

Radiant Comfort

In The New Mexican Desert

by Michael S. Weil
executive editor

It's hard to believe that in this day and age, people would flock to what can best be described as a mountainous version of the Sahara. But the fact is, New Mexico is one of the fastest growing states, from a population standpoint, in the nation. People from around the world are migrating to this region, especially to the major metropolitan centers in Santa Fe and Albuquerque.

And we're not just talking tourists. Sure, there is plenty to see and do in this ancient Indian land – from white-water rafting down the Rio Grande to visiting the still inhabited 1,000-year-old village of Taos. But people are coming to the area to stay.

And that means residential new construction is booming all over the state. Now picture this: you have a growing population moving into a vast desert community — and the comfort system of choice is radiant heating?

Strange as that sounds, it's not big news to the people who live and work there. Michael Richardson, president of Sun Mountain Plumbing and Heating, Inc., Santa Fe, says New Mexico has been a hotbed for radiant systems since the 1920s. The Plumbing, Heating, Cooling Contractors Association (PHCC) backs him up on that. According to a PHCC spokesperson, the Southwest in general, New Mexico in particular, is among the largest and fastest growing areas for the use of radiant heating in the world.

"In fact, there is so much radiant going in here," Richardson says, "that component manufacturers actually use New

Mexico as a guinea pig for their new radiant products."

Though Richardson holds licenses for all the major technologies — forced air heating, air conditioning, plumbing, and electricity — he says Sun Mountain does mostly radiant installations.

Is that unique? Not in New Mexico. What is unique is that Sun Mountain, named for one of the peaks found near Santa Fe, focuses only on the construction market — they do no service, no remodeling. The company focuses 80% of its energy on installing radiant systems and plumbing into higher-end homes, working strictly for general contractors and builders.

Sun Mountain Plumbing, a 12-year-old firm that grosses more than \$750,000 in sales annually, aligns itself with builders who, according to Richardson, are his company's key customers, and gets into projects at the design stage. Because the population growth in Santa Fe is so high, developers and builders are erecting whole

Contractor Mike Richardson of Sun Mountain Plumbing & Heating provides radiant heating to builder customers in and around Santa Fe.



communities of custom homes and Richardson's company picks up most of its jobs through them.

He says that no other plumbing and mechanical contracting firm in the state operates quite the same way. Radiant heat accounts for 98% of his residential mix. He adds that Sun Mountain also does some light commercial work (20% of their gross revenues).

Sun Mountain Plumbing and Heating must do a good job because they have more work than they can handle. According to Richardson, they turned down more than 100 homes last year. They accepted, and completed, 30 to 40. As of this printing, the company has 25 projects in backlog through the end of 2002. That seems to be a comfortable load. That, plus the 5 to 8 commercial jobs they'll do in a year, keeps this small company running on all its cylinders.

So why is radiant so popular in the high desert? Richardson says the systems are easy to install and provide homeowners the least amount of headaches because they're virtually maintenance free. He adds that modern hydronic systems are closed systems — the relatively small amount of water necessary for them to work is enclosed in a sealed environment — rubberized tubing. Because of the dry, sandy-clay nature of the area's soil, the tubing is easily and safely laid out and concrete poured on top of it.

"When laying it out, we use the full run of the tubing which is aluminum shielded," Richardson explains. He adds that the shielding provides an oxygen barrier which prevents air from infiltrating the tubing and turning the water acidic. "If that were to happen," he says, "the system can be severely damaged."

The nature of the work enables Sun Mountain to run two to three two-man crews. Each crew can lay out all the radiant tubing for a project in just one day.

Says Richardson, "the tubing we use comes in 200-ft. rolls and we lay it out in full 200-ft. runs."

Why? He says at that length the same amount of water runs through the tubing at the same flow rate. He adds that tub-



Radiant tubing is laid out in 200-ft. runs, creating a self-balancing system. The ends are manifolded as shown here so that the boiler plant can be quickly installed after the home is framed.

A Recipe For Success

Sun Mountain Plumbing and Heating, Inc. has been in business for 12 years and owner, Michael Richardson has more than 35 years of experience in the HVAC industry under his belt. To better accommodate his builder customers, and create a comfort package that was saleable and required very low maintenance, he developed recipe for a radiant system "plant" template.

