

April 14, 2008

Mo Madani
Building Codes and Standards Office
Florida Department of Community Affairs
2555 Shumard Oak Boulevard
Tallahassee, Florida 32399-2100

Re: Wind Mitigation Workshop – Roofing Gravel

Dear Mr. Madani,

I am writing this letter regarding the proposed changes to the Florida Building Code regarding the use of roofing gravel.

SPRI developed the Code referenced standard RP-4, “Wind Design Standard for Ballasted Single-ply Roofing Systems”. This standard was developed to promote the responsible use of stone and paver ballasted roofing systems. Specifically it was designed to keep the roofing system in place when exposed to the wind loads covered in the standard, and to keep loose ballast stone from being blown off of the roof system.

Stone is typically used in low slope commercial roofing applications for one of two reasons:

1. Surfacing for BUR roofing assemblies. Stone, or aggregate as it is typically referred to, is used in this application to provide many positive attributes to the assembly such as improved fire resistance, foot traffic resistance and UV resistance to name a few. The aggregate size used in this application is well defined in ASTM D1863 and is smaller in size than that used in a ballasted roof application.
2. Surfacing for ballasted single-ply and protected membrane roof systems. In this application the stone is used as ballast to hold the roofing components in place. The stone used in this application is defined in ASTM D448, and is typically either nominal 1.5” or nominal 2.5” in diameter depending upon application requirements.

As noted earlier, ANSI/SPRI standard RP-4 was developed to promote the responsible use of ballasted single-ply and protected membrane roof systems. This standard was developed based on the data obtained from extensive wind tunnel testing conducted at the National Research Council of Canada and has been revised through the years based on field experience.

The NRC test program identified the critical wind speed at which stone will

- first begin to move
- scour
- be lifted and propelled.

It also determined the impact of stone size on these speeds and the impact of parapet height.

This data was used in the development of ANSI/SPRI RP-4. As a result safety precautions are built into the Standard to prevent stone blow-off, for example:

- If stone is to be used, the standard requires the use of larger (nominal 2.5" stone) in windborne debris regions.
- In very high wind load regions the standard does not allow for the use of loose ballast stone in the perimeter and corner regions. These regions are defined as 40% of the building height.

Third party observations regarding the performance of ballasted single-ply roofs validate the viability of these systems in high wind conditions if they are properly designed.

1. RICOWI investigations after Hurricanes Charley, Ivan and Katrina validated the performance of these systems.
2. FEMA report 489, which details the performance of building components after Hurricane Ivan, noted some ballast stone blow-off, however specifically pointed out that the systems were not installed per the ANSI/SPRI standard.

The manufacturers of single-ply roof systems monitor the performance of installed systems. To date, no reports of stone blow-off or roof system failure in high wind events have been noted with ballasted systems installed per ANSI/SPRI RP-4.

Section 1504.8 of the IBC should not be incorporated into the Florida Building Code. The requirements of this section do not take into account two important variables with respect to stone blow-off. These are stone size and parapet height. Section 1504.8 treats all stone sizes the same, and all buildings the same regardless of parapet height. This is not an accurate representation of how these systems perform.

Before any changes are made to the Florida Building Code regarding the use of these systems, a study should be conducted to determine if there are problems with ballasted systems designed in accordance with RP-4. If there are, then revisions should be made to the standard to account for these issues in place of including separate and conflicting requirements in the Code.

Best regards,



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