



# National Healthy Housing Standard



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# **Foreword and Acknowledgments**

### **FOREWORD**

Housing is one of the best known and documented determinants of health. The affordability, location, and quality of housing have all been independently linked to health. Poor quality housing and blighted neighborhoods diminish property values, increase crime, and erode the cohesiveness and political power of communities. Despite the critical role of housing in public health, attention to U.S. housing conditions remains incommensurate with its importance to our wellbeing. One illustration of this is the number of homes in substandard condition. Despite setting a national goal in Healthy People 2010 to reduce the number of units in substandard condition by 52 percent, we have made no progress. There were 6.3 million units in substandard conditions in 2001; 6.3 million units remain substandard in 2011 according to the most recent American Housing Survey.

More than a century ago, growing concern about the toll of infectious diseases such as tuberculosis, typhoid, and dysentery in America spurred a national public health movement aimed at eradicating inadequate housing conditions. The effort yielded important housing improvements that dramatically curbed the outbreak of communicable diseases. In the decades that followed, the public health community became less involved with housing as separate governmental departments were established to develop and enforce housing and building codes. This separation of public health and housing has challenged the nation's ability to mount a successful campaign to improve the quality of housing and neighborhoods.

We at the National Center for Healthy Housing (NCHH) and the American Public Health Association (APHA) have created this evidence-based National Healthy Housing Standard as a tool to reconnect the housing and public health sectors and as an evidence-based standard of care for those in the position of improving housing conditions. We have drawn from the latest and best thinking in the fields of environmental public health, safety, building science, engineering, and indoor environmental quality.

Our focus in the National Healthy Housing Standard is the over 100 million existing homes in our country that offer the most significant opportunity to protect public health and reduce health disparities. Although new homes are typically safer and healthier, having been built to modern building standards, technologies and regulations, and to ever-changing consumer expectations, the new construction market remains a fraction of the overall housing stock in the country. In contrast, regulations and industry practices affecting existing owner-occupied and rental housing, the focus of this document, have not kept pace with our knowledge about housing-related disease and prevention of disease and injury through routine maintenance.

The consequences of not dealing with substandard housing are dire in both human wellbeing and cost:

- About 20-30 percent of asthma cases are linked to home environmental conditions.
- 21,000 lung cancer deaths result from radon in homes.
- Over 24 million homes that have lead-based paint hazards put children at risk of the irreversible disease of childhood lead poisoning.
- Home injuries are the leading causes of death for young children and put 6 million adults over 65 in hospitals and nursing homes due to preventable falls.

We can do better. We can make our homes smart, at least as smart as our phones. For example, carbon monoxide detectors can alert us to life threatening situations. Modern efficient ventilation systems can keep us comfortable, control humidity, and provide clean fresh air. More resilient homes can handle climate chaos, withstanding storms and wild swings in temperature with proper insulation, air sealing, structural integrity, and moisture control and more. Grab bars, handrails, and ample lighting will help accommodate our aging population. These are the homes in which today's families want to live and grow old and that future generations deserve.

We know that to bring about our vision of ensuring that all people live in safe and healthy homes, we will need to marshal political will and financial resources. Regulations are one important way to address unhealthy housing, but we can also achieve our vision by arming the private sector with the right information. In every community, property

owners, advocates, code officials, public health leaders, and others are positioned to recognize and coordinate their shared missions of keeping people safe and healthy in the places they live. We hope the Standard will inspire action and cross sector collaboration. Most of all, we hope through the implementation of this Standard we will save lives, shrink disparities, and ensure our nation's homes are the safe havens they were meant to be.

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- Sections 302.2, 302.6, 303.2, 303.18.1, 304.2, 305.4, 402.1, 402.2, 403.1, 403.2, 403.5, 404.3, 404.4.3, 505.4, 602.2.2, 602.2.3, 603.2, 603.3 of the 2012 International Property Maintenance Code.
- Section 1210.2 of the 2012 International Building Code.
- Sections 907.2.11.2, 907.2.11.3 of the 2012 International Fire Code.
- Sections 424.3, 424.5, 501.6, 504.4, 504.6 of the 2012 International Plumbing Code.
- Sections E3901, E3902.1, M1901.1, P2713, P2708.3, P3009, R310.1, R310.2, R310.2.1, R311.7.5, R311.7.8, R312.1.1, R312.1.2, R312.1.3, R312.2.1 of the International Residential Code.

# USING THIS DOCUMENT

The Standard provides health-based provisions to fill gaps where no property maintenance policy exists and also a complement to the International Property Maintenance Code and other policies already in use by local and state governments and federal agencies for the upkeep of existing homes. The Standard bridges the health and building code communities by putting modern public health information into housing code parlance. The Standard is written in code language to ease its adoption, although we anticipate that states, localities, and other users will tailor it to local conditions.

The Standard consists of seven chapters and a section of definitions. The annotated version of the Standard explains the public health rationale for each provision, and provides references and resources for more information. Individually and together, the Standard constitutes minimum performance standards for a safe and healthy home. In developing the Standard we found a variety of provisions that could be added to further enhance the health and safety of the home, but that would be difficult to achieve during property maintenance due to cost or feasibility. We have included those provisions as "stretch" measures for users who want to go above the minimum requirements or who can integrate compliance with the provisions during property renovation. We encourage the adoption of the stretch provisions wherever feasible.

# **Requirements and Stretch Provisions**

#### 1. DUTIES OF OWNERS AND OCCUPANTS

#### 1.1. Duties of Owners.

The owner has the duty to ensure that the structure, dwelling, dwelling unit, common areas, and premises are maintained in a safe and healthy condition, in compliance with this Standard and other applicable requirements.

- **1.1.1.** The owner shall ensure the collection of trash and recyclables and provide and maintain trash containers, bulk storage containers, recycling containers, and areas where the containers are stored.
- **1.1.2.** The owner shall maintain the building and premises to keep pests from entering the building and dwelling units, inspect and monitor for pests, and eliminate pest infestation in accordance with integrated pest management methods.
- **1.1.3.** The owner shall provide occupants with at least 48 hours written notice of the planned use of a chemical agent such as a pesticide or herbicide, the date and location of application, and a copy of the warning label.
- **1.1.4.** The owner shall not cause or allow any water, sewage, electrical, or gas service, facility, or equipment required for safe and healthy occupancy to be removed, shut off, or discontinued for any occupied dwelling, except for such temporary interruption as may be necessary while repairs or alterations are being performed, or during temporary emergencies requiring discontinuance of service. This provision does not apply where the occupant has contractual control over the service and shall not be interpreted as preventing a utility company from discontinuing service for reasons allowed by law.
- **1.1.5.** The owner shall investigate occupant reports of unsafe or unhealthy conditions, respond in writing, and make needed repairs in a timely manner.

## 1.2. Duties of Occupants.

The occupant shall properly use and operate the dwelling unit and owner-supplied fixtures and facilities controlled by the occupant in order to maintain a safe and healthy environment within the dwelling unit, and report unsafe or unhealthy conditions, including breakdowns, leaks, and other problems requiring repair to the owner in a timely manner.

- **1.2.1.** The occupant shall place trash and recyclables in the appropriate containers.
- **1.2.2.** The occupant shall work with the owner to ensure pest-free conditions in accordance with integrated pest management.
- **1.2.3.** If the occupant's action leads to pooling of water or another excessive moisture problem inside the dwelling unit, the occupant shall clean up and dry out the area in a timely manner.

# 2. STRUCTURE, FACILITIES, PLUMBING, AND SPACE REQUIREMENTS

## 2.1. Structure.

Every foundation, roof, floor, exterior and interior wall, ceiling, inside and outside stair, porch, trim, accessory structure, fence, door, window, and window glass shall be safe to use and capable of supporting the intended design loads and load effects and shall be in good condition.

#### 2.2. Facilities.

Every plumbing fixture and pipe, chimney, flue, smoke pipe, and every other facility, piece of equipment, or utility shall be installed in conformance with applicable statutes, ordinances, and regulations.

