

Virginia Beach, VA

Builder: Warren L. Smith, Inc., Virginia Beach, VA

Designer: The Design Collaborative, Virginia Beach, VA

Solar Designer: Atlantic Solar Center, Inc., Virginia Beach, VA

Price: \$125,000

Net Heated Area: 2512 ft²

Heat Load: 52.9 x 10⁶ BTU/yr

Degree Days: 3479

Solar Fraction: 55%

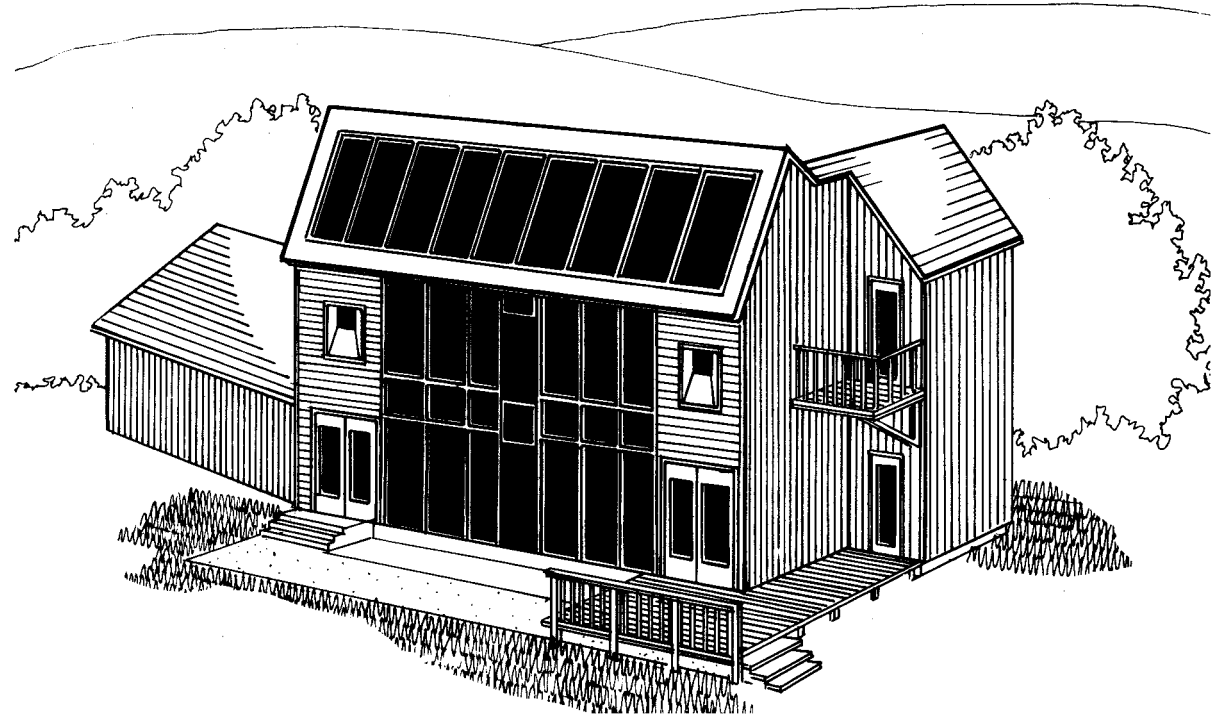
Auxiliary Heat: 2.58 BTU/DD/ft²

Passive Heating System(s): Indirect gain

Recognition Factors: **Collector(s):** South-facing insulated glass, south-facing Trombe wall glass 551 ft² **Absorber(s):** Solid brick wall **Storage:** Solid brick wall—**capacity:** 1511 BTU/°F **Distribution:** Radiation convection **Controls:** Canvas Trombe wall shades **Active Solar Heating:** 297 ft² liquid flat-plate collectors, 1000-gallon steel storage tank, hydronic distribution to back-up air system

Back-up: Electric air/air heat pump (63,000 BTU/H)

