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Building Codes for Historic and Existing Buildings: Planning and Maximizing their Application

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The rehabilitation of historic and existing buildings often triggers compliance with **building codes** that establish the minimum level of safety and performance to protect the public health, safety, and welfare. When applied to **historic buildings**, codes originally written for new construction can require major changes to significant historic features, spaces, and materials, or can render their rehabilitation infeasible. In contrast, codes written specifically for **existing buildings** and historic buildings acknowledge their special construction and physical limitations and can allow for less invasive and more cost-effective means to rehabilitate them while still meeting minimum code requirements. [Note: Words in bold are defined in the glossary.]

The aim of this Brief is to provide information on how to meet the goals of building codes while also preserving or minimizing alterations to the **character-defining features**, spaces, materials, and finishes of historic buildings. The Brief presents an overview of the most widely adopted codes in the United States and their provisions for historic buildings. It provides guidance for selecting the optimal code compliance path and suggests best practices for achieving code-compliant solutions that also allow for the preservation of a building's historic character. While the Brief is primarily intended to apply to historic buildings, much of the information also applies to the rehabilitation of existing buildings.

An existing, legally-occupied building is typically not required to comply with current code requirements, except when a jurisdiction has adopted **retroactive** code requirements (typically regarding life-safety) or when a building undergoes improvements classified by the code as a repair, alteration, or change of occupancy. Code-required improvements may be limited to the area where work is proposed or involve other areas of the building. The code requirements are established as a function of whether a proposed project is classified under the code as a **repair**, **alteration**, **change in occupancy**, or **addition**. These categories/terms are separate and independent from those used or defined in the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, which defines **Preservation**, **Rehabilitation**, **Restoration**, and **Reconstruction** as four different treatments.

For purposes of this Brief, '**code**' is the general term encompassing all adopted construction requirements related to improvements to historic buildings. These may be codes, appendices, local ordinances, or **referenced standards**. Because jurisdictions often lag in adopting the most recent edition of a **model code** and may also modify the model code or adopt unique ordinances to supplement the model code, the first step for every project is to identify the codes and other requirements applicable to a given rehabilitation project in its jurisdiction.

Excluded from the Brief are requirements generated by other zoning or planning codes including those administered by historic preservation or design review commissions, local ordinances, funding sources, or specialized codes or requirements like those used for specific building types such as hospitals or schools or developed by a property insurer. Also, while every attempt has been made to accurately quote and/or characterize the codes and code requirements discussed in this Brief, the adopted, current code applicable to the individual project should always be consulted.

Figure 1: The installation of an exterior automatic fire sprinkler system for the historic multi-story porches allowed these important, character-defining features to be retained to meet life and fire-safety code requirements. Photo: Robert Holcomb

Development Of Building Construction Codes in The United States

General

The earliest building code regulations adopted in the United States in the 19th and early 20th centuries focused on fire safety following catastrophic fires and earthquakes as well as improving substandard housing conditions. Over time, codes have expanded to establish minimum requirements for natural light, clean water, waste treatment, structural integrity, wind and flood resistance, minimum room dimensions, building **exits**, and hundreds of other requirements that affect life and property safety. After World War II, codes also served as available mechanisms to implement new public and government priorities related to housing, universal accessibility, and energy conservation. Over the next 75 years, the codes and their administration became increasingly complex, a pattern that continues as new code changes continue to raise the level of required performance of buildings. Examples include provisions focused on energy consumption and conservation, carbon reduction, design and performance of ventilation systems, and protection from wildfires at the urban-wilderness interface.

Housing Controls

Nineteenth-century land use controls addressed outbreaks of infectious diseases, poor sanitation, and inadequate ventilation in overcrowded slums, as well as the conflagrations that destroyed dense, and often wood-frame, construction in cities where residential, manufacturing, and industrial uses comingled. Local regulations controlled building height and size, interior room heights, street drainage, wall thickness and material, and chimneys and fireplaces. They also prohibited certain uses based on potential fire and health hazards. Early tenement-focused legislation in New York City (1867, 1879), Chicago (1902), and the state of California (1909) included requirements for light and fresh air in habitable rooms, interior toilets, heat, fire escapes, and minimum room sizes and ceiling heights. Other codes and legislation responded to disasters such as the 1871 Chicago fire and the 1906 San Francisco earthquake. Collectively, these regulations remain the foundation for the minimum housing standards present in current codes.

Fire Safety

Most mid-19th-century manufacturing and industrial buildings operating in the Northeastern United States were highly susceptible to fire. Rudimentary **fire protection systems** were installed in many of these buildings, with the first known perforated pipe sprinkler system installed in 1852 at the plant of the Proprietors of the Locks and Canals in 1852 in Lowell, Massachusetts. The sprinkler head patented in 1874 by Henry Parmelee of New Haven, Connecticut, was used in hundreds of systems installed between 1878 and 1882 through arrangements with the Providence Steam and Gas Company. Owned by Frederic Grinnell, the company patented its own device in 1881. Grinnell later invented the glass disc sprinkler, the precursor of modern sprinkler heads, as well as secured numerous patents including those for dry pipe valves and automatic fire alarm systems.

Fire-resistant construction and **fire suppression** systems were championed by insurance companies and manufacturers. The 1896 *Report of Committee on Automatic Sprinkler Protection*, prepared by representatives of insurance organizations and others, provided design and installation standards in response to the hundreds of unique, non-standardized installations that existed. The meetings that produced the report also created the National Fire Protection Association (NFPA) to administer these standards. Prior to 1904, NFPA membership was limited to the insurance industry.

The National Board of Fire Underwriters (NBFU), organized in 1866, also recognized the problems of unsafe building construction and uncontrolled fire hazards, as well as the importance of water supply and local fire departments. Their comprehensive 1905 *Recommended Building Code*, renamed the *National Building Code* by 1927, was based on damage assessment caused by major fires, including those following the 1906 San Francisco earthquake.

Contemporaneous efforts sought to standardize early electrical installations prone to overcurrents and fire. The demand for electricity exploded following Thomas Edison's 1879 development of the incandescent lamp, the 1882 construction of the first electric light-power station in New York City, and the use of electric lighting at the 1893 World's Columbian Exposition in Chicago. The 1897 *National Electrical Code* (NEC), published by the NBFU, was trans-

Figure 2: Sprinkler heads and other equipment can be selected and placed to have minimal visual intrusion with no impact on functionality, such as these fixed (left) or concealed (right, with arrow) sprinkler heads. Photos: Marilyn Kaplan

ferred to the NFPA in 1911, the second step in establishing the NFPA as the principal American organization producing codes and standards associated with fire safety.

In 1927 the NFPA published the *Building Exits Code*, incorporating findings from nationally publicized fires with loss of life at the Iroquois Theatre (Chicago, 1903), the Collinwood School (Cleveland, 1908), and the Triangle Shirtwaist Company (New York, 1911). Theaters, schools, factories, and other places of **public assembly** received special attention in codes following these events. The adopted code provisions focused on stairways, fire escapes, and the construction and arrangement of multiple exits in these buildings. In 1963 the NFPA changed the title of the code to *Code for Safety to Life from Fire in Buildings and Structures* and, subsequently, to the *NFPA 101 Life Safety Code*. Fire safety principles from these early documents, ranging from marking of exits to calculation of the number of required exits, have been enhanced, expanded, and incorporated into all contemporary building codes. For specialized buildings such as hospitals, universities, schools, and public buildings, *NFPA 101* is commonly enforced, often in conjunction with a model building code. Although NFPA published its first general construction code in 2000, *NFPA 5000: Building Construction and Safety Code*, it has not been widely adopted.

Seismic

The destruction caused by the San Francisco earthquake of 1906 illustrated the threat to cities identified as having moderate or high risk of experiencing significant seismic activity. The first seismic provisions included in the 1927 *Uniform Building Code* were expanded following technical and scientific advances including the earthquake magnitude scale in 1935 and the creation of the first seismic hazard maps in 1949. Passage of the 1977 Federal Earthquake Hazards Reduction Act permitted funding of risk mitigation studies by engineering, scientific, and technical organizations. The state of California's earthquakes with significant loss of life in San Fernando (1973), Loma Prieta (1989), and Northridge (1992) resulted in expanded technical requirements for new construction and existing buildings.

Alongside requirements that Federal agencies incorporate seismic-resistant design in newly owned or leased buildings by 1994, seismic provisions began to be incorporated into the model codes by the early 1990s. Code provisions have continued to be revised as more is learned about seismic activity and building performance in earthquakes. In many jurisdictions, ordinances requiring voluntary or mandatory seismic risk reduction programs have been adopted or are under consideration to address buildings with unreinforced masonry as well as non-ductile concrete construction. Some jurisdictions with large urban centers in high seismic risk areas have also adopted more restrictive construction and rehabilitation requirements than those contained in the model building code or standard.

Accessibility

Late-1950s research at the University of Illinois produced the first comprehensive document addressing accessibility in buildings, the 1961 *Specifications for Making Buildings and Facilities Accessible to and Usable by the Physically Handicapped*. Additional research in the 1970s resulted in the 1980 and subsequent editions of ANSI A117.1, published by the American National Standards Institute (ANSI).

In 1968 the Architectural Barriers Act (ABA) became the first Federal effort to require accessibility to buildings and facilities designed, built, altered, or leased by Federal agencies. Under this act, standards for accessibility were incorporated into the *Uniform Federal Accessibility Standards* (UFAS). The model code organizations' engagement in accessibility began in 1987, when the Council of American Building Officials (CABO) developed an accessibility standard intended to be compatible with code and enforcement procedures. Following the 1990 passage of the Americans with Disabilities Act (ADA), administered by the U.S. Department of Justice, Civil Rights Division, the *ADA Accessibility Guidelines for Buildings and Facilities* (ADAAG) were published in 1991. The ADA and ABA guidelines were later merged into a single document, the 2004 *Accessibility Guidelines*.

The ADA brings expanded accessibility of the built environment by means of one of its major component parts, "Title III, Public Accommodations." This part is applicable to private persons or groups that own, operate, or lease places of public accommodation. Examples of such places are restaurants, hotels, theaters, medical offices, pharmacies, retail stores, museums, libraries, parks, private schools, and day care centers. It requires that all new construction, as well as alterations and additions to existing buildings, meet specific accessibility standards. Exempt from its requirements are buildings or parts of buildings controlled by private clubs or religious organizations. Accessibility requirements for housing funded or whose financing is guaranteed by the Federal government was compulsory under Section 504 of the Rehabilitation Act of 1973. In 1988 the Fair Housing Amendments Act made new privately-funded housing of four units or more accessible to persons with disabilities.

The ADA's accessibility guidelines have had multiple revisions since 1990 including those which create closer coordination with accessibility requirements which are incorporated by reference into the locally adopted and enforceable model codes. Special provisions and considerations for historic buildings exist in both the ADA and the model code. When CABO joined the ICC in 1998, the ICC assumed the role of Secretariat of the Standard, publishing the ICC / ANSI *A117.1-Accessible and Usable Buildings and Facilities* in 1998. This publication was an important effort to incorporate accessibility requirements into the model codes and thus enforceable by local building officials as part of the permitting process. The ADA is otherwise enforceable only by Federal District Courts through lawsuits brought by individuals.

Energy Conservation

Beginning in the 1970s, energy conservation standards for residential construction were included in the *Model Energy Code* published by CABO and, for commercial buildings, in the 90.1 series of codes published by ASHRAE, formerly the American Society of Heating, Refrigerating, and Air-Conditioning Engineers. In 2000 these documents were merged into the *International Energy Conservation Code* (IECC) and have currently been adopted by many jurisdictions as a minimum standard. Energy codes typically address building envelope (roof, walls, windows, and doors), mechanical systems, service water heating (domestic hot water), lighting, and electrical power. In some cases, above-minimum codes such as the *International Green Construction Code* (IgCC) and other state or municipal codes or energy policy have also been adopted. Consistent with local, state, and Federal policy, energy performance standards will continue to increase. As already adopted by some jurisdictions, with possible eventual incorporation into the IECC, newer approaches address topics ranging from establishing limits for a building's energy use to carbon reduction.

Natural Disasters

By the 1930s the Federal government provided funding for repair and reconstruction of certain public facilities following earthquakes and other disasters. Major catastrophic events of the 1960s and 1970s precipitated additional Federal efforts, first within the Department of Housing and Urban Development (HUD) and later within the Federal Emergency Management Agency (FEMA). Created in 1979 to centralize disaster-related responsibilities, FEMA in turn became part of the U.S. Department of Homeland Security in 2003.