**2.2.1.** Mechanical, utility, and heating equipment shall be separated from habitable rooms. In multifamily buildings, equipment rooms shall be locked.

## 2.3. Plumbing System.

Every plumbing fixture, stack, vent, water, waste, and sewer pipe shall be properly installed, maintained in a safe and functional order, and kept free from obstructions, leaks, and defects.

- **2.3.1.** An approved potable water supply system shall provide an adequate amount of running water under pressure to all fixtures simultaneously.
- **2.3.2.** An adequate supply of heated running water under pressure shall be supplied to sinks, bathtubs, showers, and laundry facilities. Water heaters shall be set at a minimum temperature of 110° F (43° C). At bathtub faucets and shower heads, the maximum temperature shall be 120° F (49° C). Heated water shall be provided by either a tank-type or tankless water heater. A tank-type water heater shall have a temperature/pressure relief valve that discharges to a drip pan, storage tank, or the outside. The temperature of water discharged from a tankless water heater shall not exceed 140° F (60° C).
- **2.3.3.** Every waste pipe shall be connected to a public sewer system, an approved private sewage disposal system, or the dwelling's graywater system. No toilet waste pipe shall be connected to a graywater system. The drainage system shall have a cleanout.
- **2.3.4.** Faucet discharge points shall be located above the overflow rim of sinks, tubs, or other fixtures that collect water.

- Bathtub and shower faucets shall have anti-scald devices, such as an automatic temperature control mixing valve, water temperature limiting device, or temperature-actuated flow reduction valve.
- Each dwelling unit in multifamily housing shall have a separate meter for water supplied to the unit.
- Multifamily housing with one or more central water heaters shall comply with ASHRAE Standard188P to assess and manage the risks associated with *Legionella* in building water systems.
- A private water supply shall be tested annually to ensure that water does not have biological or chemical contaminants.
- If there is a suspected risk of excessive lead in drinking water supplied by a public water utility, the water shall be tested. The risk factors shall include, but are not limited to, presence of an occupant with a blood lead level of five micrograms per deciliter or more, pipes made of lead or leaded brass, test results indicating that the lead level in the public water supply exceeds federal limits, and plumbing repair work that has disturbed water supply components (such as faucets, valves, pipes, meters, pressure regulators, backflow preventers, lead-soldered joints, or service lines). If the lead level in the water sample exceeds 15 parts per billion, there shall be an investigation of the possible sources(s) to determine the appropriate course of action. If warranted, lead and brass-containing components shall be replaced.

#### 2.4. Kitchen.

Every dwelling unit shall have a kitchen equipped with the following:

- **2.4.1.** A kitchen sink in good working condition that is properly connected to heated and unheated water supplies and waste pipes. Any provided dishwasher and components of the sink, including disposal and water filtration devices, shall be in good working condition and properly connected.
- **2.4.2.** A counter for food preparation and cabinets and/or shelves sufficient to store occupants' food that does not require refrigeration and eating, drinking, and food preparation equipment. Cabinets shall have tight-fitting doors and no gaps between any surfaces. The counter, countertop edges, cabinets, and shelves shall be of sound construction and furnished with surfaces that are impervious to water, smooth, and cleanable.
- **2.4.3.** A range for cooking food. The range shall be properly installed with all necessary connections for safe and efficient operation and shall be maintained in good working condition.
  - **2.4.3.1.** The range shall include an oven unless both a separate oven, other than a microwave oven, and a cooktop are provided. A hot plate is not an acceptable substitute for burners on a range or cooktop. The range or cooktop shall have a vertical clearance of not less than 30 inches (762 mm) from above its surface to unprotected combustible material. Reduced clearances are permitted in accordance with the listing and labeling of the range hood.
  - **2.4.3.2.** Ventilation for the range shall be provided in accordance with Subsection 5.3.
- **2.4.4.** A refrigerator with a freezer. The refrigerator shall be in good working condition, of sufficient size to store occupants' food that requires refrigeration, and capable of maintaining a temperature less than 41° F (6° C) but more than 32° F (0° C). The freezer section shall be capable of maintaining a temperature below 0° F (-18° C).
  - **2.4.4.1.** If the lease does not provide for a refrigerator, adequate connections for the occupant's installation and operation of a refrigerator shall be provided.
- **2.4.5.** A kitchen floor in good condition with a sealed, water-resistant, nonabsorbent, and cleanable surface.

#### Stretch Provisions:

- Cabinets and countertops shall be constructed of materials that are rated No-Added Formaldehyde (NAF) or Ultra-Low-Emitting Formaldehyde Resins (ULEF).
- Wall surfaces immediately adjacent to the range, sink, and counter shall be covered with an impervious finish.
- The joints where a wall meets a cabinet or counter, and where a counter meets a stove or sink, shall be sealed or covered to permit thorough cleaning and deter pests.
- Enclosed cabinets (as opposed to a combination of shelves and cabinets) sufficient to store occupants' food that does not require refrigeration shall be provided.
- Freestanding stoves shall have brackets to prevent tip-over.

# 2.5. Bathroom.

Every dwelling unit shall have a private bathroom equipped with the following:

- **2.5.1.** A toilet in good working condition that is sealed to the waste pipe and affixed to the floor and properly connected to both the dwelling's water supply and a waste pipe leading to an approved sewage system or private waste disposal system.
- **2.5.2.** A sink in good working condition, with a stable connection to the wall or secure attachment to the floor that is properly connected to the heated and unheated potable water supply and a sealed trap leading to a waste pipe.

- **2.5.3.** A bathtub or shower in good working condition that is properly connected to the heated and unheated potable water supply and a waste pipe. The bottoms of bathtubs and shower floors shall have permanent or removable nonslip surfaces.
- **2.5.4.** Cleanable nonabsorbent water-resistant material on floor surfaces and extending on bathroom walls at least 48 inches (122 cm) above a bathtub and 72 inches (183 cm) above the floor of a shower stall. Such materials on walls and floors shall form a watertight joint with each other and with the bathtub or shower.
- **2.5.5.** Ventilation for the bathroom provided in accordance with Subsection 5.3.

# Stretch Provisions:

- Grab bars shall be firmly anchored to the wall adjacent to each bathtub, shower, and toilet in accordance with the Americans with Disabilities Act Design Guidelines.
- Tub and shower enclosures composed of tile or panel assemblies with caulked joints shall be installed over moisture-resistant backing material, such as cement board. Paper-faced wallboard shall not be used behind such tub and shower enclosures. Monolithic tub and shower enclosures (e.g., fiberglass with no seams) are exempt from these limitations unless required by the manufacturer.

# 2.6. Minimum Space.

The dwelling shall provide privacy and adequate space for sleeping and living.

- **2.6.1.** A bedroom shall not be the only passageway to the only bathroom in a dwelling unit with more than one bedroom.
- **2.6.2.** A bathroom or toilet room shall not be the only passageway to any habitable room, hall, basement, or the exterior of the dwelling.
- **2.6.3.** Every habitable room shall have a minimum floor area of 70 ft<sup>2</sup> (6.5 m<sup>2</sup>).
- **2.6.4.** Every dwelling shall have closet space or other storage space to store occupants' clothing and personal belongings.
- **2.6.5.** The ceiling height of any habitable room shall be at least 84 inches (213 cm). In a habitable room with a sloping ceiling, at least one-half of the floor area shall have a ceiling height of at least 84 inches (213 cm). If any part of a room has a ceiling height lower than 60 inches (152 cm), its floor area shall not be considered in computing the floor area of the room.
- **2.6.6.** A habitable room located partly or totally below grade shall be provided with natural light by windows in accordance with Subsection 4.3, and ventilation in accordance with Subsection 5.3. In such a room, the ceiling and any ducts, pipes, and other obstructions shall be at least 84 inches (213 cm) above the floor throughout the room, and walls and floors shall be waterproof and free of dampness.

