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2015 CODE AND COMMENTARY

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2015 International Mechanical Code® Commentary

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PREFACE

Internationally, code officials recognize the need for a modern, up-to-date mechanical code addressing the design and installation of mechanical systems through requirements emphasizing performance. The *International Mechanical Code* is designed to meet these needs through model code regulations that safeguard the public health and safety in all communities, large and small.

The principal purpose of this Commentary is to provide a basic volume of knowledge and facts relating to the code. The Commentary provides it in a small package and at reasonable cost thorough coverage of many issues likely to be dealt with when using the *International Mechanical Code*—and then supplements that coverage with historical and technical background.

Strenuous effort has been put into keeping the vast quantity of material accessible and its method of presentation useful. With a comprehensive yet concise summary of each section, the Commentary is a convenient reference for mechanical 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. At the time of printing, the Commentary reflects the most up-to-date text of the 2015 *International Mechanical Code*. 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 Mechanical 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 Mechanical 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 Central Regional Office.

ICC gratefully acknowledges the contributions to this commentary provided by Rebecca Quinn, Jeffrey Shapiro and Guy McMann.

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Chapter 1:
Scope and Administration

General Comments

This chapter contains provisions for the application, enforcement and administration of subsequent requirements of the code. In addition to establishing the scope of the code, Chapter 1 identifies which mechanical equipment, appliances and systems it covers. Sections 101 and 102 establish the scope and applicability of the code and address existing equipment and systems. Section 103 establishes the department of mechanical inspection and the appointment of department personnel. Section 104 contains the duties and authority of the code official for rulemaking, permits, inspections and right of entry. Section 105 deals with approval of modifications, alternative materials, methods and equipment. Section 106 states when permits, construction document submittals, permit issuance and fees are required. Section 107 includes inspection duties of the code official or an inspection agency that has been approved by the code official, mechanical system testing, contractor responsibilities, notice of approval and temporary connections for testing mechanical systems. Administrative provisions for violations are addressed in Section 108, including provisions covering unlawful acts, violation notices, prosecution, penalties, stop work orders and unsafe mechanical systems. Section 109 establishes the board of appeals and includes provisions for application for appeal, membership of the board, board meeting notices, open hearing requirements, when postponements are in order, appeals board decisions and court review.

The law of building regulation is based on the police power of the state. This police power is the source of all authority to enact building regulations. Police power is the power of the state to legislate for the general welfare of its citizens. This power enables passage of such laws as a mechanical 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. Although the municipality may not further delegate its police power 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, if he or she is given sufficient criteria to clearly establish the basis for deciding whether or not a proposed building, including its mechanical systems, conforms to the code.

Chapter 1 of the code is largely concerned with maintaining “due process of law” in enforcing the performance criteria contained in the body of the code. Only through careful observation of the administrative provisions can the code official demonstrate “equal protection under the law.” Although the administrative and enforcement section of a code is geared toward the code official, the provisions also establish the rights and privileges of the design professional, the contractor and the building owner. The position of the code official is to review the proposed and completed work and to determine whether a mechanical system installation conforms to the code requirements. The design professional is responsible for the design of a safe mechanical system. The contractor is responsible for installing the system in strict accordance with the plans. During the construction of a mechanical system, the code official reviews the activity to see that the spirit and intent of the law are being met and that the mechanical system provides adequate protection of public health. As a public servant, the code official enforces the code in an unbiased, proper manner. Every individual is guaranteed equal enforcement of the code. Furthermore, design professionals, contractors and building owners have the right of due process for any requirement in the code.

Purpose

A mechanical code, as with any other code, is intended for adoption as a legally enforceable document to safeguard health, safety, property and public welfare. A mechanical code cannot be effective without adequate provisions for its administration and enforcement. The official charged with the administration and enforcement of mechanical regulations has a great responsibility, and with this responsibility goes authority. No matter how detailed the mechanical code may be, the code official must, to some extent, exercise judgment in determining code compliance. The code official has the responsibility for establishing that the homes in which the citizens of the community reside and the buildings in which they work are designed and constructed to be reasonably free from hazards associated with the presence and use of mechanical equipment, appliances and systems. The code intends to establish a minimum acceptable level of safety.

PART 1–SCOPE AND APPLICATION

SECTION 101
GENERAL

[A] 101.1 Title. These regulations shall be known as the *Mechanical Code* of **[NAME OF JURISDICTION]**, hereinafter referred to as "this code."

❖ This section identifies the adopted regulations by the insertion of the name of the adopting jurisdiction into the code. This is one of several places in the code that the adopting agency must "fill in the brackets" to insert information that is specific to the local jurisdiction (see the sample ordinance in the front of the code book).

[A] 101.2 Scope. This code shall regulate the design, installation, maintenance, *alteration* and inspection of mechanical systems that are permanently installed and utilized to provide control of environmental conditions and related processes within buildings. This code shall also regulate those mechanical systems, system components, *equipment* and appliances specifically addressed herein. The installation of fuel gas distribution piping and *equipment*, fuel gas-fired appliances and fuel gas-fired *appliance* venting systems shall be regulated by the *International Fuel Gas Code*.

Exception: Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories high with separate means of egress and their accessory structures shall comply with the *International Residential Code*.

❖ This section describes the types of mechanical systems covered by the code. The code is applicable from the initial design of mechanical systems, through installation and construction and into the maintenance of operating systems. The scope of the code is primarily focused on heating, ventilating and air-conditioning (HVAC) systems, those items specifically addressed in the code and those building "service" items that make a building comfortable, functional and safe. The code is intended to cover all mechanical appliances, equipment and systems that are specifically intended, designed and necessary for the general safety and well-being of the occupants of a building. The code intends to regulate the installation, operation and maintenance of any and all equipment and appliances that can affect the health, safety and welfare of building occupants.

Note that this section references the *International Fuel Gas Code*® (IFGC®) for fuel-gas-related regulations. This is a result of a written cooperative agreement between the International Code Council® (ICC®) and the American Gas Association (AGA) to promulgate the IFGC. All regulations for the installation of fuel gas distribution piping and equipment, fuel gas-fired appliances and fuel gas-fired appliance venting systems have been removed from the code. See the IFGC for fuel-gas-related requirements.

The exception sends the user to the *International Residential Code*® (IRC®) for one- and two-family dwellings and townhouses not more than three stories in height. It is the intent of the ICC family of codes that the *International Mechanical Code*® (IMC®) be applied to structures not within the scope of the IRC. For example, a four-story single-family dwelling would be subject to the provisions of the IMC.

[A] 101.2.1 Appendices. Provisions in the appendices shall not apply unless specifically adopted.

❖ This section clarifies that the appendices are not part of the code unless specifically included in the adopting ordinance of the jurisdiction. Otherwise, the appendices are not intended to be enforceable.

[A] 101.3 Intent. The purpose of this code is to establish minimum standards to provide a reasonable level of safety, health, property protection and public welfare by regulating and controlling the design, construction, installation, quality of materials, location, operation and maintenance or use of mechanical systems.

❖ The intent of the code is to set forth requirements that establish the minimum acceptable level of protection of life or limb, health, property and public welfare. The intent becomes important in the application of such sections as Sections 102, 104.2, 105.2 and 108, as well as any enforcement-oriented interpretive action or judgment. Like any code, the written text is subject to interpretation. Interpretations should not be affected by economics or the potential impact on any party. The only consideration should be protection of the public health, safety and welfare.

[A] 101.4 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.

❖ Once the code is adopted, only a court can set aside any provisions of the code. This is essential to safeguard the application of the code text if 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

[A] 102.1 General. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern. Where, in a specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern.

❖ Bear in mind that conflicts within the code rarely, if ever, occur, but if they do, this section applies. Specific requirements of the code override or take precedence over general requirements. For example, in the 2006 edition of the code, Section 401.4 required a 10-foot (3048 mm) separation between all exhaust openings and property lines, whereas Section

501.2.1, Item 3 required a 3-foot (914.4 mm) separation for a specific type of exhaust. In this case, Section 501.2.1 would overrule. This conflict was resolved in the 2009 edition of the code.

[A] 102.2 Existing installations. Except as otherwise provided for in this chapter, a provision in this code shall not require the removal, *alteration* or abandonment of, nor prevent the continued utilization and maintenance of, a mechanical system lawfully in existence at the time of the adoption of this code.

❖ An existing mechanical system is generally considered to be "grandfathered" in with code adoption if the system meets a minimum level of safety. Frequently, the criteria for this level are the regulations (or code) under which the existing building was originally constructed. If there are no previous code criteria to apply, the code official is to apply those provisions of the code that are reasonably applicable to existing buildings. A specific level of safety is dictated by provisions dealing with hazard abatement in existing buildings and maintenance provisions, as contained in this code, the *International Property Maintenance Code*® (IPMC®) and the *International Fire Code*® (IFC®).

[A] 102.3 Maintenance. Mechanical systems, both existing and new, and parts thereof shall be maintained in proper operating condition in accordance with the original design and in a safe and sanitary condition. Devices or safeguards that are required by this code shall be maintained in compliance with the edition of the code under which they were installed. The owner or the owner's authorized agent shall be responsible for maintenance of mechanical systems. To determine compliance with this provision, the code official shall have the authority to require a mechanical system to be reinspected.

The inspection for maintenance of HVAC systems shall be performed in accordance with ASHRAE/ACCA/ANSI Standard 180.

❖ All mechanical systems and equipment are subject to deterioration resulting from aging, wear, accumulation of dirt and debris, corrosion and other factors. Maintenance is necessary to keep mechanical systems and equipment in proper operating condition. All required safety devices and controls must be maintained to continue providing the protection that they afford. Existing equipment and systems could be equipped with safety devices or other measures that were necessary because of the nature of the equipment, and such safeguards may have been required by a code that predates the current code. All safeguards required by previous or present codes must be maintained for the life of the equipment or system served by those safeguards.

Maintenance inspections must be performed in accordance with ASHRAE/ACCA/ANSI Standard 180 so that all components of the mechanical system requiring maintenance are properly addressed.

The maintenance of mechanical systems as prescribed in this section is the responsibility of the property owner. The owner may authorize another party to be responsible for the property, in which case that party is responsible for the maintenance of the mechanical systems involved.

The reinspection authority of the code official is needed to accomplish compliance with the maintenance requirements in this section.

[A] 102.4 Additions, alterations or repairs. Additions, alterations, renovations or repairs to a mechanical system shall conform to that required for a new mechanical system without requiring the existing mechanical system to comply with all of the requirements of this code. Additions, alterations or repairs shall not cause an existing mechanical system to become unsafe, hazardous or overloaded.

Minor additions, alterations, renovations and repairs to existing mechanical systems shall meet the provisions for new construction, unless such work is done in the same manner and arrangement as was in the existing system, is not hazardous and is *approved*.