The model codes include extensive provisions related to protection from seismic events, hurricanes, and fire, and more limited provisions for protection from floods. For the latter, in 1968 the National Flood Insurance Act (NFIA) made flood insurance available to homeowners, and soon thereafter flood insurance was mandatory for certain properties located in Special Flood Hazard Areas. Guidance and construction requirements published by FEMA include their publications specific to hurricanes, tsunamis, flooding, earthquakes, and fire. Code and other Federal program requirements have continued to evolve following unprecedented natural disasters in recent years.

Model Code Organizations

While the earliest regulations focused on fire safety and were often developed by property insurance companies, the advent of regional code organizations concerned with broader construction-related issues established the technical and administrative framework still followed today. Most of these organizations' members were **building code officials** from cities, towns, and government agencies, although contractors, manufacturers, and **design professionals** also participated. Each of the model code organizations produced comprehensive, regionally-tailored building codes available for local or state adoption.

The Building Officials and Code Administrators (BOCA), founded in 1915, published its first model code widely used in the northeastern states, the BOCA *Basic Building Code*, in 1950. The Southern Building Code Congress International (SBCCI), established in 1940, published the *Standard Building Code* in 1945 which was widely adopted by southeastern states. The International Conference of Building Officials (ICBO), formed in 1922 by Pacific Coast building code officials, published the *Uniform Building Code* in 1927 which was broadly used in states west of the Mississippi River. In 1972 these organizations formed the Council of American Building Officials (CABO), publishing the *One- and Two-Family Dwelling Code* for residential buildings less than four stories in height.

By the early 1990s, efforts to create a single set of national model codes had gained wide acceptance. In 1994 the three model code organizations created the International Code Council (ICC), which quickly became the predominant national organization of the building code community. While the NFPA was only initially involved in the consolidation effort, it remains the principal organization recognized for fire protection expertise, codes, and standards.

In 2000 the ICC published the first *International Building Code* (IBC), merging the composition and content of the three regional model codes into one code document. The ICC currently publishes an integrated family of fifteen codes, each revised on a three-year cycle, ranging in topic from existing buildings to energy conservation.

Codes for Existing and Historic Buildings

The post-World War II construction boom and Federal urban renewal program funded through The Housing Act of 1949, active through the 1980s, supported the demolition of thousands of buildings considered to be urban slums. In response, 1960s grassroots preservation advocacy efforts led to the passage of the National Historic Preservation Act of 1966. In addition to the creation of the National Register of Historic Places, this Federal legislation required Federal agencies to consider the potential effect or impact on historic properties through a consultation process for projects undertaken, approved, funded, permitted, or licensed by Federal agencies.

Further protection of historic buildings arose as states adopted their own state-level historic registries and consultation processes, and more historic preservation or design review commissions were created at the local level. Federal grants-in-aid and tax incentive programs were adopted in the 1970s to encourage historic building rehabilitation. For these programs, the *Secretary of the Interior's Standards for the Treatment of Historic Properties* and its now widely adopted *Standards for*

Figure 3: Some code challenges such as exiting and fire protection requirements on smaller Main Street buildings can be mitigated by using the IEBC. Photo: Marilyn Kaplan

Rehabilitation were created. Simultaneously, other Federal agencies, including HUD, shifted funds to support rehabilitation projects.

Historically, building codes were written for new construction, largely ignoring existing buildings or requiring compliance with new construction standards for substantial rehabilitation projects. Building code officials, known in various jurisdictions as the "**authority having jurisdiction**," had wide discretion in determining what improvements were required as part of a rehabilitation project, thus making it difficult to predict not only what would be required but also the level of difficulty and cost to meet those requirements. Presidential commissions of the 1960s, recognizing the potential contribution of existing buildings to meet the nation's housing needs, directed HUD (created in 1965) to develop model standards for incorporation into local building codes with special preference to the rehabilitation of existing housing and to expand the funds available for building rehabilitation. HUD recognized that to remove barriers to rehabilitation these codes needed to be flexible and to maximize retention of existing materials, construction techniques, and floor-plan configurations.

HUD's groundbreaking *Rehabilitation Guidelines* series, addressing technical and administrative obstacles to the reuse of existing buildings, included the 1980 edition of *Number 8, Guideline on Fire Ratings of Archaic Materials and Assemblie*s. Revised in 2000, this document remains an important resource relative to evaluating the fire-resistance of older building materials.

Efforts by HUD and others also resulted in the adoption of unique rehabilitation codes, chapters, or provisions in the model codes and the codes of some jurisdictions. Approaches to the challenge of balancing safety, cost, and other parameters in existing and historic buildings varied widely. Some jurisdictions required compliance with new construction standards when 50% of the value of a building was exceeded in the rehabilitation, allowing fewer code upgrades when the rehabilitation costs were 25%, or between 25% and 50%, of the building value. Others, such as in Massachusetts and Chicago, established requirements based on the level of hazard increase when comparing the pre-rehabilitation and proposed post-rehabilitation uses.

An important advance in building codes was the development of a numerical scoring system to measure the level of safety provided by a building or a proposed rehabilitation. This advancement, developed in Ohio in the 1980s, was based on a methodology developed for New York City high-rise office buildings and an appendix of the NFPA's *Life Safety Code* for health care occupancies. By assigning scores to existing safety parameters, attributes could be recognized and credited against code deficiencies to determine whether the overall proposed conditions would provide an acceptable level of safety. In 1985 this system was adopted as a supplement to the *BOCA National Building Code*, subsequently renamed Articles 25 and 32. Eventually incorporated into the *International Building Code* (IBC), this system was relocated to the *International Existing Building Code* (IEBC) where it continues to serve as the basis of the **Performance Compliance Method**.

Another approach to increased code predictability was to apply requirements as a function of owner-elective work. Rather than the earlier codes' abrupt jumps when 50% of building value was reached, in this approach the extent and stringency of code requirements gradually increased for projects defined as a repair, alteration, or change of occupancy. This served as the framework for three influential rehabilitation codes: ICBO's 1997 *Uniform Code for Building Conservation* (UCBC), the 1997 *Nationally Applicable Recommended Rehabilitation Provisions* (NARRP) prepared for HUD, and the 1998 *New Jersey Rehabilitation Subcode*.

This approach was included as the **Work Area Compliance Method** in the first edition of the *International Existing Building Code*, published in 2003. For projects undergoing a **change of occupancy**, it also established requirements as a function of whether fire and life safety hazards were increased or decreased as a result of the occupancy change. While the Work Area Compliance Method included a special chapter for historic buildings, other compliance methods had separate but less comprehensive provisions for historic buildings. The "stepped" approach to rehabilitation has been followed in other building codes, including the *International Residential Code's* (IRC) Appendix J and "Chapter 43: Building Rehabilitation", of the *NFPA 101: Life Safety Code*.

Prior to the publication of the IEBC, some jurisdictions and the model code organizations developed unique approaches for historic buildings. These included allowing the building code official or appointed boards to approve exceptions or variances; special provisions for historic house museums, bed-and-breakfasts, or a jurisdiction's most significant historic buildings as listed in the code; enforcement of minimum maintenance standards for historic properties; and the development of unique codes for historic buildings, such as the state of California's 1975 adoption of its first *California State Historical Building Code*.

Most jurisdictions now use the IEBC and its historic building provisions, and few jurisdictions have continued to maintain or develop their own separate historic building code provisions. In many cases, adoption includes modifications to the model code to meet local priorities.

Code Development, Adoption, and Enforcement

Code Development

Codes have expanded from single-focus documents concentrating on life safety to a suite of separate publications establishing thousands of minimum architectural and engineering requirements. Separate codes regulate construction and rehabilitation of residential properties, existing buildings, and new construction; ongoing operations and property maintenance; and topics such as plumbing, electrical, and mechanical systems. To eliminate redundancies, codes often explicitly refer to provisions of other codes or reference standards. Additional provisions and guidelines are included in informational or mandatory appendices of the codes or related, separate, ordinances adopted by the jurisdiction.

The International Code Council (ICC), the National Fire Protection Association (NFPA), and other organizations preparing codes and standards have unique processes for the writing and updating of codes, typically involving member participation to develop, review, and accept proposed changes. Although ICC codes are updated on three-year cycles, few jurisdictions immediately adopt the newest edition or adopt the full suite of ICC codes. Separate procedures exist for code organizations' updating of materials classified as informational only, such as guidelines and handbooks. Most code organizations follow the voluntary consensus standards for the development of codes, overseen by the American National Standards Institute (ANSI).

Types of Codes

Code provisions can be **prescriptive-based**, with requirements explicitly established, or **performance-based**, specifying overall goals and permitting the designer and building code official to determine how these will be met. Prescriptive provisions that identify specific materials or methods are traditionally the easiest to use for new construction where little interpretation or negotiation is required. Performance provisions that specify a performance goal and permit the designer to determine the means to achieve that goal provide greater flexibility and can be beneficial in resolving situations presented by the specific or unique conditions of existing and historic buildings. Examples of performance provisions include the numeric rating system of the Performance Compliance Method of the *International Existing Building Code* (IEBC) and the energy code requirements in the *International Energy Conservation Code* (IECC) that establish the amount of energy (Energy Use Intensity) a building is permitted to use annually. In both cases, the code establishes a numeric value representing the minimum performance level a building must achieve, permitting the designer to select the building systems and components that cumulatively will meet the required level of performance. **Equivalencies**, like code provisions for "alternative methods and materials," are another means to demonstrate that a code-established performance level will be met. Multiple references to this concept exist within the IEBC, although it can be difficult to quantitatively establish equivalency without computer modeling or extensive testing.

Code Enforcement: Adoption, Permitting, and Inspections

Most jurisdictions in the United States have adopted one or more of the ICC model codes. Adoptions can occur at the state or local level, and procedures for adoption vary. It is not uncommon for the code's first administrative chapter to be modified by the adopting jurisdiction, for example, to select only certain codes of the ICC model codes for adoption or to amend some sections of the code to reflect local conditions and priorities such as to include provisions addressing natural disasters, sea level rise, and greater energy performance.

Code enforcement is typically the responsibility of a jurisdiction, although third-party firms or state or county agencies may be authorized to act on the jurisdiction's behalf. Procedures are established for permits, inspections,

appeals, whether **construction documents** must be prepared by a registered **design professional**, which building types and scopes of work require a permit and inspection, and if contractors must meet licensing or certification requirements. State and Federal agencies may be exempt from local requirements and undertake their own code compliance procedures.

Enforcement responsibilities can be assigned to a single building department or shared, most typically with the fire department. Separate review and inspection may occur by topic area (plumbing, electrical, energy conservation) or by other departments or boards associated with zoning, planning, historic preservation, etc.

Permits and Inspections

When required, plans and/or specifications are reviewed to confirm that the proposed work complies with the requirements of the jurisdiction. Issuance of the **building permit** indicates that the proposed design complies with applicable code requirements and that legal permission is granted to begin construction. The permit may specify required inspections for foundations, insulation, and electrical and plumbing installations. Inspections may be undertaken by the jurisdiction or a third-party inspector, as is common for electrical installations.

Figure 4: Creative life- and fire-safety code solutions may be required for special buildings and conditions, such as the use of an automatic accordion type, horizontal-sliding fire and security door to meet code requirements. Concealed when not in use, such systems can provide up to a 3-hour fire-resistance rating.
Photo: U.S. General Services Administration

Final inspections, often initiated by a letter from the design professional indicating the completed project has been constructed in a code-compliant manner, are required for the issuance of a **Certificate of Occupancy** or **Certification of Completion**. Where inspected conditions are found to be deficient, additional work may be required.

Appeals, Waivers, and Variances

The appeal process for a project denied a permit and for projects for which a waiver of code requirements or a variance is requested varies by jurisdiction. In some cases, such requests can be acted on by staff, the building code official, or an appeal body comprised of expert professionals, while in others a more complex process involving a regional or state review board may be required.

Existing Occupied Buildings

Provided that no unsafe conditions exist, codes generally allow existing, legally constructed, and occupied buildings to remain in operation without complying with current code requirements. Most minor maintenance work can be undertaken without engagement in the code process. Only in rare instances are new code requirements retroactive. These are typically limited to items considered most critical to public health and safety, for example, smoke detectors in certain residential occupancies or swimming pool enclosures.

