

CHAPTER 12

INTERIOR ENVIRONMENT

General Comments

Chapter 12 contains provisions governing the interior environment requirements of all buildings and structures intended for human occupancy.

Section 1201 identifies the scope of the chapter.

Section 1202 provides definitions applicable to terms used in this chapter.

Section 1203 identifies special enclosed spaces where accumulated moisture must be removed by ventilation and establishes criteria (minimum openable area) for the only method of measuring compliance with the natural ventilation requirements for occupied spaces.

Section 1204 identifies the minimum space-heating requirement for interior spaces intended for human occupancy.

Section 1205 requires light for every room or space intended for human occupancy. The method of compliance is the choice of the designer, who may elect to provide artificial instead of natural light. Prescriptive requirements for stairway lighting in dwelling units are also included.

Section 1206 specifies the minimum requirements for courts and yards, including area width, accessibility for cleaning and the location of air intakes when natural light or natural ventilation is the chosen design option.

Section 1207 establishes the sound transmission control requirements for air-borne and structure-borne sound in residential buildings.

Section 1208 addresses the minimum ceiling height for all habitable and occupiable spaces along with other spaces as specified (i.e., hallways, toilet rooms and bathrooms). The minimum floor area for rooms in dwelling units is also specified.

Section 1209 provides minimal opening requirements for access to crawl spaces and attics.

Section 1210 contains requirements for toilet room surfaces and fixture surrounds.

The environmental and physiological justification for the code requirements relevant to light and ventilation of occupiable spaces is based on knowledge, technology and practices developed over centuries of building structures in which humans live and work. These design practices have been further validated by studies during the nineteenth and twentieth centuries.

The greatest impact on these provisions, and those that have resulted in changes during the past 30 years, has been from the interest in energy conservation through construction practices, including the minimization of exterior wall openings.

The requirements related to interior sound transmission and control are considered an important aspect of human comfort in residential occupancies.

Purpose

The purpose of Chapter 12 is to establish minimum conditions for the interior environment of a building. The size of spaces, light, ventilation and noise intrusion are all addressed in order to define the minimum acceptable conditions to which any occupant may be exposed. Design options of natural and mechanical systems are introduced and the criteria for performance are specified.

Even though it was not completely understood, the need for “fresh air” had been recognized for centuries. Designers of centuries-old adobe buildings in the Southwest, hide-covered Indian tepees of the plains and frame houses of early settlers in the East all relied upon the buoyancy of warm air, enabling it to rise and cooler air to flow in to replace it. Whether the design relied on solar energy, thermal mass or even wind velocity to cause the movement, it still reflected a natural movement and, as a result, has been termed “natural ventilation.” Only recently have we begun to recognize the reasons for ventilation and the implications of failing to provide an adequate quantity and acceptable quality of air for all occupants. The expression “sick building syndrome” has crept into our vocabulary and reflects the increased understanding of the relationship between interior environment requirements and the physiological well-being of the occupants.

The other purpose of regulating the interior environment is psychological. Merely providing adequate conditions is not sufficient if the occupant does not perceive them as adequate. Minimum space requirements (floor area, yard dimensions or ceiling height) address the need to perceive adequate light, ventilation and space to promote psychological well-being. Regulation of sound transmission also bears directly on the psychological and long-term physical well-being of the occupant.

Finally, adequate lighting from natural sources also meets the physical and psychological needs of the occupants and contributes directly to their overall safety. Safe use of any building under ordinary and emergency conditions depends greatly on proper illumination of the space. This chapter references the *Florida Building Code, Mechanical* as the performance standard for mechanical ventilation and the installation standard for mechanical systems used in buildings regulated by the code.

**SECTION 1201
GENERAL**

1201.1 Scope. The provisions of this chapter shall govern ventilation, temperature control, lighting, yards and courts, sound transmission, room dimensions, surrounding materials and rodent proofing associated with the interior spaces of buildings.

This section identifies the scope of Chapter 12. The requirements of this chapter are intended to govern and regulate the need for light, ventilation, sound transmission control, interior space dimensions and materials surrounding plumbing fixtures in all buildings. It is the intent of the code that the user must comply with these regulations for all newly constructed buildings and structures and for all buildings and structures, or portions thereof, when there is to be a change of occupancy.

**SECTION 1202
DEFINITIONS**

1202.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

Definitions of terms can help in the understanding and application of the code requirements. The purpose for including these definitions within this chapter is to provide more convenient access to them without having to refer back to Chapter 2. For convenience, these terms are also listed in Chapter 2 with a cross reference to this section. The use and application of all defined terms, including those defined herein, are set forth in Section 201.

SUNROOM

1. A room with roof panels that include sloped glazing that is a one-story structure added to an existing dwelling with an open or glazed area in excess of 40 percent of the gross area of the sunroom structure's exterior walls and roof.
2. A one-story structure added to a dwelling with structural roof panels without sloped glazing. The sunroom walls may have any configuration, provided the open area of the longer wall and one additional wall is equal to at least 65 percent of the area below 6 feet 8 inches of each wall, measured from the floor.

For the purposes of this code the term sunroom as used herein shall include conservatories, sunspaces, solariums, and porch or patio covers or enclosures.

This definition describes the most common type of sunroom constructed in Florida. See the definition of Habitable Space for the determination of whether a sunroom is a habitable space or not. See Section 1609.1.2 for implications relating to wind-borne debris and sunrooms. Section 2002.6 specifically addresses the construction and design of sunrooms.

SUNROOM ADDITION. Reserved.

THERMAL ISOLATION. A separation of conditioned spaces, between a sunroom addition and a dwelling unit, consisting of existing or new wall(s), doors and/or windows.

This terminology is required for the same reason provided in the definition of "Sunroom addition" (see above).

**SECTION 1203
VENTILATION**

1203.1 General. Buildings shall be provided with natural ventilation in accordance with Section 1203.4, or mechanical ventilation in accordance with the *Florida Building Code, Mechanical*.

Every room or space must be provided with ventilation. The selection of natural versus mechanical ventilation on a room-by-room or space-by-space basis is the designer's prerogative. Certain conditions require mechanical exhaust even though natural ventilation systems have been selected by the designer. Section 1203.4.2 of the code and Sections 401.7 and 403 of the *Florida Building Code, Mechanical* direct the treatment of those special situations. Existence of these conditions, however, does not require mechanical ventilation other than to address the condition. Other rooms or spaces not affected by those conditions may be served by natural systems.

1203.2 Attic spaces. Enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof framing members shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain and snow. Blocking and bridging shall be arranged so as not to interfere with the movement of air. A minimum of 1 inch (25 mm) of airspace shall be provided between the insulation and the roof sheathing. The net free ventilating area shall not be less than $1/150$ of the area of the space ventilated, with 50 percent of the required ventilating area provided by ventilators located in the upper portion of the space to be ventilated at least 3 feet (914 mm) above eave or cornice vents with the balance of the required ventilation provided by eave or cornice vents.

Exceptions:

1. The minimum required net free ventilating area shall be $1/300$ of the area of the space ventilated, provided a vapor retarder having a transmission rate not exceeding 1 perm in accordance with ASTM E 96 is installed on the warm side of the attic insulation and provided 50 percent of the required ventilating area provided by ventilators located in the upper portion of the space to be ventilated at least 3 feet (914 mm) above eave or cornice vents, with the balance of the required ventilation provided by eave or cornice vents.
2. Attic spaces, designed by a Florida-licensed engineer or registered architect to eliminate the attic venting.

All attic spaces and each separate space formed between solid roof rafters are required to be cross ventilated where the ceiling is applied directly to the under-

side of the roof rafters. Large amounts of water vapor migrate by movement of air carrying water or by diffusion through the building envelope because of vapor pressure differences. The sources of water include cooking, laundering, bathing, and breathing and perspiration of humans. These can account for an average daily production of 25 lbs. of water vapor in a typical family of four dwelling. The average can be much higher where such appliances such as humidifiers, washers, and dryers are used.

As the vapor moves into the attic, it may reach its dew point, thus condensing on roof components. This wetting and drying action can cause rotting, decay, and corrosion. To avoid this, the attic must be ventilated to prevent the accumulation of water on building components.

Additionally, attic ventilation serves to remove excess heat in the attic. Most roof covering manufacturers require attic ventilation to remove excess heat for continuation of the roof warranty.

This section is distinctly different from the 2001 *Florida Building Code*. The 2001 FBC didn't require ventilation in the upper portion of the attic unless the exception for reducing the ventilating area was applied using the vapor retarder. The 2007 FBC requires 50 percent of the ventilating area to be in the upper portion of the attic with remainder provided by soffit or eave vents regardless of whether the exception for the vapor retarder is used. It is also important to provide cross ventilation in a manner that does not introduce moisture to the attic area. Rain infiltration can occur when the attic ventilation openings are not sufficiently protected against the entrance of rain, or when more than 50 percent of the ventilation openings are located along the ridge or gable wall of the roof rather than at the eave. When the wind blows perpendicular to a roof ridge vent, a negative pressure builds up across the ridge that draws air out of the attic space through the attic vents. Cross flow of air through the attic can be achieved when outside air is drawn into the attic through the eave or cornice and exits through the ridge or gable vents. In order for this to occur, eave or cornice vents must be greater than or equal to the area of the ridge or gable vents.

Vents that permit rain to infiltrate the attic are not permitted. While there is no specific test standard for this performance aspect of vents, rain infiltration through roof vents can be addressed by as "balanced" venting which is essentially required by this section. Balanced venting is providing at least 50 percent of the required ventilating area in the upper third of the space being ventilated (e.g., through ridge or gable vents). The balance of the required ventilation is provided by eave or cornice vents that are greater than or equal to the ventilation area provided by the ridge or gable vents. Most ridge vent manufacturers require slightly more ventilation area in the eaves than provided in the ridge vent to help prevent snow infiltration.

