

Building Codes, Standards and Resource Documents: A Status Report

This article presents a report on the current status of model building codes, national standards and two important resource documents. Particular attention is given to seismic design provisions and to provisions related to concrete design and construction.



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In this article, the five major model building codes in the United States are first discussed:

- Uniform Building Code
- BOCA National Building Code
- Standard Building Code
- International Building Code
- NFPA 5000 Building Code

Uniform Building Code (UBC)

The most influential building code on the West Coast, and California in particular, is the Uniform Building Code.

The latest edition of the UBC is dated 1997.¹ The International Conference of Building Officials (ICBO), the publishers of the UBC, suspended code change cycles beyond 1996.

As a result, it has not been possible to modify this code since its publica-

tion, although errata have been issued from time to time. Notwithstanding the above fact, the State of California and other local jurisdictions within California are in the process of re-adopting the 1997 UBC for the next three years or so.

The state, which regulates schools and health care facilities, made certain amendments in the original adoption process. These amendments are being reapproved, with hardly any new ones being added. The local jurisdictions, which regulate all construction other than schools and health care facilities, have formed groups in four parts of the state to consider code amendments.

The most important of these groups are the Los Angeles Basin Uniform Code Program, including the City and the County of Los Angeles; and the

Tri-Chapters Uniform Code Program, including the East Bay, Peninsula and Monterey Chapters of ICBO, covering the entire San Francisco Bay area, but importantly excluding the City of San Francisco. The other two groups are the Sacramento Valley Uniform Code Program and the Redwood Chapter Code Committee.

The amendments agreed to by these groups may or may not be adopted by the local jurisdictions belonging to these groups. The amendment packages being considered by the four groups are not necessarily coordinated with the State or among the groups.

Thus, in the near-term future, it is more than likely that various local jurisdictions within California will have adopted variously amended versions of the 1997 UBC. The smaller jurisdictions will typically not have made

any amendments at all. If this sounds confusing, try to imagine the practitioner's life in California!

On the brighter side, the Los Angeles Basin Uniform Code Program is considering allowing alternative usage of ACI 318-99, whereas ACI 318-95 is the referenced standard in the 1997 UBC. Also, most of the groups are considering deletion of the 1.1 factor by which design loads given by the seismic design load combinations of the 1997 UBC must be multiplied in the design of concrete and masonry structures.

The seismic design provisions of the 1997 UBC are based on the 1996 SEAOC Blue Book² Appendix C, which has now moved into the main body of the 1999 Blue Book. A very important feature out of the 1994 NEHRP Provisions³ is also included.

Oregon and Washington, following California's lead, are likely to remain on the 1997 UBC for the next three years or so (each state has made certain amendments to the code). Elsewhere in UBC territory (roughly the western half of the United States), the 2000 International Building Code (IBC)⁴ is beginning to make expanding headway, although rather unsteadily so far.

The BOCA National Building Code (BOCA/NBC)

The 1996 and 1999 editions of the BOCA/NBC⁵ remain in effect in many parts of the northeast, although the 2000 IBC is gaining acceptance – more steadily than in UBC territory. The State of New York (but not the City of New York), which has never adopted any of the model codes in the past, has adopted the IBC, effective July 1, 2002.

New York City will, for the time being, remain on its current code, based on the 1988 UBC (including the 1989 Supplement). Pennsylvania, another large state in BOCA territory, has adopted the 2000 IBC. But the two major cities in the state – Philadelphia and Pittsburgh – have been granted exception to remain on their current codes for the time being.

The seismic design provisions of the 1996 and 1999 BOCA/NBC are based

on the 1991 NEHRP Provisions,³ although seismic design per ASCE 7-95,⁶ which is based on the 1994 NEHRP Provisions, is also allowed. ACI 318-95 is the reference standard for concrete design and construction in both editions.

Standard Building Code (SBC)

The 1997 and 1999 SBC⁷ remain in effect in parts of the southeast, although, once again, the 2000 IBC has been adopted or is being considered for adoption by many jurisdictions. Richardson, Texas, a suburb of Dallas, was the first jurisdiction in the United States to adopt the 2000 IBC. Fort Worth has since adopted the 2000 IBC, but Dallas has not.

South Carolina was the first state to adopt the 2000 IBC. Florida has just adopted a statewide code based on the 1999 SBC, although the wind design provisions are almost identical to those of the 2000 IBC. Florida is expected to remain on this code for some time.