# 2.7. Floors and Floor Coverings.

Floors and floor coverings shall be attached at each threshold, maintained in safe and healthy condition, capable of being cleaned, and free of bulges and buckling. Carpets shall have no tears, folds, or bumps.

- Floor coverings shall consist of low-pile carpet or nonabsorbent material such as hardwood, tile, or resilient flooring. Carpet and other floor coverings shall be certified as having low volatile organic compound (VOC) emissions, and any adhesives, padding, or other materials used in installing the floor covering shall be certified as having no VOCs or low VOC emissions, and having no perfluorocarbons or halogenated flame retardants.
- Walk-off entry mats shall be provided inside or outside each entryway that leads to the outdoors.

## 2.8. Noise.

The structure and facilities shall be maintained so that the noise level in the interior of the dwelling unit caused by exterior sources is below 45 dB  $L_{dn}$  (day-night equivalent sound level).

- Nighttime noise levels within bedrooms shall not exceed 30 dB LA measured over eight hours.
- HVAC equipment, including intermittent ventilation fans, shall operate at a noise level that creates no more than 45 dB  $L_{dn}$  in habitable rooms.
- Wall and ceiling assemblies shall meet performance standards to attenuate exterior sound reaching occupants or be constructed using materials with sound-dampening acoustical properties.
- Roof material, chimney baffles, exterior doors, mail slots, attic ventilation ports, wall-mounted air conditioners, and other building components that have the potential to admit excessive noise shall be configured to minimize sound intrusion.
- Windows shall be sealed, made weathertight, and caulked to minimize sound intrusion when closed.

#### 3. SAFETY AND PERSONAL SECURITY

## 3.1. Egress.

In accordance with local fire codes, every dwelling unit shall have at least two means of egress that serve as emergency escapes and rescue openings. Each egress shall lead outside without passing through another dwelling unit.

- **3.1.1.** Egress routes shall be unobstructed. Doors along egress routes shall be openable from the inside without the use of a key or tool.
- **3.1.2.** Any bedroom located below the fourth floor shall be provided with an exterior window openable from the inside that can be used as a means of emergency egress.
- **3.1.3.** If a habitable room partly or totally below grade is intended for sleeping purposes, at least one exterior window shall be openable from the inside and accessible for easy and ready use as an emergency exit. The window shall have the following minimum dimensions: a net clear opening of 5.7 ft² (0.53 m²); 24 inches (61 cm) from the top of the sill to the bottom of head of the window frame; a width of 20 inches (51 cm); and a sill height of not more than 44 inches (112 cm) from the floor.
  - **3.1.3.1.** If the window opening sill height is below ground elevation, the horizontal dimension (width times projection) of the window well shall be at least nine ft<sup>2</sup> (0.84 m<sup>2</sup>) and the horizontal projection shall extend at least 36 inches (91 cm) from the exterior side of the window.
  - **3.1.3.2.** If the egress window well is deeper than 44 inches (112 cm) below ground elevation, there shall be steps or a ladder permanently attached to serve as an emergency exit to ground elevation. The distance between steps or rungs shall be 18 inches (46 cm), their width shall be at least 12 inches (31 cm), and their projection from the wall shall be between three and six inches (7.6 and 15 cm).
  - **3.1.3.3.** A door leading directly from the room to the outside that provides an exit at grade level shall fulfill this requirement.

# 3.2. Locks/Security.

Means of egress (i.e., windows and/or doors) from dwellings shall have locks.

- 3.2.1. Following each change in tenancy, the locking devices on the dwelling unit entry doors shall be changed.
- **3.2.2.** Dwelling unit entry doors shall be equipped with a dead bolt lock with a minimum throw of one inch (2.54 cm) and that is capable of being opened from the interior side without a key and a device that permits the occupant to see a person at the entry door without fully opening the door.
- **3.2.3.** Exterior doors on multifamily buildings with a common entry that leads into a foyer or hallway shall have a self-closing mechanism and shall be equipped with a locking device capable of being opened from the interior side without a key.
- **3.2.4.** Exterior windows that are capable of being opened and are potential means of entry shall be equipped with a lock on the interior side.

## 3.3. Smoke Alarm.

Every dwelling unit shall have a functioning smoke alarm located on the ceiling outside each sleeping area in the immediate vicinity of the bedrooms, in each additional room used for sleeping purposes, and on every level except crawlspaces and uninhabitable attics. In dwellings or dwelling units with split levels that have no door between adjacent levels, the smoke alarm installed on the upper level shall suffice for the adjacent lower level. In the event a smoke alarm sounds, the cause of the alarm condition shall be identified and corrected.

**3.3.1.** In multifamily housing, a tamper-proof smoke detection system (interconnected with a central fire alarm system) or stand-alone smoke alarms in good working condition shall be installed on each level including basements, in heating system and storage rooms, in garages, and in other common areas.

- **3.3.2.** Battery-operated smoke alarms and the battery backup for hardwired smoke alarms shall be powered with long-lasting batteries.
- **3.3.3.** Alternative visual notification shall be provided for hearing-impaired occupants.

# Stretch Provisions:

- Smoke alarms shall be hardwired with battery backup.
- Smoke alarm batteries shall be sealed-in and tamper-proof.
- Multiple smoke detection stations shall be interconnected.
- Every dwelling unit shall have both a photoelectric smoke alarm and an ionization smoke alarm.

## 3.4. Fire Extinguisher.

Fire extinguishers shall be rated Class ABC and shall be readily accessible.

- **3.4.1.** Each dwelling unit shall have at least one 10-pound fire extinguisher in good working condition in or near the kitchen.
- **3.4.2.** In multifamily housing, there shall be fire extinguishers in common areas on each floor and in areas where flammable or combustible liquids are stored, used, or dispensed. The fire extinguishers shall be located in conspicuous, unobstructed locations that are not obscured from view.

# Stretch Provision:

• The dwelling shall have an automatic fire sprinkler system that complies with the applicable locally adopted fire code. If the local fire code has no sprinkler requirement or if no local fire code exists, the installed automatic fire sprinkler system shall comply with either the International Fire Code® or the National Fire Protection Association Standard 1.

#### 3.5. Carbon Monoxide Alarm.

Every dwelling unit shall have at least one functioning carbon monoxide (CO) alarm on every habitable floor and outside each separate sleeping area, in the immediate vicinity of every bedroom. In the event a CO alarm sounds, the cause of the alarm condition shall be identified and corrected.

- **3.5.1.** Battery-operated CO alarms shall be powered with long-lasting batteries. Hardwired CO alarms shall have long-lasting battery backup.
- **3.5.2.** Alternative visual notification shall be provided for hearing-impaired occupants.

#### Stretch Provisions:

- CO alarms and combination smoke/CO alarms shall include voice notification.
- If a combination ionization sensor smoke/CO alarm is used, a second smoke alarm utilizing photoelectric smoke sensors shall be installed.
- CO alarm batteries shall be sealed-in and tamper-proof.
- CO present at or above 30 ppm (35 mg/m³) when measured over one hour, or above nine ppm (10.5 mg/m³) measured over eight hours, shall be deemed hazardous. The cause of a hazardous indoor CO level shall be investigated to identify and eliminate its source.

## 3.6. Walking Surfaces.

Every interior and exterior stairway, ramp, deck, porch, and balcony shall be maintained structurally sound, in good repair, properly anchored, and capable of supporting the imposed loads.

**3.6.1.** Treads on exterior stairways shall have nonskid surfaces.

**3.6.2.** Every interior and exterior stairway with four or more risers shall have at least one structurally sound continuous handrail installed not less than 34 inches (86.7 cm) and not more than 38 inches (96.5 cm), measured vertically from above the nose of the tread. The handrail shall be firmly fastened, capable of supporting a load of 300 pounds, and in good condition. If a side of a stairway is open to the floor or grade below, and the handrail provides the guard required by Subsection 3.7, the rail shall be supported by balusters 34 to 38 inches (86.7 to 96.5 cm) in height, measured vertically from the nose of the tread.

