LIFE SAFETY FEATURES

TERMINAL OBJECTIVE

The students will be able to identify major life safety concerns for various types of occupancies.

ENABLING OBJECTIVES

The students will:

1. *Define means of egress elements.*
2. *Identify egress violations.*
3. *Define the hazards associated with overcrowding and explain how these hazards relate to egress systems.*
4. *Highlight the features of an emergency evacuation plan and the requirements for fire drills.*
5. *Explain life safety programs for the home.*

INTRODUCTION

When conducting an inspection of any occupied building, life safety requirements must always be given primary consideration. Traditionally, life safety meant the evaluation of the number, arrangement, and capacity of a building's exits. More recently, inspectors emphasize that total life safety involves much more than just exits. Basic occupancy life safety now involves avoiding exposure to the harmful effects of the products of combustion. The exposure may be to persons who are in the process of evacuating a building; to persons who are within the building in an area considered to be an area of refuge; or to persons in another part of the building who are not aware of the fire.

This emphasis broadens the inspector's areas of concern.

NEED FOR LIFE SAFETY

Depending on the characteristics of the occupancy, it must meet life safety requirements. Past experiences have indicated that major life losses from fire were directly related to such life safety factors as adequate number of exits, remoteness of exits, proper exit arrangement, building constructed without life safety considerations, and whether inspectors had proper life safety knowledge.

These past experiences showed that adequate life safety involved a total systems approach, not just a single requirement. Examples of how the system can be compromised include occupants trapped by blocked or locked exit doors, corridors used for storage or other purposes, overcrowding of building, exit doors not clearly marked and identified, lack of early detection or suppression systems/equipment, and lack of safe egress routes.

Today the codes address life safety requirements as a total system and not just as the number of exits or their identification. Life safety also is based on special requirements associated with the occupancy classification.

Today's inspector must know the required life safety systems for the different occupancies and be able to recognize when the system has been violated.

FUNDAMENTALS OF LIFE SAFETY

There are three major factors to consider when evaluating an occupancy's life safety risk and level of life safety: time, occupant characteristics, and potential nature of the fire.

Time

Providing life safety to occupants who are capable of exiting a building can be defined in terms of a safe egress (exit) time. This is the elapsed time from the detection or notification of a fire until the fire or other emergency is beyond control, making exits unusable. There should be heavy emphasis on the time between the ignition or start of the emergency and the time of detection, as well as consideration given to the time from detection to notification of the occupants of the building.

Occupant Characteristics

Six factors influence the ability and likelihood of occupants to respond to a fire emergency: age; ability to move unassisted; awareness (that is, being able to think and react in a reasonable and calculated manner); knowledge (knowledge of the structure and exit system); density (number of occupants in any given area); and discipline (the ability to control one's emotions in emergency conditions).

Age

An occupant's age affects one's ability to move about and negotiate portions of the means of egress. For example, young children will have more difficulty traveling up or down stairways than will young adults. Therefore, it is common to find code requirements that address the locations of preschool, kindergarten, and first grade classrooms in an elementary school. By looking at records of past fire losses, it is apparent that the very young and the very old are at the greatest risk from fire. Age usually has an effect on the other five occupant characteristics.

Mobility

Some occupants are not capable of responding to a fire emergency, or respond with some degree of difficulty. Modern building and fire prevention codes generally assume that the occupants of a health care facility will not be capable of self-preservation. Thus, the codes will set requirements for staff training to assist the occupants, for the building to be compartmentalized by firewalls and smoke barriers, and for occupants planning to evacuate to an area of refuge. Likewise, occupant mobility in a correctional facility generally is restricted. The occupants' mobility also affects the different means of egress that are permitted. For example, fire escape ladders usually are permitted only when the area is to be occupied by able-bodied individuals.

We are becoming more aware of the need to provide egress for the physically disabled. This will have a dramatic effect on the egress provisions of the various codes. Some code requirements, such as minimum clear width dimensions of doors, are intended to meet the needs of the wheelchair bound. It is expected that requirements for accessible egress routes and areas of refuge for the physically disabled soon will be incorporated into the codes.

Awareness

The awareness factor involves the occupants' ability to notice and evaluate the severity of a fire emergency. For example, in residential occupancies it is assumed that the occupants will be asleep at some time. Therefore, the life safety package for this occupancy type must consider that a fire could develop without the occupant being aware of the changes to the environment caused by the fire. In some occupancies, because of the building construction type, the awareness level of occupants will drop drastically. With this in mind, the fire inspector must consider what methods and portions of the code should be used to increase the awareness level of all occupants.

Knowledge

It is anticipated that by promoting public fire safety education, the general population will have an increasing knowledge of fire and life safety. This increasing knowledge should result in proper responses to fire

emergencies. However, knowledge also involves occupants' familiarity with the environment and egress routes. Code provisions for single-family dwellings differ from those for hotels because occupants of single-family dwellings are more familiar with the layout of the unit and available egress or escape routes.

Density

Occupant density will have a dramatic effect on the time necessary to evacuate a given space. High densities can increase the time necessary to reach an exit by slowing speed of travel and causing queuing at the exit. Codes may vary with respect to maximum occupant loads.

Discipline/Training

Some occupants will evidence a higher degree of discipline which will affect how the occupants respond. For example, the occupants of an elementary school are usually in a more disciplined environment than the occupants of mercantile or retail establishments. It is assumed that the occupants in the elementary school will respond to the direction of their teacher more than the occupants of a store may respond to a salesclerk's directions.

Occupancy Classification

Due to the many different occupant characteristics mentioned above, different occupancy classifications are required. In the module titled Building Construction and Occupancy Types, we covered in detail the occupancy classification definitions. Generally these classifications are as follows:

- Assembly.
- Mercantile.
- Storage.
- Health Care.
- Detention.
- Residential.
- Business.
- Educational.
- Industrial.
- Special Occupancies.

