

CHAPTER 4

SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY

402.11 Children's playground structures.

⌘ One of the more recent additions to covered mall buildings or as renovations to existing covered mall buildings is dedicated play areas for small children. Typically, the occasional "ride machine" has been replaced with jungle gyms, playhouses and activity areas. If these structures exceed 10 feet (3048 mm) in height ~~or approximately~~ and also exceeds 150 square feet (14 m²) in area, then the provisions of Section 402.11 through 402.11.4 must be followed.

**CHAPTER 5
GENERAL BUILDING HEIGHTS AND AREAS****508.3.3 Separated occupancies**

∪ This section describes the third option, separated occupancies, that a designer may choose to apply when constructing a building that contains more than one occupancy classification. The ~~second~~ third option differs from the first two alternatives (i.e., accessory uses and nonseparated uses) (see Sections 508.3.1 and 508.3.2) in three ways:

- Occupancies in different uses that are to be evaluated as separated occupancies must be separated in accordance with Table 508.3.3. When the table requires a separation it must be separated completely, both horizontally and vertically, with each area having fire barriers and horizontal assemblies (see Sections 706 and 710). It is the designer's option to use a combination of nonseparated and separated uses. In such cases, fire areas with nonseparated uses are evaluated based on the most restrictive code provisions applicable to the occupancies within that fire area. It should be noted that Table 508.3.3 is intended to not require a separation between occupancies posing similar levels of risk.
- The determination of sprinkler requirements in Section 903 is based on the occupancies present, respective to the threshold requirements of the fire area in which they are located. As noted in some cases an occupancy separation may not be required; therefore, the size of a fire area is potentially increased. A larger fire area may mean that the threshold limits in Section 903 are exceeded but the occupancies are still considered separated in accordance with Section 508.3.
- The determination of the minimum type of construction is based on both the height of each occupancy relative to the grade plane and the areas of each occupancy relative to the total floor area per story.

There are four basic steps to follow when using the separated uses option:

Step 1: through Step 4: *(no change to text)*

**CHAPTER 9
FIRE PROTECTION SYSTEMS**

**Figure 903.2
SUMMARY OF OCCUPANCY-RELATED AUTOMATIC SPRINKLER THRESHOLDS**

Occupancy	Threshold	Exceptions
Assembly (A-2)	Fire area > 5,000 sq.ft. or fire area occupant load > <u>100</u> 300 or fire area above/below level of exit discharge.	None

(Portions of table not shown remain unchanged)

[F] 907.9.1.4 Group R-2.

∪ Group R-2 occupancies with a fire alarm system are required to have all dwelling units wired to support visible alarm notification appliances. This includes all dwelling and sleeping units, not just those classified as either Type A or B. By reference to Sections ~~1004.2~~ 1005.2 through ~~1004.4.4~~ 1005.4.4 of ICC A117.1, the building alarm system wiring must be extended to the unit smoke detectors so that audible/visible alarm notification appliances may be connected to the building fire alarm system to notify residents with hearing impairments of an emergency situation. Chapter 11 of the code contains additional information on the classification criteria and requirements for accessible dwelling units.

CHAPTER 10 MEANS OF EGRESS

Table 1004.1.1 MAXIMUM FLOOR AREA ALLOWANCE PER OCCUPANT

∩ The table presents the maximum floor area allowance per occupant based on studies and counts of the number of occupants in typical buildings. The use of this table, then, results in the minimum occupant load for which rooms, spaces and the building must be designed. While an assumed normal occupancy may be viewed as somewhat less than that determined by the use of the table factors, such a normal occupant load is not necessarily an appropriate design criterion. The greatest hazard to the occupants occurs when an unusually large crowd is present. The code does not limit the occupant load density of an area, except as provided for in Section 1004.2, but once the occupant load is established, the means of egress must be designed for at least that capacity. If it is intended that the occupant load will exceed that calculated in accordance with the table, then the occupant load is to be based on the estimated actual number of people, but not to exceed the maximum allowance in accordance with Section 1004.2. ~~Table 1004.1.2~~ 1004.1.1 establishes minimum occupant densities based on the occupancy or function of the space (not group classification). Therefore, the occupant load of the office or business areas in a storage warehouse or nightclub is to be determined using the occupant load factor most appropriate to that space—one person for each 100 square feet (9 m²) of gross floor area.
(No change to remainder of text)

1007.1 Accessible means of egress required.

∩ The Architectural and Transportation Barriers Compliance Board (Access Board) is revising and updating its accessibility guidelines for buildings and facilities covered by the Americans with Disabilities Act of 1990 (ADA) and the Architectural Barriers Act of 1968 (ABA). The final ADA/ABA Guidelines, published by the Access Board in July 2004, will serve as the basis for the minimum standards when adopted by other federal agencies responsible for issuing enforceable standards. The plan is to eventually use this new document in place of the Uniform Federal Accessibility Standard (UFAS) and the Americans with Disabilities Act Accessibility Guidelines (ADAAG). The ADA/ABA Guidelines, Section 207/F207, references the code for accessible means of egress requirements. The ICC is very proud to be recognized for its work regarding accessible means of egress in this manner. Refer to the Access Board website (www.access-board.gov) for more specific information and the current status of this adoption process.

