

## Automatic Door Maneuverability Clearance in Vestibules

Where wheelchair access is provided at a building entrance, maneuverability clearances are important for efficient access into a building. ICC standard A117.1, *Accessible and Usable Buildings and Facilities*, contains specific provisions governing these clearances. This Technical Bulletin outlines the principles involved and will also give specific A117.1-2017 provisions and commentary concerning folding, swinging, and sliding automatic doors used in vestibules at building entrances.

1. At least one exterior door and one interior door shall have the same type of automatic door (A117.1 Section 404.3.2.) The same type of automatic door, whether fully automatic or low-energy power assist, must be provided. This is important for consistency of clearances through the doors.

**404.3.2 Vestibules.** Where an entrance includes a vestibule, at least one exterior door or gate and one interior door or gate in the vestibule shall have the same type of automatic door or gate opener.

\*It is not the intent of this section to require automatic doors at vestibules. If a designer uses the exceptions in Section 404.3.4 and 404.3.6 at a vestibule, both doors must have the same type of automatic door provided; either both must be fully automatic, or both must be a low-energy power assist door. The controls are addressed in Sections 404.3.7 and 404.3.8. The exception in Section 404.1 would not require this section to apply for doors operated only by security personnel.

**NOTE: IBC 2021 Section 1105 requires automatic doors under certain occupancy thresholds, which may in turn require automatic doors at vestibules.**

2. The minimum clear opening width shall be based on the clear opening width provided with all door leafs in the open position (A117.1 Section 404.3.3.) Doorways shall have a clear opening width of 32 inches regardless of whether the doors are in a power-on or power-off mode.

**404.3.3 Clear width.** Doorways shall have a clear opening width of 32 inches (815 mm) in power-on and power-off mode. The minimum clear opening width for automatic door systems shall be based on the clear opening width provided with all leafs in the open position.

\*This provision assures that the 32-inch clear width required by the accessible route

provisions of Section 403.5 is maintained at the door. This also matches the width found in Section 404.2.2 for manual doors.

This clear width is required whether the door power is on and operating or is not turned on. Typically the “power off” mode is in play when the door has a break-away feature for emergency evacuation with a loss of power to the building. Literally this is the same as the requirement for the break-out opening to have a 32-inch clear width as required in Section 404.3.9.

The second portion of this section is an important distinction between automatic doors and manual doors. Under this provision, if an automatic door uses two leaves to meet the 32-inch (815 mm) clear width, that is acceptable. Manual doors are limited by Section 404.2.1 to having at least one leaf that meets this clear width requirement. Because of this, an automatic door having two 30-inch (765 mm) leaves that both open together would be acceptable in meeting the clear width requirement.

3. Maneuvering clearances shall include the required latch-side or hinge-side clearance (A117.1 Section 404.2.3.)

**404.2.3 Maneuvering clearances.** Minimum maneuvering clearances at doors and gates shall comply with Section 404.2.3. Maneuvering clearances shall include the full clear opening width of the doorway and the required latch-side or hinge-side clearance.

\*The ability of an individual using a mobility device not only to approach a door but also to get the necessary leverage to open the door is the basis for the clearances established in this section [see Commentary Figures C404.2.3(a), (b), (c) and (d)].

Many combinations of conditions may confront a person who is disabled: approaching from the pull, push, hinge or latch side; operating a door that may or may not be equipped with a closer; making a parallel or perpendicular approach; and so forth.

The front approach is similar to the forward reach (see Section 308.2.1), and the hinge or latch side approach is similar to the side reach (see Section 308.3.1). Although doors are listed as part of the accessible route components in Section 402.2, the scoping provisions may not require every possible route to be accessible. When doors may be approached from more than one direction (e.g., a door along a hallway), the literal requirement is only to provide one maneuvering clearance at each door, even though providing for more than one clearance at the doors along the normal routes of travel may be the better design. Some configurations may require a person using a mobility device to move past the door, turn around and come back from another direction to have maneuvering clearance to open the door. At the same time, there is no prohibition from having maneuvering clearances overlap for adjacent doors or doors across the hall.

