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Cover: Man Khadka, installer (left), and Vince Youndt, owner, Vertex Mechanical, connect 1/2-inch Watts Radiant PEX+ tubing to the home's upstairs subfloor. Watts Radiant photo by John Herr

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by John Vastyan
Common Ground

There's no place like home

Amish barn is now an award-winning, comfortable and efficient home...

The most popular spot in a holiday season tour of homes in the Lancaster, PA area last year was the once-Amish “barn home” owned by Chris and Michelle Simon in Mount Joy, PA.

More than 350 people visited the beautifully decorated home, giving the tour a new record, and the home a best-of rating from visitors.

But it wasn't the home's size or colorful Christmas decorations that drew the most frequent remarks. As guests stepped into the home, they quickly shed coats and gloves because of invisible warmth from within that seemed to emanate from the floor itself.

“In fact, the wide-plank oak or stained concrete kitchen flooring is the source of radiant heat,” explained Chris Simon. “Michelle worked so hard to decorate the home, so I now tease her that all

she really had to do was to open the door.”

But long before the barn home was a source of comfort for the Simons and their guests, it served duty as any barn might.

Once an Amish barn

Back in the 1980s, Amish farmers Ivan and Ara Esch raised a passel of kids on the farm in Mt. Joy. Kids were born in the house and Holstein calves came into this world just a stone's throw away, out in the barn.

The place was teeming with children and the Esch's larger-than-average dairy herd produced many gallons of milk for the local market. At times, the Eschs had the entire lower floor of the barn packed with cattle.

Many years later the big barn, originally constructed in 1871, is just about all that's left

of the old homestead. Its many outbuildings, silos and the rambling two-story home are gone—all except for the barn. And what a barn it's become.

From barn to home...

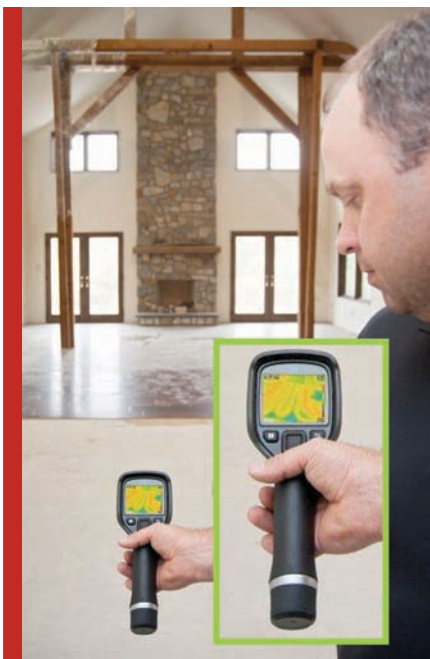
The Simons bought the now-28-acre property in May 2016 from owners who, over a 10-year period, attempted to turn the barn into a residence unsuccessfully. The Simons would complete a remodel that works, eager to make it their new home.

After several interviews, the Simons followed a friend's referral and settled on Amishman Mike Miller's firm, Buck Hill Construction, as the project's general contractor. If there's one type of construction that Amish builders know about, it's timber-framing.

The old post-and-beam barn had some structural oddities because of its unusually large size (60 by 100 feet). Inside, there were mysterious, inside-out flying buttress-type beams at each end, connecting queen post wall trusses to floor supports. The “strong back supports” were required long ago due to the strength limitations of the timbers used for structural support.

Of course, it was built for animals, which harkens back to one of the Simons' key challenges: how could they make the barn truly comfortable for people? For Chris and Michelle Simon—along with their two at-home sons, Tyler (18) and





Vince Youndt, president, Vertex Mechanical, measure floor temperature in the unfinished great room.

Evan (17) and daughter Hannah in college—This Old Barn was to become their homestead.

Enter Vertex Mechanical

On an early visit to the barn, Chris Simon learned that the previous owners had embedded radiant tubing throughout the entire lower concrete floor. He then learned from Vince Youndt, President of Stevens, PA-based Vertex Mechanical, that they could have radiant heat upstairs by encasing radiant tubing within a poured, two-inch gypcrete layer.

Simons' key challenge: how could they make the barn suitable for people?

Youndt and his team, chosen by the Simons to provide HVAC solutions for the house, devised a plan to provide hydronic radiant heating and geothermal cooling for most of the lower floor as well as the 4,900sq.ft. of living space above it.

