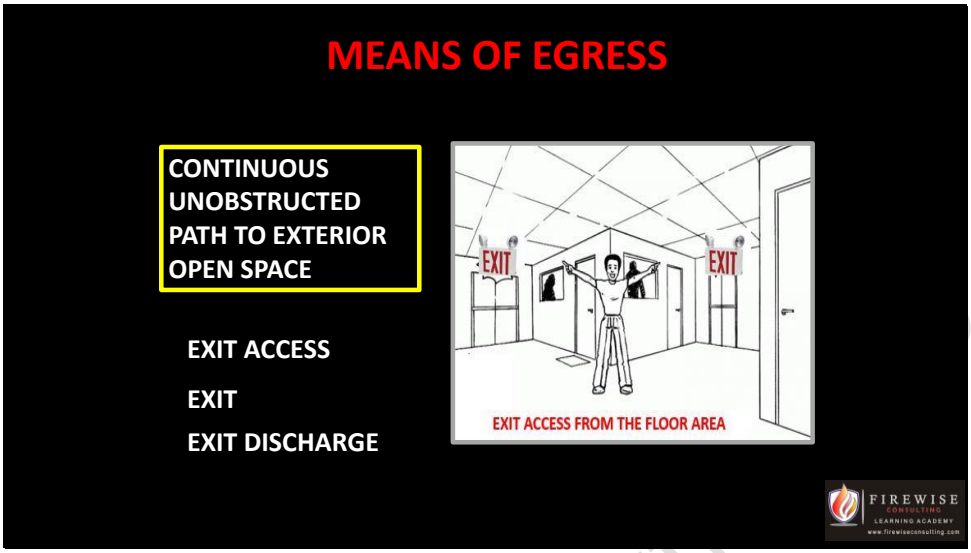
Two of the most common elements of Fire Prevention are early detection of the fire and adequate exiting. Together they are designed to notify the occupants in the early stage of the fire and provide a safe and reliable means to escape. In this unit we will discuss a number of terms used to describe exits and what makes up an exit, different types of exits, fire rated doors, methods to hold doors open for convenience, self closing devices, obstruction of exits, number of exits required, dead end corridors, exit signs and emergency lighting.

There are many terms used to describe exiting including means of egress, access to exit, exit corridors, exit stairs and exit doors. We will look at each of these terms in the next few slides.



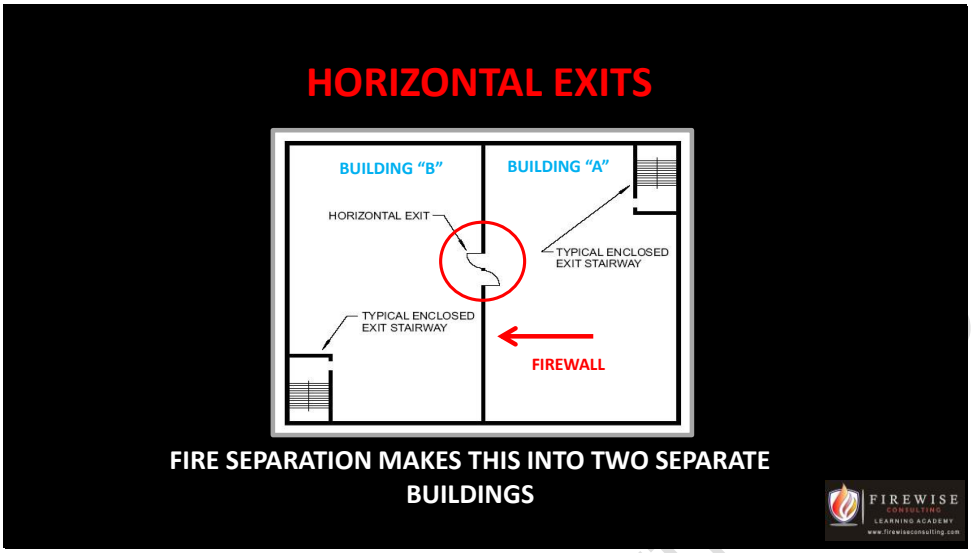
A Means of Egress is a continuous and unobstructed path of exit travel from any point within a building to a place of safety. An exit route consists of three parts:
Exit Access – is the portion of an exit route that leads to an exit.
Exit – the portion of an exit route that is generally separated from other areas to provide a protected way of travel to the exit discharge. This could be a stair tower or a corridor.
Exit Discharge - is the part of the exit route that leads directly outside or to a street, walkway, refuge area or open space with access to the outside.

