Revisions made to model building code

Standard Building Code changes affect roofing professionals

by **Mark S. Graham**

Earlier this year, the Southern Building Code Congress International (SBCCI) Inc. updated its model building code, the *Standard Building Code* (SBC). The 1999 edition includes revised provisions for roof assemblies, some of which will significantly affect roof assembly design, application and use in areas where the code is applicable.

SBCCI is one of three recognized model building code groups in the United States. The other organizations are the Building Officials and Code Administrators International (BOCA) Inc., which publishes *The BOCA National Building Code* (BNBC), and International Conference of Building Officials, publisher of the *Uniform Building Code* (UBC). SBC generally is adopted by code jurisdictions (e.g., municipalities, counties, states) in the Southeast and portions of the South. With the exception of New York and Wisconsin, which maintain their own codes, one of these model building codes usually is applied in regions throughout the United States (see Figure 1).

1999 edition

The 1999 edition of SBC contains revisions approved by SBCCI's active membership (i.e., building code officials) during the organization's 1998 code-development cycle and updates to the previous edition, which was published in 1997. SBC's 1997 edition contained significant roofing-related revisions and a complete reformat of Chapter 15, "Roofs and Roof Structures."

During SBCCI's 1998 code-development cycle, the organization appointed an ad hoc committee to examine SBC's roofing provisions and propose changes. The committee chose to discard the 1997 edition's format and suggested that SBCCI adopt the first draft of the roofing provisions of the *International Building Code*, which was being developed at the time (see "New ICC model code completed," page 22).

The committee's recommendation was approved by SBCCI's membership and resulted in, among other roofing-related changes, a complete revision of Chapter 15, which now is titled "Roof Assemblies and Rooftop Structures." A side-by-side comparison of Chapter 15 in the 1997 and 1999 editions is shown in Figure 2. Following are other significant roofing-related revisions that appear in SBC's 1999 edition.

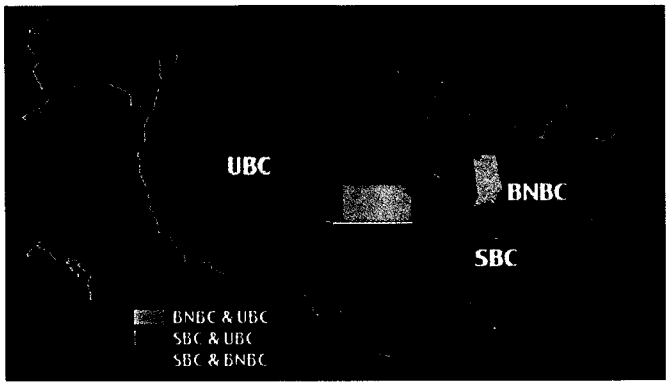


Figure 1: *U.S. map detailing the general areas where specific model building codes are applicable.*

Wind resistance

Section 1504 provides minimum requirements for roof assemblies' wind resistances. Section 1504.1 stipulates that all roof systems be designed to resist the wind loads prescribed in Chapter 16, which addresses structural loads.

The revised code specifies that low-slope roofs with slopes less than 2-in-12 (17 percent) be tested according to FM 4450, "Class 1 Insulated Steel Deck Roofs"; FM 4470, "Class 1 Roof Coverings"; UL 580, "Uplift Resistance of Roof Assemblies"; or UL 1897, "Uplift Tests for Roof Covering Systems." The section also states that individual roof assembly components that have not been tested according to these standards can be substituted if engineering calculations that demonstrate roof system compliance are provided to building officials.

The section also stipulates that ballasted, low-slope single-ply roof systems be designed for wind resistances according to ANSI/SPRI RP-4-1988, "Wind Design Guide for Ballasted Single-Ply Roofing." This design method was removed from SBC's 1997 edition but reinserted in 1999.

