2015 CODE AND COMMENTARY

The complete IPMC with commentary after each section
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PREFACE

The principal purpose of the Commentary is to provide a basic volume of knowledge and facts relating to existing structures as it pertains to the regulations regarding property maintenance set forth in the 2015 International Property Maintenance Code. The person who is serious about effectively regulating property maintenance will find the Commentary to be a reliable data source and reference to almost all aspects of property maintenance.

As a follow-up to the International Property Maintenance Code, we offer a companion document, the International Property Maintenance Code and Commentary. The basic appeal of the Commentary is that it provides in a small package and at reasonable cost thorough coverage of many issues likely to be dealt with when using the International Property Maintenance Code, then supplements that coverage with historical and technical background. Reference lists, information sources and bibliographies are also included.

Throughout all of this, strenuous effort has been made to keep the vast quantity of material accessible and its method of presentation useful. With a comprehensive yet concise summary of each section, the Commentary provides a convenient reference for property maintenance regulations. In the chapters that follow, discussions focus on the full meaning and implications of the code text. Guidelines suggest the most effective method of application, and the consequences of not adhering to the code text. Illustrations are provided to aid understanding; they do not necessarily illustrate the only methods of achieving code compliance.

The format of the Commentary includes the full text of each section, table and figure in the code, followed immediately by the commentary applicable to that text. As stated in the preface of the 2015 International Property Maintenance Code, the content of sections in the code that begin with a letter designation (i.e., [P]302.1) are maintained by another code development committee. Each section's narrative includes a statement of its objective and intent, and usually includes a discussion about why the requirement commands the conditions set forth. Code text and commentary text are easily distinguished from each other. All code text is shown as it appears in the International Property Maintenance Code, and all commentary is indented below the code text and begins with the symbol •.

Readers should note that the Commentary is to be used in conjunction with the International Property Maintenance Code and not as a substitute for the code. The Commentary is advisory only; the code official alone possesses the authority and responsibility for interpreting the code.

Comments and recommendations are encouraged, for through your input, we can improve future editions. Please direct your comments to the Codes and Standards Development Department at the Chicago District Office.
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Chapter 1: Scope and Administration

General Comments

The law of building regulation is grounded on the police power of the state. This power is the source of all authority to enact building regulations. In terms of how it is used, police power is the power of the state to legislate for the general welfare of its citizens. This power enables the passage of laws such as a property maintenance code. It is from the police power delegated by the state legislature that local governments are able to enact building regulations. If the state legislature has limited this power in any way, the municipality may not exceed these limitations. While the municipality may not further delegate its police power (e.g., by delegating the burden of determining code compliance to the building owner, contractor or architect), it may turn over the administration of building regulations to a municipal official, such as a code official, provided that he or she is given sufficient criteria to clearly establish the basis for decisions as to whether a proposed building conforms to the code.

Chapter 1 is largely concerned with maintaining “due process of law” in enforcing the provisions contained in the body of the code. Only through careful observation of the administrative provisions can the code official reasonably hope to demonstrate that “equal protection under the law” has been provided. While it is generally assumed that the administrative and enforcement sections of a code are geared toward the responsibilities of the code official, the provisions also establish the rights and privileges of the design professional, contractor and building owner.

Purpose

Chapter 1 establishes the necessary legal basis for enforcement of the code by the authority having jurisdiction. All of the police powers inherent in enforcing minimum standards for the use and maintenance of buildings must follow the line of authority, from the U.S. Constitution to the state to the actual enforcer. Chapter 1 defines the role and responsibilities of the authority having jurisdiction. To protect all parties from unfair enforcement action, this chapter also sets forth the due process that requires corrective actions to be accomplished in a constitutional manner. Police powers are not unlimited, and this chapter identifies those limitations.

PART 1 — SCOPE AND APPLICATION

SECTION 101 GENERAL

This section sets forth the scope and intent of the code as it applies to existing structures.

[A] 101.1 Title. These regulations shall be known as the International Property Maintenance Code of [NAME OF JURISDICTION], hereafter referred to as “this code.”

The purpose of this section is to identify the adopted regulations by inserting the name of the adopting jurisdiction into the code.

[A] 101.2 Scope. The provisions of this code shall apply to all existing residential and nonresidential structures and all existing premises and constitute minimum requirements and standards for premises, structures, equipment and facilities for light, ventilation, space, heating, sanitation, protection from the elements, a reasonable level of safety from fire and other hazards, and for a reasonable level of sanitary maintenance; the responsibility of owners, an owner’s authorized agent, operators and occupant; the occupancy of existing structures and premises; and for enforcement and penalties.

This section establishes the broad purpose of the code—to protect the public health, safety and welfare in both existing residential and nonresidential structures and on all existing premises.

Four specific areas are addressed in greater detail in subsequent sections:

• Establishing minimum maintenance standards for such elements as basic equipment, light, ventilation, heating, sanitation and fire safety.
• Fixing responsibility among owners, operators and occupants for following the code.
• Regulating the use of existing structures and premises.
• Providing for administration, enforcement and penalties.

These four categories provide communities with the tools to reduce risks created by deteriorated or unsafe buildings and help communities upgrade and maintain other existing structures.

[A] 101.3 Intent. This code shall be construed to secure its expressed intent, which is to ensure public health, safety and welfare insofar as they are affected by the continued occupancy and maintenance of structures and premises. Existing structures and premises that do not comply with these provi-
sions shall be altered or repaired to provide a minimum level of health and safety as required herein.

- The code is intended to provide requirements addressing public safety, health, and welfare as they relate to the use and maintenance of existing structures and premises. The code requires existing structures and premises that are not in compliance with the code to be altered or repaired to meet the code. The code requirements are intended to represent the minimum standards for public health and safety. As required in Section 102.3, repairs and alterations need to comply with several International Codes® (I-Codes®), including the International Building Code® (IBC®).

[A.102.4 Severability. If a section, subsection, sentence, clause or phrase of this code is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this code.

- Only invalid sections of the code (as established by the court of jurisdiction) can be set aside. This is essential to safeguard the application of the code text to situations whereby a provision of the code is declared illegal or unconstitutional. This section would preserve the legislative action that put the legal provisions in place.

SECTION 102
APPLICABILITY

This section details how to use the code under various conditions.

[A.102.1 General. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall be applied. Where the conditions and differences occur between provisions of this code and the reference standards, the provisions of this code shall apply. Where, in a specific case, different sections of this code have different requirements, the most restrictive shall govern.

- The most restrictive requirement is to apply where there may be different requirements in the code for a specific situation. In contrast, the code establishes a specific requirement for a certain condition, that requirement is applicable even if it is less restrictive than a general requirement mentioned elsewhere in the code.

[A.102.2 Maintenance. Equipment, systems, devices and safeguards required by this code or a previous regulation or code with which the structure or premises was constructed, altered or repaired shall be maintained in good working order.

No owner, owner's authorized agent, operator or occupant shall cause any service, facility, equipment or utility that is required under this section to be removed, shut off or discontinued for any occupied dwelling, except for such temporary interruptions as are necessary while repairs or alterations are in progress. The requirements of this code are not intended to provide the basis for removal or abrogation of fire protection and safety systems and devices in existing structures. Except as otherwise specified herein, the owner or the owner's authorized agent shall be responsible for the maintenance of buildings, structures and premises.

- This section contains general maintenance requirements. The code specifically prohibits the discontinuance of any required utility that is required to be provided. This helps to safeguard persons who have a physical condition and are dependent on these systems. Some examples of this include: need to have electricity to power a kidney dialysis machine; a patient who is on an oxygen system full time; and someone with particularly bad allergies who needs to have an air-conditioning system to help filter the air. Any safety system that exists in a building must be maintained. A fire protection system cannot be removed from a building if it is required by the code.


- Repairs, additions or alterations are to be done as required by the IBC, the International Existing Building Code® (IEBC®), International Fuel Gas Code® (IFGC®), International Mechanical Code® (IMC®), International Residential Code® (IRC®) and the International Plumbing Code® (IPC®). The International Property Maintenance Code® (IPMC®) is intended to effect any changes to requirements in the International Zoning Code® (IZC®).

[A.102.4 Existing remedies. These provisions in this code shall not be construed as additional legal interpretations of the jurisdiction or its officers or agents relating to the removal or demolition of any structure that is dangerous, unsafe or insanitary.

- Section 110 establishes one set of criteria and procedures that may be used to demolish dangerous, unsafe or insanitary buildings. This section permits a jurisdiction to continue to use any remedies already adopted for demolishing buildings. In essence, a community may employ several procedures for removing dangerous buildings. It is up to the jurisdiction to choose which procedure is best for its community and to ensure that one procedure is not chosen over another to avoid confusion and errors in processing the demolition.
SECTION 103
DEPARTMENT OF PROPERTY MAINTENANCE INSPECTION

[103.1 General. The department of property maintenance inspection is hereby created and the executive official in charge thereof shall be known as the code official.]

[103.2 Appointment. The code official shall be appointed by the chief appointing authority of the jurisdiction.]

[103.3 Deputies. In accordance with the prescribed procedures of this section and with the concurrence of the appointing authority, the code official shall have the authority to appoint a deputy(s). Such employees shall have powers as delegated by the code official.]

[103.4 Liability. The code official, member of the board of appeals or employee charged with the enforcement of this code, while acting for the jurisdiction and without malice in the discharge of the duties required by this code or any other pertinent law or ordinance, shall not be held responsible civilly or criminally personally, and is hereby relieved from all personal liability for any damage accruing to persons or property as a result of an act or by reason of an omission or omission of the code official.]

[103.4.1 Legal defense. Any suit or criminal complaint instituted against any officer or employee because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by the legal representative of the jurisdiction until the final termination of the proceedings. The code official or any subordinate shall not be liable for costs in an action, suit or proceeding that is instituted in pursuance of the provisions of this code.]

[103.4.2 Fees. The fees for activities and services performed by the department in providing inspection services under this code shall be as indicated in the following schedule.]

[SECTION 104 DUTIES AND POWERS OF THE CODE OFFICIAL]

[104.1 General. The code official is hereby authorized and directed to enforce the provisions of this code. The code official shall have the authority to interpret and to determine compliance with the code. Code compliance will not be binding on the jurisdiction, unless the qualified inspector is a certified member of the international association of property and environmental inspectors, except that the code official both to interpret and to determine compliance with the code. Code compliance will not be binding on the jurisdiction, unless the qualified inspector is a certified member of the international association of property and environmental inspectors, except that the code official both to interpret and to determine compliance with the code.]

[104.2 Inspections. The code official shall make all of the required inspections, or shall accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be in writing or signed by the code official and shall be submitted to the appropriate agency or by the responsible individual.]

[104.3 Right of entry. Where it is necessary to make an inspection of the premises covered by this code, the code official shall have the authority to enter the structure or premises at reasonable times to inspect or perform the duties imposed by this code, provided that if such structure or premises is occupied the code official shall present credentials to the owner, operator or the person in charge of the structure or premises and request entry.]

[104.4 Identification. The code official shall carry proper identification when inspecting structures or premises in the performance of duties under this code.]

FOR INSPECTIONS THAT CAN BE ACCOMPLISHED FROM WITHIN THE PUBLIC RIGHT-OF-WAY, SECOND, SUCH ACCESS MAY BE DENIED BY THE OWNER OR OCCUPANT. UNLESS THE INSPECTOR HAS REASONABLE CAUSE TO BELIEVE THAT A CODE VIOLATION EXISTS, ACCESS MAY BE UNATTAINABLE.
A 104.5 Notices and orders. The code official shall issue all notices or orders to ensure compliance with this code:

- An important element of code enforcement is the necessary advisement of deficiencies, which is accomplished through notices and orders. The code official is required to issue orders to abate illegal conditions or to ensure compliance with the code. Section 107 contains additional information for these notices.

A 104.6 Department records. The code official shall keep official records of all business and activities of the department specified in the provisions of this code. Such records shall be retained in the official records for the period required for retention of public records.

In keeping with the need for efficient business practices, the code official must keep official records pertaining to fees collected, inspections, notices and orders issued. Such documentation provides a valuable source of information if questions arise throughout the life of the building and its occupancy regarding outstanding existing code violations or conditions.

SECTION 105 APPROVAL

A 105.1 Modifications. Whenever there are practical difficulties involved in the provisions of this code, the code official shall have the authority to grant modifications for individual cases upon application of the owner or owner's authorized agent, provided the code official shall first find that special individual reason makes the strict letter of this code impractical, the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, life and fire safety requirements. The details of action granting modifications shall be recorded as amended in the department files.

- The code official may amend or make exceptions to the code as needed where strict compliance is impractical. Only the code official has the authority to grant modifications. Consideration of a particular difficulty is to be based on the application of the owner and a demonstration that the intent of the code is accomplished. This section is not intended to override the section of the code requiring the reviewing agent or code official to require only an increase in efficiency, safety or compliance.

A 105.2 Alternative materials, methods and equipment. The provisions of this code are not intended to prohibit the installation of any material or method of construction not specifically prescribed in this code, provided that any such alternative has been approved. An alternative material or method of construction is not approved where the code official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method, or design, or the use of the material, design or method of construction is not approved, the code official shall respond in writing, stating the reasons the alternative was not approved.

- The code is not intended to inhibit innovative ideas or technological advances. A comprehensive regulatory document cannot envision and then address all future innovations in the industry. As a result, the code must be applicable to and provide a basis for the approval of an increasing number of products, materials, systems and methods for which no code text or referenced standards exist. The fact that a material, product or method of construction is not officially described in the code is not an indication that its use is intended to be prohibited. The code official is expected to apply the code's general principles in approving materials, systems and methods that, while not anticipated by the drafters of the current code text, can be demonstrated to fulfill the requirements of the standard agency. The code official is responsible for determining if a requested alternative provides the equivalent level of protection of the public health, safety and welfare as required by the code. When the code official determines the alternate method is not at least equivalent to what the code prescribes for safety, durability, fire-resistance rating, etc., the code official shall be required to provide a written response to the submitter.

A 105.3 Required testing. Whenever there is insufficient evidence of compliance with this code, the code official shall require evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, the code official shall have the authority to require tests to be made as evidence of compliance at no expense to the jurisdiction.

- To provide the basis on which the code official can make a decision regarding an alternative material or type of equipment, sufficient technical data, test reports and documentation must be provided for evaluation by the code official. The code official must determine that the alternative equipment, material or construction method is equivalent to that required by the code, he or she is obligated to approve it. Any such approval cannot take the place of testing any requirements of the code. The burden of proof of equivalence lies with the applicant who proposes the use of alternative materials, equipment or methods.

A 105.3.1 Test methods. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the code official may permit to approve appropriate testing procedures performed by an approved agency.

- The code official must require the submission of any appropriate information and data to assist in the determination of equivalency. This information must be submitted before a permit will be issued. The type of information required includes test data in accordance with the referenced standards, evidence of compliance with the referenced standard specifications and design calculations. If test standard is available, the code official is required to propose the test procedures and submit them to the code official for review and approval. For example, ICC Evaluation Service (ICC-ES) has issued evaluation reports that would be particularly useful in providing the code official with the technical basis for evaluation and approval of new and innovative building materials and components. The use of such authoritative and credible research reports can greatly assist the code official by reducing the time-consuming engineering analysis necessary to review materials and products. Failure to adequately substantiate a request for the use of an alternative is very likely to be accompanied by a request to deny a required approval.

A 105.3.2 Test reports. Reports of tests shall be retained by the code official for the period required for retention of public records.

- The testing agency must be approved by the code official. The testing agency should have technical expertise, test equipment and quality assurance to properly conduct and report the necessary testing.

A 105.4 Used material and equipment. The use of used materials that meet the requirements of this code for new materials is permitted. Materials, equipment and devices shall not be used in new work or installations where, in the good judgment of the code official, it has been reconditioned and tested where necessary, placed in good and proper working condition and approved by the code official.

- The code criteria for materials and equipment have changed over the years. Evaluation of testing and materials technology has facilitated the development of new versions of older products, which may not be satisfactory. As a result, used materials are required to be evaluated in the same manner as new materials. Used (previously installed) materials and equipment must be equivalent to that required by the code if it is to be used again in a new installation.

A 105.5 Approved materials and equipment. Materials, equipment and devices approved by the code official shall be constructed and installed in accordance with such approval.

- The code is a compilation of criteria with which materials, equipment, devices and systems must comply to be suitable for a particular application. The code official has a duty to evaluate such materials, equipment, devices and systems for code compliance and, when compliance is determined, approve the same for use. The code official must be familiar with the code, and devices and systems must be constructed and installed in compliance with the code, and all conditions and limitations considered as a basis for, that applies. For example, the manufacturer's approval process is the same in the code and the code official must be aware of the code provisions. For example, if data to determine code compliance is required, such data should be in the form of test reports or engineering analysis and not simply taken from a sales brochure.

A 105.6 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from approved sources.

- When an alternative material or method is proposed for approval, the code official shall ensure that it is in compliance with the code. Reports submitted as evidence of this equivalency are required to be supplied by an approved source, meaning that the code official finds it reliable and accurate. The code official may be an example of an agency that provides research reports for alternative materials and methods.

SECTION 106 INSTALLATION

A 106.1 Unlawful acts. It shall be unlawful for a person, firm or corporation to be in conflict with or in violation of any of the provisions of this code.

- Violations of the code are prohibited. This is the basis for all citations and correction notices with regard to code violations.

A 106.2 Notice of violation. The code official shall serve a notice of violation or order in accordance with Section 107.

- The code official is required to notify the responsible party for violation of the code. The section that is allegedly being violated must be cited so that the responsible party can respond to the notice.
[A] 106.3 Prosecution of violation. Any person failing to comply with a notice of violation or order served in accordance with Section 107 shall be deemed guilty of a misdemeanor, or civil or criminal contempt as determined by the local municipality, and the violation shall be deemed a strict liability offense. If the notice of violation is not complied with, the code official shall institute the appropriate proceeding at law or in equity to restrain, correct or abate such violation, or to require the removal or termination of the unlawful occupancy of the structure in violation of the provisions of this code or of the order or direction made pursuant thereto. Any action taken by the authority having jurisdiction on such premises shall be charged against the property on which the structure is located and shall be a lien upon such real estate.

This section classifies a violation as a "strict liability offense," which is defined in Section 202 as: "there is no requirement that the person intended to violate the code or was negligent in doing so. All that is required is compliance that the notice of violation for correction was properly served and that the person failed to comply. This aids jurisdictions in prosecuting code violators. The code official must pursue, through the use of legal counsel of the jurisdiction, legal means to correct the violation. Any extensions of time for the violations to be voluntarily corrected must be for a reasonable, bona fide cause or the code official may be authorized to institute an action for the developer's actions. In general, it is better to have a standard time limitation for correction of violations. Departures from this standard may be for a clear and reasonable purpose, usually stated in writing by the violator. The code provides a mechanism for the municipality to recover costs sustained on a property through placing a lien on the property. For example, if an unbonded lot had to be mowed throughout the summer growing season, the cost of the mowing could be recovered through a lien on the property.

[A] 106.4 Violation penalties. Any person who shall violate any provision of this code, or fail to comply therewith, or with any of the requirements thereof, shall be prosecuted within the limits provided by state or local laws. Each day that a violation continues notice has been served shall be deemed a separate offense.

An adopting jurisdiction is permitted to assess penalties for violations of the code. The penalties include monetary fines, possible imprisonment. The severity of the fine or penalty is left to the jurisdiction to establish. The local jurisdiction, through its council and/or attorney or other administrative authority, will normally designate the range for the dollar amount of fines, however, the judge will determine the actual fine. This encourages support and agreement from all parties when enforcement action is taken. Fines should be large enough to discourage noncompliance with the code and to make inappropriate the violation being charged.

Each day a violation continues unabated after proper notice has been served is to be deemed a separate offense and may be charged as such. In general, it is better to correct the violations promptly and to require the building owner to correct the violations rather than risk exorbitant fines or imprisonment. Whether to cite violations on a daily basis is left to the policy decision and should be made in cooperation with the attorney who will prosecute the cases.

[A] 106.5 Abatement of violation. The imposition of the penalties described shall not preclude the legal officer of the jurisdiction from instituting appropriate action to restrain, correct or abate a violation, or to prevent illegal occupancy of a building, structure or premises, or to stop an illegal act, conduct, business or utilization of the building, structure or premises.

Despite the assessment of a penalty in the form of a fine or imprisonment against a violator, the violation itself must still be corrected. Failure to make the necessary corrections will result in the violator being subject to additional penalties as described in the preceding section.

SECTION 107
NOTICES AND ORDERS

[A] 107.1 Notice to person responsible. Whenever the code official determines that there has been a violation of this code or has grounds to believe that a violation has occurred, notice shall be given in writing in accordance with Sections 107 and 103 to the person responsible for the violation as specified in this code. Notices for condemnation proceedings shall also comply with Section 103.2.

Written notice must be given to the person responsible for the property (i.e., occupant) when the code official observes a violation of the code. When a property is condemned, the notice shall be given to the owner of the property. The notice must be in a form that will inform the person of the intent to vacate and vacate the structure.

A violation must be notified when a building is placed. This is important because both the person responsible and the owner can be charged with a violation of the code if they fail to vacate the structure.

It is also important for the code official to keep copies of all written notices issued. If the code official person responsible for the property or occupants fail to abide by a verbal order, the code official needs something more substantial to pursue any legal action. Therefore, the warning procedures are warranted, the code official will need a complete, chronologically written documentation of all notices and orders that have been issued.

[A] 107.2 Form. Such notice prescribed in Section 107.1 shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make all improvements required to bring the dwelling unit or structure into compliance with the provisions of this code.
5. Inform the property owner or owner's designated agent of the right to appeal.
6. Include a statement of the right to file a lien in accordance with Section 106.3.

The notice required by Section 107.1 must:

Be in writing.
A verbal notice is unreliable.
Clearly identify the property. The address of the property shall be sufficient if it is readily available. The legal description may be necessary when the address for the property is missing or if the land is vacant and lacks an address.
State why the notice is being issued, and identify what part of the code is being violated.
Include a correction order, and state what repairs need to be made to bring the property back into compliance with the code.
Allow a reasonable time for compliance. This is subjective. A reasonable time must not only include adequate time to allow owners to make repairs, but must also address the risk to the occupant and the community. For example, if a portion of a building is collapsing, the occupant may believe that a reasonable time to correct the damage should be several weeks or even months, however, a collapsing wall creates an immediate danger to the public. The code official should require completion of all repairs within a few days or, in extreme cases, in a matter of hours.
Provision the person responsible for the property with a notice of his or her right to seek modification of the order by appealing to a board of appeals according to Section 111.
Inform the person responsible for the property of his or her authority to file a lien upon such real estate that any action has been taken pursuant to Section 103.

[A] 107.3 Method of service. Such notice shall be deemed to have been served upon a person thereof if:

1. Delivered personally.
2. Sent by certified or first-class mail addressed to the last known address of the person.
3. If the notice is returned showing that the letter was not delivered, a copy thereof shall be posted in a conspicuous place in or about the structure affected by such notice.

Proper service of all notices is crucial. Improper or inadequate service can make satisfactory pursuit of enforcement impossible. Proper service requires one of the following methods:

1. Personal delivery to the owner or the responsible person designated by the owner. This is the most effective form of service. Usually, personal service is provided by a third party (i.e., a law enforcement officer or a licensed attorney). The code official or the sheriff's office in the jurisdiction where the person to be served resides.
2. Delivery by certified or registered mail addressed to the owner or the person's designated agent at the last known address, with a return receipt requested. This is a valid method of service, but sometimes it is not reliable. The owner may refuse to accept or ignore the service if he or she knows the purpose of the notice. Also, it may take 10 to 14 days before the official notice is posted by the post office that service could not be made. If the notice required the owner or owner's agent to correct something in a short time, the time for compliance may pass before the code official is aware the post office has not made the delivery.
3. If the certified or registered letter is returned as undelivered, posting a copy in an easy-to-see place in or about the structure will suffice. Since the code official must wait until the post office returns undelivered certified letters before they can be posted, this form of service is very time consuming.

All of the services noted above may be expensive and time consuming. In some cases, the code official may consider service to be valid if the notice was sent to the last known address of the owner or owner's agent by regular postage and the notice was returned by the post office. This method of service is obviously much cheaper and usually faster than waiting for the regular mail. However, it may not always be acceptable to the court system. The jurisdiction's attorney should be consulted to determine that the type of service is legally acceptable, reasonably cost effective and timely.

[A] 107.4 Unauthorized tampering. Signs, tags or seals posted or affixed by the code official shall not be mutilated, destroyed, altered or removed, without authorization from the code official.

This section states that tampering with signs, tags or seals posted at the property is a violation of the code.

[A] 107.5 Penalties. Penalties for noncompliance with orders and notices shall be as set forth in Section 106.4.

This section refers to Section 106.4, which establishes penalties for violating provisions of the code.

[A] 107.6 Transfer of ownership. It shall be unlawful for the current owner of a building or structure to have received a compliance order or upon whom a notice of violation has been served to sell, transfer, mortgage, lease or otherwise dispose of such dwelling unit or structure to another until the
provisions of the compliance order or notice of violation have been complied with, or until such owner or the owner's authorized agent shall have extinguished the grantees, transferee, mortgagee, or lessee, or a true copy of any compliance order or notice of violation issued by the code official and shall furnish the code official with a sworn statement from the grantees, transferee, mortgagee or lessee, acknowledging the receipt of such compliance order or notice of violation and fully accepting responsibility for the condition of the premises. The owner must provide the buyer with notice of pending violations by the code official with a signed, notarized receipt from the new transferee.

Determining the current owner of a building is a frustrating and difficult activity. To evade code enforcement action, owners will frequently transfer ownership of their property. This provision of the code permits the official to cite the sealer if he or she did not provide the code official with the required notification when the property was transferred; thus, even though the sealer may avoid complying with the outstanding violations, the property will still be charged with a violation for failing to provide proof that the transferee was aware of the pending orders.

SECTION 108

UNSAFE STRUCTURES AND EQUIPMENT

A. 108.1 General. When a structure or equipment is found by the code official to be unsafe, or when a structure is found unfit for human occupancy, or is found unlawful, such structure shall be condemned pursuant to the provisions of this code.

