



Decoded Series

- **Class 1 – Introduction to Codes + Accessibility Requirements**
- Class 2 – Fire Door Assemblies
- Class 3 – Egress and Life Safety
- Class 4 – Codes for Electrified Hardware

Lori Greene
 DAHC/CDC, CCPR, FDHI, FDAI
 Allegion, Manager – Codes & Resources

Decoded 1 – Introduction to Codes & Accessibility Requirements for Swinging Doors

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Decoded Series

Session 1 – Introduction to Codes & Accessibility Requirements for Swinging Doors

- Brief overview of some codes and standards applicable to doors and hardware.
- Who is the AHJ?
- Resources for code information
- How codes affect the door and hardware industry
- Code development process and historic events that have shaped the current codes

- A117.1 vs. ADA
- Clear Width
- Maneuvering Clearance
- Hardware & Thresholds
- Closing Speed & Opening Force
- Flush Bottom Rail
- Vision Lite Location
- Automatic Operators

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Which codes and standards apply to your project?

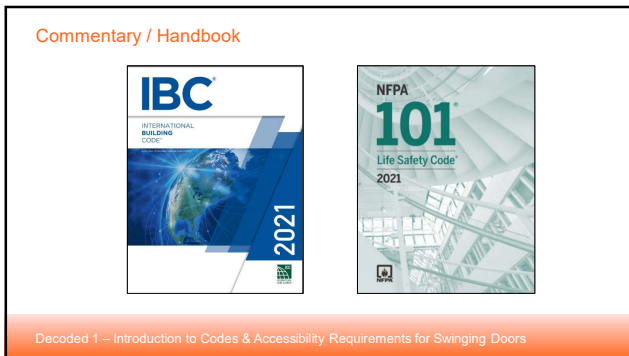


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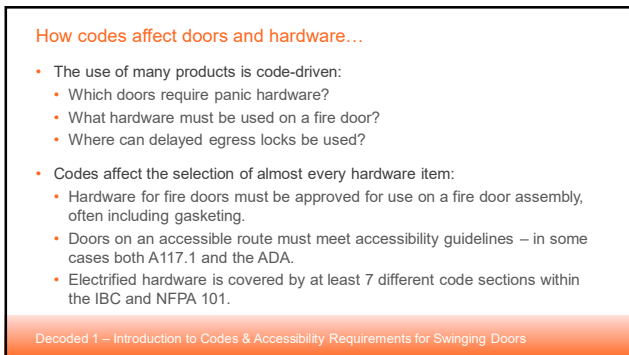
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Authority Having Jurisdiction (AHJ)

- Building Inspector
- Fire Marshal
- Insurance Inspector
- Accrediting Organization
- Health Inspector
- Electrical Inspector
- Others

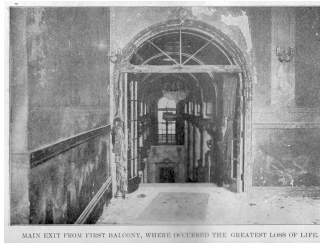


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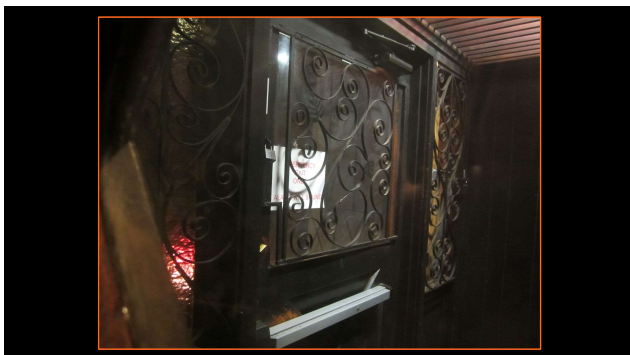
Code change is often prompted by tragedy

- Iroquois Theater Fire (1903)
 - 603 killed
- Triangle Shirtwaist Factory (1911)
 - 146 killed
- Coconut Grove (1942)
 - 492 killed
- Station Nightclub (2003)
 - 100 killed
- Many other tragic fires



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Why do we have codes?

