

## Study Session

# 3

## 2018 IRC Sections R303 through R310 Building Planning II

**OBJECTIVE:** To develop an understanding of the health and safety criteria of the code, including light and ventilation; minimum room areas and ceiling height; sanitation; toilet, bath, and shower spaces; glazing, including safety glazing; carports and garages; and emergency escape and rescue openings.

**REFERENCE:** Sections R303 through R310, 2018 *International Residential Code*

**KEY POINTS:**

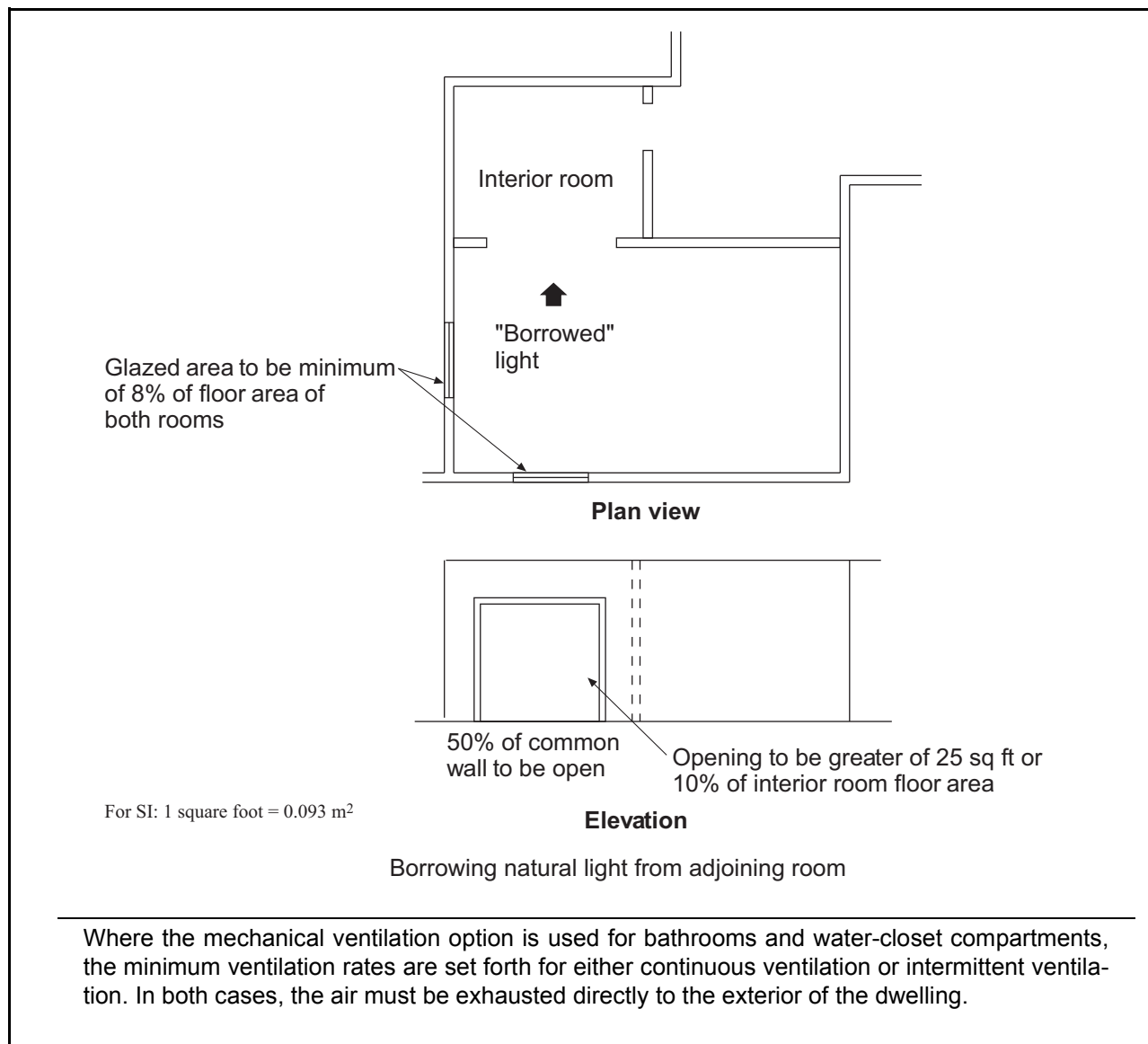
- Where natural light is used to satisfy the minimum illumination requirements, how is the minimum required amount of glazing determined? Where artificial light is used, what illumination level is mandated?
- Under what conditions is a whole-house mechanical ventilation system required?
- How must mechanical and gravity outside air intake openings be located in relationship to vents, chimneys, parking lots and other potential areas of a hazardous or noxious contaminant?
- Where must illumination be located in relationship to interior stairways? Exterior stairways?
- In what climatic areas must a heating system be provided? What performance level is mandated for the system?
- What is the minimum required size of the largest habitable room in a dwelling unit?
- What is the minimum dimension permitted for a habitable room other than a kitchen?
- What is the minimum ceiling height permitted for a living room or bedroom? A hallway? Bathroom? Basement? Where can a reduction in such heights be acceptable?
- How much clear floor space is required in front of a water closet? In front of a shower opening? What is the minimum distance needed between the centerline of a water closet and the nearest adjoining obstruction such as a wall or shower compartment?
- In what manner must safety glazing be identified? Multipane assemblies?