#### Stretch Provisions:

- Every interior and exterior stairway shall have uniform risers and treads. Risers shall be no higher than 7¾ inches (19.6 cm) and treads shall be at least 10 inches (25.4 cm) deep, unless the existing space and construction do not allow a reduction in pitch or slope.
- Interior and exterior stairways shall have handrails on both sides. Railings shall have a graspable perimeter measuring four to six inches (10–16 cm), and if noncircular in shape, shall have no sharp corners and a width no smaller than five-eighths inch (1.5 cm).

#### 3.7. Guards.

- **3.7.1.** Every stairway, porch, patio, landing, and/or balcony located more than 30 inches (76.2 cm) above an adjacent area shall have a structurally sound guard between 30 inches (76.2 cm) and 42 inches (107 cm) high, measured vertically from the floor. The guard shall be firmly fastened, capable of supporting normally imposed loads, capable of being opened in case of emergency, and in good condition. Balusters with a minimum thickness of one-half inch (13 mm) shall be placed at intervals that do not allow passage of a sphere greater than four (10.2 cm) inches in diameter. There shall be no climbable cross pieces. If the balusters do not reach the floor, the narrowest opening between the bottom of the stair guard and the floor shall be a maximum of four inches (10.2 cm).
- **3.7.2.** If the vertical distance from the top of the sill of an exterior window opening to the finished grade or other surface below is greater than 72 inches (183 cm), and the vertical distance from the top of the sill to the floor of the room is less than 36 inches (91.5 cm), the window shall have a fall prevention device compliant with ASTM F2006 or ASTM F2090.
  - **3.7.2.1.** The fall prevention device for a window that provides access to a fire escape or is otherwise designated for emergency egress shall be compliant with ASTM F2090.

#### 3.8. Chemical Storage.

- **3.8.1.** Each dwelling unit shall have a cabinet or other storage space that is lockable or not readily accessible to children for the storage of medicine and household chemical agents.
- **3.8.2.** Storage space for flammable and combustible liquids shall be available either in a building separate from the dwelling's habitable space or in an adjacent space that is not connected to the dwelling's ventilation system.

## 3.9. Pools, Hot Tubs, and Other Water Features.

- **3.9.1.** Swimming pools, hot tubs, spas (except a residential spa or hot tub with a safety cover complying with ASTM F 1346-91), ornamental ponds, and other water features that hold water more than 24 inches (61 cm) in depth shall be completely surrounded by a fence or barrier at least 48 inches (122 cm) in height above the finished ground level that is accessible only through a self-closing and self-latching gate. The gate's latch shall be located 54 inches (137 cm) above the bottom of the gate on the interior side of the gate facing the water feature. The fence and gate shall not have climbable crosspieces.
- **3.9.2.** All pools and spas shall have anti-entrapment drain covers compliant with ANSI/ASME A112.19.8, ANSI/APSP 16-2011, or any successor standard, on every suction outlet.
- **3.9.3.** Pool drains and drain covers shall be clearly visible and in good repair. Where there is a single main drain (other than an unblockable drain), a second anti-entrapment system shall be installed.
- **3.9.4.** Luminaries, receptacles, and other outlets shall have ground fault circuit interrupter (GFCI) protection.

#### 4. LIGHTING AND ELECTRICAL SYSTEMS

## 4.1. Electrical System.

Every dwelling unit shall have electric service, outlets, and fixtures that are grounded and installed properly, maintained in good and safe working condition, and connected to a source of electric power.

- **4.1.1.** Every dwelling unit shall be supplied with a three-wire, 120/240-volt, single-phase electrical service that is not shared with another dwelling unit.
- **4.1.2.** Temporary wiring or extension cords shall not be used as permanent wiring.

# Stretch Provision:

• The electrical service shall have a rating of not less than 100 amperes.

#### 4.2. Outlets.

Every habitable room shall have at least two separate and remote grounded duplex electric receptacle outlets.

- **4.2.1.** Each kitchen and each room containing a toilet, sink, bathtub, or shower stall shall have at least one grounded duplex electric receptacle outlet protected by a ground-fault circuit interrupter (GFCI).
- **4.2.2.** Receptacle outlets in garages, crawl spaces, unfinished basements, and outdoors shall be protected by GFCIs.

# Stretch Provisions:

- Habitable rooms shall have sufficient electric receptacle outlets so that no location on a wall is more than six feet from an outlet
- Every countertop space 12 inches (305 mm) or wider shall have a grounded duplex electric convenience receptacle outlet protected by a GFCI. No section of counter shall be more than 24 inches (610 mm) measured horizontally from an outlet.
- Receptacle outlets in habitable rooms that are not protected by GFCIs shall be protected by arc-fault circuit interrupters (AFCIs).

#### 4.3. Natural Lighting.

Every habitable room shall receive daylight from at least one exterior window or skylight.

- **4.3.1.** If a habitable room receives daylight from an adjacent room or area used seasonally, such as a porch, the daylight through this interconnection shall be available year-round.
- **4.3.2.** Every bathroom and kitchen shall comply with the daylight requirement for habitable rooms contained in this section, unless the room is equipped with a ventilation system consistent with Subsection 5.3.

#### 4.4. Artificial Lighting.

Each room containing a toilet, sink, bathtub, or shower stall shall contain at least one ceiling- or wall-type electric lighting fixture. Each non-habitable room, including laundry rooms, furnace rooms, and public halls, shall contain at least one ceiling- or wall-type electric lighting fixture.

- **4.4.1.** Light switches that control ceiling- or wall-type electric light fixtures shall be located conveniently for safe use.
- **4.4.2.** Every public hall, exterior entry door, and stairway in multifamily housing shall be illuminated at all times by ceiling- or wall-type electric lighting fixtures providing 800 lumens for every 200 ft<sup>2</sup> (18.6 m<sup>2</sup>) of floor area. The distance between light fixtures shall not be greater than 30 feet (762 cm).

**4.4.3.** In a building containing one or two dwelling units, every public hall, exterior entry door, and stairway shall be illuminated by ceiling- or wall-type electric lighting fixtures providing 800 lumens for every 200 ft<sup>2</sup> (18.6 m<sup>2</sup>) of floor area that is controlled by a three-way switch or a motion-activated device.

- Polychlorinated-biphenyl (PCB)-containing lighting ballasts (e.g., older pre-1978 T-12 lighting ballasts) shall be removed, replaced with lighting fixtures that do not contain PCBs, and disposed of in accordance with applicable state and federal regulations.
- The lighting fixtures in public halls, stairways, and entries shall provide 1600 lumens for every 200 ft<sup>2</sup> (18.6 m<sup>2</sup>) of floor area.
- The parking areas and walkways of multifamily housing shall be illuminated by outdoor lighting devices suitable for the premises.

# 5. THERMAL COMFORT, VENTILATION, AND ENERGY EFFICIENCY

# 5.1. Heating, Ventilation, and Air Conditioning Systems.

Facilities for heating, cooling, ventilation, and humidity control shall be maintained in good working condition and operated when necessary for the health and comfort of the occupants and in accordance with the design capacity of the installed equipment. Within 48 hours after equipment has become inoperative due to a mechanical problem or power failure other than a utility outage, an alternative safe source of necessary heating, ventilating, or cooling shall be provided.

#### 5.2. Heating System.

Except in Climate Zone 1, every dwelling shall have a properly installed heating system in good and safe working condition that is capable of safely and adequately heating all habitable rooms, bathrooms, and toilet rooms. The heating system, filtration components, distribution components, heating elements, and cooling elements (if provided), shall be sealed, cleaned, maintained, and operated in accordance with manufacturer specifications and shall be inspected and serviced annually by a licensed heating, ventilation, and air conditioning systems contractor.

