



# High-Altitude Aviation Training Site

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# One-of-a-kind military aviation training facility has a heating/cooling system to match

Ensuring that American and allied military pilots are sufficiently trained to operate aircraft in a variety of difficult conditions requires a one-of-a-kind setting and an equally unique, state-of-the-art facility.

Run by full-time Colorado Army National Guard pilots, the High Altitude Aviation Training Site (HAATS) in the small mountain town of Gypsum (near Vail), replaced a woefully outdated facility with a state-of-the-art, 14-acre facility that allows the HAATS staff to more efficiently and effectively conduct operations while doubling student throughput. The new facility includes administration areas, classrooms, a flight operations section, 50-ft (15.24 m) tall maintenance hangar, allied maintenance shops and lodging rooms.

While a more traditional HVAC system was used in the two-story dorms and offices, radiant heating and cooling technology was used in the high-ceilinged hangar and snow and ice melting (SIM) zones.

Upon reviewing the facility design, mechanical contractor Lance Daniel determined the original plan, which called for 5/8 in. pipe with 400-ft (122 m) loops, would not produce the desired heat. Daniel asked REHAU worked with Jacobs Engineering to fine-tune the design. The REHAU design called for 3/4 in. pipe with shorter 300-ft (91 m) loops that used pumping power more efficiently for the radiant heating and cooling and the same (but shorter) loops for the SIM system.



The project features four zones for conditioning, six SIM zones, eight three-way mixing valves for slab temperature control, and indoor and outdoor temperature sensors throughout. Pre-insulated PEX pipe is used to run the underground mains from the mechanical room to the radiant systems and fan coils, as well as out to the SIM system.



"We determined that the cooling tower could be operated in a free cooling mode, relying on evaporative cooling capacity rather than a traditional chiller system," said Daniel. "Past studies in the Denver area with similar climate and elevation show a 70% decrease in heating/cooling energy."

The REHAU radiant system circulates a heated or cooled water/glycol mixture through crosslinked polyethylene (PEXa) piping resting on a steel grid within a 9 in (23 cm) concrete slab. The extra-thick slab required to support the heavy aviation equipment creates an efficient thermal mass, retaining much of the heat close to the floor for worker comfort and achieving operational savings.

**"It was a complicated design with an aggressive timeline," Daniel said. "The radiant heating and cooling, SIM system and pre-insulated piping required for the HAATS project showcased the full range of solutions that REHAU is able to bring to a project."**

HAATS is projected to achieve a LEED®-NC Silver rating from the U.S. Green Building Council.

**Project:** Colorado Army National Guard High Altitude Aviation Training Site (HAATS), Gypsum, Colorado

**Construction type:** Hangar, opened in 2012

**Project scope:** 40,000 ft<sup>2</sup> (3,716 m<sup>2</sup>) hangar; 12,000 ft<sup>2</sup> (1,115 m<sup>2</sup>) snow and ice melting

**Mechanical engineer:** Jacobs Engineering

**Mechanical contractor:** LD Mechanical LLC

**REHAU systems used:** Radiant heating/cooling and snow and ice melting, RAUPEX® pipe, compression-sleeve fitting system, PRO-BALANCE® manifolds), INSULPEX® pre-insulated PEXa piping

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