Changes to BOCA's code impact roofing

The 1996 edition of BOCA's building code includes revisions that affect roof assemblies' designs and uses

by **Mark S. Graham**

Earlier this year, the Building Officials and Code Administrators International Inc. (BOCA) published a revised edition of its building code. This edition incorporates a number of roofing-related changes; some have a substantial impact on certain roof assemblies' designs and uses.

BOCA

BOCA is one of three recognized model building code groups in the United States (in addition to the Southern Building Code Congress International Inc. and International Conference of Building Officials). The BOCA building code generally is adopted by code jurisdictions (e.g., municipalities, states) in the Northeast, Mid-Atlantic and portions of the Midwest regions of the United States, as shown in Figure 1. And just as the BOCA code also may be applicable in some jurisdictions outside of these regions, the other building codes may apply in certain jurisdictions within these regions.

BOCA, like the other model building code groups, publishes its updated building code every three years. The new edition of the BOCA building code, *The BOCA National Building Code/1996* (BOCA 1996), is an updated version of the 1993 edition.

Following is an explanation of several of the roofing-related changes.

General applicability

BOCA 1993 contains a general applicability statement indicating that compliance is necessary with either the code's prescriptive (Section 1507.0) *or* performance requirements (Section 1505.0). This statement requires compliance with only a portion of the code's roofing provisions. For example, it could be interpreted as acceptable under BOCA 1993 to disregard the wind-resistance requirements in Section 1505.0 if specific material and installation requirements in Section 1507.0 are met.

BOCA 1996 eliminates the aforementioned "... or ..." statement. In effect, it mandates compliance with the requirements of both Sections 1505.0 and 1507.0.

Wind loads

BOCA 1996's specific provisions for determining wind-load requirements for roof assemblies (i.e., Section 1609.0) remain nearly the same as those in BOCA 1993. Yet, BOCA 1996 recognizes the 1995 edition of the American Society of Civil Engineers Standard 7 (ASCE 7-95) as a reference standard—that is, as an alternate wind load determination method.

ASCE-7's wind load provisions differ substantially from those in BOCA Section 1609.0, however. In some instances, wind-induced loads on a building are higher under ASCE 7-95 and in other cases, they're lower.

Wind load resistance

Revisions incorporated into BOCA 1996 clarify BOCA 1993's wind-resistance language. The changes include specific requirements that low-slope roof systems be "... designed to resist the design wind load pressure ..." and steep-slope systems be "... designed to resist the basic wind speed ..."

BOCA 1996 also requires (in Section 1505.2) low-slope membrane roof systems to be tested for wind-load resistance in accordance with Factory Mutual (FM) 4450, FM 4470, Underwriters Laboratories (UL) Standard 580 or UL 1897. FM 4450 and FM 4470 are the test methods that derive FM ratings (e.g., I-60, I-90).

Absent from BOCA 1996 is a method for testing the wind load resistance of ballasted single-ply membrane roof systems. For these systems, an industry-recognized, consensus test method standard that BOCA could adopt does not exist. Therefore, it could be interpreted that roofing professionals cannot design and install ballasted single-ply membrane roof systems and comply with BOCA 1996. In instances where ballasted single-ply membrane roof systems are being considered, and BOCA 1996 is applicable, roofing professionals are advised to consult with the roof system manufacturer regarding code compliance.

