

Builder: Diamond Crest, Inc., Blackwood, NJ Designer:
Princeton Energy Group, Princeton, NJ Solar Designer:
Princeton Energy Group
Price: n/a

Net Heated Area: 1691 ft²

Heat Load: 43.2 x 10⁶ BTU / yr

Degree Days: 4812

Solar Fraction: 72%

Auxiliary Heat: 1.56 BTU / DD / ft²

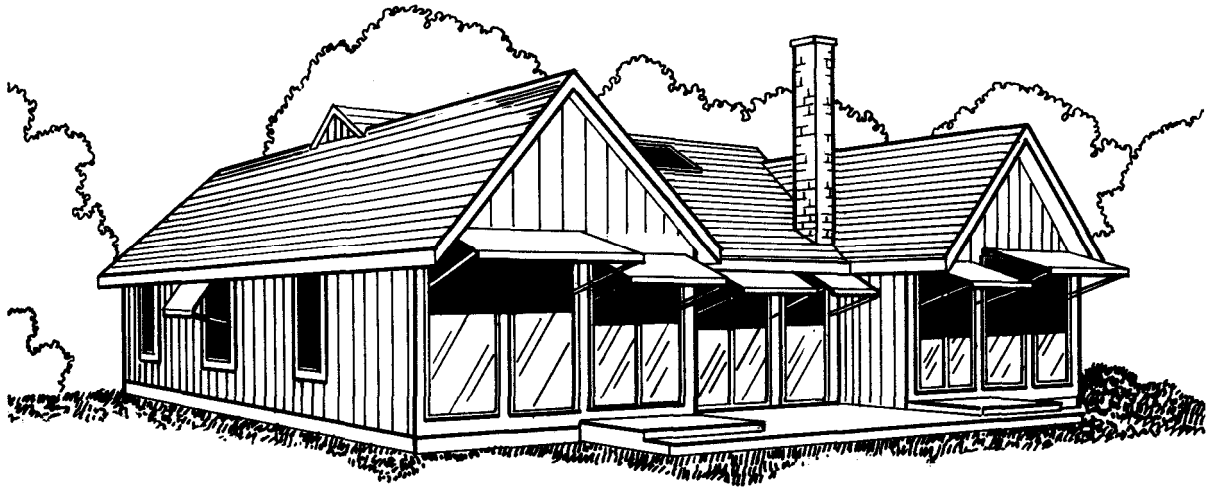
Passive Heating System(s): Indirect gain, sun-tempering

Recognition Factors: **Collector(s):** Double-glazed windows, acrylic panels, 296 ft² **Absorber(s):** Water wall surface **Storage:** Water wall-capacity: 8075 BTU / °F **Distribution:** Radiation, forced convection **Controls:** Moveable insulation, awnings

Back-up: Gas furnace (50,000 BTU / H)

Domestic Hot Water: Liquid flat-plate collectors (84 ft'), 80-gallon storage

56



This contemporary ranch design in the New Jersey Pine Barrens is a passive solar modification of a best-selling model. The basic "energy-efficient" building package includes R-25 insulation in the walls, R-45 insulation in the ceiling, foundation and ductwork insulation, air-lock entries, insulating glass windows, and operable insulating shades. Low-activity areas are located along the north wall to create a buffer zone. The passive solar features added to the building design include increased south-facing glazing, three water walls, solar control awnings, and an active solar domestic water heating system.

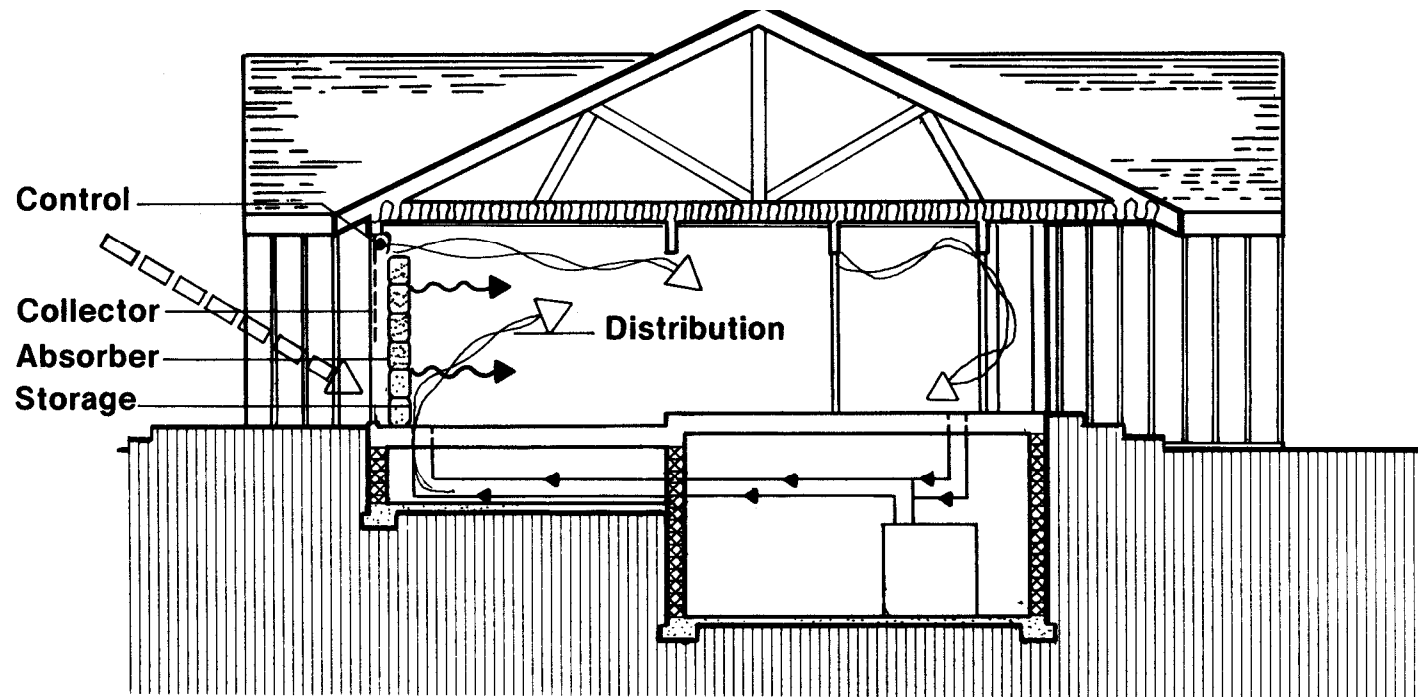
In the family room, living room, and master bedroom, solar heat is collected through south-facing fixed windows. The heat is absorbed and stored in water-filled polyethylene drums. Distribution occurs as these water walls radiate solar heat to the interior of the house. Each of these rooms also receives solar radiation through south facing sliding glass doors, but there is no storage mass for these collection areas. Solar heat can be distributed by the blower in the back-up gas-fired, forced-air heating system. If air temperature in the solar heated rooms is adequate, the blower circulates the air throughout the house. If

temperatures fall below a preset point on the thermostat, the furnace is automatically activated and boosts the temperature to the desired level.

Insulating shades are lowered on the living side of all windows at night to **control** heat loss, and they are raised again each morning to permit solar collection.

Canvas roll-down awnings are adjusted at the beginning of the cooling season to protect storage walls from solar gain. Insulating shades may be lowered during the day, and then raised at night to permit radiation of house heat to the outdoors by opening doors and windows to induce natural crossventilation.

A Sunworks™ solar domestic water heating system with single-glazed flat-plate collectors is included in the design.



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