This section provides a brief description of conditions where the code official is given the authority to condemn an existing structure or equipment. Where a structure or equipment is “unsafe,” as described in the first paragraph of this section, that structure or equipment does not comply with the requirements of the code. The deficiencies are such that an unsafe condition or a condition that is unfit for human occupancy exists.

A. 108.1.1 Unsafe structures. An unsafe structure is one that is found to be dangerous to the health, safety, property or safety of the public or the occupants of the structure by not providing minimum safeguards to protect or warn occupants in the event of fire, or because such structure contains unsafe equipment or is so damaged, decayed, dilapidated, structurally unsafe or of such faulty construction or unsound (foundation, that partial or complete collapse is possible.

Any building that endangers life, health, safety or property is unsafe. A building is considered dangerous if it meets one or more of the following conditions:

- It lacks adequate fire protection, equipment or new fire equipment;
- It contains unsafe equipment;
- All or part of the building is likely to collapse.

Only structures with major defects or life-threatening conditions are considered unsafe. Minor defects, such as an inadequate number of electrical outlets or damaged plaster, do not necessarily create an unsafe structure, even though they are violations of the code.

A. 108.1.2 Unsafe equipment. Unsafe equipment includes any heater, boiler, heating equipment, elevator, moving staircase, electrical wiring or device, flammable liquid containers or other equipment on the premises or within the structure which is in such disrepair or condition that such equipment is a hazard to life, health, property or safety of the public or occupants of the premises or structure.

- Equipment may become unsafe when it is a hazard to life, health, property or safety.

The judgment of the code official is critical in determining when equipment should be deemed unsafe. If uncertain about appropriate enforcement action, he or she should seek additional expertise and advice and, if necessary, err on the side of safety.

A. 108.1.3 Unsafe structure for human occupancy. A structure is unfit for human occupancy whenever the code official finds that such structure is unsafe, unlawful, or because of the degree to which the structure is in disrepair or lacks maintenance, is insanitary, vermin or rat infested, contains filth and contamination, or lacks ventilation, illumination, sanitation or essential living facilities or other essential equipment of the kind specified by this code, or because the location of the structure constitutes a hazard to the occupants of the structure or to the public.

A building is unfit for occupancy if it is unsafe; unlawful; with insufficient maintenance to assure degree, in disrepair; insanitary; vermin or rat infested; found to contain filth; lacking essential equipment; or located such that it is unsafe for the occupants or the public.

The list of reasons for declaring a structure unfit requires subjective judgement. Because the consequences of declaring a structure unfit for occupancy are severe, the code official should carefully and thoroughly document all conditions contributing to that determination.

A. 108.1.4 Unlawful structure. An unlawful structure is one found in whole or in part to be occupied by more persons than permitted under this code, or was erected, altered or occupied contrary to this code.

An unlawful structure is one that has serious deficiencies such that an unsafe condition or a condition that is unfit for human occupancy exists. An unlawful structure does not mean one where there are criminal activities.
Open, vacant buildings are an attractive nuisance to children, a potential fire hazard, a harborage for cockroaches and potential home for insects. Vacant buildings also create a blighting influence within a community.

The code official is authorized to condemn as unfit those buildings that are vacant and open to trespass but not in danger of collapse. When the owner has been ordered to maintain the building in a safe condition, and fails to do so, the code official must secure the structure by contracting with a public or private agent to close up the building.

The costs for closing buildings are to be charged to the property in the form of a lien. Generally, once a lien has been filed against a property, it must be satisfied before the property can be sold. This section authorizes collection by any other legal process. It also allows collection by additional methods such as small claims judgments, collection agency actions and personal liens. This enhances the chances of cost recovery.

A. 108.2.1 Authority to disconnect service utilities.

The code official shall have the authority to disconnect utility service to the building, structure or system regulating the use of the building or system in accordance with the adopted codes and standards set forth in Section 102.7 in case of emergency where necessary to eliminate an immediate hazard to life or property or where such action is necessary to comply with the building or codes and standards. The code official shall notify the serving utility and, whenever possible, the owner or owners' authorized agent and occupant of the building or structure of the decision to disconnect prior to taking such action. If not notified prior to disconnection, the owner, owner's authorized agent, or occupant of the building or structure shall be given reasonable time to find other accommodations.

A. 108.4.1 Placard removal.

The code official shall remove the condensation placard whenever the defect or defects upon which the condensation and placarding action were based have been corrected or excused or when the presence of humidity, condensation, or moisture in the building or structure is corrected, or whenever the actual or potential danger to the building or structure or those in the proximity of any structure because of explosions, explosive fumes or gases, or operation of defective or dangerous equipment. The code official is hereby authorized and empowered to order and receive such amounts to vacate the premises forthwith. The code official shall be caused to be posted at each entrance to the structure a notice reading as follows: “This Structure Is Unsafe and Its Occupancy Has Been Prohibited by the Code Official.” It shall be unlawful for any person to enter such structure except for the purpose of securing the structure, making the required repairs, removing the hazardous condition or demolishing the same.

A. 108.5 Probable condemnation. Any occupied structure shall be condemned and placarded by the code official when it is determined that the building or structure is in danger of collapse. The code official shall be notified of the probable condemnation and that the building or structure is in violation of the code and subject to its penalties.

A. 108.6 Abatement methods. The owner, owner’s authorized agent, occupant or occupant of a building, premises or equipment deemed unsafe by the code official shall abate or cause to be abated or corrected such unsafe conditions either by repair, rehabilitation, modification or other approved corrective action.

A. 108.7 Recordation of condemnation. The code official shall cause a report to be filed on an unsafe condition. The report shall state the occupancy of the structure and the nature of the unsafe condition.

SECTION 109 EMERGENCY MEASURES

A. 109.1 Iniminent danger. When, in the opinion of the code official, there is iniminent danger of failure or collapse of a building or structure that endangers life, or when any structure or building is determined to be in such a state of disrepair that it has fallen and life is endangered by the occupation of the existing structure, or when there is an actual or potential danger to the building occupants or those in the proximity of any structure because of explosions, explosive fumes or gases, or operation of defective or dangerous equipment, the code official is hereby authorized and empowered to order and receive amounts to vacate the premises forthwith.

A. 109.4 Emergency repairs. For the purposes of this section, the code official shall employ the necessary labor and materials to perform the required work as expeditiously as possible.

A. 109.5 Costs of emergency repairs. Costs incurred in the performance of emergency work and in making repairs authorized by the code official shall be paid by the owner of the premises. The legal counsel of the jurisdiction shall institute appropriate action against the owner of the premises to recover such costs. The failure to pay such costs or to pay for the labor and materials used in the repair shall be recoverable in the same manner as work performed by the city or the code official.

A. 109.6 Hearing. Any person ordered to take emergency measures shall comply with such order forthwith. Any person aggrieved by such order may appeal the cause to the appeals board. The appeals board shall be authorized to determine whether the order shall be continued, modified or revoked.
It is imperative that appeals to an emergency order occur after the hazard has been abated, rather than before, to minimize the risk to the occupants, employees, clients and the public.

SECTION 110 DEMOLITION

A110.1 General. The code official shall order the owner or person authorized to carry out any premises upon which is located any structure, which in the code official’s or owner’s authorized agent judgment after review is so deteriorated or dilapidated as to become unsafe, unsanitary or otherwise unfit for human habitation or occupancy, and such that it is unreasonable to repair the structure; to demolish and remove such structure; or if such structure is capable of being made safe by repairs, to repair and make safe and sanitary, or to board up and hold for future repair or to demolish and remove the owner’s option, or where there has been a cessation of normal construction of any structure for a period of more than two years, the code official shall order the owner or owner’s authorized agent to demolish and remove such structure, or board up until future repair.

The governing body may sell any valuable or salvagable materials for the highest price obtainable. The costs of demolition are then to be deducted from any proceeds from the sale of salvage. If a surplus of funds remains, it is to be paid to the owner with an itemized expense and income account; however, if no surplus remains, this must also be reported.

SECTION 111 MEANS OF APPEAL

A111.1 Application for appeal. Any person directly affected by a decision of the code official or a notice or order issued under the code, may appeal to the right to appeal to the board of appeals, provided that the written application for appeal is filed within 20 days after the day the decision, notice or order was served. An application for appeal shall be based on a claim of error, of the decision or action of the code official.

A111.2 Disqualification of member. A member shall not hear an appeal in which that member has a personal, professional or financial interest.

A111.2.1 Alternate members. The chief appealing authority shall appoint not less than two alternate members who shall be called by the board chairman to hear appeals during the absence or disqualification of a member. Alternate members shall possess the qualifications required for board members.

A112.1 Chairman. The board shall annually select one of its members to serve as chairman.

A112.2 Authority to determine. The chairman may determine how hearing hearings are to be conducted. Additionally, this section provides that, although strict rules of evidence are not applicable, the information presented must be deemed relevant.

A112.3 Notice of hearing. The board shall, in due course, issue a notice of hearing.

A112.4 Secretary. The chief administrative officer shall designate a qualified person to serve as secretary to the board. The secretary shall file a detailed record of all proceedings.

A112.5 Compensation of members. Compensation of members shall be determined by law.

A113.1 Notice of meeting. The board shall meet upon notice from the chairman, within 20 days of the filing of an appeal or at regularly scheduled meetings.

A114.1 Notice of hearing. The board shall be open to the public. The appellant, the appellant’s representative, the code official and any person whose interests are affected shall be given an opportunity to be heard. A quorum shall consist of a majority of the board members.

A114.2 Procedure. The board shall adopt and make available to the public written procedures detailing how hearings are to be conducted. The procedures shall not require compliance with strict rules of evidence, however, the board shall mandate that relevant information be received.

A115.1 Postponed hearing. When the full board is not present to hear an appeal, either the appellant or the appellant’s representative shall have the right to request a postponement of the hearing.

A116.1 Board decision. The board shall modify or reverse any decision if there has been a violation of a majority of the total number of appeals.

A116.2 Concurring vote of a majority of the members present is required to modify or reverse the decision of the board.

A116.3 Records and copies. The records of the decision of the board shall be recorded. Copies shall be furnished to the appellant and to the code official.

A116.4 Request for an official record. The request of the appellant or the code official for an official record is made by the appellant or the code official.

A116.5 Compensation of members. Compensation of members shall be determined by law.

A117.1 Court review. Any person, whether or not a party to the appeal, shall have the right to apply to the court for a writ of certiorari to correct errors of appeal.
[A] 112.4 Failure to comply. Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be liable to a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars.

The local jurisdiction is to designate the fine that is to apply to any person who continues work that is at issue, other than abatement work. The dollar amounts for the minimum and maximum fines are to be specified in the adopting ordinance. See a sample adoption ordinance on pages xi and xii of the code.

SECTION 112
STOP WORK ORDER

[A] 112.1 Authority. Whenever the code official finds any work regulated by this code being performed in a manner contrary to the provisions of this code or in a dangerous or unsafe manner, the code official is authorized to issue a stop work order.

This section provides for the suspension of work for which a permit was issued, pending the removal or correction of a severe violation or unsafe condition identified by the code official. Normally, correction notices are used to inform the permit holder of code violations. Stop work orders are issued when enforcement can be accomplished in no other way or when a dangerous condition exists.

[A] 112.2 Issuance. A stop work order shall be in writing and shall be given to the owner of the property, to the owner's authorized agent, or to the person doing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order and the conditions under which the cited work is authorized to resume.

Upon receipt of a violation notice from the code official, all construction activities identified in the notice must immediately cease, except as expressly permitted to correct the violation.

[A] 112.3 Emergencies. Where an emergency exists, the code official shall then be required to give a written notice prior to stopping the work.

This section gives the code official the authority to stop the work in dispute immediately when, in his or her opinion, there is an unsafe emergency condition that has been created by the work. The need for the written notice is suspended for this situation so that the work can be stopped immediately. After the work is stopped, immediate measures should be taken to correct the work at issue.

Chapter 2:
Definitions

General Comments
The words or terms defined in this chapter are deemed to be of prime importance in either specifying the subject matter of code provisions or in giving meaning to certain terms used throughout the code for administrative or enforcement purposes.

Section 201 addresses the practical concerns encountered when interpreting the code in relation to the use of gender, tense and singular versus plural. This section also provides the code official with guidance for finding definitions of those words or terms not defined herein.

Section 202 provides an alphabetical listing of those terms that are commonly used throughout the code and that are required for the effective application of code requirements.

SECTION 201
GENERAL

201.1 Scope. Unless otherwise expressly stated, the following terms shall, for the purposes of this code, have the meanings shown in this chapter.

In the application of the code, the terms used have the meanings given in this chapter.

201.2 Interchangeability. Words stated in the present tense include the future; words stated in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.

While the definitions contained in this chapter are to be taken literally, gender and tense are to be considered interchangeable. This is so that any grammatical inconsistencies within the code text will not hinder the understanding or enforcement of the requirements.

201.3 Terms defined in other codes. Where terms are not defined in this code and are defined in the International Building Code, International Existing Building Code, International Fire Code, International Fuel Gas Code, International Mechanical Code, International Plumbing Code, International Residential Code, International Zoning Code or NFPA 70, such terms shall have the meanings ascribed to them as stated in those codes.

When a word or term appears in the code and that word or term is not defined in this chapter, other references may be used to find its definition. Including the International Building Code (IBC), International Fire Code (IFC), International Existing Building Code (IEBC), International Residential Code (IRC), International Fuel Gas Code (IFGC), International Plumbing Code (IPC), and the International Mechanical Code (IMC).

Codes, by their very nature, are technical documents. Every word, term and punctuation mark can alter a sentence's meaning and, if misused, muddy its intent.

Further, the code, with its broad scope of applicability, includes terms inherent in a variety of construction disciplines. These terms can often have multiple meanings depending on the context or discipline being used at the time.

For these reasons, it is necessary to maintain a consensus on the specific meaning of terms contained in the code. Chapter 2 performs this function by stating clearly what specific terms mean for the purpose of the code.

201.4 Terms not defined. Where terms are not defined through the methods authorized by this section, such terms shall have ordinarily accepted meanings such as the context implies.

Another resource for defining words or terms not defined herein or in other codes is their "ordinarily accepted meanings." The intent of this statement is that a dictionary definition may suffice, provided that the definition is in context.

Often, construction terms used throughout the code may not be defined in this chapter or in a dictionary. In such case, one would find the definitions contained in the referenced standards (see Chapter 8) and then to published textbooks on the subject in question.

201.5 Pairs. Whenever the words "dwelling unit," "dwellings," "premises," "building," "dwelling house," "dwelling unit," "dwelling units" or "dwelling" are stated in this code, they shall be construed as though they were followed by the words "or any part thereof.

Each and every portion of a structure, whether that structure is used for one type of occupancy or several, must comply with the appropriate regulations established by the code. It is understood that every portion
or any part of a structure must comply with the code. Instead of being wordy, "or any part thereof is considered to be included after "dwelling," building," house, "sleeping room," rooming unit," etc.

SECTION 202
GENERAL DEFINITIONS

ANCHORED. Secured in a manner that provides positive connection.

This description defines the term "anchored" for use in determining unsafe conditions related to exterior walls, flooring and flooring components, wall veneer and trim, overhangs and projections, stairs, porches and decks and foundation systems. Where it is apparent that a positive connection at these elements does not exist, the code official can cite the condition as unsafe and require repair as needed (see Sections 205.1 and 305.1).

[A] APPROVED. Reference to the code official.

As related to the process of acceptance of building installations, including materials, equipment and construction systems, this definition identifies where ultimate authority resides. Where this term is used, the intent is that only the enforcing authority can accept a specific installation or component as complying with the code.

BASEMENT. That portion of a building which is partly or completely below grade.

This definition defines that portion of a building that is partly or completely below grade as being a basement. In this case, "grade" refers to the finished ground level adjacent to the exterior walls at all points around the building perimeter.

BATHTUB. A receptacle containing plumbing fixtures including a bathtub or shower.

A bathtub is literally a room containing plumbing fixtures, which is used for personal hygiene.

To be considered a bathtub, such a room need only contain one or more bathtubs or showers. Traditionally, bathrooms are designed to afford privacy to an individual; however, such rooms may be designed to accommodate multiple users or bathers.

In everyday usage, the term is used interchangeably with toilet and shower (definition of "bathroom") and, in this context, people expect a bathtub to also contain plumbing fixtures used for the elimination of bodily wastes (water closets and urinals), and fixtures used for bodily cleansing, such as lavatories (sink).

The typical bathroom in residential occupancies contains a water closet, a lavatory and either a shower or a bathtub or a shower and a bathtub. A residential bathroom may also contain a bidet.

BEDROOM. Any room or space used or intended to be used for sleeping purposes in either a dwelling or sleeping unit.

A bedroom, also referred to as a "sleeping room," is an area or room used for sleeping purposes. A bedroom typically contains a bed or a piece of furniture, store clothing or a closet, although these are not required. Bedrooms may also be temporarily used for other purposes when containing food or dust- or dust-purpose furniture, such as daybeds or sleeper sofas. In any case, bedrooms must have sufficient floor space per person in order to inspect the building in accordance with all requirements of Section 404.4. The location and number of beds can be used to establish where people are sleeping and how many persons are occupying a dwelling at a given time.

[A] SOURCE. The official who is charged with the administration and enforcement of this code, or any duly authorized representative.

The statutory power to enforce the code is normally vested in a building department (or the like) of a state county or municipality whose designated enforcement officer is termed the "code official" (see commentary, Section 104).

CONDEMN. To adjudge unfit for occupancy.

To condemn is to pronounce a structure as unfit for occupancy purposes. A condition of condemnation is the result of the most serious code violations in that it represents a condition that, in the opinion of the code official, poses a serious threat to the health and safety of the public or another structure or property. A violation that results in condemnation is typically followed by citations requiring immediate action and, in the absence of such action, condemnation. Where condemnation is used, care must be taken to follow all of the provisions outlined in Sections 107 through 110 (new commentary, Section 108).

COST OF SUCH DEMOLITION OR EMERGENCY REPAIRS. The costs shall include the actual costs of the demolition or repair of the structure less revenues obtained if salvage was conducted prior to demolition or repair. Costs shall include, but be limited to, expenses incurred or necessitated related to demolition or emergency repairs, such as the cost of labor, equipment, materials, supervision, fees of inspectors, testing agencies or experts retained relative to the demolition or emergency repairs; costs of testing; costs of surveying; costs of hazardous waste disposal; and the cost of any services or materials purchased, in any manner, for the purpose of cleaning up the property or for damage assessment. The Code requirements are applicable to all dwellings, regardless of the type of ownership. Both owner-occupied and rental or leased dwellings must comply with the requirements of the code.

A dwelling unit can exist singularly as a one-family dwelling, or in combination with other dwelling units.

When two dwelling units are grouped together in the same structure, the structure is considered a two-family dwelling unless one or more dwelling units.

Z [EASEMENT. That portion of land or property reserved for present or future use by a person or agency other than the legal owner of the land or property.

Easements are not to be used for under, unlawful, and the usable area. The easement is considered an easement unless and until it has been definitely established. Unlawful and unaccounted for land or property must be paid for and recorded in the public records. The easements which are designed to provide access to a dwelling unit or other structure must be paid for and recorded in the public records. The easements are not to be used for any unlawful or unaccounted for land or property.

Easements are important mechanisms that allow the lawful, mutual, and voluntary access of others to public roads and public property. Easements are designed to provide access to public roads and public property. Easements are important mechanisms that allow the lawful, mutual, and voluntary access of others to public roads and public property. Easements are designed to provide access to public roads and public property. Easements are important mechanisms that allow the lawful, mutual, and voluntary access of others to public roads and public property. Easements are designed to provide access to public roads and public property.
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[BE] GUARD. A building component or a system of building components located at or near the open sides of elevated walking surfaces that minimizes the possibility of a fall from the walking surface to a lower level.

This is a term common to the IBC and IRC. Guards are sometimes mistakenly referred to as "guardrails." In actuality, the guard consists of the entire vertical portion of the building. In accordance with the Code, the purpose of guarding is to minimize the potential for falls at dropoffs adjacent to walking surfaces.

[BE] HABITABLE SPACE. A space in a structure for living, sleeping, eating or cooking. Bathrooms, toilet rooms, closets, halls, storage or utility spaces, and similar areas are not considered habitable space.

Habitable spaces are those spaces that are normally considered "inhabited" in the course of residential living and accommodate the four basic activities of living, sleeping, eating and cooking. Other spaces, such as halls or utility rooms, are not considered habitable space but would, in many instances, be considered occupiable space.

HISTORIC BUILDING. Any building or structure that is one or more of the following:
1. Listed or certified as eligible for listing, by the State Historic Preservation Officer or the Keeper of the National Register of Historic Places, in the National Register of Historic Places.
2. Designated as historic under an applicable state or local law.
3. Certified as a contributing resource within a National Register or state or locally designated historic district.

The definition gives specificity as to how a building is officially determined to be eligible for the various lists of historic buildings and structures. For example, the State Historical Preservation Office in cooperation with the Keeper of the National Register of Historic Places is the official process conducted in accordance with federal standards. This definition aligns the code language with the language of the official process and removes any ambiguity as to what can be determined as eligibly.

HOUSEKEEPING UNIT. A room or group of rooms forming a single habitable space equipped and intended to be used for living, sleeping, cooking and eating which does not contain, within such a unit, a toilet, lavatory and bathtub or shower.

Housekeeping units differ from a traditional dwelling unit, as defined in the IRC, in that the sanitary facilities are not contained within the unit.

IMMEDIATE DANGER. A condition which could cause serious injury or death at any time.

As used in the code, "immense danger refers to a condition that poses a threat or danger to the building occupants or persons in the proximity of a building or premises. Section 106 empowers the code official to vacate an occupied premises, order the closing of streets or take other emergency measures to safeguard the public until the condition is no longer threatening.

INFESTATION. The presence, within or contiguous to, a structure or premises of insects, rodents, vermin or other pests.

This definition is needed for the implementation of Sections 302.5 and 302.6. An infestation is the actual presence of live insects, rodents or pests. If the actual presence of pests cannot be readily confirmed, the presence of fresh droppings, larvae, eggs, rodent holes or other such evidence can identify a current infestation.

INOPERABLE MOTOR VEHICLE. A vehicle which cannot be driven upon the public streets for reason including but not limited to, unlicensed, wrecked, abandoned, in a state of disrepair, or incapable of being moved under its own power.

Motor vehicles that are in some stage of disrepair or disassembly are often the source of property maintenance complaints. This definition clearly identifies that vehicles which are unlicensed, wrecked, abandoned, in a state of disrepair or incapable of being moved under their own power are inoperable.

[LABELLED. Equipment, materials or products to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing organization, a building development agency or another organization concerned with product evaluation that measures periodic inspection of the production of the above labeled items and whose labeling indicates either that the equipment, material or product meets identified standards or has been listed and found suitable for a specified purpose.

When a product is labeled, the label indicates, first, that the material has been tested for conformance to an applicable standard and has been determined suitable for a specified purpose. Second, that the component is subject to third-party inspection to verify that the minimum quality of material required by the appropriate standard is met. The labeling provides a readily available source of information that is useful for field inspection of installed products. The label identifies the product or maker or labeler and includes information that can be further investigated if there is any question as to its suitability for the specific installation. The labeling agency performing the third-party inspection must be approved by the code official and be necessary to the capacity and capability of the agency to perform the specific testing and inspection.

While the code does not specifically state what information must be contained on the label, a usefully referenced standard often states the minimum identifying information required. The data contained on a label typically includes, but is not necessarily limited to, the name of the manufacturer, product name or serial number, installation specifications, applicable test standards, the testing agency, and the labeling agency.

LET FOR OCCUPANCY OR LET. To permit, provide or offer possession or occupancy of a dwelling, dwelling unit, rooming unit, building or structure by a person who is not the legal owner of record thereof, pursuant to a written or written lease, agreement or license, or pursuant to a recorded or unrecorded agreement of contract for the sale of land.

This definition refers to a legal term meaning to lease or convey real estate or property to someone other than the owners.

NEGLECT. The lack of proper maintenance for a building or structure.

This definition describes the term "neglect" for use in determining if a structure or premises is dangerous in accordance with Section 108.5. Where it is apparent that a structure or premises is dangerous due to neglect, the code official can cite the condition as unsafe and require repair as needed.

[OCCUPANCY. The purpose for which a building or portion thereof is utilized or occupied.

The occupancy classification of a building is an indication of the level of hazard to which the occupants are exposed as a function of the actual building use. Occupancies are divided into occupancy group classification, which is one of the primary considerations in the development and application of many code requirements designed to control specific hazards inherent to each occupancy group.

In enforcing the code, the approved occupancy of the building is generally established by the apparent use of the building.

OCCUPANT. Any individual living or sleeping in a building or having possession of a space within a building.

By definition, a person does not possess or control a space in order to be an occupant.

OPENABLE AREA. That part of a window, skylight or door which is available for unobstructed ventilation and which opens directly to the outdoors.

The openable area is the actual area of a window or door (gazed or unglazed) through which outside air will pass through the structure. The operable area should be measured when the window or door is in its full, open position. When determining operable area, only the space between the glass stops and sashes is to be measured. The areas of sashes, meeting rails, mullions and muntins is to be deducted (see Figure 402.1).

OPERATOR. Any person who has charge, care or control of a structure or premises which is let or offered for occupancy.

This definition is needed to distinguish the unique meaning of this term, as it is intended to be used in the code, from the ordinarily accepted meaning of the term. "operator." An operator may not be the owner, but may represent the owner in the care or control of a structure.

[O] OWNER. Any person, agent, operator, firm or corporation having legal or equitable interest in the property, or recorded in the official records of the county, state or municipality as holding legal or equitable interest in the property, or otherwise having control of the property, including the guardian of the estate of any such person, and the executor or administrator of the estate of such person if ordered to take possession of real property by a court.

This term defines the person or other legal entity responsible for a building and its compliance with code requirements.

PERSON. An individual, corporation, partnership or any other group acting as a unit.

A person can be an individual or group of individuals who have formed one of several types of business organizations. Corporations, partnerships and other types of business entities are treated as "persons" under the law. They are just as responsible as any individual for complying with the code and subject to the penalties established under local or state law (see Section 109.4).