This section establishes the minimum requirements for means of egress facilities serving all spaces that are required to be accessible to people with physical disabilities. Previously, attention had been focused on response to the civil-rights-based issue of providing adequate access for people with physical disabilities into and throughout buildings. Concerns about life safety and evacuation of people with mobility impairments were frequently cited as reasons for not embracing widespread building accessibility, in the best interest of the disabled community.

The provisions for accessible means of egress are predominantly, though not exclusively, intended to address the safety of persons with a mobility impairment. These requirements reflect the balanced philosophy that accessible means of egress are to be provided for occupants who have gained access into the building but are incapable of independently utilizing the typical means of egress facilities, such as the exit stairways. By making such provisions, the code now addresses means of egress for all building occupants, with and without physical disabilities.

Any space that is not required by the code to be accessible in accordance with Chapter 11 is not required to be provided with accessible means of egress. This may include an entire story, a portion of a story or an individual room.

In new construction and additions, accessible means of egress are required in the same number as the general means of egress, up to a maximum of two. For example, in buildings, stories or spaces required by Section ~~4014.4~~ 1015.1 or 1018 to have three or more exits or exit access doors, a minimum of two accessible means of egress is required. The number of exits or exit access doors is based on occupant load; therefore, no matter how large the total occupant load of the space, two fully complying accessible means of egress are considered to provide sufficient capacity for those building occupants with a mobility impairment.

An accessible means of egress is required to provide a continuous path of travel to a public way. This principle is consistent with the general requirements for all means of egress, as reflected in Section 1003.1 and in the definition of “Means of egress” in Section 1002. This section also emphasizes the intent that accessible means of egress must be available to a person with a mobility impairment, such as a person in a wheelchair. Some mobility impairments do not allow for self-evacuation along a stairway; therefore, utilization of the exit and exit discharge may require assistance. The safety and fire evacuation plans (see IFC, Section 404) require planning for the evacuation of all occupants of a building. This assistance is typically with the fire department or other trained personnel, either along the exit stairways or in buildings five stories or taller, with the elevator system or a combination of both (see commentary, Section 1007.2.1).

The exceptions address special situations where accessible means of egress requirements need special consideration. Note that these are exceptions for accessible means of egress; not an exception for accessible entrance requirements (see Section 1105).

Exception 1 indicates that existing buildings that are undergoing alterations are not required to be provided with accessible means of egress as part of that alteration. In many cases, meeting the requirements for accessible means of egress, especially the 48-inch (1219 mm) clear stair width required in nonsprinklered buildings, would be considered technically infeasible. However, if an accessible means of egress was part of the original construction, it must be maintained in accordance with Section 3409.2.

Exception 2 is a special consideration for mezzanines. As an example, consider an open mezzanine that does not meet the requirements of Section ~~4044.4~~ 1015.1; therefore, two means of egress are required. In accordance with Section 505.3, open mezzanines are permitted to utilize two open exit access stairways leading to the main level to meet the general means of egress requirements. Stairways are not typically navigable by persons with mobility impairments without assistance. Additionally, if a mezzanine is large enough to be required to be accessible (see Section 1104.4), two accessible means of egress are required. The accessible means of egress do not permit exit access stairways. An accessible route must be available to two exits. In Exception 2, the open mezzanine is permitted to have only one accessible means of egress provided by either an enclosed exit stairway or an elevator with standby power (see Sections 1007.3 and 1007.4). An area of refuge must also be provided. In limited situations, platform lifts are permitted as part of an accessible route into a space (see Section 1109.7). If a mezzanine was permitted to be accessed by a platform lift, the platform lift could also be utilized as part of the accessible means of egress if battery back-up was provided (see Section 1007.5). Given the limited access permitted, this is not likely to occur where a mezzanine is large enough to need two means of egress.

Exception 3 is in consideration of the practical difficulties of providing accessible routes in assembly areas with sloped floors. Rooms with more than 50 persons are required to have two means of egress; therefore, each accessible seating location is required to have access to two accessible means of egress. Depending on the slope of the seating arrangement, this can be difficult to achieve, especially in small theaters. A maximum travel distance of 30 feet (9144 mm) for ambulatory persons moving from the last seat in dead-end aisles or from box-type seating arrangements to where they have access to a choice of means of egress routes has been established in Section 1025.8. In accordance with Exception 3, persons using wheelchair seating spaces have the same maximum 30-foot (9144 mm) travel distance from the accessible seating locations to a cross aisle or out of the room to an adjacent corridor or space where two choices for accessible means of egress are provided. Note that there are increases in travel distance for smoke-protected seating and small spaces, such as boxes, galleries or balconies. For additional information, see Section 1025.8.

Figure 1007.3 Accessible Means of Egress Stairway Accessed from an Area of Refuge

Note in the Figure – “Maintain minimum required clear egress width (Sections 1005.1 & ~~407.2~~ 1017.2)”

Figure 1009.3.1 Stair Winders

Note in the Figure – Delete not stating 6” min. and dimensional arrows

1009.10 Handrails.

∩ Falls are the leading cause of nonfatal injuries in the United States, exceeding even motor vehicle injuries. To protect the user from falls to surfaces below and to aid in the use of the stairway, guards (see Section 1013) and handrails are to be provided. In cases of fire where vision might be obscured by smoke, handrails serve as guides directing the user along the path of egress travel.