Access to exit means a clear path from any point in a room or area to the exit. In the event of an emergency people need to quickly leave the building. People should be able to see an exit sign from where they are and be able to reach it without obstructions.

Access and egress means the path of travel to an exit including corridors, doorways, gates, stairs etc. which may provide a means of exit.
When conducting your fire safety assessment follow these guidelines to promote safe evacuation in corridors, stairways and exits:

•There must be at least 44 inches or 112 centimeters clear width of unobstructed, clutter-free space in all corridors, stairways and exits.
•Keep all means of egress clean, clutter-free and unobstructed.
•Do not store materials or equipment in areas that are used for evacuation.
•Do not use corridors or stairways for operations related to the use of the building.

The fire code says that exit doors must be maintained so that they open freely when a force 90 Newtons is applied. That means that the door must open freely in the direction of exit travel when a force of about 20 pounds is applied to the hardware.



Horizontal exits allow people to move seamlessly from one building to another but most people don't even know they are doing it.
Horizontal exits are common is schools, hospitals, office buildings and in residential apartment buildings that are divided by fire walls. Note that the doors swing in opposite directions so exiting can be done in both directions depending where the fire is.

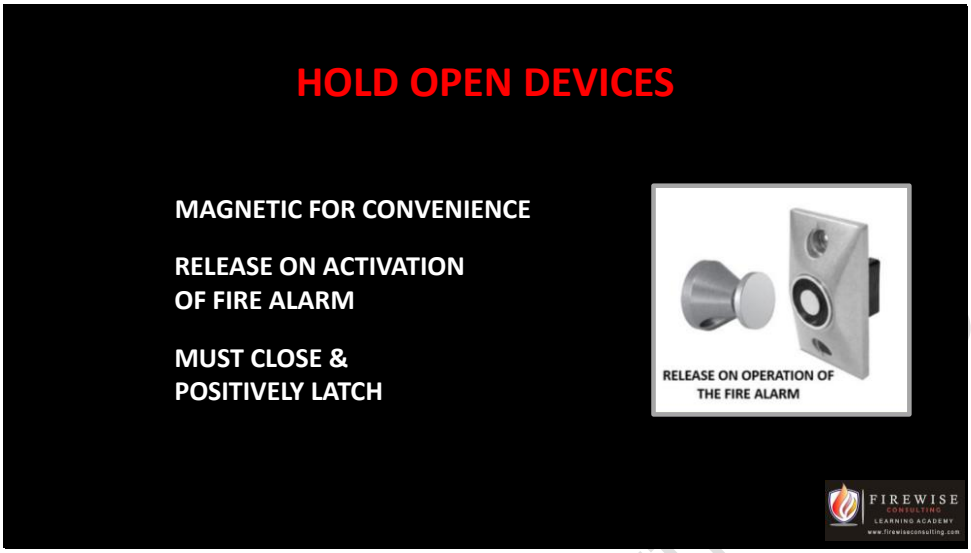
This photograph shows a horizontal exit. When a building is divided into compartments by fire separations openings through the fire separation must be protected by closers. This is most common in hospitals and care facilities where in the event of an emergency it may not be practical to move occupants out of the building. Hospitals often move patients from the area where the event is taking place to the other side of the fire separation which is deemed to be a safe area.

Horizontal exits are also common in apartment buildings. In most cases the designer has chosen to divide the building into fire compartments thus avoiding the need to install a fire sprinkler system. The space on each side of the fire separation is considered a separate building. In order to prevent the spread of fire it is critically important that the doors be kept closed and positively latched or they be held open with an approved magnetic hold open device that allows the door to return to the closed position upon activation of the fire alarm system.

Key components of a horizontal fire separation are fire rated doors, magnetic release hardware, a self closing device, fire alarm pull stations and smoke detectors in both compartments near the exit and exit signs on both sides of the exit.

