

building analysis



ABOVE: The site monitoring system collects data on local temperature and humidity.



ABOVE: One of more than 80 monitoring devices used in the buildings as part of the experiment.



ABOVE: The studio – northlights introduce daylight into the space from the rear of the building.

opened to encourage cross ventilation." Because one side of the building will remain cooler than the other, air movement will occur naturally due to differences in air pressure, even on a still day.

The house also uses passive cooling in a slightly different way, as it is not open-plan. "The roof of the house is cantilevered. Full height walls create a funnel up to the door of the house on the north side. The front door can be left open with the benefit of security gates. This induces air movement from the warm south side of the house towards the cooler north side," explains Harrall.

Harrall's project though is more than simply an experiment in passive cooling and earth sheltered temperature control. He is passionate about sustainable building. Building materials

and methods have been selected for minimal environmental impact.

For example, there are no embedded services in the dwelling or office. There are no ceiling or wall lamps, only standard or table lamps. These have battery operated infra-red switches. Electric heaters supply hot water for the house and office as needed. Harrall aims to supplement those with the use of solar heating eventually.

Low energy high repeatability

"We have used low embodied energy construction methods. We've also reduced the number of trades on site by 50%, and subsequently reduced the variety of materials by a similar amount. The cost of designing and building this four bedroom earth sheltered dwelling is less

Manufacturers and suppliers to the earth sheltered project, Long Sutton

Back up heating
De-Vi Electronics

Insulation
Springvale Combat

Facing bricks
Hanson Bricks

Tanking
Delta Membrane Systems

Earth cover
Organic Recycling

Joinery
Jeld-Wen UK

Concrete
Tarmac Topmix

Concrete blocks
Tarmac Topblock

Monitoring equipment
Delta-T Devices

than the cost of a conventional four bedroom house via the self-build method. It is predicted that the annual running costs will be around a quarter of those required for a 'normal' dwelling. Harrall's earth sheltered building project is certainly a live test of an alternative approach building. His determination will enable others to benefit from the research.

This demonstration of techniques has already attracted interest from local councils, and other earth sheltered projects are in the pipeline. In the meantime, it is interesting and encouraging to see at least one architect who is prepared to live with and in his own experiment.

BSJ will be returning to the earth sheltered project later this year to look at how the construction has progressed, and also to see early results from the monitoring process.