



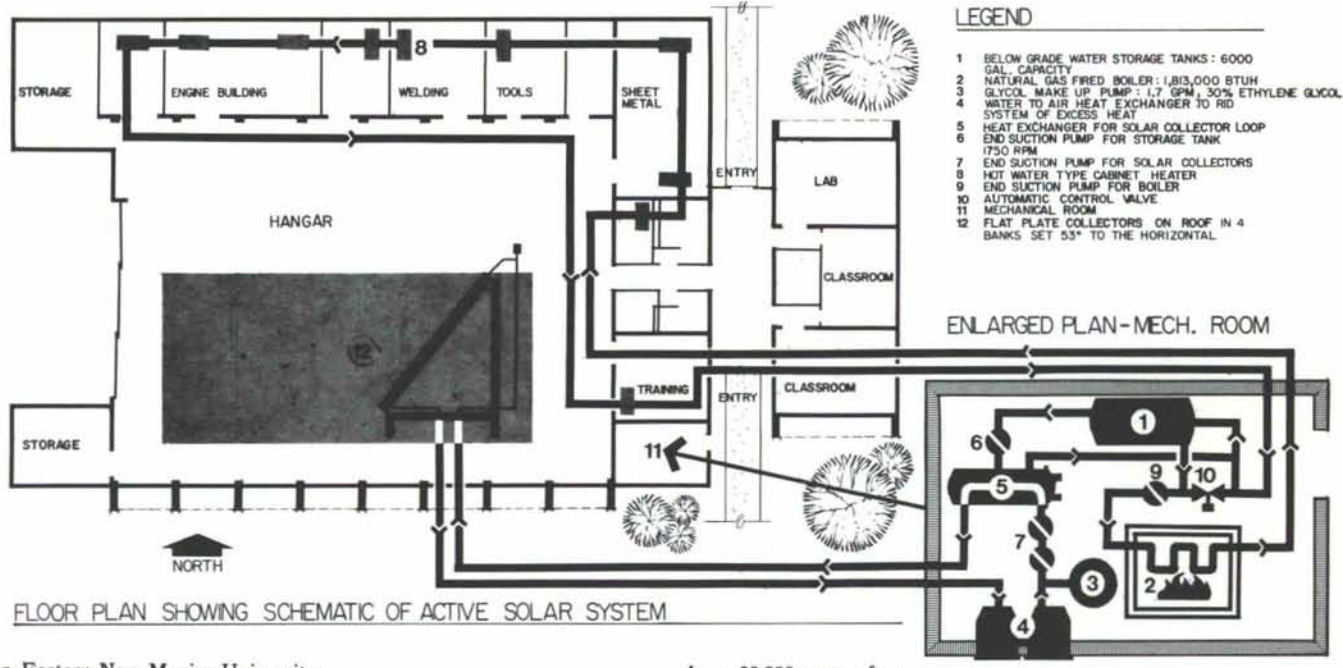
AIRFRAME & POWER MECHANICS BUILDING, ROSWELL N.M.

This structure, designed as an educational facility to train airplane mechanics is unique in its combination of occupancies. There are conventional classroom spaces, workshops, and a high bay airplane hangar. Each of these has its own distinctly different comfort requirements.

Beyond these requirements, were the desires to use a system that could adapt to changes in future energy sources, and be energy efficient with the currently available fuels. After completing the State's mandated energy analysis for the proposed facility, it was determined that an active solar assisted heating system would be feasible. The system selected is a hybrid active solar and gas fired recirculating hot water cabinet heater system. It will allow for conversion to other energy sources with minor equipment replacement. The need for circulating air in the classroom spaces was satisfied by an air handling system with a heat exchange between the hot water system.

The solar system utilizes fixed collectors that use an ethylene glycol and water mixture in a closed loop. A heat exchanger makes the transfer of energy between the two closed loop systems, after the solar system has reached a required differential in temperatures. At times of excess solar gain, two 3,000 gallon water storage tanks store heated water to be recirculated at night and on cloudy days. The system has a projected energy savings of 70% when compared to a conventional system.

In addition to the active system, passive energy conservation was incorporated into the design. Due to the mild winters and hot summers, heating was not seen as the area that could benefit most from passive contribution, but rather cooling and lighting were. The windows of the hangar are protected by both deep horizontal and vertical fins. The large windows are thus protected from direct gain in the summer, but combined with the north windows allow for cross ventilation, as well as significant daylighting. All hangar light fixtures are of the H.I.D. type to further minimize the usage of energy.



Owner: Eastern New Mexico University
 Architect: KRUGER LAKE HUTCHINSON BROWN
 General Contractor: John C. Cornell, Inc.
 Construction: Load bearing masonry and steel bar joist.

Area: 23,900 square feet.
 Mechanical System: Gas fired closed loop hot water with an active solar assistance system and a refrigerated air conditioning system.
 Cost: \$1,028,644.00.