Nature of the Fire

The likelihood of a fire, the fire growth rate, and the spread of smoke and fire also are major factors to consider when evaluating occupants' life safety. The package of code requirements addresses all three factors in attempting to provide what we consider an acceptable level of life safety.

The potential for fire relates to available ignition sources in the occupancy as well as the amount of available fuel sources. Obviously, normal, day-to-day activities that are carried out in any occupancy (heating, cooking, and lighting) are sources of ignition. Other activities associated with the occupants, such as smoking, introduce additional ignition sources. Building contents also add additional fuel to the structure. Codes address this in various ways, including requirements for using flame-resistant fabrics, limits on the storage of combustibles, and separating certain hazardous areas from the rest of the building.

Depending on the fire growth rate and smoke spread from the room, a room fire poses a life safety threat not only to the occupants in the immediate area, but to occupants in other parts of the building. Codes attempt to contain the fire to the room of origin with separation by fire-resistive walls and doors, or automatic fire suppression systems.

Principles of Life Safety

A building's total life safety package consists of different components. When one or more of the components is absent or not functioning, the life safety system is jeopardized and life loss can occur in the event of a fire. Fire inspectors must check to see whether all portions of this system are in place and properly functioning. We will look at ten of these components.

1. **Adequate exits without dependence on any other systems of the building.** The exits must be sufficient in capacity for the number of occupants, and a single failure shall not result in an unacceptable level of life safety.

2. **Construction is sufficient to provide structural strength during a fire while the occupants are exiting or in an area of refuge.** Note that, from an occupant life safety standard only, we would be concerned only that the building protects the occupants until they are able to exit. There must be additional protection for fire service personnel.

3. **Exits have been designed to the size, shape, and nature of the occupancy.** The use of the space or building determines the design requirements for the exits. A 10,000-square-foot storage building requires neither the same number nor capacity of exits as a 10,000-square-foot place of assembly due to the number and characteristics of the occupants.

4. **Exits are clear, unobstructed, and unlocked.** The occupants of the building should have a clear and unobstructed path of travel to the exits. They should be able to exit a building without having to use any special knowledge, effort, keys, or tools.

5. **Exits and routes of escape are clearly marked.** While the need for exit marking does vary from occupancy to occupancy, depending on the occupants' familiarity with the building, the codes generally require some degree of exit marking in case occupants become confused or disoriented. We must remember that even though the occupant may be familiar with the building, when a fire occurs things change: the occupant becomes excited, smoke can lower visibility, and exits become blocked; these variables may cause a person who knows the building well to become confused.

6. **Adequate lighting is provided.** Adequate lighting is essential to the safe use of the egress system, especially stairs and hallways.

7. **Alternate exit routes are provided.** With a few limited exceptions, the codes require at least two exits to be accessible from every area in the occupancy.

8. **Early warning systems are present.** This does not necessarily mean that automatic detection is required in all buildings. Depending on the occupants' awareness and their ability to detect changes in their environment, automatic detection may not be necessary. It also should be noted that, from a life safety standpoint, when automatic detection is required it usually involves smoke detection and not heat detection, unless the space is not occupied and is separated from occupied areas.

9. **Adequate protection is available for occupants as they exit the building.** Many large life loss fires have occurred in buildings that did not have properly protected exit systems. Doors were propped open, firewalls had been breached, fire doors had been removed, and openings had been cut into ceilings. These conditions allow smoke and heat to spread and make exiting difficult at best. The inspector must ensure that occupants have adequate protection as they move from their point of discovery of a fire to the exit.

10. **Allowances have been made for those design criteria that are tailored to the normal use and needs of the occupancy.** It is important that codes provide an acceptable level of safety without creating an undue hardship or inconvenience. This is not to say that the needs of the operation or use should compromise life safety, but rather that attempts should be made to provide life safety without interfering with the operation or use of the building. For example, it is obvious that locks must be permitted in correctional facilities. The codes recognize this and provide acceptable life safety by addressing the operation and reliability of the locking system without compromising security.

EGRESS SYSTEMS

We need to focus on the egress system of a structure both in relation to its physical construction within a building, and to human factors that contribute to the success or failure of the egress system. A corridor or protection exitway out of a building may look good on paper, yet create confusion or danger in an emergency. The most important point is that people must be able to exit a structure safely.

As an inspector you must be able to put yourself in the same position as building occupants and visualize what they would have to do to get out of the building. Obviously, if the owner has blocked exits or is using furniture in the area of egress, the system is compromised. Your job as an inspector is to educate the owner about the problem and to help correct it. This is a tricky task at best, because if the owner becomes offended or angry, the correction may be temporary. Your goal should be to increase the owner's understanding so the owner will want to keep the building safe.

The codes are our tools to make conditions reasonably safe for the occupants. While it is possible to memorize codes, it is far better to become so familiar with them that you can find an item quickly rather than trying to quote it. Often, when the inspector decides to quote a section of a code to a building owner, the inspector quotes the wrong section or misquotes the actual wording of the code and changes its meaning. Most of us want to translate or interpret codes to suit our individual needs; this sometimes can cause us to communicate inaccurate information.

Exit systems are simply a way to get out of any part of the building to the outside safely. To understand the system completely, we need to break it down into three distinct parts: exit access, exit discharge, and exit identification.

Exit access is that part of the system that leads from any point in the building to a protected (rated) exitway. The access is essentially unprotected by any rated walls or doors other than from exposure to those things that may surround the area, such as room walls. Exit access is directly associated with permitted length of allowed travel distance to an exit.

