



Loss Control TIPS

Technical Information Paper Series

Innovative Safety and Health SolutionsSM

Building Codes: An Introduction and Overview

History of Building Codes

Building codes have a history that dates back to the 19th century BC. The Code of Hammurabi (King Hammurabi, 1955-1913 BC, Babylon) provided requirements that took building integrity very seriously. This code described the building process, but more importantly, provided a powerful disincentive for putting up buildings prone to collapse. If a building collapses, the code says "the architect is to be put to death if the owner is killed by accident; and the architect's son if the son of the owner loses his life."

Building codes continued to evolve through Roman times, into England and Europe, and finally into Colonial America. Through the periods of change, major catastrophes involving large scale property damage and high loss of life were the driving forces behind building code development. We are all familiar with the story of Mrs. O'Leary's cow and the Great Chicago Fire, but this was only one event that kept the development of the building code alive. Collapses from wind forces, snow loads, earthquakes, floods, and a variety of natural and human-caused events forced building codes to evolve.

Today, building codes are highly developed, and important to the safety of the structure. Throughout the country, building codes and standards are the primary means by which building construction is regulated, thereby assuring the health and safety of the general public within the built environment. Federal, state, and local governments have adopted various rules which specify minimum requirements that apply to building construction.

Model Building Codes

Model building codes are technical documents written by members of the code organizations and made available for adoption by state and local jurisdictions. Most state and local building codes in the United States are based on one of the following model codes:

1. The *Standard Building Code*, used in most of the Southeastern states
2. The *National Building Code* (BOCA), used in most of the Central and Northeast states
3. The *Uniform Building Code*, used in most states west of the Mississippi River
4. The *One and Two Family Dwelling Code* and *Model Energy Code*, which regulate residential construction and energy conservation in buildings.



These model codes publish several other codes that provide the guidelines for mechanical, plumbing, and residential waste disposal systems.

Each of the model codes described above are published every three years. Code change hearings are conducted on an annual basis. The code process typically involves an initial public hearing before appointed committees, a final public hearing before a general membership body, and balloting on each contested change.

Other Codes and Standards

A number of other codes and standards that are designed to address specific hazards are adopted directly by the state or local governments or are referenced in the model codes. The National Fire Protection Association (NFPA) publishes the *National Electric Code*, the *National Fuel Gas Code*, and the *Flammable and Combustible Liquids Codes*, as well as many others. The model codes also use NFPA as well as a number of other reference standards that are developed by independent organizations. The most commonly referenced ones are the American Society of Civil Engineers (ASCE), the American Institute of Steel Construction (AISC), the National Concrete Masonry Association (NCMA), and the American Concrete Institute (ACI).

Model Code Adoption

Building Codes are regulations, ordinances, or statutory requirements of the governmental unit relating to building construction and occupancy. They are developed, adopted and administered for the protection of public health, safety and welfare. They are the minimum, legal requirements for most types of construction. Each state usually has a building code. Most states adopt one of the Model Codes, and may allow changes at the local level.

Some states adopt a uniform, statewide building code, while others delegate code adoption to counties and municipalities within the state. In either case, enforcement of these requirements occurs at the local level.

State building code laws typically establish one or both of the following features in their adoption of a building code: Uniformity and/or Mandatory.

Uniformity in the local building codes provides the state with the benefits of homogeneity within all of the local building codes throughout the state. This incorporates the efficiency of a single set of technical requirements to be administered in each community. Architects, engineers, and contractors do not need to design multiple sets of documents to satisfy local code criteria.

Mandatory requires that every jurisdiction adopt a building code. A mandatory code applies to every building in the state. This allows for the protective benefits of a building code to both rural and urban locales. However, in this method, there is no homogeneity. This can be a nightmare for contractors and designers working in the state.

Most state code systems currently fall within one of these four model features:

A **Uniform Statewide Code System** requires that a code adopted by the state be used by jurisdictions who choose to enforce a building code, but it is not mandatory that jurisdictions adopt or enforce any code.

A ***Mandatory Statewide Code System*** gives the local jurisdiction the authority to amend the state code to suit local conditions. However, this local flexibility sacrifices uniformity. To minimize the potential negative impact of this flexibility, local amendments are usually required to be more stringent than the state code.

A ***Uniform Mandatory Statewide Code System*** sets forth requirements that cannot be amended at the local jurisdiction. All jurisdictions must adopt and enforce the same building code. Most states utilizing this system provide training, technical support, product evaluation, and appeals.

A ***Limited Statewide Code System*** specifies that the state code only applies to certain types of buildings. Of the states using this system, some require code compliance for state-owned buildings, while some require code compliance for buildings used for certain purposes (e.g., public assembly, schools, hospitals). Several states combine this system with the Uniform Statewide Code, mandating state code compliance for all state owned buildings and, in jurisdictions that choose to adopt it, for all buildings.

Only five states (Arizona, Colorado, Illinois, Maine, and Pennsylvania) do not use any of these models, and defer all building code issues to the local jurisdiction within the state. Some local jurisdictions choose to adopt or enforce certain codes, while others do not.

The differences in the codes and the various methods of code adoption can cause confusion, especially for architects, designers and contractors who work in more than one state. To attempt to alleviate this problem, there is a movement to develop one model code to replace the three existing regional model codes. This single model code is scheduled to be developed and voted on by the members of the code adoption committees.

There is also a movement to have a model code mandatory and uniformly adopted by each state and jurisdiction in North America. As you might expect, this effort is meeting with resistance from those having a vested interest in maintaining separate codes. There is, however, a grass-roots effort being made to establish one code, and progress is being made. It will be interesting to see where this will go by the end of this decade.

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