Comparison of Chapter 15 in SBC's 1997 and 1999 editions	
1997 edition	**1999 edition**
Section 1501—General	Section 1501—General
Section 1502—Definitions (reference to Chapter 2)	Section 1502—Definitions (reference to Chapter 2)
Section 1503—Roof coverings	Section 1507—Roof coverings with slopes 2-in-12 (17 percent) or greater Section 1508—Roof coverings with slopes less than 2-in-12 (17 percent)
Section 1503.1.2.3 (Minimum roof slope)	Sections 1508.3.1, 1508.4.2, 1508.5.1, 1508.6.1, 1508.7.1, 1508.8.1 and 1508.9.1
Section 1503.1.4—Fasteners	Section 1506.5—Fasteners
Section 1503.1.5—Mechanical units	Section 1511.7—Mechanical units
Section 1503.2—Fire-resistance classification	Section 1505—Fire classification
Section 1503.3—Wind loads and wind resistance	Section 1504.1—Wind resistance of roofs
Section 1503.4—Re-covering/Replacement	Section 1510—Reroofing
Section 1504—Asphalt shingles	Section 1507.3—Asphalt shingles
Section 1505—Wood shingles and shakes	Section 1507.9—Wood shingles Section 1507.10—Wood shakes
Section 1506—Slate and slate-type shingles	Section 1507.8—Slate shingles
Section 1507—Roof tile	Section 1507.4—Clay and concrete tile
Section 1508—Metal shingles	Section 1507.6—Metal roof shingles
Section 1509—Metal panels/Architectural metal	Section 1507.5—Metal roof panels (slopes 2-in-12 [17 percent] or greater) Section 1508.4—Metal roof panels (slopes less than 2-in-12 [17 percent])
Section 1510—Structural metal roofing	Section 1507.5—Metal roof panels
Section 1511—Other steep roof systems	
Section 1512—Low-slope/Bituminous roof systems	Section 1508.3—Built-up roof systems Section 1508.5—Modified bitumen roofing
Section 1513—Single-ply roof systems	Section 1506.6—Thermoset single-ply roofing Section 1508.7—Thermoplastic single-ply roofing
Section 1514—Foamed-in-place roof covering	Section 1508.8—Spray polyurethane foam roofing Section 1508.9—Liquid-applied coating
Section 1515—Liquid-applied coating	Section 1508.9—Liquid-applied coating
Section 1516—General accessories	
Section 1516.1—Gutters and leaders	Section 1503.4.1—Gutters
Section 1517—Roof structures and components	Section 1511—Rooftop structures and components
Section 1517.1—Penthouse-type roof structures	Section 1511.1—Penthouse-type rooftop structures
Section 1517.3—Tanks	Section 1511.3—Tanks
Section 1517.4—Cooling towers	Section 1511.4—Cooling towers
Section 1517.5—Other roof structures	Section 1511.5—Other rooftop structures
Section 1517.6—Parapet walls	Section 1511.6—Parapet walls
Section 1517.6.4—Scuppers	Section 1511.6.4—Scuppers

Figure 2: *A comparison of SBC's Chapter 15 section formats in the code's 1997 and 1999 editions.*

New ICC model code completed

In 1992, the International Code Council (ICC) was founded to develop a set of national model codes intended for use throughout the United States and possibly internationally. ICC is composed of the three model building code groups in the United States: the Building Officials and Code Administrators International (BOCA) Inc., International Conference of Building Officials (ICBO) and Southern Building Code Congress International (SBCCI) Inc.

ICC's model codes, or "I-codes," are intended to eventually replace those of BOCA, ICBO and SBCCI. This will assist roofing and other building professionals who currently must keep up-to-date about the requirements of numerous codes.

ICC already has published several new I-codes, including the *International Plumbing Code*, *International Mechanical Code* and *International Property Maintenance Code*.

Development of the *International Building Code* (IBC) began in 1996 and was completed at a final public hearing in September in St. Louis, Mo. A companion code to IBC, the *International Residential Code* (IRC), also has been developed. It is applicable to one- and two-family residential dwellings. IBC and IRC are scheduled to be published early next year.

Fire resistance

Roof assemblies' fire-resistance classification requirements are provided in Section 1505. Section 1505.1 stipulates that roof assemblies and coverings be listed as Class A, B or C when tested in accordance with ASTM E 108, "Test Methods for Fire Tests of Roof Coverings," or UL 790, "Fire Resistance of Roof Covering Materials."

Masonry and ferrous (e.g., steel) or copper shingles or sheets have been added to the 1999 edition as roofing materials that comply with Class A requirements without specific testing.

Fasteners

Specific requirements for roof assembly fasteners are detailed in Section 1506.5—nails now must comply with ASTM F 1667, "Specification for Driven Fasteners: Nails, Spikes and Staples." In addition, the section states that a nail's corrosion resistance must meet ASTM A 641, Class 1, "Zinc-Coated (Galvanized) Carbon Steel Wire," or equivalent corrosion resistance by coating, electrogalvanization, mechanical galvanization, hot-dipped galvanization, stainless steel, nonferrous metal or other suitable corrosion-resistance means.

Asphalt shingles

SBC provisions that exempt asphalt shingles from having to comply with wind-load resistance requirements have been removed from the 1999 edition. Now, asphalt shingle roof systems must be designed to satisfy the new edition's wind-resistance requirements, which include consideration of basic wind speed (i.e., 70 mph to 110 mph [31 m/s to 49 m/s]) adjusted for building height above grade, building exposure, wind-gust effect and wind-importance factor, as prescribed in Chapter 16.