PEST ELIMINATION. The control and elimination of insects, rodents or pests by eliminating their harborage places; by removing or making inaccessible materials that serve as their food or water; by other approved pest elimination methods.

This definition is needed since Section 309 requires the use of approved pest elimination methods that are not harmful to people.

[PREMISES. A lot, plot or parcel of land, easement or public way, including any structures thereon.

When this term is used in the code, it is intended that the entire lot and all of the structures thereon be included within the scope of that code requirement.

[PUBLIC WAY. Any street, alley or similar parcel of land essentially unobstructed from the ground to the sky, which is either a dedicated or otherwise permanently appropriated to the public for use.

This term describes the ground upon which the public will be allowed passage.

ROOMING HOUSE. A building arranged or occupied for living, sleeping, cooking and eating which does not occupy a one- or two-family dwelling.

A rooming house provides shelter and sleeping arrangements for individuals. This differs from other living arrangements in that the occupant shares a dwelling unit rather than having his or her own complete and private dwelling unit. Each person rents individually from the owner and does not occupy the structure as part of a family. In most cases, occupants share a bathroom and cooking facilities. Another term that could be used is "boarding house," and it would be...

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classified as an Occupancy Group R-1 or R-2, depending upon the permanent or transient nature of the occupants.

ROOMING UNIT. Any room or group of rooms forming a single habitable unit occupied or intended to be occupied for sleeping or living, but not for cooking purposes.

• Rooming units differ from dwelling units since no cooking facilities are located in any rooming unit. Rooming units contain only sleeping and living facilities.

RUDBISH. Combustible and noncombustible waste materials, except garbage, the term shall include the residue from the burning of wood, coal, coke and other combustible materials, paper, rags, cartons, boxes, wood, excelsior, rubber, leather, tree branches, yard trimmings, tin cans, metal, mineral, metal, glass, crockery and dust and other similar materials.

• The term is usually considered to be a synonym for similar terms such as "refuse" or "trash" and generally encompasses the broad range of worthless, discarded materials other than garbage. The term "garbage" is typically limited to describing wastes generated by food preparation operations.

[BG SLEEPING UNIT. A room or space in which people sleep, which can also include permanent provisions for living, eating and either sanitation or kitchen facilities, but not both. Such rooms and spaces that are also part of a dwelling unit are not sleeping units.

• This definition is included to coordinate the Fair Housing Act Guidelines with the code. The definition for "sleeping unit" is needed to clarify the difference between sleeping units and dwelling units. Some examples would be a hotel guestroom, a dormitory, a boarding house, etc. Another example would be an addition to a studio apartment with a kitchenette (i.e., microwave, sink, refrigerator). Since the sleeping arrangements are not permanent, this configuration would be considered a sleeping unit, not a dwelling unit. As already defined in the code, a dwelling unit must contain permanent facilities for living, sleeping, eating, cooking and sanitation.

STRICT LIABILITY OFFENSE. An offense in which the prosecution in a legal proceeding is not required to prove criminal intent as a part of its case. It is enough to prove that the defendant either did or did not commit an act which was prohibited, or failed to do an act which the defendant was legally required to do.

• This term, along with its usage in Section 106.3, brings the code in line with current legal terminology in regard to the prosecution of violations. With this term, a prosecutor is not required to prove that code violations were intended by a defendant or were even due to negligence. It is difficult to prove such intention or negligence in a court of law.

[A] STRUCTURE. That which is built or constructed or a portion thereof.

• This definition is intentionally broad so as to include within its scope, and therefore the scope of the code (see Section 101.2), everything that is built as an improvement to real property. The phrase "or a portion thereof" is included so that those words do not have to be inserted at each location in the code where a provision applies to only a portion of a structure.

TENANT. A person, corporation, partnership or group, whether or not the legal owner of record, occupying a building or portion thereof as a unit.

• This definition parallels that of the term "occupant" and makes it clear that, as used in the code, an owner-occupant is considered a tenant.

TOILET ROOM. A room containing a water closet or urinal but not a bathtub or shower.

• In the context of the code, a toilet room is a room that contains plumbing fixtures used for elimination of bodily wastes (water closets and urinals) and also includes fixtures used for handwashing (lavatories). Toilet rooms are typically associated with residential occupancies. Although sometimes used interchangeably with the term "bathroom" (see the definition of "Bathroom"), a toilet room contains only plumbing fixtures designed for waste elimination and handwashing. A toilet room becomes a bathroom when it contains a bathtub or shower.

ULTIMATE DEFORMATION. The deformation at which failure occurs and which shall be deemed to occur if the sustainable load reduces to 80 percent or less of the maximum strength.

• This definition describes the term "ultimate deformation" for use in determining unsafe conditions related to structural materials that may be beyond their limit state due to ultimate deformation. "Limit state" is a condition beyond which a structure or member becomes unfit for service and is no longer useful for its intended function. Where it is apparent that a material is beyond its limit state due to ultimate deformation, the code official can cite the condition as unsafe and require repair as needed (see Section 508.1.1).

[M] VENTILATION. The natural or mechanical process of supplying conditioned or unconditioned air to, or removing such air from, any space.

• Ventilation is the process of moving air to or from building spaces. This definition is used in this chapter to establish minimum levels of air movement within a building for the purposes of providing a healthful interior environment. Ventilation would include both natural (openable exterior windows and doors for wind movement) and mechanical (forced air with mechanical equipment) methods, when permitted by the code.

WORKMANLIKE. Executed in a skilled manner; e.g., generally, plumber's, level, square, in line, undamaged and without marling adjacent work.

• To be workmanlike, maintenance or repair work must be performed in a manner consistent with work done by a skilled craftsman. In general, floors should be level, walls plum and square and windows installed so that they operate easily and fit within the rough opening to exclude the elements. The use of proper tools, methods and materials is usually necessary for workmanlike repairs.

[Y] YARD. An open space on the same lot with a structure.

• Yard is similar to "exterior property" but pertains only to the open area on a lot with a structure. A vacant lot or property without a structure does not have a yard by this definition.

BIBLIOGRAPHY

The following resource materials were used in the preparation of the commentary for this chapter of the code:


Chapter 3: General Requirements

General Comments

The title for Chapter 3 ("General Requirements") indicates that it is broad in scope. It includes a variety of requirements for exterior property areas, as well as interior and exterior elements of the structure. Chapter 3 provides specific criteria for regulating the installation and maintenance of building components. This chapter also contains requirements regulating the safety, sanitation, and appearance of the interior and exterior of structures and all exterior property areas.

Section 301 identifies the scope of Chapter 3 as containing provisions for maintaining a structure and its exterior property areas, and establishes who is responsible for complying with the chapter's provisions. This section also provides minimum maintenance requirements for vacant structures and land.

Section 302 establishes criteria for maintaining exterior property areas and accessory structures and provides vehicle storage regulations.

Section 303 contains the requirements for swimming pools, spas, hot tubs, protective barriers and gates in these barriers.

Section 304 establishes maintenance requirements for the structural, weather resistance, sanitary and safety performance of the exterior of a structure.

Section 305 establishes maintenance requirements for the structural, sanitary and safety performance of the interior of a structure.

Section 306 contains provisions for maintaining components of a structure, as well as for determining unsafe conditions based on specific parameters.

Section 307 provides for the safety and maintenance of handrails and guardrails.

Sections 308 and 309 establish the responsible parties for exterminating insects and rodents, and maintaining sanitary conditions in various types of occupancies. When specific requirements are not provided in the code, the following three options for establishing the necessary criteria are available:

1. If the jurisdiction has already established criteria, the code official can continue to enforce that criteria.
2. The jurisdiction may adopt its own criteria and incorporate them as an amendment to the appropriate section of the code.
3. The code official may adopt and enforce criteria already established by the International Building Code® (IBC).

Inadequate sanitation and insect or rodent infestations can have a significant impact on a community. A poorly kept neighborhood affects the self-image of a community, as well as the impression neighboring communities and visitors have about the area. Responsible property owners and occupants may shy away from neighborhoods that look unkempt. As a result, property values decrease and the cycle can continue until the neighborhood is considered a slum.

An area that is neat, clean and well maintained attracts owners and occupants who are usually willing to keep the area attractive, f to protect their own interests. The code official, with vigorous enforcement of sanitation and extermination regulations, can help a community maintain a positive self-image. This creates a favorable image to the rest of the community and its visitors.

Purpose

Chapter 3 provides requirements that are intended to maintain a minimum level of safety and sanitation for both the general public and the occupants of a structure, and to maintain a building's structural and weather-resistant performance.

SECTION 301

GENERAL

301.1 Scope. The provisions of this chapter shall govern the minimum conditions and the responsibilities of persons for maintenance of structures, equipment and exterior property.

This chapter establishes minimum requirements for maintenance of property areas, premises and structures. The code deals with all types and all ages of structures; therefore, the criteria must be of a minimum nature, consistent with a reasonable level of protection for the health and safety of the occupants.

301.2 Responsibility. The owner of the premises shall maintain the structures and exterior property in compliance with these requirements, except as otherwise provided for in this code. A person shall not occupy an owner-occupied or permit another person to occupy premises that are not in a sanitary and safe condition and that do not comply with the require-
GENERAL REQUIREMENTS

ments of this chapter. Occupants of a dwelling unit, roaming unit or housekeeping unit are responsible for keeping in a clean and sanitary condition of that part of the dwelling unit, roaming unit, housekeeping unit or premises which they occupy and control.

The owner is responsible for complying with the requirements of this chapter, except when the code places the responsibility on the occupants to keep their portion of the premises in a safe and sanitary condition.

Simply stated, owners must provide a safe and sanitary property and premises when they let it for occupancy. Occupants must maintain it safe and sanitary while they occupy, control or use the property and premises.

301.3 Vacant structures and land. Vacant structures and premises thereof or vacant land shall be maintained in a clean, safe, secure and sanitary condition as provided herein so as not to cause a blighting problem or adversely affect the public health or safety.

Both vacant structures and vacant land present special concerns to communities. Because no one is living on these premises, they are often ignored by the owners. Consequently, the code establishes the code official's authority to order the cleanup of vacant lands and the securing of vacant structures that might present an attractive nuisance.

When the owner fails to secure a vacant structure, Section 301.3 provides the code official with the authority to arrange for securing the building. Additionally, Section 110 authorizes the code official to require the removal of any structure that is deemed unreasonable to repair. When a structure is responsible to repair, the code official is authorized to require the necessary repairs.

SECTION 302 EXTERIOR PROPERTY AREAS

302.1 Sanitation. Exterior property and premises shall be maintained in a clean, safe and sanitary condition. The occupant or owner shall keep the exterior of the property and premises free from any accumulation of stagnant water thereon, or within any structure located thereon.

Exception: Approved retention areas and reservoirs.

Improperly graded property areas create health and safety hazards. Stagnant water provides a home for many nuisance insects including the mosquito. Stagnant water not to a structure can cause mold growth, which can lead to the decay of wooden members. Ponds are water is an attractive environment for children and has contributed to numerous drowning deaths.

Improper grading on a property results in a pool of water that is not drained or filled in, which can support the growth of trees and vegetation. Soil erosion can be a nuisance if material is being deposited in drainage systems or on adjacent properties, and is an indication of improper grading. Planting and maintaining an acceptable ground cover generally prevents erosion.

As indicated by the exception, water retention areas or reservoirs are permitted by the code even though they may contain stagnant water, however, the code official must approve their use.

302.2 Sidewalks and driveways. Sidewalks, walkways, stairs, driveways, parking spaces and similar structures shall be kept in a proper state of repair, and maintained free from hazardous conditions.

The code official is required to keep that all sidewalks, walkways, stairs, driveways, parking spaces, etc., are used and kept in proper repair. Walking surfaces that have deteriorated to the extent that presents a hazard to pedestrians must be repaired or replaced to eliminate the hazard and thus reduce the potential for accidents.

302.4 Weeds. Premises and exterior property shall be maintained free from weeds or plant growth in excess of eight inches (200 mm) in height. The standard for determining the size of weeds is as prescribed by the authority having jurisdiction.

Weeds shall be defined as all grasses, annual and perennial weeds, shrubs and plant material, other than trees or shrubs provided, however, this term shall not include cultivated flowers and gardens.

Upon failure of the owner or agent having charge of a property to cut and destroy weeds after service of a notice of violation, they shall be subject to prosecution in accordance with Section 110.5. Failure to comply with the authority having jurisdiction shall be considered as an act contrary to the provisions of this section.

302.2 Grading and drainage. Premises shall be graded and maintained to prevent the erosion of soil and to prevent the accumulation of stagnant water thereon, or within any structure located thereon.

Property owners often give detached garages, sheds, fences, retaining walls and similar structures a lower maintenance priority than the primary structure; thus, these structures are more frequently in disrepair. A thorough inspection of all property areas and accessory buildings is required. The code and to improve a neighborhood's appearance.

302.9 Defacement of property. No person shall willfully or wantonly damage, mutilate or deface any exterior surface of any structure or building on any public or private property by placing thereon any marking, graffiti or defacement.

It shall be the responsibility of the owner to restore said surface to an approved state of maintenance and repair.

Graffiti, carving and damage is a problem that plagues exterior surfaces of walls, fencing and sidewalks in cities and towns of all sizes. This problem begins as an eyesore and can result in serious consequences, including declining property values and degradation of the structural integrity and aesthetics of buildings.

It must be the responsibility of the owner to restore said surface to an approved state of maintenance and repair.
SECTION 303
SWIMMING POOLS, SPAS AND HOT TUBS

303.1 Swimming pools. Swimming pools shall be maintained in a clean and sanitary condition.

303.2 Enclosures. Private swimming pools, hot tubs and spas, containing water more than 24 inches (610 mm) in depth shall be completely surrounded by a fence or barrier not less than 48 inches (1210 mm) in height above the finished ground level and accessed on the side of the barrier away from the pool. Gates and doors in such barriers shall be self-closing and self-latching. Where the self-latching device is not less than 54 inches (1372 mm) above the bottom of the gate, the release mechanism shall be located on the post side of the gate. Self-closing and self-latching gates shall be maintained such that the gate is positively closed and latch engaged from an open position of 6 inches (152 mm) from the latch post. No existing pool enclosure shall be removed, replaced or changed in a manner that reduces its effectiveness as a safety barrier.

Exception: Spas or hot tubs with a safety cover that complies with ASTM F1340 shall be exempt from the provisions of this section.

This performance-based criteria was specifically added to address pool-related problems where a child could possibly drown by gaining entry into a pool through a gate that was not close and latch properly. Gates that may have deteriorated over time through age, wear and exposure to the elements are now addressed so that they will continue to provide the intended level of protection. The exception to this section allows for safety covers that comply with ASTM F1340. This section is consistent with current provisions in the IBC and the International Residential Code.

ASTM F1340 requires fastening the safety cover to the hot tub or spa via key locks, combination locks or similar devices that will keep the cover in place, testing to demonstrate that the cover can support a minimum required weight; limitations on openings in the cover; and minimum installation requirements.

SECTION 304
EXTERIOR STRUCTURE

304.1 General. The exterior of a structure shall be maintained in good repair, structurally sound and sanitary so as not to pose a threat to the public health, safety or welfare.

The exterior of structures must perform four primary functions:

- It must be in good repair. There should be no evidence of deterioration, or damaged or loose elements.
- It must be structurally sound. There should not be any loose or collapsing pieces. Stairways, porches, balconies and similar structural elements must safely perform their intended functions.
- It must be kept in a sanitary condition. There shall be no accumulation of debris or litter on porches and other parts of the exterior.
- It must be capable of preventing the elements (rain, snow and wind) and rodents from entering the inside.

304.1.1 Unsafe conditions. The following conditions shall be determined as unsafe and shall be repaired or replaced to comply with the International Building Code or the International Existing Building Code as required for existing buildings:

- The nominal strength of any structural member is exceeded by nominal loads, the load effects or the required strength.
- The anchorage of the floor or roof to walls or columns, and of walls and columns to foundations is not capable of supporting nominal loads or load effects.
- Structures or components thereof that have reached their limit state.
- Siding and masonry joints including joints between the building envelope and the perimeter of windows, doors and skylights are not maintained, weather resistant or water tight.
- Structural members that have evidence of deterioration or that are not capable of safely supporting all nominal loads and load effects.
- Foundation systems that are not firmly supported by footings, are not plumbed and free from cracks or breaks, are not anchored or are not capable of supporting all nominal loads and resisting all load effects.
- Exterior walls that are not anchored and attached to structural elements or the building and are free of cracks or breaks or loose or rotting materials, are not properly anchored or are not capable of supporting all nominal loads and resisting all load effects.
- Roofing and roofing components that have defects that admit rain, roof surfaces with inadequate drainage, or any portion of the roof framing that is not in good repair with signs of deterioration, fatigue or without proper anchorage and incapable of supporting all nominal loads and resisting all load effects.
- Flooring and flooring components with defects that affect serviceability or flooring components that show signs of deterioration or fatigue, are not properly anchored or are incapable of supporting all nominal loads and resisting all load effects.
- Veneer, cornices, belt courses, corbels, trim, wall facings and similar decorative features not properly anchored or are incapable of supporting all nominal loads and resisting all load effects.
- Exterior stairs, decks, porches, balconies and similar appurtenances not structurally sound or not properly anchored or are incapable of supporting all nominal loads and resisting all load effects.
- Chimneys, cooling towers, smokestacks and similar appurtenances not structurally sound or not properly anchored or are incapable of supporting all nominal loads and resisting all load effects.

Exceptions:

1. Where substantiated otherwise by an approved method.
2. Demolition of unsafe conditions shall be permitted where approved by the code official.

The purpose of these requirements is to set out general and specific delineations in a building or structure that would make it unsafe. These delineations allow the code official more specific references to conditions that characterize unsafe building or structure.

Section 304.1.1 delineates in detail unsafe conditions related to the exterior of the structure to provide the code official the ability to require replacement or repair.

1. indicates that if the strength of the structural member is exceeded by either the nominal loads or load effects, then the structure is not acceptable as capable of supporting all nominal loads and resisting all load effects.

2. deals with required strength of connections between structural members. More specifically, each connection must be able to resist nominal loads and load effects otherwise, the building or a part thereof is to be regarded as unsafe. Anchorage of various elements of a structure is essential to its stability.

3. specifies that any condition beyond which a structure or member becomes unfit for service and is no longer useful for its intended function and thus becomes unsafe.

Since weather penetration can degrade structural components, item 4 specifies that if any joint in the building envelope allows weather to penetrate, it may be used as a basis to classify the structure as unsafe. This may be, in and of itself, the basis for the classification. However, supporting evidence of deterioration caused by the penetration would add weight to the characterization as unsafe.

Item 5 addresses roofing and roof components. Structural members are essential to the structural integrity of any building. If any structural member is deteriorated to the point that it cannot safely support the nominal loads, the building may be regarded as unsafe.

Item 6 addresses foundations. Foundation systems are essential to the structural integrity of any building. If any portion of any foundation system is not supported by adequate foundation, is not plumb as intended to distribute the loads, has cracks or breaks or is inadequately anchored, the building may be regarded as unsafe.

Item 7 addresses exterior walls. Exterior walls are essential to the structural integrity of any building. If any portion of any exterior or bearing wall system is not supported by adequate foundation, is plumb as intended to distribute the loads, has cracks or breaks or is inadequately anchored, the building may be regarded as unsafe.

Item 8 addresses roofing and roof components. Since weather penetration can degrade structural components, this item specifies that any joint in the building envelope allows weather to penetrate, it may be used as a basis to classify the structure as unsafe. This may be, in and of itself, the basis for the classification. However, supporting evidence of deterioration caused by the penetration would add weight to the characterization as unsafe. The classification of the structural component of the roof assembly not capable of supporting design loads is a basis for classifying as unsafe.

Item 9 addresses flooring and floor components. Walking surfaces in floors with fatigue, defects or deterioration are a basis for regarding that a building or structure is unsafe. If a floor may collapse due to any of these conditions or is likely to cause harm or injury, it may be regarded as unsafe.

Item 10 addresses exterior wall finish. Decorative features either inside or outside that may become detached and fall, such as cornices, brackets, trim, walls, facings and similar decorative features not properly anchored or are not capable of supporting all nominal loads and resisting all load effects.

Item 11 addresses overhangs and projections from a building. With decorative features, any overhang, extension or projection—such as cornices, brackets, trim, walls, facings and similar decorative features not properly anchored or are not capable of supporting all nominal loads and resisting all load effects.

Item 12 addresses exterior stairs, decks and similar appurtenances. Exterior stairs, decks, porches, balconies and similar appurtenances are all portions of a structure.
means of egress system and as such represent a significant safety concern if left in an unsafe condition. Should any of the features or elements of a means of egress system become structurally unsound, the building or portion thereof may be regarded as unsafe.

Item 13 addresses chimneys, cooling towers and similar appurtenances. As with decorative features and other appurtenances, chimneys, cooling towers, smokestacks or similar large vertical elements that become structurally unsound may be regarded as unsafe. Exception 1 is to recognize that a qualified entity could substantiate an alternative method or material that meets the purpose and intent of the code. This alternative would need to be approved by the code official. An engineering study that substantiates the structural integrity in a rational analysis may be the basis for accepting a contention that the building is not unsafe. Exception 2 allows a building owner the option of demolition of unsafe condition subject to the code official’s approval. If the building or structure or portion thereof is demolished, and does not exist, the condition is considered to be resolved.

304.2 Protective treatment. Exterior surfaces, including but not limited to, doors, door and window frames, cornices, parapets, awnings, balconies, decks and fences, shall be maintained in good condition. Exterior wood surfaces, cedar or decay-resistant woods, shall be protected from the elements and decay by painting or other protective covering or treatment. Peeling, flaking and chipped paint shall be eliminated and surfaces repainted. Siding and masonry joints, as well as those between the building envelope and the perimeter of windows, doors and skylights, shall be maintained weather resistant and water tight. Metal surfaces subject to rust or corrosion shall be coated to inhibit such rust and corrosion; and surfaces with rust or corrosion shall be stabilized and coated to inhibit future rust and corrosion. Oxidation stains shall be removed from exterior surfaces. Surfaces designed for stabilization by oxidation are exempt from this requirement.

> Other sections of the code require items such as walls, doors, windows and architectural trim to be maintained in good repair and condition. This section makes it clear that paint or other protective covering or treatment is used to provide protection from the elements, it cannot be peeling, flaking or chipped. Additionally, buildings with deteriorated paint or with masonry joints and siding in disrepair or not weather tight will eventually decay and exert a blighting influence on the community.

[F] 304.3 Address identification. Buildings shall be provided with approved address identification. The address identification shall be easily and placed in a position to be visible from the street or road fronting the property. Address identification characters shall be large and placed in a position to be visible from the street or road fronting the property. Address identification characters shall be made of materials that will withstand weather and be visible from a distance.

304.4 Structural members. Structural members shall be maintained free from deterioration, and shall be capable of safely supporting the imposed dead and live loads.

4 MIN.

For 1/8" IPS. 24.9 mm.

Figure 304.3

ADDRESS IDENTIFICATION

4 MIN.

Figure 304.5

MAJOR DAMAGE TO A FOUNDATION WALL

This foundation is crumbling. Failure to repair it will eventually lead to its collapse.

The code official should order replacement of structural elements when major damage has occurred and should order appropriate maintenance, such as backup thinking, if the damage is only minor. All conditions that permit entry of rodents or other pests must also be addressed.

304.6 Exterior walls. Exterior walls shall be free from holes, breaks, and loose or rotting materials; and maintained weatherproof and properly surface coated where required to prevent deterioration.

> Holes, cracks, decayed wood or any other condition that permits rain or dampness to enter the structure must be repaired. Exterior surface materials must be properly coated to prevent deterioration if they are not naturally decay resistant. Many materials do not require surface coating, including, but not limited to, Ask 2015 International Property Maintenance Code® Commentary.

304.7 Roofs and drainage. The roof and flashing shall be sound, tight and not have defects that admit rain. Roof drainage shall be adequate to prevent dampness or deterioration in the walls or interior portion of the structure. Roof drains, gutters, and downspouts shall be maintained free from blockages or other obstructions that might create a safety hazard.
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diors and downspouts shall be maintained in good repair and free from obstructions. Roof water shall not be discharged in a manner that creates a public nuisance.

- A secure, non-slippery roof is necessary to keep a building properly maintained. Even small leaks can cause thousands of dollars in damage to insulation, plaster, studding and joists. Leaks usually occur along valley areas, around plumb- ing vents, chimneys, dormers and other penetrations through the roof.

Water runoff should be diverted away from the structure to prevent erosion of the foundation and other structural elements. Runoff must be diverted away from neighboring properties, public sidewalks, alleys and streets to prevent nuisance problems. Two problems that can result from improper water runoff are flooding of basements and standing water or ice buildup on sidewalks, alleys and streets. Drains, gutters and downspouts must be kept in working order so that water runoff is properly diverted.

- Exterior decorative features require regular maintenance to prevent their deterioration and to keep them from falling from the building.

304.10 Overhanging extensions. Overhanging extensions, including, but not limited to, cornices, overhangs, roof overhangs, awnings, eaves, cornices, dormers, etc., shall be maintained in good repair and be properly anchored so as to be kept in a sound condition. Windows, doors and other openings shall be weatherproofed to prevent moisture penetration. Overhanging elements shall be carefully inspected on a regular basis.

304.11 Chimneys and smokestacks. Chimneys, cooling towers, smoke stacks, and similar appurtenances shall be maintained structurally sound and in good repair. Exposed surfaces of chimney, smokestacks, and similar appurtenances shall be protected from the elements and against decay or rust by periodic application of weather-coating materials, such as paint or similar surface treatment.

- Chimneys, towers of all types and other similar appurtenances shall be frequently (at least once a year) inspected for functional or fire in danger of becoming nonfunctional or one in danger of being damaged by the corrosiveness of exhaust gases, chimneys and smokestacks shall be painted to eliminate the inside first. The code official shall examine chimneys and smokestacks for excessive rust, loose or missing mortar and cracked or disintegrating bricks.