This section requires that handrails be continuous along, and be placed on both sides of, a stairway so that a mobility-impaired person can support his or her “strong side” in both ascent and descent [see Figures 1009.4(1), 1009.4(2) and 1009.4(3)]. Safety concerns for when glass is used as part of a handrail or guards is the purpose of the reference to Section 2407. General strength requirements for handrails of other materials are found in Section 1012 ~~4204~~ with a reference to Section 1607.7.

The exceptions state conditions where handrails are only required on one side or are not needed at all.

1010.9 Edge protection.

∩ This section of the code now addresses the comprehensive requirements for edge protection for all ramps. It must be noted that edge protection is not the same as the requirements for guards. The presence of a guard does not necessarily provide adequate edge protection and the presence of adequate edge protection does not satisfy the requirements for a

guard. Edge protection is necessary to prevent the wheels of a wheelchair from leaving the ramp surface or becoming lodged between the edge of the ramp and any adjacent construction. For example, a ramp may be located relatively adjacent to the exterior wall of a building. However, between the ramp edge and the exterior wall there is a strip of earth for landscape purposes. Without adequate edge protection, persons confined to wheelchairs could possibly have their wheels run off the side of the ramp into the landscape causing them to tip. These requirements are consistent with Section 405 of ICC A117.1 and those in the new ADA/ABA Accessibility Guidelines.

Exception 1 allows a ramp to have minimal edge protection as long as its vertical rise is 6 inches (152 mm) or less. The exception is predicated on the ramp not needing any handrails, which is established by the provisions of Section 1010.8. Such a ramp would only need flared sides or returned curbs. For specific details of these types of edge protection, the provisions of Section 406 of ICC A117.1 for curb ramps must be followed.

Exception 2 reiterates that edge protection is not literally required around each side of a ramp landing. Obviously, edge protection is not required along that portion of the landing that directly adjoins the next ramp run; it is only required along the unprotected sides of ramp landings.

Exception 3 states that edge protection is not required for those sides of a ramp landing directly adjacent to the ground surface that gently slopes away from the edge of the landing. If the grade adjacent to the ramp landing slopes no more than 1/2:10 (which equates to 1:20) away from the landing, additional edge protection is not required. Such a gradual slope would not be detrimental to persons confined to wheelchairs as they negotiate the ramp landing. Note that this exception is limited to landings, not the ramp surface itself. The ramp must meet the edge protection in Section 1010.9.1 or 1010.9.2.

Depending on the configuration of the ramp and the adjacent walking surface, ramps may require a combination of handrails, edge protection and guards. See Figures 1010.8(2), 1010.8(3), 1010.8(4) and ~~1010.8(5)~~ 1010.8(1) for illustrations of some alternatives.

1011.1 Where required.

∩ Where an occupancy has two or more required exits or exit accesses, the means of egress must be provided with illuminated signs that readily identify the location of the exits and indicate the path of travel to the exits. The signs must be illuminated with letters reading "Exit." The illumination may be internal or external to the sign. The signs should be visible from all directions in the exit access route. In cases where the signs are not visible to the occupants because of turns in the corridor or for other reasons, additional illuminated signs must be provided indicating the direction of egress to an exit. "Exit" signs must be located so that, where required, the nearest one is within 100 feet (30 480 mm) or of the sign's listed viewing distance. While not a referenced standard, UL 924 permits exit signs to be listed with a viewing distance of less than 100 feet (30 480 mm). When a sign is listed for a viewing distance of less than 100 feet (30 480 mm) the label on the sign will indicate the appropriate viewing distance. If such a sign is used, the spacing of the signs should be based on the listed viewing distance.

The exceptions identify conditions where exit signs are not necessary since they would not increase the safety of the egress path.

For Exceptions 1 and 3, the assumption is that the occupants are familiar enough with the space to know the way out, which in most cases is also the way they come in.

In accordance with Exception 2, when the exit is identifiable in itself and is the main exterior door through which the occupants would enter the building, "Exit" signs are not required. For example, a two-story Group B building has a main employee/customer entrance. The entrance consists of a storefront arrangement with glass doors and sidelights. The entrance is centrally located within the building. These main exterior exit doors can be quickly observed as being an exit and would not need to be marked with an "Exit" sign.

In accordance with Exception 4, "Exit" signs are not required in sleeping room areas of Group I-3 buildings. In cases of emergency, occupants in Group I-3 are escorted by staff to the exits and to safety. The "Exit" signs also represent potential weapons when they are accessible to the residents.

In the Group A-4 and A-5 occupancies described in Exception 5, the egress path is obvious and thus exit signs are not needed. Additionally, because of the configuration of the vomitories, the "Exit" signs are not readily visible to the persons immediately adjacent to or above the vomitory.

1017.2 Corridor width.

∩ The corridor widths specified in this section are minimums (see Section 1005.1 to determine the corridor width based on the number of occupants served by the corridor). Remember, if a corridor is served by two exits in opposite directions, the occupant load served by the corridor is split to determine the width of each exit. When the corridor goes in two directions, this number can be divided in half. The wider of the two requirements must be utilized for corridor design.

The width of passageways, aisles and corridors is a functional element of building construction that allows the occupants to circulate freely and comfortably throughout the floor area under nonemergency conditions. Under

emergency situations, the egress passageways must provide the needed width to accommodate the number of occupants that must utilize the corridor for egress.