Asphalt shingle fasteners

Section 1507.3.6 states that asphalt shingles must be installed with roofing nails—not staples; SBC's previous editions allowed the use of staples. The code requires "galvanized, stainless-steel, aluminum or copper roofing nails, minimum 12-gauge [0.105-inch (2.67-mm)] shank with ⅜-inch (9.5-mm) diameter head, of a length to penetrate through the roofing materials and a minimum of ¾ of an inch (19 mm) into the roof sheathing. Where the roof sheathing is less than ¾ of an inch (19 mm) thick, the nails shall penetrate through the sheathing."

Tile

SBC's 1999 edition requires that clay tiles used in tile roof assemblies comply with ASTM C 1167, "Clay Roof Tiles." The code also details the specific prescriptive requirements for concrete roof tiles, and the Florida Roofing, Sheet Metal and Air Conditioning Contractors Association/ National Tile Roofing Manufacturers Association's *Concrete and Clay Tile Application Manual, Second Edition,* has been added as an application standard for tile roof systems.

Modified bitumen sheets

SBC stipulates that polymer-modified bitumen sheet products must comply with one of several standards, including CGSB 37-GP-56M, "Membrane, Modified, Bituminous, Prefabricated and Reinforced for Roofing"; ASTM D 6162, "Styrene Butadiene Styrene Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements"; ASTM D 6163, "Styrene Butadiene

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SBC measurement requirements	
Width of mechanical unit	**Minimum clearance**
< 24 inches (< 610 mm)	14 inches (356 mm)
24 inches < 36 inches (610 mm < 914 mm)	18 inches (457 mm)
36 inches < 48 inches (914 mm < 1.2 m)	24 inches (610 mm)
48 inches < 60 inches (1.2 m < 1.5 m)	30 inches (762 mm)
≥ 60 inches (≥ 1.5 m)	48 inches (1.2 m)

***Figure 3:** SBC's 1999 edition provides these measurement requirements for mounting rooftop mechanical equipment on raised curbs or supports.*

Styrene Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements"; and ASTM D 6164, "Styrene Butadiene Styrene Modified Bituminous Sheet Materials Using Polyester Reinforcements." Although CGSB 37-GP-56M applies to APP- and SBS-polymer-modified bitumen sheets, the ASTM standards listed apply to SBS-polymer-modified bitumen sheets only.

Reroofing

Section 1510.1 indicates that materials and application methods used in roof system re-cover and replacement must comply with new roof construction code requirements. The section also states that "more than 25 percent of the roof covering on any building shall not be removed and replaced within any 12-month period unless the entire roof covering is made to conform to the requirements for new roofing."

Section 1510.4 indicates that when re-covering over wood shingles or shakes "creates a combustible concealed space, the entire existing roof surface shall be covered with gypsum board, mineral fiber, glass fiber or other approved materials" to reduce the spread-of-fire risk.

Rooftop equipment

Previous editions of the code required rooftop mechanical equipment to be mounted on raised curbs or supports. However, the previous editions were vague, requiring curbs and supports "to be a height sufficiently above the roof." The provision now includes a list of required measurements that are consistent with guidelines in *The NRCA Roofing and Waterproofing Manual, Fourth Edition* (see Figure 3).

Closing thoughts

Although this article offers descriptions of several revisions to SBC, it does not address all roofing-related changes. It is important roofing professionals be familiar with the requirements of the specific building codes applicable in their regions.

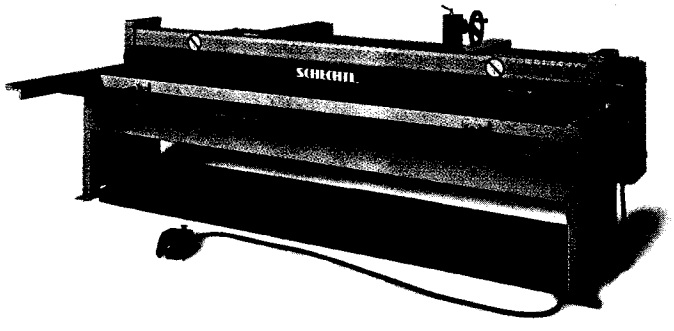
Roofing professionals working in areas that follow SBC are encouraged to obtain the revised edition and become familiar with its provisions and changes. It also is important for roofing professionals to find out when their local jurisdictions intend to adopt the 1999 edition—projects may be designed and bid on while an earlier edition of the code is applicable but constructed after the new edition is in effect.

Roofing professionals can obtain SBC's 1999 edition and other SBCCI publications by calling (205) 591-1853 or accessing the organization's Web site at www.sbcci.org. PR

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