If insufficient eave or cornice ventilation is provided, air will be drawn through the ridge or gable vents.

Therefore, it is required to have both eave and ridge or gable vents, with the eave vent area being greater than or equal to the ridge vent area (i.e., "balanced" venting).

If an adequate amount of ventilation area in the upper portion of the space is not provided and the ventilation area is provided mainly at the eave or cornice vents, then air will enter and leave the attic space at the eave, and very little cross flow of air will occur.

The ventilation openings are required to be covered with corrosion-resistant mesh or similar material in accordance with Section 1203.2.1.

If roof spaces are not created (e.g., solid concrete roof sections), ventilation is not required, as there is no concealed space for condensation, etc., to accumulate. The amount of area needed for ventilating a roof space is also established in this section. The minimum (net free) required ventilating area is required to be $1/150$ of the space being ventilation. This space being ventilated is the entire attic area including soffits and eaves. The net free ventilating area is the actual space provided to the open air. While section 1203.2.1 requires the openings to be covering with a corrosion resistant material, only the actual open space can be used to determine the ratio of $1/150$.

The net free ventilating area can be reduced to $1/300$ when a vapor retarder having a transmission rate of 1 perm is installed on the warm side of the attic insulation and [see Figure 1203.2(1) for the location of a vapor retarder]. The installation of a vapor retarder acts to prevent the passage of moisture into the attic from the habitable areas below. An effective vapor retarder reduces the need for ventilation.

A new exception in the 2007 code permits omission of attic ventilation provided it is designed to eliminate the venting by an engineer or architect. Indoor air quality is one of the foremost issues facing Floridians today, for both building occupants and builders. In humid climates, it is detrimental to allow high humidity conditions to occur in the attic of air-conditioned buildings. Attic space ventilation in humid climates allows moisture to enter the crawl space and migrate into the floor insulation and floor assembly. The code has progressively increased floor insulation R-values, resulting in lower material temperatures below the insulation. These lower temperatures are often close to or at the dew-point, creating moisture build-up in building materials, which results in prime conditions for microbial growth.

Additionally, homeowners are acclimatizing themselves to colder temperatures inside their homes. This has started a trend of creating colder temperatures below the insulation and increasing the chances for dew-point conditions to occur under the insulation, which also causes microbial growth.

Duct sweating in the attic has become a known issue in many homes in humid climates, despite increased R-values of ductwork. Allowing closed, engineered attics will reduce the opportunity for duct sweating to occur.

This change will allow design professionals to reduce the possibility of condensation in the attic and interstitial spaces, thus improving indoor air quality by reducing the potential for mold growth.

The following example illustrates the calculation of required ventilation areas for an attic space (see Figure 1203.2(2)):

Note: The area of the attic must include the area of the eave or soffit.

$$\begin{aligned} \text{Area of attic} &= (20' \times 50') + 2(50' \times 1') \\ &= 1,100 \text{ sq. ft.} \end{aligned}$$

$$\text{Net free ventilating area required} = \frac{1}{150} \text{ of area}$$

$$\begin{aligned} \text{Required ventilating area} &= 1,100/150 \\ &= 7.33 \text{ sq. ft.} \\ &= 1,056 \text{ sq. in.} \end{aligned}$$

$$\begin{aligned} \text{Minimum required ventilation} \\ \text{in upper portion of attic} &= .5 \times 1,056 \text{ sq.in.} \\ &= 528 \text{ sq. in.} \\ &\text{(Balance to be} \\ &\text{provided in soffit} \\ &\text{or eave vents.)} \end{aligned}$$

Common methods used to provide soffit ventilation include manufactured units, strips or soffit panels and holes or slots (with screening) that meet the criteria and are approved.

Note: When an approved vapor retarder is provided as noted in Figure 1203.2(1), the ventilation requirements can be reduced to $\frac{1}{300}$.

The following example illustrates the calculation of required ventilation areas where an approved vapor retarder is provided:

$$\text{Net free ventilating area required} = \frac{1}{300} \text{ of area}$$

$$\begin{aligned} \text{Required ventilating area} &= 1,100/300 \\ &= 3.67 \text{ sq. ft.} \\ &= 528 \text{ sq. in.} \end{aligned}$$

$$\begin{aligned} \text{Minimum required ventilation} \\ \text{in upper portion of attic} &= .5 \times 528 \text{ sq. in.} \\ &= 264 \text{ sq. in.} \\ &\text{(Balance to be} \\ &\text{provided in soffit} \\ &\text{or eave vents.)} \end{aligned}$$

It is important to note that the distribution of ventilation openings should be uniform along the length of the soffits and ridge.

Common methods used to provide roof ridge ventilation include manufactured roof units, ridge vents and gable louvers.

Common methods used to provide soffit ventilation include manufactured units, strips or soffit panels and holes or slots (with screening) that meet the criteria and are approved.

Where an attic space is not created, but the ceiling membrane is applied directly to the bottom of the solid roof rafters, each rafter space is to be ventilated separately. In this type of installation, it is particularly important that cross ventilation is developed between each rafter space by providing vents at the ridge and eave [see Figure 1203.2(3)]. A minimum 1 inch air space is required between the insulation and the roof sheathing.

1203.2.1 Openings into attic. Exterior openings into the attic space of any building intended for human occupancy shall be covered with corrosion-resistant wire cloth screening, hardware cloth, perforated vinyl or similar material that will prevent the entry of birds, squirrels, rodents, snakes and other similar creatures. The openings therein shall be a minimum of $\frac{1}{8}$ inch (3.2 mm) and shall not exceed $\frac{1}{4}$ inch (6.4 mm). Where combustion air is obtained from an attic area, it shall be in accordance with Chapter 7 of the *Florida Building Code, Mechanical*.

Ventilation openings that would permit the entrance of small animals into the structure must be protected in accordance with this section. Hardware cloth is a particular kind of metal wire cloth screening, and perforated vinyl is a plastic screening or grid with openings of similar dimensions. Corrosion-resistant metals and

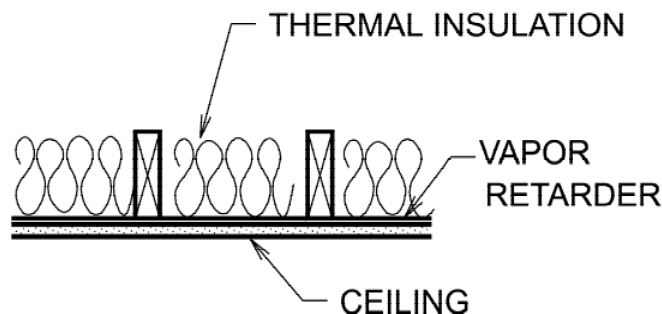
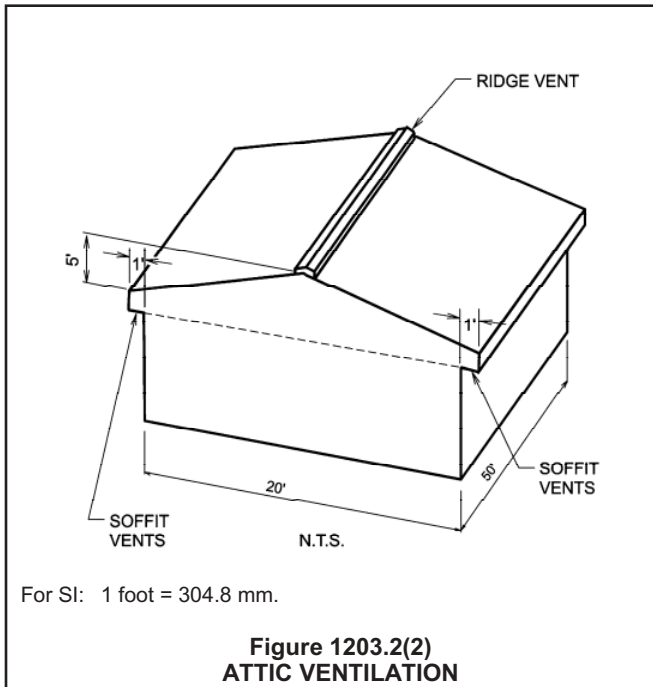


Figure 1203.2(1)
VAPOR RETARDER



vinyl have good resistance to deterioration over time. Whichever material is used, it must be non-deteriorating in addition to having the minimum and maximum opening dimensions of $\frac{1}{8}$ and $\frac{1}{4}$ inches respectively.

