



Model Code Primer

To understand the confusing patchwork of local codes, start by examining the uniform world of model codes

by Steve Carlson

In the 18th century B.C., the Babylonian King Hammurabi adopted a building code that was direct and easy to understand: If a house fell down and killed its occupant, the builder would be put to death.

Modern codes are less severe, but they are also more difficult to decipher. In most states and localities, codes are lengthy documents, covering in minute detail materials and practices for construction, mechanical systems, plumbing, fire safety, and in some cases energy conservation.

Despite many efforts over the years to consolidate them, the codes throughout the country's states, counties, and municipalities are still far from uniform. A product or practice that is "code approved" in one jurisdiction is not necessarily acceptable somewhere else.

Who Writes the Codes?

The codes are naturally complex, since the issues involved in writing them are complex and often politically sensitive. New building materials and techniques are regularly introduced, and must be evaluated to assure there will be no undue problems ten years after installation. Evolving social concerns affect code development as well. Fire safety, access for the handicapped, and indoor air pollution must sometimes be weighed against other vital concerns like affordability and energy efficiency.

The responsibility for making these tough decisions lies with state and local governments, and to a lesser extent, the federal government.

Governments rely on advice from their professional code administrators, but few jurisdictions write a whole code from scratch, since that would require reinventing the wheel. It would also result in a patchwork of codes that would make it hard for anyone to manufacture products or design buildings for use outside of any immediate jurisdiction.

As a result, states, counties, and municipalities have come to rely on three model code organizations. All three have pockets of influence throughout the country, and in other nations as well, but their major influence is regional.

The largest model code organization is the International Conference of Building Officials (ICBO), whose Uniform Building Code (UBC) provides the basis for most building codes in the West and much of the Midwest.

In the Northeast, the dominant code is the Basic/National Building Code, formulated by Building Officials and Code Administrators International (BOCA).

In the South, most codes are based on the Standard/Southern Building Code, developed by the Southern Building Code Congress International (SBCCI).

The voting members of each organization are state and local code officials. They also each have affiliate members, including architects, engineers, and other professionals, as well as government employees (for example, fire chiefs) who work with codes. BOCA recently expanded certain voting rights

to some non-code officers for specific issues within their fields of expertise.

In order to keep the lines of communication open, the three groups have joined together in an umbrella organization, the Council of American Building Officials (CABO). CABO publishes a code for one- and two-family residences, which is incorporated—either directly or by reference—by all three model code groups. It also attempts to develop national standards for projects funded by the federal government. A separate organization under CABO's umbrella, the Board for the Coordination of the Model Codes (BCMC) strives to eliminate conflicts in the model codes when uniformity appears to be in the national interest.

Other organizations are also deeply involved in the code-writing process (see listing at the end of article). The National Fire Protection Association (NFPA), for example, publishes a fire prevention code that serves as the basis for fire safety in all three model codes. NFPA also publishes the National Electrical Code, which has been adopted independently by many jurisdictions throughout the country.

Differences Among Model Codes

Representatives of all three model code organizations agree that on most major issues, the requirements are fairly similar. There are, however, some small but practical differences.

For example, Rick Vognild, code manager for SBCCI points out that other model codes require that stairways have seven-inch risers and minimum 11-inch treads, "but [SBCCI hasn't] gone that far."

At BOCA, Ken Schoonover, manager of technical information, agrees that "from a technical standpoint, there's not a lot of substantive difference" among the model codes. If a local jurisdiction was shopping for a model code, he says, the biggest advantages of BOCA are "the format—ours is easier to understand—and the services we offer."

Roy Fewell, vice president for membership services at ICBO, notes that the UBC does not reference other codes, not even the NFPA Fire Code. Therefore, if a revision is made in the NFPA provisions, it doesn't affect ICBO until it is debated and agreed to by ICBO's members.

Fewell also says ICBO is often the first model code organization to address significant new issues. "We cover as much territory as the other two model codes combined, so when people want changes, they often come to us first."