At the heart of his "plant" is a gas-fired Laars Mini-Therm II Boiler – chosen for its compact size and high efficiency rating. Water is pumped to and from the boiler using a TACO cartridge circulator pump. Zoning is accomplished using separate tubing runs connected to the boiler via Honeywell zone valves.

Sun Mountain installs Watts Radiant Onix tubing because it uses aluminum shielding for its oxygen barrier and, according to Richardson, holds up much better than some of the other tubing available today. Plus, it comes on 200-ft. rolls, which is perfect for each zone. Richardson says he uses 200 feet for each run because equal runs translate to simple heat distribution, plus the system balances itself.

In addition, Richardson's design calls for an accumulator tank, a Johnson Controls damper motor, and Watts Radiant pressure relief and diverter valves.

Potable water is supplied using Rheem Fury water tanks.

All the equipment is set on a pre-installed pad either in the garage or some other area determined when the house was being designed.

Because the tubing is manifolded prior to the concrete slab being poured, and because of the compact size and weight of the boiler plant equipment, Sun Mountain can a single installer install the system in around one day.

With this recipe, Mike Richardson and crew can accommodate 30 to 40 jobs per year.





Sun Mountain Plumbing President Michael Richardson (left) and field foreman xxxxxxxxxxxxxxxx double check the tubing runs on a new construction project just outside of Santa Fe.

ing runs that are equal in length translate to simple heat distribution. "This makes the system self-balancing — we don't need any balancing valves."

Finally, after laying out all the runs, Sun Mountain's file crews manifold the open ends prior to the concrete slab being poured.

During the construction process, Richardson says all the radiant lines are kept under pressure as a safety precaution. The tubing itself is very resilient, but he says accidents can happen.

"A nail can get driven too deep into the concrete slab and puncture the tube. If the tube is under pressure, we know immediately where the problem is and can repair it quickly."

He adds that no hydronic systems Sun Mountain installs uses more than 15 gallons of water.

"The rest is just a matter of engineering," Richardson says.

The Heart of the System

And the way he engineers the system is in a small packaged format that allows his teams to install it quickly and in a compact space pre-designed into the home's structure (See the sidebar, "A Recipe for Success").

Another reason for the popularity of radiant heat, according to James Cross

is an account representative at Dahl Wholesale Plumbing and Heating, a subsidiary of Hajoca, Inc. He explains that at night the desert can drop to 30 degrees or less.

"Tubing runs that are equal in length translate to simple heat distribution, making the system self balancing."

"People like radiant heat because it can keep their floors, their bathrooms, even their towel racks warm and comfortable. Contractors like Mike Richardson have built a nice niche for themselves as they work toward satisfying this comfort need."

Dahl, which goes to market by partnering with key contractor customers, brings a significant amount of system design expertise to the table, should the contractor need it. Sun Mountain is one such contractor and Mike

Richardson views their partnership as a vital part of how he goes to market. Besides stocking the leading and most current hydronics products necessary to build the "circulatory systems" Sun Mountain installs, Dahl provides a great sounding board for Richardson's designs and problem solving needs.

The Old Ways Still Work

One thing to keep in mind about many homes being built throughout the state — they are, in essence, built in the style of the ancient Indian tribes who have and still do populate the area. Homes are built not only to appear like adobe dwellings, but functionally they work the same way the ancient designs did.

Thick walls of plaster and clay cover wood-framed structures providing superior insulation against the burning sun and the chill of the night air.

Most homes, according to Richardson, don't need air conditioning — the structures keep the bulk of the heat out and, if the homes are designed properly, cross ventilation keeps the comfort levels, well, comfortable.

"Because of the way these homes are built, there just isn't a lot of space or ductwork. Radiant systems are ideal in this environment," Richardson adds.

"Over the years we came up with a package that could be duplicated and installed in many homes with only a few adjustments required. We use off-the-shelf products to help keep costs down and increase the speed at which everything can be installed."

He points out that one technician can install the boiler plant in about one day. The boilers Sun Mountain uses are light enough for one person to lift and "we don't over-complicate the piping," he adds.

Simple. Fast. Easy. Sun Mountain accommodates the selling needs of its builder customers, provides comfort in zoned, efficient space for new homeowners, and does it using radiant technology in the heart of the New Mexican desert.