Combustion air is air supplied to the room where a fuel-burning appliance is located, so that combustion of the fuel can take place in a safe and complete manner. Chapter 7 of the *Florida Building Code, Mechanical* permits combustion air to be taken from an attic space that is ventilated by openings to the exterior, under certain conditions. Those conditions are based on the configuration of the attic space and the ventila-

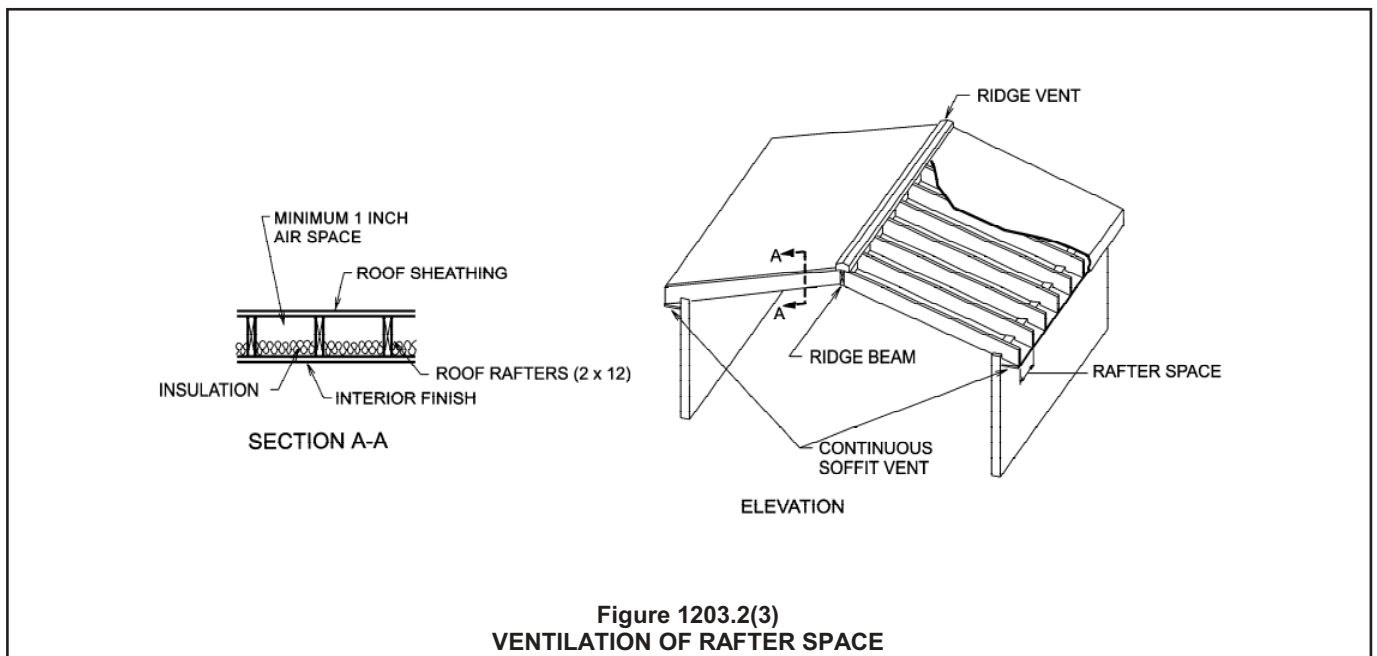
tion openings themselves (see Chapter 7 of the *Florida Building Code, Mechanical* for more information).

1203.3 Under-floor ventilation. The space between the bottom of the floor joists and the earth under any building except spaces occupied by a basement or cellar shall be provided with ventilation openings through foundation walls or exterior walls. Such openings shall be placed so as to provide cross ventilation of the under-floor space.

The intent of this section is to create an adequate flow of air through crawl spaces to achieve the ventilation goals of controlling temperature, humidity and accumulation of gases. The entire space must be properly ventilated by openings that are distributed to affect cross flow and include corner areas. Although the code does not specify the exact location of openings, for cross ventilation openings are required on at least two sides of a building, with at least one opening near each corner of the building, is typically sufficient.

Reasonably distributed ventilation openings in crawl spaces control moisture condensation, temperature, humidity, and accumulation of gases. Susceptibility to condensation is a function of the geographical location and climatic conditions.

Mechanical ventilating devices also can be installed to force air movement and ventilate the space, in which case the location and number of ventilation openings are less critical (see Exception 3 in Section 1203.3.2). The amount of ventilation openings required can be drastically reduced if a vapor retarder is used on the ground surface in the crawl space, in accordance with Exception 2 in Section 1203.3.2. Also, in accordance with Exception 3, when a vapor retarder is used, the installation of operable louvers (to close the openings in the coldest times of the year) is permitted.



1203.3.1 Openings for under-floor ventilation. The minimum net area of ventilation openings shall not be less than 1 square foot for each 150 square feet (0.67 m² for each 100 m²) of crawl-space area. Ventilation openings shall be covered for their height and width with any of the following materials, provided that the least dimension of the covering shall not exceed 1/4 inch (6 mm):

1. Perforated sheet metal plates not less than 0.070 inch (1.8 mm) thick.
2. Expanded sheet metal plates not less than 0.047 inch (1.2 mm) thick.
3. Cast-iron grilles or gratings.
4. Extruded load-bearing vents.
5. Hardware cloth of 0.035 inch (0.89 mm) wire or heavier.
6. Corrosion-resistant wire mesh, with the least dimension not exceeding 1/8 inch (3.2 mm).

The following is an example of the area calculation: A rectangular building that is 60 feet (18,288 mm) long and 20 feet (6096 mm) wide has a plan area of 1,200 square feet (111.5 m²). The amount of ventilation opening required is 1,200/150 = 8 square feet (0.74 m²) = 1,152 square inches (0.74 m²). This is the total (aggregate) amount of ventilation opening that must be distributed among all the openings.

This required amount of openings may be reduced by a factor of 10 if a vapor retarder is used on the ground surface in accordance with Exception 2 of Section 1203.3.2.

The requirement for covering the openings with perforated plates, corrosion-resistant wire mesh or other covering is to keep small animals out. Six alternatives are given for this covering, and they all must have openings that have no dimension exceeding 1/4 inch (6.4 mm).

1203.3.2 Exceptions. The following are exceptions to Sections 1203.3 and 1203.3.1:

1. Where warranted by climatic conditions, ventilation openings to the outdoors are not required if ventilation openings to the interior are provided.
2. The total area of ventilation openings is permitted to be reduced to 1/1,500 of the under-floor area where the ground surface is treated with an approved vapor retarder material and the required openings are placed so as to provide cross ventilation of the space. The installation of operable louvers shall not be prohibited.
3. Ventilation openings are not required where continuously operated mechanical ventilation is provided at a rate of 1.0 cubic foot per minute (cfm) for each 50 square feet (1.02 L/s for each 10 m²) of crawl-space floor area and the ground surface is covered with an approved vapor retarder.
4. Ventilation openings are not required when the ground surface is covered with an approved vapor retarder, the perimeter walls are insulated and the space is conditioned in accordance with Chapter 13 of *Florida Building Code, Building*.

5. Crawl spaces, designed by a Florida-licensed engineer or registered architect to eliminate the venting.

This section lists the locations and conditions where ventilation openings can be omitted entirely or the area of required openings can be reduced. Exception 1 could be used in extremely cold climates, where ventilation openings are a serious breach of the structure in terms of energy usage. It provides for ventilating the crawl space to the interior conditioned space of the building, which is heated and can accept moisture from the underground space without detrimental effects on the building structure. This typically would not be a practical solution for buildings in the State of Florida.

The use of a vapor retarder material on the ground surface inhibits the flow of moisture from the ground surface into the crawl space and thus reduces, if not virtually eliminates, the need for ventilation. Exception 2 provides for a drastic reduction in the amount of ventilation openings required. While the vapor retarder may significantly reduce the moisture accumulation, ventilation openings are still required but may be equipped with manual dampers to permit them to be closed during the coldest weeks of the year in northern climates.

Exception 3 provides for the use of mechanical ventilation, such as an exhaust fan similar to a bathroom exhaust fan, to keep air moving through the crawl space. A vapor retarder on the ground surface is also required when using Exception 3.

When a crawl space is provided with a vapor retarder on the ground surface and is mechanically conditioned and insulated, it becomes like any other space in the conditioned structure and ventilation openings are not required in accordance with Exception 4. Requirements for insulating structures are found in Chapter 13.

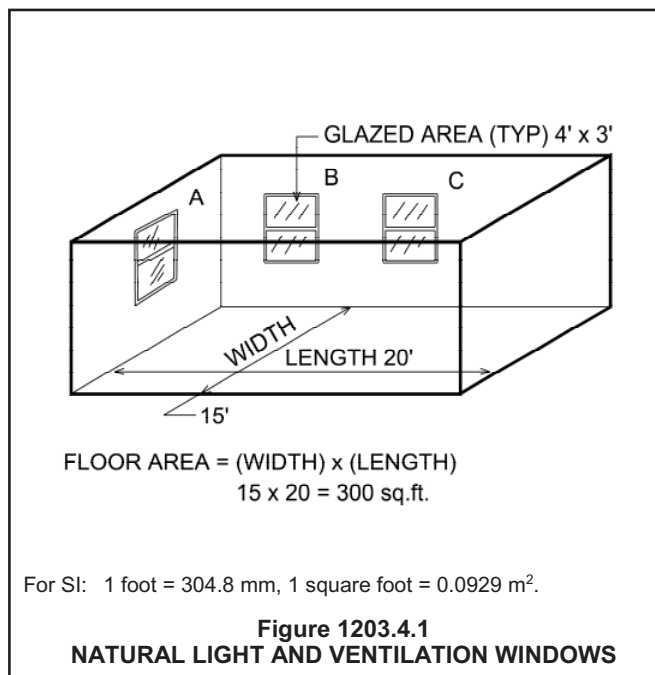
Exception 5 permits the omission of under-floor ventilation where the crawl space is designed to eliminate the venting by an architect or engineer. See Commentary on attic ventilation in Section 1203.2 for further discussion.

1203.4 Natural ventilation. Natural ventilation of an occupied space shall be through windows, doors, louvers or other openings to the outdoors. The operating mechanism for such openings shall be provided with ready access so that the openings are readily controllable by the building occupants.

This section addresses natural ventilation for all occupied spaces. Buildings can have natural ventilation in accordance with this section, or mechanical ventilation in accordance with the *Florida Building Code, Mechanical* (See Section 1203.1) Openings to the outdoor air, such as doors, windows, louvers, etc., provide natural ventilation. The section does not, however, state or intend that the doors, windows or openings actually be constantly open. The intent is that they be maintained in an operable condition so that they are available for use at the discretion of the occupant.

1203.4.1 Ventilation area required. The minimum openable area to the outdoors shall be 4 percent of the floor area being ventilated.