❖ Simply stated, new work must comply with the current requirements for new work. Any alteration or addition to an existing system involves some extent of new work and that new work is subject to the requirements of the code. Additions or alterations can place additional loads or different demands on an existing system and those loads or demands could necessitate changing all or part of the existing system. Additions and alterations must not cause an existing system to be any less in compliance with the code than it was before the changes.

[A] 102.5 Change in occupancy. It shall be unlawful to make a change in the *occupancy* of any structure which will subject the structure to any special provision of this code applicable to the new *occupancy* without approval. The code official shall certify that such structure meets the intent of the provisions of law governing building construction for the proposed new *occupancy* and that such change of *occupancy* does not result in any hazard to the public health, safety or welfare.

❖ When a building undergoes a change of occupancy, the mechanical system must be evaluated to determine what effect the change of occupancy has on it. If an existing system serves an occupancy that is different from the occupancy it served when the code went into effect, the mechanical system must comply with the applicable code requirements for a mechanical system serving the newer occupancy. Depending on the nature of the previous occupancy, changing a building's occupancy classification could result in a change to the mechanical system. For example, if a mercantile building was converted to a restaurant, additional ventilation would be required for the public based on the increased occupant load.

[A] 102.6 Historic buildings. The provisions of this code relating to the construction, *alteration*, repair, enlargement, restoration, relocation or moving of buildings or structures shall not be mandatory for existing buildings or structures identified and classified by the state or local jurisdiction as

historic buildings where such buildings or structures are judged by the code official to be safe and in the public interest of health, safety and welfare regarding any proposed construction, *alteration*, repair, enlargement, restoration, relocation or moving of buildings.

❖ This section gives the code official the widest possible flexibility in enforcing the code when the building in question has historic value. This flexibility, however, is not without conditions. The most important criterion for application of this section is that the building must be specifically classified as being of historic significance by a qualified party or agency. Usually, this is done by a state or local authority after considerable scrutiny of the historical value of the building. Most, if not all, states have such authorities, as do many local jurisdictions. The agencies with such authority typically exist at the state or local government level.

[A] 102.7 Moved buildings. Except as determined by Section 102.2, mechanical systems that are a part of buildings or structures moved into or within the jurisdiction shall comply with the provisions of this code for new installations.

❖ Buildings that have been relocated are subject to the requirements of the code as if they were new construction. Placing a building where one did not previously exist is the same as constructing a new building. This section requires alteration of the existing mechanical systems to the extent necessary to bring them into compliance with the provisions of the code applicable to new construction or requires that the existing mechanical system comply with Section 102.2.

[A] 102.8 Referenced codes and standards. The codes and standards referenced herein shall be those that are listed in Chapter 15 and such codes and standards shall be considered as part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections 102.8.1 and 102.8.2.

Exception: Where enforcement of a code provision would violate the conditions of the listing of the *equipment* or *appliance*, the conditions of the listing and the manufacturer's installation instructions shall apply.

❖ A referenced standard or portion of one is an enforceable extension of the code as if the content of the standard were included in the body of the code. For example, Sections 603.4 and 603.5 reference the Sheet Metal and Air-Conditioning Contractors National Association (SMACNA) duct construction standards in their entirety for the construction of metal and nonmetallic ducts. Section 301.7 references NFPA 70 for all electrical installations associated with the equipment and appliances regulated by the code. The use and application of referenced standards are limited to those portions of the standards that are specifically identified. It is the intention of the code to be in harmony with the referenced standards. If conflicts occur because of scope or purpose, the code text governs.

The exception recognizes the extremely unlikely but possible occurrence of the code requiring or allowing something less restrictive or stringent than the product's listing or manufacturer's instructions. The intent is for the highest level of safety to prevail. Thus, this exception allows for the conditions of the listing or the manufacturer's installation instructions to override the code requirement if the listing or installation instructions are more restrictive.

[A] 102.8.1 Conflicts. Where conflicts occur between provisions of this code and the referenced standards, the provisions of this code shall apply.

❖ The code takes precedence when the requirements of the standard conflict with the requirements of the code. Although it is the intention of the code to be in harmony with referenced standards, the code text governs if conflicts occur.

[A] 102.8.2 Provisions in referenced codes and standards. Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code, as applicable, shall take precedence over the provisions in the referenced code or standard.

❖ Although a standard or code is referenced, its full scope and content are not necessarily applicable. The standard (or code) is applicable only to the extent indicated in the text in which the standard is specifically referenced. A referenced standard or a portion thereof is an enforceable extension of the code as if the content of the standard were included in the body of the code. The use and application of referenced standards are limited to those portions of the standards that are specifically identified.

[A] 102.9 Requirements not covered by this code. Requirements necessary for the strength, stability or proper operation of an existing or proposed mechanical system, or for the public safety, health and general welfare, not specifically covered by this code, shall be determined by the code official.

❖ New technology will sometimes result in a situation or circumstance not specifically covered by the code. This section of the code gives the code official the authority to decide whether and how the code can be used to cover the new situation. Clearly such a section is needed and the code official's reasonable application of the section is necessary. The purpose of the section, however, is not to impose requirements that may be preferred when the code provides alternative methods or is not silent on the circumstances. Additionally, the section can be used to implement the general performance-oriented language of the code to specific enforcement situations.

[A] 102.10 Other laws. The provisions of this code shall not be deemed to nullify any provisions of local, state or federal law.

❖ Other laws enacted by the local, state or federal government may be applicable to a condition that is also governed by a requirement in the code. In such cir-

cumstances, the requirements of the code are in addition to those other laws, even though the building official may not be responsible for the enforcement of those laws. For example, the health department might require the pots and pans sink's waste lines in a restaurant to be indirectly connected, whereas the plumbing code allows these sinks to be either directly or indirectly connected.

[A] 102.11 Application of references. Reference to chapter section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section or provision of this code.

❖ In a situation where the code may make reference to a chapter, section number or to another code provision without specifically identifying its location in the code, assume that the referenced section, chapter, or provision is in this code and not in a referenced code or standard.

PART 2–ADMINISTRATION AND ENFORCEMENT

SECTION 103
DEPARTMENT OF MECHANICAL INSPECTION

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

❖ The executive official in charge of the mechanical department is named the "code official" by this section. In actuality, the person who is in charge of the department may hold a different title, such as building commissioner, mechanical inspector or construction official. For the purpose of the code, that person is referred to as the "code official."

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

❖ This section establishes the code official as an appointed position and gives the circumstances under which the code official can be removed from office.

[A] 103.3 Deputies. In accordance with the prescribed procedures of this jurisdiction and with the concurrence of the appointing authority, the code official shall have the authority to appoint a deputy code official, other related technical officers, inspectors and other employees. Such employees shall have powers as delegated by the code official.

❖ This section provides the code official with the authority to appoint other individuals to assist with the administration and enforcement of the code. These individuals have authority and responsibility as designated by the code official.

[A] 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 in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be rendered civilly or criminally liable personally, and is hereby relieved from personal liability for any damage accruing to persons or property as a result of an act or by reason of an act or omission in the discharge of official duties.

❖ This section tells us that a code official or an employee in his or her department should not be held personally liable for damage to persons or property resulting from enforcing code requirements in a lawful and honest way. The appointing authority is responsible for providing lawyers to handle any lawsuits against these employees. The best way to be certain that the code official's action is a "lawful duty" is to always cite the applicable code section on which the enforcement action is based.

[A] 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 representatives 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.

❖ See commentary for Section 103.4.

SECTION 104
DUTIES AND POWERS OF THE CODE OFFICIAL

[A] 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 render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies and procedures shall be in compliance with the intent and purpose of this code. Such policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

❖ The duty of the code official is to enforce the code, and he or she is the "authority having jurisdiction" for all matters relating to the code and its enforcement. It is the duty of the code official to interpret the code and to determine compliance. Code compliance will not always be easy to determine and will require judgment and expertise, particularly when enforcing the provisions of Sections 105.1 and 105.2. In exercising this authority, however, the code official cannot set aside or ignore any provision of the code.

[A] 104.2 Applications and permits. The code official shall receive applications, review *construction documents* and issue permits for the installation and *alteration* of mechanical systems, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

❖ The code enforcement process is normally initiated with an application for a permit. The code official is responsible for processing the applications and issuing permits for the installation, replacement, addition to or modification of mechanical systems in accordance with the code.

[A] 104.3 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 and be certified by a responsible officer of such *approved* agency or by the responsible individual. The code official is authorized to engage such expert opinion as deemed necessary to report upon unusual technical issues that arise, subject to the approval of the appointing authority.

❖ The code official is required to make inspections as necessary to determine compliance with the code or to accept written reports of inspections by an approved agency. The inspection of the work in progress or accomplished is another significant element in determining code compliance. Even though a department does not have the resources to inspect every aspect of all work, the required inspections are those that are dictated by administrative rules and procedures based on many factors, including available inspection resources. In order to expand the resources available for inspections, the code official may approve an inspection agency that, in the code official's opinion, possesses the proper qualifications to perform the inspections. When unusual, extraordinary or complex technical issues arise concerning either mechanical installations or the safety of an existing mechanical system, the code official has the authority to seek the opinion and advice of experts. A technical report from an expert requested by the code official can be used to assist the code official in the approval process.

[A] 104.4 Right of entry. Where it is necessary to make an inspection to enforce the provisions of this code, or where the code official has reasonable cause to believe that there exists in a building or upon any premises any conditions or violations of this code that make the building or premises unsafe, insanitary, dangerous or hazardous, the code official shall have the authority to enter the building or premises at all reasonable times to inspect or to perform the duties imposed upon the code official by this code. If such building or premises is occupied, the code official shall present credentials to the occupant and request entry. If such building or premises is unoccupied, the code official shall first make a reasonable effort to locate the owner, the owner's authorized agent or other person having charge or control of the building or premises and request entry. If entry is refused, the code official has recourse to every remedy provided by law to secure entry.

Where the code official has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owner, the owner's authorized agent or occupant or person having charge, care or control of the building or premises shall not fail or neglect, after proper request is made as herein provided, to promptly permit entry therein by the code official for the purpose of inspection and examination pursuant to this code.

❖ The first part of this section establishes the right of the code official to enter the premises to conduct the permit inspections required by Section 107. Permit application forms typically include a statement in the certification signed by the applicant (who is the owner or owner's agent) granting the code official the authority to enter areas covered by the permit, as needed, to enforce code provisions related to the permit. The right to enter other structures or premises is more limited. First, to protect the right of privacy, the owner or occupant must grant the code official permission before an interior inspection of the property can be conducted. Permission is not required for inspections that can be accomplished from within the public right-of-way. Second, access may be denied by the owner or occupant. Unless the inspector has reasonable cause to believe that a violation of the code exists, access may be unattainable. Third, code officials must present proper identification (see commentary, Section 104.6) and request admittance during reasonable hours—usually the normal business hours of the establishment—to be admitted. Fourth, inspections must be aimed at securing or determining compliance with the provisions and intent of the regulations that are specifically within the established scope of the code official's authority.

