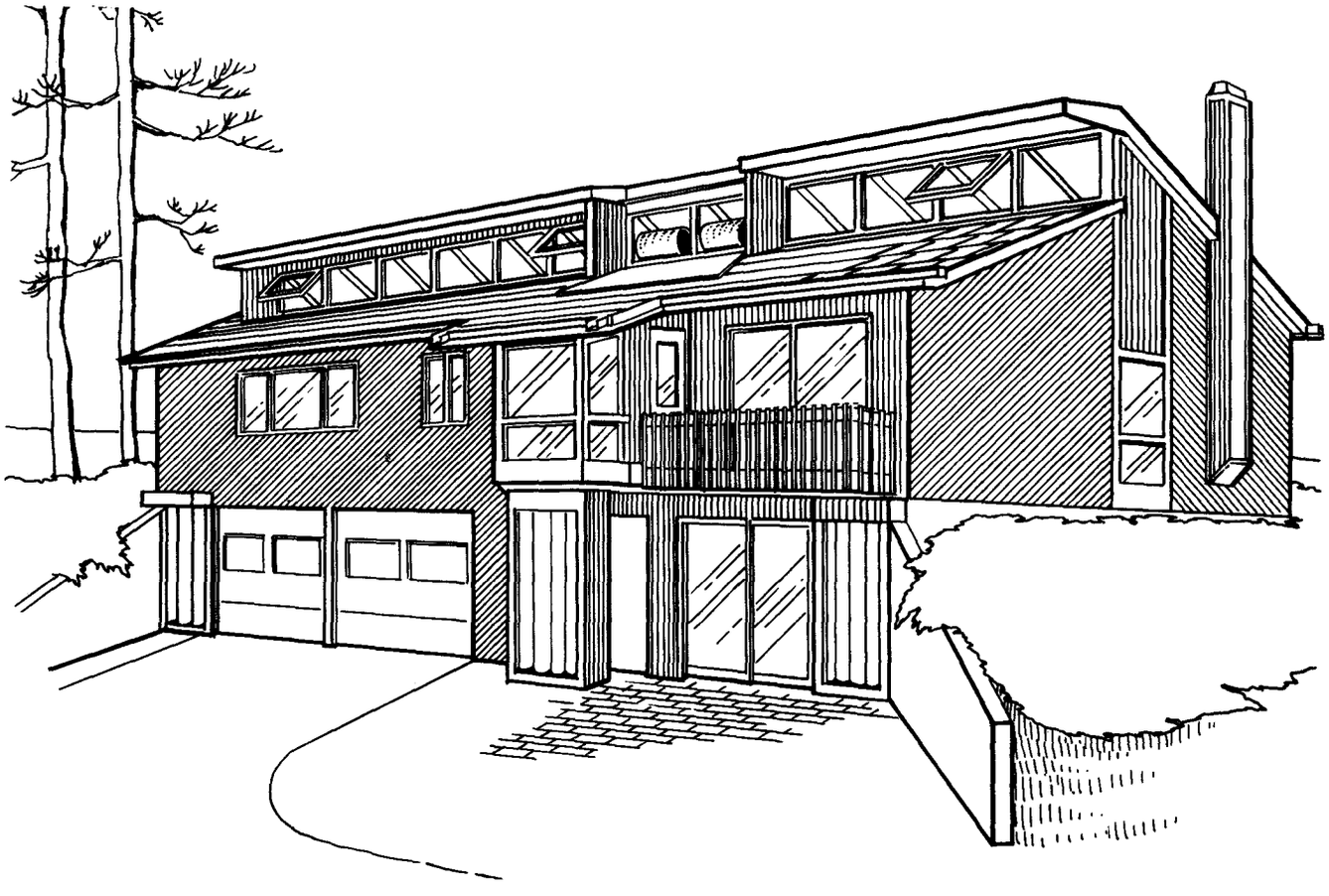
Norcross Gwinnett, GA



Builder: Millen Properties, Inc., Atlanta, GA

Designer: Paul Muldawer, Atlanta, GA

Solar Designer: Don Abrams, Atlanta, GA

Price: $55,000

Net Heated Area: 2039 ft²

Heat Load: 49.3 x 10⁶ BTU/yr

Degree Days: 2961

Solar Fraction: 51%

Auxiliary Heat: 4.08 BTU/DD/ft²

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

Recognition Factors: Collector(s): South-facing double glazing, clerestory windows, 342 ft² **Absorber(s):** Concrete floor and wall, surface of water tubes **Storage:** Concrete floor and wall, water-filled tubes—**capacity:** 35,324 BTU/°F **Distribution:** Radiation, natural convection **Controls:** Overhangs, shading panels, water-tube covers, shading louvers

Back-up: Gas furnace (40,000 BTU/H)

Domestic Hot Water: 80-gallon storage

