

Code- Compliant Hardware

FOR HEALTH CARE FACILITIES

Navigating codes while balancing life safety and security is complicated. These tips make the process easier.

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FINDING THE PROPER BALANCE BETWEEN LIFE SAFETY AND SECURITY REQUIREMENTS IS WHAT I LIKE TO CALL "SAFECURITY." MY AIM IS TO HELP YOU UNDERSTAND HOW YOU CAN NAVIGATE THE CODES AND ACHIEVE THIS BALANCE.

When I teach students how to select code-compliant hardware solutions for health care facilities, there are a few questions I get all the time.

Students want to know how to properly lock double egress doors that go from non-secure into secure areas, and how to deal with owners who want to lock the door on the egress side.

They also want to understand the difference between controlled and delayed egress and whether all assisted living facilities are classified the same for the purpose of selecting appropriate hardware.

Selecting hardware for health care facilities can get complicated, and meeting code requirements adds another level of complexity. Construction documents for new health care projects often take a long time to prepare and hours of coordination meetings that

include life safety and security checkpoints to ensure compliance.

Code Requirements

In the United States, the International Building Code (IBC) has been adopted, in one form or another, by every state. According to the International Code Council (www.iccsafe.org), as of September 2020, there are 23 states that have adopted the 2015 edition, and another 16 have adopted the 2018 edition. For this reason, I will use the 2015 edition of the IBC for code reference citations and discussion of requirements.

A few tables in this article show the differences and similarities between the IBC and The Life Safety Code (NFPA 101) and the specific requirements for the hardware. If there are conflicting requirements

when more than one code is in effect, the more restrictive requirements are followed. You will need to include any local or state amendments for your project area.

Before trying to select code-compliant hardware for a project, I recommend you build a cross-reference table in a spreadsheet with all the pertinent codes and exceptions. This way you can highlight the more restrictive requirements for each category and discuss them during the various stages of the project when codes are reviewed.

The definitions of occupancy types can be found in Chapter 3 of the IBC. To select the appropriate code-compliant hardware, it is important to understand how the facility is classified. Hospitals, nursing homes and assisted living facilities are considered institutional occupancies; however, assisted living facilities could be classified as a residential occupancy.

What differentiates institutional occupancies (listed as "Group I" in

A typical controlled egress opening that complies with IBC 2015.



the IBC) from others is that the people who inhabit them are not capable of self-preservation without the assistance of staff if there is a fire or other emergency. The IBC definition reads, “Incapable of Self-Preservation: Persons who, because of age, physical limitations, mental limitations, chemical dependency, or medical treatment, cannot respond as an individual to an emergency situation.”

Assisted living facilities for more than 16 people residing on a 24-hour basis in a supervised environment are considered Group I-1. Hospitals (including behavioral health care hospitals) and nursing homes used for medical care on a 24-hour basis for five or more people are considered Group I-2.

The hardware requirements for locking doors from the egress side in these types of institutional occupancies are generally less restrictive than other types of occupancies, mainly because staff controls evacuating or relocating patients to safe areas.

Residential occupancies are for the purposes of sleeping when not classified as institutional. Assisted living facilities of more than five, but not more than 16, people who reside on a 24-hour basis in a supervised residential environment and receive

custodial care are classified as Group R-4. Because this group is capable of self-preservation with limited verbal or physical assistance, the hardware requirements are more restrictive.

The IBC definition reads, “Custodial Care: Assistance with day-to-day living tasks, such as assistance with cooking, taking medication, bathing, using toilet facilities and other tasks of daily living. Custodial care includes persons receiving care who have the ability to respond to emergency situations and evacuate at a slower rate and/or who have mental and psychiatric complications.”

Chapter 10 of the IBC contains the door and hardware requirements for openings in a means of egress. Chapter 4 section 407 has additional special detailed requirements for Group I-2 hospitals and nursing homes. Be aware of the requirements for smoke and fire doors found in Chapter 7.

Egress Requirements

In understanding general means of egress requirements, the majority of door and hardware requirements will be found in Section 1010, titled “Doors, Gates and Turnstiles.”

