



Passive Solar Design

At Earthsong, houses are designed for natural climate control and are thermally comfortable most of the year, without the need for additional heating or cooling.

Passive solar design recognizes the crucial fact that the angle of the midday sun depends on both the latitude of the site (e.g. the closer to the equator, the higher the sun in the sky at midday), and the season (in summer the sun is much higher in the sky than in winter). We can use these facts to design overhangs above windows and doors that prevent direct sunlight coming into the house in summer, but let the lower winter sun through the glass to warm the house.

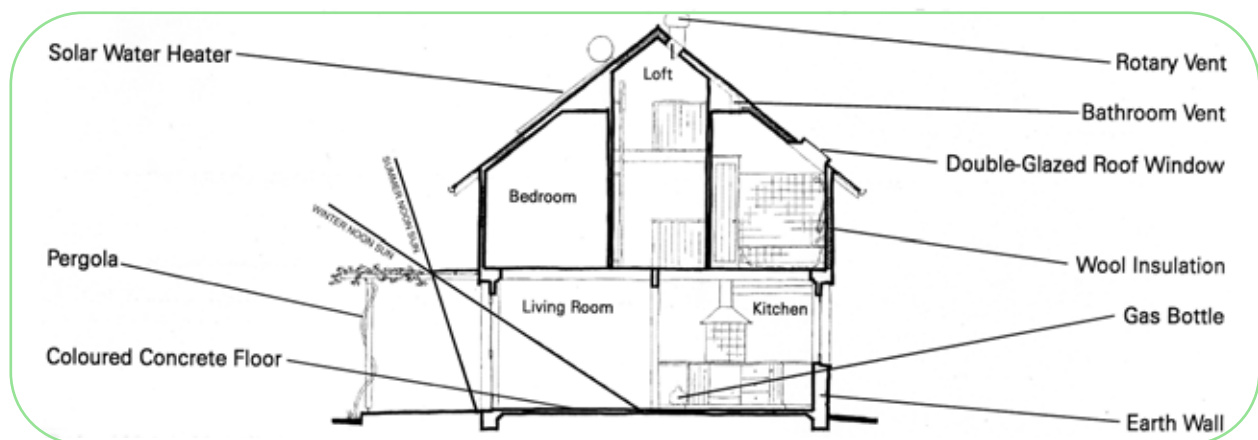
The basic principles of passive solar design can be described as follows:

- **Conserve** heat within the house by insulation, double-glazing and thermal curtains, and weather-stripping windows and doors to prevent drafts
- **Collect** sunlight/heat through north-facing windows
- **Store** the heat in heavy-weight materials such as concrete or rammed earth
- **Distribute** the warmth throughout the house through air circulation and the placement of rooms

- **Protect** the house from summer sun and winter winds
- **Disperse** unwanted heat through ventilation.

The above principles were used in the design of houses at Earthsong.

- Living areas face north for maximum sun in winter and easy sun control in summer.
- The coloured concrete floor absorbs the heat from the sun during winter days, keeping the house warm in the evenings.
- Earth walls also absorb heat and moderate the temperature swings between day and night.
- Wool and polyester insulation in the timber framed walls and roof reduces heat loss.
- Pergolas on the north side provide a structure for deciduous vines. These shade the house in summer, and lose their leaves in winter to allow the low winter sun to penetrate deeply into the house.
- The rotary vent in the loft draws cool air through the house and allows the warm air to escape in summer. This is closed off in winter.
- Behaviour is also important - placement of furniture so as not to block the sun, closing doors to unused rooms in winter, and closing curtains at dusk.



Section through Earthsong house

