

Building Code Resources

The Benefits of Statewide Building Codes



Definition of a Building Code

A building code is the minimum acceptable standard used to regulate the design, construction, and maintenance of buildings for the purpose of protecting the health, safety and general welfare of the building's users.

A Short History of Building Codes

Building codes have been around in some form for thousands of years. In 2000 B.C., the code of Hammurabi dictated that if a dwelling collapsed and caused the death of the owner, the builder would be put to death.

The Roman Empire instituted building codes after fatal building collapses, and a great fire that destroyed 15,000 buildings in 1666 led to the development of London's early building codes.

In the United States, the great Chicago fire killed 250 people, destroyed 17,000 structures and left nearly 100,000 people homeless in 1871. Four years later, that city enacted a new building code and fire-prevention ordinance.

As is often the case, building codes were the after-

thought of tragedy rather than forethought for prevention. As cities grew and experienced their own disasters, building codes were developed based on individual experiences more than scientific knowledge.

In 1905, the first nationally recognized U.S. building code was established. Much of this code regulated the type of building components that could be used in construction and did not allow for newly developed materials.

Modern building codes are steeped in established scientific and engineering principles that have been thoroughly tested. This allows for the reliance on measurable performance rather than the rigid specification of materials and methods. Over the centuries, building codes have evolved from regulations stemming from tragic experiences to standards designed to prevent them.

Benefits of State Building Codes

The purpose of building codes is to construct safe buildings, thereby reducing deaths, injuries and property damage. The codes regulate the design, construction and maintenance of buildings. Statewide adoption and enforcement of such codes result in consistent design and construction of safer buildings.

Building homes and businesses to the requirements of modern codes such as the International Building Code (IBC) and the International Residential Code (IRC) can result in safety from a wide variety of dangers including fire damage, water damage, electrocution, and natural hazards (windstorms, wildfire, flooding, freezing weather and earthquakes).

Cost-benefit studies have been conducted for wind and seismic code provisions, both individually and as a group. Every \$1 spent saves society (individuals, states and communities) an average of \$4 in future reduced losses, according to the Multi-hazard Mitigation Council (MHMC) of the National Institute of Building Sciences. The savings will increase up to \$16 when these hazards are addressed through groups of code requirements.

Current Model Building Codes

In 1994, three code organizations merged to form the International Code Council (ICC). It released its first set of codes in 2000. As a result of new code development and the merger many states are in the process of examining or updating their existing codes. The Institute for Business & Home Safety (IBHS) provides technical expertise and input through its staff engineers and has produced resource material summarizing the status of code adoption across the country at www.DisasterSafety.org.

The National Fire Protection Association (NFPA) also is a major player in the development of codes and their fire and electrical building codes are widely used throughout the United States.

The Problem with Variations in Building Codes

State standards for construction and code-related inspection and enforcement vary widely across the country. Some statewide building codes are applicable to virtually every type of structure (residential, commercial, industrial, public, schools, hospitals, and farm buildings), while others employ lesser degrees of regulation and code applicability – or none at all.

Where statewide codes exist, it is not uncommon to allow individual jurisdictions (e.g., cities of a particular class or counties) to deviate from the state standard, often resulting in a weakening of the model

minimum code. IBHS works through research and partnership to alert local and state officials to the dangers of watering down the code.

Another disturbing practice is the tendency to broadly adopt commercial building codes while excluding one-and two-family homes. This is another practice discouraged by IBHS.

In areas where no statewide code exists, such as Missouri, cities often choose to adopt and enforce building codes to govern both commercial and residential construction.

This trend may be less likely in outlying suburban or rural areas with smaller budgets. It is, however, important to note that these areas also have seen the bulk of new residential development in recent years. The combination of concentrated residential construction and lack of codes (or code enforcement) opens the door to a lack of quality control. This could have a broad impact on how these buildings will perform especially in natural disasters.

Why is it Important to Adopt a Code without Weakening Amendments?

Statewide building codes -- and adequate enforcement of those codes -- play a vital role in public safety and loss prevention. In addition to saving lives and reducing property loss, codes based on nationally recognized models can:

- reduce the need for public disaster aid;
- promote consistent guidelines for design professionals, suppliers and builders;
- create a minimum standard upon which consumers can rely; and
- contribute to the durability of structures.

Model building codes may require amendments to meet the particular administrative needs and requirements of the governing community. However, substantive content addressing design, construction or performance standards within these codes should remain untouched to ensure that minimum safety and performance are met. Leading experts in the fields of science, engineering and building construction have developed the minimum standards to ensure safe and predictable building performance.

When technical content in local codes deviates from

the standard, it should be allowed only to strengthen, rather than relax, code provisions. While local governments and the building industry may voice objections to codes (often on the asserted basis of cost), consumers, communities and builders clearly enjoy long-term benefits from effective building codes. Studies show that the costs of code enforcement may be offset by approaches such as sharing building departments between several smaller municipalities or between a city and county. This concept is similar to environmental and energy benefits a consumer sees when purchasing a more efficient air-conditioning system or more thermally efficient windows.

Federal Government

The Federal Emergency Management Agency (FEMA) supports the adoption and enforcement, without amendments, of disaster-resistant building codes, which they regard as a cornerstone of effective mitigation. FEMA realizes it is an inefficient expenditure of taxpayer dollars to respond to disasters that could have been avoided with the adoption of the International Building and Residential Codes (I-Codes).