- **5.2.1. Venting and Air Supply for Heating Equipment.** Furnaces, water heaters, wood stoves, and other devices that employ combustion-burning fuel shall be vented to the outside of the structure in an approved manner that meets manufacturer specifications and is in compliance with applicable codes and standards (e.g., ANSI 223.1/NFPA 54 National Fuel Gas Code, NFPA 31 Standard for the Installation of Oil-Burning Equipment, NFPA 211 Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances) and shall be supplied with sufficient air to support the continuous complete combustion of fuel and prevent backdrafting.
- **5.2.2. Minimum Heat Temperature.** The heating system shall be capable of maintaining a minimum room temperature of 68° F (20° C) in every habitable room, bathroom, and toilet room.
- **5.2.3. Heating Supply.** If the dwelling unit is rented, leased, or let on terms either expressed or implied that heat will be supplied, heat shall be provided to maintain a minimum temperature of 68° F (20° C) in habitable rooms, bathrooms, and toilet rooms; and at no time during the heating season shall the system allow the temperature to exceed 78° F (25° C) in any room.
- **5.2.4. Forced-Air Systems.** Any dwelling with a forced-air system shall have at least one thermostat within each dwelling unit capable of controlling the heating system, and cooling system if provided, to maintain temperature set point between 55° F (13° C) and 85° F (29° C) at different times of the day. The system shall have a clean air filter installed in accordance with manufacturer specifications at each change in tenancy and at least annually. This filter shall have a minimum efficiency reporting value of eight (MERV-8) unless the system is not equipped to use a MERV-8 filter.
- **5.2.5. Steam and Hot Water Systems.** In dwellings with heating equipment utilizing steam or hot water with a temperature of 110° F (43° C) or greater, protective covers/barriers shall be installed on and maintained for exposed surfaces of baseboard units, radiators, and piping between radiators.
- **5.2.6. Wood Stoves.** A wood stove manufactured after June, 1988 shall have a manufacturer's label certifying compliance with the emission standard at 40 C.F.R. § 60 part AAA. Clearance of 30 inches (76 cm) shall be maintained between combustible materials and a stove with no heat shield. Where a heat shield is present, the clearance between combustible materials and the stove shall be compliant with manufacturer specification for the heat shield.

- Any new combustion heating equipment installed in occupied or conditioned spaces shall be power-vented or sealed (direct-vented) combustion equipment.
- The heating system shall be controlled by a programmable thermostat to avoid temperature extremes.

- The dwelling shall have provisions to maintain the indoor temperature below a maximum of 85° F (29° C) through the use of mechanical air conditioning, ventilation systems, or passive design features.
- Air filters shall be replaced at least every three months.

#### 5.3. Ventilation.

Natural or mechanical ventilation, or a combination of the two, shall deliver fresh air to every habitable room and bathroom and be capable of removing moisture-laden air and other contaminants generated during cooking, bathing, and showering.

- **5.3.1.** Every dwelling shall have a ventilation system compliant with ASHRAE Standard 62.2 (Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings) or ASHRAE 62.1 (Ventilation for Acceptable Indoor Air Quality) as applicable to the dwelling.
- **5.3.2.** The air exhausted from a bathroom, toilet room, kitchen, clothes dryer, or basement shall not be vented into any other parts of the building's habitable space or an attic; such air shall discharge directly to the outdoors but not near any intake on the building exterior.
  - **5.3.2.1.** The exhaust vent from a clothes dryer shall consist of a rigid or corrugated semi-rigid metal duct.
- **5.3.3.** Pipes, ducts, conductors, fans, and blowers shall not discharge gases, steam, vapor, hot air, grease, smoke, odors, or other gaseous or particulate wastes directly upon abutting or adjacent public or private property or that of another occupant. Vent pipe openings and any pest-proofing screens that cover them shall be maintained free of debris.
- **5.3.4.** Basement air shall not be used as supply air for an air handling system.

# Stretch Provision:

• HVAC equipment shall have the capacity to maintain indoor relative humidity (RH) at or below 60 percent.

#### 5.4. Air Sealing.

Openings into dwellings and dwelling units shall be sealed to limit uncontrolled air movement.

- **5.4.1.** Exterior doors, windows and skylights, openings where siding and chimneys meet, utility penetrations, electrical outlets, and other openings shall be weathertight.
  - **5.4.1.1.** Pads, door sweeps, weather stripping, and seals shall be used and maintained to minimize air leaks.
- **5.4.2.** Openings separating an attached garage from a habitable room, including doors, ceilings, floors, and utility and ductwork penetrations, shall be sealed.
  - **5.4.2.1.** Any doorway between a habitable room and a garage shall be equipped with a wood door not less than 1% inches (35 mm) in thickness, a solid or honeycomb core steel door not less than 1% inches (35 mm) thick, or a 20-minute fire-rated door. The door shall have an automatic closing mechanism and be sealed with weather stripping.
  - **5.4.2.2.** There shall be no door, window, or other opening from a garage into a room used for sleeping purposes.
- **5.4.3.** Heating and air conditioning system ductwork and air handling units located in an attached garage shall be correctly insulated and sealed.
- **5.4.3.1.** There shall be no supply or return vent openings in a garage that connect to air handlers serving habitable spaces.
- **5.4.4.** In a multifamily building, walls, ceilings, and floors that separate a dwelling unit from neighboring units, corridors, chases, stairwells, and other openings shall be sealed.

# Stretch Provision:

• Air handling equipment and associated ductwork shall be relocated from a garage to an area within the conditioned space.

# 6. MOISTURE CONTROL, SOLID WASTE, AND PEST MANAGEMENT

#### 6.1. Moisture Prevention and Control.

Every foundation, roof, roofing component, exterior wall, door, skylight, and window shall be watertight, weathertight, free of persistent dampness or moisture, and in good condition.

- **6.1.1.** The building's drainage system, such as footing or foundation drains, gutters, downspouts, rainwater collection containers, or other elements, shall direct water away from the structure.
- **6.1.2.** Exterior wood surfaces shall be protected from the elements and decay by paint or other protective treatment. Weep holes in brickwork shall be left open.
- **6.1.3.** Premises shall be graded and maintained to prevent the erosion of soil and to prevent the accumulation of water on the premises, within a crawlspace, or within the structure.
- **6.1.4.** Interior and exterior surfaces and surface coverings, such as but not limited to carpet, wood, cellulose insulation, and paper, paint, and other wall coverings, including paper-faced gypsum board, shall have no signs of visible mold growth or chronic or persistent excessive dampness or moisture.
- **6.1.5.** Building material that is discolored or deteriorated by mold or mildew or causes a moldy or earthy odor shall be cleaned, dried, and repaired. Structurally unsound material shall be removed and replaced.
  - **6.1.5.1.** Removal and repair of moldy material shall be conducted in accordance with New York City's *Guidelines on Assessment and Remediation of Fungi in Indoor Environments*, the Institute of Inspection, Cleaning, and Restoration Certification's *IICRC S520 Standard and Reference Guide for Professional Mold Remediation*, or the EPA guidelines for *Mold Remediation in Schools and Commercial Buildings*.
- **6.1.6.** The underlying cause of excessive dampness or moisture, or moldy or earthy odor shall be investigated and corrected.
- **6.1.7.** Cold HVAC and plumbing components and systems (e.g., chilled-water pipes and valves, refrigerant piping, and valves) in readily accessible locations shall be sufficiently and continuously insulated to keep the temperature of their surfaces at least 10° F (4° C) above the dew point of the surrounding air.
- **6.1.8.** Unless the crawl space is sealed and insulated from the outdoors, the crawl space shall be free of high-moisture conditions or be separated from the dwelling by an air seal or other method suitable to the climate and conditions.

- Exterior weather-resistant barrier systems shall be used to reduce potential for water leaks and moisture intrusion.
- Water/mold-resistant materials shall be used on bathroom walls and floors, showers, and other areas of the home that are likely to be exposed to moisture.
- In warm-humid and mixed-humid climates:
  - Exterior wall insulations shall not include a vapor barrier/retarder material on the interior side (such as
    plastic sheeting or foil facing), with the exception of closed-cell foam insulation (spray or rigid), kraft-faced
    insulation, and seasonally adjusting membranes.
  - There shall be no vinyl wallpaper or other impermeable interior finish on the interior surface of exterior walls within an air-conditioned dwelling.
  - Exterior drainable rigid insulation systems shall be used to reduce wall assembly condensation risk.
- The building and its systems shall meet the following moisture management criteria:
  - When the building is being mechanically cooled, ventilation air shall be dried to a dew point value below the building's dew point.
  - Condensation inside HVAC components and air distribution ductwork shall be drained to an appropriate sanitary drain or condensate collection system.

