Building code revisions influence roof system design

Roofing professionals must understand the building codes affecting the areas in which they work

by Mark S. Graham

Earlier this year, two of the three model building code groups in the United States—the International Conference of Building Officials (ICBO) and Southern Building Code Congress International Inc. (SBCCI)—published new editions of their model building codes. These editions incorporate revisions approved by the code groups since their last codes were published in 1994.

A number of the revisions are roofing-related, and some will affect the design of certain roof systems in the applicable U.S. regions. This article briefly describes several of the recent roofing-related code changes to these model building codes.

Model building codes

ICBO publishes the *1997 Uniform Building Code (1997 UBC)*, SBCCI issues the *Standard Building Code, 1997 Edition (SBC 1997)*, and the Building Officials and Code Administrators International Inc. (BOCA) publishes *The BOCA National Building Code (BNBC)*. These three model codes serve as the technical basis for building code adoption and enforcement throughout much of the United States.

The general regions of applicability for each are indicated in Figure 1. Individual code jurisdictions (e.g., counties, parishes, municipalities) within these regions may, in some cases, adopt building codes other than the ones indicated. Also, some jurisdictions have not yet adopted the latest editions of the model building codes.

Identifying the revisions

In the 1997 editions of *SBC* and *UBC*, changes from the codes' previous editions are denoted to assist in identifying the revisions. In both codes, a vertical line in the margin within the code's body indicates a change from the previous edition's requirements. In *UBC*, when an entire chapter is revised, as is the case with "Appendix

Chapter 15—Reroofing," the vertical line in the margin is omitted for clarity; instead, a specific notation is made at the beginning of the chapter.

Code requirements deleted since the codes' last editions are denoted by an open star (i.e., ☆) in *SBC* and solid arrow (i.e., ➡) in *UBC*.

1997 UBC

1997 UBC is published as a three-volume set. Volume 1 presents fire- and life-safety, administrative and field inspection provisions; it specifically discusses roofing.

Volume 2 addresses structural engineering design provisions, which include wind-load requirements applicable to roof assembly design.

Material testing and installation standards are discussed in Volume 3. Included in this volume are specific *UBC* standards relating to roofing aggregates; test standards for determining the fire retardancy of roof assemblies; wood shakes and shingles; roof tile; and modified bitumen, thermoplastic and thermoset membranes.

The most noticeable roofing-related revision incorporated into *1997 UBC* is a rewrite of the language applicable to reroofing: "Appendix Chapter 15—Reroofing" on pages 1-335 and 1-336. This revision primarily is intended to clarify the code requirements relating to reroofing and make them consistent with "Chapter 15—Roofing and Roof Structures," which applies to roofing in new construction applications.

One specific change included in the reroofing appendix is the inspection and approval requirements necessary in roof re-cover situations. Section 1515.2.1 requires a preroofing inspection by a building official or other special inspector.

A building official may allow a re-cover if the preroofing inspection or other evidence reveals the following:

"1. The roof structure is sufficient to sustain the weight of the additional dead load of the new roofing.

2. The roof deck is structurally sound.

3. Roof drains and drainage are sufficient to prevent extensive accumulation of water.

4. The existing roofing is attached securely to the deck.

5. Existing insulation is not water-soaked.

6. Fire-retardant requirements are maintained."

In addition, Section 1515.1 requires written approval from a building official before reroofing work can be performed.

