NRCA's new guidelines provide assistance to roof system designers

by Mark S. Graham

NRCA has released a new publication, NRCA Guidelines for Complying With Building Codes Using ANSI/SPRI ES-1, which will help designers properly design and specify perimeter edge-metal flashings to comply with building code requirements and ANSI/SPRI ES-1, “Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.” The new guidelines include important information designers of low-slope membrane roof systems should know.

NRCA’s guidelines
NRCA’s ES-1 guide is composed of eight chapters and four appendices.

Chapter 1 provides an overview of the document’s content and an introduction to wind forces acting on buildings’ roofs.


Chapter 3 provides an overview of wind-load calculations for roof area perimeter and corner regions using ASCE 7-05 and ASCE 7-10. NRCA recommends designers use the edition of ASCE 7 that applies to the specific edition of IBC adopted by a jurisdiction. IBC 2006 and 2009 reference ASCE 7-05, while IBC 2012 and IBC 2015 reference ASCE 7-10. Also, IBC Chapter 16-Structural Design requires designers to include design wind loads in contract documents. NRCA recommends designers clearly note design wind loads for roof area perimeters and corners in their drawings or specifications.

Chapter 4 provides an overview of ANSI/SPRI/FM 4435/ES-1-11. ANSI/SPRI/FM 4435/ES-1-11 includes a minimum safety factor of 2.0 in its wind-load calculations and more properly addresses perimeter and corner regions in design wind-load calculations than ANSI/SPRI ES-1-03. However, the pressure coefficients included in ANSI/SPRI/FM 4435/ES-1-11 differ from those in ASCE 7-05, making code-compliant wind-load determination using ANSI/SPRI/FM 4435/ES-1-11 a concern.

Chapter 5 provides an overview of wind-load calculations for roof area perimeter and corner regions using ASCE 7-05 and ASCE 7-10. NRCA recommends designers use the edition of ASCE 7 that applies to the specific edition of IBC adopted by a jurisdiction. IBC 2006 and 2009 reference ASCE 7-05, while IBC 2012 and IBC 2015 reference ASCE 7-10. Also, IBC Chapter 16-Structural Design requires designers to include design wind loads in contract documents. NRCA recommends designers clearly note design wind loads for roof area perimeters and corners in their drawings or specifications.

Chapter 6 gives an overview of design wind-resistance capacity. The fundamental concept of wind design is the tested design wind resistance (uplift resistance) should be equal to or greater than the design wind loads determined using the appropriate edition of ASCE 7.

Chapter 7 discusses ANSI/SPRI ES-1-03’s and ANSI/SPRI/FM 4435/ES-1-11’s test methods for determining an edge-metal flashing’s design wind resistance. Separate test methods are provided for gravel stop and fascia profiles and copings. Edge metal manufacturers and suppliers typically can provide test data for their profiles. NRCA also has conducted testing on a number of common edge-metal profiles.

Chapter 8 offers several example calculations illustrating the use of ASCE 7 and ANSI/SPRI ES-1 for proper code-compliant wind design.

The appendices provide information comparing ANSI/SPRI ES-1-03 and ANSI/SPRI/FM 4435/ES-1-11, NRCA’s ANSI/SPRI ES-1 certification programs, design considerations for wood blocking at roof edges and applicable definitions.

Closing thoughts
Properly designing and specifying code-compliant edge-metal flashings is a relatively complex task and complicated by having to know which specific editions of the building code, ANSI/SPRI ES-1 and ASCE 7 are applicable.

NRCA developed NRCA Guidelines for Complying With Building Codes Using ANSI/SPRI ES-1 to help roof system designers properly design and specify code-compliant edge-metal flashings.

MARK S. GRAHAM is NRCA’s associate executive director of technical services.