- Indoor surfaces of both occupied and unoccupied spaces shall not be cooled to temperatures so low as
  to create an average surface relative humidity (RH) of over 80 percent that lasts for more than 30 days on
  visible surfaces in occupied spaces and surfaces inside building cavities and unconditioned space.
- Indoor dew point shall be low enough to ensure no condensation occurs on the exposed surfaces of cool HVAC components or on building materials or furnishings.
- Humidifiers shall be sized, installed, and controlled so they do not overload the air with humidity, which increases the risk of condensation inside air distribution systems and exterior walls and roofing assemblies.

#### 6.2. Solid Waste.

Every dwelling shall have adequate facilities for temporary storage of trash and recyclable materials.

- **6.2.1.** There shall be trash containers outside the dwelling for the storage of trash awaiting collection or disposal. The total capacity of these facilities shall be sufficient to store occupants' trash between scheduled collection times, and shall be placed on a cleanable surface constructed to minimize spillage.
- **6.2.2.** There shall be containers outside the dwelling for recyclable materials awaiting collection, with capacity sufficient to store occupants' recyclable materials between scheduled collection times.

# Stretch Provision:

• Exterior trash and recycling containers shall be placed at least 30 feet (nine meters) from the building, unless such space is not available.

# 6.3. Pest Management.

Integrated pest management (IPM) methods shall be used to maintain every dwelling free of infestation, openings that allow pest entry, conditions that harbor pests or provide them with food or water, and visible pest residue or debris.

- **6.3.1.** A pest management professional who has an IPM certification or a person trained in IPM shall develop the IPM program for a multifamily building.
- **6.3.2.** Every dwelling, premise, accessory structure, and fence shall be maintained in good repair, free of pest infestation, and inspected for pests and building conditions that attract and support pests.
  - **6.3.2.1.** There shall be no accumulation of trash, paper, boxes, lumber, scrap metal, food, or other materials that support rodent harborage in or about any dwelling or premises. Stored materials shall be placed in boxes or stacked in stable piles elevated at least six inches (152 mm) above the ground or floor and at least six inches (152 mm) from the walls. Stored materials shall not block any egress routes.
  - **6.3.2.2.** There shall be no trees, shrubs, or other plantings in the soil within six inches (152 mm) of any dwelling.
  - **6.3.2.3.** There shall be no accumulation of water in or about any dwelling or premises.
- **6.3.3.** Every openable window and storm door shall be supplied with adequate screens to prevent the entry of pests.
- **6.3.4.** There shall be no holes or open joints in exterior walls, foundations, slabs, floors, or roofs that equal or exceed one-eighth inch (3 mm).
  - **6.3.4.1.** The areas surrounding windows, doors, pipes, drains, wires, conduits, vents, and other openings that penetrate exterior walls shall be sealed with low-VOC caulk or closed-cell insulation.
- **6.3.5.** Pest infestation and the underlying cause shall be eliminated using control methods consistent with IPM, such as exclusion, sanitation, and least-risk pesticides scaled to and designed for the targeted infestation.
  - **6.3.5.1.** Foggers and organic phosphates shall not be used to control or eliminate pests.

#### 7. CHEMICAL AND RADIOLOGICAL AGENTS

## 7.1. General Requirements.

All chemical and radiological agents in dwellings, premises, and accessory structures, including but not limited to deteriorated lead-based paint, friable asbestos-containing material, formaldehyde, volatile organic compounds, radon, pesticides, and methamphetamine, shall be contained, stored, removed, or mitigated in a safe and healthy manner consistent with federal, state, and local laws and regulations. When an applicable regulatory limit is more protective than the level included in this section, the more restrictive limit shall apply.

#### 7.2. Lead-Based Paint.

- **7.2.1.** Lead levels at or above federal regulatory limits pursuant to 40 C.F.R. § 745.65 are deemed hazardous: (1) lead-based paint on an existing painted surface—0.5 percent by weight or 1.0 milligrams per square centimeter; (2) dust on floors—40 micrograms of lead per square foot of settled dust ( $\mu$ g/ft²); (3) dust on interior window sills—250  $\mu$ g/ft²; (4) dust on window troughs (wells)—400  $\mu$ g/ft²; (5) bare soil in children's play areas—400 parts per million (ppm) of lead; and (6) bare soil in areas of the yard that are not children's play areas—1,200 ppm.
- **7.2.2.** Painted surfaces shall be maintained intact. With the exception of paint that is tested and found not to contain lead-based paint in accordance with 40 C.F.R. § 745.82(a), deteriorated paint at a property built before 1978 shall be repaired in accordance with the renovation requirements of 40 C.F.R. § 745 Subpart E, and the underlying cause of the deterioration shall be corrected.
- **7.2.3.** All renovation, repair, and painting work that disturbs a painted surface in a pre-1978 dwelling shall be performed in accordance with the renovation requirements of 40 C.F.R. § 745, Subpart E, unless the paint has been tested and found not to contain lead-based paint in accordance with 40 C.F.R. § 745.82(a). Dust clearance testing shall be performed at the conclusion of renovation work.
- **7.2.4.** With the exception of paint that is tested and found not to contain lead-based paint in accordance with 40 C.F.R. § 745.82(a), a painted surface shall not be disturbed using methods that involve (1) open-flame burning or torching or operating a heat gun at temperatures above a maximum of 1,100° F (593° C); or (2) power sanding, grinding, power planing, needle gun, abrasive blasting, or sandblasting unless such machines have shrouds or containment systems and a High-Efficiency Particulate Air (HEPA) vacuum attachment that collects dust and debris at the point of generation. The shroud or containment system shall release no visible dust or air outside the shroud or containment system.
- 7.2.5. Lead-based paint shall not be applied to the interior or exterior surface of any dwelling or dwelling unit.

# Stretch Provision:

Lead present at or above the following limits is deemed hazardous: (1) lead-based paint on a friction, impact, or chewable surface, damaged or otherwise deteriorated, or non-intact—0.06 percent by weight; (2) dust on floors—10 micrograms of lead per square foot of settled dust (μg/ft²); (3) dust on interior window sills—100 μg/ft²; and (4) 40 μg/ft² on porches.

#### 7.3. Asbestos.

Every owner shall maintain in good repair all asbestos-containing material on the premises. All asbestos-containing material shall be maintained non-friable and free from any defects such as holes, cracks, tears, and/or looseness that may allow the release of fibers into the environment.

- **7.3.1.** Friable asbestos-containing material shall be abated by licensed asbestos professionals in accordance with federal, state, or local requirements.
- **7.3.2.** Any renovation, demolition, or other activity that will disturb asbestos-containing materials shall be preceded by asbestos abatement performed by certified asbestos professionals in accordance with federal, state, or local requirements.

**7.3.3.** Abatement, removal, and disposal of all asbestos-containing material shall comply with all appropriate federal, state, and local requirements.

## 7.4. Toxic Substances in Manufactured Building Materials.

- **7.4.1.** Building materials consisting of hardwood plywood, medium-density fiberboard, and particleboard as defined by 15 U.S.C. 2697(b)(2) shall not be used in maintenance and renovations within dwellings, unless the materials have been certified to meet the formaldehyde emission standards of 15 U.S.C. 2697(b)(2):
- (1) Hardwood plywood with a veneer core, 0.05 parts per million (ppm);
- (2) Hardwood plywood with a composite core, 0.05 ppm;
- (3) Medium-density fiberboard, 0.11 ppm;
- (4) Thin medium-density fiberboard, 0.13 ppm; and
- (5) Particleboard, 0.09 ppm.
- **7.4.2.** Building materials used in maintenance and renovations, including but not limited to paints, coatings, primers, glues, resins, adhesives, and floor coverings, shall be certified as having no volatile organic chemicals (VOCs) or low VOC emissions, and having no halogenated flame retardants (HFRs).

