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Vector mapping pinpoints roof leaks, ends guesswork for contractors searching for cause

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Time was when water seeping through the ceiling was the beginning of a protracted battle to find the cause. You'd start by calling your roofing contractor, who would begin diligently hunting for the source of the leak by walking the roof. He'd look for visual evidence of breaches in the roof membrane, loosened flashings, wind damage, and sealant failures around rooftop equipment.

Generally at least one problem would be found, but chances were good that the money spent during the first visit would not stop your leak. A second or third visit might well be necessary. Meanwhile, every time it rained you'd be risking inventory and structural damage, downtime, electrical problems, and mold infestation.

If repeated visual inspections and patches failed to put an end to the problem, the next step would be to conduct a flood test - if your roof and building structure were deemed sound and strong enough to withstand it. The roof drains would be stopped up while thousands of gallons of water were pumped onto the roof surface to a depth of several inches. Then, as the leaking water seeped and spread through the roof system and into your building, your contractor would try to determine the water's path and from that deduce the location of the leak.

Thankfully, those days are over. With the advent of vector mapping, an electronic leak detection technology first developed in Europe, it's possible to pinpoint all the breaches in a roof system in a single inspection - even those invisible to the naked eye - saving building owners and managers significant risk, time, and money.

Vector mapping positively identifies leaks by tracing the flow of an electric current across the surface of the roof membrane. Unlike the interpretive, hit-or-miss methods of visual inspection and flood testing, vector mapping detects membrane faults directly, so repairs can be made on the spot and immediately retested to ensure watertight results.

Vector mapping can be performed using either a low or high voltage apparatus. In low voltage vector mapping, the surface of the roof membrane is moistened (not flooded) to create an electrically conductive medium. A conductive wire loop is laid out on the membrane around a section of the area to be tested. Leaks are detected when the electric current flows across the moistened membrane and down through the breach to the roof deck, completing a circuit. The testing technician uses two probes connected to a receiver to determine the direction of the electric current and precisely locate the breach.

High voltage vector mapping is performed on dry horizontal or vertical surfaces using a very small current at relatively high voltage for safe and reliable testing. As the technician sweeps a highly conductive electrode brush over the membrane surface, electricity will flow through any breach in the membrane, completing a circuit between the brush and the roof deck. In either method, membrane areas that are sound will act as an insulator and prevent the flow of current to the deck.

As you might expect, technology this ingenious has more than one application. In addition to pinpointing leaks in existing roof membranes, vector mapping is ideal for quality assurance testing of new roofs, verifying the integrity of green roof membranes during and after construction, and warranty verification. It's also used to test the waterproofing integrity of plaza decks, pools, and parking garages

Traditionally, roof leaks have been one of the building owner's thorniest problems. This breakthrough technology changes the game by pinpointing the actual location of the leaks. And that means fewer headaches and big savings in time and money.

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