This section specifies the ratio of openable doors, windows or openings to the floor space being ventilated but does not address the distribution around the space or location of these openings. It is the designer's prerogative to distribute openings in such a manner as to accomplish the natural ventilation of the space. When inadequate natural ventilation is provided, mechanical ventilation can supplement any inadequacy (see Chapter 4 of the *Florida Building Code, Mechanical*). The plan reviewer can determine compliance with this section. For example, in Figure 1203.4.1, the combined openable area (the net-free area of a door, window, louver, vent or skylight, etc., when fully open) of double-hung windows B and C is equal to 4 percent of the floor area [(300 square feet) x 0.04] = 12 square feet (1 m²). The openable area of window A is not required and need not open onto a court or yard complying with Section 1206.



1203.4.1.1 Adjoining spaces. Where rooms and spaces without openings to the outdoors are ventilated through an adjoining room, the opening to the adjoining room shall be unobstructed and shall have an area of not less than 8 percent of the floor area of the interior room or space, but not less than 25 square feet (2.3 m²). The minimum openable area to the outdoors shall be based on the total floor area being ventilated.

Exception: Exterior openings required for ventilation shall be permitted to open into a thermally isolated sunroom addition or patio cover provided that the openable area between the sunroom addition or patio cover and the interior room shall have an area of not less than 8 percent of the floor area of the interior room or space, but not less than 20 square feet

(1.86 m²). The minimum openable area to the outdoors shall be based on the total floor area being ventilated.

Adjacent spaces with large connecting openings may share sources of light and ventilation. This section deals with the natural ventilation of connecting interior spaces, and it is the designer's obligation to place openings between rooms with exterior openings and connecting spaces without exterior openings in such a manner as to accomplish natural ventilation of the connected space. For purposes of ventilation, this section establishes a minimum openness requirement for the common wall between a room with openings to the exterior and an interior room without openings to the exterior. The minimum amount of openness required in that common wall is 8 percent of the floor area of the interior room or 25 square feet (2.33 m²), whichever is greater. The openable area of the exterior openings in the "outer" room is required to be equal to or greater than 4 percent (in accordance with Section 1203.4.1) of the total combined floor areas served.

Figure 1203.4.1.1 shows a cut-away of an interior room (Room A) adjacent to a room with openings to the exterior (room B). The openable area of exterior openings in space B is required to be equal to or greater than 0.04 times the area of the entire space (floor area of space A plus floor area of interior space B). The opening in the wall between adjacent spaces must be a minimum of 25 square feet (2.33 m²) but not less than .08 times the floor area of interior space A. Since the opening between the adjacent spaces must be unobstructed in accordance with this section, a door cannot be installed in the opening.

The exception deals with a very common circumstance, especially in residential construction. As long as the sunroom addition is large enough and is thermally isolated, the building owner need not move ventilation openings when installing an addition that falls within the definition of "Sunroom addition."

1203.4.1.2 Openings below grade. Where openings below grade provide required natural ventilation, the outside horizontal clear space measured perpendicular to the opening shall be one and one-half times the depth of the opening. The depth of the opening shall be measured from the average adjoining ground level to the bottom of the opening.

This section is applicable whenever occupied spaces below grade are dependent upon natural ventilation through structures like window wells. In order to provide adequate ventilation, this section sets the minimum horizontal clear space adjacent to the opening used for natural ventilation. Without this minimum horizontal area, there will be inadequate air movement through the opening.

As illustrated in Figure 1203.4.1.2, the opening area required for the story below grade intended for human occupancy per Section 1203.4.1 is:

$$A = 0.04 (L \times W)$$

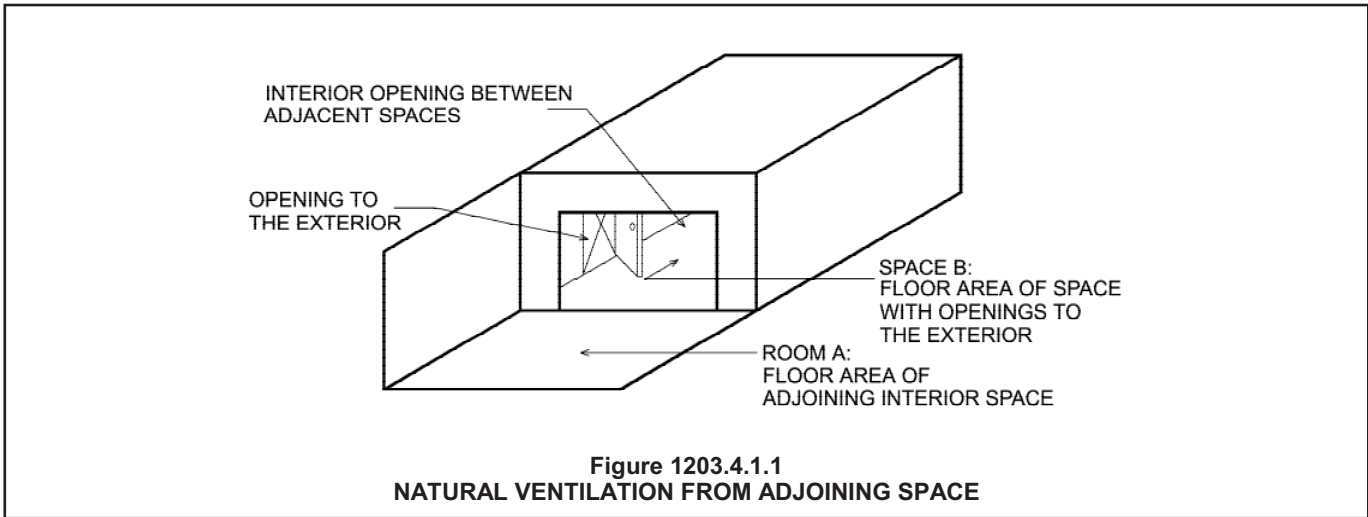


Figure 1203.4.1.1
NATURAL VENTILATION FROM ADJOINING SPACE

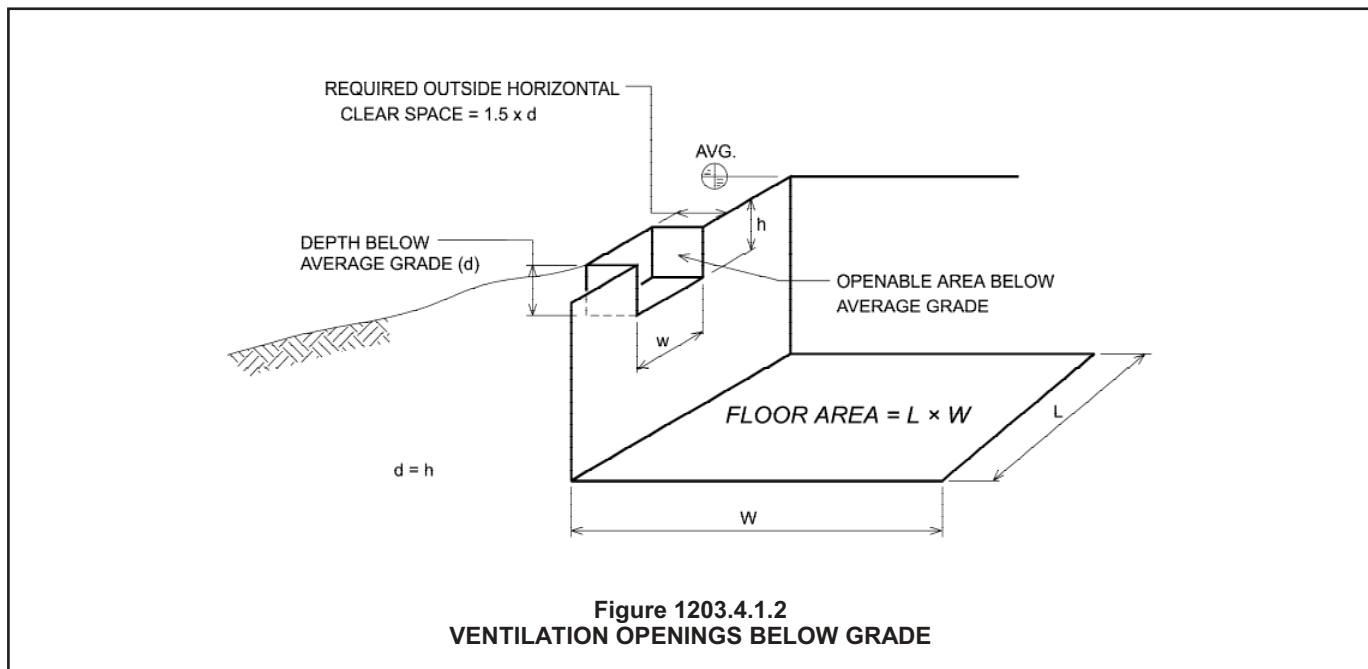


Figure 1203.4.1.2
VENTILATION OPENINGS BELOW GRADE

The area of the window in the vertical plane ($w \times h$) must equal or exceed the required opening area. Additionally, the horizontal dimension from the window to the well wall must equal one and a half times the depth of the openable portion of the window at the lowest point. If the story below grade is not intended for human occupancy, ventilation is required to be provided in accordance with Section 1203.3 for under-floor spaces.

1203.4.2 Contaminants exhausted. Contaminant sources in naturally ventilated spaces shall be removed in accordance with the *Florida Building Code, Mechanical* and the *Florida Fire Prevention Code*.