- Enforced by law
- Accountability
- Code changes



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Code Development Process

- 3-year cycle
- Proposals submitted approved, disapproved, or modified at hearings
- Public comments
- BHMA



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Code Development Process

- 3-year cycle
- Proposals submitted
- Approved, disapproved, or modified at hearings
- Public comment
- BHMA



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Accessibility

- A117.1 vs. ADA vs. Others
- Clear Width
- Maneuvering Clearance
- Hardware & Thresholds
- Closing Speed & Opening Force
- Flush Bottom Rail
- Vision Lite Location
- Operable Force



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IBC Commentary on Accessibility:

"The fundamental philosophy of the code on the subject of accessibility is that everything is required to be accessible...In the early 1990s, building codes tended to describe where accessibility was required in each occupancy, and any circumstance not specifically identified was excluded. The more recent codes represent a fundamental change in approach. Now one must think of accessibility in terms of 'if it is not specifically exempted, it must be accessible.'"

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Which areas are not required to be accessible?

Examples:

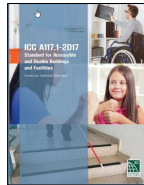
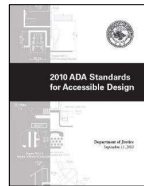
- 1103.2.6 **Construction sites.** Structures, sites and equipment directly associated with the actual processes of construction including, but not limited to, scaffolding, bridging, materials hoists, materials storage or construction trailers are not required to be accessible.
- 1103.2.10 **Single-occupant structures.** Single-occupant structures accessed only by passageways below grade or elevated above grade including, but not limited to, toll booths that are accessed only by underground tunnels, are not required to be accessible.
- 1103.2.14 **Walk-in coolers and freezers.** Walk-in coolers and freezers intended for employee use only are not required to be accessible.

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Accessibility Standards

- A117.1 – Accessible and Usable Buildings and Facilities
- ADA – Americans with Disabilities Act Standards for Accessible Design
- UFAS – Uniform Federal Accessibility Standards
- State Standards
- Fair Housing Act
- Others



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404 Doors, Doorways, and Gates

Except ADA Standards



404.1 General. Doors, doorways, and gates that are part of an accessible route shall comply with 404.

EXCEPTION: Doors, doorways, and gates designed to be operated only by security personnel shall not be required to comply with 404.2.7, 404.2.8, 404.2.9, 404.3.2 and 404.3.4 through 404.3.7.

404.2 Manual Doors, Doorways, and Manual Gates. Manual doors and doorways and manual gates intended for user passage shall comply with 404.2.

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404.2.2 Double-Leaf Doors and Gates. At least one of the active leaves of doorways with two leaves shall comply with 404.2.3 and 404.2.4.

404.2.3 Clear Width. Door openings shall provide a clearwidth of 32 inches (815 mm) minimum. Clear openings of doorways with swinging doors shall be measured between the face of the door and the stop, with the door open 90 degrees. Openings more than 24 inches (610 mm) deep shall provide a clear opening of 36 inches (915 mm) minimum. There shall be no projections into the required clear opening width lower than 34 inches (865 mm) above the finish floor or ground. Projections into the clear opening width between 34 inches (865 mm) and 80 inches (2030 mm) above the finish floor or ground shall not exceed 4 inches (100 mm).

EXCEPTIONS:

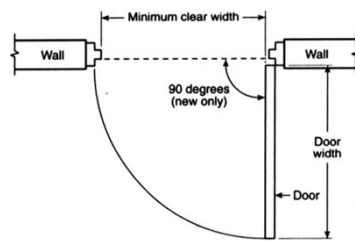
1. In alterations, a projection of 5/8 inch (16 mm) maximum into the required clear width shall be permitted for the latch side stop.
2. Door closers and door stops shall be permitted to be 78 inches (1980 mm) minimum above the finish floor or ground.

Except ADA Standards

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What hardware can help accomplish this?



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Swing clear hinges can help increase the clear opening width.

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Swing Clear Hinge

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Pocket pivots also increase the clear opening width.



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At least one leaf must provide 32 inches clear, measured from the face of the door open to 90 degrees to the edge of the inactive leaf.

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Projections Into Clear Width

- Projections into the clear opening width between 34 inches and 80 inches above the floor shall not exceed 4 inches.
- No projections into required clear opening width lower than 34 inches above the floor.