Domestic Hot Water: Active (see above) 80-gallon stone-lined storage tank

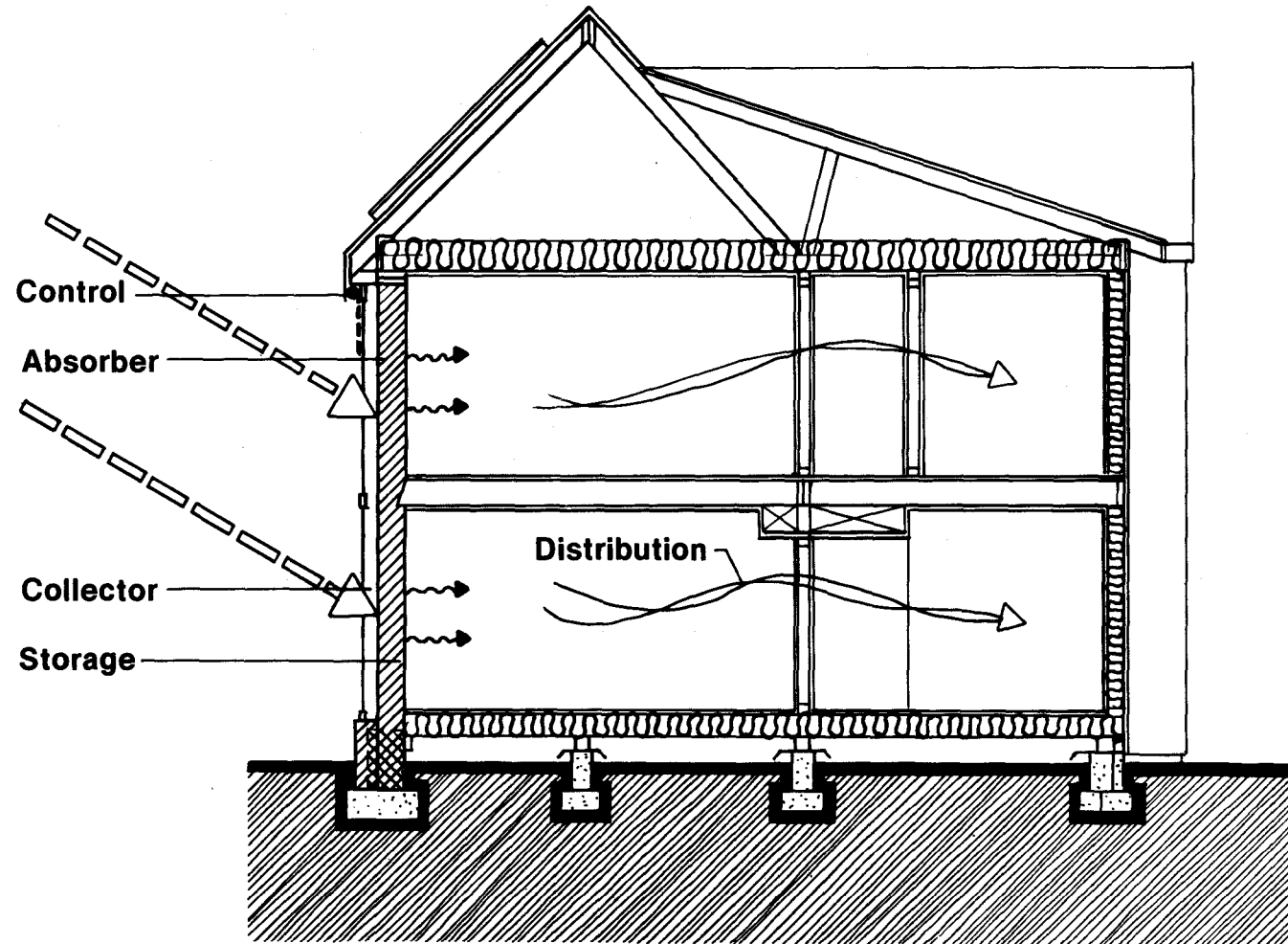


Forenergy conservation, this house has been designed with air-lock entries, a garage located on the northwest to block winter winds, and insulation values of R-24 in the walls and the crawl space floor and R-39 in the second floor ceiling.

This house features a solar mass wall system located on the south side of the house for the full height of both floors. To admit natural light to the south-facing rooms, the wall is in two parts with standard windows located between the two sections as well as on the left and right. The wall is 12-inch thick solid brick; a layer of glazing is in-

stalled in front of the brick, separated from it by 4 inches.

In winter, the sun's heat is collected through the glazing and is absorbed and stored in the wall. Gradually through the day and into the night, the wall distributes heat directly to the rooms by radiation. The mass of the wall makes this effect more pronounced in the evening. Also, the wall induces convection currents which distribute warm air through the house to the rooms on the north side. In the summer, heat gain by the Trombe wall is controlled by a canvas shade.



This plan is from the book
"Passive Solar Homes - 91 new award-winning, energy-conserving single-family homes",
The U.S. Department of Housing and Urban Development, **1982**

The solar homes designs in this book were the winners of HUD's fifth (and final) cycle of demonstration solar homes. The 91 winning home plans in the book were selected from 550 applications from builders.

This was a time of great interest and activity in the passive solar home designs - many of the winning homes show a level of innovation not found in most of today's passive solar designs.

www.BuildItSolar.com