Contaminants in the air are to be collected and exhausted by special means. Chapters 4 and 5 of the *Florida Building Code, Mechanical* and the *Florida Fire Prevention Code* specify areas or conditions that

must be separately addressed. For example, there are many operations listed in Chapter 5 of the *Florida Building Code, Mechanical* that produce contaminants that cannot be properly or safely treated by natural means. Natural ventilation only anticipates normal occupancy by people and not the extra heat loads, dust, vapors and other contaminants generated by some activities.

1203.4.2.1 Bathrooms. Rooms containing bathtubs, showers, spas and similar bathing fixtures shall be mechanically ventilated in accordance with the *Florida Building Code, Mechanical*.

Chapter 4 of the *Florida Building Code, Mechanical* contains provisions for bathroom ventilation, requiring mechanical exhaust without recirculation of air at specific rates that depend on the occupancy group.

1203.4.3 Openings on yards or courts. Where natural ventilation is to be provided by openings onto yards or courts, such yards or courts shall comply with Section 1206.

In order that adequate air movement will be provided through openings to naturally ventilated rooms, the openings must directly connect to yards or courts with the minimum dimensions specified in Section 1206.

1203.5 Other ventilation and exhaust systems. Ventilation and exhaust systems for occupancies and operations involving flammable or combustible hazards or other contaminant sources as covered in the *Florida Building Code, Mechanical* or the *Florida Fire Prevention Code* shall be provided as required by both codes.

Chapter 5 of the *Florida Building Code, Mechanical* contains specific provisions for hazardous exhaust systems in occupancies such as vehicle repair garages, aircraft fueling stations, dry cleaning plants, spray painting operations and hazardous production materials (HPM) facilities. Many of these provisions are contained in the *Florida Fire Prevention Code*, which also contains provisions for the handling and storage of hazardous materials.

SECTION 1204 TEMPERATURE CONTROL

1204.1 Equipment and systems. Interior spaces intended for human occupancy shall be provided with active or passive space-heating systems capable of maintaining a minimum indoor temperature of 68°F (20°C) at a point 3 feet (914 mm) above the floor on the design heating day.

Exception: Interior spaces where the primary purpose is not associated with human comfort.

Heating facilities are required for comfort in all new construction. The systems may be either active (such as a forced-air furnace) or passive (such as solar systems), as long as the specified performance is achieved.

Outdoor design temperatures are taken from the ASHRAE Handbook of Fundamentals and are listed in Appendix D of the *Florida Building Code, Plumbing*. Outdoor design temperatures provide a baseline from which heat load calculations are made. Heating system capacity is dependent upon the predicted outdoor temperatures during the heating season. As the outdoor temperature falls, the heat input to a building must increase to offset the increasing heat losses through the building envelope. Heating systems are designed to have the capacity to maintain the desired indoor temperature when the outdoor temperature is at or above the outdoor design temperature. When the outdoor temperatures are below the outdoor design temperature, the heating system will not be able to maintain a desired indoor temperature. It would be impractical, for example, to design a heating system based on the assumption that someday it might be -20°F (-29°C) outdoors if the outdoor temperature in that region rarely, if ever, dropped that low. In such a

case, the heating system would be oversized and, thereby, less efficient and economical.

The winter outdoor design temperature is defined as follows: For 97.5-percent of the total hours in the northern hemisphere heating season, from December through February, the predicted outdoor temperatures will be at or above the values given in Appendix D of the *Florida Building Code, Plumbing*. It would be unreasonable to expect any heating system to maintain a desired indoor temperature when the outdoor temperature is below the design temperature. When the 97.5-percent column in Appendix D of the *Florida Building Code, Plumbing* is used, it can be assumed that the actual outdoor temperature will be at or below the design temperature for roughly 54 hours of the total of 2,160 hours in the months of December through February (2,160 hours by 2.5% = 54).

SECTION 1205 LIGHTING

1205.1 General. Every space intended for human occupancy shall be provided with natural light by means of exterior glazed openings in accordance with Section 1205.2 or shall be provided with artificial light in accordance with Section 1205.3. Exterior glazed openings shall open directly onto a public way or onto a yard or court in accordance with Section 1206.

This section establishes that every space intended for human occupancy is required to have natural or artificial light. This section would also apply to “media” rooms that typically have large-screen televisions and stereo equipment. These types of rooms are intended for human occupancy and therefore have to have natural or artificial light.

1205.2 Natural light. The minimum net glazed area shall not be less than 8 percent of the floor area of the room served.

This section establishes the minimum glazed area required based on the floor area served by the window. This is required only for spaces that are not provided with artificial light in accordance with Section 1205.3. It is the intent of the code to establish this percentage as the minimum glazed area opening onto a public way or onto yards or courts, in accordance with Section 1206.

Early codes set this standard at 10 percent of the floor area served. This ratio was derived from certain architectural styles that yielded adequate light and ventilation; however, this is a more than adequate amount and has been reduced to the current levels because of energy conservation issues. Openings in excess of that minimum area are permitted to open onto areas other than a complying court or yard. In Figure 1203.4.1, the room dimensions are 15 feet times 20 feet (4572 mm times 6096 mm), or 300 square feet (27.9 m²) of area. If windows B and C are double hung, with a combined glazed area of 24 square feet (2.23 m²), they provide the minimum area required of 8 percent of the floor area (300 square feet x .08 = 24 square feet). In this example, glazing unit A

is not required for natural light. Therefore, it need not face onto a required yard or court.

The minimum 8 percent glazed area applies strictly to the glazed area. The perimeter frame, horizontal and vertical mullions could not be used for this calculation.

1205.2.1 Adjoining spaces. For the purpose of natural lighting, any room is permitted to be considered as a portion of an adjoining room where one-half of the area of the common wall is open and unobstructed and provides an opening of not less than one-tenth of the floor area of the interior room or 25 square feet (2.32 m²), whichever is greater.

Exception: Openings required for natural light shall be permitted to open into a thermally isolated sunroom addition or patio cover where the common wall provides a glazed area of not less than one-tenth of the floor area of the interior room or 20 square feet (1.86 m²), whichever is greater.

In a case where a space (or room) has no glazed area open to the required courts or yards but is adjacent to one that does, it may “borrow” natural lighting from the adjacent space if (1) the wall between the adjoining spaces is at least one-half open and unobstructed; and (2) the opening equals at least 10 percent of the floor area of the interior space or 25 square feet (2.33 m²), whichever is greater. The required glazed area facing the required court or yard must not be less than 8 percent of the total floor area of all rooms served. For example, in Figure 1205.2.1, the glazed area in space B is required to be equal to or greater than 0.08 (floor area of space A + floor area of space B).

In the figure, the opening between the adjacent spaces must meet all three criteria: the wall must be at least half open and unobstructed it must be a minimum of 25 square feet (2.33 m²) and it must be not less than one tenth of the floor area of space A.

The exception deals with a very common circumstance, especially in residential construction. As long as the patio cover or sunroom addition is large enough and is thermally isolated, the building owner need not move openings for lighting when installing a sunroom addition.

1205.2.2 Exterior openings. Exterior openings required by Section 1205.2 for natural light shall open directly onto a public way, yard or court, as set forth in Section 1206.

Exceptions:

1. Required exterior openings are permitted to open into a roofed porch where the porch:
 - 1.1. Abuts a public way, yard or court.
 - 1.2. Has a ceiling height of not less than 7 feet (2134 mm).
 - 1.3. Has a longer side at least 65 percent open and unobstructed.
2. Skylights are not required to open directly onto a public way, yard or court.

In order that enough light will be provided through openings to naturally lit rooms, the openings must

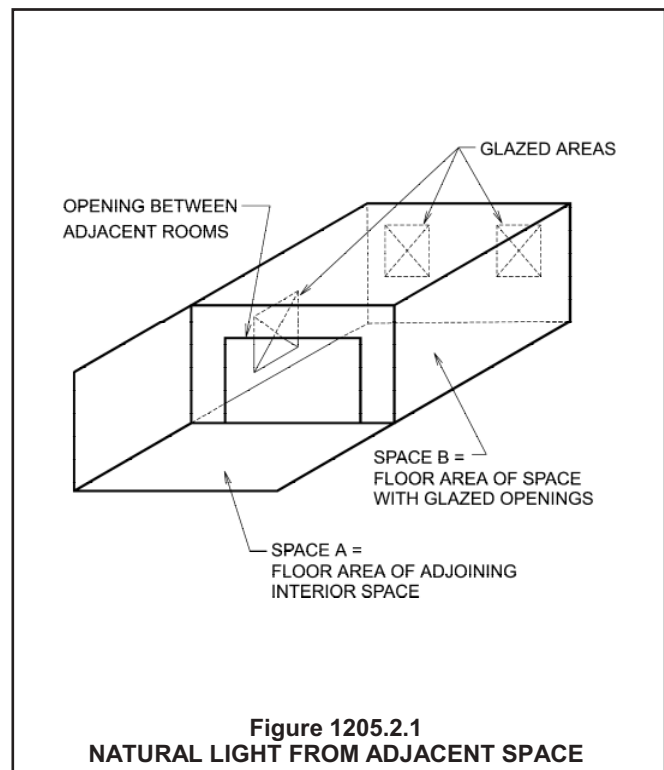
open onto yards or courts with the minimum dimensions specified in Section 1206. Skylights admit light directly from above and, therefore, are not required to face a court or yard in accordance with Exception 2. Exception 1 gives the criteria by which a roofed porch may be located directly outside required openings without significantly obstructing the entrance of light to the space.

1205.3 Artificial light. Artificial light shall be provided that is adequate to provide an average illumination of 10 foot-candles (107 lux) over the area of the room at a height of 30 inches (762 mm) above the floor level.