When performing a fire assessment the doors should be pulled free of the magnets that hold them open and allowed to close by themselves. Operating properly they will close and positively latch. If they do not close and latch maintenance is required.

Usually fire doors are rated for a time duration such as 20 minutes, 1 hour, 2 hour etc. The building designer determines what rating is required. The doors come with a label affixed to the edge of the door. The labels on doors should not be removed or painted over. These photographs are typical labels that are found on fire rated doors.



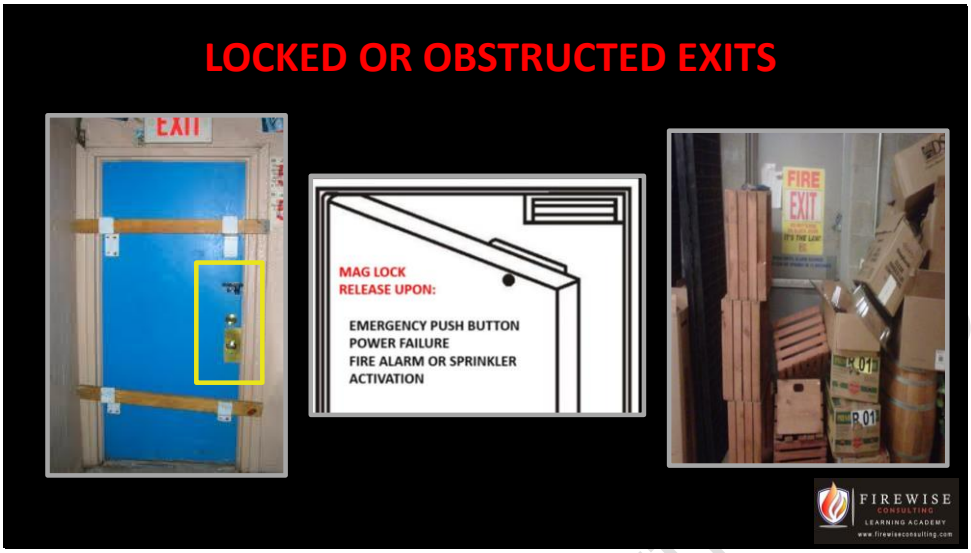
Some fire separation doors are equipped with magnetic hold open devices for the convenience of the building occupants. They are connected to the fire alarm system and will release upon activation of the alarm. When the alarm sounds the magnets release the door so it can close and positively latch. It is important the door positively latch because fire creates sufficient pressure to partially open the door. Even small openings and cracks allow smoke, hot gases and flames to enter other parts of the building.

When doing a fire assessment pull the door free of the magnet and let it fully close without your assistance. It should positively latch. If it does not the door or self-closing device requires adjustment.

Door wedges, elephant feet and other objects should not be used to hold fire separation doors in the open position. They can defeat the purpose of the door as far as containing the fire. If the door needs to be held in the open position an approved hold open device should be installed.

All fire separation doors should be equipped with a self-closing device. Self-closing devices are designed to return the door to the closed position after each use. Due to expansion, contraction and building settling fire separation doors may require adjustment to close and positively latch. Adjustments can be made to the self-closing device mechanism and other door hardware to ensure they work as designed. Sometimes the doors themselves require adjustment so they work as designed.

If a fire separation door is not equipped with a self-closing device it should have a permanent sign on both sides of the door stating that the door is to be kept in the closed position.



Exits must be in operable condition at all times when the building is occupied. They must swing freely in the direction of exit travel. Any security devices that prevent the intended operation of the door must be removed when the building is occupied.

With the exception of contained use areas where occupant movement is restricted, exit doors must not be equipped with locking hardware that would allow an occupant to be locked inside the room or space. They cannot be equipped with secondary locking devices, such as a deadbolt or slide bolt, etc. It should be possible to open any designated exit door using a single motion, without the use of a key, tool, or special knowledge.

In some situations when certain conditions are met Electromagnetic Locks are permitted to keep exit doors in the closed position but this requires the mag-locks to be released by a motion sensor, emergency push-button, power failure, an activation of the fire alarm or sprinkler system.