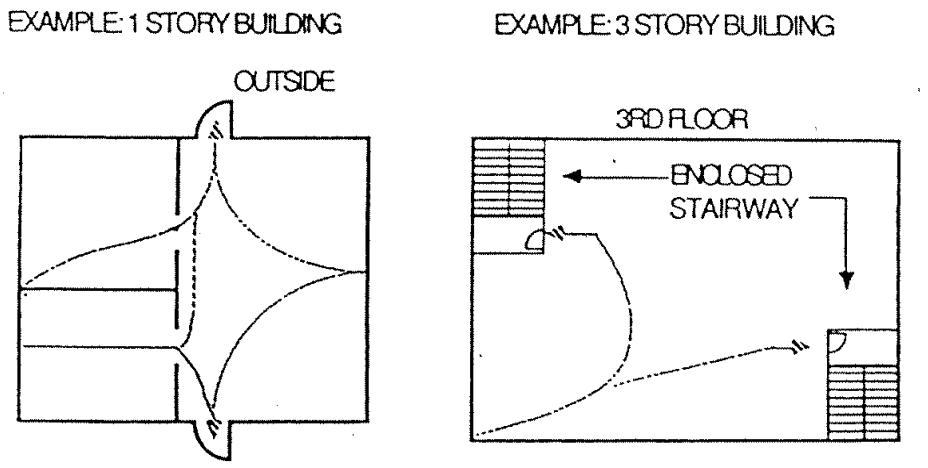


Figure 1
Exit Access

The **exit** itself is that part which is essentially protected, such as a fire-rated corridor or an exit passageway. It may be as simple as a doorway. It is that portion of a means of egress which is separated from other spaces of a building or structure by construction or equipment to provide a protected way of travel to the exit discharge.

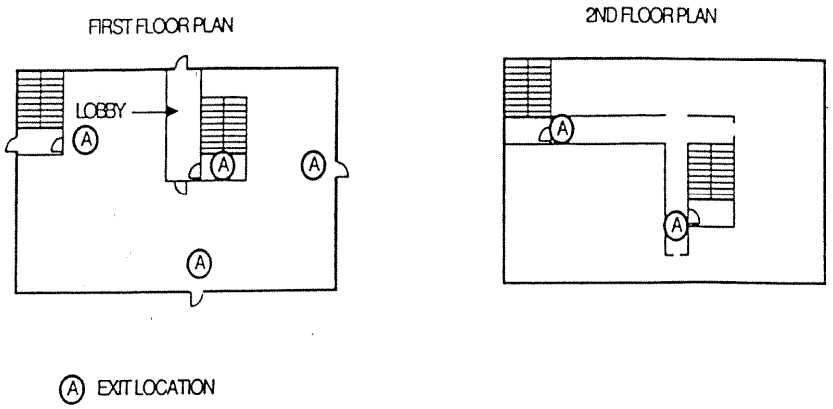


Figure 2
Exit

Exit discharge is the part of the exit system through which a person leaves the building and enters a public way.

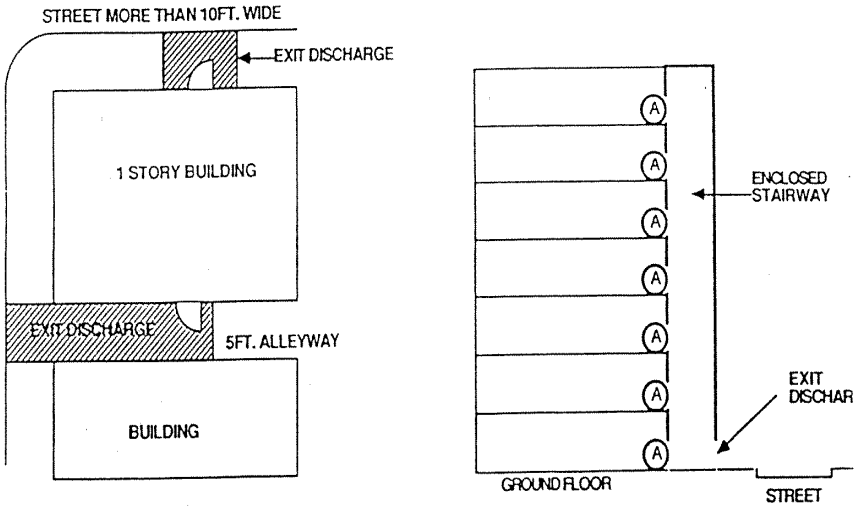


Figure 3
Exit Discharge

Remember that both exit access and exits will, at times, consist of doorways, corridors, exterior exit balconies, smokeproof enclosures, stairways, ramps, exit passageways, horizontal exits, or exit courts or yards, depending on whether or not they are protected or rated.

The concept of exiting assumes that all building occupants are entitled to be able to get out of the structure and that people within a structure have control of the elements of the exiting system within the occupancy. This simply means that all hardware on doors must be operable from the inside without the use of a key, without having any special knowledge about how the exit hardware works, or without having to exert any special effort.

Once the exit size, number of exits, or the protection level have been established, they may not be reduced. This protection level must extend clear to the public way.

Occupancy Load

In general, all of the model code groups in this country agree that when 50 or more people are assembled in one room, two exits are required. There are some exceptions to this number, depending on the type of occupancy or hazard. At a minimum, two exits are required from floors above the level of discharge. In other words, if you are exposed to an emergency and you are located above the ground-level floor of the occupancy, you must be able to find at least two alternate routes out of the structure. When we increase the occupancy load to 501 to 1,000 persons on any story or portion of the building, there must be a minimum of three remote exits. As the occupant load increases, so does the minimum number of required exits. More about this later.

There will be some incidents where the occupants of one room or floor must exit through another room or floor. In anticipation of this, there must be enough exits provided for the occupants of both levels or rooms. In some situations assumptions are made about the movement of people. It is presumed that when people are moved to an enclosed exit stairway, for example, occupants on the second floor will exit before those from the third floor arrive at that point. This is the basic plan for all floors above the ground level. Since this may not be the case in all of the basic codes in use, the fire inspector must check the local codes to assure compliance.