When the occupant load of the space exceeds 49, the minimum width of the passageway, aisle or corridor serving that space is required to be at least 44 inches (1118 mm) to permit two unimpeded parallel columns of users to travel in opposite directions. When the occupant load served is 49 or less, a minimum width of 36 inches (914 mm) is permitted and the users are expected to encounter some intermittent travel interference from fellow users, but the lower occupant load makes those occasions infrequent and tolerable. The 36-inch (914 mm) minimum width is also required within a dwelling unit.

Passageways that lead to building equipment and systems must be at least 24 inches (610 mm) in width to provide a means to access and service the equipment when needed. Due to the frequency of the servicing intervals and the limited number of occupants in these normally unoccupied areas, a reduced width is warranted. This minimum width criteria applies to many common situations, such as stage lighting and special-effects catwalks; catwalks leading to heating and cooling equipment as well as passageways providing access to boilers, furnaces, transformers, pumps, piping and other equipment.

Except for small buildings, Group E occupancies are required to have minimum 72-inch-wide (1829 mm) corridors where the corridors serve educational areas. This width is needed not only for proper functional use, but also because of the edge effect caused by student lockers and other boundary attractions and objects. Service and other corridors outside of educational areas, such as an administrative area, would be regulated consistent with their use.

In Group I-2 occupancies, where the corridor is utilized during a fire emergency for moving patients confined to beds, it is required to be at least 96 inches (2438 mm) in clear width. This width requirement is only applicable to Group I-2 since occupants in other occupancy classifications are assumed to be ambulatory. This minimum width allows two rolling beds to pass in a corridor and permits the movement of a bed into the corridor through a room door. In Group I-2 areas, where the movement of beds is not anticipated, such as administrative and some outpatient areas of a hospital, the corridor would not be required to be 96 inches (2438 mm) wide. The minimum width would be determined by one of the appropriate applicable criteria. For outpatient medical care, where the patient may not be capable of self-preservation, such as some outpatient surgery areas or dialysis treatment areas, the 72-inch-wide (1829 mm) corridor is required based on Exception 5.

1025.5 Interior balcony and gallery means of egress.

⌘ This section states the threshold where two means of egress are required based on the occupant load of the interior balcony. Note that one of the means of egress must lead directly to an exit. However, Section 1025.5.1 does not require the stairways serving the balcony to be enclosed in an exit enclosure. These requirements will ensure that at least one path of travel is always available and occupants face a minimum number of hazards.

For balconies with 50 or fewer occupants, see Section ~~1024.8~~ 1025.8.

CHAPTER 11 ACCESSIBILITY

1103.1 Where required.

∅ This section establishes the broad principle that all buildings, structures and their associated sites and facilities are required to be accessible to persons with physical disabilities. This would include anyone who utilizes a space, including occupants, employees, students, spectators, participants and visitors. The approach taken by the code on the subject of accessibility is to require all construction to be accessible and then provide for the acceptable level of inaccessibility that is reasonable and logical. In codes created before the early 1990s, the approach was to list the conditions and occupancies to which the accessibility requirements applied; however, this is no longer practical, since the exceptions are far fewer than the circumstances to which accessibility applies. The ~~44~~ 15 exceptions to this section, Sections 1103.2.1 to ~~4403.2.44~~ 1103.2.15, reflect the extent to which accessibility in construction is either exempt or reduced in scope.

1103.2.3 Employee work areas.

∅ This section states that elements within individual work stations are not required to be accessible, with the exception of visible alarms (see Section 907.9.1.2), accessible means of egress (see Section ~~4407~~ 1007) and circulation paths (see Section 1104.3.1). The assumption is that the employment nondiscrimination requirements of the Americans with Disabilities Act (ADA) will provide for “reasonable accommodations” to the disability of the employee at that station. In other words, employers will modify individual work stations for the specific requirements of the individual utilizing the space. An accessible route will be required to each work station. An example of this is an individual work station in a laboratory. Installing sinks and built-in counters at accessible levels (see commentary, Sections 1109.3 and 1109.11) could make the station impractical for use by a person without a disability. When a station is required to be adapted for an individual, it would be revised based on the individual’s needs and abilities. An accessible route to each work station in the laboratory would be required so that access to and from that station would be available. Note that the 36-inch (914 mm) clear width for the accessible route is the same as the minimum required width of an exit access aisle.

There is an additional exception for work areas that need to be raised 7 inches (178 mm) or more above the floor and have an area of less than 150 square feet (14 m²). Examples would include a raised area around a metal stamping machine, a safety manager’s observation station on a production line or the pulpit area in a church (see commentary, Section 1107.4).

1104.1 Site arrival points.

∅ The intent of this section is to require an accessible route from the point at which one enters the site to any buildings or facilities that are required to be accessible on that site. It is presumed that people with disabilities are capable of gaining access to the site from such locations as accessible parking, public transportation stops, loading zones, public streets or sidewalks.

