

ABSTRACT

Creating the built environment seems to require the destruction of the natural environment. The impact of a building on the environment goes far beyond the space that was cleared to make way for it. Humans require resources (energy, water, materials) to continue to live, work and play in the buildings that we have created. Reducing the impact of ever-enlarging human settlements is necessary to protect the environment in which we rely so much.

The Subiaco Sustainable Demonstration Home (SSDH) is a collaborative effort between a local council and the building industry to create a house that uses fewer resources than normally built homes during its construction, use, and eventual demolition. The house has sustainability design features for water efficiency and water recycling, energy generation and efficient energy use, Universal design for the disabled, Low-allergen design to improve internal air quality, and sustainably sourced materials to minimise the cost to the environment due to its construction.

The house has also been designed using Passive Solar (PS) design, so should remain thermally comfortable inside for most of the year, without the need of active heating or cooling systems. The house follows PS principles with: house and block having a north orientation, extensive glazing (protected in summer) on the north to maximise solar exposure in winter; internal thermal mass to minimise temperature swings; insulation to control heat energy flows; good ventilation to remove heat; and zoning to maximise human comfort.

The house was the subject of a thermal monitoring programme throughout 2004, which will continue to January 2006. The objective of the monitoring was to record the internal thermal conditions (temperature and humidity) to determine how effective the house is in remaining within established thermal comfort levels without the need of mechanically-based heating or cooling systems.

The house has demonstrated that it can remain within human thermal comfort levels for the majority of time, but needs to be operated properly by the occupants. In order for the house to be thermally comfortable, windows and curtains need to be opened at the right time to control the flow of energy into or out of the building. The result is a healthier, more comfortable living environment that is financially and environmentally cheaper to maintain than the currently constructed housing being created elsewhere around Australia.