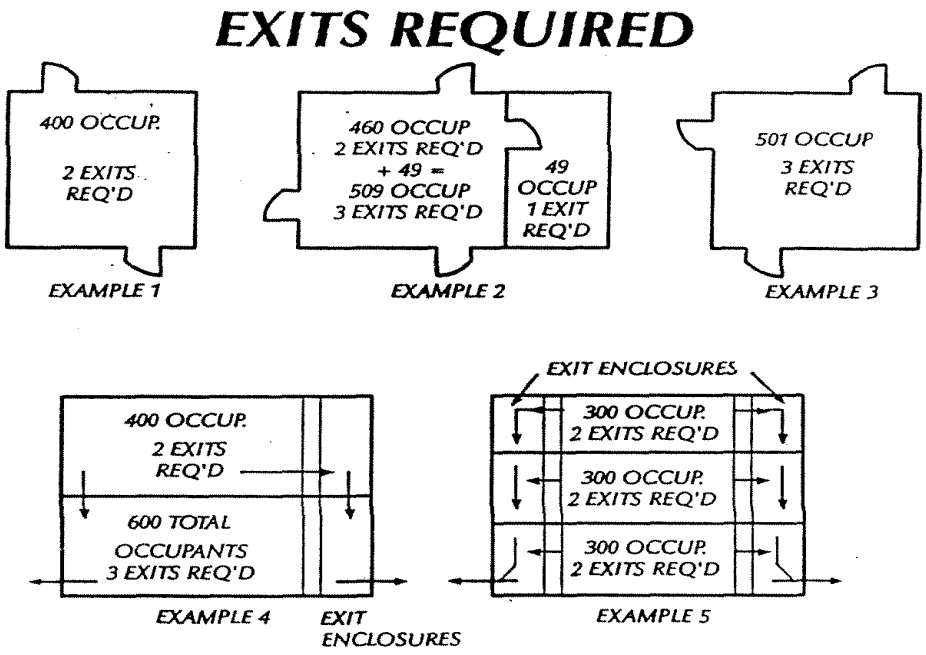


Figure 4
Required Exits

Exit Arrangements (Remoteness)

The term "remote" has been defined in several different ways. The intent always has been to have exits separated so that if one becomes unusable, occupants could use other available exits. A reasonable rule of thumb is to use "one-half the diagonal distance of the area served." This has been used for some time in most codes.

DETERMINING REMOTE EXIT LOCATIONS FOR OCCUPANCIES REQUIRING AT LEAST TWO EXIT LOCATIONS

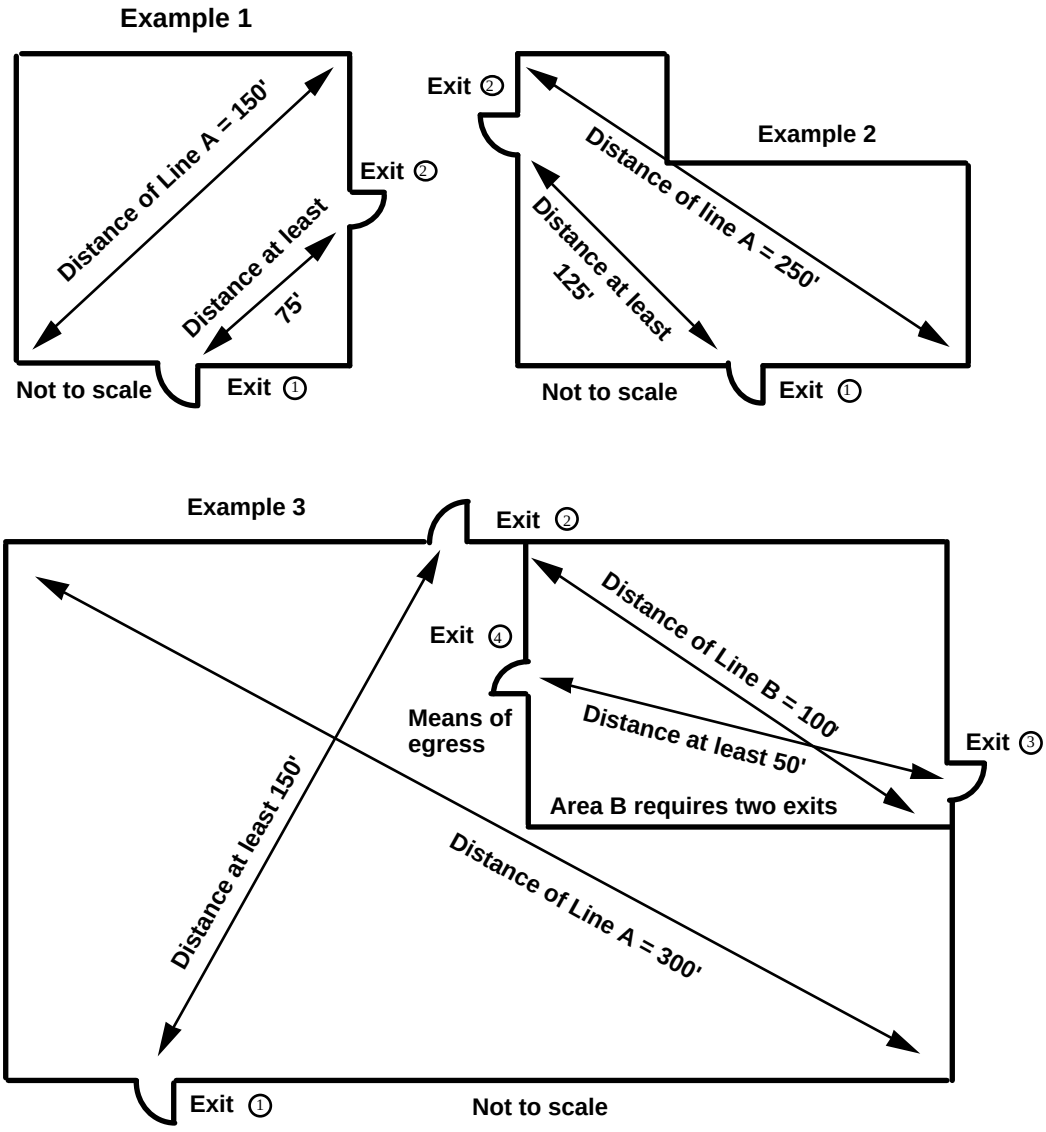
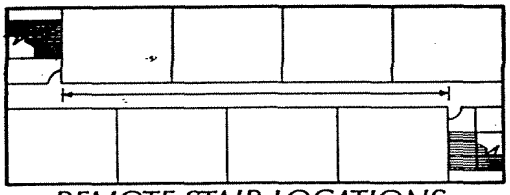
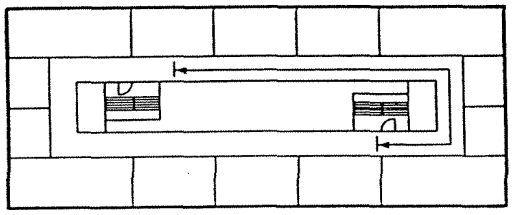