The exception addresses vehicular routes that provide the only route between an arrival point and an accessible entrance. An accessible route for pedestrian access is not required except in buildings or structures having or serving Type B units. For example, if there is a bus stop at the front of an industrial complex, but the only route to the building entrance is via a long driveway, an accessible pedestrian route to that entrance from the bus stop is not required. For special considerations in residential developments see the commentary to Sections 1107.4, ~~4407.14.1~~ 1109.14.1 and ~~4407.14.2~~ 1109.14.2.

1105.1.6 Tenant spaces, dwelling units and sleeping units.

∅ Each tenant space must have at least one accessible entrance. Dwelling and sleeping units that are Accessible, Type A or Type B units must have at least one accessible entrance. If a building is a single-tenant building, the ~~50~~ 60-percent entrance requirement in Section ~~4005.4~~ 1105.1 is also applicable. If a space, whether a tenant, dwelling unit or sleeping unit, does not have accessibility requirements, then an accessible entrance is not required.

1106.6 Location.

∅ As previously stated, the majority of disabled parking permits and license plate holders in most states are ambulatory, mobility-impaired persons. Travel distance, as well as severe weather conditions encountered when traversing from the parking lot to the building entrance, are more difficult for mobility-impaired persons to deal with than the general

population. The intent of this section is to locate the parking so that the people utilizing the accessible parking spaces have to travel a minimum distance to an accessible entrance. This requirement is stated in performance terms and requires a degree of subjective judgement on the part of both the designer and the building official in determining the appropriate location for accessible spaces that meets the intent of this section. If a facility has multiple accessible entrances, accessible parking spaces are to be dispersed consistent with the location of these entrances.

Exception 1 is intended to acknowledge a practical difficulty associated with multilevel parking structures. In many cases, a multilevel parking structure will serve accessible building entrances on more than one or all of its parking levels. Specially equipped vans for disabled persons are often modified by raising the roof of the vehicle in order to provide greater interior headroom. Consequently, such vans require greater vertical clearances. Typical parking structure design may not easily accommodate the necessary vertical clearance for accessible vans due to their low floor-to-ceiling heights. It would be impractical and economically unjustified to require parking structures to be designed solely for the purpose of enabling van-accessible spaces to be located on upper levels. Accordingly, the exception allows the required van-accessible parking spaces to be located on only one level of a multilevel parking structure. The route to and from the space, as well as at the van space and associated access aisle must meet the minimum clear height of 98 inches (2489 mm) as specified in ICC A117.1 Section ~~502.5~~ 502.6. This will usually be the entry level of the parking facility.

Exception 2 addresses sites where multiple parking facilities are provided to serve a single destination or facility. Since one or more of the parking lots or parking garages may be more attractive to users for various reasons, it is acceptable to locate the required accessible parking based on perceived user convenience and preferences, including distance, parking fees and amenities.

1107.1 General.

∩ There are two basic types of facilities that this section covers: dwelling units and sleeping units. A dwelling unit is defined in Section ~~310.2~~ 202 as a single unit that contains permanent provisions for “living, sleeping, eating, cooking and sanitation.” A sleeping unit is defined in Section 202 as a room in which people sleep, which can include some of the provisions found in a dwelling unit but not all. Occupancy of dwelling units or sleeping units can be transient or nontransient. Dwelling units are typically apartments, condominiums, detached homes or townhouses. Dwelling units can be located in hotels that offer cabins, suites or rooms with kitchen facilities. Bedrooms within dwelling units are not considered sleeping units.

A sleeping unit could be a typical hotel guestroom; a bedroom in a congregate residence, such as a dorm, sorority house, fraternity house, convent, monastery or boarding house; a nursing home room or a jail cell.

1107.6.2.1.1 Type A units.

∩ To be able to better accommodate a person who uses a wheelchair in his or her search for housing, apartments and condominiums are required to provide Type A units. Congregate residences, such as convents and monasteries, must also provide Type A units. The housing industry has been concerned that dwelling units equipped with the full range of features to accomplish accessibility will not be marketable to people without disabilities. The Type A requirements are intended to accomplish a middle ground that will satisfy both needs. Allowances made during the construction process for future conversion for accessibility, such as reinforcement in bathroom walls for future installation of grab bars, will allow a unit to be altered later at a considerably lesser cost.

Type A units are required when the site contains more than 20 dwelling units or sleeping units. So that there is a consistent number of Type A units in multibuilding sites based on the size of a development as a whole, all the buildings are added together to determine the number required. For example, a 300-unit building would require six Type A units, and a development with ~~450~~ 75 buildings with four units per building would also require six Type A units. Exception 2 is in recognition that a development may be built in stages. Only the units that are being constructed as part of that development phase are considered in determining the number of Type A units.

The Type A units must be dispersed among the classes of units provided. For example, if one-, two and three-bedroom units are available with the development and two Type A units are required, it is the designer’s choice as to which two of the options to provide as Type A units. The designer, however, cannot choose to only provide the one-bedroom option with both Type A units. This is not intended to require Type A units to be provided in different buildings in a multibuilding site. Many times in multibuilding developments, there are shared facilities such as clubhouses or pools. The designer may choose to locate the Type A units in the building closest to those amenities for ease of access for the residents. This is acceptable as long as the dispersion requirement is met.

Exception 1 allows the number of Type A units to be reduced in accordance with Section 1107.7.5 when the building’s first-floor elevation is required to be raised due to flood-plain regulations.

