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VEGETATIVE ROOFING AND WIND UPLIFT

Designers concerned about wind uplift can refer to the voluntary wind uplift design guideline called ANSI/SPR RP-14, which was developed by the Single Ply Roofing Industry with input from Green Roofs for Healthy Cities. RP-14 is modeled closely after ANSI/SPRI RP-4, “Wind Design Standard for Ballasted Single-ply Roofing Systems.” It is intended to provide a minimum design and installation reference for those individuals who design, specify, and install vegetative roofing systems. Users of RP-14 can determine the maximum allowable wind speeds for vegetative roof systems based on a specific building’s height, roof edge (parapet) height and exposure category. It is important to note that RP-14 treats vegetative roofs as ballast, and applies principles gleaned from experience in testing ballasted roof assemblies to these systems.

The basic steps for determining a compliant design using RP-14 are summarized below. You can also find them in section 6.0 (page 11).

1. Step 1: Gather the following information for your project.
 1. Basic Wind Speed- Section 2.5; Map on page 26. Uses ASCE 7-05 wind speeds.
 2. Building Height- Section 3.2
 3. Parapet Height
 4. Importance Factor- Section 2.10
 5. Surface Roughness Category- Section 2.7
2. Step 2: Using the information from above, reference the Design Tables (beginning on page 12) to determine whether you need to employ a System 1, 2 or 3 Design.
3. Step 3: Locate your roofing type and System Design recommendations.
 - 4.1 Ballasted Roofing Systems
 - 4.2 Protected Vegetative Roofing
 - 4.3 Fully Adhered Membrane.
4. Step 4: Note the ballasting requirements for the Corner, Perimeter and Field of the green roof. (Refer to Figure 1 on page 19). Refer to section 2.6 (page 3) for definitions of these roof areas.
5. Step 5: Refer to Section 3.13 for #4 Ballast and #2 Ballast Definitions.

Note: The modular tray systems manufactured by Columbia Green Technologies count as #2 Ballast (the maximum wind uplift ballast protection) because they are “Interlocking contoured fit or strapped together trays containing growth media spread at minimum dry weight of 13 psf (64 kg/m²) of inorganic material plus organic material. Columbia Green trays employ interlocking edges on all four sides of the trays. The trays are also physically fastened together using polyethylene pins, which creates an interlocking assembly which displays considerable resistance to wind uplift.

Note: the layered system manufactured by Columbia Green Technologies can count as EITHER #4 or #2 Ballast, depending on the specified depth of growing media. To count as #2 Ballast (the maximum wind uplift resistance), the layered system must have at least 4.75” of growing media to provide 13lbs/sf dry weight (26.74lbs/sf fully saturated).