Certain occupancies such as places of **public assembly** and schools, or certain building equipment, such as elevators and mechanical or fire protection equipment, may be required to have annual or periodic inspections. Such requirements and enforcement responsibilities may be established in the fire code or other local or state legislation and may address topics such as access and egress, special events, safe storage and use of hazardous materials, emergency planning and response, etc.

Minimum Property Maintenance and Housing Codes

Poorly maintained and vacant buildings are at risk of vandalism and damage due to exposure to the elements, fire, and earthquakes. These vulnerabilities not only affect their occupants, but also extend to neighboring buildings. Protection for and from these buildings is available through the enforcement of adopted minimum property maintenance standards, such as the *International Property Maintenance Code* (IPMC), housing, or fire codes. Unlike the building and rehabilitation codes that guide construction efforts, these minimum standards establish the minimum conditions for legal occupancy. Often, their enforcement is sporadic and reactive when a complaint has been lodged.

Enforcement of these minimum standards is the most efficient means to protect housing and other historic

buildings from accelerated deterioration caused by unaddressed, unsafe conditions. A jurisdiction's efforts can be reinforced by programs that identify and monitor vulnerable buildings, such as establishing an inventory of vacant or rental properties and implementing robust inspection programs. Timely code enforcement follow-up of noted unsafe and non-compliant conditions can avoid a catastrophic fire, structural collapse, unplanned relocation of occupants, or a costly emergency demolition.

Protection of these properties requires the adoption of appropriate codes and local regulations and adequate staffing and resources to support enforcement, including proactive inventorying and monitoring of existing buildings. Additional protections can also be achieved when a jurisdiction has the legal authority to undertake critical repairs at the expense of the property owner or to transfer ownership of delinquent properties to an appointed

Primary Codes and Guidelines for Historic Buildings

Codes / Publisher	Scope	Special Historic Building Provisions
International Existing Building Code (IEBC) — International Code Council, Inc. (ICC)	Repair, alteration, change of occupancy, additions, and relocation of existing buildings. Note: Appendices/Resources include *Guidelines for Seismic Retrofit, Accessibility, Wind Retrofit, and Fire Ratings of Archaic Materials and Assemblies*.	Chapter 3. Historic building provisions, applicable to all compliance paths, are limited to those addressing accessibility (accessible routes and entrances, toilet rooms). Separate provisions for Prescriptive Compliance Method are included in Chapter 5, and Work Area Compliance Method in Chapter 12. Appendix B, *Supplementary Accessibility Requirement for Existing Buildings and Facilities* establishes a consultation process if the appendix has been adopted by the jurisdiction.
International Residential Code (IRC) — ICC	New construction or existing buildings that are three stories or less above grade. Limited to single-family houses, two-family houses (duplexes), and buildings consisting of three or more townhouse units.	*Existing Buildings and Structures*, an expansion of Appendix AJ of previous IRC editions, is similar in format to the historic building provisions of the IEBC Work Area Compliance Method. The appendix is informational only and must be separately adopted by the jurisdiction.
International Energy Conservation Code (IECC) — ICC	Energy conservation requirements for new and existing buildings and residential and commercial buildings. Requirements separated for commercial and residential buildings.	In addition to Chapter 5 exceptions for alterations, code provisions are not mandatory if documentation demonstrating that compliance with the code would threaten, degrade, or destroy historic features is submitted.
International Fire Code (IFC) — ICC	Construction in new and existing buildings, including Chapter 11 retroactive provisions.	Chapter 11 references NFPA *914 Code for the Protection of Historic Structures* for fire protection planning (maintenance and availability of fire safety and evacuation plans).
Standard 90.1 Energy Standard for Buildings Except Low Rise Residential Buildings — ASHRAE	Energy requirements for new and existing buildings; a code-allowed alternate to the *International Energy Conservation Code* (IECC). Includes requirements for alterations.	Historic buildings are exempted.
Guideline 34 Energy Guideline for Historic Buildings — ASHRAE	Addresses retrofits, such as building envelope improvements, environmental control strategies, energy system analysis, HVAC selection, and lighting design.	Written for historic structures.
NFPA 914 Code for the Protection of Historic Structures — National Fire Protection Association (NFPA)	Addresses technical requirements and operations, such as fire protection, fire prevention, security, construction efforts, and special events.	Written for historic structures.
NFPA 101 Life Safety Code — NFPA	Addresses fire safety and related hazards for new and existing buildings. Often applied to larger and institutional buildings including hospitals, schools, and public buildings.	Three compliance options for historic buildings: comply with Chapter 43 provisions for historic buildings, with Chapter 43 work category (similar in format to IEBC), or with NFPA 914.

Figure 5. Special provisions for existing and historic buildings.

receiver or other entity committed to the building's protection and rehabilitation. Engagement with the courts and related agencies as part of these code enforcement actions is also essential.

The Secretary of the Interior's Standards

The *Secretary of the Interior's Standards for the Treatment of Historic Properties* (36 CFR Part 68, 1995) consists of four treatment standards: Preservation, Rehabilitation, Restoration, and Reconstruction. While not a code, they are regulatory for projects receiving Historic Preservation Fund Grant assistance and other federally-assisted projects. *The Secretary of the Interior's Standards for Rehabilitation* (36 CFR Part 67, 1990), which are included in the Treatment Standards, are regulatory for the Federal Historic Preservation Tax Incentives program (commonly known as the "Historic Tax Credits") and are the criteria used to determine if a project qualifies as "a certified rehabilitation," and, therefore, for certain tax benefits under the Internal Revenue Code.

The 1990 (specific to the tax incentives program) and the 1995 versions of the Rehabilitation Standards convey the same intent and provide the same guidance, although they are worded slightly differently, and "shall" replaces "will" in the 1995 version. The *Secretary of the Interior's Standards for the Treatment of Historic Properties*, in particular the *Standards for Rehabilitation*, are intended as general guidance for work on all historic properties, are widely used, and have been adopted at Federal, state, and local levels.

Using the Codes

Model International Codes

The International Code Council's (ICC) fifteen model codes, which address a multitude of topics associated with public health, safety, and welfare, are the most adopted codes in the United States. These model codes are adopted as published or with modifications as determined by the local jurisdiction. Adoption may explicitly reference the title of the model code and the date of its publication or instead rename the code to include the name of the jurisdiction and the date adopted.

The *International Existing Building Code* (IEBC) contains a full chapter dedicated to historic buildings. The *International Plumbing Code* (IPC) and others have requirements for existing installations and how alterations or additions are addressed. This includes the retroactive provisions of Chapter 11 of the *International Fire Code* (IFC), applicable always regardless of whether a repair or alteration is undertaken. Additional codes published by the ICC, generally with less impact on historic buildings, are shown in Figure 22. The principal codes and guidelines affecting historic and existing buildings are identified in Figure 5.

Construction and Occupancy/Use Classifications

Codes are organized by two key risk factors that establish the minimum level of safety a building must provide: **construction classification** and **occupancy classification**. The interplay of these classifications determines maximum building height, number of stories, and building area; permitted occupancies; and other requirements primarily related to fire protection and **means of egress**.

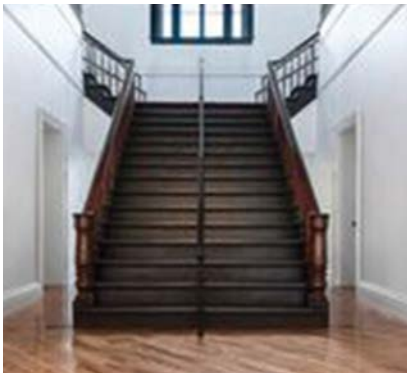

Figure 6. The IEBC provides opportunities to retain character-defining features such as historic stairways that would not be permitted to remain by codes written for new construction. Photo: Marilyn Kaplan

Construction Classification is based on the materials used in construction. Buildings are further described by fire-resistance ratings assigned to key building elements: primary structural frame, exterior and interior bearing walls, exterior nonbearing walls, interior nonbearing walls and partitions, floor construction, and roof construction.

A "Type I" building using protected non-combustible structural elements, such as concrete and fireproofed steel, has a higher degree of fire-resistance than a "Type V," fully wood-framed building. Typical 19th-century buildings classified as "Type III" include three-story "Main Street" buildings with masonry exteriors and interior wood framing. "Type IV" buildings include traditional heavy-timber and mass-timber construction, as the larger dimensions of the wood structural components provide greater fire-resistance than the smaller dimensions of modern lumber.

Occupancy classification of buildings or spaces is based on their purpose and function and relative risk to the occupants (Figure 7). A small commercial tenant space presents less risk than a day care, hospital, or nightclub use. Further sub-classifications within the broad occupancy groups are based on the characteristics of a specific use. Multiple classifications can be assigned, such as with Main Street mixed-use buildings with commercial or office use on the first floor and residential use on the upper floor(s).

Model *International Existing Building Code*

Prior to the 2003 publication of the IEBC, rehabilitation projects were regulated by the IBC or the IRC. The IBC and IRC were primarily written for new construction,

Common Occupancy and Use Classifications

Classification	Examples
INTERNATIONAL BUILDING CODE *	
Assembly Group A	
Assembly Group A-1	Motion Picture Theaters, Symphony and Concert Halls, Theaters
Assembly Group A-2	Banquet Halls, Nightclubs, Restaurants
Assembly Group A-3	Art Galleries, Community Halls, Libraries, Museums
Business Group B	Banks, Education Occupancies (Above 12th Grade), Professional Services
Mercantile Group M	Department Stores, Markets
Residential Group R	
Residential Group R-1	Hotels, Congregate Living (Transient)
Residential Group R-2	Apartment Houses, Dormitories (Non-Transient)
Residential Group R-3	Buildings up to 2 Dwelling Units, Smaller Care and Living Facilities
Residential Group R-4	Assisted Living Facilities, Group Homes with 5-16 Occupancy, 24-Hour Residential
INTERNATIONAL RESIDENTIAL CODE	
No specific occupancy or use classifications.	

*Figure 7. *Additional Occupancies include Educational (Grades K-12), Factory and Industrial, High Hazard, Institutional, Storage, Utility, and Miscellaneous.*

although Chapter 34 of the IBC, since relocated to the IEBC, addressed existing buildings. While rehabilitation projects continue to be allowed to use these codes, the unique conditions of historic and other existing buildings are often better addressed by the provisions specifically written for rehabilitation projects contained within the IEBC and the IRC's *Appendix J Existing Buildings and Structures*. Of these, only the IEBC contains specific historic building provisions.

The 2024 edition of the IEBC incorporates numerous modifications to the original document while remaining similar in approach and format to previous editions still in effect in many jurisdictions. Changes and updates are prepared on three-year cycles. While the IRC is designed to contain most requirements in a single code book, the IEBC is more complex given its references to other codes and its applicability to the full array of existing buildings and the unique conditions they present.

The IEBC offers multiple paths to establish code compliance for all residential and non-residential rehabilitation projects. The IBC and IRC can also be used for rehabilitation projects, although proposed work must meet the requirements for new construction. Special provisions for existing buildings are included in the IRC Appendix BO, *Existing Buildings and Structures* in jurisdictions where it has been adopted. Using the IEBC also incorporates requirements of other codes, most significantly the *International Energy Conservation Code* (IECC) and the IFC. The organization of the IEBC is shown in Figure 8.

Repairs

Repairs are defined as, "The reconstruction, replacement or renewal of any part of an existing building for the purpose of its maintenance or to correct damage." Requirements are limited in scope (structure, flood hazard areas, and electrical, mechanical, and plumbing systems). In general, a building cannot be made less safe or less code compliant.

Repairs to historic buildings need only comply with the requirements in "Chapter 12: Historic Buildings." Repairs using original or like materials and methods of construction and replacement of existing or missing features using original materials are allowed. Replacement glazing in hazardous locations must comply with requirements for new construction, except for glass block walls, louvered windows, and jalousies. Hazardous materials not allowed in new construction cannot be used.

Relocation

Repairs, alterations, and changes of occupancy of moved or relocated buildings may follow any one of the compliance paths of the IEBC, or the IBC or IRC. For historic buildings using the IEBC Work Area Compliance Method, foundation, exterior wall, and opening requirements must comply with new construction requirements or with the compliance alternatives of the historic building chapter. All other historic building provisions of that chapter are applicable.

For historic buildings using the Prescriptive or Performance Compliance Methods, work must comply with the requirements for repair, alteration, or change of occupancy. New construction requirements are applied to the foundation system and when a building is relocated into a flood hazard area. With some exceptions, new construction requirements for wind, seismic, and snow loads also apply.