- Occasionally, deterioration may prevent the chimney or smokestack from operating properly. Obstructed chimneys have resulted in numerous carbon monoxide deaths. If fuel-burning appliances vent into chimneys or smokestacks, the code official should be notified that the exhaust gases are being properly conveyed to the chimney, including the connection of the vent to the chimney.

- Weather-coating materials may be applied periodically to reduce the effects of the elements on these items.

304.12 Handrails and guards. Every handrail and guard shall be firmly fastened and carried normally imposed loads and shall be maintained in good condition.

This section provides for the safety and maintenance of handrails and guards.

304.13 Windows, window and door frames. Every window, skylight, door and window frame shall be kept in sound condition, good repair and weather tight.

- All windows, skylights and doors must be installed in such a manner that the window weather tight (i.e., able to prevent wind, rain or other elements from entering the structure). A window installation will provide appropriate protection while maintaining operational capability.

304.13.1 Glazing. Glazing materials shall be maintained free from cracks and holes.

All glass is to be maintained without open cracks or holes, which can admit rain and moisture. Defective glass poses hazards to occupants.

304.13.2 Openable windows. Every window, other than a fixed window, shall be easily openable and capable of being held in position by a catch or other device.

Windows that have broken or are missing hold-open hardware create a dual hazard.

First, without hardware are frequently propped open with sticks and other objects. These objects can be dislodged and cause the windows to fail, causing injury to occupants.

Second, in the event of a fire, occupants are at an increased risk if windows cannot be readily secured in an open position. People have died because of inop-erable windows, even though they could have easily broken the windows and escaped. It is advisable for the code official to check windows to make sure that they can be opened properly and remain open with their own hand.

304.14 Insect screens. During the period from (date) to (date), every door, window and other opening requires for ventilation of habitable rooms, food preparation areas, food storage areas, and areas where products to be included or utilized in food for human consumption are produced, manufactured, packaged or stored shall be supplied with approved tightly fitting screens of minimum width 16 mesh per inch (16 mesh per 25 mm), and every screen door used for insect control shall have a self-closing device in good working condition.

Exception: Screens shall not be required where other approved means, such as air curtains or insect repellant fans, are employed.

- Screens reduce insect infestations. Communities are required to establish the number of months screens must be used on windows and doors to accommodate the time period that insects are active. Insect populations become dormant or die during the cold season. Thus, screens would not be required during cold months.

The requirements for tight-fitting screens (not less than 16 mesh per 25 mm) in any food preparation, storage or service area are extremely important. Improper protection in these areas can lead to large-scale contamination of food supplies.

As indicated in the exception, air curtains, insect repellent fans, and other devices may be acceptable. The code official must be sure that such a system is operational and employed whenever the doors and windows are open. Although many openings of these areas are for business or other purposes, they are required to be weather tight to screen properly, such as out-swinging doors.

304.15 Doors. Exterior doors, door assemblies, operator systems and hardware must be maintained in good condition. Locks at all entrances to dwelling units and sleeping units shall tightly secure the door. Locks on means of egress doors shall be in accordance with Section 702.03.

- All exterior doors, door assemblies, operator systems and hardware must properly perform their intended functions (e.g., open and close easily and keep the elements out). Doors shall be easily released with a key, special knowledge or effort in accordance with Section 702.3. Security locks that comply with this requirement can be used to provide additional security for the door as well.

Malfunctioning or sticking locks that cannot secure the door may also impede egress because of difficulty in operation or release. The phrase "operator systems" as provided in this section also applies to other systems, such as automatic door openers, intercom systems, etc., that control the operation of the door. Only those systems that properly perform the operator functions as provided in this section shall be permitted to secure the door.

304.16 Basement hatchways. Every basement hatchway shall be maintained to prevent the entrance of rodents, rain and surface drainage water.

- Basement hatchways must prevent rain and water from entering the structure. Hatchway maintenance is ignored, wood members (including doors) decay and hatchway doors and latches rust and hinges break. Drainage systems provided to prevent water accumulating around hatchways and leaking inside the structure is necessary.

304.17 Guards for basement windows. Every basement window that is openable shall be supplied with rodent shields, storm windows or other approved protection against the entry of rodents.

- Basement windows are especially susceptible to the entry of the Norwegian rat, one of several rodents that frequently nest in the ground near structures. Ratproof sash guards, screens, storm windows or other protective materials must be installed on windows capable of being opened to utilize their use as an entry point.

304.18 Building security. Doors, windows or hatchways for dwelling units, room units or housekeeping units shall be provided with devices designed to provide security for the occupants and property within.

- This section establishes criteria for providing security for dwelling units, room units and housekeeping units that are rented, leased or sold.

304.18.1 Doors. Doors providing access to a dwelling unit, room unit or housekeeping unit that is rented, leased or sold shall be equipped with a deadbolt lock designed to be readily operable from the side from which it is to be made without the need for keys, special knowledge or effort and shall have a minimum lock throw of 1 inch (25 mm). Common deadbolt locks shall be installed according to the manufacturer's installation instructions in good working order. For the purpose of this section, a sliding bolt shall not be considered an acceptable deadbolt lock.

- Everyone has a right to feel safe in their own dwelling: therefore, the installation of a deadbolt lock is essential. When installed properly, deadbolt locks provide an additional layer of security purposes, however, locks and latches can interlock with other devices, such as the deadbolt and thus interfere with or prevent the egress of occupants.

- Deadbolt locks should be installed at the time of the emergency, such as a fire. The ability of occupants to open the door is primary in the event of a fire or emergency situation in which occupants may need to help prevent the loss of human life. Examples of special knowledge would be a combination lock or an unlocking device in an individual's home. Special effort would require unusual and unexpected physical abilities to unlock or make the door fully available for egress.

304.18.2 Windows. Operable windows located in whole or in part within 6 feet (1828 mm) above ground level or a walking surface below that provide access to a dwelling unit, rooming
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item or housekeeping unit that is rented, leased or let shall be equipped with a window sash locking device.

In order to coordinate the provisions of the code with the US Department of Housing and Urban Development (HUD) housing quality standard requirements for rental properties, a height requirement of 6 feet (1827 mm) above the ground was established for windows. This could be considered a security concern, thus dictating the need for window locks.

304.18.3 Basement hatchways. Basemat hatchways that provide access to a dwelling unit, storage unit or housekeeping unit that is rented, leased or let shall be equipped with devices that secure the units from unauthorized entry.

Windows to basements are equally problematic from a security point of view and, therefore, need to be equipped with locking devices to provide security for the units.

304.19 Gates. Exterior gates, gate assemblies, operator systems if provided, and hardware shall be maintained in good condition.

Latches at entrances shall tightly secure the gates.

Similar to Section 304.15 addressing doors, all gate assemblies, operator systems and hardware must be maintained to perform their intended functions (i.e., open and close as intended). Malfunctioning or sticking latches that cannot secure the gate may also impede egress because of difficulty in operation or release. The latches provided if permitted draws attention to automated doors. Maintaining the proper performance of the operator systems, where present, further assures proper egress will be maintained.

SECTION 305 INTERIOR STRUCTURE

305.1 General. The structure and equipment therein shall be maintained in good repair, structurally sound and in a sanitary condition. Occupants shall keep that part of the structure that they occupy or control in a clean and sanitary condition. Every owner of an occupied or a rooming house, housekeeping units, a hotel, a dormitory, two or more dwelling units or two or more nonresidential occupancies, shall maintain, in a clean and sanitary condition, the shared or public areas of the structure and exterior property.

The interior of a structure and its equipment must be maintained so as not to adversely affect the occupants’ health and safety. A structure must protect occupants from the exterior environment.

305.1.1 Unsafe conditions. The following conditions shall be determined and corrected by the owner or the owner’s agent before the structure is occupied.

1. The nominal strength of any structural member is exceeded by nominal loads, the load effects or the required strength;
2. The anchorage of the floor or roof to walls or columns, and of walls and columns to foundations is not capable of resisting all nominal loads or load effects;
3. Structural components thereof that have reached their limit state;
4. Structural members are incapable of supporting nominal loads and load effects;
5. Stairs, railings, balconies and all similar walking surfaces, including guards and balustrades, are structurally sound, not properly anchored or are anchored with connections not capable of supporting all nominal loads and load effects;
6. Foundation systems that are not firmly supported by footings are not plumbed and free from open cracks and breaks, are not properly anchored or are not capable of supporting all nominal loads and resisting all load effects.

Exceptions:

1. Where substantiated otherwise by an approved method.
2. Demolition of unsafe conditions shall be permitted when approved by the code official.

Section 305.1.1 describes unsafe conditions related to the interior structure, and thus details situations which can prompt the code official to require replacement or repair.

Item 2 describes that if the strength of the structural member is exceeded by either the nominal loads or load effects, the condition is to be regarded as unsafe.

Item 3 describes that the nominal loads or load effects, as defined by the IBC and the code items and 2-6 of the IBC, where a structure or component is regarded as incapable of performing its intended function and thus becomes unsafe.

Item 2 deals with required strength of connections between structural members. More specifically, each connection must be able to resist nominal loads and load effects otherwise, the building or affected portion thereof is to be regarded as unsafe.

Anchorage of various elements of a structure is essential to its stability.

When anchorage is not capable of transferring the intended loads, the structure or component is said to be unsafe.

Item 3 specifies that any condition beyond which a structure or member becomes unfit for service is no longer useful for its intended function is considered to be unsafe. This includes the serviceability limit and strength limit state.

"Limit state," as defined by the code, is a condition beyond which a structure or member becomes unfit for service and is no longer useful for its intended function (serviceability limit state) or to be unsafe (strength limit state). Any structure reaching this state is said to be unsafe.

Sections 4 through 6. The interior of a building may contain other structural elements as well. These items, which include stairs, walls, doors, glass on the outside, and guards, are specifically denoted as essential structural elements that must be preserved to allow for safe means of egress and protection.

Item 4 addresses structural members that have become unable to support the intended loads.

Item 5 addresses interior stairs, decks, porches, balconies, railings, railings, and stairways that are part of a means of egress system and as such represent a significant safety concern if left in an unsafe condition. Structural components are part of a means of egress system become structurally unsound. If any portion of any foundation is not supported and is not able to distribute the loads, this crack or cracks or is inad];equately anchored, the building may be regarded as unsafe.

Item 6 addresses foundation systems. Foundation systems are essential to the structural integrity of a building. If any portion of any foundation system is not supported and is not able to distribute the loads, this crack or cracks or is inadequately anchored, the building may be regarded as unsafe.

Item 7 is to recognize that a qualified entity could substantiate an alternative method or material that meets the intent and the fundamental purpose of the code items.

Alternative methods and materials, such as alternatives would need to be approved by the code official. An engineering study that substantiates the structural integrity in a rational analysis may be the basis for accepting a contention that the building is not unsafe.

Exception 2 allows a building owner the option of demolition of an unsafe condition subject to approval of the code official’s approval. If the building or structure or portion thereof does not exist, the condition is considered to be resolved.

305.2 Structural members. Structural members shall be maintained structurally sound and be capable of supporting the intended loads.

Improper construction, unapproved additions and repairs, water damage, deferred maintenance and overloading of structural members will result in structural damage.

Common construction and repair defects include: underdesign structural members that, over time, sag, crack, warp, and fail; inadequately fastened structural members that loosen and separate from each other; poor-quality construction materials, improperly insulated or oversized notches and holes in structural members and poorly installed structural members.

Water is one of the most destructive elements to structural members. Water damage most frequently occurs from roof leaks, plumbing leaks in bathrooms and kitchens, and water penetration into basements and cracks provide additional avenues for water damage to structural members. Areas of concern include the bottom of columns, the outside ends of beams and joists, flooring under bathrooms and kitchens and the underside of roofs. Check all of these for evidence of water penetration and damage.

Deferred maintenance is a problem with all buildings. A structure begins to deteriorate the moment it is completed. Both outside and inside factors affect structural integrity. Ice formation on the outside, and furniture, equipment and occupants on the inside. As equipment wears out or malfunctions, it needs to be repaired or replaced.

305.3 Structural members must be able to bear the loads imposed upon them. Commercial industrial buildings present special concerns for the code official. To provide some level of confidence that a structure will safely withstand weight, the code official may require the owner to provide evidence of the load-bearing capacity of the structure, as determined by a registered architect or engineer.

This information may be useful every time a structure changes occupancy. The code official cannot be sure that the building was designed or constructed since the previous calculations were prepared.

305.3.1 Interior surfaces. Interior surfaces, including windows and doors, shall be maintained in good, clean and sanitary condition. Peeling, chipping, flaking or damaged paint shall be repaired, removed or covered. Cracked or loose plaster, decayed wood and other defective surface conditions shall be corrected.

Interior surface damage is frequently the result of tenant abuse or water damage. Water damage results from leaking roofs, plumbing fixtures and water pipes, and also damages built-in open windows and doors that permit rain to enter. Any damaged interior surfaces are required to be repaired and the cause of the damage must be corrected.

Interior surfaces that contain lead-based paint may present serious health hazards to occupants, especially children. Lead is a toxic element that enters the body by inhalation or ingestion of fine particulate. Lead affects many organs as well as the central nervous system, and is especially harmful to young children because it retards brain and central nervous system development.

HJD estimates that three-quarters of the dwellings built between 1960 contain some lead-based paint. Because there is a high level of lead in paint was gradually reduced during the 1960s, and its prohibition in general application in 1978 (lead-based paint is currently reduced for specialized industrial applications), dwellings built before 1960 contain 100 percent of dwellings built between 1940, and 1959, 62 percent of dwellings built between 1960 and 1979 contain lead-based paint. Lead-based paint is often found under newer layers of paint that is not lead-based.

Lead-based paint is not an immediate hazard because the lead is not exposed. Lead poisoning through ingestion or inhalation of lead particles found contaminated in dust. The risk of poisoning becomes significant when lead-based paint is cracked and paint particles contaminate dust through peeling, chipping, flaking and abraded conditions identified in the code. Lead contamination may also enter lead-based paint that is disturbed during repair and remodeling activities such as scraping, sanding, drilling and cutting.

Lead hazard control is achieved by removing lead-contaminated dust and eliminating the source of contamination. The determination of the type of activities
3.5.6 Interior doors. Every interior door shall fit reasonably well within its frame and shall be capable of being opened and closed by being properly and securely attached to jambs, headers or tracks as intended by the manufacturer of the attachment hardware.

* The ability of a door to function as the manufacturer intended is made clear by the key elements in being able to properly exit a building. In addition to contributing to building egress, doors are also key elements in providing for security and privacy; therefore, all interior doors should be kept in a state of repair that will allow them to function effectively.

**SECTION 306 COMPONENT SERVICEABILITY**

306.1 General. The components of a structure and equipment therein shall be maintained in good repair, structurally sound and in a sanitary condition.

* Section 306.1 contains a general provision for components and equipment related to a structure to be maintained in sound and sanitary condition, which is the spirit and intent of this code.

306.1.1 Unsafe conditions. Where any of the following conditions cause the component or system to be beyond its limit state, the component or system shall be determined as unsafe and shall be repaired or replaced to comply with the International Building Code or the International Existing Building Code as required for existing buildings:

1. Soils that have been subjected to any of the following conditions:
   1.1. Collapse of footing or foundation system;
   1.2. Damage to footing, foundation, concrete or other structural element due to soil expansion;
   1.3. Adverse effects to the design strength of footing, foundation, concrete or other structural element due to a chemical reaction from the soil;
   1.4. Inadequate soil as determined by a geotechnical investigation;
   1.5. Where the allowable bearing capacity of the soil is in doubt;
   1.6. Adverse effects to the footing, foundation, concrete or other structural element due to the ground water table.

2. Concrete that has been subjected to any of the following conditions:
   2.1. Deterioration;
   2.2. Ultimate deformation;
   2.3. Fractures;
   2.4. Fluorescences;
   2.5. Spalling;

2.6. Exposed reinforcement; or
2.7. Detached, dislodged or failing connections.

3. Aluminum that has been subjected to any of the following conditions:
   3.1. Deterioration;
   3.2. Corrosion;
   3.3. Elastic deformation;
   3.4. Ultimate deformation;
   3.5. Stress or strain cracks;
   3.6. Joint fatigue; or
   3.7. Detached, dislodged or failing connections.

4. Masonry that has been subjected to any of the following conditions:
   4.1. Deterioration;
   4.2. Ultimate deformation;
   4.3. Fractures in masonry or mortar joints;
   4.4. Fractures in masonry or mortar joints;
   4.5. Spalling;
   4.6. Exposed reinforcement; or
   4.7. Detached, dislodged or failing connections.

5. Steel that has been subjected to any of the following conditions:
   5.1. Deterioration;
   5.2. Elastic deformation;
   5.3. Ultimate deformation;
   5.4. Metal fatigue; or
   5.5. Detached, dislodged or failing connections.

6. Wood that has been subjected to any of the following conditions:
   6.1. Ultimate deformation;
   6.2. Deterioration;
   6.3. Damage from insects, rodents and other vermin;
   6.4. Fire damage beyond charming;
   6.5. Significant splits and checks;
   6.6. Horizontal shear cracks;
   6.7. Vertical shear cracks;
   6.8. Inadequate support;
   6.9. Detached, dislodged or failing connections; or
   6.10. Excessive cutting and notching.

**Exceptions:**

1. Where substantiated otherwise by an approved laboratory method.
2. Demolition of unsafe conditions shall be permitted where approved by the code official.

In order to analyze all of the elements of a building, this section ensures that each component of a building must meet its intended purpose or the building (or portion thereof) can be regarded as unsafe. This provision specifies that each material (such as soil, concrete, masonry, wood, steel, etc.) used to create a building or structure must continue to be usable. Item 1 delineates some conditions of soil or foundation failure that denote unsafe conditions. Any of these allow the code official to determine that an unsafe condition exists.

Sections 2 through 6 delineate some conditions that, if present in structural elements, are sufficient to determine that an unsafe condition exists.

**SECTION 307 HANDRAILS AND GUARDRAILS**

307.1 General. Every exterior and interior flight of stairs having more than four risers shall have a handrail on one side of the stair and every open portion of a stair, landing, balcony, porch, deck, ramp or other walking surface that is more than 30 inches (762 mm) above the floor or grade below shall have guards. Handrails shall be not less than 30 inches (762 mm) in height or more than 42 inches (1067 mm) in height measured vertically above the nosing of the tread or above the finished floor of the landing or walking surfaces. Guards shall be not less than 30 inches (762 mm) in height above the floor of the landing, balcony, porch, deck, or ramp or other walking surface.

**Exceptions:** Guards shall not be required where exempted by the International Existing Building Code or the International Building Code.

* Note that this section does not discuss maintenance requirements for handrails and guards. It contains requirements for handrail and guard installation at specific locations in an existing building. If these locations are present at an existing building, then the minimum handrail and guard requirements are mandating. Handrails are required beside of all means of egress stairs more than four risers in height. Handrails can neither be less than 30 inches (762 mm) in height nor more than 42 inches (1067 mm) above the nosing of the tread (see Commentary Figure 307.1).

Guards are required on the open side of all unenclosed walking surfaces greater than 30 inches (762 mm) in height that include stairs, landings, balconies, porches, docks or ramps. The guard must be at least 30 inches (762 mm) above the floor in all cases. Guards are to contain intermediate rails, balusters or other construction to reduce the chance of an adult or child falling through the guard. If the guard is missing some intermediate rails or balustrades, it is recommended that it be repaired to its original condition if it will provide protection equivalent to that when originally constructed.

The exception refers to the building code currently adopted by the jurisdiction. If the current adopted building code would not require a guard for a particular location in a new building, then a guard would not be required in accordance with this exception.
SECTION 308
RUBBISH AND GARBAGE

308.1 Accumulation of rubbish or garbage. Exterior property and premises, and the interior of every structure, shall be free from any accumulation of rubbish or garbage.

In sanitary houses are found in almost every community. The code official may frequently find conditions where occupants fail to properly store and remove their garbage and refuse. Occasionally, the conditions may be so bad that he or she must condemn the structure as unfit for human occupancy in accordance with Section 108.1.3. Emotion, personal and mental problems may be contributing factors. The code official may have to work with health officials, social workers, child protection workers, and a host of other social service agencies to obtain a solution to the problem.

Improperly stored garbage and rubbish in public halls and stairways may result in insect and rodent infestations, trip hazards and accidental fires. More importantly, improper storage creates a hazard when the exit must be used in an emergency, such as a fire.

308.2 Disposal of rubbish. Every occupant of a structure shall dispose of all rubbish in a clean and sanitary manner by placing such rubbish in approved containers.

Rubbish includes all waste materials except garbage. Occupants are the unit, the occupant of the unit—not the owner—of the building. The building is the structure. The unit is the group of rooms that comprise the habitable portion of the structure. The occupant is the person or persons who have the right to use such rooms.

308.3 Disposal of garbage. Every occupant of a structure shall dispose of garbage in a clean and sanitary manner by placing such garbage in approved garbage disposal facility or approved garbage containers.

Garbage is the animal and vegetable waste created from the preparation and consumption of food. Occupants are responsible for disposing of the garbage by either using a garbage disposal (if available) or by placing the waste in approved garbage storage containers.

Improper disposal of garbage can attract rodents, insects, animals and vermin, produce noxious odors and create potential health problems. Similar to rubbish disposal, garbage disposal problems can be the result of:

1. Careless disposal (not properly wrapped or stored) by the occupants.
2. Insufficient containers to handle the regular amount of garbage.
3. Garbage not being picked up frequently enough.
4. The mechanical garbage disposal not operating.

The health consequences to the occupants and the neighborhood are probably more severe with garbage than rubbish; therefore, the code official must promptly order the correction of this problem and require an ongoing program of garbage disposal.

308.3.1 Garbage facilities. The owner of every dwelling shall supply one of the following: an approved mechanical food waste grinder in each dwelling unit; an approved incinerator unit in the structure available to the occupants in each dwelling unit; or an approved leakproof, covered, outside garbage container.

The owner of any dwelling must provide a mechanical garbage disposal, an approved incinerator or enough containers to hold all garbage produced.

Rubbish storage facilities. The owner of every occupied premises shall supply approved covered containers for rubbish, and the owner of the premises shall be responsible for the removal of rubbish.

The owner is responsible for the removal of all rubbish. This provision is helpful as an enforcement tool. It eliminates confusion as to whether the tenant, the operator or the owner is responsible.

308.3.2 Containers. The owner of every building containing garbage shall provide, and at all times cause to be utilized, approved leakproof containers provided with covers of a size fitting covers for the storage of such materials until removed from the premises for disposal.

The operators of restaurants and similar establishments that produce garbage are required to provide sufficient numbers of containers to store the garbage properly until such time that it is removed from the premises.

Improper storage of animal and vegetable wastes produces noxious odors and permits rodents and other vermin access to the garbage. It also creates potential health problems.

SECTION 309
PEST ELIMINATION

309.1 Infestation. Structures shall be kept free from insect and rodent infestation. Structures in which insects or rodents are found shall be promptly exterminated by approved processes that will not be injurious to human health. After pest elimination, proper precautions shall be taken to prevent reinfection.

There are two basic types of insect infestations: nuisance and wood destroying. Nuisance insects include flies, fleas, bees, cockroaches and silverfish. Wood-destroying insects include termites, powder-post beetles and carpenter ants.

Nuisance insects are usually found near food sources and in damp areas. Wood-destroying insects are sometimes difficult to find. The code official or a professional exterminator may be able to locate potential infestations. Concrete in contact with the soil should be visually checked for evidence of termite tubes leaking from the soil to wood members. Wood infested with powder-post beetles frequently has the appearance of having been penetrated by shotguns pellets. A large powder-post beetle infestation leaves many small holes in the wood. Additionally, active beetles leaves a fine wood powder called "fraise" on the wood.

Eliminating nuisance insects may require treating the building with insect spray on a regular basis. Eliminating wood-destroying insects may require poisoning the soil around the building. Severe pest infestations may necessitate replacement of structural members.

Evidence of a rodent infestation can include droppings, gnaw marks and oily rub stains (imprints left where the rodent's body rubbed against the structure). Such infestations should be treated immediately. Additionally, corrective measures must be taken to reduce the possibility of a reinfection.

309.2 Owners. The owner of any structure shall be responsible for pest elimination within the structure prior to renting or leasing the structure.

The owner must eliminate all rodents and insects before building or property is occupied. A building can be rented or leased. Although it would appear to be easier to enforce this provision, the reality is that a new occupant may not notice any insect or rodent problems until after the building has been occupied. An owner cannot be expected to know about these problems. The occupant is responsible for maintaining the property free of infestation. Accordingly, the code official should cite the occupant for rodent or insect infestations.

309.3 Single occupant. The occupant of a one-family dwelling or of a single-tenant nonresidential structure shall be responsible for pest elimination on the premises.

In a single-family dwelling or a single-tenant nonresidential unit, the occupant of the unit—not the owner—is responsible for maintaining the property free of infestation. Accordingly, the code official should cite the occupant for rodent or insect infestations.

309.4 Multiple occupancy. The owner of a structure containing two or more dwelling units, a multiple occupancy, a rooming house or a nonresidential structure shall be responsible for pest elimination in the public or shared areas of the structure.
structure and exterior property. If infestation is caused by failure of an occupant to prevent such infestation in the area occupied, the occupant and owner shall be responsible for pest elimination.

The owners of public or shared areas in multifamily residential and nonresidential buildings must eliminate rodents and insects from the public or shared areas of the structure and exterior property. If a single unit in one of these buildings is infested, it is the owner and occupant’s responsibility to provide for the extermination.

309.5 Occupant. The occupant of any structure shall be responsible for the continued rodent and pest-free condition of the structure.

Exception: Where the infestations are caused by defects in the structure, the owner shall be responsible for pest elimination.

Occupants must maintain their units in a clean and sanitary manner, free of rodents. If the occupants fail to maintain their unit, then they are responsible for all pest elimination costs.

From a practical point of view, this section is difficult to enforce. Occupants who are going to be charged pest elimination fees may move out before paying such a fee. Unfortunately, once the unit is vacated the owner becomes responsible for the pest elimination. Because the owner is responsible for correcting any defects in the structure (see Section 301.2), he or she is then responsible for any infestation caused by these defects.