#### 7.5. Radon.

Radon present at levels at or above the EPA action level of four picocuries radon per liter of air (pCi/L) in the lowest habitable level of the dwelling shall be deemed hazardous. Radon levels shall be determined by an approved testing method in accordance with state and local requirements. Radon levels exceeding four pCi/L shall be mitigated by a qualified radon mitigation professional who meets state and local requirements. If there are no state or local requirements qualifying radon testing and mitigation professionals, radon testing and mitigation shall be performed by a professional certified by a national private-sector radon proficiency program.

# Stretch Provision:

• Radon present at levels at or above two pCi/L in the lowest habitable level of the dwelling shall be deemed hazardous. Radon determined by an approved testing method to exceed two pCi/L shall be mitigated by qualified radon mitigation professionals in accordance with state and local requirements. If there are no state or local requirements qualifying radon testing and mitigation professionals, radon testing and mitigation shall be performed by a professional certified by a national private-sector radon proficiency program.

#### 7.6. Pesticides.

Pesticides shall only be used in accordance with IPM methods discussed in Section 6.3, using the least toxic pesticide with demonstrated efficacy for the identified pest.

- **7.6.1.** Pesticides shall be applied only in areas and at concentrations which comply with manufacturer specifications. When it is determined by an approved method that a hazardous amount of a pesticide has been applied in a location or at a concentration contrary to manufacturer specifications, the hazard shall be immediately mitigated.
- **7.6.2.** Pesticides shall be stored and disposed in accordance with manufacturer specifications.

#### 7.7. Methamphetamine.

A dwelling that has been used for methamphetamine manufacture shall be vacated until certified by an approved testing method as safe from hazardous materials related to the methamphetamine manufacturing process.

#### 7.8. Smoke in Multifamily Housing.

- **7.8.1.** Smoking shall be prohibited in all indoor common areas of multifamily buildings.
- **7.8.2.** Smoking shall be prohibited in exterior areas less than 25 feet (762 cm) from building entrances, outdoor air intakes, and operable windows.

- **7.8.3.** Tenants and prospective tenants shall be informed in writing of any applicable smoke-free policy and the location of designated smoke-free and smoking areas. Signs shall be posted in all designated areas.
- **7.8.4.** Tenants who terminate a lease early due to incursion of tobacco smoke or the inception of a smoke-free policy shall be exempt from early termination penalties or security deposit forfeiture.

- A property-wide policy shall be established in consultation with current tenants to designate exterior common areas where smoking shall be prohibited and areas where smoking shall be permitted.
- A property-wide policy shall be established in consultation with current tenants to designate dwelling units where tobacco smoking shall be prohibited.

# **Definitions**

**Accessory structure** shall mean a detached structure, such as garage or shed, that is subordinate to the principal building(s) on the same premises.

**Adequate** shall mean sufficient to accomplish the purpose intended without unreasonable risk to human health or safety.

**Approved** shall mean established by the local or state authority having such administrative authority or determined by the designated official.

**Asbestos** shall mean chrysotile, amosite, crocidolite; or, in fibrous form, tremolite asbestos, anthophyllite asbestos, or actinolite asbestos.

**Asbestos-containing material** shall mean any material or product containing more than one percent asbestos.

**Backdrafting** shall mean improper venting of combustion appliances that causes combustion by-products or other gases to enter the indoor environment rather than to exhaust outdoors.

**Balusters** shall mean pillars or columns in a series supporting a rail or guard.

**Basement** shall mean a portion of a building located partly or entirely below grade.

**Biological agent** shall mean but not be limited to mold, infestation, human and animal waste, wastewater, sewage, rotting material, and accumulation of trash that may harbor viruses, parasites, fungi, and/or bacteria.

**Bulk storage container** shall mean a metal trash container that is more than 40 inches (102 cm) in height, has a capacity of more than two cubic yards (1.5 m³), and is equipped with fittings for hydraulic and/or mechanical emptying, unloading, and/or removal.

**Carbon monoxide alarm** shall mean an electronic device that measures the level of carbon monoxide gas in the air and is equipped with a sensor that activates an audible alarm when an amount of carbon monoxide above the device's threshold level accumulates in the area in which the alarm is located.

**Chemical agent** shall mean chemicals that have the potential to cause adverse health effects.

**Chimney** shall mean a vertical masonry shaft of reinforced concrete or other approved noncombustible, heat-resisting material enclosing one or more flues, to remove products of combustion from solid, liquid, or gaseous fuel.

Class ABC fire extinguisher shall mean a fire extinguisher capable of putting out (1) fires in ordinary combustible materials, such as wood, cloth, paper, rubber, and many plastics (Class A); (2) fires in flammable liquids, combustible liquids, petroleum greases, tars, oils, oil-based paints, solvents, lacquers, alcohols, and flammable gases (Class B); and (3) fires that involve energized electrical equipment (Class C).

**Cleanable** shall mean moisture-resistant, free from cracks, pitting, chips, or tears, and designed to be cleaned frequently.

**Climate Zone 1** shall mean the geographic region designated by the International Energy Conservation Code that receives each year at least 5,000 cooling degree days, which are calculated by multiplying temperature differences above 50 degrees Fahrenheit by the amount of time such higher temperatures are reached

**Common areas** shall mean areas within multifamily housing that are designated for use by all occupants, owners, tenants, or users of a building or building complex, including but not limited to corridors, hallways, lobbies, parking areas, laundry rooms, recreational spaces, pools, and exterior property.

**Dwelling** shall mean any building wholly or partly used or intended to be used for living, sleeping, cooking, and eating.

**Dwelling unit** shall mean a room or group of rooms used or intended to be used for living, sleeping, cooking, and eating by one or more individuals living together as a single household.

**Egress** shall mean the path available for a person to leave a building. This route shall be unobstructed, and doors along this route cannot be subject to locking from the side to which people will be leaving.

**Electrical system** shall mean a system that makes electricity available in a building and distributes it through outlets and lighting fixtures for occupant use.

**Emergency escape and rescue opening** shall mean an operable window, door, or other similar device that provides for a means of escape and access for rescue in the event of an emergency.

**Flue** shall mean a conduit made of non-combustible heat-resisting material that is used to remove the products of combustion from solid, liquid, or gaseous fuel.

**Formaldehyde** shall mean the colorless, flammable carcinogenic chemical, an organic compound with the formula HCHO, which is used in the manufacture of building materials (e.g., pressed wood products) and household products. Federal limits for formaldehyde emissions from building materials (hardwood plywood, medium-density fiberboard, and particleboard) were established in 15 U.S.C. 2697(b) (2).

**Friable** shall mean asbestos-containing material that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

**Grade** shall mean the finished ground level adjoining building at all exterior walls.

**Graywater system** shall mean a system for collecting household waste water from plumbing fixtures other than toilets and treating it for non-potable reuse.

**Guard** shall mean a building component or a system of building components located near the open sides of elevated walking surfaces or adjacent to a window that minimizes the possibility of a fall from the walking surface or window to the lower level.

**Habitable room** shall mean an enclosed floor space used or intended to be used for living, sleeping, cooking, or eating, and excluding bathrooms, toilet rooms, laundries, furnace rooms, pantries, kitchenettes, utility rooms, foyers, communicating corridors, stairways, closets, storage spaces, workshops, or rooms with less than 70 ft<sup>2</sup> (6.5 m<sup>2</sup>) of floor space.

**Handrail** shall mean a horizontal or sloping rail intended for grasping by the hand for guidance or support.

**Harborage** shall mean any conditions or place where pests can obtain water or food, nest, or obtain shelter.

**Healthy**: See "safe and healthy."

**Heating system** shall mean facilities that, for the purpose of maintaining thermal comfort during cold weather, heat air or water through a furnace or heat pump and distribute such heat through vents, ducts, pipes, or radiators, or hardwired electrical heaters. Neither a cooking appliance nor a portable, unvented fuel-burning space heater is a heating system.