Organization of the 2024 IEBC

Chapter		
1	Scope and Administration	Applies to all compliance methods.
2	Definitions	Applies to all compliance methods.
3	Provisions for All Compliance Methods	Applies to all compliance methods. In addition to the Prescriptive Compliance, Performance Compliance, and Work Area Compliance methods, it establishes an additional code path for Alterations based on code provisions in place at the time the building was constructed.
4	Repairs	Establishes minimum requirements for projects of limited scope. Repairs to Historic Buildings are only required to comply with repair requirements of Chapter 12.
5	Prescriptive Compliance Method	Prescriptive Compliance Method
6	Classification of Work	Work Area Compliance Method
7	Alterations – Level 1	Work Area Compliance Method
8	Alterations – Level 2	Work Area Compliance Method
9	Alterations – Level 3	Work Area Compliance Method
10	Change of Occupancy	Work Area Compliance Method
11	Additions	Work Area Compliance Method
12	Historic Buildings	Work Area Compliance Method Chapter 12 serves as an overlay to Chapters 7–10.
13	Performance Compliance Method	Performance Compliance Method
14	Relocated or Moved Buildings	Applies to all repairs and compliance methods, with specific requirements for new foundations, structural work, and flood hazard areas.
15	Construction Safeguards	Applies to all compliance methods.
16	Referenced Standards	If adopted by jurisdiction, applies to all compliance methods.
Appendix		
A	Guidelines for the Seismic Retrofit of Existing Buildings	If adopted by jurisdiction, applies to all compliance methods.
B	Supplementary Accessibility Requirements for Existing Buildings and Facilities	If adopted by jurisdiction, applies to all compliance methods. Provides consultation process with historic preservation officials.
C	Guidelines for the Wind Retrofit of Existing Buildings	If adopted by jurisdiction, applies to all compliance methods.
Resource		
a	Guidelines on Fire Ratings of Archaic Materials and Assemblies.	Applies to all compliance methods. Provides fire-resistance ratings for older building elements or materials not typically included in modern codes.

Figure 8. Identifying which code compliance method [(Prescriptive (Chapter 5); Work Area (Chapters 6-11); or Performance (Chapter 13)] is best suited to a particular project is essential. Early consultation with the building code official to discuss the selected path can expedite the design and code review/processes.

Alterations and Changes of Occupancy: Compliance Methods

For projects classified as an **alteration** or **change of occupancy**, the IEBC provides a choice of compliance paths: Prescriptive Compliance, Work Area Compliance, Performance Compliance, or, for Alterations, compliance with requirements at the time the building was constructed, with limitations and additional provisions. Use of this so-called "law-in-existence" approach may work best with more recently constructed historic buildings.

Although typically less well-suited to historic buildings, rehabilitation projects can also comply with the new construction requirements of the IBC, the IRC, or the IRC's *Appendix J* provisions for existing buildings if this has been adopted by the jurisdiction.

Prescriptive Compliance Method. This traditional approach to building regulation originated in Chapter 34 of the IBC and was relocated to the IEBC in 2012. It is often preferred by those most familiar with the IBC due to its similar format and content.

This method includes extensive structural requirements related to earthquake damage and seismic design; gravity, lateral, and wind loads; improvements in floor hazard areas; fire-resistant ratings; and fire escapes, as well as windows and emergency escape openings when an addition is constructed or an alteration or change of occupancy occurs.

For historic buildings, the application of this method is limited to conditions judged by the code official to constitute a **distinct life safety hazard**. Special allowances are also available to buildings located in **flood hazard areas** and in the application of structural provisions.

Performance Compliance Method. Also originating from Chapter 34 of the IBC, this method uses a numerical scoring system to determine if a project will meet an acceptable level of safety. Scores calculated for twenty-one safety parameters are used to determine the total minimum scores for the categories of fire safety, means of egress, and general safety. Deficiencies in one parameter can be compensated by a higher score in another. A total building score equal to or exceeding the minimum safety scores for the three categories establishes compliance.

This method can be extremely flexible in responding to the unique conditions presented by different historic and existing buildings. It benefits smaller rehabilitation projects, including those with business or mixed-use occupancies, by often allowing a building to forgo a new sprinkler system or to maintain an existing system. The method is a scoring system of twenty-one fire safety parameters (Figure 12a, 12b).

Work Area Compliance Method. Projects using this method are classified as one of three levels of alteration, based on the extent of proposed work, a change of occupancy, or an addition.

The Work Area Compliance Method establishes code requirements incrementally, based on the scale and type of proposed work. Requirements increase in stringency from the lowest level, Alteration—Level 1, to the highest levels of work, either Alteration—Level 3 (when the work area exceeds 50% of the building area) or a change of occupancy. Requirements for projects involving a change of occupancy also increase or decrease based on the hazard rating associated with the change. The hazard ratings of existing and proposed occupancies are compared using three hazard scales (Means of Egress, Heights and Areas, and Exposure of Exterior Walls).

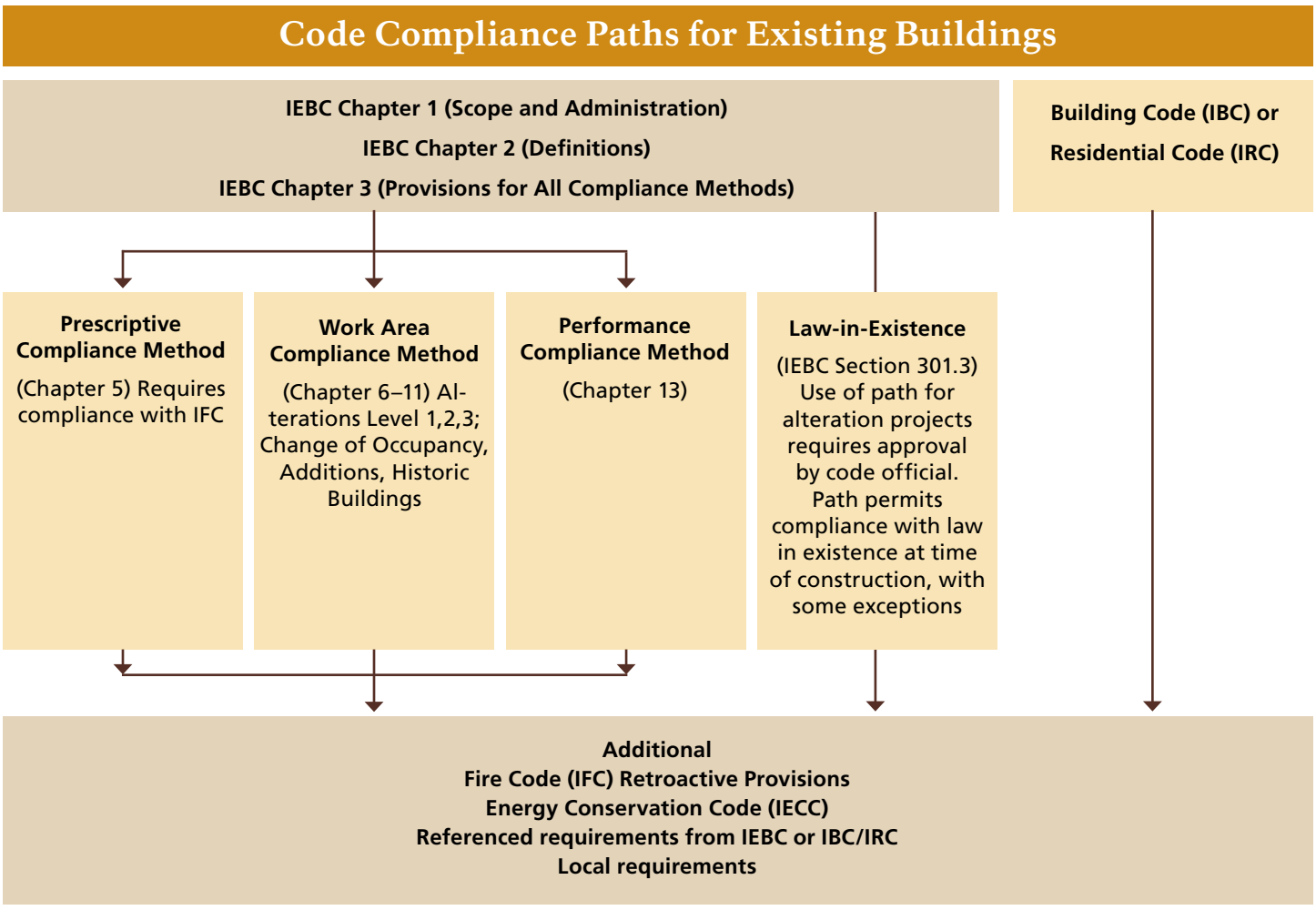

Figure 9. The IEBC contains 4 compliance paths: the fifth path permits the use of the IBC or IRC. This figure illustrates the general structure of the 2024 IEBC, excluding chapters applicable to Repairs, Relocated or Moved Buildings, Construction Safeguards, and Appendices. Variations may occur depending on which model codes, and which edition of each, have been adopted by the jurisdiction. Note that use of the IRC's Appendix AJ provisions for existing buildings requires the jurisdiction to have explicitly adopted this appendix.

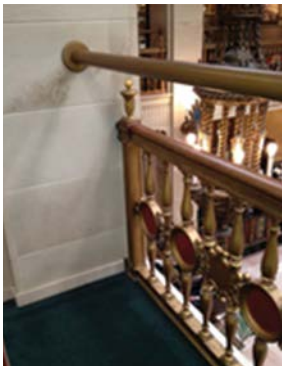

Figure 10. A modern horizontal element was installed to meet the code-required railing height while still retaining the lower historic railing. Photo: Nicholas Vann

The most restrictive requirements are applied to projects involving a change of occupancy, with the most restrictive provisions applied to occupancies the code considers having the highest hazard. For example, since an Assembly occupancy is considered more hazardous than a Business occupancy in all three hazard scales, requirements for the proposed Business occupancy would be less stringent than those for the Assembly space.

Application to Historic Buildings

According to the IEBC, historic buildings are defined as, "Any building or structure that is one or more of the following:

1. Listed, or certified as eligible for listing, by the State Historic Preservation Officer or the Keeper of the National Register of Historic Places, in the National Register of Historic Places.

2. Designated as historic under an applicable state or local law.

3. Certified as a contributing resource within a National Register, state designated or locally designated historic district."

This definition excludes buildings that have only been determined eligible for listing by a locality or only identified in a historic resources survey or inventory. Additionally, in the Prescriptive Compliance Method, a slightly different definition of historic buildings is used in determining when full improvements in flood hazard areas are required.

"Chapter 3: Provisions for All Compliance Methods" contains the base provisions applicable to the four compliance paths contained in the IEBC. Additional or modified provisions unique to the selected compliance method found in other

Work Area Compliance Method, Classification of Work

Classification	Definition	Comment
Alteration – Level 1 (Chapter 7)	Removal and replacement, or the covering of existing materials, elements, equipment, or fixtures using new materials, elements, equipment, or fixtures that serve the same purpose.	Building cannot be made less safe, specifically regarding means of egress and fire protection. Includes limited requirements for new building elements and materials (interior finishes, windows, emergency egress/rescue, fuel gas piping), reroofing, structural requirements for reroofing, and energy conservation in work area.
Alteration – Level 2 (Chapter 8)	Reconfiguration of space, the addition or elimination of any door or window, the reconfiguration or extension of any system, or the installation of any additional equipment.	Requirements from Alteration - Level 1 plus requirements for new work including some exceptions from IBC (windows, electrical, dead-end corridors, ceiling height, below grade transportation, and structural). Includes requirements for vertical openings, fire protection, means of egress, and structural components in work area and beyond. Additional requirements for electrical, mechanical, plumbing, and energy conservation limited to work areas.
Alteration – Level 3 (Chapter 9)	Work area exceeds 50 percent of the total building area.	Requirements from Alteration - Levels 1 and 2, plus special requirements for high-rise buildings; extension of area of required work for building elements and materials including in means of egress; and additional requirements for fire protection and structural components.
Change of Occupancy (Chapter 10)	Includes any change of occupancy classification, any change from one group to another within an occupancy classification, or any change in use within a group for a specific occupancy classification.	Includes requirements for fire protection, means of egress, accessibility, structural, electrical, mechanical, and plumbing. Some requirements are established as a function of the relative change of hazard between the previous and the new occupancies (higher, equal, or less).
Additions (Chapter 11)	An extension or increase in the floor area, number of stories, or height of a building or structure.	For additions not separated from the existing building by a fire wall, it provides some exceptions from requirements for new construction (except height and area), as well as some requirements applicable to the existing building.

