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NEWS, PRODUCTS AND INFORMATION FOR PLUMBING & HEATING PROFESSIONALS

Getting into hot water

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Radiant for raptors and macropods!

Rehabitat Inc. chooses floor heat for ailing animals

Plumbing & mechanical contractor Dave Yates admits occasional frustration at customers who seem unwilling to make decisions and waffle 'til it hurts. But on this sales call, he came face-to-face with the biggest communications challenge of all: a group of customers who simply couldn't speak for themselves.

Yates is president of F. W. Behler Inc., a York, Pa.-based plumbing and mechanical firm that specializes in radiant heat. He's been in the business a long time, so it's hard to surprise him with something entirely new. But he knew quickly that there was something unique about this visit when, following his invitation into the kitchen, a young kangaroo sauntered over to his place at the table as if to say, "you're in m' spot, bub."

Yates was introduced to Owen, the larger of several macropods at the animal rehabilitation, breeding and release center in rural Dillsburg, Pa. Rehabitat Inc. (www.rehabitat.org) is operated by Wendy Looker, director of the facility. After a few curious sniffs and an examination that seemed curiously to focus on his nose, the kangaroo eyed him approvingly and hopped off. Seconds later, startled by his reflection in the dishwasher, Owen snorted an alarm, delivered a perfect drop kick and returned to Looker for protection.

As she cuddled the kangaroo, Looker explained that she and the

Rehabitat staff were making plans for a new building. She'd heard that radiant heat would offer the greatest comfort for her charges while saving operation costs. Installation costs were a real concern — the heating solution would need to fit within a tight budget.

Looker explained that as Owen and his other kangaroo siblings grew to a height of 6+ feet, they were going to need a large enclosure to create a more natural environment. With feet this big — almost as long as he is tall — a warm floor would feel remarkably like his own native Australia.

As he soon discovered, kangaroos weren't the only ones in need of warm feet. There were wallabies (another macropod), bearcats, a two-toed sloth and a wide variety of owls, hawks and eagles and several Australian heeler dogs. Without question, a warm environment would enhance their comfort and speed up recovery times. Looker's appreciation of Yates' insight grew when he suggested that they might choose places not to install radiant heat. "They may need a cool place to regulate body heat," Yates suggested.

Looker is a certified wildlife rehabilitator who cares for many animals, though her specialty and her passion are endangered species, and raptors. The other animals, like the macropods, come and go as time and capacity permit. As a non-profit

facility, they must raise \$40,000 each year to care for the raptors. "We take care of the other animals out of our own pockets."

She explained that 95% of the 80 to



Here, Yates checks a wall-mounted, direct-vent, propane-fired Mini-Therm boiler by Laars Heating Systems, and a pre-manufactured "HydroControl" injection panel made by Watts Radiant.

120 raptors that come into her care each year — and whose care is the chief focus of their work — are there because of an altercation with humans. Usually, they arrive at Rehabitat after being struck by a car, hitting a glass window, electrocution from power lines or poisonings. Wendy provides medical care and kindness until they're ready to be released back into their natural world. In cases where the birds are too injured to be returned to the wild, these birds become part of the Rehabitat traveling education crew and often act as foster parents for raising orphaned birds.

During his first visit to Rehabitat, Yates was given a tour of numerous outbuildings and fly-ways. He was introduced to two Kinkajous with prehensile tails, several skunks (among them, an albino baby), two foxes and a parrot named Elmo who, according to Yates, carried on excited conversation with Looker the entire time they were in "his" building.

Looker explained that many Rehabitat tenants have appeared on

national television shows including Late Night with Conan O'Brien. "It helps to have a big mouth like Elmo," she said. "He has no fear."

Looker's only fear was they might not be able to afford radiant. But to meet the facility's budget constraints, Yates soon found ways to trim labor costs. Over the next week or so, they settled on a plan to use as much of the Rehabitat volunteer work force as possible with no compromise to safe-

A look inside Rehabitat's Inhabitants

Rehabitat's goal is to quickly return healthy animals back to their natural environment. Treatment may include X-rays, surgery, fracture repair, wound management or basic nursing. "We disturb the recuperating birds as little as possible, keeping stress to a minimum," said Wendy Looker, director of Rehabitat Inc.

Patients include the nearly-blind adult Great Horned Owl whose permanent disabilities won't permit its release.

Brutus, the Saw-Whet owl. Fiercely independent and not one to grow too fond of its human handlers, Brutus was remarkably adept at grabbing and holding bare fingers. Any handler soon learned of his remarkable skill at piercing the skin between a thumb and index finger. Brutus was a fixture at Rehabitat for eight years and was among the facility's best ambassadors.

And, last May, Looker took a call from the Pennsylvania Game Commission — they had a Golden Eagle, lethargic and believed to have a broken leg. The eagle quickly received emergency veterinary care. To treat the bird's dehydration and shock, Looker replaced fluids each hour for the next two days through stomach tube injections. Eventually strong enough to endure X-rays, the staff saw that she had no broken bones.

A test for lead poisoning revealed the problem. "A very strong and determined bird, the eagle was an inspiration to those around her, earning the name, "Faith."