**KEY POINTS:**  
**(Cont'd)**

- What test standards are applicable to safety glazing materials? Which test standard is acceptable for glazing installed in any hazardous location?
- What specific locations in and adjacent to doors are subject to human impact and require safety glazing? In tub and shower areas? In guards and railings? At stairways and stairway landings?
- When is sloped glazing considered a skylight? What glazing materials are permitted in skylights? When must a screen be installed below a skylight?
- How does a carport differ from a garage? What limitations are placed on carports?
- Where are escape and rescue openings required? What is the minimum size of such openings? Maximum sill height? What limitations are placed on the operation of the opening?
- When a window well serves an escape and rescue opening, what is its minimum size?
- How may a bulkhead enclosure be utilized as an escape and rescue opening?
- Under what conditions may an emergency escape window be located under a deck or porch?

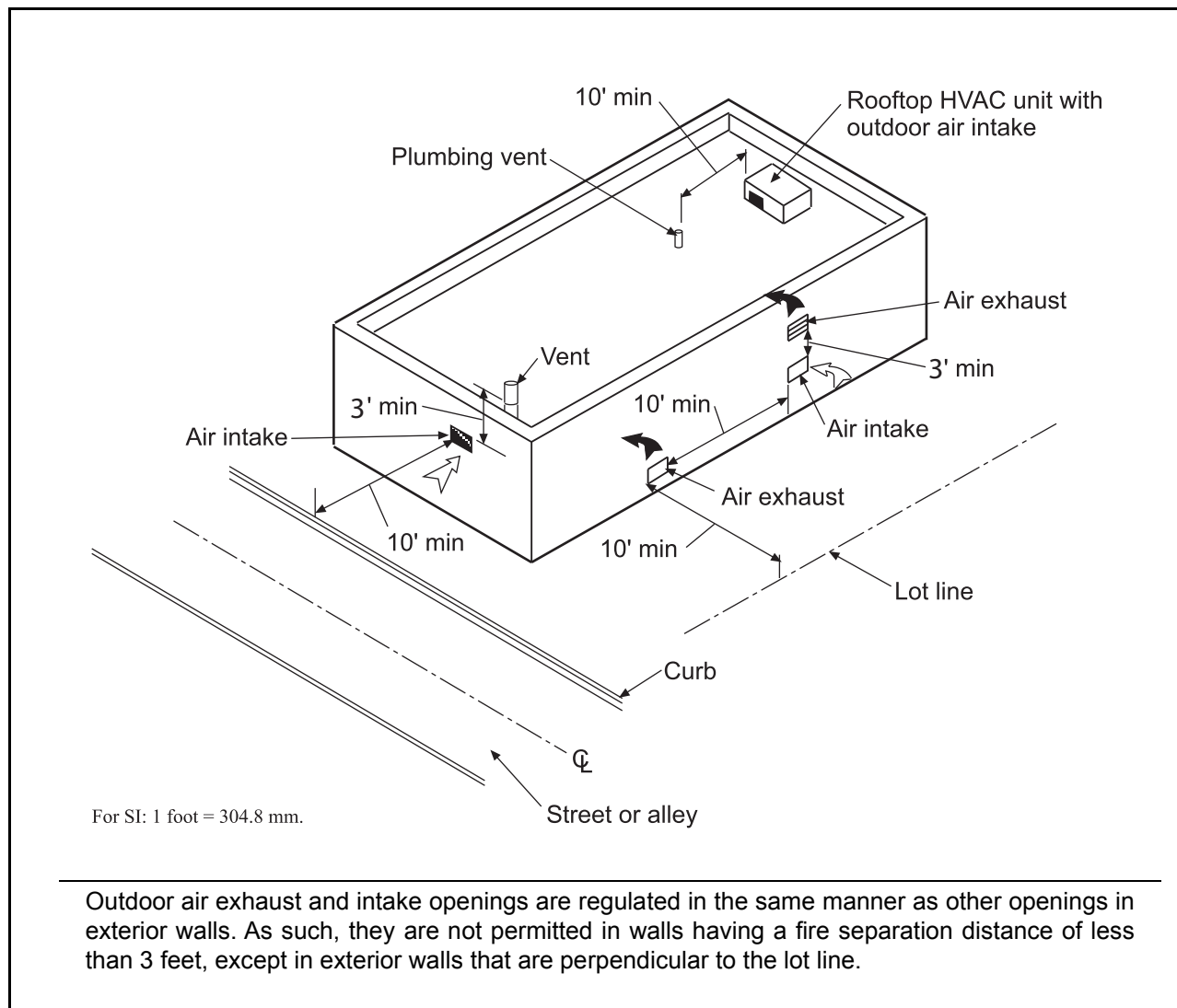
**Code Text:** *Habitable rooms shall have an aggregate glazing area of not less than 8 percent of the floor area of such rooms. Natural ventilation shall be through windows, skylights, doors, louvers or other approved openings to the outdoor air. The openable area to the outdoors shall be not less than 4 percent of the floor area being ventilated. Exceptions allow the use of artificial light and mechanical ventilation.*

**Discussion and Commentary:** A usable and sanitary interior environment depends on the inclusion of adequate light and ventilation for the habitable spaces within the dwelling unit. Traditionally, the use of natural light and, to some degree, natural ventilation has been mandated as the means for achieving such an environment. It has become increasingly more common to use artificial lighting and a mechanical ventilation system. These methods create additional design flexibility and functionality while maintaining a pleasant and sanitary living environment.