Searches to gather information for the purpose of enforcing the other codes, ordinances or regulations are considered unreasonable and are prohibited by the Fourth Amendment to the U.S. Constitution. "Reasonable cause" in the context of this section must be distinguished from "probable cause," which is required to gain access to property in criminal cases. The burden of proof establishing reasonable cause may vary among jurisdictions. Usually, an inspector must show that the property is subject to inspection under the provisions of the code; that the interests of the public health, safety and welfare outweigh the individual's right to maintain privacy; and that the inspection is required solely to determine compliance with the provisions of the code.

Many jurisdictions do not recognize the concept of an administrative warrant and may require the code official to prove probable cause in order to gain access upon refusal. This burden of proof is usually greater, often requiring the code official to state in advance why access is needed (usually access is restricted to gathering evidence for seeking an indictment or making an arrest); what specific items or information is sought; its relevance to the case against the subject; how knowledge of the relevance of the information or items sought was obtained; and how the evidence sought will be used. In all such cases, the right to privacy must always be weighed against the right of the code official to conduct an inspection to verify that the public health, safety and welfare are not in jeopardy. Such important and complex constitutional issues should be discussed with the jurisdiction's legal counsel. Jurisdictions should establish procedures for securing the necessary court orders when an inspection is deemed necessary following a refusal.

The last paragraph in this section requires the owner or occupant to permit entry for inspection, if a

proper inspection warrant or other documentation required by law has been obtained.

[A] 104.5 Identification. The code official shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

❖ This section requires the code official (including by definition all authorized designees) to carry identification when conducting the duties of the position. The identification removes any question of the purpose and authority of the inspector.

[A] 104.6 Notices and orders. The code official shall issue all necessary notices or orders to ensure compliance with this code.

❖ An important element of code enforcement is the necessary advisement of deficiencies and corrections, which is accomplished through notices and orders. The code official is required to issue orders to abate illegal or unsafe conditions. Sections 108.7, 108.7.1, 108.7.2 and 108.7.3 contain additional information concerning these notices.

[A] 104.7 Department records. The code official shall keep official records of applications received, permits and certificates issued, fees collected, reports of inspections, and notices and orders issued. Such records shall be retained in the official records for the period required for retention of public records.

❖ In keeping with the need for an efficiently conducted business practice, the code official must keep records pertaining to permit applications, permits, fees collected, inspections, notices and orders issued. Such documentation provides a valuable resource if questions arise regarding the department's actions with respect to a building. This section requires that other documents be kept for the length of time mandated by a jurisdiction's, or its state's, laws or administrative rules for retaining public records.

SECTION 105
APPROVAL

[A] 105.1 Modifications. Where there are practical difficulties involved in carrying out 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 that the code official shall first find that special individual reason makes the strict letter of this code impractical and the modification is in compliance with the intent and purpose of this code and does not lessen health, life and fire safety requirements. The details of action granting modifications shall be recorded and entered in the files of the mechanical inspection department.

❖ The code official may amend or make exceptions to the code, as needed, where strict compliance is impractical. Only the code official has 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 permit setting aside or ignoring a code provision; rather, it is intended to provide acceptance of equivalent protection. Such modifications do not, however, extend to actions that are necessary to correct violations of the code. In other words, a code violation or the expense of correcting one cannot constitute a practical difficulty.

[A] 105.2 Alternative materials, methods, equipment and appliances. The provisions of this code are not intended to prevent the installation of any material or to prohibit any method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material or method of construction shall be *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 work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety. Where the alternative material, design or method of construction is not approved, the *code official* shall respond in writing, stating the reasons why the alternative was not approved.

❖ The code is not intended to discourage innovative ideas or technological advances. A comprehensive regulatory document such as a mechanical code, cannot envision and then address all future innovations in the industry. As a result, a performance code must be applicable to and provide a basis for the approval of an increasing number of newly developed, innovative materials, systems and methods for which no code text or referenced standards yet exist. The fact that a material, product or method of construction is not addressed in the code is not an indication that the material, product or method is prohibited. The code official is expected to apply sound technical judgment in accepting materials, systems or methods that, while not anticipated by the drafters of the current code text, can be demonstrated to offer equivalent performance. By virtue of its text, the code regulates new and innovative construction practices while addressing the relative safety of building occupants. The code official is responsible for determining whether a requested alternative provides a level of protection of the public health, safety and welfare equivalent to that required by the code. The last sentence requires that the reasons why a proposed alternative was disapproved be provided in writing to the applicant. The applicant for a code modification or variance deserves to know why their proposed alternative was unacceptable. This will help the applicant prepare their case and will also discourage authorities from making determinations without having solid justification based on the spirit and intent of the codes.

[A] 105.2.1 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 construction, it is incumbent upon the code official to determine whether this alternative is, in fact, an equivalent to the methods prescribed by the code. Reports providing evidence of this equivalency are required to be supplied by an approved source, meaning a source that the code official finds to be reliable and accurate. The ICC Evaluation Service (ICC-ES) is one example of an agency that provides research reports for alternative materials and methods.

[A] 105.3 Required testing. Where there is insufficient evidence of compliance with the provisions of this code, or 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 as evidence of compliance to be made at no expense to the jurisdiction.

❖ Sufficient technical data, test reports and documentation must be submitted for evaluation by the code official to provide the basis on which he or she can make a decision regarding an alternative material or type of equipment. If evidence satisfactory to the code official proves 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 have the effect of waiving any requirements of the code. The burden of proof of equivalence lies with the applicant who proposes the use of alternative equipment, materials 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 shall approve the testing procedures.

❖ 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 can 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. A research report issued by an authoritative agency is particularly useful in providing the code official with the technical basis for evaluation and approval of new and innovative materials and components. The use of authoritative research reports can greatly assist the code official by reducing the time-consuming engineering analysis necessary to review materials and products. Failure to substantiate a request for the use of an alternative method is a valid reason for the code official to deny a request.

[A] 105.3.2 Testing agency. Tests shall be performed by an *approved* agency.

❖ 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] 105.3.3 Test reports. Reports of tests shall be retained by the code official for the period required for retention of public records.

❖ Test reports for retrieval of substantiation of the modification based on the tests are to be retained in accordance with public record laws. The attorney of the jurisdiction could be asked for the specific time period stated in applicable laws of the locality.

[A] 105.4 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 materials, equipment, devices and systems must be constructed and installed in compliance with, and all conditions and limitations considered as a basis for, that approval. For example, the manufacturer's instructions and recommendations are to be followed if the approval of the material was based, even in part, on those instructions and recommendations. The approval authority given to the code official is a significant responsibility and is a key to code compliance. The approval process is first technical and then administrative and must be approached as such. 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] 105.5 Material, equipment and appliance reuse. Materials, *equipment*, appliances and devices shall not be reused unless such elements have been reconditioned, tested and placed in good and proper working condition and *approved*.

❖ The code criteria for materials, equipment and appliances have changed over the years. Evaluation of testing and materials technology has permitted the development of new criteria that the old materials may not satisfy. As a result, used materials must be evaluated in the same manner as new materials. Used (previously installed) equipment and appliances must be equivalent to that required by the code if they are to be used again in a new installation.

SECTION 106
PERMITS

[A] 106.1 Where required. An owner, owner's authorized agent or contractor who desires to erect, install, enlarge, alter, repair, remove, convert or replace a mechanical system, the installation of which is regulated by this code, or to cause such work to be performed, shall first make application to the code official and obtain the required permit for the work.

> **Exception:** Where *equipment* and *appliance* replacements or repairs must be performed in an emergency situation, the permit application shall be submitted within the next working business day of the department of mechanical inspection.

❖ In general, a permit is required for all activities that are regulated by the code, and these activities cannot begin until the permit is issued. A mechanical permit is required for the installation, replacement, alteration or modification of mechanical systems and components that are in the scope of applicability of the code. Replacement of an existing piece of equipment or related piping is treated no differently than a new installation in new building construction. The permit causes the work to be inspected to determine compliance with the intent of the code. The exception provides for prompt permit applications for situations where equipment and appliance replacements and repairs are done to address an emergency situation. This action enables the department of mechanical inspection to promptly inspect the work.

[A] 106.1.1 Annual permit. Instead of an individual construction permit for each alteration to an already *approved* system or equipment or application installation, the code official is authorized to issue an annual permit upon application therefor to any person, firm or corporation regularly employing one or more qualified tradespersons in the building, structure or on the premises owned or operated by the applicant for the permit.

❖ Sometimes the AHJ will issue an annual permit for buildings such as hospitals, school campuses, industrial and manufacturing plants, and the like, where work that requires a permit is ongoing throughout the year. Such occupancies typically have their own full-time engineering and trades employees to design, oversee and perform the work. Some buildings are altered continuously because of changes in technologies and changing operations within the occupancy. It would be burdensome to obtain numerous permits throughout the year on a continuous basis. It is the responsibility of the permit holder to make arrangements with the code official regarding periodic inspections for the work. This is especially important for work that will be concealed.

[A] 106.1.2 Annual permit records. The person to whom an annual permit is issued shall keep a detailed record of alterations made under such annual permit. The code official shall have access to such records at all times or such records shall be filed with the code official as designated.

❖ Annual permits need to be monitored to prevent abuse of the privilege and to allow for changes in the scope of the work or changes in who is performing the work. Accurate record keeping of the work performed will advise the code official of situations where a project-specific permit needs to be issued instead of being under the umbrella of an annual permit.

[A] 106.2 Permits not required. Permits shall not be required for the following:

1. Portable heating appliances.
2. Portable ventilation appliances and *equipment*.
3. Portable cooling units.
4. Steam, hot water or chilled water piping within any heating or cooling *equipment* or appliances regulated by this code.
5. The replacement of any minor part that does not alter the approval of *equipment* or an *appliance* or make such *equipment* or *appliance* unsafe.
6. Portable evaporative coolers.
7. Self-contained refrigeration systems that contain 10 pounds (4.5 kg) or less of refrigerant, or that are actuated by motors of 1 horsepower (0.75 kW) or less.
8. Portable fuel cell appliances that are not connected to a fixed piping system and are not interconnected to a power grid.

Exemption from the permit requirements of this code shall not be deemed to grant authorization for work to be done in violation of the provisions of this code or other laws or ordinances of this jurisdiction.

