



## **American Solar Designs 2<sup>nd</sup> Fort Meade Solar Air-Heating Roof**

Annandale, VA, September 30, 2016—American Solar, Inc. completed the design and mechanical installation for a swimming pool wing of the Gaffney fitness center at Fort Meade, MD.

American Solar Inc. designed a solar air-heating roof for the swimming pool wing of the Gaffney Fitness Center and installed the mechanical systems to deliver solar heated air to the pool HVAC system.

The Gaffney Fitness Center Gym re-roof was the site of a previous ‘solar’ re-roof funded by DOD ESTCP in 2012. The Engineering Office at Fort Meade received an Innovation / New Technology - Army Energy Award for the project, which provided both a new 40-year metal roof and heating savings for; space heat, outdoor air preheat, and domestic hot water preheat.

Another wing of the fitness center houses the swimming pool. When the pool roof showed signs of failure, the Fort decided to recover the roof with another solar air-heating metal roof. In this case, the system will use the solar-heated air recovered from the roof to heat outdoor air for the pool heating and cooling system.

The pool HVAC system controls indoor temperature, humidity, and air quality and pool water temperature. It uses a combination of outdoor air, gas fired boiler hot water, and compression refrigeration to manage air and pool water temperatures (80-85F), humidity, and air quality.

Industry experts recognize this type of pool environmental control for its innovative efficiency. The system is more efficient than a traditional system, which simply flushes the humid air from the pool and replaces it with outdoor air, which the system typically must heat or cool.

During several hours per year, the air from the solar air-heated roof will be 30 to 40F above outdoor air temperatures. American Solar’s design delivers that solar air to the outdoor air intake, enabling the pool unit’s selective economizer to operate with 100% outdoor air many more hours per year at lower energy use when compared to typical outdoor air temperatures.

The solar air-heating re-roof is a straightforward metal roof installed with a few inches of solar air space below the conventional metal roof panels. When the sun heats the roof panels, the air temperature in the solar air space can reach 80F above outdoor air temperatures. With proper airflow, the temperature of the delivered air

typically peaks about 40F above outdoor air temperature. A simple fan delivers airflow equal to 100% of the outdoor air requirement of the pool. The current design calls for delivering 4,000 cfm of airflow. The 1.5 KW fan will deliver 50KW of heat to 4,000 cfm of air with a 40F temperature rise, a COP of 33.

The solar air is the lowest cost source of energy for heating the pool wing with most of the system cost going to the roof, which the base needed to replace, even without solar heat recovery. American Solar designed the system to handle a base load. The system will operate for many hours per year and will simply turn off whenever it cannot provide economical heat, at night or on rainy days. During the turn-off times, the building's boiler will handle the full load. It is simple and reliable with only simple thermostatic controls and a conventional fan that blows air at the outdoor air intake.

**About American Solar, Inc.**

American Solar provides project development, consulting services and technical advice for solar-thermal projects in the agricultural, commercial, industrial, and government markets. The company develops projects for its patent-protected solar air-heating technologies. ASI also conducts research and testing of solar air-heating and low temperature air-heat-recovery systems.

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