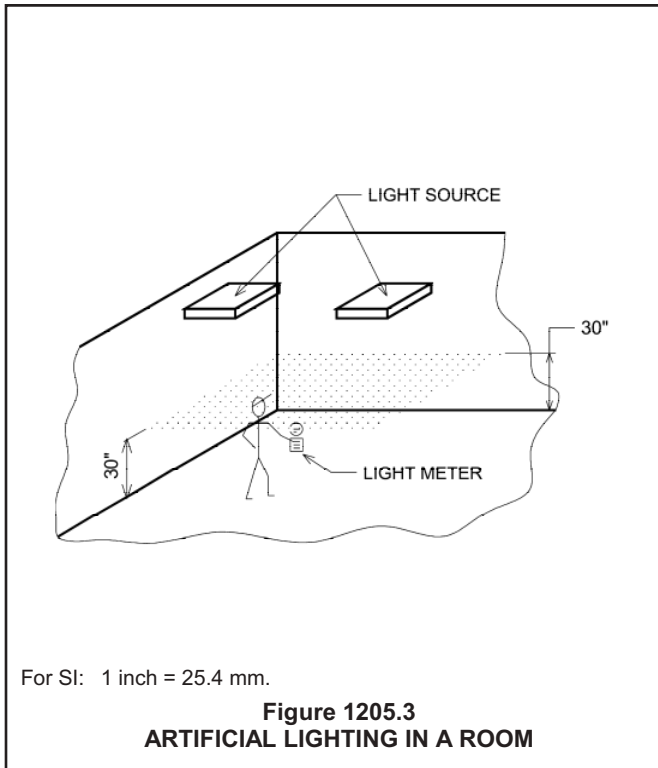
The section establishes the minimum required illumination for rooms without the minimum required natural light (see Figure 1205.3).

1205.4 Stairway illumination. Stairways within dwelling units and exterior stairways serving a dwelling unit shall have an illumination level on tread runs of not less than 1 foot-candle (11 lux). Stairs in other occupancies shall be governed by Chapter 10.

Stairway illumination is essential to the safe use of stairs during normal use as well as during egress in an emergency. The lighting must be operable by switches in the vicinity of the stair, located as required by the *National Electrical Code*. Emergency egress lighting, also referred to as “means of egress illumination,” is required in occupancies other than dwelling units at a lower rate of illumination (see commentary, Sections 1006 and 1205.5).



**Figure 1205.2.1
NATURAL LIGHT FROM ADJACENT SPACE**



1205.4.1 Controls. The control for activation of the required stairway lighting shall be in accordance with Chapter 27 of the *Florida Building Code, Building*.

The *National Electrical Code* provides for controls at the top and bottom of stairways within dwelling units, allowing an occupant to illuminate the stairways before traversing any stairs, regardless of the direction of travel. Illuminated switches, where required, allow an occupant to quickly find the switches when the stairs are dark.

Illumination controls for exterior stairs that are operable from the inside of a dwelling unit allow an occupant to safely egress by activating exterior stair illumination prior to leaving the building. Exterior stairs must be provided with the minimum illumination level specified in Section 1205.4.

1205.5 Emergency egress lighting. The means of egress shall be illuminated in accordance with Section 1006.1.

Means of egress illumination is required in all buildings to allow occupants enough light to negotiate the exit access (such as corridors) and exits (such as enclosed stairs) at all times the building is occupied (see commentary, Section 1006.1).

**SECTION 1206
YARDS OR COURTS**

1206.1 General. This section shall apply to yards and courts adjacent to exterior openings that provide natural light or ventilation. Such yards and courts shall be on the same property as the building.

These provisions are intended to regulate those exterior areas of a building or structure that are supposed to supply required natural light or ventilation to interior spaces. These requirements are intended to increase the likelihood that the exterior walls are provided with enough adjacent open space to allow the required light and ventilating air to freely enter the exterior wall openings. These exterior areas are defined as courts and yards. Courts and yards must be open, uncovered and on the same lot as the building. Courts may be either partly or wholly surrounded by the building (see commentary in Section 202 on definitions of "Yard" and "Court". Requirements are provided in Section 1206, which regulates the minimum width, area, air intake and drainage of courts and yards. The requirements of Sections 1206.2 through 1206.3.3 do not apply if artificial ventilation and lighting is provided for the spaces opening onto the court or yard in accordance with Section 1203.1 or 1205.1.

1206.2 Yards. Yards shall not be less than 3 feet (914 mm) in width for one- and two-story buildings. For buildings more than two stories in height, the minimum width of the yard shall be increased at the rate of 1 foot (305 mm) for each additional story. For buildings exceeding 14 stories in height, the required width of the yard shall be computed on the basis of 14 stories.

A yard is distinguished from a court by the definitions in Chapter 2 (see commentary, Chapter 2). A court is bounded on at least three sides, whereas a yard is open at both ends.

The required width of a yard is measured perpendicular from the face of the wall to the opposing wall on the other side of the yard. A five-story building would be required to have a yard at least 6 feet (1829 mm) in width [3 feet (914 mm) plus 1 foot (305 mm) each for stories three through five]. A 20-story building is required to have a yard at least 15 feet (4572 mm) [3 feet (914 mm) plus 1 foot (305 mm) each for stories three through 14]. The last sentence of the section simply requires a minimum yard width of 15 feet (4572 mm) for all buildings over 14 stories in height. If the building is adjacent to a court rather than a yard, the requirements of Section 1206.3 apply. Neither Section 1206.2 nor 1206.3 is applicable if artificial lighting and ventilation is provided for spaces facing the yard or court in accordance with Sections 1203.1 and 1205.1.

1206.3 Courts. Courts shall not be less than 3 feet (914 mm) in width. Courts having windows opening on opposite sides shall not be less than 6 feet (1829 mm) in width. Courts shall not be less than 10 feet (3048 mm) in length unless bounded on one end by a public way or yard. For buildings more than two stories in height, the court shall be increased 1 foot (305 mm) in width and 2 feet (310 mm) in length for each additional story. For buildings exceeding 14 stories in height, the required dimensions shall be computed on the basis of 14 stories.

Courts are defined in Chapter 2 as being bounded on no less than three sides by walls or other enclosing construction. A court adjacent to a five-story building would be required to have a width measured perpendicular from the wall facing the court of at least 6 feet

(1829 mm) when required openings are on one wall and 9 feet (2743 mm) when required openings are on opposing walls [3 feet (914 mm) plus 1 foot (305 mm) each for stories three through five, or 6 feet (1829 mm) plus 1 foot (305 mm) each for stories three through five]. If the same court is bounded on all sides, the required minimum length would be 16 feet (4877 mm) [10 feet (3048 mm) plus 2 feet (610 mm) each for stories three through five]. The last sentence simply requires all buildings higher than 14 stories to have a minimum court width of 15 feet (4572 mm) without opposing required openings, a minimum width of 18 feet (5486 mm) where required openings oppose each other and a minimum length of 34 feet (10,363 mm) if bounded on all sides [width equals 3 feet (914 mm) or 6 feet (1829 mm) plus 1 foot (305 mm) each for stories three through 14, and length equals 10 feet (3048 mm) plus 2 feet (610 mm) each for stories three through 14]. The requirements of this section are not applicable if artificial lighting and ventilation are provided for spaces facing the court in accordance with Sections 1203.1 and 1205.1.

1206.3.1 Court access. Access shall be provided to the bottom of courts for cleaning purposes.

Courts must be conveniently accessed for maintenance. Clearly, a court intended to be a source of ventilation air must be maintained in a manner conducive to its purpose.

1206.3.2 Air intake. Courts more than two stories in height shall be provided with a horizontal air intake at the bottom not less than 10 square feet (0.93 m²) in area and leading to the exterior of the building unless abutting a yard or public way.

This section is applicable only to courts that are bounded on all four sides by walls or other construction. A fully bounded court takes on characteristics similar to a chimney during summer weather when the building mass is heated from the daytime sun. In order for a fully bounded court to function as an efficient source of natural ventilation, the bottom of the court must have a source of fresh air (similar to a chimney). This source of fresh air is supplied through the required opening of 10 square feet (0.93 m²) connected directly to a street or yard. The requirements of this section are not applicable if artificial lighting and ventilation are provided for spaces facing the court in accordance with Sections 1203.1 and 1206.1.

1206.3.3 Court drainage. The bottom of every court shall be properly graded and drained to a public sewer or other approved disposal system complying with the *Florida Building Code, Plumbing*.

A court is an inherent water trap. A court that is not both graded and drained will accumulate water and remain in a saturated condition, which will promote an unsanitary condition, including odors. Based on the design and nature of the soil after construction, paving the court may be the best solution to eliminate a problem.

SECTION 1207 SOUND TRANSMISSION

1207.1 Scope. This section shall apply to common interior walls, partitions and floor/ceiling assemblies between adjacent dwelling units or between dwelling units and adjacent public areas such as halls, corridors, stairs or service areas.

Since noise transmission can be quantified and affects the quality of life, the code incorporates regulations that address noise transmission in multiple-family residential construction, wherein the occupants may have no control over noise. The regulated components of construction are those through which noise is primarily transmitted.

1207.2 Air-borne sound. Walls, partitions and floor/ceiling assemblies separating dwelling units from each other or from public or service areas shall have a sound transmission class (STC) of not less than 50 (45 if field tested) for air-borne noise when tested in accordance with ASTM E 90. Penetrations or openings in construction assemblies for piping; electrical devices; recessed cabinets; bathtubs; soffits; or heating, ventilating or exhaust ducts shall be sealed, lined, insulated or otherwise treated to maintain the required ratings. This requirement shall not apply to dwelling unit entrance doors; however, such doors shall be tight fitting to the frame and sill.