**Infestation** shall mean the recurrent presence of any life stages of a pest that presents a hazard to humans, property, or the environment.

**Insects** shall mean all species of classes of Arachnida and Insecta (Hexapoda) of the phylum Arthropoda and includes but is not limited to flies, mosquitoes, bed bugs, crickets, cockroaches, moths, bees, wasps, hornets, fleas, lice, beetles, weevils, gnats, ants, termites, mites, ticks, spiders, and scorpions.

**Integrated pest management** shall mean a systematic strategy for managing pests that consists of prevention, exclusion, monitoring, and suppression of pests. Where chemical pesticides are necessary, a preference is given to materials and methods that maximize safety and reduce environmental health risk. Methods to manage pests include eliminating their harborage places; removing or making inaccessible their food and water sources: routine inspection and monitoring; identification of evidence found; treatment that is scaled to and designed for the infestation; using the least-toxic pesticide for the identified pest; and follow-up inspection until the infestation is gone. Low-toxicity pesticide products are labeled with the signal word of CAUTION while WARNING, DANGER, and POISON indicate higher levels of toxins.

L<sub>dn</sub> (day-night equivalent sound level) shall mean a weighted average sound level measured over a 24-hour period with adjustments anticipating reduced levels during evening and night hours to factor occupants' extra sensitivity to noise during those time periods.

**LA**<sub>eq</sub> shall mean an average sound level measured over a specified period.

**Lead-based paint** shall mean equal to or greater than 1.0 milligram lead per square centimeter or 0.5 percent lead by weight for existing surfaces, paint, or other surface coatings, and equal to or greater than 90 parts per million (ppm) or .009 percent lead for paint and other surface coatings at the point of purchase.

**Lead-based paint hazard** shall mean any deteriorated lead-based paint, dust-lead hazard, soil-lead hazard, lead-based paint present on chewable surfaces with teeth marks, or lead-based paint present on friction surfaces, in accordance with 40 C.F.R.§ 745.65.

**Let** shall mean to lease or grant the use and possession of real property whether or not for compensation.

**Long-lasting** battery shall mean a battery having a life of ten or more years.

**Methamphetamine** shall mean the synthetic drug with more rapid and lasting effects than amphetamine, sometimes used or manufactured illegally as a stimulant.

**Mixed-humid climate** shall mean a region that receives more than 20 inches (50 cm) of annual precipitation, has approximately 5,400 heating degree days (65° F or 18° C basis) or fewer, and where the average monthly outdoor temperature drops below 45° F (7° C) during the winter months. The U.S. counties located in a warm-humid climate are identified by Building America.

**Mold** shall mean a growth that a fungus produces on damp or decaying organic matter or on living organisms.

**Multifamily housing** shall mean any dwelling containing more than two dwelling units.

**Occupant** shall mean any individual living, sleeping, cooking, or eating in and having possession of a dwelling or dwelling unit.

**Owner** shall mean any person who alone, jointly, or severally with others, has legal title to the premises, dwelling, or dwelling unit, with or without accompanying actual possession thereof; has charge, care, or control of any premises, dwelling, or dwelling unit, as owner, agent of the owner, or other person; is executor, administrator, trustee, or guardian of the estate of the owner; is a mortgagee in possession; or is the senior officer or trustee of the association of unit owners of a condominium.

**Person** shall mean any individual, firm, corporation and its officers, association, partnership, cooperative, trustee, executor of an estate, governmental agency, or any other legal entity recognized by law.

**Pesticide** shall mean any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant, or desiccant.

**Pests** shall mean insects, rodents, or other vermin.

**Plumbing** shall mean and include any and all of the following facilities and equipment: water pipes, garbage disposal units, waste pipes, toilets, sinks, bathtubs, shower baths, catch basins, drains, vents, installed clothes washing machines and dishwashers, and any other supplied plumbing fixtures, together with all connections to water, sewer, or gas lines.

**Potable water** shall mean water that complies with the maximum contaminant limits of the United States Environmental Protection Agency (EPA) or a regulatory limit that is more protective than EPA's.

**Premises** shall mean a lot or parcel of land or plot of land, either occupied or unoccupied by any dwelling, and includes any such building, accessory structure, or other structure thereon

**Privacy** shall mean the existence of conditions that permit an individual or individuals to be without observation, interruption, or interference by unwanted individuals.

**Properly connected** shall mean installed in accordance with all applicable codes and ordinances, and in good working order and not constituting a hazard to life or health.

**Radon** shall mean the odorless, tasteless, and invisible gas found in both outdoor air and indoor air that is a form of ionizing radiation produced by the decay of uranium in soil and water.

**Recyclable materials** shall mean disposable products composed of glass, metal, paper, plastic, and similar content that can be processed to produce a new supply of the same material or be reused in the production of other materials.

**Riser** shall mean the vertical surface that connects one tread of a step or stair to the next.

**Rodent** shall mean any member of the order Rodentia, including but not limited to field and wood mice, wood rats, squirrels, woodchucks, gophers, Norway rats (*Rattus norvegicus*), roof rats (*Rattus rattus*), and house mice (*Mus musculus*).

**Safe and healthy** shall mean the condition of being free from danger and chemical, biological, and physical agents that may cause injury, disease, or death; and fit for human occupancy.

**Smoke** shall mean emissions from a lighted pipe, cigar, cigarette, hookah, weed, herbs, or any other lighted biomass-burning substances such as but not limited to tobacco, marijuana, and incense.

**Smoke detector** shall mean a device that is equipped to activate an audible alarm when it detects the presence of combustion products in air.

**Space heater** shall mean a self-contained convection or radiant heater designed to heat a room, two adjoining rooms, or some other limited space or area.

**Supplied** shall mean paid for, furnished by, provided by, or under the control of the owner or operator.

**Toilet room** shall mean a room containing a water closet or urinal but not necessarily a bathtub or shower.

**Trash** shall mean garbage, refuse, or ashes.

**Trash container** shall mean a container with a tight-fitting lid that is constructed of metal or other durable material that is impervious to rodents, insects, and handling stress; and is capable of being filled, emptied, and cleaned without creating unsanitary conditions.

**Tread** shall mean the horizontal surface of a step or stair.

**Unblockable drain** shall mean a pool, spa, or whirlpool drain of any size and shape that a human body cannot sufficiently block to create a suction entrapment hazard.

**Ventilation system** shall mean the natural or mechanical process of supplying or removing conditioned or unconditioned air to or from a space.

**Volatile organic compounds**, or VOCs, shall mean organic chemical compounds whose composition makes it possible for them to evaporate under normal indoor atmospheric conditions of temperature and pressure.

**Walk-off mat** shall mean a coarse-ribbed or plushsurfaced mat with nonslip backing placed inside or just outside building entrances designed to capture dirt, water, and other materials tracked inside by people and equipment.

**Warm-humid climate** shall mean the region where either of the following conditions occurs: (1) 67° F (19.4° C) or higher wet bulb temperature for 3,000 or more hours during the warmest six consecutive months of the year; or (2) 73° F (22.8° C) or higher wet bulb temperature for 1,500 or more hours during

the warmest six consecutive months of the year. The U.S. counties located in a warm-humid climate are identified in Figure 301.1 and Table 301.1 of the 2012 International Energy Conservation Code.

**Waterproof** shall mean impervious to water.

**Watertight** shall mean closely sealed, fastened, or fitted so that no water enters or passes through the surface.

**Weathertight** shall mean secure against penetration by air, wind, rain, snow, and other weather conditions.

#### **Interpretation of Terms:**

Where the words "dwelling," "dwelling unit," "premises," and "structure," or a particular building component are used in this Standard, they shall be construed as if they were followed by the words "or any part thereof." Words used in the singular include the plural, and the plural the singular.