Figure 11. All of the above classifications must also comply with Provisions for all Compliance Methods. The provisions of Chapter 12 Historic Buildings serve as an overlay to each of these classifications.

Performance Compliance Method

TABLE 1305.2.3—COMPARTMENTATION VALUES

OCCUPANCY	CATEGORIES[a]				
	a	b	c	d	e
A-1, A-3	0	6	10	14	18
A-2	0	4	10	14	18
A-4, B, E, S-2	0	5	10	15	20
F, M, R, S-1	0	4	10	16	22
I-2	0	2	8	10	14

a. For compartment sizes between categories, the compartmentation value shall be obtained by linear interpolation.

Figure 12a. Table 1305.2.3 shows how the Compartmentation Value used in the Summary Sheet (Table 1306.1 in the 2024 IEBC) is determined. A value between 0 and 22, based on building size as further detailed in the chapter, is selected and added to the appropriate column of the Summary Sheet in order to establish a total building score.

TABLE 1306.1—SUMMARY SHEET—BUILDING CODE

SAFETY PARAMETERS	FIRE SAFETY (FS)	MEANS OF EGRESS (ME)	GENERAL SAFETY (GS)
1305.2.1 Building height			
1305.2.2 Building area			
1305.2.3 Compartmentation			
1305.2.4 Tenant and dwelling unit separations			
1305.2.5 Corridor walls			
1305.2.6 Vertical openings			
1305.2.7 HVAC systems			
1305.2.8 Automatic fire detection 1305.2.9 Fire alarm system			
1305.2.10 Smoke control	* * * *		
1305.2.11 Means of egress	* * * *		
1305.2.12 Dead ends	* * * *		
1305.2.13 Maximum exit access travel distance	* * * *		
1305.2.14 Elevator control			
1305.2.15 Means of egress emergency lighting	* * * *		
1305.2.16 Mixed occupancies		* * * *	
1305.2.17 Automatic sprinklers		÷ 2 =	
1305.2.18 Standpipes			
1305.2.19 Incidental use			
1305.2.20 Smoke compartmentation			
1305.2.21.1 Care recipients ability for self-preservation[a]	* * * *		
1305.2.21.2 Care recipients concentration[a]	* * * *		
1305.2.21.3 Attendant-to-care recipients ratio[a]	* * * *		
Building score–total value			

* * * *No applicable value to be inserted.
a. Only applicable to Group I-2 occupancies.

Figure 12b. Shows the list of twenty-one parameters addressed in Table 1306.1. Summary Sheet- Building Codes, (partially excerpted in this figure). Tables 1305.2.3 and 1306.1 are copyrighted materials excerpted from the 2024 International Existing Building Code. Copyright © 2023. International Code Council, Inc. All rights reserved. Reproduced with permission. www.ICCSAFE.org.

chapters also apply. Chapter 3 provisions for historic buildings only apply to accessibility. Additional historic building provisions included in Appendix B, *Supplementary Accessibility Requirements for Existing Buildings and Facilities*, apply when the appendix has been adopted by the jurisdiction.

Figure 13. Careful selection, design, and location of exit signs can help preserve the historic character of significant historic spaces while still meeting code requirements. Photo: Marilyn Kaplan

Although the Performance Compliance Method does not include additional provisions for historic buildings, it can and has been successfully applied to many historic building projects. The Prescriptive Compliance Method includes special provisions for historic buildings related to life safety hazards, flood hazard areas, and structural requirements. The Work Area Compliance Method contains the most provisions for historic buildings in its chapter titled, "Chapter 12: Historic Buildings."

Historic Buildings: Work Area Compliance Method. "Chapter 12: Historic Buildings" is an overlay to the requirements established for alterations and changes of occupancy in non-historic buildings. This chapter includes specific provisions and procedures that may allow many historic features, materials, and conditions to remain.

Additional Codes and Standards Impacting Historic Buildings

Some states and jurisdictions use other approaches to regulate existing and historic buildings. The simplest of these are amendments to the IEBC that address local conditions or priorities. For example, among other amendments to the IEBC, the *Existing Building Code of Massachusetts* modifies the provisions for historic house museums to include specific requirements for maximum occupancy, exiting, and fire protection equipment.

The state of Ohio regulates existing buildings within its *Ohio Building Code*. Many requirements parallel or match those in the IEBC, including the Performance Compliance Method, titled therein as *Compliance Alternatives*. For historic buildings, the code only states that "The provision of this code relating to the construction, repair, alteration, addition, restoration and movement of buildings, and change of occupancy shall not be mandatory for historic buildings where such buildings are judged by the building code official to not constitute a distinct life safety hazard."

The state of California has maintained its *State Historical Building Code since 1975*. Unique to this code is its authorship by the State Historical Building Safety Board, which is separate from the state's code adoption process for the *California Building Code*. While the California Building Code serves as the base document, it is the Safety Board that determines if a particular alternative is "**reasonably equivalent**" to a requirement established by the *California Building Code*. Having a single board responsible for all historic building code-related activities—from writing the code to hearing appeals—provides the framework to document and ultimately codify commonly accepted alternative solutions.

The *New Jersey Rehabilitation Subcode*, developed in parallel to the IEBC in the late 1990s, is unique in format, designed to eliminate barriers, and be a stand-alone, user-friendly document. Noteworthy are the more expansive and explicit allowances for historic house museums and its establishment of the *Secretary of the Interior's Standards for the Treatment of Historic Properties* as the basis for using the historic building provisions.

Since 2001, *NFPA 914 Code for Fire Protection of Historic Structures* has been successfully used on some historic building projects. This code uniquely establishes a decision-making process that includes construction, equipment, and operational approaches for fire prevention and security. NFPA 914 is identified in the *International Fire Code* as an alternate approach to developing a fire protection plan. For existing buildings, the state of Vermont adopts only the structural provisions of the IEBC; otherwise, it relies on the provisions of "Chapter 43: Building Rehabilitation" of NFPA 101. Vermont specifically establishes NFPA 914 as the code to be used for historic buildings.

Existing Buildings Not Undergoing Improvement

With few exceptions, existing conditions are **grandfathered.** Unless a repair, rehabilitation project, or addition is planned, requirements of the *International Existing Building Code* (IEBC) are not applied retroactively. Exceptions include retroactive provisions such as those contained within the *International Fire Code* (IFC) and *International Property Maintenance Code* (IPMC), which establish minimum requirements for ongoing occupancy including those related to maintenance of safety-related features. Additional minimum property standards for housing are sometimes adopted by local ordinance.

The *International Energy Conservation Code* (IECC) and other Energy Provisions

The *International Energy Conservation Code* (IECC) contains energy conservation measures for residential and

Historic Building Provisions of the IEBC Work Area Method

R=Repair, A=Alteration, C=Change of Occupancy

Topic	Key	Summary of Provision
GENERAL (1201)		
Scope 101.1	**R,A,C**	This section establishes that the intent of the chapter is the preservation of historic buildings, with specific provisions for a documentation report, treatment of museums, and requirements for historic buildings located in flood hazard areas or determined to be unsafe.
Report 1201.2	**R,A,C**	The requirement to submit a Report is determined by the building code official. The Report must identify all unsafe conditions; provide a structural description and assessment of strengths or weaknesses for buildings classified as Seismic Design Category D, E or F; and describe building components with a level of safety substantially below those required of existing nonhistoric buildings. It is not required for Level 1-Alterations. Further guidance is provided in the Historic Building Code Report section of this Brief.
Special Occupancy exceptions - museums 1201.3	**R,A,C**	Allows single family residences less than 3,000 square feet per floor and a maximum of 3 stories to be used for museum tours and other public assembly activities to be classified as a Group B occupancy, as approved by the building code official. A Group B occupancy is less restrictive than an Assembly occupancy and allows some flexibility in addressing life safety and egress conditions.
Flood Hazard Areas 1201.4	**R,A,C**	For work defined as a substantial improvement, flood hazard requirements of the IBC and IRC do not apply if the building will retain its historic status following work (note: unique definition of 'historic' than otherwise used in the IEBC).
Unsafe conditions 1201.5	**R,A,C**	Limits the scope of required repairs to specific conditions deemed unsafe by the building code official.
REPAIRS (1202)		
General 1202.1	**R**	Allows use of original or like materials and methods of construction, except for hazardous materials or glass in hazardous areas.
Replacement 1202.2	**R**	Replacement of existing or missing features using original materials and matching the original configuration, height and size are permitted. With the exception of permitted repair of glass block walls, louvered windows and jalousies, replacement glazing in hazardous locations must meet the requirements of the IBC.
FIRE SAFETY (1203)	**Provides alternate treatment of elements ranging from means of egress to exit signs for alterations and change of occupancy. However, if the building code official determines that a distinct fire hazard exists, an automatic fire sprinkler system may be required.**	
General (Fire Suppression) 1203.2	**A,C**	Buildings that do not conform to the construction requirements of the IEBC and that are determined to constitute a distinct fire hazard must have an automatic sprinkler system as determined appropriate by the code official. The sprinkler system may be considered an acceptable alternative to code requirements except for the required number of exits.
Means of Egress 1203.3	**A,C**	Existing door openings and corridor and stairway widths may be approved when the code official determines these to have sufficient width and height for passage. The existing swing of front or main exit doors can remain if sufficient egress exists at other locations, as approved by the code official.
Transoms 1203.4	**A,C**	In Group R-1, R-2, and R-3 sprinklered occupancies, transoms in corridors and other fire-resistance rated walls may be maintained if fixed in the closed position and a sprinkler is installed on each side of the transom.
Interior Finishes 1203.5	**A,C**	Existing finishes demonstrated to be historic are permitted to be retained.
Stairway Enclosure 1203.6	**A,C**	In buildings of 3 stories or less, a fire-resistant rating of the exit enclosure is not required if the use of tight-fitting doors and solid elements limit the spread of smoke.
One-hour fire-resistant Assemblies 1203.7	**A,C**	Existing wall and ceiling finishes of wood or metal lath and plaster are not required to achieve a 1-hour fire-resistant rating.
Glazing in fire-resistance Rated Systems 1203.8	**A,C**	Historic glazing materials can remain in interior walls without achieving a 1-hour fire-resistant rating if the opening has approved smoke seals and the affected area has an automatic sprinkler system.
Stairway Railings 1203.9	**A,C**	Grand stairways are not required to meet handrail and guard requirements. At all stairways, existing handrails and guards can remain provided they are not structurally dangerous.
Guards 1203.10	**A,C**	Existing guards can be repaired to maintain the level of protection provided by the means of egress. Spacing between existing intermediate railings or openings with ornamental patterns can remain. Missing historic elements or members can be replaced in kind.
Exit Signs 1203.11	**A,C**	Alternative exit signs identifying exits and egress path that avoid damage to historic character are permitted, as approved by the code official.