Evaluation Services

All of the model code groups offer evaluation services for new products.

If you have a better mousetrap, and want to prove to local officials that it's adequate for use in buildings, you can apply to any of the model code groups for a report. If the code group agrees the gadget or material is consistent with its model, the report will say so. Acceptance is still up to your local code official, of course. But if a local code is based on BOCA, for example, then a favorable report from BOCA's

Research and Evaluation Department can help.

If you want to market the gizmo nationwide, CABO offers a National Evaluation Service (NES). A report from NES will indicate that your product is consistent with the requirements of all three model codes.

According to NES, a properly submitted application normally takes about six months to process. However, the process can take longer if there are significant differences among the three model codes in their requirements for your product. Representatives of all three groups must sign off before a report is written.

A favorable report isn't a permanent document—since the codes are changing constantly, most manufacturers renew their applications every year or two. The current NES listings include 104 products, while the evaluation services of each of the model code groups have four to five times that number.

The code groups do not perform tests. Therefore, the first step for an applicant is to hire a reputable laboratory to test the product. Fazel says most applications that are received are ultimately approved, because applications aren't submitted until successful tests have been performed.

Gary Nichol, senior engineer at SBCCI, says the chief beneficiaries of evaluation reports are companies that make products "not covered specifically by the codes." If a "suitable alternate" performs as well as a product specifically covered by the codes, he says, a report can help to dispel questions by local code officials.

As an example, Nichol said a favorable report was recently given to pre-fab concrete exterior wall panels manufactured by a Danish company. The product was not similar to anything made in the U.S., so it was not specifically approved in the codes. But the manufacturer submitted test data showing that it met the same performance standards as products that are code-approved, so a favorable report made it marketable in the U.S. On occasion, Nichol says, a favorable evaluation has led to revisions in the model codes themselves.

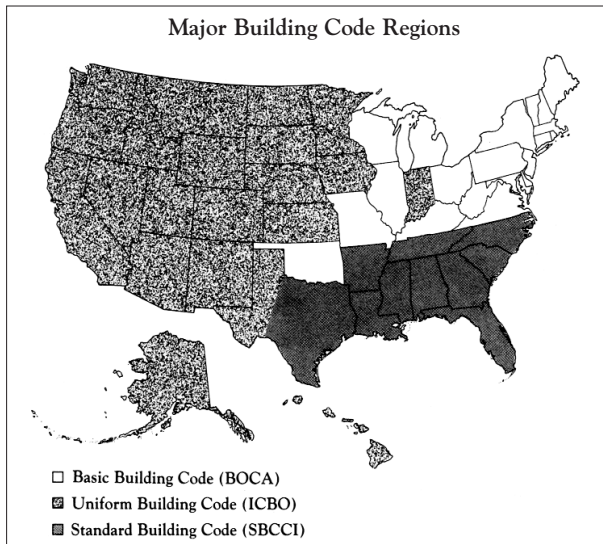
A recent list of NES reports includes specific brands of composite sandwich panels, foundation insulation, vinyl siding, and joist hangers. A list supplied by BOCA of reports by its Research and Evaluation Department includes specific brands of wooden I-beams, insulation board, insulating building panels, laminated veneer lumber, pipe couplings, air-supported structures, powder-driven fasteners, and vacuum flush toilets.

How Model Codes Filter Down

It's important to remember that codes only have the force of law when they are adopted by state and local governments. And those laws don't automatically change whenever a model code changes.

The model codes are all re-published in three-year cycles, because many jurisdictions update codes every three years. For the benefit of communities that update their codes annually, the model groups publish supplements out-

Major Building Code Regions



lining the changes that have been approved each year.

But many jurisdictions are more deliberate (or more sluggish, depending on your point of view).

According to Rick Vognild of SBCCI, "Most communities that use our code update every one to three years. Some of them update every six years. Some of them never update."

Roy Fewell of ICBO says that in southern Florida and the Virgin Islands the 1953 model code still predominates. In San Francisco, it's the 1979 code. Jefferson Parish, Louisiana, still relies on the 1946 Uniform code.

