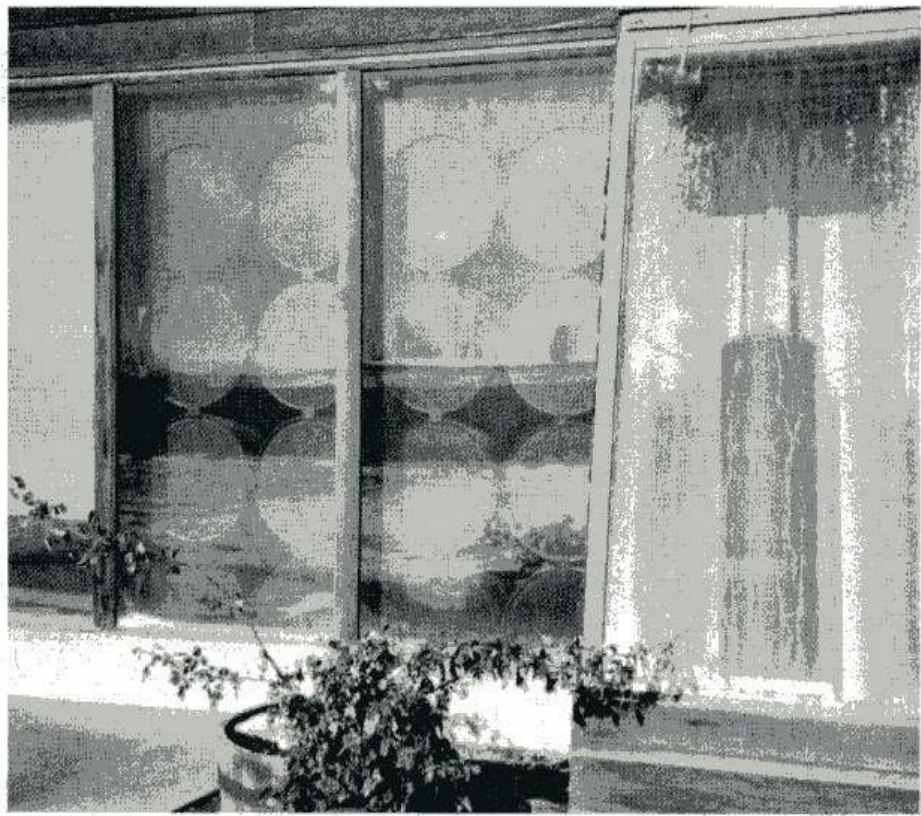


These 55-gallon oil drums are visible behind the windows of the SunEarth house in Longmont, Colo. The barrels are painted with a non-glossy, black finish and filled with water. The water absorbs the sun's heat during the day and the heat is released at night. The house was built by Paul Shippee.



SunEarth House Saves Energy Costs

By Melissa Petrone

One man's radical approach to energy conservation and solar heating led to the construction of the SunEarth house in Longmont, Colo. Designed and built by Paul Shippee, the home has sparked the curiosity of passers-by for more than a decade.

The SunEarth house is an earth-covered structure that is passive solar heated and naturally cooled. Its design is based on the siting of the house on the lot and simple methods for conserving energy and using the sun. The architect considered each of those factors in the SunEarth house design.

The energy-conscious house is constructed with concrete walls that are insulated on the exterior. Earth is piled up over the north, west and east walls. One foot of earth with vegetation covers the roof. The weight is supported by steel bar joists and a concrete deck. The earth covering slows down the effect of rapid temperature drops on cold nights.

Passive solar allows heat to come in through the windows. The heating system is a direct gain, passive solar system and drum wall. The south side exposes 300 square feet of glass windows. The windows are two panes of insulated glass that run floor to roof. Behind the windows are 54 large, vertically stacked barrels. Sunlight directly warms these 55-gallon oil drums that are painted with a flat black finish and filled with water. During the day, the water and interior concrete walls inside the house absorb the sun's heat. The heat is released slowly after the sun sets.

At night, when temperatures begin to drop, a blower pushes polystyrene beads between the two panes of glass, providing insulation to keep the daytime heat inside the home. On winter nights, this moveable Beadwall™ insulation converts the large window areas to R20 heat loss barrier.

Six vertical skylights are arranged on the north side of the earth roof. Maximum solar energy takes place during the winter, and minimum solar energy occurs in the summer.

For three years after the house was built, it was computer-monitored. According to the National Solar Data Network, the SunEarth house out-performed hundreds of passive solar houses in the country.

According to Bob White, who has lived in the SunEarth house for three years, utility bills are cut by more than half. "During the coldest winter months, the gas bills run about \$24," he said. The house has a natural gas back-up heating system.

Paul Shippee says his purpose was not to cut down costs. "I wanted to build an energy-efficient and passive solar house. I combined the best of my two ideas into one home, which in turn is cost-efficient."

Shippee said there is one drawback to the house. "The 55-gallon drums may not

be visually attractive to everyone. Sheer blinds can be placed in front of the windows to distract attention and somewhat mask the drums," he said. Shippee has a degree in civil engineering. He was the founding president of the Colorado Solar Energy Industries Association, and the former director of Colorado Sunworks.

A grant from the U.S. Department of Housing and Urban Development paid for much of the solar energy collection and measuring devices.

The SunEarth house has continued to minimize energy use for 12 years. While there are many earth-sheltered homes throughout the United States, few are quite as innovative as the Longmont house. "Considering the current energy situation, this home is a prime example of energy efficiency and can be a model representative for the future," Shippee said.



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