This compact 2-level house includes such design features as major glass areas, diagonal wood siding, and a vaulted clerestory. The building site slopes gently to the south away from the street, which runs along the high north boundary of the lot; a recreation area guaranteeing future solar access is on the low south boundary. Prevailing winter winds are deflected from the house by evergreens on the northwest and by shrubs adjacent to the north, east, and west walls of the house. Additionally, all sides of the lower floor, except the south, are buried, effectively blocking most infiltration to this level.

The lower level includes an entrance through the 2-car garage, a laundry room, and a playroom. The major living spaces are located on the upper level.

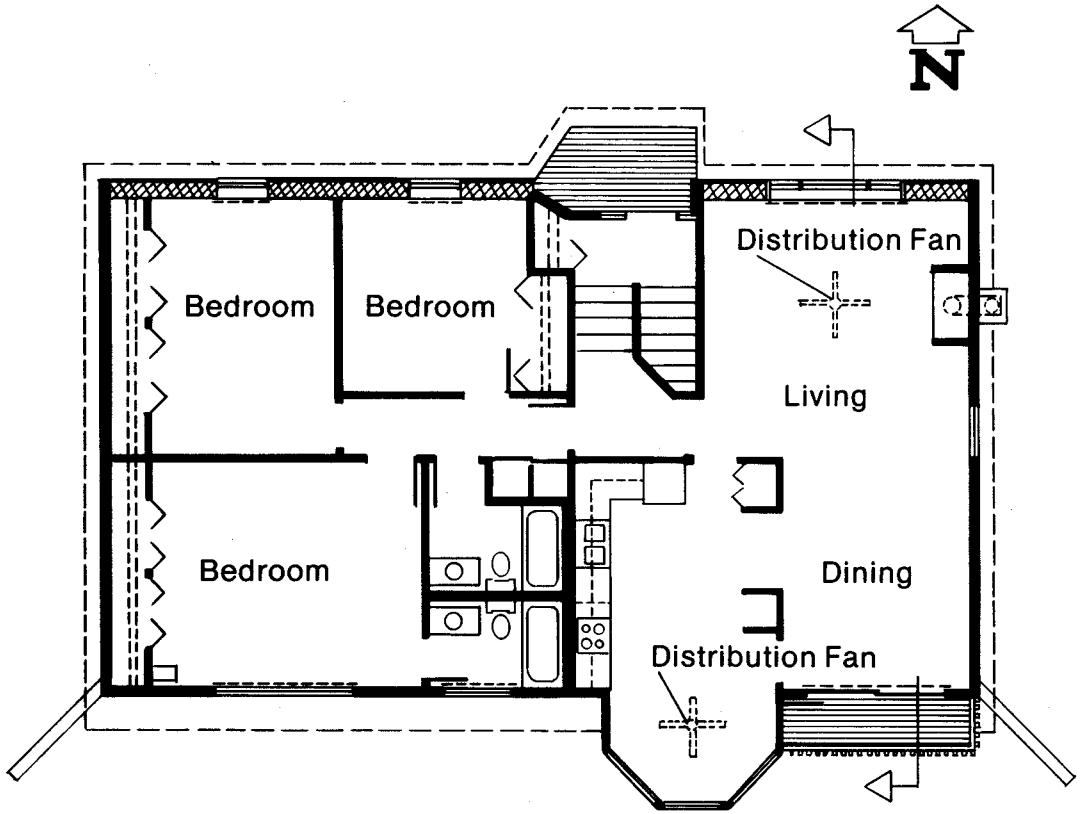
Three passive **collection** systems are used in this house. The first is 150square feet of double-glazed clerestory windows. The second is a 120square-foot double glass, direct solar heating system. The third is 60square feet of double glass that heat water-filled tubes.

