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New testing methods keep pace with roof design

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From 'inverted' roofs to 'cool' roofs and now 'green' roofs, new roofing systems and materials promise to improve energy efficiency and reduce environmental impacts. Fortunately, the technologies for testing roof integrity and performance are keeping pace with these rapid developments in roofing design.

Infrared thermography has dramatically improved our ability to assess the internal conditions of most low-slope roofing systems. An infrared scan reveals valuable details about the location and extent of moisture damage within the roof structure. This information can substantially reduce roof repair and replacement costs by identifying sound sections for conservation and targeting problem areas for effective repair.

Ballasted roofs, however, cannot be reliably tested with infrared thermography. Instead, we test these roofs with a nuclear moisture gauge, which uses low-level neutron interactions to safely and accurately locate moisture deep within the roof system. Like infrared testing, nuclear moisture inspection enables us to map the roof's internal moisture damage, saving building owners tens or even hundreds of thousands of dollars in unnecessary repairs and replacement.

But when the question is "where is the leak?", even these advanced methods may not supply a definitive answer. Too often, the old fashioned and risky 'flood test' has been the only way to track down hard-to-find leaks in roof membranes. Thankfully, those days are over.

Electronic vector mapping is redefining leak detection and quality assurance in low-slope roofing systems. This cutting-edge technology pinpoints even the smallest breaches in roof membranes by tracing the flow of a low-voltage electric current across the membrane surface. Already Europe's most widely-used method for roof leak detection, vector mapping is rapidly being adopted by manufacturers and contractors in the United States.

Vector mapping is ideal for quality assurance testing of new roofs, including verification of green roof waterproofing membranes prior to installing the soil overburden. Vector mapping can also pinpoint leaks in existing roof membranes, making it extremely useful for warranty verification purposes.

Most roofs are well-suited to vector mapping, including insulated and non-insulated systems, graveled and ballasted roofs, and even roofs under standing water. Metal-coated and carbon black membranes, however, are poor candidates due to their electrical conductivity.

As roof designs continue to evolve, we'll continue to develop new technologies and practices to help building owners maintain and extend their valuable assets.

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