

August 2011

Central Waters Brewing Company – Radiant Floor Heating**Challenge**

Central Waters Brewing Company is a craft brewer based in Amherst, producing such beers as Shine On, Glacial Trail IPA, and Ouisconsing Red Ale. The brewery produced about 5,000 barrels of beer in 2010 and expects to produce 7,500 barrels in 2011.

During the brewery's relocation in 2006, the owners sought an energy efficient heating system that could be tied into a future solar hot water heating system. A radiant floor heating system was chosen to heat the 13,500 square feet in the new building,

Strategy

In comparing the installation costs of different systems, the owners found that installing a boiler for a radiant system would be about the same price as installing a forced air furnace. In other words, the installation of the heating apparatus for a radiant system was cost neutral. However, the cost of installing the hydraulic PEX tubing for the radiant system would be about \$1 more per square foot than comparable ductwork. Thanks to Focus on Energy funds, the owners decided that the extra cost was far from prohibitive, and went forward with installing the radiant floor system.

The system uses PEX tubing, laid out beneath a 5-inch concrete slab, to circulate a glycol fluid, transferring heat into the concrete slab, and eventually into the facility. Beneath the concrete slab was 8 inches of closed cell insulation, and below that was a 6 inch gravel base. This served to isolate the concrete slab from the earth.

The brewery worked with Bob's Plumbing & Heating of Amherst to install the tubing (they would work with Bob's again in 2008 while installing their solar thermal system). The radiant floor heating system went live in January of 2007.

Results

The heating system has proven to be an unquestionable success, according to the owners. Between Focus on Energy rebates and much lower energy bills, the owners estimated that they recovered much of the cost of the system during the first full heating season. In fact, Paul Graham, president of the brewery, affirms that their energy bills remained nearly constant from January 2007 through 2010, despite the fact that production doubled during the same period (from 1500 to 3000 barrels).

Although it is difficult to measure direct savings from the radiant system (since the facility never existed without the system), Graham estimates that they save \$200-250 per month in heating costs during the cold season, or about 185 therms per month. A typical facility of the same size (13,500 square feet) and function consumes between 500 and 700 therms of natural gas per month for heating. The radiant floor system thus reduces gas usage by 26 - 37% over an average commercial/industrial building heated by natural gas.



In addition to saving money, the radiant system is very reactive. The brewery employees have to open doors regularly for loading or transferring materials, sometimes for extended periods of time, which releases a lot of heat during the colder months. But as soon as the door closes, the radiant heating system is very quick to bring the facility back up to temperature, whereas a forced air system would take much longer.

The brewery was able to tie the radiant floor system into their solar thermal panels, installed in 2009. This development has led to further decreasing energy bills, and increases the value and usability of the solar panels.

When asked if they would have done anything differently, Graham stated that he only wished they would have been able to do it sooner.

Paul Graham, President, Central Waters Brewing Company: info@centralwaters.com

Anello Mollica, Vice President, Central Waters Brewing Company: info@centralwaters.com