Bibliography

The following resource materials were used in the preparation of the commentary for this chapter of the code:


Chapter 4:

Light, Ventilation and Occupancy Limitations

General Comments

Chapter 4 establishes the minimum criteria for light and ventilation and identifies occupancy limitations. Section 401 outlines the scope of Chapter 4 (i.e., minimum light, ventilation and space requirements). This section also establishes who is responsible for complying with the provisions of the chapter, permits alternative arrangements of windows and other devices to comply with the requirements for light and ventilation and prohibits certain room arrangements and occupancy uses.

Requirements for light, ventilation and space have not always been incorporated in construction and occupancy codes. In the United States, one of the first attempts to establish criteria for light and ventilation occurred with the passage of the 1867 Tenement Housing Act in New York City. A principal feature of the act required sleeping rooms to communicate directly with external air, or to have a ventilating window or transom connected to a neighboring room or hall.

In 1879, New York City passed a second Tenement Housing Act, which expanded the light and ventilation requirements of the 1867 law by mandating that windows have an opening of at least 12 square feet (1.1 m²) in every room. Finally, New York City passed the Tenement Housing Act of 1901, which required owners to provide additional lighting and ventilation to all tenements. Many other provisions also contributed to the health, safety and welfare of the occupants.

Light, ventilation and space requirements relate to basic human needs. In its Basic Principles of Healthy Housing, the Committee on the Hygiene of Housing of the American Public Health Association (APHA) established several principles regarding the relationship of housing to health. These basic principles include several that relate specifically to the need for adequate light, ventilation and space, including physiological needs, psychological needs and protection against disease and accidents.

Fundamental physiological needs:

• Adequate space for exercise and for the play of children.

Fundamental psychological needs:

• Adequate privacy for the individual.

• Facilities that make possible the performance of household tasks without undue physical and mental fatigue (adequate space and sufficient ceiling heights reduce physical and mental fatigue).

• Protection against contagion.

• Sufficient space in sleeping rooms to minimize the danger of contact infections.

Protection against accidents:

• Adequate facilities for escape in case of fire.

Protection against overcrowding:

• Population controls can maintain neighborhood density, which can avoid overtaxing public facilities such as parks and schools, and avoid accelerated wear of dwellings.

Habitable rooms require adequate light to assist occupants in providing for proper cleanliness and sanitation, and to reduce fire hazards. Well-lighted rooms have a positive impact on mental health; while dark, dingy rooms can have the opposite effect.

Ventilation is defined as "the natural or mechanical process of supplying conditioned or unconditioned air to, or removing such air from, any space." Ventilating air into a space serves three functions:

• Combustion and makeup air for fuel-burning appliances is provided.

• Air being exhausted from the building through mechanical or natural means is replaced.

• Air movement within the structure is enhanced.

Ventilation air exhausting from a structure also serves three functions:

• Excess moisture is eliminated.

• Unpleasant odors, toxic fumes, dirt, dust and other particulate matter are removed.

• Air movement within the structure is enhanced.

Over-sized or improperly installed mechanical ventilation can cause fuel-burning appliances to backdraft into the structure and may cause toxic materials to be exhausted into inappropriate locations.

Adequate space provides for the physical and mental health of occupants. Crowded conditions have a negative impact on occupants by preventing easy movement.
throughout the dwelling. Crowded conditions may also lead to accidents and injuries. Additionally, occupants are subjected to an increase in the spread of disease and germs through sneezing and coughing. Overcrowding may also have a negative effect on mental health.

SECTION 401
GENERAL

401.1 Scope. The provisions of this chapter shall govern the minimum conditions and standards for light, ventilation and space needed for occupancy in a structure.

- Buildings must comply with minimum criteria and conditions for light, ventilation and space. Specific requirements are outlined in this chapter.

401.2 Responsibility. The owner of the structure shall provide and maintain light, ventilation and space conditions in compliance with these requirements. A person shall not occupy as an owner-occupant, or permit another person to occupy, any premises that do not comply with the requirements of this chapter.

- The owner is responsible for complying with all light, ventilation and space requirements established in this chapter. A noncomplying structure shall not be occupied until it is brought into compliance with the criteria.

401.3 Alternative devices. In lieu of the means for natural light and ventilation herein prescribed, artificial light or mechanical ventilation complying with the International Building Code shall be permitted.

- Light and ventilation by artificial means are permitted, such as electric lighting instead of natural light and mechanical ventilation instead of natural ventilation. Electric lighting is permitted to replace the natural light requirements of Section 402. Mechanical ventilation is permitted to replace the natural ventilation requirements of Section 403. Any alternative method approved by the code official must comply with the installation and performance requirements of the building code.

SECTION 402
LIGHT

402.1 Habitable spaces. Every habitable space shall have not less than one window of approved size facing directly to the outdoors or to a court. The minimum total glazed area for every habitable space shall be 8 percent of the floor area of such room. Wherever walls or other portions of a structure face a window of any room and such obstructions are located less than 9 feet (2.74 m) from the window and extend to a level above that of the ceiling of the room, such window shall not be deemed to face directly to the outdoors nor to a court and shall not be included as contributing to the required minimum total window area for the room.

402.2 Common halls and stairways. Every common hall and stairway in residential occupancies, other than in one- and two-family dwellings, shall be lighted at all times with not less than a 60-watt standard incandescent light bulb for each 200 square feet (18.6 m²) of floor area or equivalent illumination, provided that the spacing between lights shall not be greater than 30 feet (9.1 m). In addition to the required illumination, emergency lights shall be illuminated at all times the building space served by the means of egress is occupied with not less than 1 foot candle (11 lux) at floor, landings and room areas.

- The intent of this section is to establish a minimum level of lighting in common halls and stairs of residential occupancies, such as apartment buildings. Adequate lighting in hallways and stairways is essential for safe exiting in a fire emergency, reduces the chance of injury due to falls during normal use and helps deter crime.

This section contains a prescriptive requirement for 50-watt lightbulbs for every 200 square feet (19 m²) of area for ease of application and enforcement (see Commentary Figure 402.2). It assumes a typical ceiling height of not more than 10 feet (3048 mm). Equivalent illumination by means other than 60-watt incandescent bulbs is explicitly permitted, and the code official would establish equivalency by judgment or by actually measuring with a light meter. This lighting is required to be provided at all times, since residential buildings are typically occupied at all times.

In all occupancy groups other than residential, a lower, minimum level of lighting (1 foot candle [11 lux] is required at all times when the building is occupied. The 1 foot candle (11 lux) threshold is consistent with the International Fire Code® (IFC®) and the International Building Code® (IBC®) for acceptable lighting in means of egress components.

The next step is to require the opening between the adjacent spaces to be a minimum of 25 square feet (2.3 m²), but not less than 0.08 multiplied by the floor area of Space A.

For SI: 1 square foot = 0.0929 m².

Figure 402.1(1) DETERMINATION OF MINIMUM GLAZED AREA

In the above example, all rooms except Bedroom B have sufficient glazed area, with each room being part of the room's floor area. Bedroom B is 180 sq. ft. in area, but the window is only 8 sq. ft. Therefore, either another window must be installed or the existing window must be replaced with a larger window.
402.3 Other spaces. All other spaces shall be provided with natural or artificial light sufficient to permit the maintenance of sanitary conditions, and the safe occupancy of the space and utilization of the appliances, equipment and fixtures.

☼ No specific criteria for minimum light and ventilation are established for other spaces, such as storage and utility rooms, closets and mud rooms. All spaces, however, must have enough light to maintain their cleanliness and to allow for the safe use of appliances, equipment and fixtures located within them.

403.1 Habitable spaces. Every habitable space shall have not less than one operable window. The total operable area of the window in every room shall be equal to not less than 4% percent of the minimum glazed area required in Section 402.1.

Exception: Where rooms and spaces without openings to the outdoors are ventilated through an adjoining room, the unobstructed opening to the adjoining room shall be 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 ventilation openings to the outdoors shall be based on a total floor area being ventilated.

☼ As stated in Section 401.3, mechanical ventilation is an acceptable alternative to the natural ventilation requirements in this section. Most detached single-family dwellings utilize natural ventilation. Every habitable room (see the definition of "Habitable space" in Chapter 2) must have one window that can be easily opened to provide natural ventilation. In order to supply adequate natural ventilation, workable windows must be capable of opening to at least 45 percent of the minimum glazed area required for natural light, as established in Section 402.1 (see the definition of "Openable area" in Chapter 2). The operable area should be measured when the window or door is in its full, open position. When determining operable area, only the space between stops or between stops and sash is to be measured. The area of sashes, meeting rails, mullions and muntins is to be deducted (see Commentary Figure 403.1).

The exception allows for rooms to "share" required ventilation openings, as long as there are substantial unobstructed openings between the rooms. The example given in the commentary to Section 402.1 is applicable here.

403.2 Bathrooms and toilet rooms. Every bathroom and toilet room shall comply with the ventilation requirements for habitable spaces as required by Section 403.1, except that a window shall not be required in such spaces equipped with a mechanical ventilation system. Air exhausted by a mechanical ventilation system from a bathroom or toilet room shall discharge to the outdoors and shall not be recirculated.

☼ All bathrooms and toilet rooms must have windows that conform to the requirements of Section 402.1 for natural light and Section 403.1 for natural ventilation. If a window is not provided or not large enough to comply with the light and ventilation requirements of these two sections, then an approved mechanical vent may be used.

Mechanical ventilation in dwelling unit bathrooms and toilet rooms is required to exhaust moisture-laden air to the exterior. The vent must not terminate in any attic or other closed spaces (see Commentary Figure 403.2), which would allow moisture to condense on the building structure and lead to deterioration of the structure.
2. Devices such as coffee pots and microwave ovens shall not be considered cooking appliances.

- Unless approval has been granted through a certificate of occupancy, cooking is prohibited in dormitory or housing units (see the definition of "Rooming unit" in Chapter 2). Cooking equipment is prohibited in these types of rooms, since cooking in sleeping areas may create fire and health hazards, as well as odor and moisture problems.

Exception 1: Provides for the allowance of cooking in a rooming unit or a dormitory unit based on written approval as granted by the code official. Such an allowance should take into consideration the types of food to be cooked and the heat source and conditions under which the cooking will be done. Requiring approval in writing verifies that there will be a traceable, verifiable record of the conditions of approval. Such a record is useful in enforcing the conditions of the approval. Exception 2 allows the use of coffee pots and microwave ovens in rooming units and dormitory units. These types of appliances are typically used for short periods of time, and are currently used in hotel and motel units without significant problems.

403.3 Process ventilation. Where injurious, toxic, irritating or noxious fumes, gases, dusts or mists are generated, a local exhaust ventilation system shall be provided to remove the contaminating agent at the source. Air shall be exhausted to the exterior and not recirculated to any space.

- A mechanical vent, hood or cabinet is required when any process creates potentially hazardous fumes, gases or dust. The ventilation has to be located at the source of the contamination and must exhaust directly to the exterior. The criteria for new exhaust systems are found in the International Mechanical Code® (IMC®). If the exhausted air contains dust, dirt, chemicals or other contaminates, the exhaust may require additional treatment to prevent contamination of the exterior air (see Commentary Figure 403.4).

403.5 Clothes dryer exhaust. Clothes dryer exhaust systems shall be independent of all other systems and shall be exhausted outside the structure in accordance with the manufacturer’s instructions.

- Clothes dryers are prohibited from exhausting into other ventilation or exhaust systems. Clothes dryers create large volumes of lint, dust and moisture that will clog or corrode any system not designed for this type of exhaust. Additionally, the exhaust gases are hot and may contain combustion products. Improper or inadequate provisions for exhaust may create a fire and health hazard.

- Manufacturers’ installation instructions must be followed when exhausting clothes dryers. The exception recognizes condensing ductless clothes dryers. Typically, in a condenser dryer, there are two separate loops. The inside loop of air that is sealed from the outside loop of environment air from within the drum is heated, then blown through the tumbler clothes, then the moisture-laden air is passed through a heat exchanger, where the water condenses. The sensible dry air is then reheated, where it is again blown through the drum and clothes, and the cycle begins again.

- The outside loop in a condenser dryer consists of either air or water. Some condenser dryer models are air-cooled, and use the ambient room air as a heat sink by blowing it across the outside of the heat exchanger. These dryers will tend to heat the indoor air in one’s laundry room significantly. Note, however, that only heat is released, and all moisture is contained within the unit. The condensed water can be either pumped away to a drain line or stored in a container within the dryer to be emptied later.

SECTION 404
OCCUPANCY LIMITATIONS

404.1 Privacy. Dwelling units, hotel units, rooming units and dormitory units shall be arranged to provide privacy and be separate from other adjoining spaces.

- Privacy is a fundamental psychological need. Every person needs a space to relax, sleep and dress that is separate from public or common rooms. Walls, doors and doors should be arranged to offer the occupants their own private space.

404.2 Minimum room widths. A habitable room, other than a kitchen, shall be not less than 7 feet (2134 mm) in any plan dimension. Kitchens shall have a minimum clear passageway of 3 feet (914 mm) between countertops and appliances or countertops and walls.

- To prevent the use of inadequately sized rooms for living space, the code establishes a minimum dimension of 7 feet (2134 mm) at the narrowest width of all habitable rooms, except kitchens. Narrow rooms do not allow for the installation of furniture without unduly obstructing passageways through the rooms.

Kitchens require only 3 feet (914 mm) of clearance between countertops and appliances or countertops and walls. Kitchens are not expected to be occupied for long periods of time, nor is it expected that kitchens will be occupied by a large number of persons at any one time.
404.3 Minimum ceiling heights. Habitable spaces, hallways, corridors, laundry areas, bathrooms, toilet rooms and habitable basement areas shall have a minimum clear ceiling height of 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 a maximum of 6 inches (152 mm) below the required ceiling height.

2. Basement rooms in one- and two-family dwellings occupied exclusively for laundry, study or recreation purposes, having a minimum ceiling height of 6 feet 8 inches (2033 mm) with a minimum clear height of 6 feet 4 inches (1932 mm) under beams, girders, ducts and similar obstructions.

3. Rooms occupied exclusively for sleeping, study or similar purposes and having a sloping ceiling over all or part of the room, with a minimum clear ceiling height of 7 feet (2134 mm) over not less than one-third of the required minimum floor area. In calculating the floor area of such rooms, only those portions of the floor area with a minimum clear ceiling height of 5 feet (1524 mm) shall be included.

**Sufficient ceiling heights are necessary to provide an adequate volume of air for occupants in closed spaces and to provide for their psychological well-being. The height requirements are established by this section.**

To accommodate various conditions, the code establishes exceptions that permit a reduction in ceiling height within limited conditions. These exceptions include the following:

- **Exception 1** makes provisions for beams and girders to extend into the required minimum height. This is consistent with the IBC and the International Residential Code (IRC) requirements, which allow this type of projection to accommodate structural members.

- **Exception 2** is included to permit the use of existing basements with low headroom. It is anticipated that these rooms will be used only occasionally and will not adversely affect the occupants’ health or safety.

- **Exception 3** is included to accommodate the many 1/2-story houses that have the sloped attic area finished into bedrooms and similar uses.

- **Similar to the previous exception,** the 7-foot-high (2134 mm) ceiling must extend over one-third of the required area established in Section 404.4.1. Thus, if a room is larger than the room required size for its use, the 7-foot-high (2134 mm) portion may be less than one-third of the room’s actual floor area.

- **Example:** A bedroom of 175 square feet (16.3 m²) would be required to have a 7-foot-high (2134 mm) ceiling over no less than 23.3 square feet (2.2 m²) of the room area. The minimum required size of a bedroom is 70 square feet (6.5 m²) (see Section 404.4.1); one-third of the required 70 square feet (6.5 m²) is 23.3 square feet (2.2 m²).

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404.4 Bedroom and living room requirements. Every bedroom and living room shall comply with the requirements of Section 404.4.1 through 404.4.5.

- **The size of bedrooms and living rooms in a dwelling unit are determining factors in the comfort and safety of occupants. As such, the code establishes minimum sizes and restricts certain configurations in regard to bathrooms, means of egress and other habitable rooms.**

- **404.4.1 Room area.** Every living room shall contain not less than 120 square feet (11.2 m²) and every bedroom shall contain not less than 70 square feet (6.5 m²) and every bedroom occupied by more than one person shall contain not less than 50 square feet (4.6 m²) of floor area for each occupant thereof.

- **The smallest living room allowed is 120 square feet (11.1 m²). Utilizing the minimum room width of 7 feet (2134 mm) would result in a living room that approximates 7 feet by 17 feet (2134 mm by 5182 mm). A more functional room size would perhaps be 10 feet by 12 feet (3048 mm by 3658 mm). The smallest bedroom allowed is 70 square feet (6.5 m²). This is barely enough space for a regular-sized (twin) bed and dresser. If a bedroom is intended to accommodate more than one person, the room must have at least 50 square feet (4.6 m²) per person. A sleeping room for two people must contain at least 100 square feet (9.3 m²), for three, 150 square feet (13.9 m²) and so on. Inadequate sleeping space may increase the spread of communicable diseases, reduce privacy and provide insufficient space for clothing, furniture and other personal belongings. See the commentary to Section 404.5 for examples of the application of the requirements of this section.

- **404.4.2 Access from bedrooms.** Bedrooms shall not constitute the only means of access to other bedrooms or habitable spaces and shall not serve as the only means of egress from other habitable spaces.

**Exception:** Units that contain fewer than two bedrooms.

- **Every occupant must be provided with privacy in his or her sleeping room. The need for privacy may lead occupants to lock or barricade doors in certain situations; therefore, if the only access to other habitable spaces or the means of egress is through a bedroom, there is a possibility that the only way out of a dwelling unit may be blocked in an emergency situation.** Even without an emergency, occupants may be seriously inconvenienced in their movement about the dwelling unit. Bedrooms, therefore, must be arranged so that other occupants and guests do not have to pass through one bedroom to get to another bedroom or other habitable spaces (see Commentary Figure 404.4.2). Additionally, dwelling units must be configured such that occupants can egress from any habitable room in the dwelling unit without passing through a bedroom. The dwelling unit with only one bedroom to have an arrangement where the only access to habitable rooms or the means of egress is through the bedroom. It is assumed in this case that only the occupants of the bedroom will require access to other rooms or the means of egress.

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This section provides the code official with another tool to control overcrowding problems.

404.4.5 Other requirements. Bedrooms shall comply with the applicable provisions of this code including, but not limited to, the light, ventilation, area, ceiling height and room width requirements of this chapter; the plumbing facilities and water-heating facilities requirements of Chapter 5; the heating facilities and electrical receptacle requirements of Chapter 6; and the smoke detector and emergency escape requirements of Chapter 7.

**Sections 404.4.1 through 404.4.5 do not contain all the code requirements that pertain to bedrooms.** Bedrooms are habitable rooms (see the definition and commentary for “Habitable room” in Chapter 2) and as such are subject to all the code requirements that apply to habitable rooms. The purpose of this section is to alert the code user to requirements for bedrooms that are located in other sections and chapters of the code. In particular, see the following sections of the code and the associated commentary:

- **Section 402.1 for minimum light requirements.**
- **Section 403.1 for minimum ventilation requirements.**
- **Section 402.4 for minimum room width.**
- **Section 404.3 for minimum ceiling height.**

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*Figure 404.4.2* BEDROOM ACCESS

<table>
<thead>
<tr>
<th>BEDROOM A</th>
<th>BEDROOM B</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIVING ROOM</td>
<td>KITCHEN</td>
</tr>
</tbody>
</table>

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2015 INTERNATIONAL PROPERTY MAINTENANCE CODE® COMMENTARY
LIGHT, VENTILATION AND OCCUPANCY LIMITATIONS

- Section 503.2, which prohibits a toilet room from being the only passageway to a hall or other space from a bedroom.
- Section 505.4, which requires a provision for combustion air in bedrooms that contain a fuel-burning water heater.
- Sections 602.2 and 602.5 for minimum heat required in a bedroom.
- Section 605.2, which requires at least two separate and remote receptacle outlets in each bedroom.
- Section 702.4 for required emergency escape windows and doors in bedrooms.
- Section 704 for required smoke detectors in the vicinity of the bedrooms.

404.5 Overcrowding. Dwelling units shall not be occupied by more occupants than permitted by the minimum area requirements of Table 404.5.

Overcrowding often is a problem in rental properties and in small, single-family dwellings. It can create serious problems; for example, disease spreads more easily, privacy is lost, mental health is affected and buildings are subject to more abuse and wear. Overcrowding can have a destructive effect on a whole neighborhood if it takes place in several houses on the same block or in several units in the same apartment building. Reducing overcrowding will reduce related health and safety hazards.

The code requires all types of dwelling units to comply with occupancy area requirements. There is no exception for owner-occupied houses; however, overcrowding of owner-occupied, single-family residences requires the careful thought and judgement of the code official to determine an appropriate course of action.

Proving that a building is overcrowded may be difficult. Tenants may lie about the number of occupants in their unit to avoid eviction. To determine the number of occupants, the code official may try to count beds or the names on mailboxes. Neighbors may also provide valuable information about the number of occupants and may be able to tell when the occupants are most likely to be home. It may be necessary to conduct inspections during evening hours in order to find an adult occupant at home. School enrollment records can also provide information on overcrowding.

Some communities have laws requiring an occupancy permit to be issued before a dwelling unit can be occupied. This allows the number of occupants shown on the application to be checked against the maximum occupancy of the dwelling unit as determined by an inspection [see Commentary Figure 404.5(1)].

Some floor plan arrangements would allow the dining and living room areas to be considered as combined dining/living/bedroom. To illustrate the alternative analytical approach for the maximum number of occupants, consider the following example in which two analyses will be made: the first assumes only the three bedrooms are used for sleeping purposes; the second assumes the living/dining area is to be counted as providing sleeping space [see Commentary Figure 404.5(2) for an example of an arrangement where the access to the kitchen is not through the dining/living room]. The requirement of Section 404.4.2; therefore, would be met and the maximum occupant load would be the highest of the following two analyses:

ANALYSIS 1 OCCUPANT LOAD ANALYSIS WITH NO COMBINED SLEEPING ROOM USAGE

1. Sleeping space: Section 404.4.1 indicates that 70 square feet (6.5 m²) is required for a room occupied by one person and 50 square feet (4.6 m²) per person is required for a room occupied by more than one person. In this example, we arrive at the following:

<table>
<thead>
<tr>
<th>SLEEPING AREAS</th>
<th>ACTUAL AREA (SQUARE FEET)</th>
<th>ALLOWABLE NO. OF OCCUPANTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bedroom 1</td>
<td>110</td>
<td>2</td>
</tr>
<tr>
<td>Bedroom 2</td>
<td>127</td>
<td>3</td>
</tr>
<tr>
<td>Bedroom 3</td>
<td>92</td>
<td>1</td>
</tr>
</tbody>
</table>

For Sl: 1 square foot = 0.0929 m².

At this point the maximum possible occupant load is five. It can be no higher due to lack of additional sleeping space.

2. Living, dining and kitchen space: Table 404.5 establishes the minimum required areas that will accommodate various numbers of occupants. By using Table 404.5, the following is derived:

<table>
<thead>
<tr>
<th>SPACE</th>
<th>ACTUAL AREA (SQUARE FEET)</th>
<th>ALLOWABLE NO. OF OCCUPANTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living room</td>
<td>220</td>
<td>6 or more</td>
</tr>
<tr>
<td>Dining room</td>
<td>100</td>
<td>6 or more</td>
</tr>
</tbody>
</table>

For Sl: 1 square foot = 0.0929 m².

3. Maximum allowable number of occupants: The actual living, dining and kitchen areas provide the maximum required space for six or more occupants; therefore, the maximum allowable number of occupants based on this analysis, which is five occupants, is governed by the sleeping space provided.

In this case, the living, dining and kitchen areas provide the minimum required space for any number of occupants. As such, if Bedroom 3 were 100 square feet (9.3 m²) rather than 90 square feet (8.4 m²), the maximum allowable occupant load would be six, rather than five, because Bedroom 3 would provide adequate sleeping space for two occupants.

ANALYSIS 2 OCCUPANT LOAD ANALYSIS WITH COMBINED LIVING/DINING/_SLEEPING SPACE

It was previously determined that the bedrooms provide sleeping space for five occupants and the living, dining and kitchen areas are adequate for any number of occupants; however, the code does not prohibit the dual use of a room as living/sleeping or living/dining/sleeping, as long as the room meets the requirements for each intended use. In this example, the living/dining room could be considered a combined living/dining/sleeping room.

When determining the maximum occupant load for a combined living/sleeping or living/dining/sleeping room, Section 404.5.1 mandates that the minimum area required by Table 404.5 are not to be included as sleeping areas. Therefore, if the combined living/dining/sleeping room were used by one person for sleeping, at least 70 square feet (6.5 m²) is necessary (Section 404.4.1), leaving 250 square feet (23.2 m²) available for combined living/dining purposes [320 square feet (29.7 m²) total minus 70 square feet (6.5 m²)] equals 250 square feet (23.2 m²). Table 404.5 and Section 404.5.2 would allow a combined living/dining room of 250 square feet (23.2 m²) to accommodate any number of occupants (six or more) which is the same as the first example. The total number of occupants for which a sleeping area is provided is now a maximum of six (the bedrooms accommodate five and the combined living/dining/sleeping room accommodates one) therefore, the maximum allowable occupant load based on this analysis would be six.

In this example the combined living/dining/sleeping room would be subject to all requirements for sleeping areas, including emergency escape windows (Section 702.4) and smoke detectors (Section 704).
The code does not prohibit a living or dining room from serving a dual purpose as a sleeping area, however, the room must be sized to accommodate both functions. See the commentary to Section 404.5 for additional examples of calculating the maximum allowable occupant load in dwellings where certain rooms are used for dual purposes.

### 404.5.2 Combined spaces

Combined living room and dining rooms spaces shall comply with the requirements of Table 404.5 if the total area is equal to or required for separate rooms and if the space is located so as to function as a combination living room/dining room.

When a living room and a dining room are combined into one room, the combined area must equal the sum of the minimum required area of each separate room established by Table 404.5. See Analysis 2 in the commentary to Section 404.5 for further illustration.