❖ The mechanical installations intended to be exempt from the requirement for a permit are very limited as evidenced by Items 1 through 8. Items 1, 2, 3 and 6 pertain to appliances and equipment that are temporarily used and are not designed for permanent installation. Examples of portable heating, cooling and ventilating appliances and equipment include space heaters; construction site heaters; window unit air conditioners; ventilating fans and blowers; and cooling and ventilation equipment for localized manufacturing processes.

Item 8 also includes the term "portable," but it is used to differentiate this equipment from the permanently installed fuel cell appliances that are hard-piped to a fuel source, such as a natural gas line and/or connected to the electrical generation power grid (see commentary, Section 924). Portable fuel cell appliances are fueled by on-board gas cylinders and are used as portable generators for such use as charging the batteries of electric cars.

Item 4 applies to steam and water piping that is contained within a packaged assembly or within the enclosure of HVAC equipment, such as air-handling

units, heat pumps, cooling towers, chiller units, fan coil units and similar assemblies. This piping is considered part of the equipment and is, therefore, subject to the requirements for the equipment.

Item 5 applies to the replacements of equipment components and appliance components that are minor. A permit would be required if the component replacement could potentially affect either the safety of the equipment or the conditions of approval of the equipment. For example, replacement of a defective control with a control of the same type and specifications as the original factory-supplied control would not require a permit. Replacement of a burner assembly with a burner assembly having a different input capacity or that is designed to burn a different fuel would require a permit.

Item 7 applies to package-type equipment such as freezers, walk-in and reach-in coolers, refrigerated cabinets and cases and similar equipment in which all components of the refrigeration system are located within a single enclosure. The refrigerant charge and compressor motor horsepower are the thresholds of applicability of this item.

The equipment, piping and installation of the eight described items must comply with the code even though a permit is not required for the minor items.

[A] 106.3 Application for permit. Each application for a permit, with the required fee, shall be filed with the code official on a form furnished for that purpose and shall contain a general description of the proposed work and its location. The application shall be signed by the owner or the owner's authorized agent. The permit application shall indicate the proposed *occupancy* of all parts of the building and of that portion of the site or lot, if any, not covered by the building or structure and shall contain such other information required by the code official.

❖ This section limits permit applicants to the building owner or an authorized agent of the owner. An owner's authorized agent could be anyone who is given written permission to act in the owner's interest to obtain a permit, such as an architect, engineer, contractor, tenant or other. Permit forms will generally have enough space for a very brief description of the work to be accomplished, which is sufficient for small jobs. For larger projects, the description will be contained in construction documents.

[A] 106.3.1 Construction documents. *Construction documents*, engineering calculations, diagrams and other data shall be submitted in two or more sets with each application for a permit. The code official shall require *construction documents*, computations and specifications to be prepared and designed by a *registered design professional* where required by state law. Where special conditions exist, the code official is authorized to require additional *construction documents* to be prepared by a *registered design professional*. *Construction documents* shall be drawn to scale and shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that the work conforms to the provisions of this code. *Construction documents* for buildings more than two stories in height shall indicate where penetrations will be made for mechanical systems, and the materials and methods for maintaining required structural safety, fire-resistance rating and fireblocking.

Exception: The code official shall have the authority to waive the submission of *construction documents*, calculations or other data if the nature of the work applied for is such that reviewing of *construction documents* is not necessary to determine compliance with this code.

❖ When the work is of a "minor nature," either in scope or needed description, the code official may use judgment in determining the need for a detailed description of the work. An example of minor work that may not involve a detailed description is the replacement of an existing piece of equipment in a mechanical system or the replacement or repair of a defective portion of a piping system. These provisions are intended to reflect the minimum scope of information needed to determine code compliance. Complex mechanical systems often contain special conditions that can require the involvement of a registered design professional, such as a registered engineer or architect. Many boilers, high heat appliances and appliances located in hazardous areas can create dangerous situations that require more details to be provided on additional construction documents. A statement on the construction documents, such as "All mechanical work must comply with the 2006 edition of the ICC *International Mechanical Code*," is not an acceptable substitute for showing the required information. This section also requires the code official to determine that state professional registration laws are complied with as they apply to the preparation of construction documents.

[A] 106.3.2 Preliminary inspection. Before a permit is issued, the code official is authorized to inspect and evaluate the systems, *equipment*, buildings, devices, premises and spaces or areas to be used.

❖ Some projects might require a preliminary inspection by the code official prior to a permit being issued. This is especially useful for remodel and addition projects where the conditions of the existing building mechanical systems are unknown or are of questionable condition. This section authorizes the code official to make such inspections.

[A] 106.3.3 Time limitation of application. An application for a permit for any proposed work shall be deemed to have been abandoned 180 days after the date of filing, unless such application has been pursued in good faith or a permit has been issued; except that the code official shall have the authority to grant one or more extensions of time for additional periods not exceeding 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

❖ Once an application for a permit has been submitted for proposed work, a time limit of 180 days is established for issuance of the permit. This prevents the

code official from having to hold onto incomplete or delayed applications for an indefinite amount of time. The code official can grant extensions for this time period if provided with a written request with justifiable reasons for the extension request.

[A] 106.4 Permit issuance. The application, *construction documents* and other data filed by an applicant for a permit shall be reviewed by the code official. If the code official finds that the proposed work conforms to the requirements of this code and all laws and ordinances applicable thereto, and that the fees specified in Section 106.5 have been paid, a permit shall be issued to the applicant.

❖ This section requires the code official to review all submittals for a permit for compliance with the code and further requires code officials to verify that the project will be carried out in accordance with other applicable laws as well. This may involve interagency communication and cooperation so that all laws are being obeyed. Once the code official finds this to be so, a permit may be issued upon payment of the required fees.

[A] 106.4.1 Approved construction documents. When the code official issues the permit where *construction documents* are required, the *construction documents* shall be endorsed in writing and stamped "*APPROVED*." Such *approved construction documents* shall not be changed, modified or altered without authorization from the code official. Work shall be done in accordance with the *approved construction documents*.

The code official shall have the authority to issue a permit for the construction of part of a mechanical system before the *construction documents* for the entire system have been submitted or *approved*, provided adequate information and detailed statements have been filed complying with all pertinent requirements of this code. The holder of such permit shall proceed at his or her own risk without assurance that the permit for the entire mechanical system will be granted.

❖ Construction documents that reflect compliance with code requirements form an integral part of the permit process. Successful completion of the work depends on these documents. This section requires the code official to stamp the complying construction documents as being "*APPROVED*" and fixes the status of the document in time. *Approved* documents may not be revised without the express authorization of the code official to maintain the code-compliance level of the documents.

[A] 106.4.2 Validity. The issuance of a permit or approval of *construction documents* shall not be construed to be a permit for, or an approval of, any violation of any of the provisions of this code or of other ordinances of the jurisdiction. A permit presuming to give authority to violate or cancel the provisions of this code shall be invalid.

The issuance of a permit based upon *construction documents* and other data shall not prevent the code official from thereafter requiring the correction of errors in said *construction documents* and other data or from preventing building operations from being carried on thereunder where in violation of this code or of other ordinances of this jurisdiction.

❖ This powerful code section states the fundamental premise that the permit is only a license to proceed with the work. It is not a license to violate, cancel or set aside any provisions of the code. This statement is important because it means that despite any errors in the approval process, the permit applicant is responsible for code compliance.

[A] 106.4.3 Expiration. Every permit issued by the code official under the provisions of this code shall expire by limitation and become null and void if the work authorized by such permit is not commenced within 180 days from the date of such permit, or if the work authorized by such permit is suspended or abandoned at any time after the work is commenced for a period of 180 days. Before such work recommences, a new permit shall be first obtained and the fee therefor shall be one-half the amount required for a new permit for such work, provided that changes have not been made and will not be made in the original *construction documents* for such work, and provided further that such suspension or abandonment has not exceeded one year.

❖ The permit becomes invalid under two distinct situations, but both are based on a six-month period. The first situation is when no work has been started six months from issuance of the permit. The second situation is when there is no continuation of authorized work for six months. The person who was issued the permit should be notified, in writing, that the permit is invalid and what steps must be taken to restart the work. This section also provides the administrative authority with a means of offsetting the costs associated with the administration of expired, reissued permits by charging a nominal fee for permit reissuance. If, however, the nature or scope of the work to be resumed is different from that contemplated by the original permit, the permit process essentially starts from "scratch" and full fees are charged. The same procedure would also apply if the work has not commenced within one year of the date of permit issuance or if work has been suspended for a year or more.

[A] 106.4.4 Extensions. A permittee holding an unexpired permit shall have the right to apply for an extension of the time within which the permittee will commence work under that permit when work is unable to be commenced within the time required by this section for good and satisfactory reasons. The code official shall extend the time for action by the permittee for a period not exceeding 180 days if there is reasonable cause. A permit shall not be extended more than once. The fee for an extension shall be one-half the amount required for a new permit for such work.

❖ Although it is customary for a project to begin immediately following issuance of a permit, there may be occasions when an unforeseen delay may occur. This section intends to afford the permit holder an opportunity to apply for and receive a single 180-day extension of time within which to begin a project

under a still-valid permit (less than 180 days old). The applicant must, however, give the code official an adequate explanation for the delay in starting a project, which could include such things as the need to obtain approvals or permits for the project from other agencies having jurisdiction. This section requires the code official to determine what constitutes "good and satisfactory" reasons for any delay, and further allows the jurisdiction to offset its administrative costs for extending the permit by charging one-half the permit fee for the extension.

[A] 106.4.5 Suspension or revocation of permit. The code official shall have the authority to suspend or revoke a permit issued under the provisions of this code wherever the permit is issued in error or on the basis of incorrect, inaccurate or incomplete information, or in violation of any ordinance or regulation or any of the provisions of this code.

❖ A permit is in reality a license to proceed with the work. The code official, however, must revoke all permits shown to be based, all or in part, on any false statement or misrepresentation of fact. An applicant may subsequently reapply for a permit with the appropriate corrections or modifications made to the application and the construction documents.

[A] 106.4.6 Retention of construction documents. One set of *approved construction documents* shall be retained by the code official for a period of not less than 180 days from date of completion of the permitted work, or as required by state or local laws. One set of *approved construction documents* shall be returned to the applicant, and said set shall be kept on the site of the building or job at all times during which the work authorized thereby is in progress.

❖ Once the code official has stamped or endorsed as approved the construction documents on which the permit is based (see commentary, Section 106.4.1), one set of approved construction documents must be kept on the construction site to serve as the basis for all subsequent inspections. To avoid confusion, the construction documents on the site must be precisely the documents that were approved and stamped because inspections are to be based on these approved documents. Additionally, the contractor cannot determine compliance with the approved construction documents unless those documents are readily available. Unless the approved construction documents are available, the inspection should be postponed and work on the project halted.

[A] 106.4.7 Previous approvals. This code shall not require changes in the *construction documents*, construction or designated *occupancy* of a structure for which a lawful permit has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned.

