INDOORCOMFORTMARKETING.COM





FEBRUARY 2012



HVAC SOLUTIONS: Radiant warms 200-year-old New England church, improves IAQ

Serving the industry for 90 years



HVAC SOLUTIONS

Radiant to the rescue

NEW ENGLAND CHURCH GETS THE MECHANICAL OVERHAUL OF A LIFETIME

Radiant retrofit solves an age-old indoor air quality problem at same time

Ver 200 years ago, the congregation of the First Church of Templeton, Massachusetts put hammer to nail and built a long lasting place of worship. Constructed in 1811, the church building has been in constant use by the congregation, which was founded in 1755, to the present day.

Year after year, the heat would be turned on each Saturday afternoon, then shut off after the service on Sunday. Each week, the old sanctuary would get warm, cold, warm and cold again. As the decades passed, the cycles of condensate moisture eventually ate away the foundation sills, an unfortunate situation discovered when, according to Pastor Bill Ault, church managers had commissioned a repainting of the church. It was then that the bad news was delivered. The entire foundation sill was rotting away.

In order to save the church, said Ault, "...we needed to replace many of the church's structural elements." But this major overhaul looked like a job that seemed beyond a hope and a prayer.

"And, the closer experts looked into it, the more attention became focused on the need to update mechanical systems as well," said Ault.

Fortunately for the large congregation with an ailing church building, Huhtala Oil—located just six miles from the church on the town's square—was well prepared to take on the challenge.

With ten service trucks, 45 employees, and a successful business passed down for three generations, company managers learned long ago that to serve the area successfully, they need to be well acquainted with the art of hydronic heating. Huhtala faced a formidable task: be-

Jerry McKee, Huhtala service manager (L), and Darryl Delisle, Burner Service Professional, review materials and equipment needed for the job.







yond the gradually crumbling foundation walls and rot-ting beams, the decrepit old forced air heating system coughed up dust-at record high decibels. The large, loud and cranky oilfired furnace provided inaeequate heat distribution, unholy fuel costs and great discomfort with its inefficient combustion, scorched air and volumes of recirculated dust.

Illustrative of the style and complexity of the work they do, Huhtala pros took a serious look at the church and the heating system that served it, arriving at a plan that won the church board's approval.

Long before work began to retrofit the building and its long-overdue-for-an-overhaul mechanical system, Winchendon, MA-based Old Time Restoration pros were brought







was built in 1811.

in to realign and strengthen the compromised foundation and drooping skeleton. During its long life, the church's supporting timbers, which were actually whole logs, and other key parts of the foundation, had begun to weaken and rot. One thing led to another, and before long, the need to strengthen the church's foundation focused the attention of the compromise of having a dirtfloor crawl space.

"We saw the crawl space as not only a big impediment to getting the mechanical work done, but also in accessing it for routine maintenance," said Ault. "The crawl space was, in a way, part of the weakened foundation, and when we saw the link between the two problems, it was easy to make a connection between foundation repair and excavation."

So, when the real work began, two Huhtala professionals started by opening a hole into the old rock foundation at the rear of the church, providing access to its sagging underbelly. An entire network of new girders, joists and steel supports were used to slowly raise and straighten the church—truing floor, ceiling and roof sections that hadn't been level for decades.

Small, tracked excavators were brought through the hole to carve-out and deepen the dirt basement. Restoration, construction, concrete and mechanical system workers also used the gaping hole as their means of entry and aggress. Within several weeks, the church had a full basement, complete with a heavy, reinforced concrete slab. When the concrete trucks had dropped their last load, 260 cubic yards of concrete were left to cure.

The initial plan was in favor of hydro-air, tapping boiler heat delivered through fan coil units in the church's ductwork. "But we couldn't come up with an acceptable ducting plan," said Huhtala.

So their attention turned to radiant. And what a retrofit it would be.

The job would prove to be Huhtala's most substantial and complex radiant installation to date. The plan for a three-zone radiant heat system called for outdoor reset controls, an ambient design temperature of -10°F and circulated, under-floor delivery temperatures of 115-120°F,



After all the bids were given, and several of them for forced air, church board members made an aesthetic decision to go with radiant. "They didn't want the return of dust storms and hot, blown air," said Huhtala Oil's president, Dave Huhtala. Their mechanical plan was chosen.

required to penetrate the old, heavy hardwood flooring with some carpeted areas.

With $1\frac{1}{2}$ to two-inch flooring in most areas, inconsistent (and often insufficient) insulation, and with joist bays of widely varying widths, the Huhtala crew ran into a problem not uncommon in antique construction-designing a custom radiant system that would heat effectively, and with consistency in all areas of the church.

With the help of Frank Melberg at Randolph, MA-based manufacturer's rep firm, Emerson Swan, the Huhtala crew was steered toward the use of Watts Radiant products, including preassembled Hydronex control panels, and several Taco 007 circulators and zone controls.

"We've always been pleased with the efficiency and quality that Taco products bring to the job," said Huhtala, noting that he particularly liked the simplicity of replacing a pump cartridge rather than swapping out the entire pump.

"We believe that the Watts panels saved us 20 to 30 hours of on-site assembly and installation work," continued Huhtala. Reps at Emerson Swan also assisted with system design.

Once they decided to deliver heat with staple-up radiant, Jerry McKee, Huhtala's service department manager, said they chose to use Onix (from Watts Radiant) over other tubing due to its versatility in staple-up radiant-Onix is pliable and flexible, and has virtually no memory,

> providing an ease of installation with the tight bends and random pipe spacing intervals that the old building brought with it.

> So in went the Onix-7,800 lineal feet of it. Because of its flexibility, installers could connect both ends to a manifold, bend it back onto itself (with no fear of crimping) to push it through holes along the outer walls to assure equally-sized loops. The biggest advantage to Onix, however, is its ability to flatten slightly when stapled. This increases the heat transfer to hardwood flooring,



eliminating the need for expensive, time-consuming heat transfer plates.

"The Onix also worked perfectly because of our need to staple it in joist bays with plenty of obstacles and, occasionally, protruding nails that we could simply steer the tubing around," added McKee, explaining why he preferred it to less flexible tubing.

For the First Church of Templeton, the radiant retrofit was the answer to many prayers. With the dangerously rotting sills replaced and all structural facets reinforced, the church is now equipped with quiet and adequate heat, members can enjoy their faith and fellowship in comfort, sans all of the dust and allergens.





-Fuel Oil and Diesel Fuel Transporum Transfer Engineer. The truck is a Heil trailer.

truck with a 2700 gallon Boston Steel ucks in their fleet, two tractor trailers cility. They can store 130,000 gallons osene, off-road fuel and diesel fuel. picked up at a thru-put in the area.