

Thermography sees ‘invisible’ problems

By Paul Weideman

Ralph Pattelena has a really cool and expensive toy. And he gets to use it for his work. The Fluke infrared camera, a yellow, pistol-like instrument with a viewing display on the rear, shows the professional home inspector problem areas that are invisible to the naked eye.

Even though it sometimes seems like the hand-held camera can see through things, it only measures surface temperatures. With an astounding sensitivity. During a recent visit, Pattelena pointed the device toward one side of a conference room at The New Mexican. The display on the back revealed the wood studs in the wall about 20 feet distant.

We weren't really seeing them directly; but the studs and the insulated wall spaces between them showed up in different colors — because they had (slightly) different temperatures.

“I've probably done over 9,000 inspections in the last almost 20 years,” Pattelena said. “Business is down and with this whole focus on energy we decided to branch out with energy auditing. The most important part of this is that we're using infrared photography to scan the house from the inside.”

He said the first such devices, which were then so big they were toted around on trucks, were used by the military to find people by detecting body heat. Since then, the technology has been miniaturized and found its way into civilian applications.

Pattelena's Web site, www.santafehomeinspection.com, has a series of animations, fading back and forth between visible-light and infrared views of potential problem areas in houses. One labeled “Roof Leak” shows a section of ceiling which, in the infrared capture, shows a blue, darker spot. “That shows up because that spot is cooler than the surrounding area due to evaporative cooling,” Pattelena explained. “So there's moisture there.”

In “Electrical Hotspot,” the special camera exposes a glowing area on a switchplate in a Las Campanas house. The dimmer switch would seem fine to the inspector walking in and testing the lights by turning them on and off. But if left on for a few seconds, the glow, spotted in a scan of the room, read 182.5 degrees Fahrenheit on the IR camera display, definitely a fire hazard.

The example labeled “No Problem” is one where the camera neutralized a concern. Streaks on the wall under a portal made it look like there was a roof leak above. Thermography showed that was not the case. In fact, the roof had been repaired in the past and the owner had forgotten to remedy the streaking.

Another use for the IR camera is “Energy Efficiency Analysis,” to locate areas where your building envelope is compromised, perhaps at skylights or where vigas or beams pass through a wall, or at windows and doors.

Pattelena has been doing home inspections in Santa Fe



Two examples of problem-finding via infrared inspection, with naked-eye images on the left and infrared-camera images on the right. Above, the camera reveals cold-air infiltration where a viga penetrates a wall. Bottom, the radiant-heating zone in foreground appears to be nonfunctional.



since 1991. “The objective is to protect the interest of the buyer,” he said. “Although sometimes it's someone who decides to sell the house and wants to make sure there are no serious problems.”

On a standard home inspection, Pattelena employs a checklist of about 500 points, but infrared inspections are extra. “We don't include this in our regular inspection. We offer it as a service in addition to that,” he said. “If you're going to spend a million dollars on a house, you might think it would be prudent to do this for \$500 or whatever it would be for the particular house. Or you might want to use it to find thermal leaks and reduce your energy bills.”

Pattelena, a native of the Boston area, began in the construction machinery business in New York. In 1976, the company that employed him opened a construction-equipment business in Al Khobar, Saudi Arabia.

“It was a joint venture with a Saudi family,” he said. “We had about seven employees doing about \$1.5 million in business a year. We were distributors of middle-size equipment. For example, we were the largest international dealer of Bobcats [loaders].”

“In 1978 I took it over and in two years, I expanded it to two more offices in Jeddah and Riyadh. After about four years, we had nearly 60 employees and we were doing maybe \$10 million worth of business.”

He also got the New York office to make sure there was a Korean-, Arabic-, and English-speaking salesman in each office, because those were the customers: Middle Eastern construction companies, a few American and European contractors, and Korean contractors — Pattelena estimates there were at least 30,000 Korean construction workers in Saudi Arabia at the time.

His company's business was fed by the region's burgeoning oil economy. “They had tremendous revenue and they wanted to improve their country, so they were building schools and highways, all kinds of infrastructure projects.”

He and his wife, Barbara, relocated to Santa Fe in 1990 and started the home-inspection business the following year.

Why?

“Our Realtor said there weren't a lot of good inspectors here at the time,” Pattelena responded. “Also I thought if I wanted to have a business, after what I'd done before, I wanted no employees, no inventory, and no accounts receivable. This kind of suited those criteria.”

He also felt like he had the right kind of skill set, with the construction-equipment business experience following his bachelor of science degree in civil engineering and a master's in business administration, both earned at Cornell University.

“I wasn't going into it for the money, but it turned out to be better than I expected,” he said of Santa Fe Home Inspections. “Our son, Steve, joined the firm in the late 1990s and we have one other employee, David McDonald. I don't do the home inspections myself any more.”

But he has this fairly unique proficiency. A SIRI (Specialist - Infrared Residential Inspector) list shows just two in New Mexico: Pattelena and one in Carlsbad.

Besides getting that fancy scope/camera, he also put in some education time to learn how to read and interpret what's shown on the little screen.

“Oh, yeah. I've taken three classes,” he said. “I'm a Level 1 Thermographer.”