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THE NEWSMAGAZINE OF MECHANICAL CONTRACTING

The structure has a challenging site, built into the side of a mountain.



UC Colorado Springs Science & Engineering Building aims for LEED Silver

SPECIAL TO CONTRACTOR

COLORADO SPRINGS, COLO. -- Trautman & Shreve Mechanical Contractors and Engineers, Denver, is building the new LEED Silver University of Colorado at Colorado Springs Science and Engineering Building.

Rising energy costs and a greater awareness of the need for "green" facilities have resulted in more and more projects incorporating sustainable design and construction approaches, said Dave Coffey, Trautman & Shreve vice president and facilitator of operations on the UCCS project. With a renewed emphasis on energy efficiency and the desire on the part of many owners to achieve sustainability standards, HVAC installations have come to play a key role in the success of any project with complex mechanical systems, Coffey pointed out.

Trautman & Shreve, an EMCOR company, is the HVAC contractor for the \$53 million UCCS Science and Engineering Building, now under construction, which is being built to achieve a LEED Silver certification.

Created by the U.S. Green Building Council, the Leadership in Energy and Environmental Design system awards up to 69 points under categories such as sustainable sites, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality, and innovation and design pro-

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DOE announces water heater Energy Star program for 2009

BY ROBERT P. MADER
OF CONTRACTOR'S STAFF

WASHINGTON – The U.S. Department of Energy has announced the final criteria for its water heater Energy Star program that will begin next January.

Water heating represents between 13% and 17% of national residential energy consumption, making it the third largest energy end use in homes, behind heating and cooling and kitchen appliances, DOE said in its Final Criteria Analysis, released in April. As homes become more energy efficient, DOE noted, the percentage of energy used for water heating steadily increases. Water heating is the only major residential energy end use that Energy Star has

not addressed.

"We're very pleased to have an Energy Star for water heaters program," said Bill Hoover, director-at-large, A.O. Smith Corp., Milwaukee. "It will sen-

sitize the buying public to the fact that there are more efficient water heaters out there and it will encourage them to invest in them."

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EnergyStar Criteria for Water Heaters

Category	Energy Factor*	Improvement Over Federal Standard
Gas Storage Heaters (as of 2009)	0.62	6.9%
Gas Storage Heaters (as of 2010)	0.67	15.5%
Whole Home Gas Tankless Heaters	0.82	41.4%
Integrated-Heat-Pump Heaters	2.00	121.2%
Solar Heaters	1.80**	NA
Gas-Condensing Heaters	0.80***	37.9%

* Energy Factor is a measurement of relative efficiency: the higher the number, the greater the efficiency.

** Solar water heaters must have a solar fraction of 0.50; eligible models must also have OG-300 certification from the Solar Rating Certification Corp. The energy factor represents a typical system with a solar fraction of 0.50, an OG-300 certification and a 50-gal. auxiliary tank.

*** These water heaters must also have a first-hour rating of 67 gal. per hour or greater.

Extend energy credits, repeal 3% withholding tax, Congress told

BY ROBERT P. MADER
OF CONTRACTOR'S STAFF

WASHINGTON – Dozens of plumbing contractors descended on Capital Hill on May 1 to urge their Representatives and Senators to extend

tax credits for purchases of energy efficient equipment and to repeal a pending 3% withholding tax on all government contracts.

Politically active members of the Plumbing-Heating-Cool-

ing Contractors – National Association took part in the association's annual legislative conference. In an attempt to increase the effectiveness of their lobbying, the PHCC-NA

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Building aims for LEED

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cess. There are four certification levels, basic, silver, gold and platinum, with basic certification requiring a minimum of 26 points. The UCCS Science and Engineering Building is a 140,000-sq.ft. facility that will include office, research, classroom, laboratory, teaching, support, circulation, mechanical, public and other spaces. The project features a sophisticated building automation system to monitor and control all HVAC components. To help achieve LEED certification, variable speed pumps for the HVAC systems were specified, as well as a direct evaporating chilled water system. An ice storage system will enable the building to generate and store chilled water during off-peak periods, taking advantage of lower utility rates.

The HVAC system design was benchmarked to an ASHRAE 90.1-1999 energy cost budget building in accordance with the LEED version 2.1 savings calculation requirements, Coffey explained. The regulated loads are separated from the non-regulated loads to determine the percent cost savings for the new building, earning the project four LEED points for energy and atmosphere credit. The utility rates for the building were established based on published rate data by the local utility, Colorado Springs Utilities. An analysis of the utility rates showed that peak periods occur during weekdays from 4:00 PM to 10:00 PM from January through March and from September through December; from April through September, peak rates apply between the hours of 11:00 AM and 6:00 PM.

The actual utility rates were entered into an energy model and a blended rate was calculated and used to separate the regulated and non-regulated loads. However, because ASHRAE 90.1-1999 does not explicitly address demand control ventilation and requires the same ventilation air rates, DOE-2.2 was used to perform an exceptional calculation for the demand control ventilation measure.

As the project's HVAC contractor, Trautman & Shreve's role includes the fabrication and installation of the HVAC equipment; sheet metal; piping; medical air and vacuum systems; and steam, hot and chilled water systems. Other components include placement of nine custom air handlers and an associated hot water heat recovery unit as well as installation of five 3.8 million Btuh condensing boilers, and two 160-ton air-cooled screw chillers.

The contractor is planning and implementing all fabrication and installation processes using three-dimensional computer-aided design. The simulation

software being used is a combination of eQUEST, version 3.5 to develop the geometry, and DOE-2.2 (version 44e4) to do the energy modeling. Trautman & Shreve is working side by side with the architectural design group, AR7, and the mechanical and electrical engineering firm, M-E Engineers of Colorado Springs, to ensure the equipment is laid out and installed in strict accordance with the engineer's specifications so the sustainable design criteria is met.

Even with close communication, work under the contract presents a host of challenges, involving both LEED-related and general construction issues. The



A carefully planned process is being used to ensure all the building's mechanical components are properly fabricated.

first challenge is the location of the new building, which is being constructed into the side of a mountain, greatly limiting space for an adequate staging area. As a result, all of the building's mechanical components need to be fabricated offsite and transported to the project site for installation, as the schedule requires.

A carefully planned, step-by-step process is being used to make sure all the mechanical components are properly fabricated and installed and that all of the materials are not only approved by the mechanical engineer, but by the owner as well. This is also intended to avoid any costly re-fabrication and eliminate the need for remedial work once the installation is under way. To facilitate this process, Trautman & Shreve has two supervisors on the project who are certified by the USGBC as LEED Accredited Professionals. The supervisors -- one responsible for the sheet metal and the other for the piping -- will ensure that all the materials as well as the project consumables meet LEED requirements. They will also provide quality control and quality assurance, all according to LEED specifications and guidelines. The role of these two supervisors is particularly important because the project design calls for a considerable amount of custom-made equipment, the ice storage system, custom AHU, and the high-efficiency boilers.

The project is slated for completion in March 2009.