Topic	Key	Summary of Provision
Automatic sprinkler systems 1203.12	**A,C**	Buildings that do not conform to the construction requirements of the IBC and determined to constitute a distinct fire hazard shall be accepted if provided with an approved automatic sprinkler system, or an alternative life-safety system approved by the code official.
CHANGE OF OCCUPANCY (1204)		
Building Area 1204.2	**C**	Allowable floor area established in the IBC can be exceeded by 20%.
Location on Property 1204.3	**C**	When there is an increase to a higher hazard category for Exposure of Exterior Walls, alternative methods to achieve the fire-resistance and exterior opening protective requirements are permitted. These may require completion of a Historic Building Report per 1201.2.
Occupancy Separation 1204.4	**C**	A required fire separation of 1 hour is not required if the building has an approved automatic sprinkler system throughout.
Roof Covering 1204.5	**C**	Roof-covering materials with no less than a Class C rating (ASTM E108, UL 790) are permitted in lieu of a fire-retardant roof covering.
Means of Egress 1204.6	**C**	Existing door openings and corridor and stair widths can remain providing there is sufficient width and height for passage, the capacity of the exit system is adequate for the occupant load, or where operational controls to limit occupancy are approved by the code official.
Door Swing 1204.7	**C**	Existing swing of front doors can remain if other approved exits have sufficient capacity to serve the total occupant load, as approved by the code official.
Transoms 1204.8	**C**	Existing transoms in corridor walls required to have a fire-resistance rating can remain if fixed in a closed position with fixed wire glass or other approved glazing installed on one side of the transom, or if in compliance with 1203.4.
Interior Finishes 1204.9	**C**	In lieu of compliance with the fire test requirements of the IBC, non-conforming materials can remain if surfaced with an approved fire-retardant coating that achieves the required classification. Testing of the fire-retardant coating is required. This coating is not required if the building has an automatic sprinkler system throughout and the non-conforming materials are historic.
One-hour Fire-resistant Assemblies 1204.10	**C**	Existing wall and ceiling finishes of wood lath or plaster are not required to achieve a 1-hour fire-resistant rating.
Stairways and Guards 1204.11	**C**	Alternatives for stairways and guards that meet the requirements of 1203 shall be accepted provided these are acceptable or judged to meet the intent of the code by the code official. Existing conditions at all stairways and guards are permitted to remain for buildings less than 3,000 square feet.
Exit Signs 1204.12	**C**	Alternative exit sign locations identifying exits and exit path that avoid damage to historic character are permitted, as accepted by the code official.
Exit Stair Live Load 1204.13	**C**	Historic stairways in buildings changed to a Group R-1 or R-2 occupancy can remain if demonstrated to be capable of supporting a 75-psf live load.
Natural Light 1204.14	**C**	The existing level of natural lighting can remain if compliance with natural light requirements would lead to a loss of historic character or materials.
STRUCTURAL (1205)		**Modifies the structural requirements established in other chapters. Authorizes the building code official to accept existing and previously approved live and roof live loads and limits the extent of repair required when substantial structural damage has occurred.**
Structural 1205.1	**R,A,C**	Existing floor structure previously approved live loads and roof live loads can be accepted by the code official, including operational controls limiting live load or roof live load. Regardless of the level of damage, structural repairs to return a building to its pre-damaged condition are permitted without additional work.
Dangerous Conditions 1205.2		Conditions determined dangerous by the code official are not required to be remedied beyond what is required to address the dangerous condition.
RELOCATED BUILDINGS (1206.1)		
Relocated Buildings 1206.1	**R,A,C**	Allows relocated buildings to use the historic building provisions, provided that new foundations and exterior wall and opening requirements comply with the IBC or the IEBC. The building must also retain its historic designation.

Figure 14. References to the IBC require compliance with provisions for new construction included in that code. "Section 1203 Fire Safety" heading includes provisions for Alterations and Changes of Occupancy. "Section 1204 Change of Occupancy" provisions are applicable only to projects defined as a Change of Occupancy. For the complete text of noted provisions, refer to the current edition of the IEBC, as adopted by the jurisdiction.

Figure 15. Small and mid-size house museums are provided special treatment in the IEBC, provided that adequate exiting is available. Given the level of careful oversight of these buildings, house museums can be great candidates to use the alternate approaches contained in NFPA 914. Photo: Marilyn Kaplan

non-residential buildings. For smaller residential buildings, the IECC's provisions are repeated within the *International Residential Code* (IRC). While the IECC is one of the most widely-used energy codes, the state of California's 2022 *Building Energy Efficiency Standards* and *ANSI/ASHRAE/IES Standard 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings* (Standard 90.1) establish alternate performance standards and design approaches.

In response to Federal and state policy and mandates, recent editions of the widely adopted IECC have expanded in scope and requirements. Some jurisdictions have also adopted rating systems, building performance standards, and codes such as the *International Green Construction Code* (IgCC) or ASHRAE *Standard 189.1—Standard for the Design of High-Performance Green Buildings* to increase a building's energy and environmental performance beyond the minimum established by the IECC. Less common are local or state 'stretch' or 'reach' codes, such as the state of Massachusetts' *Stretch Code*, enacted in 2009 to establish energy performance requirements exceeding those of the state's base building energy code.

The IECC is one of the more complex of the model codes. It contains three compliance path options: prescriptive, modeling, or compliance with Standard 90.1. Modeling, using the IECC's Section C407 or the two modeling paths in Standard 90.1, is most often undertaken for complex buildings or those with additional sustainability goals. Nationwide, using the prescriptive path is the most common approach.

The IECC specifies energy efficiency measures based on a project's categorization as a repair, alteration, change of occupancy, or addition. Like the stepped approach of the Work Area Compliance Method of the IEBC, the improvements imposed by IECC are proportionate to the scope of owner-elective work. All existing buildings are granted certain exceptions from the IECC, including allowing storm windows or window-film to be installed over single-glazed windows, and minimal or no insulation when wall, ceiling, or roof cavities are not exposed.

Prior to 2015, the IECC exempted historic buildings. The IECC now requires the submission of a report to document when energy efficiency measures would "threaten, degrade, or destroy the historic form, fabric, or function" of the historic building. This documentation is similar to the report identified for historic buildings in the IEBC, although in the IEBC it is only mandatory

Provisions for Historic and Existing Buildings in the International Energy Conservation and Fire Codes

INTERNATIONAL ENERGY CONSERVATION CODE	
Residential buildings (all existing buildings)	(R503.1.1) For work to all existing buildings (except repairs or additions), if energy use of the building is not increased, the following is permitted: • Storm windows installed over existing fenestration. • Insulation at ceiling, wall, or floor cavities exposed during construction limited to filling cavity with insulation. • No insulation required if existing roof, wall, or floor cavity is not exposed during construction. • No insulation required if project is limited to roof replacement. • Insulation limited to above or below sheathing where reroofing exposes sheathing or insulation. Installation of surface-applied window film (to reduce solar heat gain) on existing single pane fenestration that is permitted to be retained.
Residential buildings (historic buildings)	(R501.6) Compliance is not required if the Historic Building Report submitted demonstrates that compliance would threaten, degrade, or destroy the historic form, fabric, or function of the building. Report must be signed by owner, design professional, a representative of the State Historic Preservation Office, or the historic preservation authority having jurisdiction.
Commercial buildings (all existing buildings)	(C503.1.1) For work to all existing buildings (except repairs or additions), if energy use of the building is not increased, following is permitted: • Storm windows installed over existing fenestration. • Installation of surface-applied window film (to reduce solar heat gain) on existing single pane fenestration that is permitted to be retained. • Insulation at ceiling, wall, or floor cavities exposed during construction limited to filling cavity with insulation. • No work if existing roof, wall, or floor cavity is not exposed during construction. • No work for projects limited to roof recover. Air barriers not required for roof recover and roof replacement if project excludes other work at building envelope.
Commercial buildings (historic buildings)	(C501.6) Compliance is not required if the historic building Report submitted demonstrates that compliance would threaten, degrade, or destroy the historic form, fabric, or function of the historic building. Report must be signed by design professional, a representative of State Historic Preservation Office, or the historic preservation authority having jurisdiction.
INTERNATIONAL FIRE CODE	
All buildings	(S102.6) Establishes that compliance is not mandatory where buildings do not constitute a distinct hazard to life or property, providing that a fire protection plan per S1103 has been developed.
Construction project	(S1103.1.1) Fire safety requirements including equipment and construction are not required for historic buildings with a fire protection plan developed in accordance with NFPA 914, provided that fire safety and evacuation plans are maintained and available.
Ongoing use / retroactive	(S1032) Requirements for maintenance of the means of egress system for historic and existing buildings; no other provisions for historic buildings.

Figure 16. Summary of provisions for historic buildings in the fire and energy codes.

if required by the code official to document that compliance with other (non-historic) provisions "would be damaging to the contributing historic features." In some jurisdictions, the local or state historic preservation office may be asked to document which historic features would be adversely affected by proposed energy efficiency measures. *The Secretary of the Interior's Standards for Rehabilitation & Illustrated Guidelines on Sustainability for Rehabilitating Historic Buildings* (2017) and *Preservation Brief 3: Improving Energy Efficiency in Historic Buildings* provide guidance on how to make historic buildings more sustainable and energy-efficient while preserving their historic character and features. With careful planning and execution, many historic rehabilitation projects can achieve higher levels of energy performance than those strictly required by code.

The Americans with Disabilities Act (ADA) and Accessibility Codes

The Americans with Disabilities Act (ADA), a Federal civil rights law prohibiting discrimination against individuals with disabilities, became law in 1990. State and local governments are governed by Title II of the Act, while Title III governs public accommodations in privately-owned, leased, or operated hotels, restaurants, retail spaces, doctor's offices, movie theaters, etc.

Owners of places of public accommodation are responsible for 'readily achievable' barrier removal, with priorities established in the following order:

1. Access into the place of public accommodation from public sidewalks, parking, or public transportation.
2. Access to areas where goods and services are available to the public.
3. Access to restroom facilities.
4. Access to the goods, services, facilities, privileges, advantages, or accommodations of a place of public accommodation.

Barrier removals at buildings includes items such as the installation of ramps, widening of doorways, rearranging shelves and furniture, and accessible door hardware.

As defined in the Act, 'readily achievable' means easily accomplishable and able to be carried out without much difficulty or expense, as determined by factors such as:

1. The nature and cost of the action needed,
2. The overall financial resources of the site or sites involved in the action; the number of persons employed at the site; the effect on expenses and resources; legitimate safety requirements that are necessary for safe operation, including crime prevention measures; or the impact otherwise of the action upon the operation of the site,
3. The geographic separateness, and the administrative or fiscal relationship of the site or sites in question to any parent corporation or entity,
4. If applicable, the overall financial resources of any parent corporation or entity; the overall size of the parent corporation or entity with respect to the number of its employees; the number, type, and location of its facilities, and
5. If applicable, the type of operation or operations of any parent corporation or entity, including the composition, structure, and functions of the workforce of the parent corporation or entity.

Title III (Public Accommodations) of the ADA has no retroactive construction requirements. When work on an existing building occurs, however, 20% of the expenditures must be spent over a three-year period to provide an accessible path of travel. Once the 20% threshold has been reached, no additional funds need be spent to improve the accessible path of travel. However, future requirements for readily achievable barrier removal are only eliminated once the building is 100% accessible per new construction standards.

Efforts to coordinate the technical provisions of the ADA with those of the IEBC and other model codes continue. Given the often technical and practical difficulty of making existing buildings fully accessible, both the ADA and IEBC accept a lesser level of accessibility for existing buildings when compared to new construction. In the IEBC, the accessibility requirements are triggered when construction associated with an alteration, change of occupancy, or addition occurs. Also, accessibility requirements are identical in all compliance paths, and no accessibility requirements are triggered for projects classified as a repair, or for buildings undergoing a change of occupancy classification if no construction work is required or undertaken. However, ADA-established thresholds and requirements for removing barriers in places of public accommodation still apply.

The ADA includes exceptions for existing buildings when implementation would be **technically infeasible**, i.e., unable to be accomplished without moving a major structural element. For historic buildings, additional exceptions for site arrival points, accessible routes, entrances, and toilet facilities exist when compliance would threaten or destroy the historic significance of the property.

Fire Codes

The IFC is typically used to establish a minimum level of performance for building use and operations once construction is complete. Although there is overlap and coordination with the IBC and the IEBC, the IFC addresses a wider range of topics such as handling or the use of hazardous materials, treatment of vacant premises, indoor displays, ongoing maintenance of fire protection systems and features, fire protection water supply, and fire apparatus access roads.

Enforcement of the IFC begins with the issuance of an **occupancy permit** and is ongoing at a schedule set by the jurisdiction. Some jurisdictions use the IFC without adoption of other construction codes, while most use the IFC in conjunction with the IBC and/or NFPA 1 or NFPA 101. Inconsistencies in procedures or requirements can occur when the codes are not developed by the same organization. Enforcement of the IFC is most often assigned to the fire department, with potential overlap when the fire safety aspects of the building code are enforced by the building code official.

Figure 17. Metal ceilings commonly present code challenges when fire separation is required between different uses on the first and upper floors. Acceptable code solutions permitting retention may include the application of intumescent coatings, the addition of a sprinkler system, or the addition of fire-rated material above the ceiling, in which case the original metal ceilings can be salvaged and reinstalled or, if not possible, replaced with matching new ceiling tiles. Photo: Benton Henry

Although most requirements are not retroactive, some jurisdictions may enforce provisions from the chapters entitled "Fire Safety Requirements for Existing Buildings" and "Means of Egress." One of the many informational and optional appendices included in the IFC is the appendix *High-Rise Buildings – Retroactive Automatic Sprinkler Requirements*. The IFC overlaps with the scope of codes and standards published by the National Fire Protection Association, many of whose documents are included as reference standards in the IFC.

The administrative chapter, which may be modified by a jurisdiction, includes the following section on historic buildings which refers the user back to NFPA 914: "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 do not constitute a distinct hazard to life or property. Fire protection in designated historic buildings shall be provided with an approved fire protection plan as required in Section 1103.1.1."