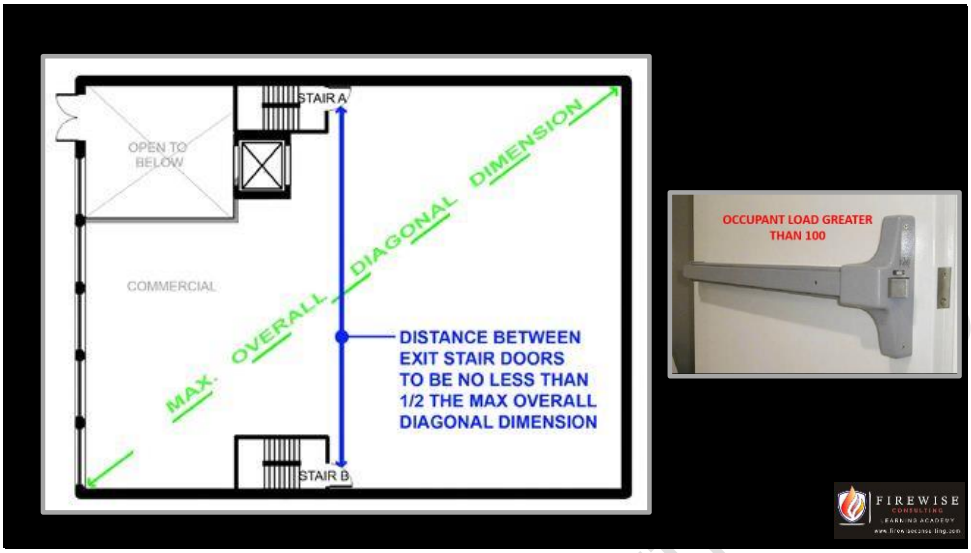
No storage or accumulation of materials should be allowed in the path of exit travel.

During your fire safety self-assessment, make sure there is nothing on the outside of the building that can interfere with the operation of the doors or anything that can block the swing of the door from opening outward freely. Make sure that vehicles cannot accidently block the exits. If they can, the building owner should have barriers placed so the door cannot be blocked.

Codes and standards that regulate a building's egress systems can be very complex and will vary depending on the use of the particular building, area, or room and the specific requirements of the Authority Having Jurisdiction. Here are some basic requirements that apply to most exits but again they can vary depending on the applicable codes.

The number of exits required and the size of the exit is based on the size, use and occupant load of the building. In most cases floor areas should be served by at least 2 exits. There are some exceptions for small buildings and floor spaces. For any room or space with only one exit, the maximum occupant load should not exceed 60 people.

Your local fire department fire prevention division should be contacted to answer questions about exiting requirements for your building.

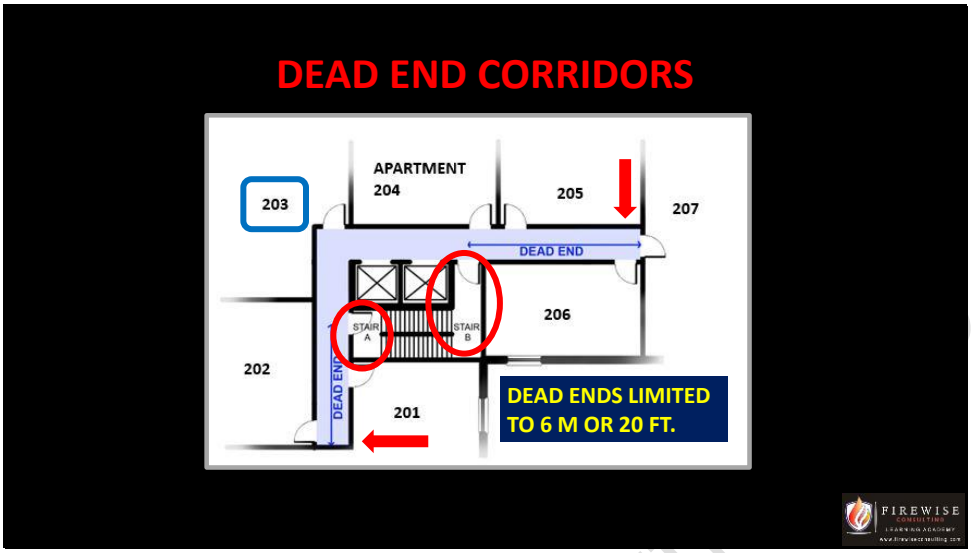


The distance between 2 exits from a floor area should be one half the maximum diagonal dimension of the floor area. In other words the exits should be spread some distance apart.