Figure 5
Arrangement of Exits

Owners and developers want exterior wall spaces for rental, not stairs. They insist on construction that places the stairs, restrooms, mechanical shafts, and custodial closets in the center of the building. This makes the inspector's job much more difficult. Here the one-half diagonal distance must be used between entrances to the stair enclosures, and great care must be used to ensure that stair shafts are properly separated and constructed.



REMOTE STAIR LOCATIONS



"CORE" CONSTRUCTION - REMOTE STAIR ENCLOSURES ARE MANY TIMES A REAL CHALLENGE AND A PROBLEM

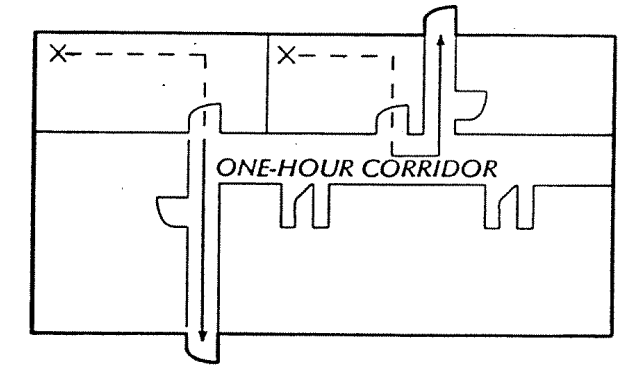
Figure 6
Core Construction

Calculating Exit Widths

Several of the model codes previously have used the Unit of Exit Width method to calculate exit widths. Now they use a fraction of an inch measurement for each occupant, depending on the egress component. Generally, 0.2 inch is used when traveling through doors, ramps, or corridors that involve level travel, and 0.3 inch when traveling on stairways. The reasoning for this is that people will move more steadily on level footing than where they are required to change levels. The inspector must check the code in use to assure that the proper formula is applied to determine the exit capacity of a structure.

Travel Distance

The allowable travel distance to an exit varies with the occupancy, and also varies depending upon the code used. The chart below gives a breakdown of the travel distances based on some of the codes in use. Travel distance is measured from a point one foot away from the wall in the most remote spot, in a line that you would travel to arrive at an exterior exit door, horizontal exit, exit passageway, or enclosed stairway.



MAXIMUM TRAVEL DISTANCE

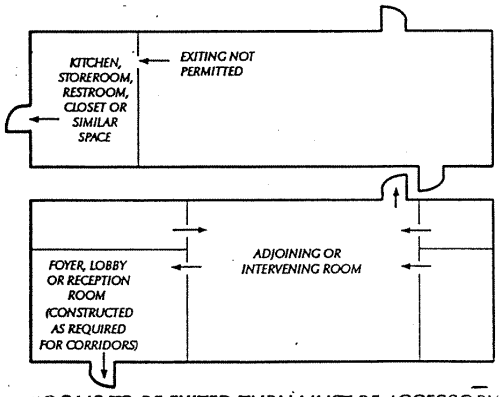
	UNSPRINKLED	SPRINKLED
NFPA	200'	250'
BOCA	200'	250'
SBCCI	200'	250'
ICBO	150'	200'

(EXCEPTION ICBO - MAY BE INCREASED 100' IF LAST 100' IS IN A RATED CORRIDOR)

Figure 7
Travel Distance to Exits

Contiguous Rooms

Mazes can arise within buildings just by having room after room exit through one another. Generally speaking, the code requires a room to exit into a clearly marked passage to an exit. There are some exceptions to this in the codes. Some codes prohibit exiting through kitchens, storerooms, restrooms, closets, or similar spaces. Foyers, lobbies, or reception rooms that are constructed and treated as corridors are exceptions to the rule that a corridor may not pass through an intervening room.

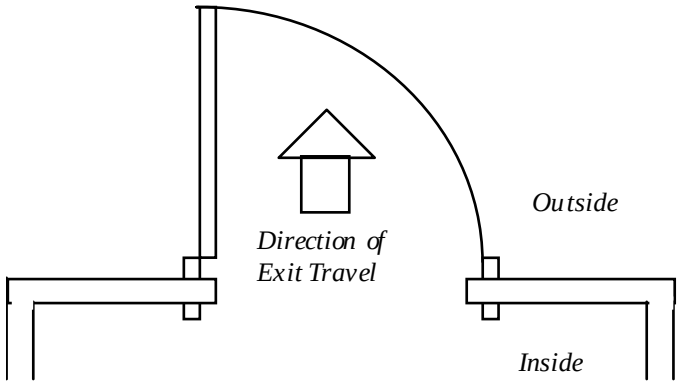


ROOMS TO BE EXITED THRU MUST BE ACCESSORY TO THE OTHER, NOT SMALLER THAN, AND NOT MORE HAZARDOUS.