The code requires common walls between dwelling units and between dwelling units and public areas to have a minimum sound transmission class (STC) of 50. The STC is a measure of an assembly's ability to resist sound transmission. The higher the number (rating), the higher the resistance (less sound transmission). Standard architectural wall construction assemblies have been tested for sound transmission ratings, and reference to the construction specifications will yield such information. Air-borne noise originates in the air, such as voice or music. For structure-borne sound, see the commentary to Section 1207.3.

As a rule, vertical assemblies meeting the requirements of this section consist of double walls or walls containing insulation similar to exterior walls.

1207.3 Structure-borne sound. Floor/ceiling assemblies between dwelling units or between a dwelling unit and a public or service area within the structure shall have an impact insulation class (IIC) rating of not less than 50 (45 if field tested) when tested in accordance with ASTM E 492.

The impact insulation class (IIC) is a measure of an assembly's ability to resist sound transmission. The higher the number (rating), the higher the resistance (less sound transmission). Floors between dwelling units and those between dwelling units and public areas are required to have a minimum IIC rating of 50.

Usually, floor assemblies that are carpeted meet the minimum requirement for an IIC rating of 50. Other areas with hard-surfaced finishes may require additional treatment or insulation to comply with these requirements.

There are various resource documents containing STC ratings and IIC ratings, including the following:

GA 600, *Fire Resistance Design Manual*, by the Gypsum Association; NCMA TEK 69A, *New Data on Sound Reduction with Concrete Masonry Walls*, by the National Concrete Masonry Association and BIA TN 5A, *Sound Insulation—Clay Masonry Walls*, by the Brick Institute of America. These or any other similar sources can be submitted as a basis for approval once it is demonstrated to the building official that the data are based on ASTM E 90 and E 492.

SECTION 1208 INTERIOR SPACE DIMENSIONS

1208.1 Minimum room widths. Habitable spaces, other than a kitchen, shall not be less than 7 feet (2134 mm) in any plan dimension. Kitchens shall have a clear passageway of not less than 3 feet (914 mm) between counter fronts and appliances or counter fronts and walls.

This section pertains to the minimum horizontal dimensions required for all habitable spaces. Any room that functions as a living room, bedroom, dining room or any other similar habitable space (see commentary Section 202 on definition of "Habitable Space) must be sized such that, essentially, a cylinder with a diameter of 7 feet (2134 mm) may be placed in it. Only kitchens are exempt from this requirement. This code provision allows the circulation of ventilation air through the space while maintaining reasonably sized living quarters for the occupants.

1208.2 Minimum ceiling heights. Occupiable spaces, habitable spaces and corridors shall have a ceiling height of not less than 7 feet 6 inches (2286 mm). Bathrooms, toilet rooms, kitchens, storage rooms and laundry rooms shall be permitted to have a ceiling height of not less than 7 feet (2134 mm).

Exceptions:

1. In one- and two-family dwellings, beams or girders spaced not less than 4 feet (1219 mm) on center and projecting not more than 6 inches (152 mm) below the required ceiling height.
2. If any room in a building has a sloped ceiling, the prescribed ceiling height for the room is required in one-half the area thereof. Any portion of the room measuring less than 5 feet (1524 mm) from the finished floor to the ceiling shall not be included in any computation of the minimum area thereof. For accessibility provisions related to vertical clearance of areas adjoining an accessible route, refer to Section 11-4.4.2.
3. Mezzanines constructed in accordance with Section 505.1.

Occupiable spaces or rooms (including habitable spaces) are required to have a specific minimum ceiling height. Bathrooms, toilet rooms, kitchens, storage rooms and laundry rooms are permitted to have a lower minimum ceiling height in accordance with this section. Ceiling height is one of the variables that affects the circulation of air in a space. Additionally,

there is a psychological need for spaciousness in a living space or in one of the accessory spaces.

Figure 1208.2(1) illustrates the application of Exception 1 for beams and girders spaced no more than 4 feet (1219 mm) on center in one- and two-family dwellings.

Figure 1208.2(2) illustrates the application of Exception 2. Rooms with sloped ceilings are required to meet two distinct conditions. First, the area of the room having a floor-to-ceiling clearance of less than 5 feet (1524 mm) does not contribute to the minimum floor area required by Section 1208.3. Second, at least one-half of the actual total area of the room must meet the minimum ceiling height requirements of Section 1208.2 [see Figure 1208.2(2)]. Accessibility requirements may supercede the requirements of this section. See section 11-4.4.2.

Exception 3 is consistent with Section 505.1, which establishes the minimum ceiling height for mezzanines at 7 feet (2134 mm). In accordance with Section 505.2, mezzanines cannot exceed one-third of the area of the room in which they are located.

1208.2.1 Furred ceiling. Any room with a furred ceiling shall be required to have the minimum ceiling height in two-thirds of the area thereof, but in no case shall the height of the furred ceiling be less than 7 feet (2134 mm).

Furring, the process of applying wood (or other material) strips to a wall, ceiling, or floor for leveling, or to provide air space to avoid dampness, is frequently used in remodeling and repairing existing buildings, or to provide a desired architectural feature. A furred ceiling is not a sloped ceiling and would not be subject to the requirements in Section 1208.2. An example of the required ceiling height for a room with a furred ceiling is shown in Figure 1208.2.1.

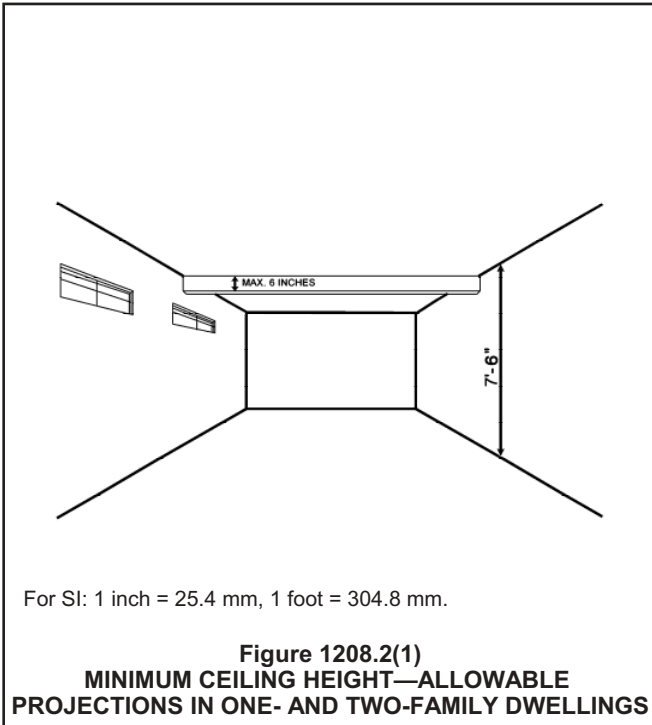
In Figure 1208.2.1, floor area A1 must be greater than or equal to two-thirds (length times width). Note that only those ceiling heights furred to a height of less than 7 feet, 6 inches (2286 mm) affect area A1.

1208.3 Room area. Every dwelling unit shall have at least one room that shall have not less than 120 square feet (13.9 m²) of net floor area. Other habitable rooms shall have a net floor area of not less than 70 square feet (6.5 m²).

Exception: Every kitchen in a one- and two-family dwelling shall have not less than 50 square feet (4.64 m²) of gross floor area.

This section applies only to dwelling units. A minimum area of 120 square feet (13.9 m²) for at least one room of each dwelling unit and a minimum of 70 square feet (6.5 m²) for all other habitable rooms. These minimums reflect the physiological requirements of light and ventilation and also preserve the individual's perception of space and the elements necessary for a psychological sense of well-being. The code does not regulate the minimum area of rooms and spaces in other than residential occupancies.

The exception permits kitchens in one- and two-fam-



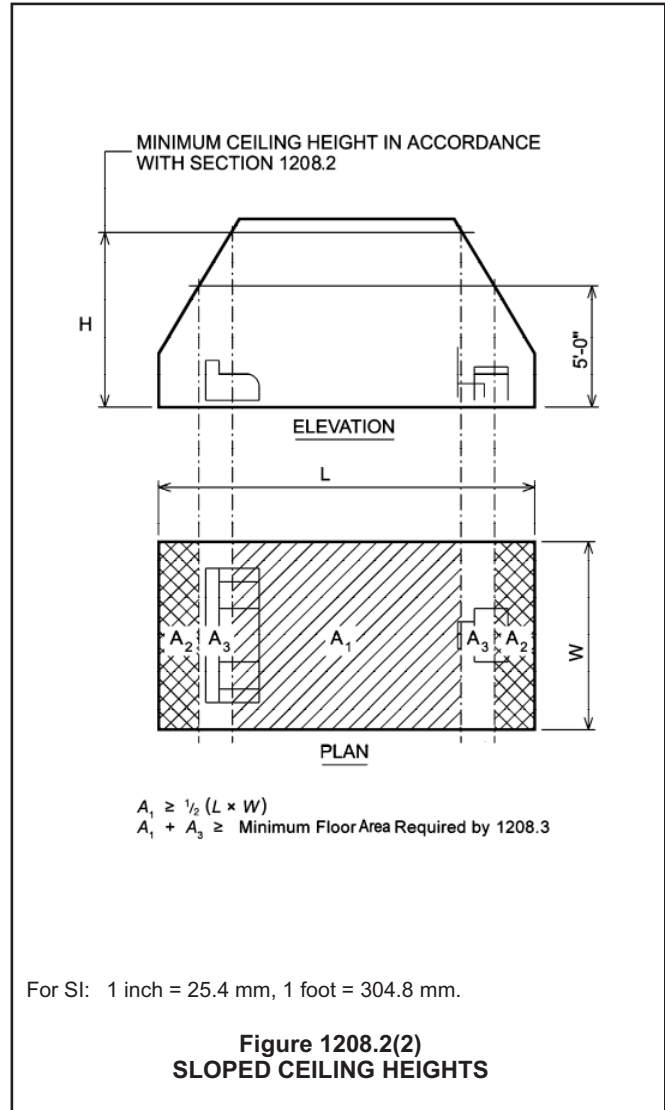
ily dwelling units to have not less than 50 square feet (4.65 m²) minimum of gross floor area.