❖ This section provides the code official with a useful tool to protect the continuity of permits issued under previous codes or code editions, as long as such permits are being actively executed subsequent to the effective date of the ordinance adopting the newer code.

[A] 106.4.8 Posting of permit. The permit or a copy shall be kept on the site of the work until the completion of the project.

❖ This section requires the permit (or a copy of the permit) to be on the work site until the project is completed. Having the permit at the job site provides project information and evidence to anyone needing to know if the project has been duly authorized.

[A] 106.5 Fees. A permit shall not be issued until the fees prescribed in Section 106.5.2 have been paid, nor shall an amendment to a permit be released until the additional fee, if any, due to an increase of the mechanical system, has been paid.

❖ All fees are to be paid prior to permit issuance. This requirement establishes that the permit applicant intends to proceed with the work and also facilitates payment.

[A] 106.5.1 Work commencing before permit issuance. Any person who commences work on a mechanical system before obtaining the necessary permits shall be subject to 100 percent of the usual permit fee in addition to the required permit fees.

❖ This section is intended to serve as a deterrent to proceeding with work on a mechanical system without a permit (except as provided in Sections 106.1 and 106.2). As a punitive measure, it doubles the permit fee to be charged. This section does not, however, intend to penalize a contractor called upon to do emergency work after hours if he or she promptly notifies the code official the next business day, obtains the requisite permit for the work done and has the required inspections performed.

[A] 106.5.2 Fee schedule. The fees for mechanical work shall be as indicated in the following schedule.

[JURISDICTION TO INSERT APPROPRIATE SCHEDULE]

❖ A published fee schedule must be established for plans examination, permits and inspections. Ideally, the department should generate revenues that cover operating costs and expenses. The permit fee schedule is an integral part of this process.

[A] 106.5.3 Fee refunds. The code official shall authorize the refunding of fees as follows.

1. The full amount of any fee paid hereunder which was erroneously paid or collected.
2. Not more than **[SPECIFY PERCENTAGE]** percent of the permit fee paid where work has not been done under a permit issued in accordance with this code.
3. Not more than **[SPECIFY PERCENTAGE]** percent of the plan review fee paid where an application for a permit for which a plan review fee has been paid is withdrawn or canceled before any plan review effort has been expended.

The code official shall not authorize the refunding of any fee paid, except upon written application filed by the original permittee not later than 180 days after the date of fee payment.

❖ This section allows for a partial refund of fees resulting from the revocation, abandonment or discontinuance of a mechanical project for which a permit has been issued and fees have been collected. The incomplete work for which the excess fees are to be refunded refers to the work that would have been required by the department had the permit not been terminated. The refund of fees should be related to the cost of enforcement services not provided because of termination of the project.

SECTION 107
INSPECTIONS AND TESTING

[A] 107.1 General. The code official is authorized to conduct such inspections as are deemed necessary to determine compliance with the provisions of this code. Construction or work for which a permit is required shall be subject to inspection by the code official, and such construction or work shall remain accessible and exposed for inspection purposes until *approved*. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid.

❖ The inspection function is one of the more important aspects of building department operations. This section authorizes the code official to inspect the work for which a permit has been issued and requires that the work to be inspected remain accessible to the code official until inspected and approved. Any expense incurred in removing or replacing material that conceals an item to be inspected is not the responsibility of the code official or the jurisdiction. As with the issuance of permits (see Section 106.4.2), an approval as a result of an inspection is not a license to violate the code. Any work approved which might contain a violation of the code does not relieve the applicant from complying with the code.

[A] 107.2 Required inspections and testing. The code official, upon notification from the permit holder or the permit holder's agent, shall make the following inspections and other such inspections as necessary, and shall either release that portion of the construction or shall notify the permit holder or the permit holder's agent of violations that must be corrected. The holder of the permit shall be responsible for the scheduling of such inspections.

1. Underground inspection shall be made after trenches or ditches are excavated and bedded, piping installed, and before backfill is put in place. Where excavated soil contains rocks, broken concrete, frozen chunks and other rubble that would damage or break the piping or cause corrosive action, clean backfill shall be on the job site.
2. Rough-in inspection shall be made after the roof, framing, fireblocking and bracing are in place and all ducting and other components to be concealed are complete, and prior to the installation of wall or ceiling membranes.
3. Final inspection shall be made upon completion of the mechanical system.

Exception: Ground-source heat pump loop systems tested in accordance with Section 1210.10 shall be permitted to be backfilled prior to inspection.

The requirements of this section shall not be considered to prohibit the operation of any heating *equipment* or appliances installed to replace existing heating *equipment* or appliances serving an occupied portion of a structure provided that a request for inspection of such heating *equipment* or appliances has been filed with the department not more than 48 hours after such replacement work is completed, and before any portion of such *equipment* or appliances is concealed by any permanent portion of the structure.

❖ Inspections are necessary to determine that an installation conforms to all code requirements. Because the majority of a mechanical system is hidden within the building enclosure, periodic inspections are necessary before portions of the system are concealed. The code official is required to determine that mechanical systems and equipment are installed in accordance with the approved construction documents and the applicable code requirements. All inspections that are necessary to provide verification must be conducted. Generally, the administrative rules of a department may list the interim inspections to be required. Construction that occurs in steps or phases may necessitate multiple inspections; therefore, an exact number of required inspections cannot be specified. Where violations are noted and corrections are required, reinspections may be necessary. As time permits, frequent inspections of some job sites, especially where the work is complex, can be beneficial if they detect code compliance problems or potential problems before they develop or become more difficult to correct. The contractor, builder, owner or other authorized party is responsible for arranging for the required inspections and coordinating inspections to prevent work from being concealed before it is inspected.

1. Inspection of underground piping is especially important because once it is covered, it is the most challenging part of a mechanical system in which to detect a leak. If repairs are necessary, underground repairs are proportionally more expensive because of the need for heavy equipment and the more labor-intensive nature of working below grade level. To reduce possible damage to pipe from rubble, rocks and other rough materials, excavations must be bedded and backfilled with clean fill materials spread and tamped to

provide adequate support and protection for piping.

2. A rough-in inspection is an inspection of all parts of the mechanical system that will eventually be concealed in the building structure. The inspection must be made before any of the system is closed up or hidden from view. To gain approval, the mechanical systems must pass the required rough-in tests.

   A rough-in inspection may be completed all at one time or as a series of inspections. This is administratively determined by the local inspections department and is typically dependent on the size of the job.

3. A final inspection may be done as a series of inspections or all at one time, similar to a rough-in inspection. A final inspection is required prior to approval of mechanical work and installations. For the construction of a new building, final approval is required prior to the issuance of the certificate of occupancy as specified in the building code. To verify that all previously issued correction orders have been complied with and to determine whether subsequent violations exist, a final inspection must be made. All violations observed during the final inspection must be noted and the permit holder advised.

   The final inspection is made after the completion of the work or installation. Typically, the final inspection is an inspection of all that was installed after the rough-in inspection and not concealed in the building construction. Subsequent reinspections are necessary if the final inspection has generated a notice of violation.

   The exception is in relation to Item 1 in this section, which requires inspection before backfill is put in place. The construction sequence of ground-source heat pump loop systems involves trenching, placement and testing of that portion of the system; backfilling; then trenching for another portion of the system. Thus, the exception is needed so that an inspection is not necessary for each test and prior to the backfilling operation for each portion of the system. The frequency of inspection would otherwise be excessive.

   The last paragraph of this section provides for prompt operation of replacement heating equipment or appliances, and this allows the occupied areas of a facility to be heated as soon as the new heating equipment or appliance is installed. Any corrections to the installation that are identified by field inspection are to be done.

[A] 107.2.1 Other inspections. In addition to the inspections specified in Section 107.2, the code official is authorized to make or require other inspections of any construction work to ascertain compliance with the provisions of this code and other laws that are enforced.

❖ Any item regulated by the code is subject to inspection by the code official to determine compliance with the applicable code provision, and no list can include all types of work in a given building. Also, other inspections before, during or after the rough-in could be necessary. This section gives the code official the authority to inspect any regulated work.

[A] 107.2.2 Inspection requests. It shall be the duty of the holder of the permit or their duly authorized agent to notify the code official when work is ready for inspection. It shall be the duty of the permit holder to provide *access* to and means for inspections of such work that are required by this code.

❖ This section clarifies that it is the responsibility of the permit holder to arrange for the required inspections when the work is completed. It also establishes his or her responsibility for keeping the work open for inspection and providing all means needed to accomplish the inspections.

[A] 107.2.3 Approval required. Work shall not be done beyond the point indicated in each successive inspection without first obtaining the approval of the code official. The code official, upon notification, shall make the requested inspections and shall either indicate the portion of the construction that is satisfactory as completed, or notify the permit holder or his or her agent wherein the same fails to comply with this code. Any portions that do not comply shall be corrected and such portion shall not be covered or concealed until authorized by the code official.

❖ This section establishes that work cannot progress beyond the point of a required inspection without the code official's approval. Upon making the inspection, the code official must either approve the completed work or notify the permit holder or other responsible party of that which does not comply with the code. Approvals and notices of noncompliance must be in writing, as required by Section 104.3, to avoid any misunderstanding as to what is required. Any work not approved cannot be concealed until it has been corrected and approved by the code official.

[A] 107.2.4 Approved inspection agencies. The code official is authorized to accept reports of *approved* agencies, provided that such agencies satisfy the requirements as to qualifications and reliability.

❖ The determination as to whether to accept an agency test report rests with the code official and the reporting agency must be acceptable to the code official. Appropriate criteria on which to base approval of an inspection agency can be found in Sections 301.5.2.1 through 301.5.2.3.

[A] 107.2.5 Evaluation and follow-up inspection services. Prior to the approval of a prefabricated construction assembly having concealed mechanical work and the issuance of a mechanical permit, the code official shall require the submittal of an evaluation report on each prefabricated construction assembly, indicating the complete details of the mechanical

system, including a description of the system and its components, the basis upon which the system is being evaluated, test results and similar information, and other data as necessary for the code official to determine conformance to this code.

❖ As an alternative to the physical inspection by the code official in the plant or location where prefabricated components are produced (such as modular homes and prefabricated structures), the code official has the option of accepting an evaluation report from an approved agency detailing such inspections. Evaluation reports can serve as the basis from which the code official will determine code compliance.

[A] 107.2.5.1 Evaluation service. The code official shall designate the evaluation service of an *approved* agency as the evaluation agency, and review such agency's evaluation report for adequacy and conformance to this code.

❖ The code official is required to review all submitted reports for conformity to the applicable code requirements. If, in the judgment of the code official, the submitted reports are acceptable, the code official should document the basis for the approval.