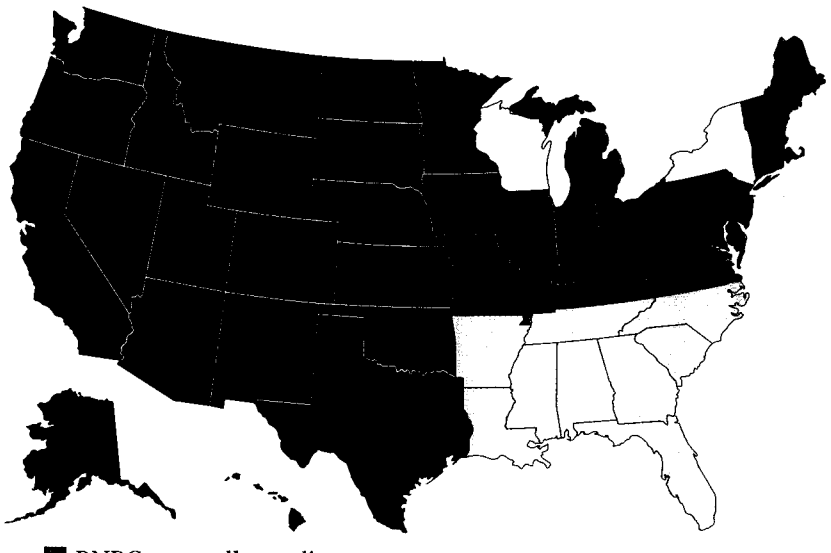
The general limitation for allowing only one re-cover over an existing roof covering, which was included in the previous editions of *UBC*, has been removed from *1997 UBC*. Specific requirements limiting the number of allowable re-covers now depend on the existing roof covering type and "overlay" roof covering type. A table has been added to the reroofing appendix (Table A-15-A—Allowable Reroofs Over Existing Roofing) that clarifies the permissible roof system types for roof re-cover situations.

For example, the table indicates it is permissible to install a built-up roof (BUR) system overlay over one existing BUR or modified bitumen system provided the other code requirements are met. However, the table also indicates it is not permissible to apply a sprayed polyurethane foam-based roof system overlay over any existing roof system type other than an existing BUR system.

In "Chapter 15—Roofing and Roof Structures," the most notable revisions are to a number of the definitions applicable to roofing. Generally, these definitions are revised to be more consistent with what is understood in the roofing industry. For example, the definition of equiviscous temperature is revised to be consistent with that used in *The NRCA Roofing and Waterproofing Manual, Fourth Edition.*

Also, the fire-retardancy classifications for roofing materials have been rewritten in terms more familiar to those in the roofing industry. In *1997 UBC*, cement shingles or sheets, exposed concrete slabs, ferrous or copper shingles or sheets, slate shingles, clay or concrete roof tile, and other approved noncombustible materials now are considered noncombustible roof coverings.

Figure 1: General areas of code applicabilities



■ *BNBC* generally applies.
□ *SBC* generally applies.
■ *UBC* generally applies.
□ State-developed code generally applies.

SBC 1997

The most noticeable roofing-related revision in *SBC 1997* is a complete reformat of "Chapter 15—Roofs and Roof Structures." The Florida Roofing, Sheet Metal and Air Conditioning Contractors Association was the proponent of the chapter reformat, which is intended to make the roofing chapter easier to use and consolidate roof system types into easily understood sections. A comparison of the section format from *SBC 1994* to *SBC 1997* is shown in Figure 2.

Other revisions to *SBC 1997* include adding specific American Society for Testing and Materials (ASTM-) based material standards as minimum requirements for certain roofing materials. For example, fiberglass-reinforced asphalt shingle compliance with ASTM D 3462-93, "Standard Specification for Asphalt Shingles Made From Glass Felt and Surfaced With Mineral Granules," has been established as a minimum material requirement. It is important for roofing professionals to realize most 20-year and some 25-year fiberglass shingles currently on the market do not comply with ASTM D 3462-93; therefore, these products *do not* comply with *SBC 1997*.

ASTM standards for other roofing materials, including organic shingles, underlayment felts, self-adhering polymer-modified bituminous sheet underlayments and slate shingles, also have been incorporated into *SBC 1997*.

In addition, for asphalt shingle roof systems, *SBC 1997* now requires that a cricket be installed behind any chimney greater than 30 inches (672 mm) wide.

Conclusions

Recent changes to *1997 UBC* and *SBC 1997* have a noticeable effect on the design of certain roof systems. Although this article offers a brief description of some of the revisions, not all roofing-related changes are discussed.

Roofing professionals are encouraged to know which particular building codes, and editions of those codes, are applicable in the areas in which they regularly work. In many instances, different codes or code editions may be applicable in neighboring jurisdictions. Roofing professionals also are urged to be familiar with applicable building code requirements.

