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Installed UVC Earns LEED Credit

By B. Checket-Hanks
Of *The NEWS* Staff

SAMMAMISH, Wash. — As building owners become more interested in LEED (Leadership in Energy and Environmental Design) certification and saving energy in general, opportunities will continue to flourish for HVAC contractors who can provide energy-saving solutions. When those solutions also improve comfort and IAQ, they become even more attractive.

In this case, the efficiency benefits will be sustained thanks to planned maintenance from contractor PSF Mechanical, a Seattle-based firm that has been in business since 1898 and is still growing. “We’ve been almost tripling in the last few years,” said consultant Don Meyer. The contractor provides design, installation, and service-maintenance for its commercial customers, (including a nationwide contract with upscale retailer Nordstrom). Service work is fairly new for the company, and it was facilitated with the purchase of Stebbins Mechanical.

The Sammamish local government building’s construction was designed with efficiency in mind, to qualify for a LEED rating. PSF will be providing service and maintenance to help the system maintain its low energy consumption. “There’s no sense in putting in LEED-certified equipment without ongoing maintenance,” said Meyer.

A LEED FIRST

The new city hall for the city of Sammamish was constructed on the 25-acre Sammamish Commons as a redevelopment



Heating and cooling for the Sammamish, Wash., city government building is provided by two packaged rooftop air-handling units designed by Petra Engineering. Both VAV units are equipped with DX and hot water coils, and can provide 100 percent economizer cooling.

project. Early in the design process, Notkin Mechanical Engineers, Seattle, pointed out the importance of IAQ both for occupant safety and to help improve energy consumption; UV lights looked like they could do both. However, so far no product had qualified for LEED points.

UVC Emitters™ from Steril-Aire Inc. (Burbank, Calif.), installed in the air-handling units downstream of the cooling coils, changed that. According to Steril-Aire, this project became the first to earn a LEED “Innovation in Design” point for the use of UVC germicidal lights in air handlers.

When Notkin project engineer Darren Schwend, P.E., saw an opportunity to earn a LEED point for UVC, he needed to put together a detailed narrative on its proven IAQ, energy, and coil-cleaning benefits. Working with distributor Air

Commodities Inc. (Seattle), Schwend submitted published studies, articles, and other documentation to the U.S. Green Building Council (USGBC) to make the case for UVC.

“In the fall of 2007, we learned that the project received an Innovation in Design point for UVC as well as the overall LEED Silver certification that we sought,” said Schwend.

“The application of high-output UVC lights in mechanical systems is a practical technique that offers benefits for many types of buildings,” added John Rowland, P.E., a Notkin partner, “and we are very pleased that the USGBC now recognizes UVC under their LEED rating system.”

HVAC SYSTEMS

The first floor of the 45,000-square-foot building contains the Sammamish City

Hall, police station, council chambers, and public lobby. A smaller second floor contains commercial spaces that initially will be leased, but may be used for future growth of the city hall and police station. The building is adjacent to a large civic plaza and public park with lawns, picnic shelters, and areas for viewing into a wetland habitat.

Heating and cooling is provided by two packaged rooftop air-handling units (AHUs) designed by Petra Engineering. Both variable air volume (VAV) units are equipped with DX and hot water coils, and can provide 100 percent economizer cooling. AHU 1, a 24,000-cfm unit, serves the first-floor municipal facilities. AHU 2, a 9,500-cfm unit, serves the second-floor space.

The UVC devices are single-ended (SE Series) UVC Emitters designed specifically for rooftop systems. According to the manufacturer, the high-output devices are installed by making a 1-inch hole in the equipment wall and mounting the fixture to the unit's exterior. The lamp penetrates into the system, but the power supply remains external.

The lamps emit enough energy to penetrate microbes and kill or deactivate their DNA and RNA so that they cannot grow and replicate. UVC continuously cleans the coils, reducing or eliminating the need for coil cleaning as a scheduled maintenance task, pointed out Meyer. Clean coils operate much more efficiently than fouled coils.

According to Meyer, PSF Mechanical's duties will include changing UV bulbs and filters annually or as needed. The filters are standard 30 percent efficiency models to protect the equipment, plus HEPA filters. The cleaner coils, Meyer said, will help improve coil efficiency by keeping them clean even down through the center, despite fins or rifles that could trap and hold moisture and dirt, leading to potentially heavy fouling, and which can reduce airflow significantly.

"Your coil in an AHU is either DX or chilled/hot water," he explained. "Air going across the coil has a certain amount of heating or cooling content." Fins increase the efficiency of the coils by providing



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more heat transfer surface, "but also more opportunity for the collection of dirt and dust," Meyer said. "The coil could be 90 percent efficient, but you've taken it down to 70-50 percent."

GOOD AIR QUALITY

Local governments can be quite sensitive to IAQ. "In cities it's a big issue," Meyer said. Combining lower energy consumption with better IAQ can be a challenge, and it requires a certain amount of customer education.

"Customers can be short-sighted when it comes to payback," Meyer said. "For a quicker payback, they may need to accept a higher first cost." They also need to look at long-term or even lifetime consumption. "I was just talking to a customer; he was complaining about change of seasons and maintenance for burners," Meyer said.

"Every mechanical contractor out there wants to do the best thing, but customers sometimes handcuff us. It's up to me to educate them, but choosing the cheapest provider also handcuffs them.

"It's about education," he continued, "but if you hold my feet to the fire, I may decide not to take your job."

Sevda Baran, project manager for

Sammamish Commons, said, "The air quality in the building has been excellent. We are very satisfied with the IAQ and operational benefits, and we are excited to be the first project to use this technology for LEED credit."

Baran said the facility runs the lights 24/7 and plans to replace the bulbs on an annual basis as recommended by the manufacturer. These practices will help ensure that the UVC system maintains the germicidal output needed to prevent mold from growing on the coils or infectious microbes from circulating through the air.

Robert Scheir, Ph.D., president of Steril-Aire, stated, "The inclusion of UVC in the LEED rating system is precedent-setting and will reward other building owners, designers, engineers, and contractors who take advantage of this technology in the future." ■

FOR MORE INFORMATION...

Contact Steril-Aire Inc., 2840 N. Lima St., Burbank, CA 91504; 800-278-3745 or 818-565-1128; 818-565-1129 (fax); sales@steril-aire.com; www.steril-aire.com.



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