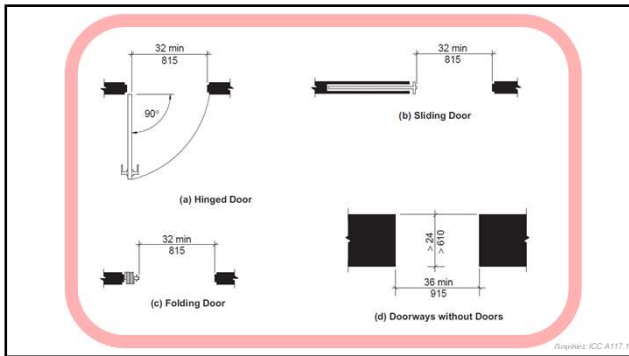
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May not project more than 4 inches into the clear opening width

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Clear Opening Height

- Minimum clear height = 80 inches
- Exception – 78 inches to the closer arm or stop
- 2018 and prior editions of the IBC do not address clearance to mag-locks, but the 2021 edition references electromagnetic locks (and automatic operators).
- Other codes and standards do not specifically address mag-locks.



80 inches or 78 inches minimum, depending on the code

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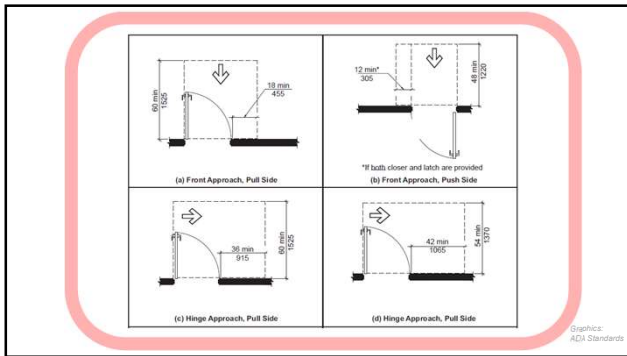
Maneuvering Clearance

Table 404.2.4.1 Maneuvering Clearances at Manual Swinging Doors and Gates

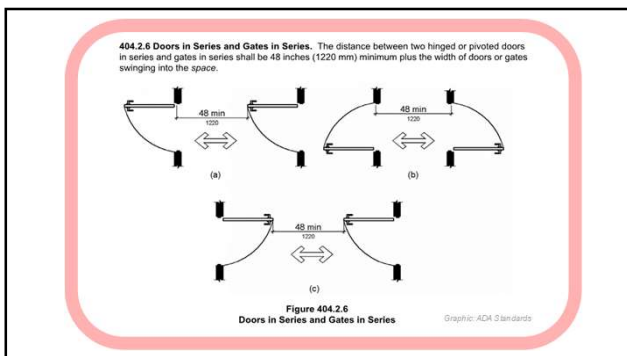
Type of Use		Minimum Maneuvering Clearance	
Approach Direction	Door or Gate Side	Perpendicular to Doorway	Parallel to Doorway (beyond latch side unless noted)
From front	Pull	60 inches (1525 mm)	18 inches (455 mm)
From front	Push	48 inches (1220 mm)	0 inches (0 mm) ¹
From hinge side	Pull	60 inches (1525 mm)	36 inches (915 mm)
From hinge side	Push	54 inches (1370 mm)	42 inches (1065 mm)
From latch side	Pull	42 inches (1065 mm) ²	22 inches (560 mm) ³
From latch side	Push	48 inches (1220 mm) ⁴	24 inches (610 mm)

- Add 12 inches (305 mm) if closer and latch are provided.
- Add 6 inches (150 mm) if closer and latch are provided.
- Beyond hinge side.
- Add 6 inches (150 mm) if closer is provided.

