













Scale of development
Small

Type of development
Detached House

Sustainability features

-  **Design**
-  **Energy**
-  **Biodiversity**
-  **Water Conservation**
-  **Water treatment & discharge**
-  **Health & Wellbeing**
-  **Materials**
-  **Maintenance**
-  **Waste**
-  **Community**

Features

- Carbon neutral living – Energy generated on site equivalent to energy consumed.
- Designed for passive performance with sunspace, thermal mass and heat exchange ventilation.
- Local wood used extensively in construction, reducing embodied energy.

Introduction

Designed for low impact through choice of materials, energy efficient design and renewable energy technologies.

Passive Performance

Designed by Arco2 Architects and built with the help of friends, family and WWOOF volunteers, the building makes good use of natural heating and lighting. A 'sunspace' on the South Corner of the house is a full height glazed facade with stone faced block walls to the interior, this area collects solar heat which can be distributed through the house by a heat-exchange ventilation system. Windows at the top can be opened to dispel excess heat. Externally insulated concrete slab and block retaining walls provide thermal mass to balance temperature fluctuations. Argon filled double glazing is used throughout.

Low Impact Materials

Ninety percent Cornish timber, much of which was sourced from an adjoining forest, milled and air dried on site. Douglas Fir post and beam frame with Western Red Cedar roof shingles and cladding boards. Western Red Cedar does not require treatment or painting which reduces pollution and maintenance costs. Sheep's wool insulation provides 225mm in the walls and 300mm in the roof. The wool is reclaimed from carpet manufacturing by-product. An existing building was demolished providing aggregate for the driveway and the kitchen features worktops cut from reclaimed billiard table slate.

Energy

A MORSØ 8kW log stove is fuelled with wood coppiced from the eight acres of woodland which make up the property. Heat is distributed through the building by the ventilation system so radiators are not required.

Roof mounted solar photovoltaic panels with Sunny Boy grid tied inverter have a 4.2 kW installed capacity, generating around 4,000 kWh per year which is approximately equal to the yearly consumption of this three bedroom house.

A roof mounted, 4 m² flat plate solar thermal collector reduces the demand on electricity for hot water heating.

Electricity is also conserved by using energy efficient lighting and appliances, including an induction hob. *Ecoballs* are used in the washing machine, avoiding pollution caused by detergents and saving water.