In addition, particularly because new model codes recently have been published, roofing professionals should be aware when their local

Figure 2: A comparison of the section formats from SBC 1994 to SBC 1997

"Chapter 15—Roofs and Roof Structures"

SBC 1994	*SBC 1997*
Section 1501—General	Section 1501—General
Section 1502—Definitions	Chapter 2—Definitions
Section 1503—Penthouse-type roof structures	Section 1517.1—Penthouse-type roof structures
Section 1504—Tanks	Section 1517.3—Tanks
Section 1505—Cooling towers	Section 1517.4—Cooling towers
Section 1506—Other roof structures	Section 1517.5—Other roof structures
Section 1507—Parapet walls	Section 1517.6—Parapet walls
Section 1508—Gutters and leaders	Section 1516—General accessories
Section 1509—Roof coverings	Section 1503—Roof coverings
Section 1509.1—General	Section 1503.1—General
Section 1509.2—Fire-resistance classification	Section 1503.2—Fire-resistance classification
Section 1509.3—Wind loads and wind-resistance	Section 1503.3—Wind loads and wind-resistance
Section 1509.4—Asphalt shingles	Section 1504—Asphalt shingles
Section 1509.5—Mineral fiber shingles	Section 1506—Slate and slate-type shingles
Section 1509.6—Slate shingles	Section 1506—Slate and slate-type shingles
Section 1509.7—Concrete and clay roof tile	Section 1507—Roof tile
Section 1509.8—Wood shingles and shakes	Section 1505—Wood shingles and shakes
Section 1509.9—Built-up roof systems	Section 1512—Low-slope/bituminous roof systems
Section 1509.10—Slate or mineral-surfaced roll roofing	Section 1512.8—Slate or mineral-surfaced roll roofing
Section 1509.11—Metal roof systems	Section 1508—Metal shingles; Section 1509—Metal panels/architectural metal; and Section 1510—Structural metal roofing
Section 1509.12—Synthetic sheet membrane roof systems	Section 1513—Single-ply roof systems
Section 1509.13—Replacement/re-covering	Section 1503.4—Replacement/re-covering
Section 1509.14—Valleys and wall flashings	Included in various sections
Section 1509.15—Liquid-applied coatings	Section 1515—Liquid-applied coatings
Section 1509.16—Foamed-in-place roof insulation	Section 1514—Foamed-in-place roof coverings

authorities intend to adopt new versions of building codes. In some cases, projects may be designed and bid when one code edition is applicable—and actually constructed after a new code has been adopted and is in effect.

Editor's note: *For information about the roofing-related revisions incorporated in the latest edition of* BNBC 1996, *readers should refer to "Changes to BOCA's code impact roofing," June 1996 issue, page 24. The article can be accessed by calling NRCA's Fax-on-Demand at 1-888-455-6722, Document No. 1304.*

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Purchasing the codes

The building codes discussed in this article can be purchased from the following model code groups:

■ *BNBC 1996*
BOCA
4051 W. Flossmoor Road
Country Club Hills, Ill.
60478-5795
(708) 799-2300

■ *SBC 1997*
SBCCI
900 Montclair Road
Birmingham, Ala. 35213
(205) 591-1853

■ *1997 UBC*
ICBO
5360 Workman Hill Road
Whittier, Calif. 90601-2298
(310) 692-4226
(publication orders only)

Building code violations

by Steve Phillips

It's important that roofing professionals comply with building codes. A construction contractor whose work is not consistent with the building code in the jurisdiction where the work was performed may face civil liability for negligence, as well as contractual liability.

If a contract states that a contractor shall be responsible for constructing work in accordance with the building code, the contractor can be liable for breach of contract and resulting damages if there is a building code violation. General contractors' subcontract forms frequently impose a specific contractual obligation upon subcontractors to make sure their work adheres to applicable building codes. If a code violation was inherent in the plans and specifications given to the contractor or subcontractor, the contractor may be able to assert a claim for indemnification and contribution against the design professional or other parties who prepared the plans and specifications.

Even in the absence of a specific contract provision, a contractor is likely to face claims if his work violates the applicable building code. This is particularly relevant in reroofing situations when there is no design professional and a roofing contractor developed the reroofing specification.

In most states, a building code violation is considered to be evidence of negligence. In some situations, a building code violation may be considered *negligence per se*. This means the contractor, for all practical purposes, has no defense to a negligence claim based on a code violation. Some states have enacted statutes stating that persons who have been injured as a result of building code violations are entitled to bring claims against the party responsible for the code violations. PR

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