[A] 107.2.5.2 Follow-up inspection. Except where ready access is provided to mechanical systems, service *equipment* and accessories for complete inspection at the site without disassembly or dismantling, the code official shall conduct the in-plant inspections as frequently as necessary to ensure conformance to the *approved* evaluation report or shall designate an independent, *approved* inspection agency to conduct such inspections. The inspection agency shall furnish the code official with the follow-up inspection manual and a report of inspections upon request, and the mechanical system shall have an identifying label permanently affixed to the system indicating that factory inspections have been performed.

❖ The owner is required to provide special inspections of fabricated assemblies at the fabrication plant. The code official or an approved inspection agency must conduct periodic in-plant inspections to ensure conformance to the approved evaluation report described in Section 107.2.5. Such inspections would not be required where the mechanical systems can be inspected completely at the job site.

[A] 107.2.5.3 Test and inspection records. Required test and inspection records shall be available to the code official at all times during the fabrication of the mechanical system and the erection of the building; or such records as the code official designates shall be filed.

❖ All testing and inspection records related to a fabricated assembly must be filed with the code official to maintain a complete and legal record of the assembly and erection of the building.

[A] 107.3 Testing. Mechanical systems shall be tested as required in this code and in accordance with Sections 107.3.1 through 107.3.3. Tests shall be made by the permit holder and observed by the code official.

❖ The concept of this section is that the testing of mechanical systems is required where testing is specified in the technical chapters of the code. See the "tests" listing in the index of the code for examples of mechanical systems that require testing.

[A] 107.3.1 New, altered, extended or repaired systems. New mechanical systems and parts of existing systems, which have been altered, extended, renovated or repaired, shall be tested as prescribed herein to disclose leaks and defects.

❖ Testing is necessary to make sure that the system is free from leaks or other defects. Testing is also required, to the extent specified in the technical chapters of the code, for portions of existing systems that have been altered, extended, renovated or repaired.

[A] 107.3.2 Apparatus, material and labor for tests. Apparatus, material and labor required for testing a mechanical system or part thereof shall be furnished by the permit holder.

❖ The permit holder is responsible for performing tests, as well as for supplying all of the labor and apparatus necessary to conduct the tests. The code official observes but never performs the test.

[A] 107.3.3 Reinspection and testing. Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the code official for inspection and testing.

❖ If a system or a portion of a system does not pass the initial test or inspection, violations must be corrected and the system must be reinspected. To encourage code compliance and to cover the expense of the code official's time, many code enforcement jurisdictions charge fees for inspections that are required subsequent to the first reinspection.

[A] 107.4 Approval. After the prescribed tests and inspections indicate that the work complies in all respects with this code, a notice of approval shall be issued by the code official.

❖ After the code official has performed the required inspections and observed any required equipment and system tests (or has received written reports of the results of such tests), he or she must determine whether the installation or work is in compliance with all applicable sections of the code. The code official must issue a written notice of approval if the subject work or installation is in apparent compliance with the code. The notice of approval is given to the permit holder and a copy of the notice is retained on file by the code official.

[A] 107.4.1 Revocation. The code official is authorized to, in writing, suspend or revoke a notice of approval issued under the provisions of this code wherever the notice is issued in error, on the basis of incorrect information supplied, or where it is determined that the building or structure, premise or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code.

❖ This section is needed to give the code official the authority to revoke a notice of approval for the reasons indicated in the code text. The code official can suspend the notice until all of the code violations are corrected.

[A] 107.5 Temporary connection. The code official shall have the authority to authorize the temporary connection of a mechanical system to the sources of energy for the purpose of testing mechanical systems or for use under a temporary certificate of *occupancy*.

❖ Typical procedure for a local jurisdiction is to withhold the issuance of the certificate of occupancy until approvals have been received from each code official responsible for inspection of the structure. The code official is permitted to issue a temporary authorization to make connections to the public utility system prior to the completion of all work. The certification is intended to acknowledge that, because of seasonal limitations, time constraints, the need for testing or partial operation of equipment, some building systems may be connected even though the building is not suitable for final occupancy. The intent of this section is that a request for temporary occupancy or the connection and use of mechanical equipment or systems should be granted when the requesting permit holder has demonstrated to the code official's satisfaction that the public health, safety and welfare will not be endangered. The code official should view the issuance of a "temporary authorization or certificate of occupancy" as substantial an act as the issuance of the final certificate. Indeed, the issuance of a temporary certificate of occupancy offers a greater potential for conflict because once the building or structure is occupied, it is very difficult to remove the occupants through legal means.

[A] 107.6 Connection of service utilities. A person shall not make connections from a utility, source of energy, fuel or power to any building or system that is regulated by this code for which a permit is required, until authorized by the code official.

❖ This section establishes the authority of the code official to approve utility connections to a building, such as water, sewer, electricity, gas and steam, and to require their disconnection when such approval has not been granted. For the protection of building occupants, including workers, such systems must have had final inspection approvals, except as allowed by Section 110.3 for temporary connections.

SECTION 108
VIOLATIONS

[A] 108.1 Unlawful acts. It shall be unlawful for a person, firm or corporation to erect, construct, alter, repair, remove, demolish or utilize a mechanical system, or cause same to be done, 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 related to violations of the code.

[A] 108.2 Notice of violation. The code official shall serve a notice of violation or order to the person responsible for the erection, installation, *alteration*, extension, repair, removal or demolition of mechanical work in violation of the provisions of this code, or in violation of a detail statement or the *approved construction documents* thereunder, or in violation of a permit or certificate issued under the provisions of this code. Such order shall direct the discontinuance of the illegal action or condition and the abatement of the violation.

❖ The code official is required to notify the person responsible for the erection or use of a building found to be in 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] 108.3 Prosecution of violation. If the notice of violation is not complied with promptly, the code official shall request the legal counsel of the jurisdiction to 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.

❖ The code official must pursue, through the use of legal counsel of the jurisdiction, legal means to correct the violation. This is not optional. Any extensions of time so that the violations may be corrected voluntarily must be for a reasonable, bona fide cause or the code official may be subject to criticism for "arbitrary and capricious" actions. In general, it is better to have a standard time limitation for correction of violations. Departures from this standard must be for a clear and reasonable purpose, usually stated in writing by the violator.

[A] 108.4 Violation penalties. Persons who shall violate a provision of this code or shall fail to comply with any of the requirements thereof or who shall erect, install, alter or repair mechanical work in violation of the *approved construction documents* or directive of the code official, or of a permit or certificate issued under the provisions of this code, shall be guilty of a **[SPECIFY OFFENSE]**, punishable by a fine of not more than **[AMOUNT]** dollars or by imprisonment not exceeding **[NUMBER OF DAYS]**, or both such fine and imprisonment. Each day that a violation continues after due notice has been served shall be deemed a separate offense.

❖ A standard fine or other penalty as deemed appropriate by the jurisdiction is prescribed in this section. Additionally, this section identifies a principle that "each day that a violation continues shall be deemed a separate offense" for the purpose of applying the prescribed penalty in order to facilitate prompt resolution.

[A] 108.5 Stop work orders. Upon notice from the code official that mechanical work is being performed contrary to the provisions of this code or in a dangerous or unsafe manner, such work shall immediately cease. Such notice shall be in

writing and shall be given to the owner of the property, or to the owner's authorized agent, or to the person doing the work. The notice shall state the conditions under which work is authorized to resume. Where an emergency exists, the code official shall not be required to give a written notice prior to stopping the work. Any person who shall continue any work on the system 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 for a fine of not less than **[AMOUNT]** dollars or more than **[AMOUNT]** dollars.

❖ Upon receipt of a violation notice from the code official, the contractor must immediately stop construction activities identified in the notice, except as expressly permitted to correct the violation. A stop work order can result in inconvenience and monetary loss to the affected parties; therefore, justification must be evident and judgement must be exercised before a stop work order is issued. A stop work order can prevent a violation from becoming worse and more difficult or expensive to correct. A stop work order may be issued where work is proceeding without a permit to perform the work. Hazardous conditions could develop where the code official is unaware of the nature of the work and a permit for the work has not been issued. The issuance of a stop work order on a mechanical system may result from work done by the mechanical contractor that affects a nonmechanical component. For example, if a mechanical contractor cuts a structural element to install piping, the structure may be weakened enough to cause a partial or complete structural failure. As determined by the adopting jurisdiction, a penalty may be assessed for failure to comply with this section and the dollar amount is to be inserted in the blanks provided.

[A] 108.6 Abatement of violation. The imposition of the penalties herein prescribed shall not preclude the legal officer of the jurisdiction from instituting appropriate action to prevent unlawful construction or 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 mechanical system on or about any 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.

[A] 108.7 Unsafe mechanical systems. A mechanical system that is unsafe, constitutes a fire or health hazard, or is otherwise dangerous to human life, as regulated by this code, is hereby declared as an unsafe mechanical system. Use of a mechanical system regulated by this code constituting a hazard to health, safety or welfare by reason of inadequate maintenance, dilapidation, fire hazard, disaster, damage or abandonment is hereby declared an unsafe use. Such unsafe *equipment* and appliances are hereby declared to be a public nuisance and shall be abated by repair, rehabilitation, demolition or removal.

❖ Unsafe conditions include those that constitute a health hazard, fire hazard, explosion hazard, shock hazard, asphyxiation hazard, physical injury hazard or are otherwise dangerous to human life and property. In the course of performing duties, the code official may identify a hazardous condition that must be declared in violation of the code and, therefore, must be abated.

[A] 108.7.1 Authority to condemn mechanical systems. Whenever the code official determines that any mechanical system, or portion thereof, regulated by this code has become hazardous to life, health, property, or has become insanitary, the code official shall order in writing that such system either be removed or restored to a safe condition. A time limit for compliance with such order shall be specified in the written notice. A person shall not use or maintain a defective mechanical system after receiving such notice.

Where such mechanical system is to be disconnected, written notice as prescribed in Section 108.2 shall be given. In cases of immediate danger to life or property, such disconnection shall be made immediately without such notice.

❖ When a mechanical system is determined to be unsafe, the code official is required to notify the owner or agent of the building as the first step in correcting the difficulty. The notice is to describe the repairs and improvements necessary to correct the deficiency or require removal or replacement of the unsafe equipment or system. Such notices must specify a time frame in which the corrective actions must occur. Additionally, the notice should require the immediate response of the owner or agent. If the owner or agent is not available, public notice of the declaration should suffice for complying with this section. The code official may also determine that disconnection of the system is necessary to correct an unsafe condition and must give written notice to that effect (see commentary, Section 108.2), unless immediate disconnection is essential for public health and safety reasons (see commentary, Section 108.7.2).