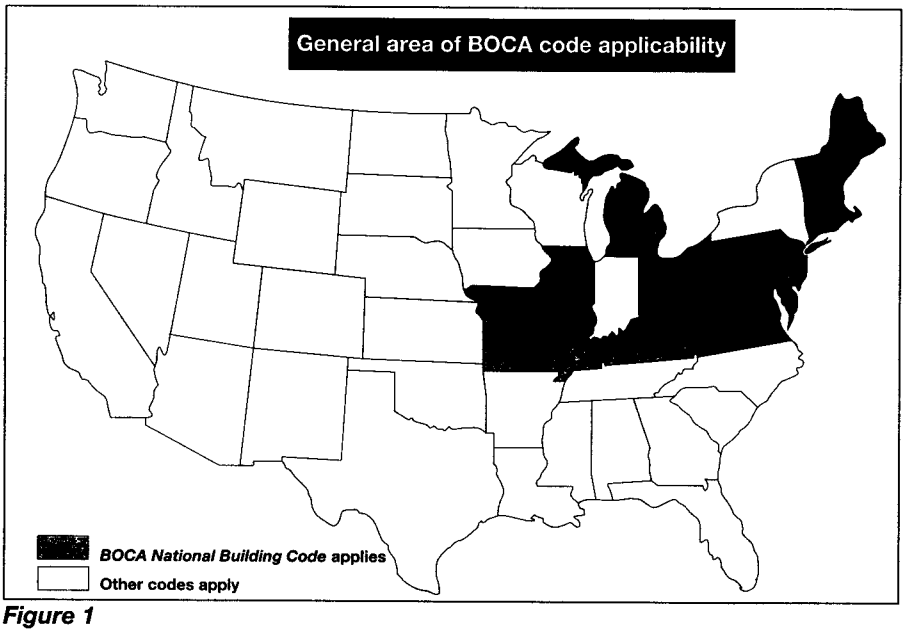


Figure 1

Aggregate/ballast/pavers

A new provision in BOCA 1996 (Section 1505.2.1) requires that aggregate, ballast and pavers on roof systems be wind tested and shown to stay in place when subjected to the design basic wind speed. However, a specific method for performing the test is not stated.

Currently, an industry-recognized, consensus test method standard for determining the wind resistance of aggregate, ballast or paver roof surfacings has not been developed. Also, none of the FM or UL test methods recognized by the code for determining wind load resistance currently addresses the wind resistances of any surfacing materials. Therefore, it could be interpreted that roofing professionals cannot install roof systems that employ aggregate, ballast or paver surfacings and comply with BOCA 1996.

When considering roof systems that use aggregate, ballast or paver surfacings, and BOCA 1996 is applicable, roofing professionals are advised to consult the roof system manufacturer regarding code compliance.

Shingle attachment

In an effort to improve the wind resistance of asphalt shingles, BOCA 1996 requires that asphalt strip shingles be installed with a minimum of six fasteners (instead of four, as required in the 1993 code) for buildings located along the hurricane ocean line. The hurricane ocean line specifically is defined in the code as encompassing "... the Atlantic and Gulf of Mexico coastal areas and 100 miles (160 km) inland ..."

Steep roof underlayment

For steep-slope roof systems, such as those employing asphalt shingles, BOCA 1996 requires that underlayments comply with American Society for Testing and Materials (ASTM) Standard D226, Type I.

Because of this requirement, so-called "nonspec" underlayment felt, which is not in compliance with ASTM D226, Type I, would not be in compliance with BOCA 1996.

Attic ventilation

The language in BOCA 1993 concerning attic ventilation is revised in BOCA 1996 to require balanced placement of ridge and eave vents. BOCA 1996 states, "... one-half of ventilation openings shall be provided by ridge or gable vents, with the balance of the ventilation openings provided by eave or cornice vents ..."

Also, BOCA 1996 requires that attic vents "... be tested for rain and snow infiltration in a manner representative of the intended installation and shall not permit the entrance of rain and snow when so tested ..." However, a specific method for testing attic vents—to ensure that they comply with the code—is not indicated. Where BOCA 1996 is applicable, roofing professionals are encouraged to consult ventilation product manufacturers for specific test data required for code compliance.

Code adoption

The authority to adopt and enforce the BOCA code or those of the other model code groups lies with the governmental body (e.g., municipality, state) that enacts the code into law.

In some instances, the code and version that covers one jurisdiction will not be the same code or code edition that is applicable in adjacent jurisdictions. Similarly, enforcement and interpretation of codes also vary.

Conclusions

Recent changes to the BOCA building code have a substantial impact on certain roof assemblies' designs and uses. Although this article offers a brief description of several of the revisions incorporated into BOCA 1996, not all of the roofing-related changes are discussed.

Roofing professionals should know the requirements of the applicable building codes (and editions used) that pertain to their projects.

Roofing professionals also should know when their local jurisdictions intend to adopt new versions of the building code. In some instances, projects may be designed and bid while one version of the code is applicable—and actually constructed after a new code has been adopted and is in effect.

Editor's note: The BOCA National Building Code/1996, *its past editions and other BOCA codes can be purchased from BOCA at 4051 W. Flossmoor Road, Country Club Hills, Ill. 60478-5795; telephone (708) 799-2300.* PR

Mark S. Graham is NRCA's associate executive director of technical services.