Amendments to Codes

Another reason that codes are far from identical is that local people often seek and obtain amendments to them. In fact, most states, counties, and municipalities that use model codes add their own amendments.

Therefore, if you've been working in an area that bases its code on the 1988 Standard/Southern code, for example, and move to another jurisdiction that uses the same model, you can't assume that it's exactly the same code.

Local individuals and organizations with an interest in code issues often find that it is easier to approach their local code administrators or elected officials to secure code changes than to seek changes in the national models.

The model code groups incorporate state and local governments in the amendment process. ICBO, for example, offers to publish the amendments adopted by member cities and states. Among the jurisdictions that take ICBO up on that offer are Oregon, Los Angeles, Dallas, and Houston.

How to Change the Codes

The model code groups are all open to proposals for change from any source. In practice, proposals are submitted by architects, builders, and very occasionally by homeowners.

Not surprisingly, many code changes are also proposed by the code officials and affiliate members who make up the model code organizations.

As a practical reality, some proposals carry more weight than others. As one model code official put it: "The National Association of Home Builders probably carries more weight than a little old lady in tennis shoes." Additionally, no proposal for major change gets very far without substantial

documentation and research to back it up.

Dick Morris, code specialist for NAHB, points proudly toward recent successes by builders' groups in obtaining model code changes. Examples include approval of wood foundations, a major revision by CABO in its plumbing specifications, and changes in wiring requirements that make it possible to pursue "smart house" designs. A current project, he says, is to secure approval of shallow foundations—poured above the frost line—similar to designs used in Scandinavian countries.

Morris strongly encourages builders to work for code changes that they feel would be beneficial. In the past, he says, builders have generally reacted to changes proposed by others, while more recently they have increasingly worked to initiate positive reforms.

He says that if an issue is local, it's usually most constructive to work with the local jurisdiction, rather than a model code group. Morris also says that when a model code group adopts a position that is contrary to builders' interests, they should oppose it on a local level.

"Last June, BOCA approved mandatory sprinklering of all apartments," he notes. The provision is opposed by many builders, and when it filters down to a local code, local builders' associations may take political action to have it amended.

If a builder wants to effect a change in a model code, Morris says, organized action has the best chance of success. The best procedure is to develop a consensus in local and state builders' associations, then seek assistance from NAHB. Fighting for a model code change can be extremely expensive, Morris says, because of the high cost of research and testing.

Revisions in the Model Codes

In any given year, each of the model codes generally makes between 80 and 200 changes. Those changes represent action on roughly half of the proposals submitted—although the proposals are sometimes changed significantly by the time of adoption.

There has been a general increase in the rate of code changes. For example, in the three-year cycle leading to the 1964 Uniform Code, ICBO considered 836 proposals for change, and adopted 297. The cycle leading to the 1985

code involved 1,014 proposals, of which 473 were adopted.

Most of those changes are minor and technical: Provisions are often reworded for clarity and consistency with modern accepted practices. But other proposals—the most notable recent example is the issue of residential fire sprinklers—evoke lengthy and sometimes heated debate. Other controversial issues faced recently by the various code groups include dimensions of stair treads and risers, the height of handrails, and safety glazing for skylights.

As an example of the issues faced annually by an individual code group, at BOCA's annual conference in June, the following items highlighted a list of 96 issues that came up for a vote:

- Plumbing vent requirements were revised, to eliminate a perceived conflict in the earlier codes regarding sizing of relief vents.
- Several changes were made in requirements for handicapped-accessible bathroom fixtures. Among them were an increase in the range of acceptable heights for water closets to make possible the use of conventional systems; an increase in sink heights to facilitate wheelchair movement; and permitting the use of detachable tub seats.