The government support of these codes means that their provisions:

- meet the minimum requirements of the National Flood Insurance Program (NFIP);
- are substantially equivalent for seismic design to the 2000 or 2003 editions of the National Earthquake Hazard Reduction Program (NEHRP) Recommended Provisions for New Buildings and Other Structures published by FEMA;
- and reflect the current state-of-the-art engineering requirements for wind, such as those found in the 2005 edition of the ASCE 7 standard.

Currently, the 2006 edition of the I-Codes and the 2003 NFPA 5000 Building Construction and Safety Code meet these criteria.

NEHRP, Executive Order (E.O.) 12699 requires that all new construction of federally owned, leased, regulated, or assisted buildings must be designed and constructed using a building code that meets a specific criterion. This criterion states that federal agencies are permitted to

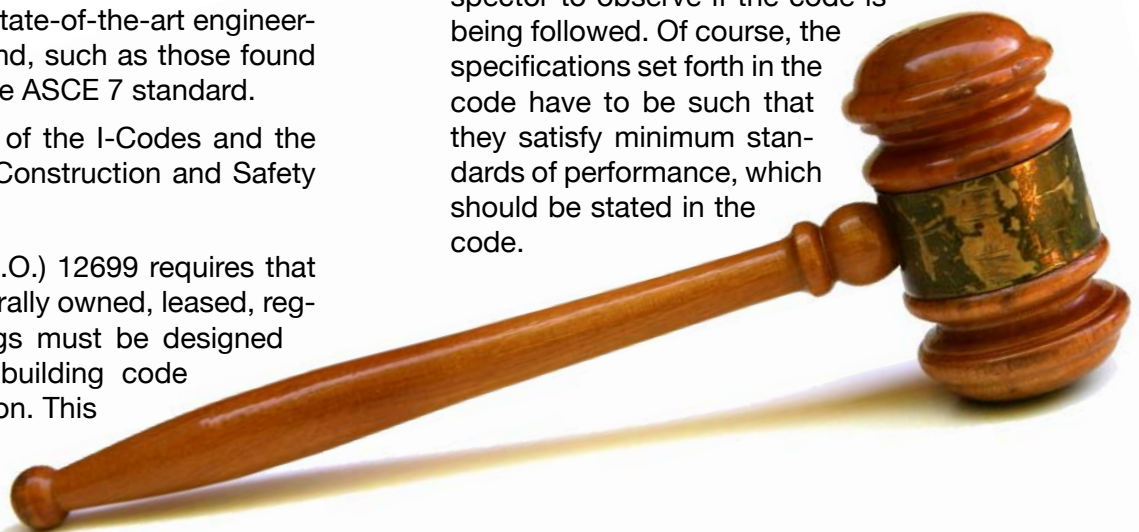
use only those model building codes that have been determined to be substantially equivalent to a recognized seismic standard. At this time, the 2003 and 2006 I-Codes and the 2003 NFPA 5000 meet that criterion.

Federal guidelines that govern building, funding and other types of support surrounding construction require compliance with the intent of the codes without amendment. Communities that choose to use weakened amended versions of modern building codes may be subject to less federal funding for pre- and post-disaster mitigation.

Performance vs. Prescriptive Codes

Typically two classes of codes are employed:

- Codes are classified as “performance codes” if they require the completed construction to satisfy specified standards (such as 120 mph winds) without describing in detail how to accomplish the task. “Prescriptive codes” require that certain materials be used and describe how to build in some detail (e.g., use 8d nails). There are also variations that combine elements of performance and prescriptive codes.
- Performance codes allow the designer and builder to use any combination of materials and methods that will satisfy the requirements for the code. Such codes allow wide latitude, and some say this makes them more difficult to enforce. A plan reviewer or inspector may require additional information to determine how the combinations of materials and methods in a set of specifications will perform. Prescriptive codes by their nature enable the plan reviewer and inspector to observe if the code is being followed. Of course, the specifications set forth in the code have to be such that they satisfy minimum standards of performance, which should be stated in the code.



Enforcement is Critical

Good building codes have little value if they are not enforced. Independent studies of damage following Hurricane Andrew and the Northridge Earthquake revealed that lax code enforcement needlessly increased total damage.

Building codes are generally enforced at the local level. These departments are often funded by permit fees, which average less than one percent of construction costs. Plan reviewers and building inspectors are vital to the success of building codes. Unless these functions are adequately funded and staffed with qualified, trained, tested and certified personnel, the full value of building codes will not be realized.

Building Code Effectiveness Grading Schedule (BCEGS)

IBHS worked with the Insurance Services Office (ISO) in the development of a program where the enforcement capacity of a jurisdiction could be evaluated. ISO collects information related to personnel qualification and continuing education as well as number of inspections performed per day. This type of information, combined with local building codes, is used to determine a grade for that jurisdiction at the time of the evaluation. The grades range from 0 to 9 with the lower grade being more ideal. Information about the factors that contributed to the overall score can also be obtained through ISO. Insurers can use BCEGS for policyholder credits, based on the performance of a jurisdiction and the building code being enforced.

Summary

Building codes are the minimal standards to which buildings are constructed throughout the country, and they are instituted to ensure the safety and health of building occupants. Stronger codes are more cost-effective in the long run, and to be effective they must be enforced by qualified personnel, who are properly trained, to ensure that the approved standard is met for the minimal safety and performance of a building.

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4775 East Fowler Avenue, Tampa, FL 33617 • (813) 286-3400

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