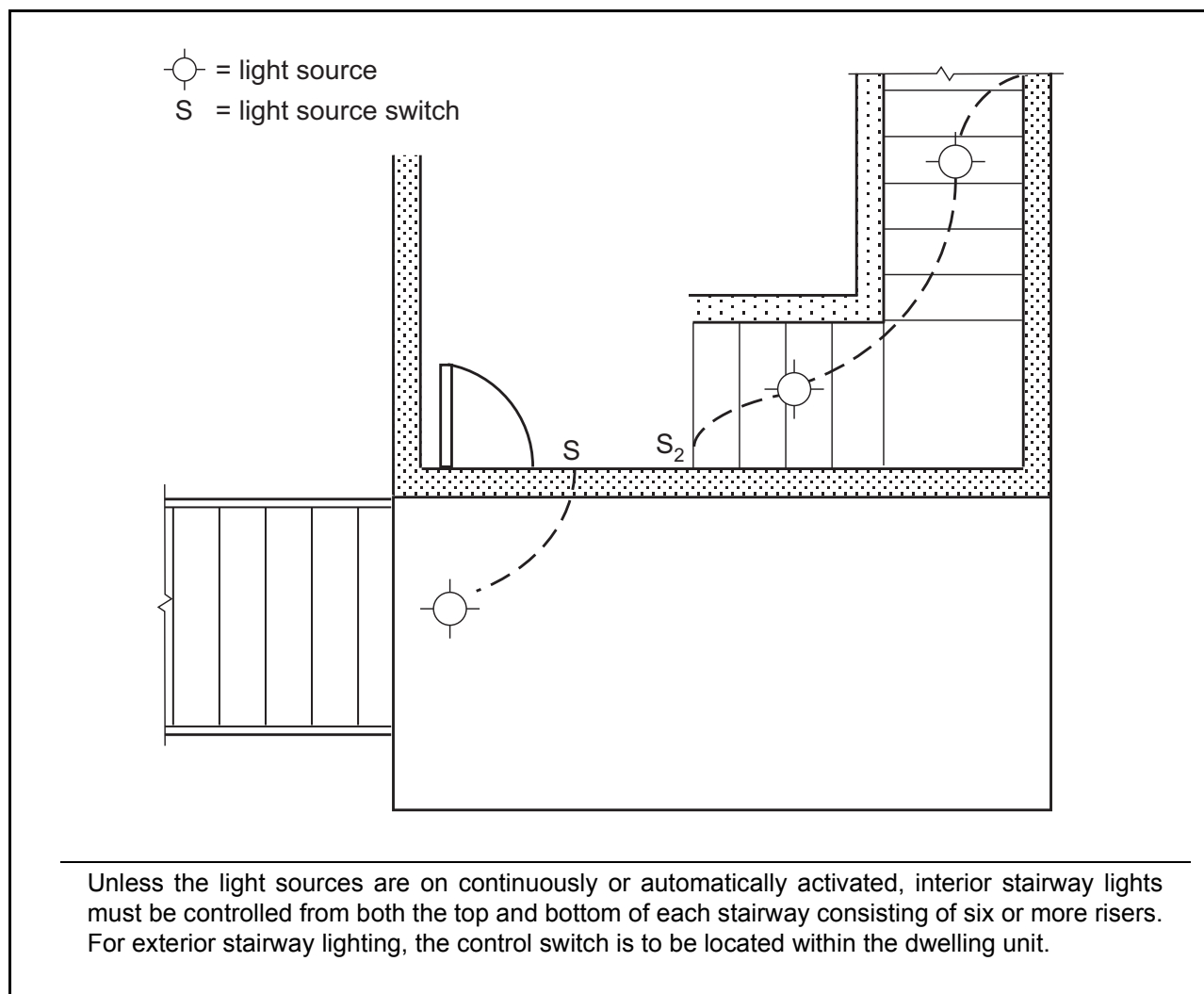
**Code Text:** *Mechanical and gravity outdoor air intake openings shall be located not less than 10 feet (3048 mm) from any hazardous or noxious contaminant, such as vents, chimneys, plumbing vents, streets, alleys, parking lots and loading docks. See the exceptions, including #1, which allows for a lesser separation provided the intake opening is located at least 3 feet below the contaminant source. Exhaust air shall not be directed onto walkways.*

**Discussion and Commentary:** In the context of this section, intake openings include windows, doors, combustion air intakes and similar openings that naturally or mechanically draw in air from the building exterior. The alternative to the 10-foot separation requirement, a 3-foot vertical separation distance, will allow noxious gases and contaminants to disperse into the atmosphere before they can be drawn into an air intake opening.



