To All OIRCA Members:

Wind Design of Membrane Roofing Systems

The purpose of this bulletin is to address the confusion surrounding the wind design of membrane roofing systems; in particular as it relates to wind-uplift resistance test methods.

There has been a great deal of discussion and speculation relating to anticipated changes to the National Building Code (NBC) in particular the addition to the code of CSA standard A123.21-14, “Standard test method for the dynamic wind uplift resistance of membrane-roofing systems”. A new NBC will be released in 2015 and this CSA standard is expected to be included.

In Ontario we use the Ontario Building Code (OBC) with the current version being the 2012 edition which came into effect January 1, 2014. Future changes to the OBC are expected to be staggered with some having been added in 2014 and the balance in 2017.

Section 4.1 of the OBC, in particular 4.1.7 addresses Wind Load design in significant detail. There is currently no requirement in that section of the code to demonstrate compliance; that would change with the addition of CSA 123.21-14.

The CSA 123.21-04 test method, first edition, was published in 2004 under the title “Standard test method for the dynamic wind uplift resistance of mechanically attached membrane-roofing systems”. This test method was originally developed by a National Research Council Canada (NRCC) industry based consortium initiated in 1994. The consortium is known as the Special Interest Group for Dynamic Evaluation of Roofing Systems (SIDGERS).

In 2005 a second consortium, the Adhesive Applied Roofing Systems (AARS) developed a second test method to address adhered roofing systems and the second edition of CSA 123.21-10, “Standard test method for the dynamic wind uplift resistance of membrane-roofing systems” was released in 2010.

In 2014 the third edition of the standard, CSA 123.21-14, “Standard test method for the dynamic wind uplift resistance of membrane-roofing systems” was released and it supersedes the previous two. This version adds the partially attached (hybrid) membrane roofing system, where for example rigid roof insulation boards are mechanically attached to the structural deck and the membrane system is adhered over top; one of the most common applications of low-slope roofing in Canada.
The mission of SIDGERS when established back in 1994 was to develop a dynamic wind uplift test method that ultimately would find its way into the country’s building codes. In 2015 that will happen as CSA 123.21-14 is expected to appear in the NBC.

That said the OBC rules in Ontario. We expect that the earliest we might see CSA 123.21-14 appear in that code is 2017. Until that does happen, the status quo remains in effect in Ontario; wind load designs must meet section 4.1.7 of the 2012 OBC.

In this country it is widely accepted that the “dynamic” testing method most closely replicates the actual wind conditions found on a roof. FM Global uses a “static” testing method which many believe does not mimic actual roof top wind conditions.

Wind design guides including Loss Prevention Data Sheets from FM Global are available to assist designers where specific insurance requirements must be met. It should be noted though that there is no requirement in the code to use FM wind uplift testing procedures to demonstrate compliance with the code.

What does all this mean to the roofing contractor? When there is some doubt as to whether a specified roofing system meets the requirements of the OBC, obtain written confirmation from the manufacturer that the specified roofing system does in fact meet the requirements of the OBC and the project’s specifications.

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