### 404.6 Efficiency unit

Nothing in this section shall prohibit an efficiency living unit from meeting the following requirements:

1. A unit occupied by not more than one occupant shall have a minimum clear floor area of 120 square feet (11.2 m²). A unit occupied by not more than two occupants shall have a minimum clear floor area of 220 square feet (20.4 m²). A unit occupied by three occupants shall have a minimum clear floor area of 320 square feet (29.7 m²). These required areas shall be exclusive of the areas required by Items 2 and 3.

2. The unit shall be provided with a kitchen sink, cooking appliance and refrigeration facilities, each having a minimum clear working space of 30 inches (762 mm) in front. Light and ventilation conforming to this code shall be provided.

3. The unit shall be provided with a separate bathroom containing a water closet, lavatory and bathtub or shower.

4. The maximum number of occupants shall be three.

Efficiency units are typically 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 for bedrooms in Section 404.4. The total allowable number of occupants in the dwelling, however, is limited to two or three, depending on the area of the unit. The purpose of 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 limit of total occupants to two or three persons.

Item 1 establishes the minimum required area based on the number of occupants. The item states that these areas are exclusive of the areas required by Items 2 and 3. For example, Item 2 requires that the kitchen be provided with (at minimum) a sink, cooking appliance and refrigerator. It further requires that each of these have a 30-inch (762 mm) clear working space in front of the fixture or appliance. The space taken up by the appliance and the required clear working space of 30 inches (762 mm) in front of each appliance cannot be included in the minimum required floor space in Item 1 (see the last sentence of Item 1). Similarly, the floor area of the bathroom required in Item 3 is not included in the minimum required floor space in Item 1. Lastly, Item 4 establishes the maximum occupant load of three.

There are no minimum floor areas required in the kitchen or bathroom. Having enough space for the required fixtures, appliances and working spaces is considered sufficient to provide functional floor area.

### 404.7 Food preparation

All spaces to be occupied for food preparation purposes shall contain suitable space and equipment to store, prepare and serve foods in a sanitary manner. There shall be adequate facilities and services for the sanitary disposal of food wastes and refuse, including facilities for temporary storage.

Kitchens must be provided with stoves, ovens, refrigerators, freezers, cabinets, countertops and drawers in sufficient quantity and in a condition that the occupants can store their food safely and at appropriate temperatures to protect the food. All equipment must be constructed and maintained so that it can be cleaned.

Food preparation areas must also be provided with garbage disposals or containers that permit the safe temporary storage of garbage and refuse. Containers should be constructed and maintained to prevent insect and rat infestations.
Chapter 5: Plumbing Facilities and Fixture Requirements

General Comments

Chapter 5 establishes the minimum criteria for the installation, maintenance and location of plumbing systems and facilities, including water supply systems, water-heating appliances, sewage disposal systems and related plumbing fixtures. Existing plumbing installations may present unique inspection problems for the code official. Almost all installations are concealed by finished walls, ceilings and floors. The code official must inspect the visible portions of the system and assess the acceptability of the whole installation. To help the code official make suitable judgments, a foundation of basic principles may aid in the enforcement process. The following is a listing of 23 basic principles of environmental sanitation and safety for the design, installation and maintenance of plumbing systems, which establish the fundamental concepts behind health and safety regulations for plumbing systems. Knowing these principles aids in understanding the code requirements, which leads to more effective code enforcement.

Principle No. 1: All Occupied Premises Shall Have Potable Water

All buildings, structures and premises intended for human habitation, occupancy, use or employment, or the preparation or processing of food, drinks or other materials for human consumption shall be provided with an adequate, safe and potable water supply through a safe system of piping to all fixtures, appliances and appurtenances. Such a water supply must not be connected to an unsafe water source, nor shall it be subjected to the hazards of backflow.

Principle No. 2: Adequate Water Required

Plumbing fixtures, devices and appurtenances shall be supplied with water in sufficient volume and at pressures adequate to enable them to function properly and without undue noise under normal conditions of use.

Principle No. 3: Hot Water Required

Hot water shall be supplied to all plumbing fixtures that normally need or require hot water for their proper use and function.

Principle No. 4: Water Conservation

Plumbing shall be designed and adjusted to use the minimum quantity of water consistent with proper performance and cleaning.

Principle No. 5: Dangers of Explosion or Overheating

Devices for heating and storing water shall be designed and installed so as to guard against dangers from explosion or overheating.

Principle No. 6: Use Public Water and Sewers Where Available

Every building with installed plumbing fixtures intended for human habitation, occupancy or use shall be located where there is a public water supply and sewer service shall have a connection with the water supply and sewer.

Principle No. 7: Required Plumbing Fixtures

Each family dwelling unit shall have at least one water closet, one lavatory, one kitchen-type sink and one bathtub or shower to meet the basic requirements of sanitation and personal hygiene. All other structures for human occupancy or use shall be equipped with sufficient sanitary facilities as prescribed in the code, but with no less than one water closet and lavatory.

Principle No. 8: Smooth Surfaces Required

Plumbing fixtures shall be made of durable, smooth, nonabsorbent and corrosion-resistant material and shall be free from concealed fouling surfaces.

Principle No. 9: Drainage System of Adequate Size

The drainage system shall be designed, constructed and maintained to guard against fouling, deposit of solids and clogging, and with adequate cleanouts arranged so that the pipes may be readily cleaned.

Principle No. 10: Durable Materials and Good Workmanship

The piping of the plumbing system shall be of durable material, free from defective workmanship and designed and constructed so as to give satisfactory service for its reasonably expected life.

Principle No. 11: Liquid Seal Traps Required

Each fixture directly connected to the drainage system shall be equipped with a liquid seal trap.

Principle No. 12: Trap Seals Must Be Protected

The drainage system shall be designed to provide adequate circulation of air in all pipes without danger of siphonation, aspiration or forcing of trap seals under conditions of ordinary use.
Section 501 General

501.1 Scope. The provisions of this chapter shall govern the minimum plumbing systems, facilities and plumbing fixtures to be provided.

Buildings must comply with the minimum criteria for the provisions of plumbing systems, facilities and fixtures established by this chapter. Any structure that does not conform to these criteria is in violation of the code and is subject to all penalties established by the jurisdiction as indicated in Section 106.

501.2 Responsibility. The owner of the structure shall provide and maintain such plumbing facilities and plumbing fixtures in compliance with these requirements. A person shall not occupy as owner-occupant or permit another person to occupy any structure or premises that does not comply with the requirements of this chapter.

The owner is responsible for complying with the requirements of this chapter. A structure must not be occupied if the plumbing systems or facilities do not conform to the minimum code requirements.

Section 502 Required Facilities

502.1 Dwelling units. Every dwelling unit shall contain its own kitchen unit, water closet and kitchen sink that shall be maintained in a sanitary, safe working condition. The lavatory shall be placed in the same room as the water closet or located in close proximity to the door leading directly into the room in which such water closet is located. A kitchen sink shall not be used as a substitute for the required lavatory.

Every dwelling unit is to have at least one water closet, one lavatory, one kitchen-type sink and one bathtub or shower to meet the basic requirements for sanitation and personal hygiene.

The kitchen sink is intended to provide separate facilities for food preparation and dishwashing and is not intended for hand cleansing after using the toilet facilities, thus reducing the likelihood of contamination of surfaces that are subject to contact with food.

502.2 Rooming houses. Not less than one water closet, lavatory and bathtub or shower shall be supplied for each four room units. Rooming houses with shared bathroom and toilet facilities must conform to the following minimum number of fixtures: one water closet, one lavatory and one bathtub or shower (i.e., one bathroom group) for each four room units, or proportion thereof.

For example, a house with 22 rooming units requires at least six bathroom groups of plumbing fixtures (22 ÷ 4 = 5.5; rounded up to 6).

502.3 Hotels. Where private water closets, lavatories and bathtubs are not provided, one water closet, one lavatory and one bathtub or shower having access from a public hallway shall be provided for each 10 occupants.

Hotels with guestrooms that share bathroom and toilet facilities must conform to the following minimum number of fixtures: one water closet, one lavatory and one bathtub or shower for each 150 occupants, or portion thereof.

For example, a hotel with 22 occupants requires a minimum of three water closets, three lavatories and three bathtubs or showers or a combination of three bathtubs and one shower.

502.4 Employees’ facilities. Not less than one water closet, one lavatory and one drinking facility shall be available to employees.

To provide employees with sufficient sanitary facilities, every place of employment is to have at least one water closet, one lavatory and one drinking facility.

Passage through bathrooms and toilet rooms to get to other rooms, spaces, corridors or the exterior is recommended and could also provide the means of egress because of locked doors, wide floors and obstructions.

503.2 Location. Toilet rooms and bathrooms serving hotel units, rooming units or dormitory units or housekeeping units, shall have access by traversing no more than one flight.
of stairs and shall have access from a common hall or pas-
sageway.

- Occupants of hotel units, rooming units, dormitory units or housekeeping units should not have to travel between the next adjacent story or pass through another occupant's unit to gain access to a bathroom or toilet facility. Convenient access to facilities is a basic feature for their use and maintenance.

[P] 503.3 Location of employee toilet facilities. Toilet facilities shall have access from within the employees' working area. Toilet facilities shall not be located on more than one story above or below the employees' working area and the path of travel to such facilities shall not exceed a distance of 500 feet (152 m). Employee facilities shall either be separate facilities or combined employee and public facilities.

Exception: Facilities that are required for employees in storage structures or kiosks, which are located in adjacent structures and which are not used in the course of employment, shall not have to travel a distance of 500 feet (152 m) from the employees' regular working area to the facilities.

- Employers are required to provide toilet facilities for employees within the employees' regular work areas. Employers should not have to travel more than 500 feet (152 m) or beyond the next adjacent story to reach the toilet room.

Employee toilet facilities can be for employees' use only or they can share customer facilities. If toilet rooms are inconvenient or located too far from the work area, they create a physical hardship for employees.

This section does not require storage buildings and kiosks to contain toilet facilities, as long as there are toilet facilities in an adjacent building such that the distance from the work area to the toilet facilities does not exceed 500 feet (152 m). The building with the toilet facilities must be under the same ownership, lease or control. Employers should not expect their employees to depend upon neighborhood gas stations, stores or other businesses to provide access to toilet facilities.

[P] 503.4 Floor surfaces. In other than dwelling units, every toilet room floor shall be maintained to be a smooth, hard, nonabsorbent surface to permit such floor to be easily kept in a clean and sanitary condition.

- A toilet room floor is much easier to maintain if the surface is smooth, hard and nonabsorbent. In areas such as toilet rooms where the public is likely to enter a facility, the primary concern remains keeping the floor area as clean as possible to safeguard against the spread of disease.

SECTION 504 PLUMBING SYSTEMS AND FIXTURES

[P] 504.1 General. Plumbing fixtures shall be properly installed and maintained in working order, and shall be kept free from obstructions, leaks and defects and be capable of performing the function for which such plumbing fixtures are designed. Plumbing fixtures shall be maintained in a safe, sanitary and functional condition.

- All plumbing fixtures must operate adequately and perform their intended functions. Fixtures may drain quickly without permitting sewer gases to enter the structure. Fixtures are not to leak from either the water supply piping or the waste discharge piping.

Fixtures must be cleaned so that they cannot be adequately cleaned. Kitchen sinks and lavatories that have leaks that prevent them from being kept clean are not more than one story above or below the employees' working area and the path of travel to such facilities shall not exceed a distance of 500 feet (152 m). Employee facilities shall either be separate facilities or combined employee and public facilities.

Exception: Facilities that are required for employees in storage structures or kiosks, which are located in adjacent structures and which are not used in the course of employment, shall not have to travel a distance of 500 feet (152 m) from the employees' regular working area to the facilities.

- Employers are required to provide toilet facilities for employees within the employees' regular work areas. Employers should not have to travel more than 500 feet (152 m) or beyond the next adjacent story to reach the toilet room.

Employee toilet facilities can be for employees' use only or they can share customer facilities. If toilet rooms are inconvenient or located too far from the work area, they create a physical hardship for employees.

This section does not require storage buildings and kiosks to contain toilet facilities, as long as there are toilet facilities in an adjacent building such that the distance from the work area to the toilet facilities does not exceed 500 feet (152 m). The building with the toilet facilities must be under the same ownership, lease or control. Employers should not expect their employees to depend upon neighborhood gas stations, stores or other businesses to provide access to toilet facilities.

[P] 504.1 General. Plumbing fixtures shall be properly installed and maintained in working order, and shall be kept free from obstructions, leaks and defects and be capable of performing the function for which such plumbing fixtures are designed. Plumbing fixtures shall be maintained in a safe, sanitary and functional condition.

- All plumbing fixtures must operate adequately and perform their intended functions. Fixtures may drain quickly without permitting sewer gases to enter the structure. Fixtures are not to leak from either the water supply piping or the waste discharge piping.

Fixtures must be cleaned so that they cannot be adequately cleaned. Kitchen sinks and lavatories that have leaks that prevent them from being kept clean are a potential health risk. The likelihood that disease-causing organisms can be spread to food sources or from person to person. Fixtures with structural cracks can fail suddenly, possibly causing personal injury and further property damage.

- [P] 504.2 Fixture clearances. Plumbing fixtures shall have adequate clearances for usage and cleaning.

- Inadequate clearance between fixtures and adjacent surfaces can create confined spaces that allow disease and odor-causing bacteria to multiply. For proper sanitation, fixtures must have sufficient clearances for proper use and cleaning.

Although the code does not specify exact clearances between fixtures and adjacent surfaces, the code official must use good judgment and review the required clearances for compliance with the Code.

[P] 504.3 Plumbing system hazards. Where it is found that plumbing systems in a structure contain a hazard to the occupants or the structure by reason of inadequate service, inadequate venting, cross connection, backflow prevention, isolation or damage or for similar reasons, the code official shall require the defects to be corrected to eliminate the hazard.

- Any plumbing system having a deficiency or condition that is deemed by the code official to be hazardous to the occupants or to the structure must be repaired or altered to eliminate the hazard. Hazards in a plumbing system include, but are not limited to, the following:

  - Undersized piping
  - Inadequate venting
  - Cross connections
  - Lack of backflow prevention means
  - Lack of sufficient fixtures
  - Improperly installed or out-of-order fixtures or fittings
  - Deteriorated, damaged, worn or otherwise defective piping, fixtures or fittings
  - Inadequately supported fixtures or piping
  - Inadequate water pressure or volume

One of the most commonly encountered hazards is a submerged outlet in older-style fixtures in water closets, bathtubs, lavatories, laundry tubs and water softeners. Cross connections and improperly protected outlets greatly increase the chance that contaminated water will be introduced into the potable water supply.

- [P] 508.5.1 General. Every sink, lavatory, bathtub or shower, drinking fountain, water closet or other plumbing fixture shall be properly connected to the public water system or to an approved private water system. Kitchen sinks, lavatories, laundry, kitchen and utility sinks (all cook sinks), laundry facilities, bathtubs and showers shall be supplied with potable drinking water in accordance with the International Plumbing Code.

- The water for all plumbing fixtures must be properly connected to either a public or an approved private water system. If there is no objection to the quality of the private water supply, the code official should require that the water be tested and approved by either a public health authority or a local health department. A plumbing system cannot be considered adequate if the water entering the system is contaminated or otherwise unfit for human consumption.

The desired qualities for safe water are:

  - Free of pathogenic organisms
  - Free of toxic chemicals
  - Free of odor, taste, color and turbidity
  - Free of excessive minerals
  - Relatively noncorrosive
  - Adequate in quantity and pressure

All sinks, lavatories, bathtubs and showers must be supplied with cold and hot or tempered running water as regulated by the code. Heated water is a basic necessity for washing and bathing purposes. Inspectors should be trained to ensure that the code only allows tempered water [which is 80°F (26°C)] to 110°F (43°C)] for use in the bathroom and other residential and commercial premises. The Code requires tempered water to be supplied to hot-water fixtures located in public toilet facilities.

[P] 508.5.2 Continuation. The water supply shall be maintained free from contamination, and all water wells for plumbing fixtures shall be located above the flood level run of the fixture. Shampoo basin faucets, junior sink faucets and other hose bibs or faucets to which hoses are attached and left in a disused condition can be replaced with an approved atmospheric-vacuum breakers or an approved permanently attached hose connection vacuum breaker.

- Cross connections and unprotected outlets are the most commonly encountered sources of contamination in potable water systems. The Code defines a cross connection as any physical connection or arrangement between two otherwise separately supplied systems—one of which contains potable water and the other water of unknown or questionable safety, steam, gas or chemical—a means by which the possibility for flow from one system to the other, with the direction of flow depending on the pressure differential between the two systems. The code official must not always be able to discover all cross connections and unprotected outlets in a building, but should become familiar with the localities where such usually occur. Many older-style plumbing fixtures were designed or installed with built-in submerged water outlets. A few of the more common fixtures and appliances that might have unprotected outlets include water closets, bathtubs, lavatories, kitchen sinks, laundry facilities, air conditioning and heating units.

- Water softerener drains are often improperly connected to the public water system, thereby creating cross connections (see Commentary Figure 505.2(1)).

There are two basic methods of preventing contamination of the potable water supply. The first is to provide an air gap at the water outlet and the floor level rim of the fixture. The second is to install backflow prevention devices in the water supply line.

Air gags are the ideal solution because it does not rely on the performance of mechanical devices to prevent backflow into the water supply. Typically, an air gap must be at least 1 inch (25 mm) above the flood level rim of the fixture. There are minimum requirements for air gap protection of fixtures in Table 508.16.1.1 of the Code.

An example of an unprotected outlet is identified in Commentary Figure 505.2(2) when the following conditions exist:

  - The third-floor water closet has the ball cock (fill valve) submerged in the water of the water closet tank.
  - The water pressure within the building is low because of corrosion buildup in the water pipes or simultaneous usage of fixtures.
  - The water closet is flushed, thereby opening the ball cock.
  - Contaminated water can be drawn from the water closet tank into the supply pipes.

In such circumstances when the sink is filling, the pressure within the building can be higher at the water closet fill valve. This creates a siphon action in the water closet tank. A potentially hazardous event has occurred that could introduce contaminated water into the potable water supply.

- The solution to this problem is fairly simple. The water closet fill valve should be replaced with an antisiphon fill valve that extends a minimum of 1 inch (25 mm) above the overflow tube in the water closet tank. Alternatively, the water pressure should be increased through the building should be increased by replacing or upsizing the water supply piping.

Another common condition that can result from hoses being attached to threaded outlets. Backflow can occur when the open end of the hose is submerged in any liquid and the possibility of backflow exists when a hose outlet is connected to a hose drag or other spread chemical fertilizers, herbicides or insecticides. If negative pressure should occur in the water supply piping, the water and chemicals from the hose could be siphoned into the water supply.

The solution to this problem, however, is to install a hose connection-type vacuum breaker on the water supply outlet fitting. When a negative pressure occurs in the
water supply, the vacuum breaker opens to the atmosphere allowing air to enter the piping system, thus "breaking" the vacuum.

A type of cross connection occurs when a water supply is connected directly to an appliance or a piece of equipment. Some examples are water supplies to hot water and steam boilers, lawn irrigation systems, fire suppression systems, carbonated beverage machines and equipment used for various industrial applications, such as food processing. These items are not able to function with an air gap between the supply pipe and the appliance or fixture. Consequently, some type of backflow preventer device must be installed in the water supply line to prevent the water flow from reversing direction. Common types of protection include pressure-type vacuum breakers, barometric loops and reduced pressure principle backflow preventers.

Any time there is not an obvious air gap or visible backflow preventer device in a water supply line, the code official should attempt to determine if a hazard exists.

Cross connections between a private water supply (typically a well system) and a potable public water supply are not permitted under any circumstance. If the ground water becomes contaminated, a cross connection could affect the entire public water supply system.

The code official should work with local plumbing inspectors or water departments to identify and eliminate all cross connections and unprotected potable water outlets.

**505.3 Supply Line.** The water supply system shall be installed and maintained to provide a supply of water to plumbing fixtures, devices and appliances in sufficient volume and at pressures adequate to enable the fixtures to function properly, safely, and free from defects and leaks.

+ Inadequate water pressure or insufficient volume can cause plumbing fixtures, washing machines, dishwashers and other appliances to operate improperly.
+ Inadequate water pressure can restrict the flow of water into bathtubs, showers and sinks to the point that the fixtures are not usable. The code requires enough pressure and volume so that all fixtures and appliances are functional and free of undue hazards.

Figure 505.21
COMMON CROSS CONNECTIONS

There are many causes of inadequate water pressure and lack of sufficient volume. A few of the common causes include:

- Private wells
- Inadequate ground-water supply
- Defective pumps or a pump that has lost its prime
- Storage tank that has lost its air cushion
- Sand or silt plugging the well point

Municipal systems:

- Inadequate pressure in the public water main
- Sudden loss of pressure in an area caused by the use of a nearby fire hydrant, a broken main water line, etc.

Quite frequently, an inadequate water supply is the result of problems within a building. A few examples include clogged or corroded pipes, undersized piping, cramped or bent pipes and a system that is inadequately designed. A change in occupancy of a building might create demands that exceed the original water piping capacity.

**505.4 Water Heating Facilities.** Water heating facilities shall be properly installed, maintained and capable of providing an adequate amount of water to be drawn at every required sink, lavatory, bathtub, shower and laundry facility at a minimum temperature of 110°F (43°C). A gas-burning water heater shall not be located in any bathroom, toilet room, bedroom or other occupied room normally kept closed, unless adequate combustion air is provided. An approved combination temperature and pressure relief valve and relief valve discharge pipe shall be properly installed and maintained on water heaters.

+ A water heater can be dangerous if it is not properly installed and maintained. A water heater is a closed vessel that can be subjected to high temperature and pressure. Under the right conditions, a water heater can explode violently and cause extensive structural damage to buildings and personal injury or death. As such, water heaters should be thoroughly inspected. The following is a guide for the inspection of water heater systems.

1. Electric water heaters:
   - Is the electric service for the house adequate to supply the normal demands of the house as well as the increased demands of a water heater?
   - Is the electrical wiring for the water heater of adequate size and properly installed in accordance with the electrical code?
   - Are all conductors properly installed and protected against physical damage?

2. Fuel-burning water heaters:
   - Which fuel is being used? Commonly used fuels include natural gas, propane gas and fuel oil.
   - Is the fuel piping constructed from approved materials, properly connected and adequately supported?
   - Is there a readily accessible, properly installed shutoff valve to stop the fuel supply?

3. Safety controls (electric and fuel-burning):
   - Do the safety controls and devices appear to be in good condition without evidence of tampering or modification?
   - Is the thermostat (temperature control) operational and in good condition?
   - Does the water heater have a temperature and pressure relief valve or a combination temperature and pressure relief valve? These safety valves are necessary to relieve excessive pressures, thereby preventing an explosion of...
the water heater. The temperature and pressure relief valves or combination temperature and pressure relief valve must be rated for a pressure higher than the working pressure rating of the water heater, and in no case higher than 150 pounds per square inch (psi) (1034 kPa).

- Is the temperature relief-valve-sensing element located in the top 6 inches (152 mm) of the water heater tank? This is the hottest water in the tank.
- Is the relief valve in good condition and free of corrosion or leakage?
- Is the relief valve rating equal to or greater than the British thermal unit per hour (Bu/h) input rating of the water heater? An undersized safety relief valve does not offer adequate protection.
- Does the relief valve have a discharge pipe to divert heated water toward the floor and to a point where it will not cause damage to the structure? The discharge pipe must be rigid piping of the same diameter as the relief valve outlet. The lower end of the discharge pipe must not be closed or plugged and is not to have a threaded end that would invite closure. The relief valve discharge pipe must not be located where it would be subject to freezing, as this could result in a complete blockage of the pipe.

4. Venting:
- Do all fuel-burning water heaters vent the combustion products to an approved chimney or venting system?
- Does the vent have adequate clearance from combustible materials (wood, paper, cloth, etc.)?

- Are the vent or chimney connectors constructed of approved materials? They should be constructed from corrosion-resistant materials such as aluminum, galvanized steel and stainless steel. The joints should be fastened with sheet metal screws, rivets or other approved means.
- Does the chimney, vent or connector show signs of deterioration, corrosion or condensation?
- Is the vent/chimney connector properly supported and connected to the vent or chimney?

If there is a doubt or question about a particular installation (see Commentary Figure 505.4), plumbing inspectors or water department officials should be consulted.

Fuel-burning water heaters must not be installed in bathrooms, toilet rooms, bedrooms or any other rooms that are normally kept closed when in use, unless combustion air is brought directly to the appliance from outside of the room. Adequate combustion air must always be provided regardless of the appliance location. The International Mechanical Code® (IMC®) prohibits the installation of fuel-fired water heaters in such rooms in all cases, except where the water heater is a direct-vent type or is placed in a dedicated enclosure completely isolated from the occupied room. Asphyxiation of the room occupants could possibly result from inadequate combustion air, venting system failure or appliance malfunction (see Section 603.2).

The code official must also be sure that the water heater is able to provide water of at least 110°F (43°C) to every fixture requiring hot water (see Section 505.1).

Temperature and pressure relief valves are absolutely necessary to prevent the possibility of water heater explosion resulting from overheating.

SECTION 506
SANITARY DRAINAGE SYSTEM

[P] 506.1 General. Plumbing fixtures shall be properly connected to either a public sewer system or to an approved private sewage-disposal system.

- Plumbing fixtures must be connected to an approved public or private sewer system. Private systems that should not be approved would include pit privies, cesspools or any system that discharges to storm drains, ponds, lakes, streams or rivers.

[P] 506.2 Maintenance. Every plumbing stack, vent, waste and soil pipe shall function properly and be kept free from obstructions, leaks and defects.

All waste, soil, sewer and vent piping must be installed and maintained so as to function properly. Obstructions or defects that present health hazards must be corrected. Leaking pipes or joints must be replaced or repaired. All repairs and new installations must be in accordance with the IPC.

A thorough and accurate inspection of the plumbing system requires knowledge of plumbing systems; however, with training and experience, the code official can identify typical problems and improper installations in broad terms, he or she should inspect the following elements of a plumbing system: fixtures; sanitary drainage systems; air vents; and hangers and supports.