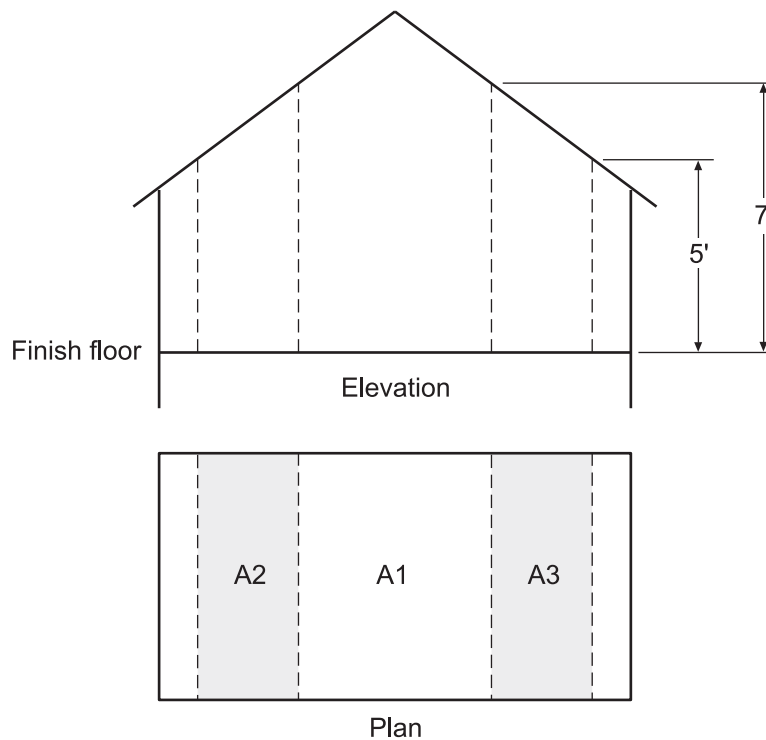
**Code Text:** *Interior stairways shall be provided with an artificial light source to illuminate the landings and treads. See the exception where remote, central or automatic control of lighting is provided. Where lighting outlets are installed in interior stairways, there shall be a wall switch at each floor level to control the lighting outlet where the stairway has six or more risers. See the exception for lights that are continuously illuminated or automatically controlled. Exterior stairways shall be provided with an artificial light source located at the top landing of the stairway.*

**Discussion and Commentary:** A stairway is one of the most hazardous areas of a dwelling unit. As such, the code highly regulates the design and construction of all stairways. In addition, adequate lighting must be provided to enable the stairway user to see the treads, their nosings and any obstructions that may be present. Stairway landings must also be adequately lighted.



**Code Text:** *Habitable rooms shall have a floor area of not less than 70 square feet (6.5 m<sup>2</sup>). Habitable rooms shall not be less than 7 feet (2134 mm) in any horizontal dimension. See the exceptions for kitchens regarding minimum size and horizontal dimensions.*

**Discussion and Commentary:** Acceptable sizes for habitable rooms have been established. Because habitable rooms are expected to be those spaces within a dwelling unit where most activities take place, they are the only areas regulated. Most habitable rooms need be only 7 feet by 10 feet to comply with the provisions; however, at least one larger room must be provided. It is seldom that any habitable room in today's typical dwelling unit would be designed with such a small floor area.