1107.6.4.1 Accessible units.

∩ The requirement for one sleeping unit and its associated facilities (e.g., bathing room) to meet Accessible unit criteria is consistent with Group I-1 requirements. All common rooms are required to be fully accessible. ICC A117.1, Section 1002 Chapters 3 through 9, provide the technical criteria for Accessible sleeping units.

1108.2.6.1 Receivers.

∩ Table ~~4408.2.7.4~~ 1108.2.6.1 specifies the number of required receivers in an assembly occupancy. Exception 1 states that if a facility has more than one assembly space with an audio amplification system, such as a multiplex theater, then the total seating for all the spaces may be used to determine the number of receivers required.

Exception 2 states that since induction loop technology renders an entire space accessible to the assistive listening system, the hearing-aid compatible receivers are not necessary.

1108.2.6.2 Public address systems.

∩ If stadiums, arenas or grandstands provide public announcements, the same information should be displayed on some type of electronic signage. Most stadiums, arenas and grandstands have electronic scoreboards that are capable of displaying text messages. If electronic signage is not provided, compliance with Sections ~~4408.2.7.2.4~~ 1108.2.6.2.1 and ~~4408.2.7.2.2~~ 1108.2.6.2.2 is not required.

1108.2.8.1 Dining surfaces.

∩ Section ~~4408.2.9.4~~ 1108.2.8.1 establishes the criteria for the percentage of tables, booths, bars and counters that will be used for eating or drinking that must be accessible. This criteria is consistent with Section 1109.11 for the required percentage of accessible built-in surfaces in all other occupancies. The required accessible surfaces are also required to be distributed throughout the facility such that a comparable choice of locations and types (i.e., tables, booths, counters, etc.) is available. This requirement, in conjunction with Section ~~4408.2.9~~ 1108.2.8, provides a reasonable and appropriate degree of accessibility throughout dining areas. The result is that a person with a mobility impairment will be able to approach, enter and move about in virtually all portions of a dining area. The entire dining or drinking area must be accessible. In addition, 5 percent of the total surfaces provided must be accessible. The issue of whether a portion of the bar in a restaurant is required to be accessible is subjective. The assumption is that if other types of seating are provided adjacent to the counter, then services provided at the counter will also be available at the adjacent seating; therefore, if adequate accessible seating is available adjacent to the bar area, the bar is not required to be lowered. If the bar is the only eating or dining surface, however, then a portion of the bar must be made accessible.

1109.2 Toilet and bathing facilities.

∩ This section generally requires toilet rooms and bathing facilities to be accessible. A person using a wheelchair must be able to approach and enter the room. Within the toilet room and bathing facility, a minimum of one of each element or fixture is required to be accessible. Elements and fixtures include such things as water closets, lavatories, mirrors, towel dispensers, hand dryers and any other device that is installed and intended for use by the occupants of the room. Requirements for the total number of bathing and toilet facilities are in Chapter 29 of the code [which is duplicated from Section 403 of the *International Plumbing Code*® (IPC®)]. Large assembly and mercantile occupancies must also include a unisex accessible bathroom in addition to their other toilet facilities (see commentary, Section 1109.2.1).

ICC A117.1 is the document referenced for all accessible toilet room requirements. The technical requirements in ICC A117.1 are based on allowing a person in a wheelchair to perform a side transfer [see Figure 1109.2(1)]. Maintaining a clear floor space at each fixture is important [see Figures 1109.2(2) and 1109.2(3) for possible configurations].

Exception 1 addresses a condition in which a toilet room or bathing facility is permitted to be adaptable rather than fully accessible. The intent is that if a toilet room is part of an individual office and serves only the occupant of that office, the adaptable toilet room can be readily modified to be fully accessible based on that individual's needs. Preplanning during construction and design, such as installing blocking for grab bars and arranging plumbing fixtures to have adequate clear floor space, will facilitate future alterations.

Exception 2 is intended to correlate with the provisions of Section 1107, which establish the minimum number of facilities required to be Accessible, Type A or Type B units. Without this exception, the code would literally be requiring accessible fixtures in an inaccessible toilet room or bathing facility. It is important to note that the bathrooms associated with required Accessible, Type A and Type B dwelling and sleeping units must comply with the requirements in ICC A117.1, Chapter 10.

Exception 3 specifies that all toilet rooms ~~in excess of those required by the IPC~~ and clustered together need not be accessible. In such configurations, typically found in a doctor's office or drug test center, the requirement is reduced to a 50-percent minimum. If these toilet rooms are clustered in separate locations, such as in a multiclinic facility, the 50-percent minimum would be applied to each cluster.

The IPC permits urinals to be substituted for water closets to a maximum of 67 percent in each toilet room (see IPC Section 419.2). Exception 4 states that if only one urinal is provided within a toilet room, that urinal is not required to be accessible. This situation would typically only occur in bathrooms with one water closet compartment.

While Exception 2 would exempt all the nonaccessible patient rooms in a hospital from accessible bathroom requirements, the intent of Exception 5 is also to exempt the Accessible units that may be provided within the critical-care or intensive-care units from requiring accessible bathrooms. In critical-care or intensive-care units the patients are often too ill to use the bathroom without assistance; therefore, assistance is offered and expected in these areas to all patients. In addition, critical-care and intensive-care rooms often must be designed to maximize free space for equipment and personnel in case of emergency care situations.