1. Sanitary drainage system: The system must be free of leaks. Leaking drain pipes can cause structural damage and spread illness from the pathogenic organisms in the waste water.

The code official should inspect all visible drainpipes for any improper connections or installations. A few frequently encountered problems include the following:

a. Improperly installed materials: Materials not designed or approved for plumbing applications are often used for repairs and modifications in plumbing systems. The improper use of fittings, joining means and connectors is common in existing structures. Drainage piping with no slope or reverse slope can promote blockages.

b. Joints and pipes that have been "patched" with tape, putty, caulk or tar thus indicating past or current leakage in the drainage system.

c. Unworkmanlike installation: This often indicates that an untrained handyman has made repairs.

The code official should check the entire system for any indications of unvented fixtures, improper materials or other typical violations. Additionally, it should be determined whether permits were obtained to install the work.

2. Vents and venting: Plumbing systems are designed with an integral venting system to prevent the backsiphonage of the waste or drainage inlets in fixture traps. Fixture vents must be provided and maintained where necessary to protect traps from pressure fluctuations and siphon action that cause loss of the water seal.

3. Traps: Each plumbing fixture must have a trap at the connection to the sanitary drainage system. A trap creates a water seal that prevents sewer gas from entering the structure. Sewer gases can be toxic and carry bacterial-laden aerosols. Some types of sewer gases are even explosive.

4. Hangers and supports: Improperly or inadequately supported waste and vent piping frequently indicates a nonprofessional installation. All piping is required to be adequately supported to maintain pitch and alignment and prevent strain on connections and joints.

In general, the code official should inspect the entire visible plumbing system for: leakage; the presence of fixture, standpipe and floor drain traps, approved materials (with approved connections) and an acceptable venting system.

[P] 506.3 Grease interceptors. Grease interceptors and automatic grease removal devices shall be maintained in accordance with this code and the manufacturer's installation instructions. Grease interceptors and automatic grease removal devices shall be regularly serviced and cleaned to prevent the discharge of oil, grease, and other substances harmful or hazardous to the building drainage system, the public sewer, the private sewage-disposal system or the sewer treatment plant or processes. Records of maintenance, cleaning and repairs shall be available for inspection by the code official.

This section clarifies that grease interceptors and automatic grease removal devices require ongoing, routine maintenance in order to perform their intended function. Any such device should be in accordance with the manufacturer's maintenance criteria. The language is coordinated with the provisions of Section 1003.1 of the IPC, which establishes when these devices are required to be installed. Failure to maintain these devices results in public health hazards via sanitary sewer overflows into buildings, roads and streams and premature deterioration and failure of public and private sewage systems.
SECTION 507
STORM DRAINAGE

[IF] 507.1 General. Drainage of roofs and paved areas, yards and courts, and other open areas on the premises shall not be discharged in a manner that creates a public nuisance.

> Storm water must be discharged so that it does not pond in paved areas, yards, courts or open areas. Standing water can freeze in cold climates, thereby causing a slip hazard. In warm weather, standing water can create an insect breeding ground.

> Roof gutters and downspouts are not required, provided that storm water is discharged in such a manner that it does not create a public nuisance.

The code official should also check local ordinances to determine if run-off storm drainage water and sump pumps can be allowed to enter the sanitary sewer system. Most communities are now requiring all storm drainage water to be separated from the sanitary sewer system. Disconnecting the storm water from the sanitary sewer system can reduce the costs of sewage treatment and eliminate an overload of the treatment facility.

> The emphasis in storm drainage is to remove the water quickly without creating hazards to pedestrians or causing damage to any structures on the same or neighboring property.

Bibliography

The following resource materials were used in the preparation of the commentary for this chapter of the code:


Chapter 6: Mechanical and Electrical Requirements

General Comments

Chapter 6 establishes minimum criteria for the installation and maintenance of the following: heating and air-conditioning equipment; appliances and systems; water-heating equipment; appliances and systems; cooking equipment and appliances; ventilation and exhaust equipment; gas and liquid fuel distribution piping and components; fireplaces and solid fuel-burning appliances; chimneys and vents; electrical services; lighting fixtures; electrical receptacle outlets; electrical distribution system equipment, devices and wiring; and elevators, escalators and dumbwaiters.

The primary objectives of mechanical and heating equipment inspections are to detect, identify and abate any condition that is a potential fire or explosion hazard; is a potential cause of asphyxiation or carbon monoxide poisoning; poses the risk of physical injury to an occupant; prevents the equipment from adequately performing its intended function; or that otherwise endangers the occupants or the structure.

The primary objectives of electrical equipment and system inspections are to detect, identify and abate any condition that is a potential fire hazard or electrical shock hazard. Any condition that inadequately provides for the supply and distribution of electrical power throughout the structure must also be detected, identified and abated.

All mechanical and electrical facilities must be capable of providing the minimum levels of safety, illumination, comfort, utility and convenience as prescribed in this chapter.

Purpose

All mechanical and electrical equipment, appliances and systems must be properly installed to serve the intended purpose. Proper installation, however, does not guarantee safety or performance. In addition to proper installation, all such equipment, appliances and systems must be maintained, as they are subject to deterioration, wear and aging, and may require cleaning, lubrication, adjustment, etc. All materials and components used to construct mechanical and electrical systems have a limited life span, and require repair or replacement at various time intervals that are specific to the material or component.

The purpose of Chapter 6 is to establish minimum performance requirements for electrical and mechanical facilities and to establish minimum standards for the safety of such facilities.

SECTION 601
GENERAL

601.1 Scope. The provisions of this chapter shall govern the minimum mechanical and electrical facilities and equipment to be provided.

> Minimum performance guidelines for mechanical and electrical facilities and equipment are established in this chapter. Installations that do not conform to these minimum criteria are unacceptable.

601.2 Responsibility. The owner of the structure shall provide and maintain mechanical and electrical facilities and equipment in compliance with these requirements. A person shall not occupy as owner-occupant or permit another person to occupy any premises that does not comply with the requirements of this chapter.

> It is the responsibility of the owner of the structure to provide and maintain the required electrical and mechanical facilities. An owner must not occupy or allow any other person to occupy a structure that is not in compliance with this chapter, thus, the requirements of this chapter are the minimum necessary to make a structure occupiable.

SECTION 602
HEATING FACILITIES

602.1 Facilities required. Heating facilities shall be provided in structures as required by this section.

> This section establishes the scope of requirements in Section 602 [see the International Mechanical Code (IMC) for space-heating requirements for new structures].

602.2 Residential occupancies. Dwellings shall be provided with heating facilities capable of maintaining a room temperature of 68°F (20°C) in all habitable rooms, bathrooms and toilet rooms based on the winter indoor design temperature for the locality indicated in Appendix D of the International Plumbing Code. Cooking appliances shall not be used, nor shall portable unvented fuel-burning space heaters be used, as a means to provide required heating.

Exception: In areas where the average monthly temperature is above 30°F (-1°C), a minimum temperature of 60°F (16°C) shall be maintained.

> This section establishes the following minimum requirements for space heating in residential structures.
 Adequate heat is required for human health and comfort. The elderly, infirm and very young are most susceptible to illness and death from inadequate space heating.

Heating equipment must be provided and maintained by the owner and must be able to heat all habitable rooms, bathrooms, and toilet rooms to at least 68°F (20°C) based on the outside design temperature established for each locality adopting the code. This 68°F (20°C) standard is the minimum indoor temperature at which people can be reasonably comfortable and can maintain healthy living. This is intended as an absolute minimum since most dwelling occupants will seek indoor temperatures 5°F to 10°F (2°C to 5°C) higher than this.

The outdoor design temperatures are listed in Appendix D of the International Plumbing Code® (IPC). Outdoor design temperatures provide a baseline for what minimum energy is needed to make the heating system dependent on 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 maintain the desired indoor temperature when the outdoor temperature is at or above the outdoor design temperature. When the outdoor temperature is below the outdoor design temperature, the heating system will not be able to maintain a desired indoor temperature. It would be impractical, if not impossible, to design heating systems based on the assumption that someday it might be -20°F (-29°C) outdoors if the outdoor temperature in that area had historically averaged 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 95 percent of the total hours in the northern hemisphere heating season, from December through February, the outdoor temperatures will be at or above the values given in Appendix D of the IPC. 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 95 percent percentile column in Appendix D of the IPC 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 2,160 hours (December through February) (2,160 - 2,160 hours x 0.54 = 54). The lack of adequate space-heating systems can result in the misuse of cooking appliances. It is not uncommon for occupants to use fuel-fired ovens and cooktop burners to supply space heating when the minimum required indoor temperature cannot be maintained, and unfortunately, the typical occupant is not aware of the danger in doing so. Fuel-fired cooking appliances are not designed for continuous or unattended use, and open flames, heat radiation and high surface temperatures pose a significant fire hazard when the appliance is misused.

This section also prohibits the use of fuel-burning, unvented space heating equipment in any portion of the heating that is required for residential occupancies. Similar to cooking appliances, fuel-burning, unvented space heating equipment is dangerous, especially when used as one of the essential means of providing the required heat. Occupants are likely to locate portable space heaters in rooms where they should not be and also locate such heaters too close to combustible materials and furnishings.

The exception recognizes that in warmer portions of the country, where the average monthly temperature meets or exceeds 30°F (1°C), the minimum inside temperature can be reduced from 68°F (20°C) to 65°F (18°C). As a result of this code requirement, the occupants are ensured of having a comfortable interior environment.

603.3 Heating equipment for any building who owns, leases or lets one or more dwelling units or sleeping units on terms, either expressed or implied, to furnish the heating equipment or the heating system for the period from [DATE] to [DATE] to maintain a minimum temperature of 68°F (20°C) in all habitable rooms, bathrooms and toilet rooms.

Exceptions:
1. When the outdoor temperature is below the winter outdoor design temperature for the locality, maintenance of the minimum room temperature shall not be required. This part of the heating system is serving at its full design capacity. The winter outdoor design temperature for the locality shall be as indicated in Appendix D of the International Plumbing Code.
2. In areas where the average monthly temperature is above 30°F (-1°C), a minimum temperature of 65°F (18°C) shall be maintained.

The owner or operator of a rental residential property who agrees to provide heat by express agreement or implication must provide it to all habitable rooms, bathrooms, and toilet rooms. The heat supply must be capable of maintaining a temperature of at least 68°F (20°C), 24 hours per day. The occupants could set the temperature of their unit to a temperature which is lower than the temperature set by the landlord, and therefore, discharge all products of combustion directly to the occupied space. Prolonged use of such appliances can produce dangerously high levels of carbon monoxide and other contaminants, especially considering that employees are being subjected to uncomfortable and unhealthy conditions created by undersized, malfunctioning, defective or otherwise inadequate heating systems. Having adequate space heating also helps eliminate the risk for drafty rooms, cold water, smoke, and fire and asphyxiation increases because of improper use. Contact with or close proximity to combustible materials, overloaded wiring and extension cords, lack of ventilation and the user's typical heat sources, such as portable water, contribute to the potential hazards.

Exception 1 recognizes the limitations of all heating systems that operate when the outdoor temperature is below the winter design temperature. This exception states that the minimum indoor temperature requirement of 68°F (20°C) does not apply when the outdoor temperature is below the design temperature for the heating system. The exception addresses only the circumstances where the heating system cannot keep up because the outdoor conditions exceed that for which it was designed (see Section 602.2). The exception applies only to heating systems that are operating at their design efficiency or their design heat output. It does not apply to improperly designed systems, underground systems or any system operating at less than its full output.

On those rare days when the outdoor temperature is lower than what the heating system was designed to handle, it is anticipated that the indoor temperature might not be maintained. Heating systems that were sized according to outdoor temperatures above the actual outdoor design temperature for the building, which are installed, are improperly designed, and as such, do not comply with the intent of the exception (see commentary, Section 602.2).

Exception 2 is the same as the exception to Section 602.2.

602.4 Occupiable work spaces. Indoor occupiable work spaces that are occupied during the period from [DATE] to [DATE] to maintain a minimum temperature of 65°F (18°C) during the period the spaces are occupied.

Exceptions:
1. Air-conditioning, storage and operational areas that require cooling or special temperature conditions.
2. Areas in which persons are primarily engaged in rigorous physical activities.
3. Merchandise, business, factory and similar occupancies in which people are employed must be kept at a temperature of at least 65°F (18°C) during the hours that employees are working. People cannot be expected to work in an environment that is not comfortable. The 65°F (18°C) minimum is lower than required for residential occupants.

603.2 MECHANICAL EQUIPMENT

603.1 Mechanical appliances. Mechanical appliances, fireplaces, solid fuel-burning appliances, cooking appliances and water heating equipment shall be installed and maintained in a safe working condition, and shall be capable of performing the intended function.

Because appliance, mechanical equipment and fireplaces are subjected to deterioration, periodic inspection and servicing is required to maintain performance and to verify continued safe operation. Fireplaces, chimneys, and other flame-producing devices must be properly installed, inspected and maintained. They require frequent inspection and maintenance because the coal, coke, and creosote corrosion of such devices will cause them to be subjected. Routine cleaning is required to remove the highly flammable creosote soot and creosote from the chimney. Fireplaces, chimneys, and other flame-producing devices shall be maintained by qualified persons.

Inspections should include such related items as chimney flues, chimney caps, dampers, doors,
screens, connectors, heat extensions and clearances to combustibles. Appliances located in buildings that are not owner-occupied are less likely to receive attention or be observed and are therefore more likely to be neglected. Appliances of concern include water heaters, furnaces, boilers, room heaters, clothes dryers and cooking appliances.

Fireplaces and solid fuel-burning appliances must be installed and maintained in accordance with the IMC. The appliance manufacturer’s installation instructions and the IMC, International Fuel Gas Code® (IFGC®) and IPC should be consulted in determining if an appliance or mechanical equipment is installed properly.

603.2 Removal of combustion products. Fuel-burning equipment and appliances shall be connected to an approved chimney or vent.

Exception: Fuel-burning equipment and appliances that are labeled for unvented operation.

A1. All fuel-burning appliances are required to discharge the products of combustion (flue gases) to an approved chimney or vent (see exception). Chimneys and vents must be capable of creating sufficient draft to properly vent the appliances served. Appliances that are listed and labeled for unvented operation such as domestic cooking appliances, room heaters and gas-fired refrigerators are exempt from this requirement.

Some components of the combustion products produced by fuel-burning appliances are toxic to humans and animals and can cause illness and death. The most harmful component of combustion products is carbon monoxide (CO). Typical symptoms of CO poisoning are nausea, headache, dizziness, disorientation, confusion, rapid breathing, fatigue, flu-like symptoms and loss of consciousness. Exposure to CO is detrimental to health in all cases and can be lethal depending upon its concentration, the duration of exposure and the condition of the occupants. Combustion products must not be allowed to enter or leak into any occupiable or habitable space.

Chimneys and vents should be periodically inspected for deterioration or blockage that could impair their operation or allow combustion products to leak into the building. The appliance or equipment connections to a chimney or vent should also be inspected for deterioration, blockage or separation of connections.

Evidence of chimney or vent connector decay or rusting generally indicates improper draft. A venting system that creates insufficient draft or that is subject to backdraft (reverse flow) will experience accelerated deterioration because of the corrosive effect of the combustion products (flue gases). "Draft" is the pressure differential necessary to cause the flow of flue gases from the appliance or equipment to the chimney or vent and up to the outdoor atmosphere. Proper draft should be verified by a trained heating technician and should be checked each time the appliance or equipment is serviced.

The exception recognizes that a chimney or vent is not required for fuel-burning appliances listed and labeled for unvented operation. It is imperative that unvented appliances be operated and maintained in strict accordance with the manufacturer’s instructions (see the IFGC for additional requirements for unvented room heaters).

MECHANICAL AND ELECTRICAL REQUIREMENTS

603.3 Clearances. Required clearances to combustible materials shall be maintained.

A Proper clearances must be maintained between combustible materials and all heat-producing appliances and equipment. Adequate clearances are necessary to prevent the possibility of ignition of combustibles. The required clearances for the listed appliances and equipment must be maintained in accordance with the manufacturer's requirements. Clearances for chimneys, vents and their connectors are also specified in the IMC and IFGC.

Frequently, an inspector will encounter combustible materials that have been placed too close to heat-producing appliances and equipment after the installation. Combustible storage, furnishings and remodeling are typical examples of such encounters. Most occupants are unaware of the hazard created when they store combustibles near or in contact with heat-producing appliances.

It is imperative that adequate clearances be maintained to avoid a potential fire hazard.

603.4 Safety controls. Safety controls for fuel-burning equipment shall be maintained in effective operation.

A All appliances and heating equipment are equipped with safety controls and devices intended to prevent fire or explosion in the event of equipment malfunction or abnormal operation. Typical controls and devices are as follows: temperature limit switches; pressure relief valves; flame failure and failure of heat transfer media; loss of ignition source; loss of venting means and loss of main flue, among others.

All such safety controls must be periodically tested and inspected to verify their proper functioning and adjust their reliability. Such testing and inspection should be performed by trained technicians when the appliances are serviced and cleaned.

An improperly operated or malfunctioning safety control or device could create an extreme fire safety hazard.

603.5 Combustion air. A supply of air for complete combustion of the fuel and for ventilation of the space containing the fuel-burning equipment shall be provided for the fuel-burning equipment.

A1. Combustion air includes the air necessary for complete combustion of the fuel. The air required for draft hood dilution and the air necessary for ventilation of the enclosure in which the appliance is located. A lack of combustion air will result in incomplete combustion of the fuel that, in turn, causes soot production, increased CO production, serious appliance malfunction and the risk of fire. The lack of draft hood dilution air will result in improper draft and appliance venting. The incomplete combustion of fuel and improper draft and venting compound each other and greatly increase the risk of CO poisoning. The lack of ventilation air can result in excessive temperatures in the appliance enclosure, thereby increasing the risk of overheating the appliance and the risk of fire.

In existing structures, adequate combustion air provisions are often lacking or have been blocked, covered or otherwise hindered. Proper combustion air supply is an important part of any inspection.

Fuel-burning equipment must be provided with combustion air in accordance with the IMC and IFGC.

604.6 Conservation devices. Devices intended to reduce fuel consumption by attaching to a fuel-burning appliance, to the fuel supply line thereto, or to the vent outlet or vent piping from thereon, shall not be installed unless labeled for such purpose and the installation is specifically approved.

A Energy-saving devices are required to be labeled of an approved testing agency, must be installed in accordance with the manufacturer’s installation instructions and must be installed with the specific approval of the code official.

Improperly installed or applied energy-saving devices can adversely affect the operation of an appliance and cause it to become unsafe. A common example would be the improper installation of a fuel damper or restrictor device in the chimney or vent connector of a fuel-burning appliance. The resultant installation could cause vent failure and subject the occupants to dangerous pressure relief valves, among others.

The installation of such devices would require a permit under the IFGC or IMC.

SECTION 604

ELECTRICAL FACILITIES

604.1 Facilities required. Every occupied building shall be provided with an electrical system in compliance with the requirements of this section and Section 605.

A This section prescribes the minimum electrical facilities that must be installed and maintained in all buildings used for human occupancy.

604.2 Service. The size and usage of appliances and equipment shall be such as to require the use of additional facilities in accordance with NFPA 70. Dwelling units shall be served by a three-wire, 120/240 volt, single-phase electrical service having a minimum capacity of 60 amperes.

A This section prescribes the minimum size of the electrical service that must be provided for all structures. The electrical service consists of the service conductor, metering devices, service-entrance grounding means, main disconnect, main overcurrent device and, typically, the distribution panelboard and all overcurrent devices. These components are generally required to be sized and installed dependent upon the size of the load (demand). The total electrical usage or load must be determined as prescribed in NFPA 70. For dwelling units, the IRC also provides load calculation methods.
Lack of ground fault circuit interrupter (GFCI) protection.

The most common hazard is improper overcurrent protection of conductors. Fuses and circuit breakers are devices designed to limit current flow to the maximum safe current-carrying capacity (ampacity) of a conductor. With rare exception, the conductor’s current-carrying capacity (ampacity) must be greater than the fuse or circuit breaker rating. If the fuse or circuit breaker has a larger ampere-rating capacity than the conductor, it can be damaged in the event of a circuit operation. The resulting overload will cause conductor heating, which can lead to fire. The typical scenario involves an occupant who thinks he or she has “cured” a fuse-blowing problem by substituting fuses that are larger in size. In actuality, an extreme fire hazard has been created by eliminating the circuit conductor overcurrent protection. Type S tamper-proof fuses and adapters can be installed to prevent the occupants from installing the wrong size fuses.

60.3.1 Abatement of electrical hazards associated with water exposure. The provisions of this section shall govern the repair and replacement of electrical systems and equipment that have been exposed to water.

The purpose of this section is to provide enforceable provisions to mitigate hazards associated with electrical equipment that has been exposed to water. These provisions are derived from "Guidelines for Handling Submerged Electrical Equipment" published by the National Electrical Manufacturers Association (NEMA).

Section 604 defines the scope of the section as pertaining to electrical equipment and systems that have been exposed to water.

604. Electric equipment. Electrical distribution equipment, motor circuits, power equipment, transformers, wire, cable, flexible cords, wiring devices, ground fault circuit interrupters, surge protectors, molded case circuit breakers, low-voltage fuses, luminaires, ballasts, motors, and electronic control, signaling and communication equipment that have been exposed to water shall be replaced in accordance with the provisions of the International Building Code.

Exception: The following equipment shall be allowed to be repaired where an inspection report from the equipment manufacturer or approved organization indicates that the equipment has not sustained damage that requires replacement:

1. Enclosed switches, rated a maximum of 600 volts or less;
2. Busways, rated a maximum of 600 volts;
3. Panelboards, rated a maximum of 600 volts;
4. Switchboards, rated a maximum of 600 volts;
5. Fire pump controllers, rated a maximum of 600 volts;
6. Manual and magnetic motor controllers;
7. Motor control centers;
8. Alternating current high-voltage circuit breakers;
9. Low-voltage circuit breakers;
10. Protective relays, meters and current transformers;
11. Low- and medium-voltage switchgear;
12. Liquid-filled transformers;
13. Cast-resin transformers;
14. Wire or cable that is suitable for wet locations and whose ends have not been exposed to water;
15. Low- or medium-voltage circuit breakers, whose ends have not been exposed to water;
16. Luminaires that are listed as submersible;
17. Motors;
18. Electronic control, signaling and communication equipment that have been exposed to water.

Listed in this section are various types of electrical equipment that, if exposed to conditions such as submersion in floodwater or inundation by fire sprinkler discharge, must be replaced. Protective components, such as circuit breakers, overload relays, low voltage or medium voltage protective devices within a switchgear, or accessories are necessary for the safe operation of the distribution circuits and should be replaced when exposed to water. The ability of a transformer or switchgear to function properly may be impaired by corrosion to the transformer core, food debris deposited inside the transformer, or contamination of the transformer fluid. The exception to this section allows for repair of certain components of an electrical distribution system and certain electrical equipment provided that documentation is obtained from the equipment manufacturer or approved manufacturer’s representative is submitted to the code official indicating that the level of damage to the equipment does not warrant replacement. Note that in EXCEPTION that panelboards and switchboards listed in the exception refer to the boards, buses and relay hardware, not the circuit breakers that they hold.

60.3.2 Abatement of electrical hazards associated with fire exposure. The provisions of this section shall govern the repair and replacement of electrical systems and equipment that have been exposed to fire.

This section defines the scope of the section as pertaining to electrical equipment and systems that have been exposed to fire.

60.3.2.1 Electrical equipment. Electrical switchgear, receptacles and fixtures, including furnaces, water heating, security systems and power distribution circuits, that have been exposed to fire, shall be replaced in accordance with the provisions of the International Building Code.

Exception: Electrical switchgear, receptacles and fixtures that shall be allowed to be replaced without an inspection report from the equipment manufacturer or approved manufacturer’s representative indicates that the equipment has not sustained damage that requires replacement.

This section lists the type of electrical components and equipment that must be replaced, where they have been exposed to fire. The code does not elaborate on what is meant by "exposed to fire," but the assumption is that the equipment and components have been exposed to high temperature and flame impingement. The ability of electrical switchgear, receptacles and fixtures—including furnaces, water heating, security systems, and power distribution circuits—to operate as intended can be impaired by exposure to fire. The exception to this section allows for repair of these components provided that an inspection report from the equipment manufacturer or approved manufacturer’s representative is submitted to the code official indicating that the level of damage to the equipment does not warrant replacement.

SECTION 605 ELECTRICAL EQUIPMENT

605.1 Installation. Electrical equipment, wiring and appliances shall be properly installed and maintained in a safe and approved manner.

This section provides necessary safety requirements for electrical equipment, wiring and appliances.

All electrical equipment, wiring and appliances shall be properly installed and maintained in accordance with this code. It is the responsibility of the building owner or operator to provide and safely maintain the electrical facilities required herein.

605.2 Receptacles. Every building space in a dwelling unit shall contain not less than two separate and remote receptacle outlets. Every laundry area shall contain not less than one ground-fault type receptacle or a receptacle with a ground-fault circuit interrupter. Every bathroom shall contain not less than one receptacle. Any new bathroom receptacle outlet shall have ground fault circuit interrupter protection. All receptacle outlets shall have the appropriate faceplate cover for the location.

Every room or space in a dwelling unit that is used for living or cooking, eating or sleeping, must be provided with at least two separate receptacle outlets. Such outlets must be spaced from each other as practicable. The quantity of receptacles required by this section is far less than that required by NFPA 70 and the IRC for new construction, but is considered to be a reasonable compromise for existing structures.

This provision is intended to minimize or eliminate the use of extension cords. The amount of electrical current that any extension cord can safely conduct is limited by the size of its conductors. This principle is not understood by much of the general population. As a result, extension cords are commonly overloaded by the connection of either too many appliances or any loads in excess of the cord’s capacity. Overloading...
extension cords causes an increase in the conductor's temperature. This increase can exceed the temperature rating of the conductor's insulation, causing it to melt, deteriorate, or burn. The burning insulation can easily start a fire, and the resultant loss of conductor insulation can cause a short circuit or ground fault that can also act as a source of ignition. The buildup of heat in an extension cord is often made worse by excessive cord length and by the insulating effect of rugs that often cover extension cords. Flexible cords are more susceptible to physical damage than permanent wiring methods. Damage to cords increases the likelihood of shorts, ground faults, all of which can cause a fire. In addition to the fire hazard, extension cords pose a tripping hazard to the occupants and, when damaged, can pose an electrical shock hazard. Securing flexible cords to a wall baseboard, door jambs, etc., with nails, staples or other fasteners to eliminate tripping hazards can create another dangerous condition by increasing the likelihood of shorts and poor connections, both of which can cause a fire.