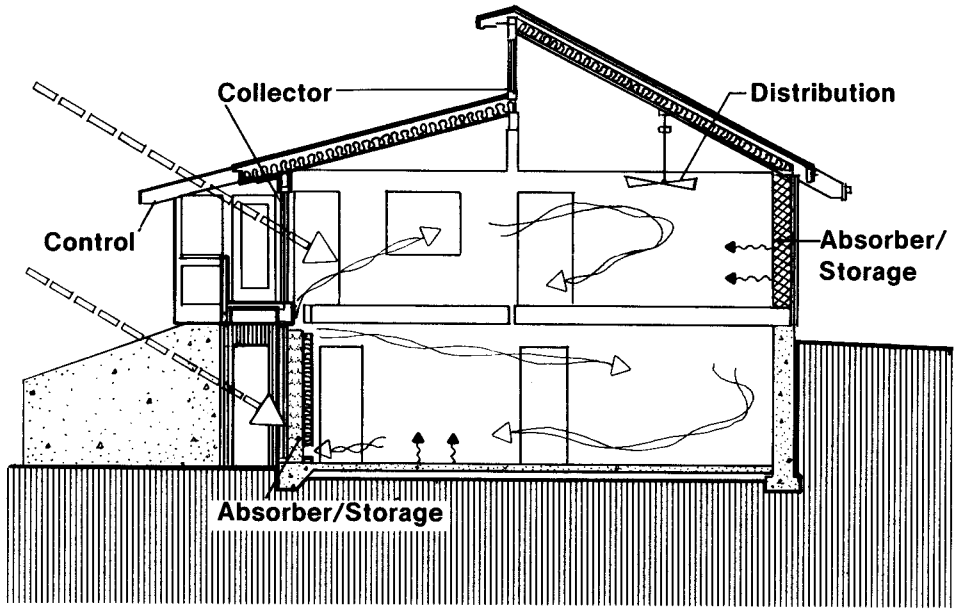
Absorption of heat for the direct system includes the surface of the slab in the lower level and the plaster surface of the north masonry wall of the upper level. **Storage** of this absorbed heat is in the mass of the masonry floor and wall. The 12-inch diameter water tubes both **absorb** and **store** heat.

Distribution of heat is by radiation from the masonry wall and concrete floor. Natural convection **distributes** heat from the water tubes. Cool air enters a vent in the bottom of the tube enclosure, contacts the warm tubes, is heated, and rises through a vent at the top of the tube enclosure into the living spaces above.

Control of the solar radiation is by fixed overhangs and seasonal shading panels that eliminate unwanted heat gains. The indirect gain system can be **controlled** by moving covers over the water tube modules to stop transfer of heat up into the living spaces. Throughout the summer months sun is blocked from reaching the tubes by fixed shading louvers above them.

Additional energy-conserving features of this house include: operable windows in high spaces to encourage natural ventilation during the cooling season; good wall and ceiling insulation; programmable thermostatic control of the back-up heating system; energy-saving appliance and fixtures; and an outside air source convection-type fireplace with glass doors.





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 ofHUD'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.