

Homework Brings

DOING YOUR HOMEWORK REALLY PAYS OFF WHEN IT COMES TO MAJOR HOME PROJECTS. WHEN HOMEOWNERS JEN STEVENS AND JOE RINTELMAN WERE PREPARING TO BUILD THEIR NEW HOUSE IN GRAFTON, WI, THEY HAD A VERY SPECIFIC SET OF REQUIREMENTS AND DESIRES. THEY WERE SO SPECIFIC ABOUT THE PLANS THAT RINTELMAN ACTED AS GENERAL CONTRACTOR HIMSELF.

"Sometimes people have done their homework ahead of time, and sometimes people come to me with suggestions on what they want to do," said Mark Doll, president of Professional Geothermal Systems, Port Washington, WI "They were very specific on what they wanted and how to achieve it. That was where I came in."

The homeowners' goals were to use green technology to save money on domestic hot water heating, zone control for all areas of the home, a radiant floor heating system and a geothermal loop in the pond located on the property.

"You can tell very quickly when you're talking to a contractor who knows what they're talking about when it comes to geothermal, and you can tell someone who's trying to give you a sales job," Rintelman said. "Mark clearly knew what he was talking about. He helped educate us, and we were certain that he understood what we needed and what we desired, and he gave us lots of options to achieve that."

Team Effort

The home Rintelman and Stevens were building is too far from the road to hook into natural gas, which meant their only other option in terms of traditional heating sources was propane. The pond on the property was a perfect candidate for a geothermal system, so while excavation work was under way for the house, PGS roughed in the header lines to the

pond so the foundation could be poured. Once the building was roughed in, radiant floor heat was added in the basement and the main floor. Doll used Roth radiant X-PERT (polyethylene for raised temperature) tubing and Roth balancing manifolds for the flooring.

Rintelman and Stevens are very hands-on, so they helped with that part of the project.

"We asked Mark if he would be comfortable with us tackling laying the tubing for the radiant heat," Rintelman said. "It's not particularly challenging but it's time consuming. That save us a substantial amount of money."

That was another reason they were so happy they chose Doll and PGS.

"He understood where we were coming from and he understood we had the knowledge and skills to be able to do these things effectively," Rintelman said. "He was more than willing to work with us on that."

The geothermal system in the pond required setting up the loop field, burying the heat exchanger in the pond, tying the header lines in, folding the pond loops out and filling them with water. PGS used a B&D non-pressurized flow center, B&D HSS non-pressurized buffer tank and Grundfos pumps for this portion of the project.



The geothermal loop system was installed in a pond. This is where the B&D flow center, buffer tank, and Grundfos pumps came into play.



PHOTOGRAPHY BY PROFESSIONAL GEOTHERMAL SYSTEMS

BY ELAINE YETZER SIMON

A+ Comfort

Inside the house, PGS installed a WaterFurnace 4-ton water to water heat pump with a COP of 3.1 for radiant floor heating and a WaterFurnace 4-ton water-to-air heat pump with a part load rating of 4.6 COP and 28.5 EER and full load rating of 4.0 COP and 20.0 EER.

The WaterFurnace Intellizone system is the central brain for the entire system on the forced air side. It opens and closes dampers, changes what stage the equipment is on and adjusts blower speed.

PGS divided the house into separate zones. There are four zones of radiant floor in the lower level and one zone of forced air. On the main floor, there are two zones of forced air and three zones of radiant floor.

Honeywell Prestige IAQ thermostats control heating, cooling and ventilation, including a Honeywell ERV air exchanger.

PGS worked on the project in stages from June through the following March.

Unique Element: the 'Sport Court'

The most unusual aspect of this project is the half-court basketball court underneath the garage. This "sport court," as Rintelman and Stevens call it, presented a few challenges.

"At first, we weren't sure if we even wanted to put any ductwork in there or how we wanted to approach that because it's 20 feet underground and it should stay at a pretty constant temp year round," Rintelman said.

Just in case, they decided to add the heat option.