In addition to the fire hazard, extension cords pose a tripping hazard to the occupants and, when damaged, can pose an electrical shock hazard. Securing flexible cords to a wall baseboard, door jambs, etc., with nails, staples or other fasteners to eliminate tripping hazards can create another dangerous condition by increasing the likelihood of shorts and poor connections, both of which can cause a fire.

SECTION 608 ELEVATORS, ESCALATORS AND DUMBWAYS

608.1 General. Elevators, dumbbells and escalators shall be maintained in compliance with ASME A17.1. The most current certificate of inspection shall be on display in all times within the elevator or attached to the escalator or dumb- way, be available for public inspection in the office of the building owner or operator, be posted in a publicly conspicuous location approved by the code official. The inspection and tests shall be performed at not less than the periodic intervals listed in ASME A17.1, Appendix N, except where otherwise specified by the authority having jurisdiction.

• Elevators, escalators and dumbways shall be maintained in compliance with ASME A17.1, Safety Code for Elevators and Escalators. ASME A17.1 contains requirements for periodic inspection and testing that are necessary to detect any possible defects. The safety of the system is dependent upon routine safety checks performed by competent elevator service technicians.

Displaying the certificate of inspection is an aid to building inspectors and provides the users of the machinery with some convenience in its safety. This requirement will also encourage the owner to obtain the required inspections. Additionally, the option to post the certificate in a publicly conspicuous location approved by the code official allows a building operator to request that the certificate be placed in a location other than in the elevator or on the escalator or dumb- way, but in a location that is publicly conspicuous and approved by the code official.

608.2 Elevators. In buildings equipped with passenger eleva- tors, not less than one elevator shall be maintained in opera- tion at all times when the building is occupied.

Exception: Buildings equipped with only one elevator shall be permitted to have the elevator temporarily out of service for testing or servicing.

• If a building has more than one passenger elevator, at least one such elevator must be kept operational during all periods of building occupancy. As indicated in the exception, a building with only one elevator is allowed to have its elevator temporarily out of service only for the purpose of maintenance, repair or testing.

SECTION 607 DUCT SYSTEMS

607.1 General. Duct systems shall be maintained free of obstructions and shall be capable of performing the required function.

• Exhaust ducts for toilet rooms, bathrooms, kitchens and clothes dryers require maintenance to prevent blockages and obstructions that can cause appliance/ equipment malfunction, poor performance and poten- tial fire hazards. Heating, cooling and ventilation ducts also need to be maintained to allow proper airflow, to maintain proper HVAC equipment operation and to help eliminate airborne contaminants that could cause health hazards. Ducts can collect hazardous quantities of grease, lint, dust and debris that could be potential fire hazards. Duct systems of all types are typically ignored by building owners and occupants and thus receive little if no maintenance.

Bibliography

The following resource materials were used in the preparation of the commentary for this chapter of the code:


Chapter 7: Fire Safety Requirements

General Comments
Chapter 7 establishes minimum requirements for fire safety facilities and fire protection systems.
A critical element that must be investigated during an inspection is the condition of fire safety systems.
These provisions take on even greater importance in those jurisdictions where periodic fire inspections are not conducted in accordance with a comprehensive fire code.
In jurisdictions where fire inspections are regularly performed on existing facilities, all inspections must be coordinated between the appropriate officials to alleviate multiple and duplicative notices and, at the worst, conflicting instructions.
A great potential for fatal fires exists where people sleep—dwellings units, hotels, motels, nursing homes, etc. The reasons for the increased hazard are obvious: there are often delayed reactions before people notice a fire (occupants waking from sleep are temporarily confusion); rooms are darkened and the occupants are dressed in bedclothes. All of these circumstances reduce the reaction time of the occupants and increase the likelihood that they will make a fatal judgment.

Purpose
Building codes regulating new construction are intended to verify, prior to occupancy, that the building has been constructed in a manner that will provide the occupants a relatively safe and secure environment. Once these new structures are occupied, a variety of hazards inherent in their use may arise. Often, these hazards are unanticipated and can affect the overall safety of the occupants.
The purpose of Chapter 7 is to address those fire hazards that arise as the result of a building's occupancy. It also provides minimum requirements for the fire safety issues that are most likely to arise in older buildings.

SECTION 701 GENERAL

- This section establishes the overall goal of the chapter and outlines who is responsible for complying with its provisions.

701.1 Scope. The provisions of this chapter shall govern the minimum conditions and standards for fire safety relating to structures and exterior premises, including fire safety facilities and equipment to be provided.

- In the International Codes® (I-Codes®), the foremost code to address fire safety in existing buildings is the International Fire Code® (IFC®). Fire safety is also within the scope of the code; however, for correlation with the IFC, most of the requirements of Chapter 7 either parallel or directly reference that code. As stated in the preface to this commentary, sections of this chapter with the [F] designation in front of the section number are controlled initially by the International Fire Code Development Committee during the annual code change process of the International Code Council® (ICC®), thereby preventing conflicts between the code and the IFC.

Fire safety requirements having to do with means of egress, fire-resistance rating of building elements and fire protection systems, such as sprinklers and smoke detectors, are addressed in this chapter. Fire safety topics such as storage of combustibles, use or storage of hazardous materials and the regulation of certain activities or operations within buildings that contribute to the fire hazard are covered exclusively in the IFC.

701.2 Responsibility. The owner of the premises shall provide and maintain such fire safety facilities and equipment in compliance with these requirements. A person shall not occupy as owner-occupant or permit another person to occupy any premises that do not comply with the requirements of this chapter.

- The owner of the premises should provide and maintain such fire safety facilities and equipment in compliance with these requirements. A person should not occupy as owner-occupant or allow another person to occupy any premises that does not comply with the requirements of this chapter.

This section clearly establishes that the owner of the premises is responsible for compliance with these requirements. Whereas occupants who are not owners have some responsibility in regard to clean and safe conditions within individual dwelling units (see Section 301.2), the requirements of this chapter pertain to building systems and components that are not typically under the control of the occupants.
SECTION 702
MEANS OF EGRESS

1. Means of egress in existing buildings is regulated by the IRC. The IRC contains provisions for number of means of egress, exit size, exit access, guard rails, handrails, doors, dead ends, obstructed exits, exit signs and other requirements for evaluating the means of egress in existing buildings. Assisted egress and emergency escape openings are life safety features that are frequently affected by routine operations in existing buildings, and can be inspected by property maintenance inspectors in the course of a typical inspection. These topics, therefore, are included in the subsections of Section 702 of the code.

2. A safe, continuous and unobstructed path of travel shall be provided from any point in a building or structure to the public way. Means of egress shall comply with the International Fire Code.

3. Even a slight delay in a fire situation can mean the difference between life and death. Dangerous levels of smoke can develop in a deceptive quick manner at the earliest stages of a fire, and obstruction to means of egress or insufficient means of egress very often leads to tragedy in a fire.

4. This section prohibits obstruction of corridors, hallways and stairs by miscellaneous storage that could delay egress. It also prohibits dead-end corridors or passageways that could cause confusion or require occupants to retrace their steps to find a way out of the building. Specific requirements for means of egress, such as permissible length of dead-end corridors or required means of egress width, are found in the IRC.

5. The required width of aisles in accordance with the International Building Code [IBC] needs to be sufficient to be safe, and shall be unobstructed.

6. Assembly occupancies that contain seats, tables, displays and similar furnishings or equipment present a unique challenge for efficient and orderly exiting in an emergency situation. The IRC contains detailed requirements for the configuration, width and availability of aisles in these occupancies. This section requires aisles to be safe, and that they will serve their intended (and required) function.

7. Locked doors. Means of egress shall be readily operable. A door which egress is to be made without the need for keys, special knowledge, or effort, except where the door hardware conforms to that permitted by the fire code.

8. One of the fundamental principles of means of egress in both new and existing buildings is that doors must be readily operable from the "egress side" (the side occupants approach when they exit) and not obstructed. Doors that require key operation from the inside are prohibited except in very limited circumstances involving security at main entrance doors for certain occupancies as prescribed in the International Building Code [IBC]. Locks that are operated from the interior, such as thumb turns or flush bolts, are typically prohibited since they require special effort, although this is subject to the judgement of the code official in existing buildings. Doors that are locked from the exterior of the building but are released by the unlatching mechanism from the interior, such as panic hardware and security hardware involving doorknobs or lever mechanisms, are the preferred alternative if security is needed.

9. Emergency escape openings. Required emergency escape openings shall be maintained in accordance with the code in effect at the time of construction, and the following.

10. Required emergency escape and rescue openings shall be operational from the inside of the room without the use of keys or tools. Bars, grilles, grates or similar devices are permitted to be placed over emergency escape and rescue openings provided the minimum net clear opening size complies with the code that was in effect at the time of construction and such devices shall be releasable or removable from the inside without the use of a key, tool or force greater than that which is required for normal operation of the escape and rescue opening.

11. This section takes into account that many changes have occurred over the years in the many editions of the construction codes. The provisions for emergency escape and rescue openings are only subject to the code that is in effect at the time of construction, rather than expecting all structures to retroactively meet the requirements of each new code.

12. The IRC defines "emergency escape openings" to refer to the escape windows and doors that are required for sleeping rooms and basements in new construction. In the IRC, emergency escape openings can be provided only from basements as well as all sleeping rooms, however, codes for new construction prior to the development of the IRC did not require escape window or escape door assemblies (typically 20 minutes) for basements without sleeping rooms.

13. The intent of this section is that emergency escape openings required at the time of a building's construction be maintained unobstructed. It prohibits the installation of security devices on these required openings unless the windows or doors are clearly labeled as such (required net clear opening size) in a manner that facilitates the quick use of the window in an emergency situation; therefore, security devices that require the unscrewing of screws or bolts, plying with a bar or unlocking with a key in order to be removed or moved, are not permitted on these openings. In addition, they must not require force for their removal, since they may need to be operated by children or the elderly.

SECTION 703
FIRE-RESISTANCE RATINGS

1. Required fire-resistance-rated walls and opening protectives are those elements that are required to be rated in order to sustain the fire that was in effect at the time of construction. This section requires these be maintained so that they will perform their intended function.

2. Fire-resistance-rated assemblies. The required fire-resistance rating of fire-resistance-rated walls, fire stops, shall enclosures, partitions and floors shall be maintained.

3. The "required fire-resistance rating" means the required rating of walls or floors at the time of construction. These required rated assemblies cannot be compromised in terms of their construction or they will not perform as intended in a fire emergency. For instance, holes for running pipe or cable cannot be created in rated corridor walls where they extend above the ceiling. If the code that was in effect at the time of construction to extend to the floor deck above. Pneumatics of this type would be prohibited unless protected as set forth in the IRC for new construction. Similarly, wall sheathing on rated walls cannot be removed and replaced unless the new material conforms to the listing for the rated wall.

4. Opening protective. Required opening protective shall be maintained in an operative condition. Fire and smokestop devices that are maintained in an operable condition. Fire doors and smoke barrier doors shall not be blocked or obstructed or otherwise made inoperative.

5. Opening protective are window and door assemblies that are required to be installed in accordance with the applicable standard and have a fire protection rating. For example, corridor walls that are required to be rated as fire-rated door assemblies (typically 30 minutes) and closing so that they can serve their intended function and limit the spread of smoke and fire in a fire emergency. If a closer is removed or the door is propped open by a doorstop, the door has been made inoperable and would allow the free passage of flame and smoke as if the opening were not protected. Similarly, if a fire shut-ter protecting a window is removed or propped open such that it will not operate upon signa-tion of heat, it has been made inoperable and violates this section of the code.

SECTION 704
FIRE PROTECTION SYSTEMS

1. Smoke detectors are an essential life safety feature in residential occupancies, and are the only fire protection devices that are installed in all dwellings. Therefore, the code contains provisions for homes and the IRC for installation details.

2. General. Systems, devices and equipment to detect a fire, actuate an alarm, or suppress or control a fire or any combination thereof shall be maintained in an operable condition at all times in accordance with the International Fire Code and the IRC.

3. Fire protection systems currently in existing buildings, including sprinklers, standpipes, smoke detectors and other fire protection systems are regulated by the IRC.

4. Automatic sprinkler system inspection, testing and maintenance of automatic sprinkler systems shall be in accordance with NFPA 25.

5. This section gives the code official the requirements for the inspection, testing and maintenance of fire sprinklers, fire pumps, standpipes, etc., on existing buildings. This information will be useful in areas where the property maintenance inspector is the individual verifying the requirements.

6. Fire department connection. Where the fire department connection is not visible to approaching fire apparatus, the fire department connection shall be indicated by an approved sign mounted on the street front or on the side of the building. Such sign shall have the letters "FDC" not less than 6 inches (152 mm) in height and less than 2 inches (51 mm) high or an arrow to indicate the location. Such signs shall be subject to the approval of the fire code official.

7. The section acknowledges that fire department connections (FDCs) on existing buildings may not always be readily visible to the fire engine at the nearest point of fire department vehicle access. In those instances, the location of the connection must be clearly marked with signage. The FDC may be located on the side of the building or in an area adjacent to the fire-fighting forces. A sign is necessary so that those driving the apparatus know where to maneuver the vehicle to connect the water supply and language is also found in section 912.2.2 of the IRC.

8. Single- and multiple-station smoke alarms. Single- and multiple-station smoke alarms shall be installed in existing Group I-1 and R occupancies in accordance with Sections 704.2.1 through 704.2.3.

9. This section introduces the requirements for the installation of smoke alarms in existing Group I-1 and R occupancies. These requirements recognize the benefit of installing smoke alarms in existing structures, but provide specific requirements for buildings that are not undergoing substantial renovations. These provisions also correlate with Section 704.3.8 of the IRC.

10. Where required. Existing Group I-1 and R occupancies shall be provided with smoke alarms in accordance with Sections 704.2.1 through 704.2.14. Interconnection and power sources shall be in accordance with Sections 704.2.2 and 704.2.3.

Exceptions:

1. Where the code that was in effect at the time of construction required smoke and smoke alarms were
complying with those requirements are already provided.
2. Where smoke alarms have been installed in occupancies and dwellings that were not required to have them at the time of construction, additional smoke alarms shall not be required provided that the existing smoke alarms comply with requirements that were in effect at the time of construction.
3. Where smoke detectors connected to a fire alarm system have been installed as a substitute for smoke alarms, additional smoke alarms may still be required if the occupancy is in a high-hazard area or the IRC and its relationship to the other International Codes.

Section 704.2.1.1. Installation near cooking appliances. Smoke alarms shall be installed adjacent to the following locations unless the area where this would prevent placement of a smoke alarm in a location required by Section 704.2.1.1 or 704.2.1.2.
1. Lifestyles shall not be installed less than 20 feet (6096 mm) horizontally from a permanently installed cooking appliance.
2. Ionization smoke alarms with an alarm-silencing button shall not be installed less than 10 feet (3048 mm) horizontally from a permanently installed cooking appliance.
3. Photoelectric smoke alarms shall not be installed less than 10 feet (3048 mm) horizontally from a permanently installed cooking appliance.
4. This section and the following section are intended to reduce nuisance alarms attributed to locating smoke alarms in close proximity to cooking appliances and bathrooms in which steam is produced. The provisions are consistent with similar requirements included in Sections 4.3.4 of the 2010 and 2013 editions of NFPA 72.

Section 704.2.1.2. Installation near bathrooms. Smoke alarms shall be installed adjacent to the following locations unless the area where this would prevent placement of a smoke alarm in a location required by Section 704.2.1.1 or 704.2.1.2.
1. The exterior of any room or area in the immediate vicinity of the bathroom that contains a bathtub or shower.
2. The exterior of any room or area in the immediate vicinity of the bathroom that contains a bathtub or shower, unless the area where this provision would prevent placement of a smoke alarm in a location required by Section 704.2.1.1 or 704.2.1.2.
3. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch, as may be required for overcurrent protection.

Exceptions:
1. Smoke alarms are permitted to be solely battery operated in existing buildings where no construction is taking place.
2. Smoke alarms are permitted to be solely battery operated in buildings that are not served from a commercial power source.
3. Smoke alarms are permitted to be solely battery operated in existing areas of buildings undergoing alterations or repairs that do not result in the removal of interior walls or ceiling finishes exposing the structure, unless there is an attic, crawl space or basement available that could provide access for building wiring without the removal of interior finishes.

Smoke alarms are required to use AC as a primary power source and battery power as a secondary source to improve their reliability. For example, during a power outage, the primary power source is increased because of the use of candles or lanterns for temporary light. Required backup battery power is intended to provide continuing service of smoke alarms. Smoke alarms are commonly designed to emit a recurring signal when batteries are low and need to be replaced.
Certain occupancies may already have an emergency electrical system in the building to monitor other building system conditions. The emergency electrical system provides a level of reliability equivalent to battery backup.

Exception 1 allows DC power operation only where no construction work is being done.

Exception 2 allows DC power operation only where buildings do not have commercial electrical service.

Exception 3 allows DC operation only in areas of buildings that are not being altered or repaired to result in the removal of interior finishes. Where interior finishes are being removed, DC power will be required unless Exception 2 is met.

704.2.4 Smoke detection system. Smoke detectors listed in accordance with UL 268 and provided as part of the building's fire alarm system shall be an acceptable alternative to single- and multiple-station smoke alarms and shall comply with the following:

1. The fire alarm system shall comply with all applicable requirements in Section 907 of the International Fire Code.

2. Activation of a smoke detector in a dwelling or sleeping unit shall initiate an alarm notification in the dwelling or sleeping unit in accordance with Section 907.5.2 of the International Fire Code.

3. Activation of a smoke detector in a dwelling or sleeping unit shall not activate alarm notification appliances outside of the dwelling or sleeping unit, provided that a supervisory signal is generated and monitored in accordance with Section 907.6.5 of the International Fire Code.

This section specifically allows the use of an automatic smoke detection system as an alternative to smoke alarms. In the past, when this concept was proposed, it was only specifically allowed through an alternative method and materials approach even though in concept it provides the same level of protection as smoke alarms. Such systems provide the same safety features necessary for occupants but are simply part of a fire alarm system. Note that if a detector activates within a sleeping or dwelling unit, the occupant notification system is not intended to activate. This is consistent with the operation of smoke alarms. Item 3 specifically requires the notification to be only to occupants of the sleeping unit or dwelling unit.

Chapter 8: Referenced Standards

General Comments
Chapter 8 contains a comprehensive list of all standards that are referenced in the code. It is organized in a manner that makes it easy to locate specific references. This chapter lists the standards that are referenced in various sections of this document. The standards are listed herein by the promulgating agency of the standard, the standard identification, the effective date and title and the section or sections of this document that reference the standard. The application of the referenced standards shall be as specified in Section 102.7.

It is important to understand that an advisory document related to building design and construction is qualified to be a "referenced standard." The ICC has adopted a criterion that standards referenced in the International Code® and standards intended for adoption into the International Code® must meet in order to qualify as a referenced standard. The policy is summarized as follows:

- Code references: The scope and application of the standard must be clearly identified in the code text.
- Standard content: The standard must be written in mandatory language and appropriate for the subject covered. The standard shall not have the effect of requiring proprietary materials or prescribing a proprietary testing agency.
- Standard promulgation: The standard must be readily available for development and maintained in a consensus process such as ASTM or ANSI.

The ICC Code Development Procedures, of which the standards policy is a part, are updated periodically. A copy of the latest version can be obtained from the ICC offices.

Once a standard is incorporated into the code through the code development process, it becomes an enforceable part of the code. When the code is adopted by a jurisdiction, the standard also is part of that jurisdiction's adopted code. It is for this reason that the criteria were developed. Compliance with this policy provides that documents incorporated into the code are, among others, developed through the use of a consensus process, written in mandatory language and do not mandate the use of proprietary materials or agencies. The requirement for a standard to be developed through a consensus process is vital, as it means that the standard will be representative of the most current body of available knowledge on the subject as determined by a broad spectrum of interested or affected parties without dominance by any single interest group. A true consensus process has many attributes, including, but not limited to:

- An open process that has formal (published) procedures that allow for the consideration of all viewpoints.
- A definitive review period that allows for the standard to be updated or revised.
- A process of notification to all interested parties.
- An appeals process.

Many advisory documents related to plumbing system design, installation and construction, though useful, are not "standards," and are not appropriate for reference in the code. Often, these documents are developed or written with the intention of being used for regulatory purposes, and are unsuitable for use as a regulation due to extensive use of recommendations, advisory comments and nonmandatory terms. Typical examples of such documents include installation instructions, guidelines and practices.

The objective of ICC's standards policy is to provide regulations that are clear, concise and enforceable—thus the requirement for standards to be written in mandatory language. This requirement is not intended to mean that a standard cannot contain informational or explanatory material that will aid the user of the standard in its application. When it is the desire of the standard's promulgating agency for such material to be included, however, the information must appear in a nonmandatory location, such as an annex or appendix, and be clearly identified as not being part of the standard.

Overall, standards referenced by the code must be authoritative, relevant, up to date and, most important, reasonable and enforceable. Standards that comply with ICC's standards policy fulfill these expectations.

Purpose
As a performance-oriented code, the code contains numerous references to documents that are used to regulate materials and methods of construction. The references to these documents within the code text consist of the promulgating agency's acronym, its publication designation (e.g., IBC) and a further indication that the document being referenced is the one that is listed in Chapter 8. Chapter 8 contains all of the information that is necessary to identify the specific referenced document. Included is the following information on a document's promulgating agency (see Figure 8):

- The promulgating agency (i.e., the agency's title).
This chapter lists the standards that are referenced in various sections of this document. The standards are listed herein by the promulgating agency of the standard, the standard identification, the effective date and title and the section or sections of this document that reference the standard. The application of the referenced standards shall be as specified in Section 102.7.

**ASME**
American Society of Mechanical Engineers
Three Park Avenue
New York, NY 10016-5999

<table>
<thead>
<tr>
<th>Reference number</th>
<th>Title</th>
<th>Referenced in code section number</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASME A17.1/CSA B44—2013</td>
<td>Safety Code for Elevators and Escalators</td>
<td>606.1</td>
</tr>
</tbody>
</table>

**ASTM**
ASTM International
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959

<table>
<thead>
<tr>
<th>Reference number</th>
<th>Title</th>
<th>Referenced in code section number</th>
</tr>
</thead>
</table>

**ICC**
International Code Council
500 New Jersey Avenue, NW
6th Floor
Washington, DC 20001

<table>
<thead>
<tr>
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<th>Title</th>
<th>Referenced in code section number</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBC—15</td>
<td>International Building Code</td>
<td>102.3, 201.3, 401.3, 702.3</td>
</tr>
</tbody>
</table>

**NFPA**
National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169

<table>
<thead>
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<th>Reference number</th>
<th>Title</th>
<th>Referenced in code section number</th>
</tr>
</thead>
<tbody>
<tr>
<td>25—14</td>
<td>Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems</td>
<td>704.1.1</td>
</tr>
<tr>
<td>70—14</td>
<td>National Electrical Code</td>
<td>102.4, 201.3, 604.2</td>
</tr>
</tbody>
</table>
Appendix A: Boarding Standard

Appendix A provides minimum specifications for boarding a structure. This can be utilized by a jurisdiction as a set of minimum requirements in order to result in consistent boarding quality. These requirements also provide a reasonable means to eliminate hazarding unsafe conditions or materials for the boarding and securing of a structure. It is important to note that the provisions of Appendix A are not mandatory unless specifically referenced in the adopting ordinance of the jurisdiction having authority.

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

A101 GENERAL

A101.1 General. Windows and doors shall be boarded in an approved manner to prevent entry by unauthorized persons and shall be painted to correspond to the color of the existing structure.

A102 MATERIALS

A102.1 Boarding sheet material. Boarding sheet material shall be minimum 1/2-inch-thick (12.7 mm) wood structural panels complying with the International Building Code.

A102.2 Boarding framing material. Boarding framing material shall be minimum nominal 2-inch by 4-inch (51 mm by 102 mm) solid sawn lumber complying with the International Building Code.

A102.3 Boarding fasteners. Boarding fasteners shall be minimum 1/4-inch-diameter (9.5 mm) carriage bolts of such a length as required to penetrate the assembly and as required to adequately attach the washers and nuts. Washers and nuts shall comply with the International Building Code.

A103 INSTALLATION

A103.1 Boarding installation. The boarding installation shall be in accordance with Figures A103.1(1) and A103.1(2) and Sections A103.2 through A103.5.

A103.2 Boarding sheet material. The boarding sheet material shall be cut to fit the door or window opening nearly or shall be cut to provide an equal overlap at the perimeter of the door or window.

A103.3 Windows. The window shall be opened to allow the carriage bolt to pass through or the window sash shall be removed and stowed. The 2-inch by 4-inch (51 mm by 102 mm) strong back framing material shall be cut minimum 2 inches (51 mm) wider than the window opening and shall be placed on the inside of the window opening 6 inches (152 mm) minimum above the bottom and below the top of the window opening. The framing and boarding shall be pre-drilled. The assembly shall be aligned and the bolts, washers and nuts shall be installed and secured.

A103.4 Door walls. The door opening shall be framed with minimum 2-inch by 4-inch (51 mm by 102 mm) framing material secured at the entire perimeter and vertical members at a maximum of 24 inches (610 mm) on center. Blocking shall also be secured at a maximum of 48 inches (1219 mm) on center vertically. Boarding sheet material shall be secured with screws and nails alternating every 6 inches (152 mm) on centers.

A103.5 Doors. Doors shall be secured by the same method as for windows or door openings. One door to the structure shall be available for authorized entry and shall be secured and locked in an approved manner.

A104 REFERENCED STANDARD

IBC—15 International Building Code A102.1, A102.2, A102.3
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