TITLE: Issues with ANSI/SPRI ES-1

DESIGNATION: IIBEC TA-003-2013 (REV 2022)

OBJECTIVE: To provide commentary regarding issues associated with the ANSI/SPRI ES-1 standard.

BACKGROUND

In 1998, ANSI/SPRI developed ES-1, "Wind Design Standard for Edge Systems Used with Low-Slope Roofing Systems." The design standard addressed copings and horizontal roof edges, and the following factors were to be considered when designing roof edges: Structural integrity of the substrate that anchors the edge (i.e., nailers), wind resistance of the edge detail, and materials specifications.

In 2003, the *International Building Code* (IBC) adopted the 1998 version of the standard, addressed in Chapter 15, paragraph 1504.5, "Edge Securement for Low-Slope Roofs."

The IBC requires that edge systems are to be tested in accordance with RE-1, RE-2 and RE-3 as applicable for the design pressure at the building site. This requirement has been adopted by a majority of the code enforcing bodies throughout the United States and has become the basis for building design. The design and testing of gutter systems are covered in other ANSI/SPRI documents.

COMPLIANCE / CODE CONFORMANCE

There are several sources that offer tested assemblies by which the edge metal can comply with the current standard. They are as follows:

- Manufacturers who have designed and tested proprietary premanufactured edge metal and coping systems in accordance with ANSI/SPRI ES-1 standards
- National Roofing Contractors Association (NRCA) ANSI/SPRI ES-1 tested details available at www.nrca.net.
- Sheet Metal and Air Conditioning Contractors National Association (SMACNA) ANSI/SPRI ES-1 tested details available in the *SMACNA Architectural Sheet Metal Manual* and at www.smacna.org
- Designed, shop-fabricated edge metal and coping profiles that have been tested in accordance with ANSI/SPRI ES-1
- Underwriters Laboratories Inc. (UL) ANSI/SPRI ES-1 certified metal edge systems. UL certifies these roof edge systems under the product category "Roof-Edge Systems, Metal, for Use with Low-Slope Roofing Systems (TGJZ)."
- If a 'non-tested' assembly is desired or necessary, the 'performance-based' option within the 2018 IBC can be used as allowed in IBC Section 104.11 'Alternative materials, design and methods of construction and equipment'. This is often performed on

DISCLAIMER

new construction where the coping is a part of the exterior wall system and is engineered by the design professional responsible for the exterior wall. Use of this alternative may or may not still require some form of testing, however the conditions and need can be jointly agreed upon with the code authority.

ISSUES

- Limits design creativity: Since there are a limited number of tested fabrications, a designer is somewhat limited to using one of these predetermined components and making it work with proposed new construction or with existing conditions. The other available option is developing an original design, producing a prototype, and having it tested by an independent laboratory.

- Limited applications and flexibility with existing building conditions: Existing buildings with unusual or atypical conditions and/or features along the perimeters of roofs traditionally do not lend themselves to the application of predesigned sheet metal fabrications. Again, this option would involve the time and expense of developing a prototype and having it tested by an independent laboratory.

- Past performance of "tested/approved" systems: There have been applications where "tested" assemblies that met the applicable standards were installed and subjected to elevated wind forces and did not perform as expected. The source of the failure may have been due to issues related to the dimensional characteristics associated with field measuring and/or the actual installation of the components where the as-built conditions did not conform to the laboratory conditions. Since many of the tested fabrications rely on interlocking and/or snapped-on components, variations in the dimensional limitations could result in less-than-desirable performance.

- Areas not located in hurricane-prone regions or high-wind zones: A large portion of the United States is not located within hurricane-prone regions or high-wind zones, and the requirement for the edge metal to meet these standards may be considered somewhat excessive and may not be the most cost-effective and practical solution. It would appear that fabricating and installing sheet metal edge flashings in accordance with established industry standards, such as SMACNA and NRCA, that have not been through the testing protocols have provided proven serviceable solutions without failures for those buildings located outside of the subject areas.

SUMMARY AND CONCLUSIONS

ANSI/SPRI ES-1 standard was developed for the betterment of the design, installation, and performance of perimeter edge metal systems and currently is included in the building code that has been adopted by most jurisdictions. It should be understood that there are alternate paths to compliance and that the final design should be tested to RE-1, RE-2 and/or RE-3 per the wind loads for the specific building site. The applicability, overall financial impact, and potential risks of these requirements should be reviewed by both the building owner and the designer.