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Air Force officials using more green-roof technologies

Phil Chase monitors Sedum plants on the vegetative rooftop of the 21st Space Wing headquarters building at Peterson Air Force Base, Colo. Heat is redirected through the plants instead of the rooftop, cooling the inside of the building. The building's roof is about 67 degrees cooler than the nearby 21st Mission Support Group building. Mr. Chase is the solid waste and hazardous materials program manager for the 21st Civil Engineer Squadron Asset Management Flight. (U.S. Air Force photo/Thea Skinner)

by Debbie Aragon
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Public Affairs

1/13/2011 - **LACKLAND AIR FORCE BASE, Texas** -- If they're not providing top cover on Air Force bases already, chances are they will be soon.

With the Air Force's continued emphasis on sustainability, energy conservation and environmental consciousness, green-roof technologies, and other efficiency measures are high on the priority list for new military construction and ongoing roof repair and replacement programs, said Paula Shaw, the Air Force Sustainability Design and Development Program manager at the Air Force Center for Engineering and the Environment.

The most common technologies used by the Air Force are cool roofs, vegetative roofs and renewable-energy generation. They are designed to create more sustainable infrastructure that reduces energy use, lessens the impacts of storm water runoff, and allows for water conservation. Of current Air Force construction projects, almost 200 of them, at more than 100 locations, incorporate these new, efficient technologies.

Cool-roof technology is the most commonly used roofing innovation in the Air Force. Using a variety of solar-reflective materials to lower the temperature of the roof, cool-roof technology supports the U.S. Green Building Council's Leadership in Energy and Environmental Design criteria.

Cool roofs save energy costs associated with chilling the air inside the buildings. They are installed at various locations around the Air Force, including Offutt AFB, Neb., Nellis AFB, Nev., and recently on a new fitness center at Tyndall AFB, Fla., according to officials.

A vegetative roof, one that is covered with low-growing plantings that require little maintenance, reduces storm water runoff by as much as 80 percent, reduces the roof's temperature to save energy and extends the life of the roof, according to engineers.

"The (Peterson AFB) project was set up to validate the usefulness of green-roof technologies to the Air Force," said Randy Hawke, facilities excellence architect at Peterson AFB. "Along with the roof, a one-year study was conducted to evaluate possible benefits to the Air Force."

The payback, Mr. Hawke said, is probably considerably better than the one-year study reflected. A study over a 3-5 year period would need to be accomplished to fully understand all of the savings, he added.

"In my opinion, the technology is great," he said.

Vegetative roofs are also in place at Andrews AFB, Md., and Ramstein Air Base, Germany, and although there are no other vegetative roofs planned currently at Peterson AFB, there are six active projects that include these types of roofs across the Air Force.

The third technology, renewable energy, uses solar technologies to generate electrical power and heat water. Thirteen current projects include these types of roofs.

Because of their very nature, not all sustainable roof technologies are suited for all areas.

"Not one technology is right for all locations and all building types," Ms. Shaw said. Engineers consider various factors to determine the feasibility of using green-roof technologies. These factors include, but are not limited to,

both the location of the base and the location of the building on the base. For example, a building close to a flight line may not be compatible for a vegetative roof as it may attract birds, which would cause a hazard to flying operations. Additionally, although the initial start up costs for sustainable roof technologies may be higher than a standard roof, engineers look at the overall life-cycle cost to determine if the technology is appropriate, Ms. Shaw said.

Going forward, Ms. Shaw said she expects architectural compatibility to evolve to include sustainable roof strategies as part of the design philosophy.

"Green roofs are a wonderful opportunity that we're only beginning to explore," she said. "The next step is to understand how to combine these and other sustainable roof technologies to maximize the benefits and performance."

(325th Fighter Wing Public Affairs at Tyndall AFB contributed to this story)