Except for doors serving a single dwelling unit and some sliding and revolving doors all exit doors should be the swing type that open outward in the direction of exit travel. If a revolving door is used a swing door providing equivalent exiting capacity should be located next to it. An exit door may swing inward if it serves an occupant load less than 60 people.

For buildings and rooms with more than 100 occupants, doors should be equipped with panic hardware.

There should be no mirrors, drapes or other items placed in or adjacent to an exit in a manner that would confuse the direction of exit travel.



In case of fire, it's good to have 2 means of exit because smoke or heat can block the path to safety. In this example, a scissor stair provides two means of egress for residents of this apartment building. However, this corridor has two dead ends. This means that in case of fire, residents coming out of apartment 203 have 2 directions to choose from but the rest of the apartments have only one possible direction they can go to get to an exit stair. Therefore most building codes limit dead end corridors to about 6 meters or 20 feet. Alterations to buildings can create dead end corridors. Before starting any renovations, check with your local building and fire authorities first.

Exits must be located so as to be clearly visible or their locations must be clearly indicated.
Exits and exit routes should be clearly marked so that anyone in the building can easily tell the direction of escape, from any point in the building.
Every exit door must have an exit sign placed over or adjacent to it if the exit serves:
a) a building more than 2 storeys in building height,
b) a building having an occupant load of more than 150, or
c) a room or floor area that has a fire escape as part of a required means of egress.

Exit signs should be red or green and located where they are highly visible.

Exit signs have the word EXIT in easy-to-read letters that are at least 6 inches high.

Most fire and building codes require emergency lighting in exits, principal routes providing access to exit in an open floor area and corridors used by the public to exit a building.

Emergency lighting is required to give enough lighting to enable occupants of a building to evacuate the building safely in the event of an emergency or power failure. Emergency lights are designed to come on when the power goes out. Every model, therefore, requires some sort of a battery or generator system that will provide electricity to them during a power failure. Most individual light sources can be rotated and aimed where light is needed most in an emergency, such as toward fire exits.

The level of illumination required will vary depending on location and use. A general rule however is, that there should be enough lighting so you can see to tie your shoes.

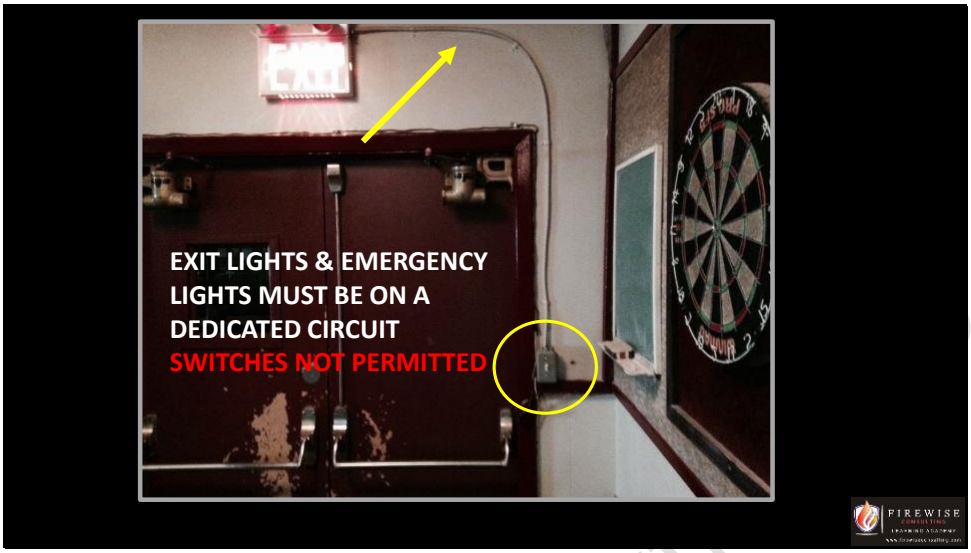
Many fixtures have a test button which overrides the unit and causes it to switch on the lights and operate from battery power even if the main power is still on. Emergency lights should be tested monthly but also require annual inspection, testing and maintenance by a qualified technician. Individual units should be tagged signed and dated by technician and a report should be available to the Authority Having Jurisdiction upon request.

