



High-Profile: GREEN FACILITIES DEVELOPMENT NEWS



Designing a Vegetated Green Roof System for Electronic Leak Detection

by Laura Kozel

With the increasing number of vegetated roofs, electronic leak detection is a critical part of the design and installation to mitigate risk to the contractors and building owner. Although vegetated roofs have many benefits, their primary function is to manage stormwater, and they will be a valuable tool to support compliance with the upcoming new Massachusetts DEP stormwater management requirements.

Electronic leak detection technology can pinpoint any breaches in the waterproofing membrane, even with ballast or a vegetated green roof, if the entire system is designed appropriately. It is far superior to the alternatives of flood testing or infrared scans, neither of which locate exactly where the breach is in the waterproofing.

Electronic leak detection techniques, which include Smartex vector mapping and high voltage testing, find breaches by trying to force current or complete a circuit through the non conductive waterproofing membrane. The following must be taken into consideration to ensure the system can be tested:

- EPDM is not testable in general because it is a conductive membrane.
- Waterproofing membranes should be chosen to avoid the need for a polyethylene root barrier in the vegetated roof system. The root barrier will permanently inhibit the ability to do any type of electronic leak scans. It acts as a barrier between the



Vegetated green roof at Simmons College, Boston installed by Apex Green Roofs over a Sarnafil PVC membrane

waterproofing membrane and the surface where the technicians are performing the test. The only alternative is a permanent, automated leak detection system.

- Vector mapping requires water in the system to work. It is recommended that the membrane be exposed for several months prior to testing or that the membrane be carefully pressure-washed to ensure water is in the system.
- The setup for vector mapping can

be installed on any roof to facilitate future one-time scans of the roof.

- A conductive mesh is required under the waterproofing in a fully adhered roofing system that includes a vapor barrier to be able to test.

- A conductive mesh may also be built into a roofing system to increase the accuracy of the test as it will minimize the distance water has to travel beneath the waterproofing to complete the circuit.

The vegetated roof at Simmons College is a great example of a testable design. The vegetated roof was built by Apex Green Roofs over a Sarnafil G476 waterproofing membrane. This membrane does not require a root barrier. The green roof profile, which meets all current ASTM green roof standards, includes a protection fabric, sheet drain (holding .12 gallons/sq ft), 4 oz separation fabric, and four to eight inches of engineered green roof media. The green roof is accessible and has a curved patio area of pedestal pavers. It is predominantly an extensive roof with seven varieties of sedum but also includes some semi-intensive planting pockets that are eight inches deep which support taller, herbaceous plantings like Rudbeckia (commonly known as Black Eyed Susan), little bluestem, and some native grasses. This vegetated roof has a wide variety of plants, colors, and bloom times and heights up to three feet.

Progeo Monitoring is a local source for electronic leak detection and offers Smartex technologies for one-time scans and permanent, automated leak detection systems.

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