The seismic design provisions of the 1997 and 1999 SBC are based on the 1991 NEHRP Provisions, although seismic design per ASCE 7-95, which is based on the 1994 NEHRP Provisions, is also allowed. ACI 318-95 is the reference standard for concrete design and construction in both editions.

International Building Code (IBC)

Adoption of the IBC⁴ has been discussed above, although not in a comprehensive manner. A 2001 Supplement to that code has been published, and a 2002 Accumulative Supplement is about to be published. The 2003 IBC will be more or less finalized at Public Hearings to be held in Pittsburgh, Pennsylvania during the second and third weeks of April 2002. Final action on the 2003 edition will be taken at the Annual Business Meeting of the International Code Council (ICC), to be held in Fort Worth, Texas at the end of September 2002. The new edition will be published in early 2003.

Seismic provisions of the 2000 IBC are based largely on the 1997 NEHRP Provisions, although a few of the features of the 1997 UBC, which are not

part of the 1997 NEHRP Provisions, are included. The entire seismic design provisions are contained in Sections 1613 through 1623 of the code.

This situation is about to change. Large segments of the seismic design provisions are expected to be deleted from the 2003 IBC and replaced by references to the corresponding sections of ASCE 7-02. It is also expected that seismic design provisions will largely be deleted from the IBC in its 2006 edition, which will most likely adopt the seismic design requirements of ASCE 7-05 by reference.

The reference standard for concrete design and construction is ACI 318-99 in the 2000 IBC, and will be ACI 318-02 in the 2003 IBC.

NFPA 5000 Building Code

This code is expected to be published in the fall of 2002. Until that happens, it may be largely useless to speculate on the adoption of this code.

The NFPA 5000,⁸ in its 2002 edition, has adopted the structural load, including seismic, provisions of ASCE 7-02. These provisions are not duplicated within the NFPA Code. The reference standard for reinforced concrete design and construction is ACI 318-02.

ASCE Minimum Design Loads for Buildings and Other Structures

The seismic design provisions of the 2002 edition of ASCE 7⁶ are generally based upon the 2000 NEHRP Provisions, although some provisions previously found only in the UBC and the IBC have been included. Since NFPA 5000-2002 has adopted the seismic design provisions of ASCE 7-02, and since the likelihood exists that the 2006 IBC will adopt the seismic design provisions of ASCE 7-05 by reference, ASCE has decided to open up the development process of the seismic design provisions of ASCE 7. A broad-based Seismic Task Group has been formed to oversee the development of seismic design provisions.

For the purposes of seismic design and detailing of reinforced concrete structures, ACI 318-02 is the reference standard in ASCE 7-02.

NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures

As indicated above, this is the resource document for the seismic design provisions in all model codes except the 1997 UBC, which has its seismic design provisions based on the 1999 SEAOC Blue Book. This document underwent significant changes from its 1991 to 1994 to 1997 editions. The changes from the 1997 to the 2000 edition are relatively modest.

Over the years, the NEHRP resource document has become more like a code or standard. A decision has been made that this document should go back to its original and more traditional role of being a true resource document. It is likely that in the 2003 edition of the NEHRP Provisions, sig-

nificant segments will be deleted and replaced by references to the relevant sections of the ASCE 7 standard. The NEHRP document will attempt to break new ground in areas such as structural redundancy, performance-based design, active and passive energy dissipation, and so forth.

SEAOC Blue Book

The traditional code and commentary format of the "Recommended Lateral Force Requirements and Commentary," developed by the Seismology Committee of the Structural Engineers Association of California (SEAOC),² is now obsolete because:

- SEAOC no longer has a direct role in the definition of seismic provisions in building codes, and
- Commentary describing the basis

of current code provisions (i.e., NEHRP) can be obtained for free from FEMA (ASCE 7 is also developing commentary).

The latest proposal is to organize the document into three parts as follows:

- Part I: Comparisons and critiques of current U.S. building code provisions.
- Part II: Commentary and recommendations on topics that can be used by engineers in the near-term for design.
- Part III: A forum for topics that are longer term in nature.

It has also been proposed that the title of the document be changed from its traditional title of "Recommended Lateral Force Requirements and Commentary." What will actually transpire remains to be seen.

REFERENCES

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