[A] 108.7.2 Authority to order disconnection of energy sources. The code official shall have the authority to order disconnection of energy sources supplied to a building, structure or mechanical system regulated by this code, where it is determined that the mechanical system or any portion thereof has become hazardous or unsafe. Written notice of such order to disconnect service and the causes therefor shall be given within 24 hours to the owner, the owner's authorized agent and occupant of such building, structure or premises, provided, however, that in cases of immediate danger to life or property, such disconnection shall be made immediately without such notice. Where energy sources are provided by a public utility, the code official shall immediately notify the serving utility in writing of the issuance of such order to disconnect.

❖ Disconnecting a mechanical system from the energy supply is the most radical method of hazard abatement available to the code official and should be reserved for cases in which all other lesser remedies have proven ineffective. Such an action must be preceded by written notice to the owner and any occupants of the building being ordered to disconnect. Disconnection must be accomplished within the time frame established by the code official in the written notification to disconnect. When the hazard to the public health and welfare is so imminent as to mandate immediate disconnection, the code official has the authority and even the obligation to cause disconnection without notice.

[A] 108.7.3 Connection after order to disconnect. A person shall not make energy source connections to mechanical systems regulated by this code which have been disconnected or ordered to be disconnected by the code official, or the use of which has been ordered to be discontinued by the code official until the code official authorizes the reconnection and use of such mechanical systems.

Where a mechanical system is maintained in violation of this code, and in violation of a notice issued pursuant to the provisions of this section, the code official shall institute appropriate action to prevent, restrain, correct or abate the violation.

❖ When any mechanical system is maintained in violation of the code, and in violation of any notice issued pursuant to the provisions of this section, the code official is to institute appropriate action to prevent, restrain, correct or abate the violation. Once the reason for discontinuation of use or disconnection of the mechanical system no longer exists, only the code official may authorize resumption of use or reconnection of the system after it is demonstrated to the code official's satisfaction that all repairs or other work are in compliance with applicable sections of the code. This section also requires the code official to take action to abate code violations (see commentary, Section 108.2).

SECTION 109
MEANS OF APPEAL

[A] 109.1 Application for appeal. A person shall have the right to appeal a decision of the code official to the board of appeals. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or an equally good or better form of construction is proposed. The application shall be filed on a form obtained from the code official within 20 days after the notice was served.

❖ This section literally allows any person to appeal a decision of the code official. In practice, this section has been interpreted to permit appeals only by those aggrieved parties with a material or definitive interest in the decision of the code official. An aggrieved party may not appeal a code requirement per se. The intent of the appeal process is not to waive or set aside a code requirement; rather, it is intended to provide a means of reviewing a code official's decision on an interpretation or application of the code or to review the equivalency of protection to the code requirements.

[A] 109.1.1 Limitation of authority. The board of appeals shall not have authority relative to interpretation of the administration of this code nor shall such board be empowered to waive requirements of this code.

❖ This section establishes limits on the board of appeals. The board may not interpret the administration provisions of the code but does have interpretation authority regarding the technical requirements of the code. The board is not allowed to set aside any of the technical requirements of the code; however, it is allowed to consider alternative methods of compliance with the technical requirements.

[A] 109.2 Membership of board. The board of appeals shall consist of five members appointed by the chief appointing authority as follows: one for 5 years; one for 4 years; one for 3 years; one for 2 years; and one for 1 year. Thereafter, each new member shall serve for 5 years or until a successor has been appointed.

❖ The board of appeals is to consist of five members appointed on a rotating basis by the "chief appointing authority"; typically, the mayor or city manager. This method of appointment allows for a smooth transition of board of appeals members, thus ensuring continuity of action over the years.

[A] 109.2.1 Qualifications. The board of appeals shall consist of five individuals, one from each of the following professions or disciplines.

1. *Registered design professional* who is a registered architect; or a builder or superintendent of building construction with not less than 10 years' experience, 5 of which shall have been in responsible charge of work.
2. *Registered design professional* with structural engineering or architectural experience.
3. *Registered design professional* with mechanical and plumbing engineering experience; or a mechanical contractor with not less than 10 years' experience, 5 of which shall have been in responsible charge of work.
4. *Registered design professional* with electrical engineering experience; or an electrical contractor with not less than 10 years' experience, 5 of which shall have been in responsible charge of work.
5. *Registered design professional* with fire protection engineering experience; or a fire protection contractor

with not less than 10 years' experience, 5 of which shall have been in responsible charge of work.

❖ The board of appeals consists of five persons with the qualifications and experience indicated in this section. One must be a registered design professional (see Item 2) with structural or architectural experience. The others must be registered design professionals, construction superintendents or contractors with experience in the various areas of building construction. These requirements are important in that technical people rule on technical matters. The board of appeals is not the place for policy or political deliberations. It is intended that these matters be decided purely on their technical merits, with due regard for state-of-the-art construction technology.

[A] 109.2.2 Alternate members. The chief appointing authority shall appoint 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 membership and shall be appointed for 5 years, or until a successor has been appointed.

❖ This section authorizes the chief appointing authority to appoint two alternate members who are to be available if the principal members of the board are absent or disqualified. Alternate members must possess the same qualifications as the principal members and are appointed for a term of 5 years, or until such time that a successor is appointed.

[A] 109.2.3 Chairman. The board shall annually select one of its members to serve as chairman.

❖ It is customary to determine chairmanship annually so that a regular opportunity is available to evaluate and either reappoint the current chairman or appoint a new one.

[A] 109.2.4 Disqualification of member. A member shall not hear an appeal in which that member has a personal, professional or financial interest.

❖ All members must disqualify themselves from any appeal in which they have a personal, professional or financial interest.

[A] 109.2.5 Secretary. The chief administrative officer shall designate a qualified clerk to serve as secretary to the board. The secretary shall file a detailed record of all proceedings in the office of the chief administrative officer.

❖ The chief administrative officer is to designate a qualified clerk to serve as secretary to the board. The secretary is required to file a detailed record of all proceedings in the office of the chief administrative officer.

[A] 109.2.6 Compensation of members. Compensation of members shall be determined by law.

❖ Members of the board of appeals need not be compensated unless required by the local municipality or jurisdiction.

[A] 109.3 Notice of meeting. The board shall meet upon notice from the chairman, within 10 days of the filing of an appeal, or at stated periodic meetings.

❖ The board must meet within 10 days of the filing of an appeal, or at regularly scheduled meetings.

[A] 109.4 Open hearing. Hearings before 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.

❖ All hearings before the board must be open to the public. The person who filed the appeal, his or her representative, the code official and any person whose interests are affected must be heard.

[A] 109.4.1 Procedure. The board shall adopt and make available to the public through the secretary procedures under which a hearing will be conducted. The procedures shall not require compliance with strict rules of evidence, but shall mandate that only relevant information be received.

❖ The board is required to establish and make available to the public written procedures detailing how hearings are to be conducted. Additionally, this section provides that although strict rules of evidence are not applicable, the information presented must be relevant to the appeal.

[A] 109.5 Postponed hearing. When five members are 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.

❖ When all five members of the board are not present, either the person making the appeal or his or her representative may request a postponement of the hearing.

[A] 109.6 Board decision. The board shall modify or reverse the decision of the code official by a concurring vote of three members.

❖ A concurring vote of three members of the board is needed to modify or reverse the decision of the code official.

[A] 109.6.1 Resolution. The decision of the board shall be by resolution. Certified copies shall be furnished to the appellant and to the code official.

❖ A formal decision in the form of a resolution is required to provide an official record. Copies of this resolution are to be furnished to both the person making the appeal and the code official. The code official is bound by the action of the board of appeals, unless it is the opinion of the code official that the board of appeals has acted improperly. In such cases, relief through the court having jurisdiction may be sought by corporate council.

[A] 109.6.2 Administration. The code official shall take immediate action in accordance with the decision of the board.

❖ To avoid any undue delay in the progress of construction, the code official is required to act quickly on

the board's decision. This action may be to enforce the decision or to seek legislative relief if the board's action can be demonstrated to be inappropriate.

[A] 109.7 Court review. Any person, whether or not a previous party of the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer.

❖ This section allows any person to request a review by the court of jurisdiction if that person believes errors of law have occurred. Application for the review must be made after the decision of the board is filed with the chief administrative officer. This helps to establish the observance of due process for all concerned.

SECTION 110
TEMPORARY EQUIPMENT, SYSTEMS AND USES

[A] 110.1 General. The code official is authorized to issue a permit for temporary *equipment*, systems and uses. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The code official is authorized to grant extensions for demonstrated cause.

❖ The code official is permitted to issue temporary authorization to make connections to a public utility system prior to completion of all work. This acknowledges that, because of seasonal limitations, time constraints, or the need for testing or partial operations of equipment, some building systems may be safely connected even though the building is not suitable for final occupancy. The temporary connection and utilization of connected equipment should be approved when the requesting permit holder has demonstrated to the code official's satisfaction that public health, safety and welfare will not be endangered.

[A] 110.2 Conformance. Temporary *equipment*, systems and uses shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary requirements of this code as necessary to ensure the public health, safety and general welfare.

❖ Even though a utility connection may be temporary, the only way to make sure that the public health, safety, and general welfare are protected is for those temporary connections to comply with the code.

[A] 110.3 Temporary utilities. The code official is authorized to give permission to temporarily supply utilities before an installation has been fully completed and the final certificate of completion has been issued. The part covered by the temporary certificate shall comply with the requirements specified for temporary lighting, heat or power in the code.

❖ Commonly, the utilities on many construction sites are installed and energized long before all aspects of the system are completed. This section would allow such temporary systems to continue, provided that they comply with the applicable safety provisions of the code.

[A] 110.4 Termination of approval. The code official is authorized to terminate such permit for temporary *equipment*, systems or uses and to order the temporary *equipment*, systems or uses to be discontinued.

❖ This section provides the code official with the necessary authority to terminate the permit for temporary equipment, systems, and uses if conditions of the permit have been violated or if temporary equipment or systems pose an imminent hazard to the public. This enables the code official to act quickly when time is of the essence in order to protect public health, safety and welfare.

Bibliography

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

"Building Valuation Data." As published in the International Code Council's *Building Safety Journal Online*. Whittier, CA: International Code Council, Semiannually in May/June and November/December Issues.

IFC-15, *International Fire Code*. Washington, DC: International Code Council, Inc., 2014.

IFGC-15, *International Fuel Gas Code*. Washington, DC: International Code Council, Inc., 2014.

IPMC-15, *International Property Maintenance Code*. Washington, DC: International Code Council, Inc., 2014.

IRC-15, *International Residential Code*. Washington, DC: International Code Council, Inc., 2014.

Legal Aspects of Code Administration. Washington, DC: International Code Council, 2002.

NFPA 70-14, *National Electrical Code*. Quincy, MA: National Fire Protection Association, 2013.

Chapter 2: Definitions

General Comments

Chapter 2 establishes the meanings of key words and terms used in the code.