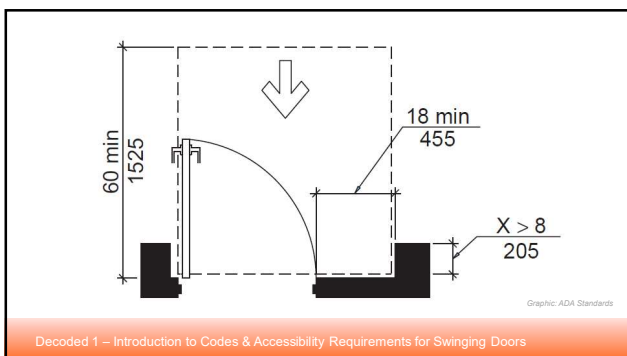
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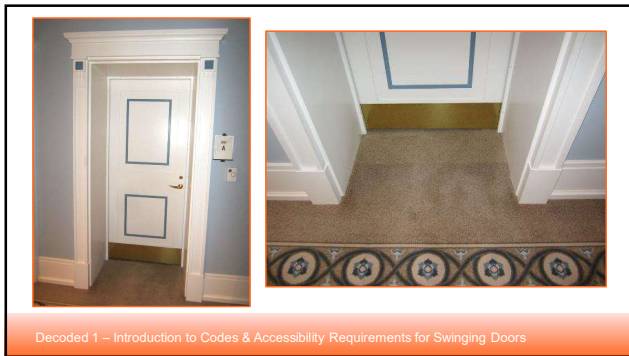
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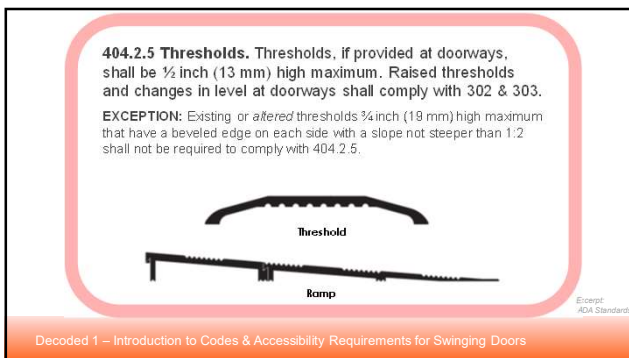
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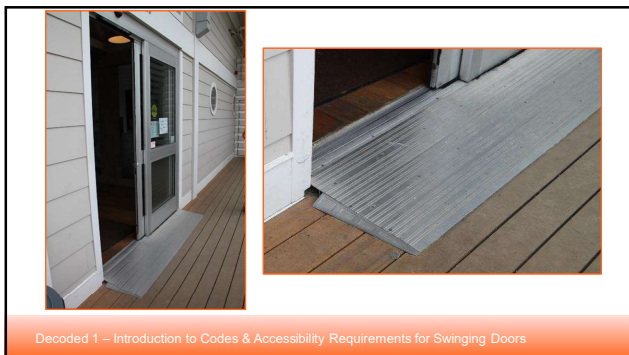
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Door Hardware



Do these levers meet accessibility standards?

In California, the lever must return to within ½-inch of the face of the door.

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Thumbturns

- Size is not specified by the standards.
- No grasping, tight pinching, or twisting the wrist.
- Accessibility standards are not prescriptive on this issue.



Accessible

???

404.2.6 Door Hardware

Handles, pulls, latches, locks, and other operable parts on accessible doors shall have a shape that is easy to grasp with one hand and doesn't not require tight grasping, pinching or twisting of the wrist to operate.

Exception: Locks used only for security purposes not normal operation

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Pulls

- Projection of pull is not specified by ADA or A117.1.
- Pull should be open so hand can slide through.
- Accessibility standards are not prescriptive on this issue either.
- ADA Guide recommends 1 ½ inches of clearance.



Accessible

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308.2 Forward Reach.

308.2.1 Unobstructed. Where a forward reach is unobstructed, the high forward reach shall be 48 inches (1220 mm) maximum and the low forward reach shall be 15 inches (380 mm) minimum above the floor.

FIG. 308.2.1
UNOBSTRUCTED FORWARD REACH

Graphic and Excerpt ADA Standards

Hardware must be mounted between 34 inches and 48 inches AFF.

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EXCEPTIONS:

- Existing locks shall be permitted in any location at existing glazed doors without stiles, existing overhead rolling doors or grilles, and similar existing doors or grilles that are designed with locks that are activated only at the top or bottom rail.
- Access gates in barrier walls and fences protecting pools, spas, and hot tubs shall be permitted to have *operable parts* of the release of latch on self-latching devices at 54 inches (1370 mm) maximum above the finish floor or ground provided the self-latching devices are not also self-locking devices and operated by means of a key, electronic opener, or integral combination lock.