A person using a mobility device is expected to move through a door opening, as opposed to occupying a floor space at a work surface or lavatory. Door maneuvering clearances encompass all of the vertical space above the required clearance area.

The 2009 edition of this standard included a sentence stating that the maneuvering clearance should not include knee and toe clearance. This introduced the question of whether anything could overlap the maneuvering clearance. The text that previously existed in the standard was an attempt to allow small protrusions where a person using a wheelchair would still have had adequate space to operate the door. Unfortunately, the previous text was vague. Protruding objects in the maneuvering clearance area, such as a counter or lavatory, could prevent a standing person with a walker or a person using a wheelchair from fully utilizing the clearance area. Therefore, provisions for knee and toe clearances under elements should not overlap the door maneuvering clearances [see Commentary Figure C404.2.3(e)]. The A117.1 committee deleted the sentence as part of the coordination with the 2010 ADA Standard for accessible design; however, it may still be something that code officials and designers will want to discuss to determine exactly how the provision is to be applied. Stating that absolutely no protrusions allowed over the maneuvering clearance for the full height of the door would include common protrusions such as light switches, room signage, fire alarm pull stations, corridor bumpers or light sconces; in a bathroom this could also include hand dryers or recessed garbage cans.

Maneuvering clearances at doors permit the user approach and passage. The standard does not require maneuvering clearances that would permit the user to make a turn and pull or push the door closed after passing through the doorway. If such maneuvering space is provided near but not adjacent to the door, then the user must make a 180-degree (3 rad) turn where space is provided, retrace the path, close the door and move away from the door backward. Consideration should be given to providing sufficient maneuvering space for the closing, opening, approach to and retreat from doors. The exception in Section 404.1 would not require this section to apply for doors operated only by security personnel.

4. Maneuvering clearances shall be provided on the egress side of low-energy automatic and full power automatic doors that serve as part of an accessible means of egress (A117.1 Section 404.3.4.)

**404.3.4 Maneuvering clearances.** Maneuvering clearances at power-assisted doors and gates shall comply with Section 404.2.3. Maneuvering clearances complying with Section 404.2.3 shall be provided on the egress side of low-energy automatic and full power automatic doors and gates that serve as part of an accessible means of egress.

**Exceptions:**

1. Low-energy automatic and full power automatic doors and gates that have standby power or battery back-up shall not be required to comply with this section.
2. Low-energy automatic and full power automatic doors and gates that remain open in the power-off condition shall not be required to comply with this section.
3. Full power automatic sliding doors and gates that include a break-away feature shall not be required to comply with this section.

\*Power assist doors are required to provide the same maneuvering clearance requirements as manual doors (see the commentary for Section 404.2.3) because normal operation would require a continuous pressure on the hardware.

The *International Building Code* (IBC) is referenced by the 2010 ADA Standard for Accessible Design for accessible means of egress. The referenced editions are the 2000 with the 2001 Supplement and the 2003. Later editions could be utilized under the allowance for equivalent or better requirements. The IBC has criteria by which exits are required to serve as accessible means of egress in new construction.

Accessible means of egress must be maintained, but they are not required to be added in existing buildings. The concern was that if there was a loss of power to the building, a person using a mobility device that needed the maneuvering clearance would not be able to self-evacuate. There are three options that will allow for the automatic door to operate even if there is a loss of power.

Exception 1 states that for a low occupancy space, such as a bathroom, or at doors where the general population will not use the automatic operation for emergency evacuation, such as at a low-energy automatic door, a battery backup would be an effective means to still allow for self-evacuation even after a power outage.

Exception 2 allows for the option of automatic doors to be set so if there is a loss of power, the automatic doors will move to the open position.

Exception 3 allows for automatic doors to have a break-away feature that will result in the doors being in the open position once they have been broken away; this is typically the option for automatic horizontal sliding doors.

Both Exceptions 2 and 3 would have the best allowances for accessible means of egress in buildings with larger occupancies.