

Barracks Complex Raises the Energy Efficiency Bar for Military Housing

The 370,156 gross square-foot barracks consists of three pairs of four-story buildings and a one-story pavilion linking each pair of buildings.

PROJECT: FORT CARSON 13TH COMBAT AVIATION BRIGADE BARRACKS
FORT CARSON, COLORADO

FIRM: THE RMH GROUP, INC.
LAKEWOOD, COLORADO

Located at the base of the Rocky Mountains about an hour's drive south of Pikes Peak and Colorado Springs, Fort Carson is one of two U.S. Army bases working to attain "net zero" energy, water, and waste by 2020. As one key step in that direction, The RMH Group, Inc., in 2015 helped lead completion of a \$94.9 million net zero energy barracks complex using a combination of innovative integrated mechanical systems and highly insulated, tight construction. That complex is now home to the 13th Combat Aviation Brigade and has set new standards for world-class energy efficiency, functionality and comfort in military personnel housing.

"The RFP set out guidelines to really press the envelope in energy efficiency,"

says William Green, president of The RMH Group, which provided design and engineering for the complex's mechanical systems. "The innovation here really started at the building envelope by reducing loads, getting it as tight as possible, and having features such as high-mass walls and very tight construction. Then we put in a very efficient



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mechanical system that took full advantage of that tight envelope." The highly aggressive energy performance requirements led the team to select one of the most innovative mechanical systems ever employed in a military barracks. The low-maintenance system uses radiant floor heating and cooling combined with chilled beams to produce an exceptionally comfortable living space. Heat recovery chillers used to cool the buildings redirect heat to underground thermal storage tanks providing domestic hot water preheating and building heat

in the winter, eliminating the need for a cooling tower and the associated water use. Solar hot water panels provide 30 percent of the domestic hot water heating and gravity thin-film exchangers capture heat from shower drains to provide shower water preheat.

"That is really one of the more significant energy saving features," Green says. "It's amazing how much you can raise the temperature of the cold water going to the shower by wrapping the drain pipe with the cold water line. Depending on how cold the water is going in, you can pick up 50 percent of the waste heat going down the drain and reduce your energy consumption for hot water."



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