with the following:

- Single doors: Select rim-type panic hardware; do not specify mortise units.
- Double doors with mullions: Provide rim-type, center latching devices.
- Double doors without mullions: Provide the following exit device types for each indicated application:
 - Aluminum Entrance Doors: Applications without mullions are not permitted.
 - Fire-rated wood and steel doors: Usually specify mortise lock device with double cylinder on one door of pair (refer to "fire-rated and securable doors" paragraph below), and exit only function vertical rod device on other door. For interior locations where fire-rating can be maintained, omit bottom rods. Where bottom rod is required, specify ADA compliant rod and latch guard.
 - Non-fire-rated wood and steel doors: Usually specify mortise lock device on one door (refer to "fire-rated and securable doors" paragraph below), and exit only function vertical rod device on other door. Omit bottom rods for interior locations without security requirements. Where bottom rod is required, specify ADA compliant rod and latch guard.
- For fire-rated doors and securable, non-fire rated doors with rim and mortise type panic device applications (requiring an active lever handle), provide an exterior-side cylinder that retracts the latch bolt (but will not unlock outside trim) in conjunction with an interior-side, separately keyed cylinder, mounted in the latch head, that will unlock the outside trim.
- Specify pulls in conjunction with panic hardware, except where levers are required for fire-rated devices, or are necessary to match adjacent trim. Never select lever handles for use on public entrance doors to buildings.
 - Where lever trim must be provided to match existing non-fire-rated hardware in a given location, specify rigid lever function only.

Coordinators: At all double doors without mullions include a coordinator and carry bar. Doors with a mortise lock on the active door may have an open-back strike substituted for the coordinator and carry bar as permitted by rating authority.

Mullions: On double doors, where a fixed mullion is not included, provide a removable mullion. Key operated mullions are preferred. Where provision of a mullion is not considered feasible, provide special exit device hardware indicated above.

Thresholds: Require that aluminum thresholds be cut-in around mullions, frame members, and stops, not simply butted to them, to provide a continuous surface across the full width of the opening from jamb to jamb. At exterior doors, specify thermally broken thresholds.

Stabilizers: Require stabilizer sets on all aluminum entrance doors and frames.

Electrified Hardware (connected to campus central electronic system):

- General:
 - Do not specify magnetic locks or delayed egress devices without prior approval of the Design Manager.
 - Specify passive infrared request to exit devices in lieu of hardware with integral REX function. Coordinate with electrical.
- Hardware types / components:
 - Electric strikes: Specify where feasible. For pairs of doors with removable center mullions, specify wiring to electric strikes with quick disconnects. Do not specify for fire rated doors.
 - Electric mortise lockset: Specify for interior applications only.
 - Electric panic device with electric latch retraction:
 - Specify battery backed local power supply. For pairs of doors or doors in close proximity, provide single power supply serving both doors.
 - Specify label in end cap of exit device indicating location of power supply.
 - Electric power transfer: Provide heavy duty mortise type only. Electrified hinges and door cords are prohibited without prior approval of the Design Manager.
 - Door contacts: Specify 1" recessed door contacts where possible.

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