1109.9 Detectable warnings.

~~⌘ If amenities such as coat hooks or shelves are provided for use by the general public (in nonaccessible spaces), then those same amenities must be provided in an accessible space.~~

A detectable warning is a standardized feature built in or applied to walking surfaces to warn a visually impaired person of a hazard on or near his or her path of travel that may otherwise go unnoticed and could result in injury to that person. A typical example of the need for a detectable warning is at any walking surface where a significant drop-off occurs that, if unnoticed, has the potential to cause injury should a person fall.

This section requires a detectable warning at the edges of passenger transit platforms where they border a drop-off. For example, loading platforms in both light and heavy-rail transit stations where passengers await the arrival of trains are a serious potential hazard to a person with a vision impairment when there is no train at the station. There have been incidents where people with severe vision impairments have fallen off the transit platform and been killed or seriously injured. The presence of a detectable warning at the platform edge where it borders the drop-off would be encountered and recognized by a person with a vision impairment either through detection by a long cane or by foot contact with the detectable warning surface.

The exception for bus stops is established so as not to require a detectable warning at the curb between a sidewalk and the street. Detectable warnings at curbs are contradictory to the envisioned application of detectable warnings in the built environment. The curb itself is a recognizable and well-known cue to people with vision impairments to proceed with caution.

There is a great deal of controversy and general disagreement as to the benefit or advisability of detectable warning surfaces throughout the built environment. The use of such warnings at transit stations is, to date, the only well documented use of detectable warnings, as discussed in studies such as "Tactile Warnings to Promote Safety in the Vicinity of Transit Platform Edges," conducted by the Urban Mass Transportation Administration, and "Pathfinder Tactile Tile Demonstration Test Project," conducted by the Metro-Dade Transit Agency. The Access Board will be looking into this issue as part of the development of *Public Rights-of-Way Guidelines*.

ICC A117.1 prescribes the type of surface that constitutes a detectable warning in Section 705. One option for the detectable warning surface that is currently considered suitable consists of raised, truncated domes with a diameter between 0.9 inches (23 mm) and 1.4 inches (36 mm), a height of approximately 0.2 inch (5.1 mm) and center-to-center spacing of between 1.6 (41 mm) and 2.4 inches (61 mm). However, there is current and ongoing research into the use and application of truncated domes as a suitable detectable-warning surface for various applications, including interior and exterior locations. ICC A117.1 requires that the type of detectable warning surface utilized must be standard throughout a building, facility, site or complex of buildings. If different types of detectable warning surfaces are utilized, their usefulness is diminished. The different messages they would convey to a person with a vision impairment would not be consistent and may be confusing and easily misinterpreted.

It is anticipated that future applications of detectable warnings will be considered when additional research and documentation of their usefulness and suitability is available. One issue, among many, is the durability of a detectable warning surface in an exterior application and the potential difficulty that truncated domes may present to a person in a wheelchair, as well as to nondisabled persons who may have to negotiate the surface.

**CHAPTER 16
STRUCTURAL DESIGN**

**TABLE 1604.3.6
CONCRETE ROOF MEMBER DEFLECTION CRITERIA**

Construction	LOADS		
	L	S or W	D+L
IBC Table 1604.3			
Roof members	<i>l</i> /360	<i>l</i> /360	<i>l</i> /240
Concrete per ACI 318 See Table 9.5(b)			
Flat roofs	<i>l</i> /180	a	a

a. No deflection limit specified in ACI 318

1607.6 Truck and bus garages.

□ The uniform load specified in this section is to be applied to the garage floor in accordance with Section 1607.6.1 (also see Table 1607.6 for the specified concentrated loads that are to be included in the design). ~~The uniform and concentrated loads are to be applied as separate load cases and not at the same time.~~

1607.9.1 General.

This section provides a method of reducing uniform floor live loads that is based on the provisions of ASCE 7. The concept is that where the design live load is governed by the minimum live loads in Table 1607.1, the actual load on a large area of the floor is very likely to be less than the nominal live load in the table. Thus, the allowable reduction increases with the tributary area of the floor that is supported by a structural member; therefore, a girder that supports a large tributary area would be allowed to be designed for somewhat less live load per square foot than a floor beam that supports a smaller total floor area. The following example demonstrates the live load reduction method (refer to Figure 1607.9.1) calculation for the conditions shown in Figure 1607.9.1:

Solution:

For interior beam $K_{LL} = 2$ (Table 1607.9.1)

$$K_{LL} A_T = (2)(750 \text{ sq. ft.}) = 1500 \text{ sq. ft.}$$

Using Equation 16-22

$$L = 50 \left(0.25 + \frac{15}{\sqrt{1500}} \right) = 32 \text{ psf} \quad > 0.5 L_0$$

$$0.5 L_0 = 25 \text{ psf} < 32 \text{ psf}$$

Use reduced live load, $L = 32 \text{ psf}$

**Figure 1608.1(3)
DRIFTING SNOW ONTO ADJACENT LOW STRUCTURE**

(Add math symbol on dimension between buildings) – $S \leq 20$ feet

CHAPTER 18
SOILS AND FOUNDATIONS

1802.3.2 Expansive soils.

SWELLING POTENTIAL PLASTICITY INDEX

Low	0-15
Medium	$10 \leq PI < 35$
High	20-55
Very high	35 and above

Figure 1802.3.2
SWELLING POTENTIAL OF SOILS AND PLASTICITY INDEX

Source: R.B. Peck, W.E. Hanson and T.H. Thornburn
Foundation Engineering 2nd ed.
(New York: John Wiley & Sons, 1974).