Section 201 addresses the practical concerns encountered in writing a technical document as they relate 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 is an alphabetical listing of the terms commonly used throughout the code and that are required for the effective application of code requirements.

Purpose

Codes, by their very nature, are technical documents. Literally every word, term and punctuation mark can add to or change the meaning of the intended result. This is even more so with performance code text where the desired result often takes on more importance than the specific words.

Furthermore, the code, with its broad scope of applicability, includes terms used 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, a consensus on the specific meaning of terms contained in the code must be maintained. Chapter 2 performs this function by stating clearly what specific terms mean for the purpose of the code.

SECTION 201 GENERAL

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

❖ This chapter contains definitions of terms that are associated with the subject matter of this code. Definitions of terms are necessary for the understanding and application of the code requirements.

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

❖ Although the definitions contained in Chapter 2 are to be taken literally, gender and tense are considered to be interchangeable; thus, 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 Fire Code*, *International Fuel Gas Code* or the *International Plumbing Code*, such terms shall have meanings ascribed to them as in those codes.

❖ When a word or term that is not defined in this chapter appears in the code, other references may be used to find its definition, such as the *International Building Code*® (IBC®), the *International Fire Code*® (IFC®), the *International Fuel Gas Code*® (IFGC®) or the *International Plumbing Code*® (IPC®). These codes contain additional definitions (some parallel and duplicative) that may be used in the enforcement of this code or in the enforcement of the other codes by reference.

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 in this chapter or in other codes is their "ordinarily accepted meanings." The intent of this statement is that a dictionary definition may suffice, if the definition is in context.

In some cases, construction terms used throughout the code may not be defined in Chapter 2 or in a dictionary. In such case, one would first turn to the definitions contained in the referenced standards (see Chapter 15) and then to published textbooks on the subject in question.

SECTION 202 GENERAL DEFINITIONS

❖ This portion of the commentary addresses only those terms whose definitions appear in Chapter 2. The commentary for definitions that are located elsewhere in the code can be found in the indicated sections that contain those definitions.

ABRASIVE MATERIALS. Moderately abrasive particulate in high concentrations, and highly abrasive particulate in moderate and high concentrations, such as alumina, bauxite, iron silicate, sand and slag.

❖ Abrasive materials flowing in a duct can cause erosion damage to the duct system and air-moving equipment.

ABSORPTION SYSTEM. A refrigerating system in which refrigerant is pressurized by pumping a chemical solution of refrigerant in absorbent, and then separated by the addition of heat in a generator, condensed (to reject heat), expanded, evaporated (to provide refrigeration), and reabsorbed in an absorber to repeat the cycle; the system may be single or multiple effect, the latter using multiple stages or internally cascaded use of heat to improve efficiency.

❖ Absorption refrigeration systems use two fluids (an absorbent and a refrigerant) and a heat source to remove heat through evaporation at a lower pressure and to reject the heat through condensation at a higher pressure. Typical absorption systems use ammonia as the refrigerant and water as the absorbent, or lithium bromide as the absorbent and water as the refrigerant.

ACCESS (TO). That which enables a device, *appliance* or *equipment* to be reached by ready access or by a means that first requires the removal or movement of a panel, door or similar obstruction [see also "Ready access (to)"].

❖ Providing access to mechanical equipment and appliances is necessary to facilitate inspection, observation, maintenance, adjustment, repair or replacement. Access to equipment means that the equipment can be physically reached without having to remove a permanent portion of the structure. It is acceptable, for example, to install equipment in an interstitial space that would require lay-in suspended ceiling panels to be removed to gain access. Mechanical equipment would not be considered as being provided with access if it were necessary to remove or open any portion of a structure other than panels, doors, covers or similar obstructions intended to be removed or opened. Also, see the definition of "Ready access (to)."

Access can be described as the capability of being reached or approached for the purpose of inspection, observation, maintenance, adjustment, repair or replacement. Achieving access may first require the removal or opening of a panel, door or similar obstruction and may require the overcoming of an obstacle such as elevation.

AIR. All air supplied to mechanical *equipment* and appliances for *combustion*, ventilation, cooling and similar purposes. Standard air is air at standard temperature and pressure, namely, 70°F (21°C) and 29.92 inches of mercury (101.3 kPa).

❖ The term "air," for the purposes of the code, includes air used, moved or conditioned by the mechanical systems that are regulated by the code.

AIR CONDITIONING. The treatment of air so as to control simultaneously the temperature, humidity, cleanness and distribution of the air to meet the requirements of a conditioned space.

❖ Air conditioning is commonly referred to only in the context of cooling and dehumidifying air; however, the definition also indicates a much broader scope. In essence, the process of providing ventilation air to a space constitutes air conditioning because the introduction of any ventilation air is an attempt to control the indoor environment.

AIR-CONDITIONING SYSTEM. A system that consists of heat exchangers, blowers, filters, supply, exhaust and return ducts, and shall include any apparatus installed in connection therewith.

❖ This definition is limited to the components commonly used in a mechanical air-conditioning system. Additional apparatus considered as part of the air-conditioning system would include thermostats, humidistats, dampers and any other controls needed for the system to operate properly.

AIR DISPERSION SYSTEM. Any diffuser system designed to both convey air within a room, space or area and diffuse air into that space while operating under positive pressure. Systems are commonly constructed of, but not limited to, fabric or plastic film.

❖ A simple example of an air dispersion system is a tube or hose with holes in it that connects to the supply air duct. This tube extends into the conditioned space and distributes the air more uniformly throughout the space.

Air dispersion systems usually connect to the supplying air duct at a sidewall. The supplying air duct conveys air from the air-handling unit to the destination room, space or area. At this point, a sidewall grille or other type of diffuser could be used to diffuse the air into the space. This diffuser would rely on the velocity of the exiting air and its direction to meet requirements of the space. For this example, the air dispersion system would be mounted in place of the sidewall grille. By the air dispersion system being physically longer, the velocity of air exiting the system is more uniformly distributed throughout the space.

This technology has been used for over 50 years in the United States, and longer in Europe. The concept, in the United States, originated in the agricultural industry, and through innovative fabric technology and proven performance, has evolved into an attractive means to diffuse air within various spaces. These spaces include where food is processed (refrigeration), industrial, warehouses, retail, convention centers, offices, athletic, and laboratory environments. These systems are tested and listed in accordance with UL 2518.

AIR DISTRIBUTION SYSTEM. Any system of ducts, plenums and air-handling *equipment* that circulates air within a

space or spaces and includes systems made up of one or more air-handling units.

❖ An air distribution system consists of air-moving equipment; intakes and outlets; supply and return openings and the interconnecting ductwork, plenums and conduit necessary to conduct airflow to and from the inlets and outlets. The primary characteristic is the ability of the system to distribute and circulate air throughout one or more spaces within a building. Air distribution systems in the context of the code are environmental air-conditioning systems that heat, cool and ventilate the occupied spaces of a building. Exhaust equipment, makeup air supply units, rooftop units, turnover units and unit heaters are examples of equipment commonly installed without distribution ductwork. Such installations would not be considered as air distribution systems. Air distribution systems are capable of supplying air to and removing air from spaces and recirculating all or a portion of the air handled.

For the purpose of applying Section 606, an air distribution system that employs multiple air handlers operating in parallel would be considered a single system with an airflow capacity equal to the sum of the individual air handlers. Individual air handlers that operate independently and do not share common supply return ducts would be considered as separate systems (see commentary, Section 606).

AIR, EXHAUST. Air being removed from any space, *appliance* or piece of *equipment* and conveyed directly to the atmosphere by means of openings or ducts.

❖ Exhaust air may be from a space, an appliance or a piece of equipment. Exhaust air may or may not contain contaminants from the space being exhausted.

Exhaust air systems are terminated outside the building, in some cases after the exhaust air has been treated to remove any harmful emissions. Exhaust air is not recirculated.

AIR-HANDLING UNIT. A blower or fan used for the purpose of distributing supply air to a room, space or area.

❖ In addition to blowers, air-handling units may contain heat exchangers, filters and means to control air volume.

AIR, MAKEUP. Any combination of outdoor and transfer air intended to replace exhaust air and exfiltration.

❖ Makeup air is not to be confused with combustion air. Makeup air replaces the air being exhausted through such systems as bathroom and toilet exhausts, kitchen exhaust hoods, hazardous exhaust systems and clothes dryer exhaust systems (refer to Chapter 5 for specific requirements for makeup air). Exhaust systems cannot function at design capacity without adequate volumes of makeup air to replace the air being exhausted. Makeup air generally refers to outdoor air, but can be any combination of outdoor air and transfer air.

AIR, OUTDOOR. Ambient air that enters a building through a ventilation system, through intentional openings for natural ventilation, or by infiltration.

AIR, TRANSFER. Air moved from one indoor space to another.

[A] ALTERATION. A change in a mechanical system that involves an extension, addition or change to the arrangement, type or purpose of the original installation.

❖ An alteration is any modification or change made to an existing installation. For example, changing refrigerant types or heat transfer fluids in a system would be considered alterations.

APPLIANCE. A device or apparatus that is manufactured and designed to utilize energy and for which this code provides specific requirements.

❖ An appliance is a manufactured component or assembly of components that converts one form of energy into a different form of energy to serve a specific purpose. The term “appliance” generally refers to residential- and commercial-type equipment that is manufactured in standardized sizes or types. The term “appliance” is generally not associated with industrial-type equipment. For the application of the code provisions, the terms “appliance” and “equipment” are mutually exclusive.

Examples of appliances include furnaces; boilers; water heaters; room heaters; refrigeration units; cooking equipment; clothes dryers; wood stoves; pool, spa and hot tub heaters; unit heaters; ovens and similar fuel-fired or electrically operated appliances (see the definition of “Equipment”).

APPLIANCE, EXISTING. Any *appliance* regulated by this code which was legally installed prior to the effective date of this code, or for which a permit to install has been issued.

❖ The definition creates a distinction between legally existing appliances and illegally existing appliances. Any appliance that is installed without a permit, if a permit was required at the time of installation, is not a legally existing appliance. An appliance that was illegally installed prior to the effective date of the code is not considered existing, but is “new,” and therefore subject to enforcement of the requirements for new installations. This definition is important in the application of Section 102.2 of the code.

APPLIANCE TYPE.

High-heat appliance. Any *appliance* in which the products of *combustion* at the point of entrance to the flue under normal operating conditions have a temperature greater than 2,000ºF (1093ºC).

❖ A high-heat appliance is one in which the temperature of the products of combustion, measured at the point of entry to the flue under normal operating conditions, exceeds 2,000°F (1093°C). High-heat appliances include industrial furnaces, retorts and kilns.

Low-heat appliance (residential appliance). Any *appliance* in which the products of *combustion* at the point of