Coordination with the *Secretary of the Interior's Standards for Rehabilitation*

Of the ten standards of the *Secretary of the Interior's Standards for Rehabilitation* (36 CFR 68, issued 1995), *Standards 2*, *5*, and *6* generally have the most impact on the use and application of building codes (the separate sets of standards for the treatments Preservation, Restoration, and Reconstruction have similar implications in the application of codes):

> *Standard 2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces and spatial relationships that characterize a property will be avoided.*
>
> *Standard 5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.*
>
> *Standard 6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.*

Additional guidance on code-required work and its impact on historic building features, spaces, materials, and finishes is included as separate sections in the *Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings* that accompany *The Secretary of the Interior's Standards for the Treatment of Historic Properties.*

Best Practice: Balancing Historic Preservation and Code Compliance

Optimizing code solutions for historic buildings requires coordination of the owner's program; code, architectural, and engineering requirements; and historic preservation goals. The following steps are recommended:

Step 1: Establish a Qualified Project Team

Step 2: Identify Historic Significance and Character-Defining Features

Step 3: Integrate Preservation Goals into Project Planning

Step 4: Select Optimal Code Compliance Path

Step 5: Coordinate with Building Code, Fire Code, and Historic Preservation Officials

Step 6: Adjust and Present Final Submission

Step 1: Establish a Qualified Project Team

The project team should be led by design professionals experienced in the planning of historic preservation projects and may include a historic preservation or code consultant. The team's familiarity and/or research on acceptable preservation practices, emerging materials and technologies, and innovative solutions can minimize identified conflicts. Early introduction of the full team to the project, ideally starting with the development of concept drawings and preliminary identification of character-defining features, provides the greatest likelihood that preservation-related concerns will be successfully integrated into the planning process and considered by all team members.

The team should work closely with the building and fire code officials to confirm applicable codes and ordinances, procedures, and special concerns of the jurisdiction, to learn of successful solutions from relevant projects, and determine whether additional requirements, including a Historic Building Report, would be required to support alternative solutions. The IFC deserves special attention as the requirements can be differently interpreted and enforced by the fire and building departments.

Step 2: Identify Historic Significance and Character-Defining Features

Evaluation of the historic significance of the property and identification of its character-defining features should be undertaken by a qualified design professional or historic preservation consultant. These features may be identified in documentation used for the historic designation, in a Historic Structure Report if one has been prepared, or in a building survey undertaken as part of the project planning. The National Park Service's *Preservation Brief 17: Architectural Character—Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving their Character* and *Preservation Brief 18: Rehabilitating Interiors in Historic Buildings: Identifying and Preserving Character-Defining Elements* and other Preservation Briefs and guidance on building interiors can assist in the identification and treatment of character-defining features. Local and state preservation officials can also be of assistance. Conflicts between code requirements and historic preservation goals can best be resolved by early identification and consideration in the project's early design and planning stages.

Step 3: Integrate Preservation Goals into Project Planning

Planning and detailing code-related work must strive to protect a building's historic character, by avoiding or minimizing alterations of significant historic spaces, architectural features, and materials. The appropriate treatment of historic buildings is guided by

the *Secretary of the Interior's Standards for Rehabilitation*, which are widely used and adopted at the Federal, state, and local levels. Many jurisdictions have adopted alternate language based on the Standards.

Design and treatment decisions should be made on a case-by-case basis in consideration of the relative importance of the building's historic character-defining features, including previous alterations that have acquired historic significance. Existing conditions must also be evaluated and documented, anticipating that certain conditions may only be discovered during construction. This requires adequate research from the project team at the onset of the project so that design and system options that meet the Standards can be explored. Some solutions may also require custom details or materials. Achieving a design that meets the Standards and complies with applicable codes requires flexibility, as multiple iterations and/or refinements may be necessary before arriving at the final design.

Step 4: Select Optimal Code Compliance Path and Alternatives

Experienced design professionals and building code officials may be able to anticipate the compliance method most appropriate to a particular project. For example, the IEBC's Performance Compliance Method can work well on "Main Street" projects involving older, small-scale commercial buildings, while the law-in-existence path may be suitable to more recently constructed historic buildings. The Work Area Compliance Method allows the retention of features such as historic transoms, interior finishes, stairway railings, windows, doors, and glazing, although in some cases a sprinkler system may be required. Given that each project is unique relative to its construction, occupancy classification, program, condition, and extent of character-defining features present, evaluating multiple compliance paths may be necessary to find the optimal solution.

The Work Area Compliance Method is the only path that may require a Historic Building Report. This report, or a preservation official's written confirmation of historic designation or identification of character-defining features, can also serve as supporting documentation regardless of compliance path.

Step 5: Coordinate with Building Code, Fire Code, and Historic Preservation Officials

Once character-defining features and conflicting code requirements have been identified, coordination should begin with building code and historic preservation officials. A preliminary meeting attended by both parties will allow early discussions of any specific project concerns, including identification of successful solutions from similar projects, direction for further investigations, and clarity on where code flexibility may be possible. In some cases, the initial meeting may determine that input from a higher-ranking code official or a waiver or variance will be required.

Coordinating review and approvals on time-sensitive projects can be an additional challenge when reviews by different departments are required for various code compliance issues such as fire and building for construction-related matters, in addition to planning and zoning approvals required for historic preservation or design review.

Step 6: Adjust and Present Final Submission.

Submission requirements vary widely by agency and jurisdiction. In addition to providing all required and requested information, the final submission to the building code official must clearly document all aspects of the project, including where alternates and equivalencies are presented. A supplemental report based on the format and content of the report specified in the Work Area Compliance Method can be a useful supplement to the materials submitted to the building code official.

Figure 18. The building code review for this mixed-use building in Monroe, WI, included a comparison of requirements established by application of the three compliance Methods of the IEBC. In lieu of a sprinkler system, the Performance Compliance Method permitted the use of other fire and life safety features. Photo: Chris Rute

Historic Building Code Report

When using the Historic Building chapter as part of the Work Area Compliance Method of the IEBC, the building code official may require the submission of a Historic Building Code Report to document the basis for acceptance of alternatives.

For projects where other compliance paths do not allow character-defining features to be retained, the Report can be used to "demonstrate how the intent of these provisions is complied with in providing an equivalent level of safety." To establish equivalency, the first administrative chapter of the IEBC, and most jurisdictional codes based on the IEBC, includes a section titled "Alternative materials, design and methods of construction, and equipment," similar to the text included in the IECC and IRC.

The building code official may request supporting research, such as test reports from approved sources, or other tests to establish equivalency. For items related to fire-resistance, Resource A of the IEBC, *Guidelines on Fire Ratings of Archaic Materials and Assemblies*, is an invaluable tool for establishing fire-resistance ratings of older materials and systems not typically found in the modern codes.

The requirement for the Report and confirmation of the required content should be reviewed with the building code official in advance. In the IEBC, the Report is prepared by a **design professional** and may include the following components, as required in previous editions of the IEBC.

1. Identification of the specific provisions of the Historic Buildings chapter applicable to the proposed work.
2. Discussion of how compliance with provisions of other IEBC chapters would damage character-defining features.
3. For buildings of Seismic Design Category D, E, F, a structural evaluation and identification of any strengths or weaknesses of vertical and horizontal elements of the lateral force-resisting system is required.
4. For character-defining features unable to be preserved using the Historic Buildings chapter, alternative solutions providing equivalent levels of safety can be presented following the code's administrative requirements of Chapter 1, which may differ depending on jurisdiction.

The content of the Report can be included in the code analysis that establishes a project's existing conditions and design parameters. Incorporating the Report in the construction drawings increases the likelihood of future discovery as part of a project's permanent record and communicates the project's historic preservation goals to the contractor and trades undertaking the work. A sample format for the Report is shown in Figure 19.

In the 2024 edition of the IEBC, the code official cannot require a Report for Level 1 alterations unless the proposed work makes the building less compliant with the provisions of the IBC. Where a Report is required by the code official, it must document unsafe conditions, address the structural components per Number 3 above, and describe any components of the building providing a level of safety below that of existing nonhistoric buildings.

Historic Building Report Format

	TITLE	SUMMARY
1	Code Analysis	Identification of applicable codes and selected code compliance method, construction, and occupancy classifications; building description (size, height, construction materials, etc.); and additional key code requirements.
2	Summary of Chapter 3 Requirements	Identification of applicable requirements associated with structural design, accessibility, smoke alarms and carbon monoxide detection, and exterior wall coverings.
2	Code Conflicts with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (or *Standards for Rehabilitation* or other applicable or adopted historic preservation standards)	Identification of specific code provisions damaging to character-defining features (termed "contributing features" in the IEBC).
3	Conflicts resolved by Historic Building Provisions of the IEBC (Work Area Compliance Method only)	Identification of features compliant with Historic Building Provisions.
4	Seismic Evaluation	As required by Chapter 3 and modified by selected compliance path.
5	Conflicts Unresolved by Historic Building Provisions	Proposed Modifications, Alternatives, and Equivalencies, following requirements of Chapter 1.
6	Photographs	Overall and close-up views as required to depict character-defining features.
7	Existing and Proposed Drawings	Floor plans and/or elevations, depending on the scope of project. Information, and seal of design professional as required by jurisdiction.

Figure 19. Sample report format (IEBC, Chapter 12).

Modifications, Alternatives, and Equivalencies

Code Section	Text
IEBC 104.23 Alternative materials, design and methods of construction, and equipment	*The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative is not specifically prohibited by this code and has been approved. Exception: Performance-based alternative materials, designs or methods of construction and equipment complying with the ICC Performance Code. This exception shall not apply to alternative structural materials or to alternative structural designs.*
IEBC 104.2.3.4 Equivalency criteria	*An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in the code with respect to all of the following, as applicable: 1. Quality. 2. Strength 3. Effectiveness. 4. Durability. 5. Safety, other than fire safety. 6. Fire safety.*
IEBC 104.24 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, provided that the code official shall first find that one or more special individual reasons makes the strict letter of this code impractical, and that the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, accessibility, life and fire safety, or structural requirements. The details of the written request for and action granting modifications shall be recorded and entered in the files of the Department of Building Safety.*

Figure 20. Alternate solutions accepted by the building code official as meeting the intent of the code are permitted in all codes to allow the use of new technologies and non-specified materials or designs.

Figure 21. The photograph on the right illustrates partial deployment of vertical fire curtains activated as part of a fire alarm and detection system. In this installation, a combination of fixed glazing and smoke curtains to separate the open corridors from the multi-story atrium permitted the stunning historic atrium space to remain largely unaltered and the corridors to be included in the building's egress calculations in meeting code requirements. Photo: Higgins Quasebarth & Partners, LLC

Summary

Successful application of code requirements in a manner that is sympathetic to historic buildings and their character-defining features, spaces, materials, and finishes is essential for their long-term preservation and viability. Historic buildings must respond to current performance requirements for accessibility, fire and structural safety, and energy conservation, as well as emerging requirements addressing protection from natural disasters and resilience.

The last two decades have brought tremendous advancements in how the model codes address historic buildings. Unique codes, special code provisions, and new compliance paths are now available, although updates and refinements will continue. Future editions of the construction and fire prevention codes may result in easier application to the single historic building project, although such advancements are unlikely to reach the ease of navigating codes for new construction. Instead, achieving success in the interplay of historic

preservation and health and public safety goals will always rely on the collaborative application of experience, knowledge, and creativity of the project team working with the building and fire code officials.

Glossary

Addition (IEBC). "An extension or increase in floor area or height of a building or structure."

Alteration (IEBC). "Any construction or renovation to an existing structure other than a repair or addition."

Appeal. A process by which the decision of the building code official can be presented to higher-ranking staff or an independent body for review and possible reversal or modification.

Approved (IEBC). "Acceptable to the code official."

Authority Having Jurisdiction. See building code official.

Building Code. A document establishing the minimum standards for construction materials and methods that are permitted for construction.

Building Code Official. The governmental unit, agency officer, or other designated authority responsible for code administration and enforcement. Alternate terms can be "building official," "code official," "code enforcement official," and "authority having jurisdiction."

Building Permit. Document issued by the jurisdiction certifying a proposed project's compliance with applicable codes and other laws.

Certificate of Completion. Document issued by design professional or other inspector attesting that a project has been executed and accepted as being constructed in accordance with all requirements.

Certificate of Occupancy. Document issued by the jurisdiction certifying a building's compliance with applicable codes and other laws, indicating it to be in a condition suitable for occupancy.

