

WIND UPLIFT ON GREEN ROOFING – IS IT OVERBLOWN?

BY LIZ MORRIS, GRP

After several decades of experience in North America, green roof designers, suppliers and installers have spent a lot of time perfecting their trade. The industry has learned a great deal about how to install vegetated roofing that is thriving, leak-free, and long-term (as in, lasting for many decades).

As the world of living architecture continues to mature, we are now expanding into new realms never thought possible. For example, the University of Miami is in the middle of a hurricane super-highway. Until recently, not much green roofing happened in hurricane zones, due to concerns about keeping green roofs on buildings during very high winds. But this campus's 25 new green roofs were accepted by Miami-Dade for high velocity hurricane zone wind resistance, and are the new standard for protection against wind uplift.

Considering that hurricane zones are generally located in highly sensitive coastal environments, it is especially important that we are able to utilize the most impactful aspect of sustainable urban development in these areas – which is the reintroduction of vegetation through living architecture. These fragile watershed ecosystems can benefit significantly from on-structure vegetation, especially due to improved stormwater management, reduced urban heat island effect, and enhanced air quality.

It's not just hurricane zones that call for withstanding strong winds. Non-coastal cities located on fresh waters also can experience damaging gusts through lake- and canyon-effects. High-rise green roofing on skyscrapers in any wind zone must consider the potential for displacement of the green roof components in strong winds.

So how to design in hurricane zones? It is important (even without on-structure vegetation) to get a comprehensive under-

standing of the wind conditions on site. Whether caused by other buildings, high-rise conditions, or location in a hurricane zone, the first step is knowing the various wind-uplift scenarios each roof area will experience.

The next step is ensuring the system configuration can withstand the rooftop conditions without displacement of any components. Generally, the edges of the roof are most sensitive to wind uplift, but can be secured with the use of vegetated free zones of strapped or otherwise secured pavers. Or, in the case of the University of Miami Lakeside Village housing, their green roofs have a double parapet wall, which left a non-vegetated wind tunnel around the perimeter of each roof, to channel the wind away from the greenery.

Another consideration is the use of insulation and drainboards, both of which could introduce the potential for uplift if not sufficiently ballasted and secured. The use of soil stabilizers, such as several layers of mesh within and on top of the growing media, can help keep it in place during high winds. But planting is also key to protection against wind scour - thriving roofs with full coverage of vegetation will hold their growth media in place more effectively than sparse, unhealthy plantings.

As green roofs and living walls become increasingly commonplace, and the benefits clearer and increasingly measurable, we can now begin to expand into hurricane zones, urban high-rise conditions, and cities with strong lake effects – which happen to be areas that can most benefit from living architecture.

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