



JMU Refuses to Let Money Go Down the Drain

BY JOSEPH P. MCGUINN

James Madison University in Harrisonburg, Virginia has embarked on a rational means to reduce energy costs and provides a sustainable approach to student housing. The investment to install a Drain Water Heat Recovery system (DWHR) at Wayland Hall is estimated to pay for itself in less than three years but will provide dividends for over 40.

VMDO Architects of Charlottesville, Virginia, with principal David Oakland AIA, LEED AP, initially suggested to JMU that a LEED accreditation for the renovation of the historic residence hall would be a good idea in the current construction climate. He suggested a Silver Certificate would not be difficult to achieve.

The administration at JMU was so convinced by Oakland's argument that they asked to see if it would be possible to get to the Platinum level. Oakland enlisted his associates Michelle Westrick AIA, LEED AP and Frances Lengowski AIA, LEED AP to investigate options to get to the Platinum level. Westrick cited a recent project at Harvard that successfully used a DWHR system in a laboratory to reduce water heating costs for sanitizing equipment. That led her to contact RenewABILITY Energy Inc. in Waterloo, Canada about the product. VMDO then contacted Lawrence Perry & Assoc. of Roanoke, Virginia to handle the mechanical design. Under the lead of Mike Wolfe, CPD, they created a design that took advantage of the DWHR system for the residence hall showers.

The DWHR system is essentially a double-walled heat exchanger that takes the already heated water used for showers (or other processes) and recaptures that heat before it goes down the drain. The type L copper unit is installed in the drain stack and as incoming cold water is introduced, it is preheated by the drain water. Because Weyland




Hall is a long three-story building as opposed to a tall building, this particular system incorporates three C4-72 Power-Pipes installed in parallel in each of two drain stacks at either end of the building and one in the mechanical room for a separate apartment for a total of seven units. The renovation was based on having four showers in each bathroom and the DWHR units were installed in the showers vertical drainage stack under each floor. Each C4-72 is 4" in diameter and 6'-0 in length. This extracts the shower water heat and preheats the incoming replacement cold water, which is introduced in a 1" pipe that connects to a rectangular copper tube that surrounds the drain pipe. This creates a counter flow arrangement to maximize heat exchange efficiency and surface contact to produce a 63 percent efficiency rating for this unit.

There is a falling film effect on the drain pipe caused by surface tension of the drain water on the drain pipe. In practical terms, the drain water is measured at 99 degrees F, the incoming cold water is at 48 degrees F, and the preheated water exits at 86 degrees F. The preheated water is delivered directly to the cold water side of the showers to reduce the tempering levels. The incoming flow can handle 10 gpm at a pressure of 160 psi. Cold water for other uses is diverted to those locations prior to going through the Power-Pipe.

Andy Wielicki, of the general contractor Donley's, stated the installation was straightforward and without issue. The Power-Pipe has no moving parts and comes with a ten-year warranty.

The Power-Pipe was specified under division 22 and Rick Hughes of LP&A who is managing the LEED certification process, has put it under the Energy & Atmosphere category and calculated a minimum of a 25 percent reduction for energy to heat hot water.

The building was occupied in fall 2011 and has performed as anticipated and without any problems. 

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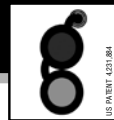
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