



Synopsis

PVEA Solar Pilot Project Installation

Performed: 8/10/ 2007

OVERVIEW:

PACE, a participant in the Solar Pilot Program through the (SCF) Southern California Forum, installed its Second SunBank Solar Water Heating System on August 10th, 2007 at 1800 E. Pine St. Compton, CA 90221. The installation was performed by the PACE Environmental Services installation crew and a plumbing subcontractor, Randy Hernon Plumbing. While unanticipated issues were encountered during the course of the installation, our dedicated crew and plumbing contractor solved all problems, contributing to a successful installation.

INSTALLATION PROCEDURES:

The SunBank 2000 Open Loop Solar Water Heating System consists of 3 major components:

1. Solar Collectors
2. Open Loop Circulation Plumbing
3. Water Heater

These components were installed only after carefully inspecting /assessing the worksite and obtaining all necessary permits from the local Building & Safety Department.

The installation procedure follows:

1. Site assessment & evaluation.
2. Obtaining all necessary permits.
3. Installing the SunBank2000 Solar Water Heating System.
 - a. Replacing existing 40 gallon gas water heater with a new unit. (This also requires the replacement of old water heater enclosure and provision and positioning of new water heater landing as needed).
 - b. Installation of roof mounted collector panels and all associated plumbing including connecting all circulatory fluid fittings & pipe.
 - c. Installing all associated circulation fluid plumbing including Shut-off , mixing and drain valves . Testing the system for leaks.

SITE ASSESSMENT:

The site assessment determined the feasibility of installing the solar system at this particular location. The orientation of the roof relative to the sun, position of trees or objects which may cast shadows over the collectors along with the condition of the roof all impacted our decision. The site assessment also determined the configuration of the system to be installed. During our preliminary site assessment we anticipated installing the larger SunBank 4000 closed loop system with the additional 80 gallon heat exchange tank. Subsequently, the manufacturer finalized their SunBank 2000 open loop system, designed for smaller households. After evaluating this system, we concluded that it was better suited for our site. Furthermore, It was also determined that the existing gas water heater was in poor condition and needed to be replaced.

In addition to the Solar Water Heating system, the home was also inspected for needed weatherization work.

PERMITS:

The City of Compton Building & Safety Dept. requires building and plumbing permits for work associated with the installation of the SunBank 2000 Solar Water Heating System. In addition, we were also required to obtain a business permit. My experience in obtaining all necessary information and permits from the City of Compton was challenging. I visited their Building and Safety Department on no less than 5 occasions. The Lead Inspector, Mr. Orozco, was helpful, though.

INSTALLATION:

After attending installations with other participating agencies, we have concluded that our installations should be performed in two phases. Since the duration of most installations ran well into the evening hours, we have determined that at least two days should be allocated for installation to protect the crew from the stress of a 10 hour work day and overexposure to the Sun (especially during summer). This two phase approach is perhaps more relevant to the larger SunBank 4000 system, but the SunBank 2000 system can also present a number of challenges, as we experienced during the course of our installation. Time must also be allotted for careful and thorough inspection of the system after installation. Due to its simplicity, we assigned only a day for our installation of the SunBank 2000 system, but we were challenged with replacing the existing water heater and enclosure.

1. Tank:

The existing 40 gallon gas water heater was replaced along with its enclosure and concrete landing. Our plumber found the existing venting of the tank to be inadequate and not in compliance. The existing tank landing was also inadequate because it leaned and was too small. We also did not account for the additional space required to install the circulation plumbing associated with the SunBank 2000 system. We therefore needed a larger water heater enclosure and concrete landing. A considerable amount of time was spent installing

all of these components. Additionally, we had to make several trips to the local hardware store (Home Depot). The manufacturer is, therefore, currently finalizing a newer version of the SunBank 2000 system incorporating a more space saving design.



40 gallon tank and enclosure before installation.



New 40 gallon tank and enclosure after installation.

2. Solar Collectors

The SunBank 2000 Solar Water Heating System utilizes two solar collectors, each weighing 19lbs. and 72" x 20" x 3" in dimension. The collectors are mounted on aluminum rails which are fastened with bolts to the roof rafters. All plumbing is joined by 1/2" compression fittings. Since this is an open loop system, water is circulated from the tank to the collectors, and back to the tank. This was a straightforward installation, and we mounted a freeze protection system (optional part of the kit) to protect the system from freezing during winter nights. All roof penetrations were subsequently covered with sealant.



Solar Collectors mounted in position. The PV solar panel for the circulation pump is visible in the foreground.

4. Circulation Plumbing

The circulation plumbing consists of ½"OD flexible copper tubing and a circulation pump powered by DC low voltage generated by a small PV panel mounted on the roof. All circulation plumbing is joined together with compression fittings. Subsequent to installation, all plumbing was tested for leaks and insulated. A temperature limiter safety switch was also installed to limit the water temperature and pressure in the tank to safe limits. There is no clear description of this procedure in the manual, and I consulted with the manufacturer on its proper installation. The manufacturer assured me that it will incorporate this procedure in all future manuals.

CONCLUSION:

While the SunBank 2000 open loop Solar water heating system is less complex than it's larger cousin, the SunBank 4000 closed loop system, careful planning and a thorough site assessment should be conducted prior to installation. Communicating with the City of Compton Building & Safety Department was challenging. All necessary permits were obtained prior to the commencement of work. The installation could be performed in one or two days, depending on factors such as the location and condition of the existing water heater, water heater landing & enclosure and plumbing. For most installations, two days should be assigned for the work. Our installation was completed in 10 hours. Additional time was required to troubleshoot the system.

The participating agencies have installed 16 solar water heating systems, including two by PACE, up to this point in the program. All but two of the systems are the larger SunBank 4000 closed loop variants. We are only one of two agencies who have installed the smaller and less complex SunBank 2000 open loop system. Our installation experience, therefore, covers both systems. The initial installation training served as only an introduction, and most of our knowledge and experience was gained through hands-on involvement while participating with installations of other agencies. We have gained additional and broader knowledge with our installation of both systems.