Change of Occupancy. A change from one specific occupancy classification to another occupancy classification. A change of use is a change within one occupancy classification.

Character-Defining Features. The historic features and defining characteristics of a historic building that are illustrative of a type, period, and/or style of architecture and establish the building's historic and visual character. Historic building rehabilitations should not change, obscure, damage or destroy distinctive materials, features, spaces, or spatial relationships. See the National Park Service's *Preservation Brief 17: Architectural Character: Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving their Character* and *Preservation Brief 18: Rehabilitating Interiors in Historic Buildings: Identifying and Preserving Character-Defining Elements* and other guidance for more information.

Compartmentation. Division of a building into compartments for fire risk management to contain a fire within a specific section of a building and limit the passage of flames and smoke. A compartment is defined by its fire-resistant materials including fire doors and other barriers.

Construction Classification. The code's classification of a building or space based on the fire-resistance ratings of the construction elements, used to establish minimum construction requirements. For fire safety, buildings are classified from least safe, such as constructed with dimensional wood framing, to the safest, i.e., concrete construction.

Construction Documents. Written and graphic documentation describing the design, location, and physical characteristics of a project's elements necessary to guide construction and obtain a building permit.

De Minimis. A legal term for slight variations or tolerances from a requirement with no meaningful impact on performance.

Design Professional. An individual, including an architect or engineer, who is registered or licensed to practice their respective design profession as defined by the professional registration laws of a state or jurisdiction.

Distinct Fire Hazard. A condition that diminishes the level of fire safety, life safety, or property protection of a structure to an unacceptable level as deemed by the local code or fire official.

Egress. The path an occupant follows to leave a building or room. See means of egress.

Equivalent or Equivalency. Alternate materials, equipment, or devices to those specified in a particular code that will meet its established performance standards.

Existing Building (IEBC). "A building erected prior to the date of adoption of the appropriate code or one for which a legal building permit has been issued."

Existing Structure. For application of provisions in flood hazard areas, a building or structure for which the start of construction commenced before the effective date of the community's first flood plain management code, ordinance, or standard.

Exit. Components of a means of egress between exit access and exit discharge, including exterior exit doors at the level of exit discharge, interior exit stairway and ramps, exit passageways, exterior exit stairways and ramps, and horizontal exits.

Fire Alarm System (ICC). "A system or portion of a combination system consisting of components and circuits arranged to monitor and annunciate the status of fire alarm or supervisory signal-initiating devices and to initiate the appropriate response to those signals."

Fire Code. A document establishing the minimum standards for fire safety for construction, rehabilitation, and ongoing operations.

Fire Code Official. The governmental unit, agency officer, or other designated authority responsible for administration and enforcement of the fire code. Alternate term to "fire prevention code official" and "authority having jurisdiction."

Fire Protection System (ICC). "Approved devices, equipment and systems or combinations of systems used to detect a fire, activate an alarm, extinguish or control a fire, control or manage smoke and products of a fire or any combination thereof."

Fire-Resistance Rating (ICC). "The period of time a building element, component, or assembly maintains the ability to confine a fire, continues to perform a given structural function, or both, as determined by the tests, or the methods based on tests, prescribed in Section 703."

Fire Suppression System. An automatic system used to extinguish, control, or prevent a fire from occurring or spreading. The system includes a method of early detection of a fire through heat, smoke, and other warning signals, a supply of water or other substance that is discharged through an integrated system of piping, and additional operating equipment. While water-based systems are most common, including water mist systems that use water droplets and require a separate pressure source, systems may also use gaseous or chemical agents. Most standards for the many types of systems available are published by the National Fire Protection Association.

Flood Hazard Areas (IEBC). "The greater of the following two areas:

1. The area within a flood plain subject to a 1-percent or greater chance of flooding in any year.

2. The area designated as a flood hazard area on a community's flood hazard map, or otherwise legally designated."

Grandfathered. A code provision in which existing conditions are permitted to remain and are not required to meet current code.

Higher Hazard Seismic Area. Based on maps by U.S. Geological Survey or others, areas that are more likely prone to earthquake hazards.

Historic Building (IEBC). "Any building or structure that is one or more of the following:

1. Listed, or certified as eligible for listing, by the State Historic Preservation Officer or the Keeper of the National Register of Historic Places, in the National Register of Historic Places.

2. Designated as historic under an applicable state or local law.

3. Certified as a contributing resource within a National Register, state designated, or locally designated historic district."

Historic Building Code Report. See Report.

Intumescent Fire-Resistant Coatings (ICC). "Thin film liquid mixture applied to substrates by brush, roller, spray, or trowel which expands into a protective foamed layer to provide fire-resistant protection of the substrates when exposed to flame or intense heat."

Live Load (ICC). "A load produced by the use and occupancy of the building or other structure that does not include construction or environmental loads such as wind load, snow load, rain load, earthquake load, flood load or dead load."

Means of Egress (ICC). "A continuous and unobstructed path of vertical and horizontal egress travel from any occupied portion of a building or structure to a public way. A means of egress consists of three separate and distinct parts: the exit access, the exit, and the exit discharge."

Figure 22. Within the family of codes published by the International Code Council (ICC), the International Existing Building Code (IEBC) provides the most flexibility for historic and existing buildings. Photo: International Code Council

Model Code. Code written for building construction developed and maintained by a code standards organization and available for adoption by a jurisdiction. Model codes are adopted as published or with modifications.

National Register of Historic Places. The official list of the nation's historic places worthy of preservation, authorized by the National Historic Preservation Act of 1966. The National Register is maintained by the National Park Service as part of a national preservation program to coordinate and support public and private efforts to identify, evaluate, and protect America's historic and cultural resources.

Occupancy. The purpose or activity for which a building or space is designed or intended to be used. Occupancies are further subclassified according to their group.

Occupancy Classification. A classification determined by the code used to establish minimum construction-related requirements. Higher-hazard occupancies such as warehouses storing paint, furniture, or paper; barns; pulp and paper mills, etc., typically require the inclusion of more fire protection features.

Operational Features. Non-built features that contribute to life safety and property protection through the creation and enforcement of policy regulating how a building is to be used and maintained. Examples include a limitation on the number of persons permitted to occupy a space to address floor load capacity or visitation led by docents familiar with the building in the case of museums with egress limitations.

Performance Based. A code or code provision that establishes an overall performance goal for a building component or system, permitting the goal to be achieved in ways presented by the design professional and approved by the code official. Performance-based codes are considered to have greater flexibility, permit the use of new technology and materials, and address the unusual conditions provided by existing buildings.

Performance Compliance Method. One of the compliance methods in the IEBC, using a quantitative method for evaluating existing and acceptable risk.

Permit. An official document or certificate issued by a building or fire department authorizing performance of a specified activity, such as a Building Permit, Certificate of Completion of a construction project, or Certificate of Occupancy.

Prescriptive Based. A code or code provision that requires each building component to be built to a certain standard, e.g., a one-hour fire-rated wall, or 36-inch stair width.

Prescriptive Compliance Method. One of the compliance methods in the IEBC, most like the approach of the codes for new construction.

Preservation (NPS). One of the four established treatments of historic properties under the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, defined as "the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property." Work, including preliminary measures to protect and stabilize a property, generally focuses on the ongoing maintenance and repair of historic materials and features rather than extensive replacement or new construction. New exterior additions are not within the scope of this treatment (see Rehabilitation); however, the limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.

Public Assembly. Buildings or spaces designed or occupied for gatherings such as civic, social, recreation, or religious functions, as well as food or drink consumption. Depending on the jurisdiction, an occupant load as small as 50 persons can be defined as a public assembly.

Reconstruction (NPS). One of the four established treatments of historic properties under the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, defined as, "the act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period in time and in its historic location."

Reference Standard. An adopted technical document, developed by an industry organization and/or professional association, establishing supplemental criteria for minimum quality and performance for the design, manufacture, testing or installation of a material, product, or assembly. Unless noted as included for informational purposes only, a reference standard is an enforceable extension of the code.

Rehabilitation (NPS). One of the four established treatments of historic properties under the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, defined as "the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values." The *Standards for Rehabilitation* are the most commonly used and adopted of the four sets of *Standards*, along with associated guidelines and other related guidance issued by the National Park Service (NPS). The 1990 version of the *Standards for Rehabilitation* is used to determine if a project qualifies as "a certified rehabilitation" under the Federal Historic Preservation Tax Incentives program.

Rehabilitation (IEBC). "Any work, as described by the categories of work defined herein, undertaken in an existing building."

Relocatable Building (IEBC). "A partially or completely assembled building constructed and designed to be reused multiple times and transported to different building sites."

Repair (IEBC). "The reconstruction, replacement or renewal of any part of an existing building for the purpose of its maintenance or to correct damage."

Report. In the context of the Historic Buildings Chapter of the IEBC, a historic building code report establishes the basis and requirements for using this chapter when required by the building code official.

Restoration (NPS). One of the four established treatments of historic properties under the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, defined as "the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period in time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period." The limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional as appropriate with a restoration period.

Retroactive. Building-related conditions that must be brought to current code regardless of whether a construction project is proposed. Retroactive requirements are generally limited, as most conditions that were lawfully constructed are permitted to remain. See Grandfathered.

Seismic Design Category (ICC). "A classification assigned to a structure based on its risk category and the severity of the design earthquake ground motion at the site."

Seismic Forces (IEBC). "The loads, forces, and requirements prescribed herein, related to the response of the building to earthquake motions, to be used in the analysis and design of the structure and its components. Seismic forces are considered either full or reduced, as provided in Chapter 3."

State Historic Preservation Officer. As established in the National Historic Preservation Act of 1966, the appointed official and office in each of the 59 states, territories, and the District of Columbia responsible for Federal and state historic preservation activities including maintaining historic registers, review of projects for Federal Section 106 compliance and the Historic Tax Credit program, and related programs supporting historic preservation.

Substantial Damage (IEBC). "For the purpose of determining compliance with the flood provisions of this code, damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred."

Substantial Improvement (IEBC). "For the purpose of determining compliance with the flood provisions of this code, any repair, alteration, addition, or improvement of a building or structure, the cost of which equals or exceeds 50 percent of the market value of the structure, before the improvement or repair is started. If the structure has sustained substantial damage, any repairs are considered substantial improvement regardless of the actual repair work performed. As used in the IEBC, the term does not, however, include either of the following:

1. Any project for improvement of a building required to correct existing health, sanitary, or safety code violations identified by the code official and that is the minimum necessary to ensure safe living conditions.

2. Any alteration of a historic structure, provided that the alteration will not preclude the structure's continued designation as a historic structure."

Substantial Structural Alteration (IEBC). "An alteration in which the gravity load-carrying structural elements altered within a 5-year period support more than 30 percent of the total floor and roof area of the building or structure. The areas to be counted toward the 30 percent shall include mezzanines, penthouses, and in-filled courts and shafts tributary to the altered structural elements."

Technically Infeasible. As used in the *Accessibility Standards*, an alteration that has little likelihood of being accomplished because the existing structural conditions require the removal or alteration of a load-bearing member that is an essential part of the structural frame; or because other existing physical or site constraints prohibit modification or addition of elements, spaces or features which are in full and strict compliance with the minimum requirements for new construction and which are necessary to provide accessibility.

Tolerances. An allowable deviation from dimensional requirements of the code that will have insignificant impact on safety and performance.

Unsafe (IEBC). "Buildings, structures or equipment that are unsanitary, or that are deficient due to inadequate means of egress facilities, inadequate light and ventilation, or that constitute a fire hazard, or in which the structure or individual structural members meet the definition of 'Dangerous,' or that are otherwise dangerous to human life or the public welfare, or that involve illegal or improper occupancy or inadequate maintenance shall be deemed unsafe. A vacant structure that is not secured against entry shall be deemed unsafe."

Variance. A regulatory process by which an applicant can request permission to deviate from the code provisions.

Waiver. See **Variance**.

Work Area (IEBC). "That portion or portions of a building consisting of all reconfigured space as indicated on the construction documents. Work area excludes portions of the building where incidental work entailed by the intended work must be performed and portions of the building where work not initially intended by the owner is specifically required by this code."

Work Area Compliance Method. One of the compliance methods in the IEBC; it includes the most provisions specific to historic buildings.

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This publication and other sets of NPS guidelines, related guidance, and technical preservation information are available from the Technical Preservation Services website at https://www.nps.gov/tps/index.htm.

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Front cover image: Davenport Hotel, Spokane, WA. Photo: Nicholas Vann.

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