1010.1.9.6 CONTROLLED EGRESS DOORS IN GROUPS I-1 AND I-2.

Electric locking systems, including electro-mechanical locking systems and electromagnetic locking systems, ***shall be permitted to be locked in the means of egress in Group I-1 or I-2 occupancies where the clinical needs of persons receiving care require their containment.*** Controlled egress doors shall be permitted in such occupancies where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or an approved automatic smoke or heat detection system installed in accordance with Section 907, provided that the doors are installed and operate in accordance with all of the following:

TABLE 1: CONTROLLED EGRESS BY OCCUPANCY

	Group I I-1 Assisted Living	Group I I-2 Healthcare	Group R Residential
IBC 2006	-	-	-
IBC 2009 1008.1.9.6	-	YES	-
IBC 2012 1008.1.9.6	-	YES	-
IBC 2015 1010.1.9.6	YES	YES	-
IBC 2018 1010.1.9.7	YES	YES	-
NFPA 101 2006 18.2.2.2.4(1)	YES	YES	-
NFPA 101 2009 18.2.2.2.5.1	YES	YES	-
NFPA 101 2012 18.2.2.2.5.2	YES	YES	-
NFPA 101 2015	YES	YES	-



Unless by exception, doors in a means of egress must be readily opened from the egress side without the use of a key, tool, special knowledge or effort.

The minimum clear opening width of doors is 32 inches, measured from the face of the door to the face of the stop when the door is opened 90 degrees. For means of egress doors in a Group I-2 occupancy used for the movement of beds, the minimum clear width is 41 1/2 inches. Patients in hospitals and nursing homes will likely be evacuated or relocated to an area of refuge while in their beds, which is why the doors along the egress path must be wider.

The minimum height of door openings is 80 inches with no obstruction from closers or stops below 78 inches. For this reason, surface mounted mag locks, when specified, should be used on doors 84 inches and taller so as not to obstruct the clear height. Always double-check the height of surface mag locks, including any installation mounting brackets on the manufacturer's cut sheet. If you need a mag lock for a 6-foot-8-inch-high door, it would need to be a shear lock.

Unless by exception, doors in a means of egress must be readily opened from the egress side without the use of a key, tool, special knowledge or effort. Exception 1 to 1010.1.9.3 allows locking the door on the egress side in places of detention or restraint and applies to many doors within health care facilities.

This exception allows for mechanical locking of the door from the egress side. It purposely leaves room for interpretation by the authority having jurisdiction (AHJ). It does not allow an owner or architect to simply apply the exception loosely based on what might be easier for the staff – for example, keeping tabs on patients by locking them in their room.

The exception is commonly reserved for areas of a hospital where the clinical needs of the patients require their containment or restraint for their physical safety and behavioral health. Most AHJs will

TABLE 2: CONTROLLED EGRESS BY REQUIREMENTS

	Sprinkler/ Detection System Release	Unlock on Power Loss to Lock	Signal From Fire Command/ Nurse Unlock	Approved Procedures Posted	All Clinical Staff Carry Credential/ Key	Emergency Lighting at Door	Reduced Restriction For Mental Health	Reduced Restriction For Infant Protection	No More Than One Before Entering Exit	Listed UL294
IBC 2006	-	-	-	-	-	-	-	-	-	-
IBC 2009 1008.1.9.6	YES	YES	YES	YES	YES	YES	YES	NO	NO	NO
IBC 2012 1008.1.9.6	YES	YES	YES	YES	YES	YES	YES	NO	YES	NO
IBC 2015 1010.1.9.6	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
IBC 2018 1010.1.9.7	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
NFPA 101 2006 18.2.2.2.4(1)			YES		YES					
NFPA 101 2009 18.2.2.2.5.1	YES	YES	YES	NO	YES	NO	NO	NO	NO	NO
NFPA 101 2012 18.2.2.2.5.2	YES	YES	YES	NO	YES	NO	NO	NO	NO	NO
NFPA 101 2015 18.2.2.2.5.2	YES	YES	YES	NO	YES	NO	NO	NO	NO	NO



A typical delayed egress opening that complies with IBC 2015.

TABLE 3: DELAYED EGRESS BY OCCUPANCY

	Group I I-1 Assisted Living	Group I I-2 Healthcare	Group R Residential
IBC 2006 1008.1.8.6	YES	YES	YES
IBC 2009 1008.1.9.7	YES	YES	YES
IBC 2012 1008.1.9.7	YES	YES	YES
IBC 2015 1010.1.9.7	YES	YES	YES
IBC 2018 1010.1.9.8	YES	YES	YES
NFPA 101 2006 7.2.1.6.1	YES	YES	YES
NFPA 101 2009 7.2.1.6.1	YES	YES	YES
NFPA 101 2012 7.2.1.6.1.1	YES	YES	YES
NFPA 101 2015 7.2.1.6.1	YES	YES	YES

require all clinical staff members to carry a key and have a posted life safety evacuation plan and possibly other safeguards to use this exception.

Special Locking Arrangements

The two most common special locking arrangements in health care facilities are controlled egress and delayed egress. These are considered special locking arrangements because they electrically lock the door on the egress side, but come with restrictions on where, when and how to use them.

Controlled egress is very limited in where it can be used. Table 1 shows the various code cites and in IBC 2015 and beyond, it can be used only in Group I-1 assisted living facilities and Group I-2 hospitals and nursing homes. If an assisted living facility is classified as R-4, controlled egress cannot be used.