Figure 8
Exits Through Adjoining Rooms

Exit Doors

Doors must swing in the direction of exit travel when the occupant load exceeds 50, or when occupants exit from a hazardous area. Again, as is so common throughout the codes, there are exceptions to this rule.



Exit Door Serving Any Hazardous Area
or
Generally Serving an Occupant Load of 50 or More

Figure 9
Door Swing

As with occupancy loads and travel distances, there are requirements for minimum and maximum door widths. This is spelled out clearly in the codes, but generally there must be a minimum 32-inch clear opening when the door is completely open. The minimum width of 36 inches and a maximum width of 48 inches per leaf are the specified widths. The maximum is 48 inches because the weight of the door would make it difficult to swing a door larger than this.

Minimum and maximum door widths are spelled out clearly in the codes, but generally are 32 inches clear when fully opened, with a minimum width of 36" and a maximum width of 48 inches per leaf.

(ICBO IS ONLY CODE LISTING 36" LEAF AS MIN.)

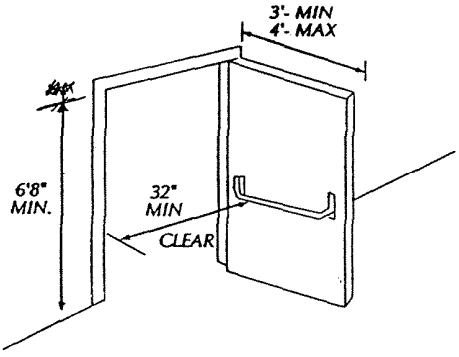


Figure 10
Clearance Widths

Revolving, sliding, and overhead doors generally assumed to require special effort or knowledge to open or operate are not considered legal means of normal egress. Some codes do allow special sliding or folding doors as exits.

Fire Doors

In dealing with fire doors the inspector should be aware of several requirements relating to this special type of door. Fire door assemblies must be complete and must include a rated and labeled frame in addition to the rated door. They also must include a self-closing device, positive latching lock set, or fire exit (panic) hardware, and rated hinges. The inspector must ensure that the fire door fits in the frame properly and that there is not an excessive gap between the door and the frame. If the door has glass, it should be installed at the factory as part of the assembly process and not done at the local level. Almost all cutting of any sort into wood doors must be done either at the factory or by a shop which has been authorized to make such adjustments.

Exit Hardware

The fire door system not only provides a method of containing the travel of fire and smoke from one portion of a structure to another, but provides a valuable means of protection for the occupants. With fire doors and rated walls, safe areas can be developed; these are referred to as areas of refuge. When fire doors are propped open or not maintained, it creates a significant danger. The inspector must spend extra time assuring that fire doors and all their parts are in proper working condition.

Panic hardware is not required in all instances for egress from rooms or buildings. It is required, however, in assembly, educational, and institutional occupancies, and typically whenever the occupant load exceeds 50. If panic hardware is to be installed on any fire-resistive rated door, it must be listed as fire exit hardware.

Everyone must be able to get out of a building in an emergency. There are, however, some circumstances where special control devices are necessary and are permitted by code. A good example of this is the deadbolt permitted on the main door of a business occupancy when there is a sign adjacent to it which reads, "This door to remain unlocked during

business hours." Another example may be the controls for doors in jails or prisons.

Other Considerations

Total evacuation programs for all occupancies include such factors as distance as it relates to dead-end corridors. A corridor or passageway that extends past a point where two ways of travel in different directions is no longer possible is considered a dead-end corridor. The length of these corridors is identified in the code and is based on the occupancy classification. Generally dead-end corridors are limited to 20 feet in length.

Most building occupants soon learn that the corridors in their buildings provide some of the best storage space available. It is available every time they travel in the corridor, it is easily accessible, and it can be used to avoid taking up space in closets and storage areas. Many office managers decide that a corridor is the perfect place to locate more offices. These problems are very simple to correct: corridors are not designed for storage of any materials, desks, people, or other items. They must be kept clear for the movement of people to exits. Using corridors as offices is generally prohibited.

No exit system is complete without proper **exit identification**. Exit signs are required by all of the codes, and must be visible to the occupants as they travel through the building. Many signs must have arrows to indicate the direction of travel. The inspector must search the code to determine the location and number of exit signs. Some occupancies also will require that the exit sign system have an alternate or backup power source. Again, this must be determined by the inspector after a search of the code.

In addition to the exit identification system, an emergency lighting system to illuminate the path of travel to the exit must exist in some occupancies. Where the code requires an illumination system, the inspector must ensure that it provides proper coverage of the corridor, room, stairway, etc. As with the exit lighting system, codes that require emergency lighting also require a backup power system. This is usually provided by a battery system that will activate when there is a loss of regular power. This must be checked to assure that each battery is charged and able to provide the proper illumination for the exit. Emergency lights may be connected to an emergency generator; the inspector must identify what system is used in each building.

Occupant Load

We need to return to occupant load.

Overcrowded buildings are an important issue for inspectors. The building owner is in business to make a profit; in most cases this relates directly to how many people can be admitted to a structure.

Model codes use certain factors to determine occupant load. Occupancy type, construction, and location will have a direct bearing on the occupant load. The occupant load will determine the number of exits required from a room or building and their total width. Occupant loads are determined by the type of use or activity being conducted in the area or building and the size of the floor area. The occupant load factors that are to be used to determine occupant loads are noted in the codes.

Some occupant load factors are based on gross floor area and some on net floor area. The gross floor area is the area within the inside perimeter of the outside walls. The net floor area is the actual occupied floor area, not including accessory unoccupied areas or the thickness of the walls. For example, a rectangular room has a measured length (wall to wall) of 100 feet and a measured width of 50 feet. Within the room is a storage closet of 8 square feet, encased columns which total 12 square feet in area, and a fixed piece of furniture, such as a bar, of 24 square feet. The gross and net floor areas would be calculated as follows:

GROSS FLOOR AREA	100 ft. x 50 ft. = 5,000 sq. ft.
NET FLOOR AREA	5,000 sq. ft. - (8 + 12 + 24) sq. ft.
	5,000 sq. ft. - 44 sq. ft. = 4,956 sq. ft.