1208.4 Efficiency dwelling units. An efficiency living unit shall conform to the requirements of the code except as modified herein:

1. The unit shall have a living room of not less than 220 square feet (20.4 m²) of floor area. An additional 100 square feet (9.3 m²) of floor area shall be provided for each occupant of such unit in excess of two.
2. The unit shall be provided with a separate closet.
3. The unit shall be provided with a kitchen sink, cooking appliance and refrigeration facilities, each having a clear working space of not less than 30 inches (762 mm) in front. Light and ventilation conforming to this code shall be provided.
4. The unit shall be provided with a separate bathroom containing a water closet, lavatory and bathtub or shower.

Efficiency units are very small apartments consisting of one or two rooms and a bathroom. Efficiency units that comply with this section are not required to comply with the minimum area requirements in Section 1208.3; however, the total allowable number of occupants in the dwelling is limited, depending on the area of the unit in accordance with Item 1. The purpose of both efficiency units and this section is to provide for combined use of spaces in an economical or “efficient” manner without jeopardizing health or comfort. This is possible because of the occupant limitation.

In addition to the living room, an efficiency dwelling unit must have a separate closet and bathroom. There are no minimum area requirements for these spaces. However, the fixture clearances in the bathroom must



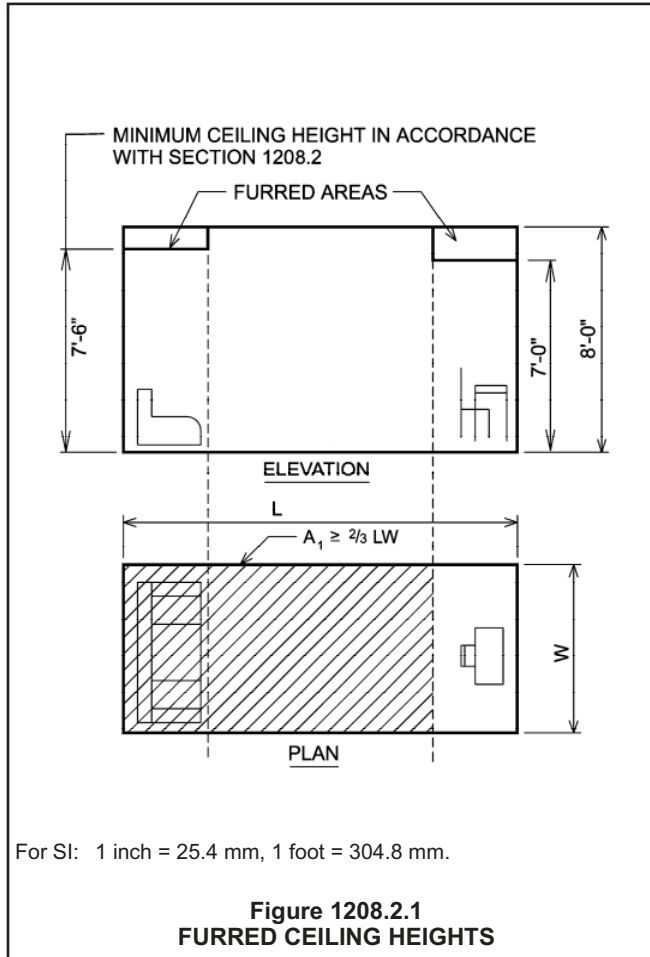
be as required in the *Florida Building Code, Plumbing*. There is not a requirement for a separate kitchen, but if the required sink and appliances are located in the living room, they cannot encroach on the required minimum floor space.

SECTION 1209 ACCESS TO UNOCCUPIED SPACES

1209.1 Crawl spaces. Crawl spaces shall be provided with a minimum of one access opening not less than 18 inches by 24 inches (457 mm by 610 mm).

The requirements of this section establish 18 inches by 24 inches (457 mm by 610 mm) as the minimum size opening for crawl spaces. If access is through a wall, the 18-inch (457 mm) minimum would be the height and the 24-inch (610 mm) minimum would be the width.

Items such as plumbing and wiring installations pass through crawl spaces at times. Required initial



and periodic inspections, and repairs cannot be carried out without access to such crawl spaces.

1209.2 Attic spaces. An opening not less than 20 inches by 30 inches (508 mm by 762 mm) shall be provided to any attic area having a clear height of over 30 inches (762 mm). A 30-inch (762 mm) minimum clear headroom in the attic space shall be provided at or above the access opening.

Access to the attic provides a convenient and nondestructive means for fire department personnel to visually check for an attic fire and, if need be, gain entry to the concealed spaces and suppress a fire. Access to attic spaces can be provided through the ceiling within each compartment that is created by draftstops or through openings within the draftstops themselves. Openings located within the draftstop are required to be self-closing and the opening protective must provide structural fire integrity (the ability to remain in place) similar to the draftstop. Access is required when the attic space has a clear height greater than 30 inches (762 mm) measured from the top of the ceiling joists (or top of the floor sheathing, if present) to the underside of the roof rafters.

1209.3 Mechanical appliances. Access to mechanical appliances installed in under-floor areas, in attic spaces and on roofs

or elevated structures shall be in accordance with the *Florida Building Code, Mechanical*.

Access to mechanical appliances is needed to maintain and service the equipment. See Section 306 in the *Florida Building Code, Mechanical* for detailed requirements.

SECTION 1210
SURROUNDING MATERIALS

1210.1 Floors. In other than dwelling units, toilet and bathing room floors shall have a smooth, hard, nonabsorbent surface that extends upward onto the walls at least 6 inches (152 mm).

The purpose of this requirement is to provide nonabsorbent surfaces that can be maintained in a sanitary condition. The 6-inch (152 mm) extension of the surface up the surrounding walls is so that the wall will not absorb moisture during cleaning and, thus, will be left in a clean and sanitary condition.

1210.2 Walls. Walls within 2 feet (610 mm) of urinals and water closets shall have a smooth, hard, nonabsorbent surface, to a height of 4 feet (1219 mm) above the floor, and except for structural elements, the materials used in such walls shall be of a type that is not adversely affected by moisture.

Exceptions:

1. Dwelling units and sleeping units.
2. Toilet rooms that are not accessible to the public and which have not more than one water closet.

Accessories such as grab bars, towel bars, paper dispensers and soap dishes, provided on or within walls, shall be installed and sealed to protect structural elements from moisture.

Accessories such as grab bars, towel bars, paper dispensers and soap dishes, provided on or within walls, shall be installed and sealed to protect structural elements from moisture.

The walls near urinals and water closets need to have the surface specified in this section since they are subject to moisture. Exception 1 recognizes that water closet facilities in dwelling units and sleeping units are not exposed to as much use as those that serve the public and, thus, are easier to maintain. Exception 2 acknowledges that toilet fixtures that do not serve the public are also subject to less use. The *Florida Building Code, Plumbing* defines “public” and “private” restrooms as identified below:

PUBLIC OR PUBLIC UTILIZATION. In the classification of plumbing fixtures, “public” applies to fixtures in general toilet rooms of schools, gymnasiums, hotels, airports, bus and railroad stations, public buildings, bars, public comfort stations, office buildings, stadiums, stores, restaurants, and other installations where a number of fixtures are installed so that their utilization is similarly unrestricted.

PRIVATE. In the classification of plumbing fixtures, “private” applies to fixtures in residences and apartments, and to fixtures in nonpublic toilet rooms of ho-

INTERIOR ENVIRONMENT

tels and motels and similar installations in buildings where the plumbing fixtures are intended for utilization by a family.

Based on these definitions, employee toilet rooms and toilet rooms in private office buildings would still be considered accessible to the public according to this section.

This section requires protection of the structural supports for accessories so that they will maintain their strength.

1210.3 Showers. Shower compartments and walls above bathtubs with installed shower heads shall be finished with a smooth, nonabsorbent surface to a height not less than 70 inches (1778 mm) above the drain inlet.

The 70-inch (1778 mm) requirement in this section is based on the height of the shower compartment and walls that are exposed to significant moisture that would cause the surface to become unsanitary over a long period of time.

1210.4 Waterproof joints. Built-in tubs with showers shall have waterproof joints between the tub and adjacent wall.

The joint between the tub and wall must be sealed to prevent moisture from getting into the supporting floor and framing. Waterproof joints are also needed to keep the concealed area of the wall in a sanitary condition.

1210.5 Toilet rooms. Toilet rooms shall not open directly into a room used for the preparation of food for service to the public.

The requirement that toilet rooms not open directly into rooms where food is prepared for the public is necessary to keep the food preparation area in a sanitary condition.

Bibliography

The following resource materials are referenced in this chapter or are relevant to the subject matter addressed in this chapter.

ASHRAE-2001, *ASHRAE Fundamentals Handbook*. Atlanta: American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., 2001.

BIA TN 5A-83, *Sound Insulation—Clay Masonry Walls*. Reston, VA: Brick Institute of America, 1983.

FEMA FIA-TB 1, *Openings in Foundation Walls for Buildings Located in Special Flood Hazard Areas*. Washington, DC: Federal Emergency Management Agency, 1997.

GA 600-00, *Fire Resistance Design Manual*. Evanston, IL: Gypsum Association, 1997.

NCMA TEK 69A-92, *New Data on Sound Reduction with Concrete Masonry Walls*. Herndon, VA: National Concrete Masonry Association, 1992.