Excerpt ADA Standards

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Sliding Doors

- When fully open, operable hardware must be exposed and usable from both sides.
- Surface-mounted pulls are required, and door does not retract fully into the pocket.

This application does not meet current accessibility standards.

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ADA Standards – Operation
California Building Code

404.2.7 Door and Gate Hardware. Handles, pulls, latches, locks, and other operable parts on doors and gates shall comply with 309.4. Operable parts of such hardware shall be 34 inches minimum and 48 inches maximum above the finish floor or ground. Where sliding doors are in the fully open position, operating hardware shall be exposed and usable from both sides.

Excerpt ADA Standards

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ADA Standards – Operation
California Building Code

309.4 Operation. Operable parts shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. **The force required to activate operable parts shall be 5 pounds (22.2 N) maximum.**
EXCEPTION: Gas pump nozzles shall not be required to provide operable parts that have an activating force of 5 pounds (22.2 N) maximum.

Excerpt ADA Standards

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ICC A117.1 2017
2021 IBC

404.2.6 Door and gate hardware. Handles, pulls, latches, locks and other operable parts on doors and gates shall have a shape that is easy to grasp with one hand and does not require tight grasping, pinching or twisting of the wrist to operate. **The operational force to retract latches or disengage devices that hold the door or gate in a closed position shall be as follows:**
1. Hardware operation by a forward, pushing or pulling motion: 15 pounds (66.7 N) maximum.
2. Hardware operation by a rotational motion: 28 inch-pounds (315 N-cm) maximum.

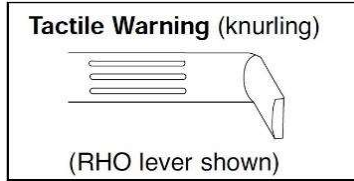
Excerpt ICC A117.1

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Tactile Warning

This requirement does not appear in the ADA or A117.1 but may appear in state standards.



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404.2.8 Closing Speed. Door and gate closing speed shall comply with 404.2.8.

404.2.8.1 Door Closers and Gate Closers. Door closers and gate closers shall be adjusted so that from an open position of 90 degrees, the time required to move the door to a position of 12 degrees from the latch is 5 seconds minimum.

404.2.8.2 Spring Hinges. Door and gate spring hinges shall be adjusted so that from the open position of 70 degrees, the door or gate shall move to the closed position in 1.5 seconds minimum.

Delayed action closers are not required by the accessibility standards.

Excerpt: ADA Standards

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404.2.9 Door and Gate Opening Force.

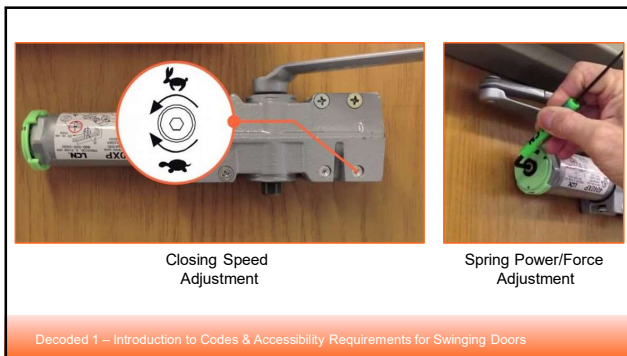
Fire doors min. opening force allowable by the appropriate administrative authority. The force for pushing or pulling open a door or gate other than fire doors shall be as follows:

1. Interior hinged doors & gates: 5 pounds, maximum
2. Sliding/folding doors: 5 pounds, maximum

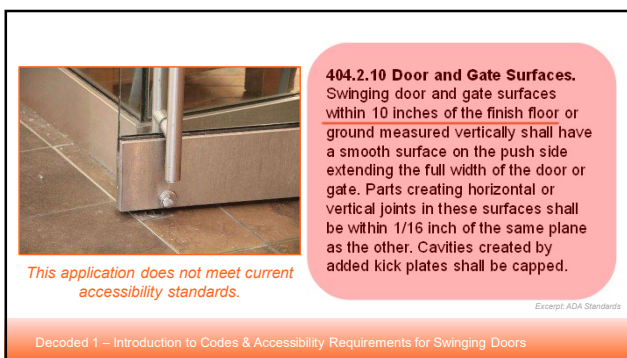
Forces don't apply to force required to retract latch bolts or disengage other devices that hold the door or gate in a closed position.