Occupant Load Calculation Examples

Let's look at some examples to show how to calculate occupancy load.

1. If the above room were used as an office area with an occupant load of one person per 100 square feet (gross), the calculated occupant load would be:

   5,000 sq. ft. ÷ 100 sq. ft./person = 50 people

2. If the above room were used for concentrated assembly, and the occupant load factor of one person per seven square feet (net) were used, the calculated occupant load would be:

   4,956 sq. ft. ÷ 7 sq. ft./person = 708 people

3. The above room is to be used as an office area for a department which is expanding. Presently, the department has 60 people working in a 4,800-square-foot space. The department head advises you that the additional area is so that the staff can expand and that the density of employees will be about the same as the existing space. The occupant load of this area would be determined as follows.

   4,800 sq. ft. ÷ 60 people = 80 sq. ft./person

   5,000 sq. ft. ÷ 80 sq. ft./person = 62.5 persons

The third example illustrates two points. First, occupant density is greater than one person per 100 square feet as was used in the first example. Therefore, an occupant load factor representing the actual intended use must be determined. An alternative would be to use the actual number of people anticipated to occupy the area, if the number is known. The second point is that the calculation will not always result in a whole number. The codes generally do not specify what to do with respect to rounding off numbers. General mathematical procedures of rounding off to the nearest whole number should be sufficiently accurate. Therefore, in this example, the calculated occupant load would be 63. Some code officials prefer to always round up to the next highest whole number. Such a procedure is acceptable and will be more conservative.

The number of persons allowed to occupy any structure has a direct relationship to the structure's exit system. Therefore, the inspector must, early in the inspection process, assure that the occupancy load is posted and enforced and does not exceed the available exit capacity from the room or building.

The calculation process may be complicated and, in some cases, it is. The beginning inspector should seek assistance to properly calculate occupant load.

EMERGENCY EVACUATION PLANS

Fire codes require that certain occupancies have an emergency evacuation plan. Some state laws also require such plans. A search of the code is necessary to assure that all occupancies needing a plan do, in fact, have one.

The purpose of an evacuation plan is simple--to remove all occupants safely from the structure. All of the life safety features discussed earlier must be designed so that all occupants can move as quickly as possible, but safely. The plan must cover all floors, rooms, and occupants.

Fire Drills

The evacuation plan is tied directly to fire drills. Fire drills must occur in many occupancies on a regular basis; the building manager or owner should keep records to show compliance.

The fire drill is the test of the evacuation plan, of the life safety system that the inspector has inspected and approved. Therefore, when possible, the inspector should witness the fire drill. There should be a test of the total life safety system (alarms, fire doors, emergency lighting, panic hardware) and the evacuation procedures.

Home Fire Safety Programs

All discussion to this point has been about buildings other than one- and two-family dwellings. It is also the fire department's responsibility to encourage people to train for home evacuations.

In most states, local fire departments have access to training programs on home fire safety. The United States Fire Administration (USFA) has published a lot of literature on the subject. This material is free to the public. One can request it by writing or calling. An address and phone number appear on p. LS-24. The National Fire Protection Association (NFPA) also publishes pamphlets and programs for community use. Local departments must determine which programs will work for them and make the necessary plans to use them.

After determining which program to use, the inspector can decide how to present the program. In other words, how do you reach the people who

need to know how to escape from their homes in case of an emergency? One way is to use local schools. It has been determined that after reaching the local schoolchildren, there is a good chance that they will take the information home to their parents and take part in developing an evacuation plan. Consider offering presentations to local garden clubs, community clubs, service groups, senior citizen groups, parent/teacher organizations, etc.

Many fire departments hold open houses at their stations some time during National Fire Prevention Week. This is an excellent time to provide home fire safety information, but it takes place only once a year; fire safety must be presented on a continuing, year-round basis.

We spend quite a lot of time planning evacuation from commercial and large residential buildings, but very little time actually planning home fire drills. Home fire drills should be emphasized in safety programs.

Residential Automatic Fire Sprinkler Systems

A feature now available to the home owner is the residential automatic sprinkler system. These systems are designed specifically for the home. They differ from commercial-use sprinkler systems because they respond quickly, and use a much smaller amount of water than commercial building sprinkler systems.

Residential sprinkler systems must be designed and installed properly to meet all the code requirements of the local jurisdiction. The fire inspector should know something about residential sprinkler systems. USFA is the best source for information.

Advise homeowners to check with their insurance company concerning lower premiums associated with the addition of a residential automatic fire sprinkler system. Properly installed and maintained residential systems offer a high level of life safety protection.

SUMMARY

Model codes provide a tool to design and enforce life safety for all occupancies. Occupancy classifications attempt to group the various risk factors associated with life safety. In certain instances, such groupings may not be applicable; the fire inspector should evaluate the risk and protection features to ensure that adequate life safety has been provided.

Life safety is more than exits. In fact, many would argue that the controls on fire growth and fire development are more critical to life safety, because such restrictions provide additional safe egress time. The use and effectiveness of the egress system are highly dependent upon the characteristics of the occupants. However, as safe egress time is increased, inappropriate action by the occupants may not be as critical.

Fire inspectors face serious life safety challenges. Inspectors must deal with building owners who want to make a profit but may not want to be restricted by codes.

An inspector has done the job when an emergency occurs in an occupancy that has previously been inspected and all systems work. There is no loss of life or injuries to the occupants. All are able to exit the building and the total life safety package works. All the hard work that has gone into making the system work has paid off.