The other key factor is that controlled egress can only be used on means of egress doors where the clinical needs of the persons receiving care require their containment. This would apply to areas such as a dementia unit, memory care unit, infant patient wing and behavioral health area, to name a few.

TABLE 4: DELAYED EGRESS BY REQUIREMENTS

	Sprinkler/ Detection System Release	Unlock on Power Loss to Lock	Signal From Fire Command Center Unlock	15 Second Delay	Where Approved 30 Second Delay	Sign on Door	Emergency Lighting at Door	No More Than One Before Entering Exit	Listed UL294
IBC 2006 1008.1.8.6	YES	YES	YES	YES	YES	YES	YES	YES	NO
IBC 2009 1008.1.9.7	YES	YES	YES	YES	YES	YES	YES	YES	NO
IBC 2012 1008.1.9.7	YES	YES	YES	YES	YES	YES	YES	YES	NO
IBC 2015 1010.1.9.7	YES	YES	YES	YES	YES	YES	YES	*YES	YES
IBC 2018 1010.1.9.8	YES	YES	YES	YES	YES	YES	YES	*YES	YES
NFPA 101 2006 7.2.1.6.1	YES	YES	YES	YES	YES	YES	NO	BY OCCUPANCY TYPE	NO
NFPA 101 2009 7.2.1.6.1	YES	YES	YES	YES	YES	YES	NO	BY OCCUPANCY TYPE	NO
NFPA 101 2012 7.2.1.6.1.1	YES	YES	YES	YES	YES	YES	NO	BY OCCUPANCY TYPE	NO
NFPA 101 2015 7.2.1.6.1	YES	YES	YES	YES	YES	YES	YES	BY OCCUPANCY TYPE	NO

*With exceptions

The requirements for controlled egress are shown in Table 2 for comparison to different editions of the code. Photo 1 shows a typical controlled egress opening that complies with IBC 2015. The mag lock on the egress side is fail safe and tied to the sprinkler system to release on actuation.

The mag lock can be unlocked remotely by a signal from the fire command center or from a nurse's station. The door is unlocked on the egress side when a valid credential is presented to the card reader; otherwise, the door remains locked. All clinical staff must carry the credential to unlock the door.

There can only be one controlled egress opening in a path of egress before entering an exit. Emergency lighting must be provided at the door, and the lock mechanism must be listed UL294. The procedures for unlocking the doors must be approved and posted in accordance with Chapter 4 of the International Fire Code.

There are two exceptions to these requirements. If the occupied area functions as part of a psychiatric treatment area or where there is a listed egress control system to reduce the risk of child abduction from a nursery or obstetrics area, then the locks do

not need to be fail safe or tied to the sprinkler/smoke detection system. In addition, you can have more than one controlled egress opening in a path of egress before reaching an exit.

When given the option, most health care facility owners choose controlled egress because it is the easiest way to lock a door from the egress side in a health care facility. They do not have to worry about a loud alarm waking or disturbing other patients. When used as part of an infant abduction system, facility owners do not have to be concerned about potentially confusing signage on the door.

Controlled egress works well as part of a security interlock in behavioral health care. Most importantly, controlled egress can achieve both life safety and security on these critical patient care doors.

However, there may be areas the hospital wants to lock for security purposes where patient care does not require containment. There are also facilities that fall under an earlier edition of the IBC that does not allow controlled egress. And what about those R-4 assisted living facilities? These are examples of where the second type of special locking arrangement, delayed egress, comes in.

Delayed egress has a broader application and can be used to lock the egress side of doors for 15 seconds, possibly 30 seconds by exception, and has been in the life safety codes since 1981.

Delayed egress locking systems can be used on Group I-1, I-2 and R-4 health care facilities as long as all of the criteria are met. Table 4 shows the requirements for delayed egress across the different editions of the code and, as you can see, there is not as much variation.

Staff carry the credential for the card reader or other control device to shunt the system and allow entry to the secured space. If an unauthorized person attempts to use the doors, a loud alarm sounds and the person is prevented from leaving for 15 seconds (or longer by exception). If there was actuation of the fire alarm, sprinkler system or loss of power to the locking device, the doors would be free for immediate egress.

There are many trade-offs and exceptions in the codes for health care facilities. One of the main reasons that

Group I institutional occupancies are allowed to have these special locking arrangements is because the buildings have full sprinkler systems. Plus, the staff are trained in the evacuation and safe movement of patients to an area of refuge.

When specifying and selecting code-compliant hardware, there is a fine line between balancing both life safety requirements with an owner's security needs. I hope that, moving forward, you feel more confident in your ability to help owners achieve "safecurity" in their health care facilities. +



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