By mid-2017, Vertex professionals were installing Watts Radiant tubing to the upstairs oriented strand board (OSB) subfloor attached to massive floorboards.

Comfort solutions

"I especially appreciate that Watts Radiant offers 1,200-foot spools of ½-inch RadiantPEX+ tubing—ideal for the many 300-foot loops used at the Simon's project," said Youndt, a two-time Radiant Professional's Alliance (RPA) award-winner who knows a thing or two about radiant heat.

"We also favor their stainless steel manifolds because of the flexibility they provide in adjusting flow if that's needed."

Youndt's heat load calculation for the Simon's home came to 128,000 British thermal units (BTUs) for space heating and domestic water.

The first in line for space heating is a five-ton water-to-water heat pump. Youndt subsequently selected a 150 MBH Laars Mascot LX wall-hung, mod-con boiler to meet midwinter supplemental heat needs as well as heat for domestic water. The boiler injects heat into the buffer tank when ambient temps trump the geo.

Packed with features, the made-in-America LX includes an easy to use control system, outdoor reset, primeless condensate trap, zero clearance installation and venting up to 150 feet.

The natural gas or liquid petroleum (LP)-fired unit offers 95% efficiency, full modulation and a plentiful supply of domestic hot water on combi units, but Youndt chose a boiler-only model.

For the Simon family, domestic water heating needs are met by a Bradford White 60-gallon indirect and 40-gallon water heater. The 60-gallon unit receives heat from the boiler; the smaller 40 is tied to the larger geo system's desuperheater, which uses waste heat to temper the tank before entering the cold side of the water heater. This provides a 60% energy savings for domestic water



Man Khadka, installer, (left) and Vince Youndt, connect 1/2-inch Watts Radiant PEX+ tubing to the home's upstairs subfloor.



Doug Zerbe, technical manager, replaces the cover on a new Taco 007 circulator during final inspections, and system commissioning.

heating. A third Bradford White unit, a 40-gallon indirect, serves as the geothermal water-to-water buffer tank.

“The Bradford White systems have big, high-flow stainless steel coils inside, ideal for quick heat transfer and recovery,” added Youndt. “However, their biggest attribute is that we’ve used them exclusively for decades with no disappointment. If my guys need a water heater or indirect, there’s no choice in the matter, and we’ve never regretted it.”

Meanwhile, Vertex’s drilling subcontractor drilled four, 300-foot vertical boreholes to meet the need for eight tons of geothermal cooling.

There are eight comfort zones in the home, all controlled by Taco Zone Sentry zone valves, each tied to a Taco zone control. Other key components include a Taco 4900 air separator, a Watts 911 combination fill and backflow preventer as well as Extrol expansion tanks.

“We also chose four of Taco’s newest, ECM-powered 007e system circulators, each tied to a tekmar 406 control,” added Youndt. “The circs are super-efficient, a perfect partner to zone valve-controlled hydronic zones, and offer two key advantages over other ECM circs in this size: Taco’s ‘BIO Barrier’ protects the pump from contaminants, and its ‘SureStart’ function automatically frees locked rotor conditions and self-purges air.”

“We chose tekmar for our

controlling strategy. The tekmar team was incredible to work with. I explained our strategy to them, and we created a system that was easy to install, easy to program and offers ideal functionality. We also installed the tekmar 485 to give the Simon’s remote access to the home’s climate control.”

Astonished visitors

As the project neared completion, a pleasant surprise was an unexpected visit from Amish farmers Ivan and Ara Esch who hadn’t seen the farm in decades.

“Ira was astonished, recalling the barn’s tightly-packed cattle,” said Chris Simon. “I think he’ll

As the old saying goes, “There’s no place like home.”

be talking about the barn’s transformation for years.”

On Dec. 12, 2016, the Simons received their certificate of occupancy. Christmas that year was one they’ll never forget. Twelve months later, they eagerly welcomed guests during the Christmas tour.

For the Simons, there’s no easy way to describe the giddy feeling they get while standing at one of the big windows in bare feet, while only inches away, a winter storm rages outside. As the old saying goes, “There’s no place like home.”

John Vastyan owns Common Ground, a Manheim, PA-based trade communications firm.



The barn home’s mechanical system puts Laars, Bradford White, Watts, tekmar and Taco together for what Vince Youndt describes as an “awesome solution for the Simon family.”