For more information on topics discussed here, write or call:

Publication Center
United States Fire Administration
Building N, Room 310
16825 S. Seton Ave.
Emmitsburg, MD 21727
1-800-238-3358

Activity 1

Different Occupancies

Purpose

To identify occupancy types in your jurisdiction as an introduction to a discussion of the key characteristics of each type.

Directions

Select from the list below five different occupancies in your own jurisdiction.

- Assembly.
- Mercantile.
- Storage.
- Health Care.
- Detention.
- Residential.
- Business.
- Educational.
- Industrial.
- Special Occupancies.

1. _____

2. _____

3. _____

4. _____

5. _____

As a large group, describe the characteristics of each occupancy that relate to life safety.

1. _____

2. _____

3. _____

4. _____

5. _____

Activity 2

Egress Systems

Purpose

To evaluate an egress system, including arrangements and considerations.

Directions

1. Evaluate the egress systems of the sample arrangements using the information in this module.

2. Comment on the following:

   Example #1

   a. Required exits. _____

   b. Exit arrangement. _____

   c. Exit remoteness. _____

   Example #2

   a. Required exits. _____

   b. Exit arrangement. _____

   Example #3

   a. Required exits. _____

   b. Exit arrangement. _____

   Example #4

   a. Required exits. _____

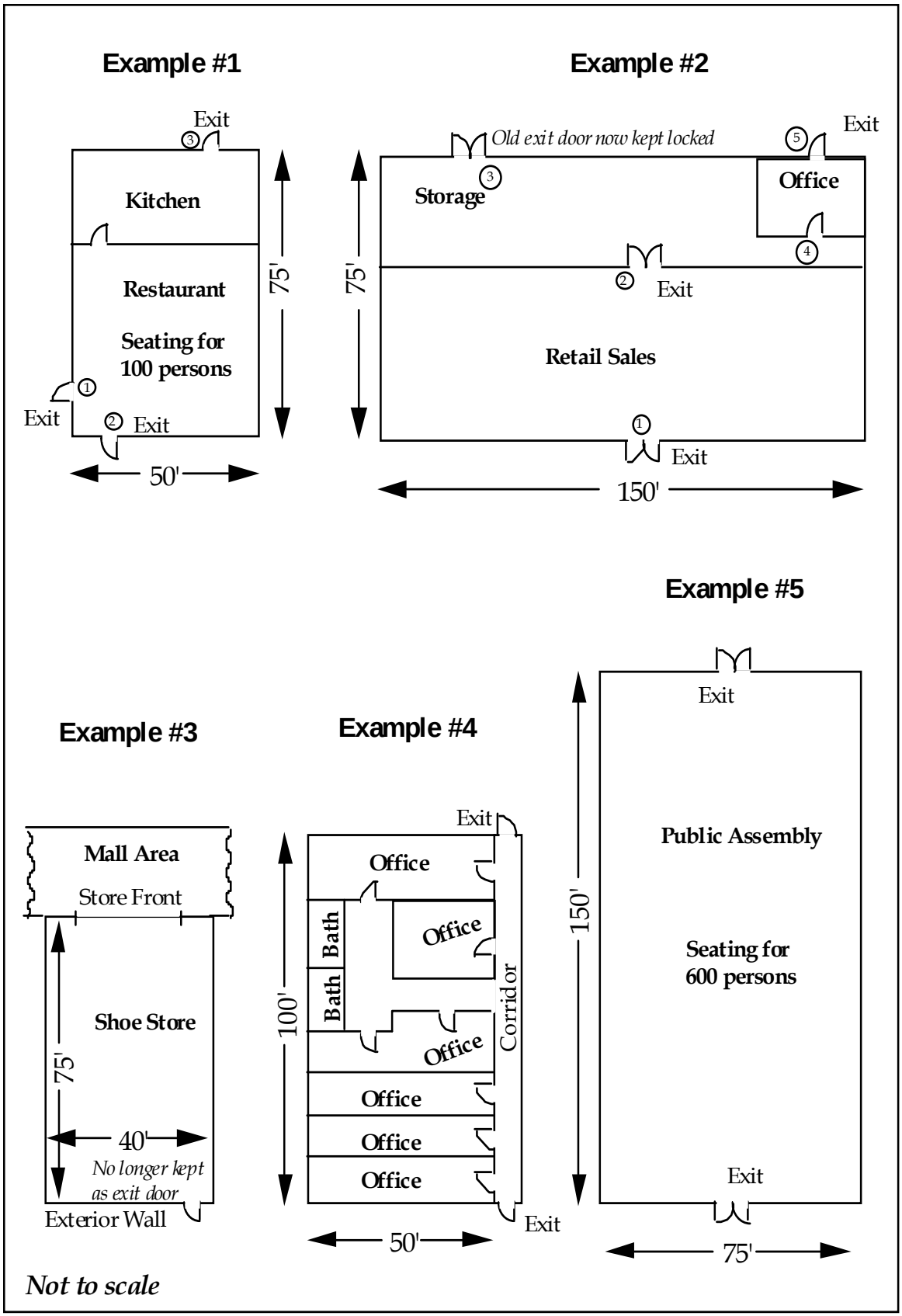
   b. Corridor arrangement. _____

   Example #5

   a. Number of exits required. _____

   b. Exit arrangement. _____

3. Each group will comment on its work.


Example #1
Exit
3
Kitchen
Restaurant
Seating for
100 persons
75'
1
Exit
2
Exit
50'
Example #2
Old exit door now kept locked
5
Exit
3
Storage
Office
4
2
Exit
75'
Retail Sales
1
Exit
150'
Example #5
Exit
Public Assembly
Seating for
600 persons
150'
Exit
75'
Example #3
Mall Area
Store Front
Shoe Store
75'
40'
No longer kept
as exit door
Exterior Wall
Example #4
Exit
Office
Office
Bath
Bath
Office
Corridor
Office
Office
Office
100'
Exit
50'
Not to scale