CHAPTER 25 GYPSUM BOARD AND PLASTER

2511.1.1 Installation.

This section refers to Section ~~2508~~ 2507 for the appropriate standards to regulate the proper installation of gypsum lath and related gypsum board materials and accessories. The expected performance of a product or material is dependent on proper installation. Table 2511.1.1 lists the appropriate ASTM standards for plaster construction.

2512.1 General.

This section is intended to define the standards and guidelines for the type of materials and installation of exterior plaster. The requirements of this section include the limitations of gypsum plaster and gypsum veneer plaster. This section will also address plaster applied to solid backings, alternative application methods, curing and plaster additives. Guidelines and requirements for preventing water infiltration into the building are discussed in this section.

Portland Cement plaster (stucco) is the only type approved by the code for the use of exterior plaster finish. Exterior ~~portland~~ cement plasters are required by the code to be applied in no less than three coats when applied over expanded metal or wire-fabric lath for the same reasons discussed for interior plaster (see commentary, Section 2511.1.1 and Figure 2512.1). When ~~portland~~ cement plaster is applied over other approved plaster bases, the code permits the application of a two-coat plaster system. The code also allows plaster work that is going to be completely concealed to be applied as a two-coat system, provided the total thickness meets the requirements of ASTM C 926, because the finish coat (second coat) of plaster will be the surface that will receive the exterior finish, such as paint, and it is critical for the finish coat to provide a clean, smooth and visually acceptable surface. Where the plaster surface is to be completely concealed, it is not necessary to provide a finish coat.

TABLE 2512.6 CEMENT PLASTERS

The timing between coats will vary with climate conditions and the type of plaster base being used. Table 2512.6 specifies the minimum curing times between coats; however, temperature and relative humidity will extend or reduce the curing time required between consecutive coats. Cold or wet weather will increase the required curing time, while hot or dry weather will shorten it. Moderate changes in temperature and humidity can be controlled by providing additional heating during cold and damp weather, and by reducing the loss of moisture by prewetting during hot or dry weather.

All the conditions mentioned above must be taken into consideration when selecting the most appropriate method of curing that will provide the best results for the application being considered as well as the job conditions present during the curing process. Any of the three curing methods listed below, or any combination of the three, are permitted by the code:

1. Moist curing is accomplished by applying a fine fog spray of water as often as required to retain moisture and control the rate of curing. Moisture is generally applied two times a day—once in the morning and again in the late afternoon or evening—although job conditions are more of a factor than a predetermined time schedule. Care must be taken to avoid erosion damage to ~~portland~~ cement-based plaster surfaces due to excessive amounts of water running down vertical surfaces. Except in extreme or severe drying conditions, the wetting of the finish coat should be avoided.
2. Plastic film, when taped or weighted down around the perimeter of the plastered work area, will provide a vapor barrier to retain the moisture between the membrane and the plaster. Care must be taken when placing the plastic film around the work area. If the film is placed too soon before the plaster is allowed to stiffen, the film can come into contact with the wet plaster and damage the surface texture. If too much time is allowed before placing the film, an excessive amount of moisture will have escaped causing premature curing, which can cause cracking to the finished plaster.
3. Canvas, cloth or sheet material barriers can be erected to deflect sunlight and wind, both of which will affect the rate of evaporation. If the humidity is very low, this method alone may not provide adequate protection.

**CHAPTER 34
EXISTING STRUCTURES**

3403.2.3.2 Alterations.

∪ The term “alteration” is defined in Section 202 as “any construction or renovation to an existing structure other than repair or addition.” This section of the code gives more specific guidance with respect to the impact of an alteration on the seismic resistance of the structure. Alterations that increase the seismic load on existing structural elements by more than 10 percent or decrease the seismic resistance of existing structural elements by more than 10 percent require the entire seismic-force-resisting system to be in compliance with the seismic load provisions applicable to a new structure. Alterations that affect existing structural elements to a lesser extent are permitted without requiring the existing structure to comply with the provisions for new structures, as long as the alteration itself complies.

The exception addresses the issue of upgrading existing structures voluntarily for improved seismic performance. It does not apply to situations where other code sections trigger full compliance with the code. Otherwise, it allows an owner to initiate an improvement to the seismic-force-resisting system to the extent that it is viable to do so and provided the required engineering analysis is furnished.

3409.3 Extent of application.

∪ Alterations to existing buildings or structures should neither increase the need for greater accessibility, nor make the building or structure any less safe or usable. The scoping requirements for alterations are provided in Section 3409.8, but in no case should those alterations require any greater degree of accessibility than if the building or structure was brand new.

~~Exception 3 has been added to the code to address the specific circumstances when an existing Type A dwelling unit is undergoing alterations and renovations. If this Type A dwelling unit is “individually owned” such as a condominium, then it only needs to meet the code’s requirements as a Type B dwelling unit. The provisions for Type B dwelling units are provided in Chapter 11 of the code and referenced standard ICC A117.1.~~