"Treating the sport court was difficult because we could not get ductwork low where we wanted it, for a couple of reasons," Doll said. "One, it was subgrade. There was really no way to get down there. Also, they didn't want any ductwork low because it could get damaged by basketballs."

The problem was solved, at least in the short term, by putting the ductwork in the ceiling.

"It stays up in the corner of the court, kind of out of the trajectory range of a basketball," Doll said. "When we had to have it up so high, we had to design for a certain amount of velocity to throw the air down low."

PGS installed the WaterFurnace Intellizone system in the sport court, which automatically varies the compressor staging and variable speed ECM blower speed. That eliminates the need for a bypass damper and improves an already efficient system.

Rintelman and Stevens are glad they added heat to the area.

"We found this winter that actually it did get quite cold in there, chiefly because we have Spancrete across the top and above that is our garage, which isn't heated or insulated," Rintelman said. "As a result, the sport court got into the 40s. We're just very pleased we have the ability to get forced air heat down there."

Equipment Choices

Doll said he uses components that provide the best fit to each project, but he always installs WaterFurnace heat pumps.



Mark Doll, left, with Justin Franke, lead installer and service manager.



This striking home was worthy of a first-class comfort system. From the pond loop, to the controls, to ventilation and radiant heat, it will provide ideal conditions for years to come.



Pictured above is the WaterFurnace 5 Series water-to-air heat pump for cooling load and heating zones without radiant floor heat.



Above right, is the Envision water-to-water heat pump for radiant floor heat load. To its left is the B&D HSS non-pressurized buffer tank.

At left, the B&D non-pressurized flow center.



PRODUCTS KEY TO SUCCESS

- WaterFurnace Envision NSW050 water to water heat pump
- WaterFurnace 5 series NDV049 water to air heat pump
- WaterFurnace Intellizone zone system
- EWC zone dampers
- Honeywell Prestige IAQ thermostats
- Honeywell VNT5200E1000 ERV air exchanger
- B&D non-pressurized flow center
- B&D HSS non-pressurized buffer tank
- Grundfos pumps
- Roth radiant X-PERT in-floor tubing
- Roth balancing manifolds
- Level rock lightweight gypsum base concrete over pour

“I always try to pick components that work well together and that work for my systems because my professional geothermal system is made up of several other components,” Doll said. “It’s kind of like a recipe and getting the right combination of components to work together.”

He prefers WaterFurnace because of the company’s 10-year parts and labor warranty, excellent technical support and customer service for contractors.

“If we ever have an issue, we have a hotline to WaterFurnace and we can speak right to tech service,” Doll said. “When you call and say you have an issue, it feels like they are right there with you and behind you 100 percent regardless of what’s going on.”

Doll often uses Roth radiant floor piping because it’s flexible and easy to work with, even when it’s cold, which was important for this install. He also recommends B&D Manufacturing and Honeywell for their excellent tech support and quality products.

“I’m trying to give the customer everything they want and more, and I want to be able to do that with confidence that we’re not going to have any issues down the road with things breaking down,” Doll said.

Looking to the Future

Rintelman said they were sticklers about the quality of construction because they intend to live in the home for the foreseeable future.

“We built this house to be our first and last house,” he said. “We expect to be here 40 years plus. We put a lot of resources in the things you don’t necessarily see because we want longevity. We realize we’ll probably remodel at some point, but the structure itself needs to be solid.”

Rintelman said they are very pleased with Professional Geothermal Systems’ contributions.

“It was wonderful to have the geothermal unit in place to help us through the winter and maintain the comfort level of our home,” he said. “This winter was particularly cold and the unit performed very well.”

When Rintelman and Stevens considered the 30% credit they received on the geothermal system, and fuel costs, it made sense for them to go with the more expensive geothermal set-up.

“Obviously the geothermal is considerably higher up front,” he said. “But for us, thinking about being here for 40 years, that’ll pay back probably in less than a decade. With the current tax rebates, it really was a no-brainer for us.” 