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Exceptions:

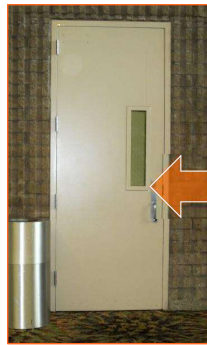
1. Sliding doors shall not be required to comply with 404.2.10.
2. Tempered glass doors without stiles and having a bottom rail or shoe with the top leading edge tapered at 60 degrees minimum from the horizontal shall not be required to meet the 10 inch (255 mm) bottom smooth surface height requirement.
3. Doors and gates that do not extend to within 10 inches (255 mm) of the finish floor or ground shall not be required to comply with 404.2.10.
4. Existing doors and gates without smooth surfaces within 10 inches (255 mm) of the finish floor or ground shall not be required to provide smooth surfaces complying with 404.2.10 provided that if added kick plates are installed, cavities created by such kick plates are capped.

Excerpt:
ADA Standards

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Vision
Lights



43 inches
max
AFF

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Power-Operated Doors

- Full-Power Operated automatic doors – must comply with ANSI/BHMA A156.10

404.3 Automatic and Power-Assisted Doors and Gates. Full-powered automatic doors shall comply with ANSI/BHMA A156.10 (incorporated by reference, see "Referenced Standards" in Chapter 1). Low-energy and power-assisted doors shall comply with ANSI/BHMA A156.19 (1997 or 2002 edition) (incorporated by reference, see "Referenced Standards" in Chapter 1).



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Power-Operated Doors

- Power-Assist and Low Energy – must comply with ANSI/BHMA A156.19

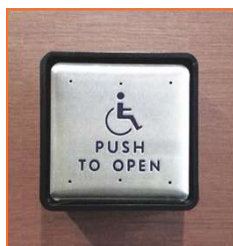
404.3 Automatic and Power-Assisted Doors and Gates. Full-powered automatic doors shall comply with ANSI/BHMA A156.10 (incorporated by reference, see "Referenced Standards" in Chapter 1). Low-energy and power-assisted doors shall comply with ANSI/BHMA A156.19 (1997 or 2002 edition) (incorporated by reference, see "Referenced Standards" in Chapter 1).



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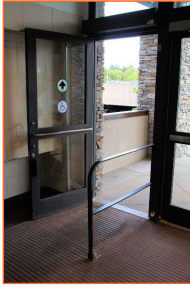
Requirements of A156.19 for low energy operators

- Initiated by a "knowing act"
 - Wall- or jamb-mounted push button
 - Touchless switches
 - Opening the door
 - Wireless transmitter
 - Access control - keypad, card reader, keyswitch



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Low energy operators not initiated by a knowing act must follow the requirements of A156.10.

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Knowing Act Switches

- 1 foot to 5 feet from door preferred, 12 feet maximum
- Accessible from swing side with door open
- User not in path of moving door
- User in full sight of door when activating switch
- 34 inches to 48 inches AFF
- **Some jurisdictions require high and low actuators**



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2010 ADAAG – Automatic Doors

404.3.1 Clear Width. Doorways shall provide a clear opening of 32 inches (815 mm) minimum in power-on and power-off mode. The minimum clear width for automatic door systems in a doorway shall be based on the clear opening provided by all leaves in the open position.

404.3.2 Maneuvering Clearance. Clearances at power-assisted doors and gates shall comply with 404.2.4. Clearances at automatic doors and gates without standby power and serving an accessible means of egress shall comply with 404.2.4.

EXCEPTION: Where automatic doors and gates remain open in the power-off condition, compliance with 404.2.4 shall not be required.

Excerpt: ADA Standards

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Session 1 – Intro to Codes & Accessibility Requirements

- Overview of codes & standards
- Who is the AHJ?
- Resources for code information
- How codes affect the door and hardware industry
- Code development process and tragic fires that have shaped current codes

- A117.1 vs. ADA
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