An emergency lighting installation may be either a central standby source such as a bank of batteries or self-contained units which incorporate the lamp, battery, charger and control equipment.

Self-contained emergency lighting units must be inspected monthly to ensure that the lights are functioning and not obviously damaged or obstructed, the terminal connections are clean, free of corrosion and lubricated when necessary and that the battery clamps are clean and tight and the battery surface is kept clean and dry.

Emergency lighting must also be tested every 12 months by a qualified technician to ensure that the unit will provide emergency lighting for a duration equal to the design criterion under simulated power failure conditions. Written records must kept of all inspection, testing and maintenance and be available to the Authority Having Jurisdiction upon request.

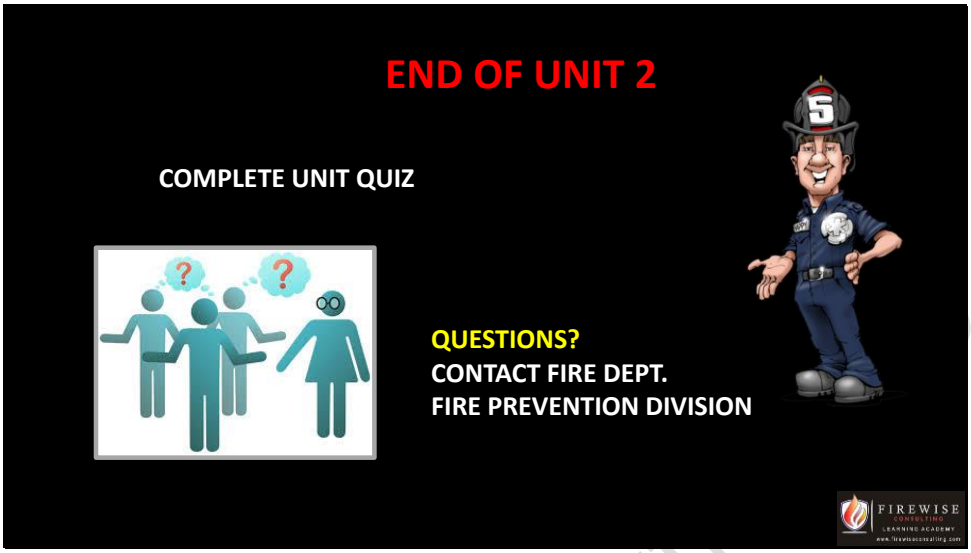
Some new lighting designs are battery backup ballasts that are installed in or adjacent to existing lighting fixtures. Upon sensing power loss the ballasts switch to emergency mode turning the existing lights into emergency lighting.



Emergency lights and exit signs must be on a dedicated electrical circuit wired directly into the panel without switches that can turn the lights on and off. In this case the exit sign could be turned on or off using the switch on the right hand side of the exit door.

In this unit we discussed a number of terms used to describe exits including access to exit, exit corridors, and exit discharge.
We identified that exit corridors should be a minimum of 44" wide.
Most exit doors should swing in the direction of exit travel and open when a force of about 20 lbs. is applied to the hardware.
Horizontal exits have double leaves that swing in opposite directions.
Door wedges, elephant feet and other objects should not be used to hold fire separation doors in the open position.
Doors can be equipped with magnetic hold open devices for the convenience of the occupants.
If a fire separation door is not equipped with a self-closing device it must have a "keep closed" sign on both sides of the door.
Exits must be unobstructed at all times.
Exit signs are required in buildings over 2 storeys and when the occupant load is more than 150 or there is a fire escape.

Emergency lighting should provide enough lighting so you can see to tie your shoes.
When there is more than one exit they should be spread some distance apart.
Look for dead end corridors which may be the result of renovations to the building.
Check the Inspection, Testing and Maintenance records for the fire protection systems.



Congratulations that is the end of Unit 2 which dealt with exiting. You are now read to move on to Unit 3 which deals with fire separations but first please complete the Unit Quiz. If you have any questions now is a good time to contact the fire prevention division of your local fire department.