$$A1 + A2 + A3 \geq \text{required room floor area per Section R304}$$

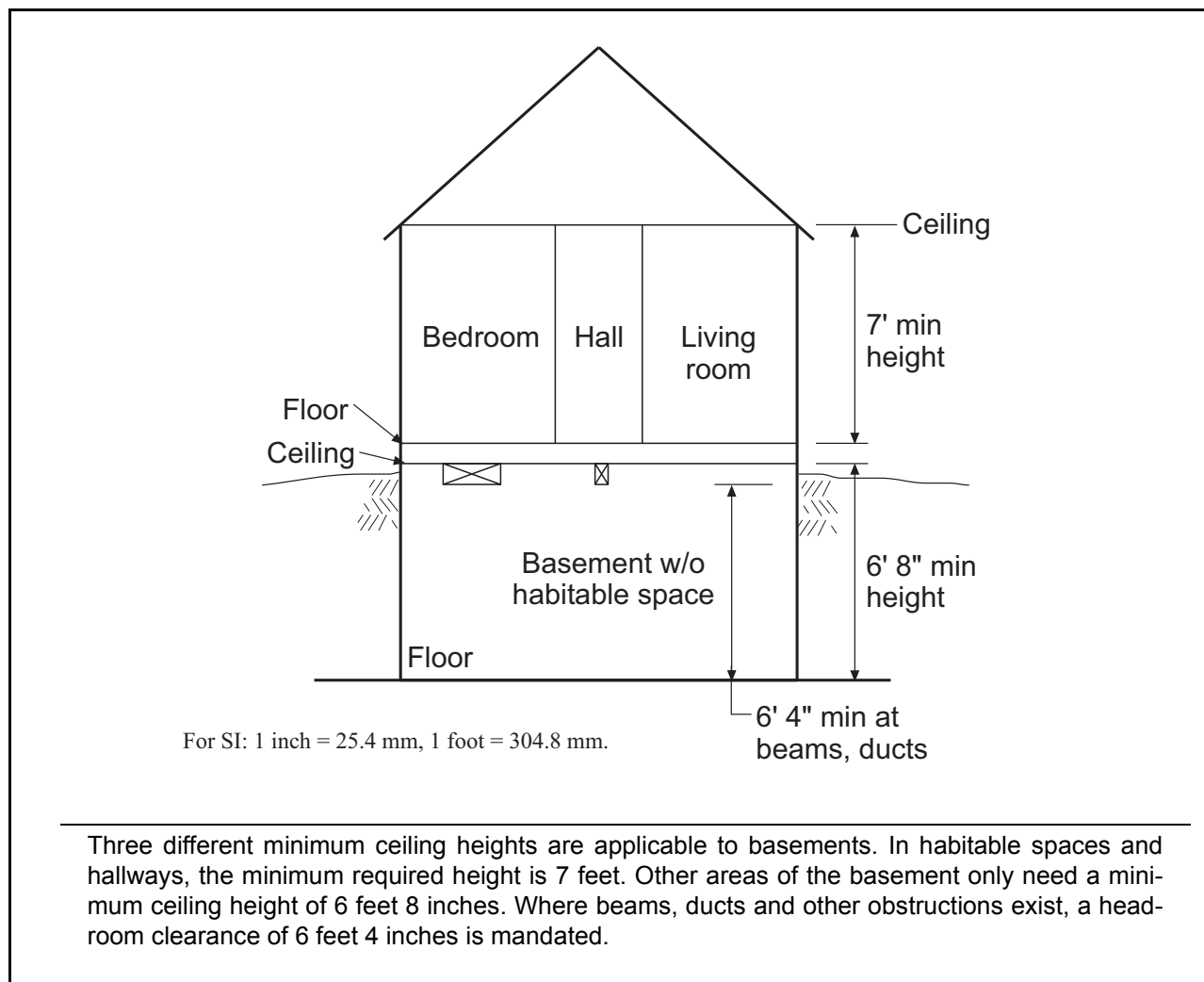
$$A1 \geq 50\% \text{ of required room floor area per Section R304}$$

For SI: 1 degree = 0.1745 rad

The minimum required floor area for any habitable room having a sloping ceiling, as would typically be encountered where an attic area is finished for use as a living or sleeping area, must be based on only those portions of the room with a ceiling height of at least 5 feet.