- Provisions for underground storage tanks for flammable and combustible liquids were updated.
- Flammability requirements for furnishings in institutional structures were adopted, to reduce the probability of ignition by cigarettes and limit the danger of a fire spreading to another room.
- Restrictions were placed on use and fire-resistance standards for textile wall coverings.
- After lengthy debate, BOCA voted to require fire sprinklers in all multi-family dwellings, in all rooms except small bathrooms.

For More Information

The principal relationship most building professional have with codes is keeping track of the rules and complying with them. But codes play such a key role in the building industry that builders should, at minimum, have a working knowledge of how they are written and adopted.

For more detailed information on specific areas of interest, you may want to contact one or more of the organizations listed below. ■

Steve Carlson is associate editor of *The Journal of Light Construction*.

Organizations Involved In Code Issues

Following are some of the organizations that play a role in deliberation of code issues and establishment of the standards that are included in codes. They are all excellent sources of information within their subject areas.

ANSI

American National Standards Institute
1430 Broadway
New York, NY 10018
212/354-3300

Among other things, ANSI develops standards for elevators, escalators, moving walks, accessibility by the handicapped, and manufactured home installations.

ASHRAE

American Society of Heating, Refrigeration, and Air Conditioning Engineers
1791 Tullie Circle, NE
Atlanta, GA 30329
404/636-8400

ASME

American Society of Mechanical Engineers
2029 K Street NW, Room 605
Washington D.C. 20006
202/785-3756

ASTM

American Society of Testing and Materials
1916 Race Street
Philadelphia, PA 19103
215/299-5400

BOCA

Building Officials and Code Administrators International
4051 West Flossmoor Road
Country Club Hills, IL 60477
312/799-2300

BOCA is responsible for the Basic/National Codes. These include the Basic/National Building Code, Mechanical Code, Plumbing Code, Fire Prevention Code, Existing Structure Code, and Energy Conservation Code.

CABO

Council of American Building Officials
5203 Leesburg Pike, Suite 708
Falls Church, VA 22041
703/931-4533

CABO is an umbrella group consisting of the three major model code organizations. It publishes the Model Energy Code and One and Two Family Dwelling Code. It also promotes uniformity among the three major model codes, through the activities of its Board for Coordination of the Model Codes (BCMC).

IAPMO

International Association of Plumbing and Mechanical Officials
5032 Alhambra Avenue
Los Angeles, CA 90032
213/223-1471

IAPMO develops several Uniform Codes available through ICBO. They include the Uniform Plumbing Code, Mechanical Code, Solar Energy Code, and Swimming Pool Code.

ICBO

International Conference of Building Officials
5360 South Workman Mill Road
Whittier, CA 90601
213/699-0541

ICBO is responsible for the Uniform Codes. They include the Uniform Building Code, Plumbing Code, Mechanical Code, Housing Code, and Fire Code.

NAHB

National Association of Home Builders
Technology and Codes Services
15th and M Streets, NW
Washington, DC 20005
800/368-5242, ext. 300

NAHB provides code information for builders, offers technical assistance to state and local builders' associations, and lobbies for revisions in model codes.

NCSBCS

National Conference of States on Building Codes and Standards
481 Carlisle Drive
Hemdon, VA 22070
703/437-0100

NCSBCS compiles information about state and local building codes and related issues, and provides forums for discussion of code issues. It publishes a comprehensive listing of code requirements in each state: "Directory of State Building Codes and Regulations."

NEBCA

New England Building Code Association, Inc.
123 W. Washington Street
Boston, MA 02114

NEBCA works to promote better building codes and better understanding of code issues among enforcement officials and those involved in the construction industry.

NFPA

National Fire Protection Association
Batterymarch Park
Quincy, MA 02269
617/770-3000

NFPA is responsible for the NFPA Fire Codes, National Electric Code, Life Safety Code, and Fire Safety Criteria for Mobile Home Installations.

SBCCI

Southern Building Code Congress International
900 Montclair Road
Birmingham, AL 35213
205/591-1853

SBCCI is responsible for the Standard Codes. They include the Standard Building Code, Fire Prevention Code, Gas Code, Housing Code, Mechanical Code, and Plumbing Code.