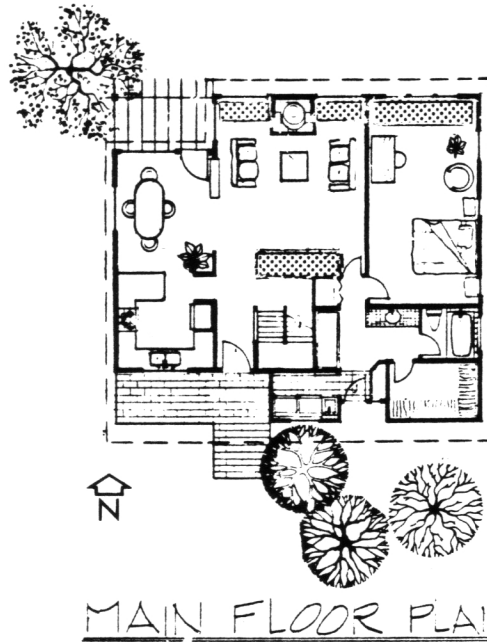


Readers' Forum

Solar Home of the Month



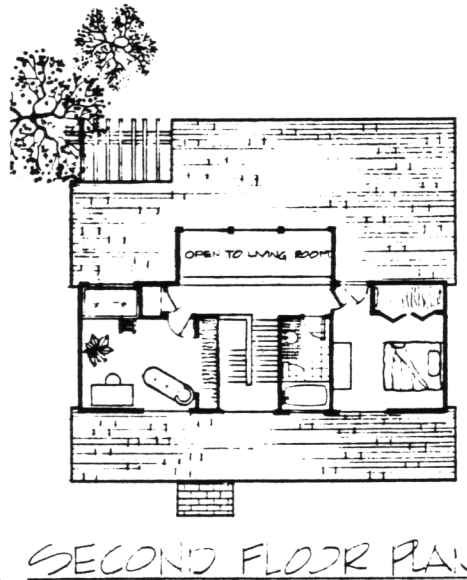
PASSIVE SOLAR HEATING AND COOLING WITH A WATER WALL

The Morgan house is an excellent example of a water wall house. This beautiful, 1750-square foot water wall solar house is located in Davis, California.

Brock Wagstaff, the architect of this three-bedroom, two-bath custom house, said the clients wanted an open plan house with good livability for a family of four. They not only got that—but also a very comfortable house with 100% natural cooling in an area where summer temperatures often exceed 100°F, and 80%+ natural heating in a mild winter climate.

The house includes virtually all the elements of good water wall design, starting with proper orientation. This is complemented with 2"x6" stud walls, with R-19 insulation. Ceiling insulation was limited to 6" R-19 batts by the depth of rafters in the cathedral ceiling, but is R-30 elsewhere.

Solar gain is through the south windows, both ground level and clerestory. These provide a total of about 180 square feet of south glass. Thermal storage is provided in the tile-covered concrete slab in the south rooms and four steel water tanks. Two of these tanks are sitting benches in the living room, each measuring 2'x2'x5'. The third water tank in the den is counter height, 2'6"x2'x11'. The fourth tank sits against the north side of the house under the second story balcony. This 2'6"x2'x11" wall-size tank functions pri-



GENERAL INFORMATION

	GROSS SQ. FT.
FIRST FLOOR	1,260
SECOND FLOOR	490
TOTAL	1,750
CARPORT	800
WORKSHOP	160

SCALE: 1/2" = 1'-0"

Illustrations by Joy Brenton

marily for cooling. Total thermal storage is almost 400,000 BTU, and provides carry-over for several days of heating or cooling.

Summer cooling is aided by good orientation and good solar control, with wide overhangs and an arbor over the deck. Night ventilation provides convective cooling by cross and stack ventilation. Effective ventilation is assured by the north-south window orientation and the open plan. A Casablanca fan provides additional cooling on the few days when interior temperatures reach the high seventies.

Hot water is also, naturally, solar, with a two-panel thermosiphon system. The storage tank is located on the second floor. Backup water heating is gas, as is the backup space heating.

The house was built by Bob Schneider, an old hand at solar construction. To ensure that everything went together smoothly and economically, Schneider worked closely with the architect and the water wall supplier Denny Long of Passive Solar Development. The tanks were shop-built and installed by Long who has now made over 120 water wall installations, including many single-family detached homes, apartments, subdivisions, and commercial buildings.

—David Bainbridge