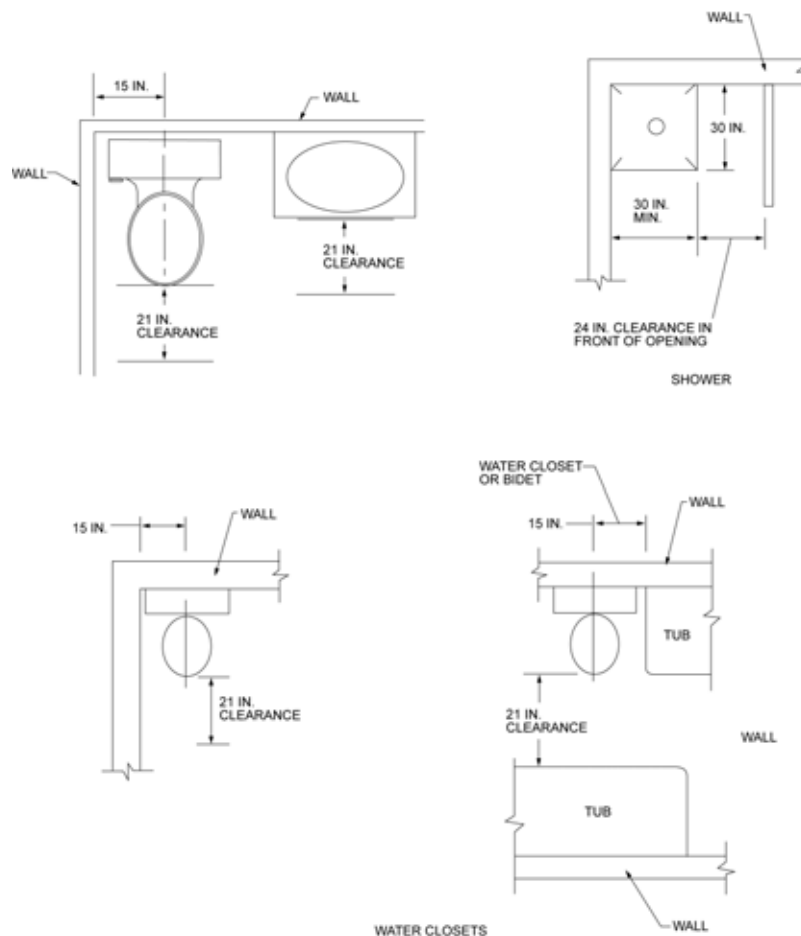
**Code Text:** *Habitable space, hallways and portions of basements containing these spaces shall have a ceiling height of not less than 7 feet (2134 mm). Bathrooms, toilet rooms and laundry rooms shall have a ceiling height of not less than 6 feet 8 inches (2032 mm). See the exceptions addressing rooms with sloped ceilings, bathrooms and basements. Portions of basements that do not contain habitable spaces or hallways shall have a ceiling height of not less than 6 feet 8 inches (2032 mm). See the exception allowing beams, ducts and similar obstructions to project to within 6 feet 4 inches of the finished floor.*

**Discussion and Commentary:** For both safety reasons and usability by the occupants, the minimum ceiling height throughout occupiable areas of a dwelling unit is regulated. Most rooms that are commonly used by the occupants are included, other than closets and storage areas. Where basements are used for habitable purposes, they too must comply with the minimum height requirement of 7 feet.



**Code Text:** *Fixtures shall be spaced in accordance with Figure R307.1 and in accordance with the requirements of Section P2705.1. Bathtub and shower floors and walls above bathtubs with installed shower heads and in shower compartments shall be finished with a nonabsorbent surface. Such wall surfaces shall extend to a height of not less than 6 feet (1829 mm) above the floor.*

**Discussion and Commentary:** It is necessary to provide adequate clearances at and around bathroom fixtures to allow for ease of use by the occupants of the dwelling unit. The code addresses clear floor space and clearances for lavatories, water closets, bathtubs, and showers. In addition, the minimum permitted size for a shower is 30 inches by 30 inches with a clearance of at least 24 inches provided in front of the shower opening.



The need for nonabsorbent surfaces in shower areas subject to water splash is based on two concerns. For sanitation purposes, finish materials must be of a type that can be cleaned easily. Also, continued absorption of moisture will lead to deterioration of the structural components.