Sadly, Faith lost her battle with lead poisoning. Looker explained that her loss was significant — the east coast golden eagle population is roughly 100 birds.

ty or system designs. This also meant the bulk of work would be performed on weekends and week nights when volunteers were available. "They had me hooked. As an animal lover, and one who likes a good cause, this was a project that inspired me emotionally," said Yates.

The system they settled on for the new 1,800 square foot building would be divided into three distinct areas: office/dogs; raptors; and macro-pods. To further reduce installation time, Yates would install a compact, wall-mounted, direct-vent, propane-fired Mini-Therm boiler by Laars Heating Systems and a pre-manufactured "HydroControl" injection panel made by Watts Radiant.

"Injection piping gave us the opportunity to minimize piping and, at the same time, maximize the use of remote radiant manifolds to distribute the heat in various zones within the concrete slab," explained Yates. "Given the very low flow rates needed to transfer Btus with injection pumping, PEX lines were (Turn to macropods, page 48.)

Macropods

(Continued from page 47.)

added to deliver warm water to both manifolds.”

Yates' design also planned for the distribution manifolds to be installed close to the floor level so that their tubing runs could disappear into the concrete directly below them. Yates planned it this way to protect the radiant system from critters that, no doubt, would scratch and gnaw and leave acidic deposits that, over time, could compromise the system.

On the first installation day, Yates was a bit apprehensive about the tight timeframe they'd have to install the tubing prior to the pouring of a concrete floor slab. But he was relieved when the platoon of eager volunteers arrived.

The work crew consisted of Wendy's husband, Joe, a postal carrier who, for years has helped to support his wife's passion; their daughter, Stephanie; Gary, a plumber by trade who quickly took a liking to radiant

heat work; Jamie, who enjoyed a break from her full-time tax collection duties; and Duane, who works for Purina by day.

After giving them a quick seminar on installation techniques, the group soon settled into a routine. A key advantage was Yates' choice of "Onix" radiant tubing made of synthetic rubber. The Watts Radiant product, unlike the more rigid PEX tubing, was easily positioned and secured to the wire mesh reinforcement.

Whenever the work felt like work to Yates, Looker — seeing Yates' fascination with all the critters around them — would pull him aside to answer questions or describe some of what he'd been seeing. Screech owls, barn owls and Kestrels are raised, occasionally bred and released into the wild.

Yates also learned that, at night, dozens of turkey vultures visited with the raptors housed in one of the largest enclosed fly-ways in the northeast. If given an opportunity, the mischievous birds developed ways to steal bits of food and play with floating toys in the Looker's pool. They



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also teased her wire-haired dachshunds by walking around on the wire screening covering their runways. But by dark, they'd settle in for a night's roost and disappear by the next morning.

Toward the end of the installation, a newborn Wallaby entered the wildlife Rehabitat family and was named "Davey" . . . for the staff's radiant heating contractor. Davey

seemed to enjoy visits to the mechanical room when Yates and his son Mike were completing installations there.

And, this winter — their first with radiant comfort — the warm macropods, raptors and canine critters were comfortably cuddling up to the warm concrete slab, resting well and healing remarkably well. Radiant heat was just what the doctor ordered. ■

Maintenance is key for hydronic systems

According to reports from the Hydronic Foundation Inc., keeping air out of a closed-loop system goes a long way in the health of a hydronic system. Air and fluid shouldn't mix in a hydronic system. The oxygen will cause corrosion of the wetted parts. Also, vapor in the system can break the siphon effect of the closed loop and result in loss of circulation. Most hydronic systems are rated for 15-psi steam or 30-psi water. Most are equipped with air vents to eliminate air and micro bubbles.

When filling the system, bleed air from the system at the high points to ensure the system, including all the heat exchangers, is completely full of fluid. The pumps used in hydronic systems are designed to circulate fluid. Their low head need overcome only the friction loss in the system. They are not considered pressure pumps. The usual circulator may be rated up to 100 gpm at a 40" head or 17.37 psi. The pumps should be located below the boiler water line to ensure a positive head, and to minimize the possibility of cavitation, which not only is noisy, but leads to pump rotor failure.

A vital part of the system is the thermal expansion tank. Modern expansion tanks have a diaphragm designed to separate water (glycol) in the system from air and to absorb the increased volume of the liquid as it expands while being heated. Older horizontal tanks

were suspended above the boiler. Since there was no diaphragm, the air above the tank was gradually absorbed into the water, causing the tank to become waterlogged. The same effect can occur should the diaphragm in a modern thermal expansion tank rupture. An automatic fill valve and backflow preventer continually top off the system and introduce more water and dissolved air into the system. The next cycle expands the water in the system until it exceeds the relief valve setting and escapes to drain.

As soon as the fluid cools down, a negative pressure is developed in the system. If the packing glands on the control valves at the heat exchangers should leak, air will be sucked into the system. The closed loop will be broken by vapor lock and circulation will not occur. The result: no heat above the head of water.

Another source of air in the system is from periodic draining and refilling of the system. Water in a hydronic system may be discolored, however. That is not a good reason to flush out a hydronic system that is properly sealed and working correctly. This is not necessary with a tight system. The result is added potential for corrosion from the oxygen dissolved in the fill water.

Finally, check the condition and size of the expansion tank. Check the packing glands on all valves and check the fill system. If a closed loop hydronic system needs water, there's a leak somewhere. For more info, contact the Hydronic Foundation at 423/929-8548.

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