

The Greenhouse Building Fact Sheet

Why an L-shape

The Greenhouse is L-shaped to make the most of the sun's light and heat. The orientation of both the building and the lake were also planned to enhance the local area and reflect the aesthetics of the immediate surroundings giving particular consideration to the existing wildlife lake adjacent the development.

Heating the building

Consideration has been given to the energy consumption within the building. High efficiency condensing boilers, a ground source heat pump and underfloor heating maintain a steady temperature inside the 32,000 squared feet building.

The heat pump is a geo-thermal heating and cooling system which operates on a slinky system, with over 1500m of plastic pipe laid under the pond and car parks. The heat pumps absorb heat from the ground via the horizontal slinky loop pipework and is able to provide 80kw of heating and 20kw of cooling. The building is split into zones and each zone is provided with local control via a room thermostat.

Natural air conditioning

Natural light is harnessed as much as possible and instead of air conditioning a passive ventilation system draws in fresh air from outside. The building utilises a combination of windows, and roof mounted chimney terminals all of which integrate within the building.

The power of the environment

The Greenhouse generates all its own electricity. The 35metre high turbine has blades measuring 15 metres long and harnesses wind energy to generate 225KW of electricity. It is the main source of electricity for the development and all surplus power is sold back to the national grid. The Danish-built turbine was transported from Cumbria and is re-used at The Greenhouse site. Solar panels are installed south facing on the flat roof area mounted at an angle to maximise the annual thermal yield. Heat is transferred from the solar panels into the mains pressure hot water tank.

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Other Sustainable Features

The building is constructed from materials that have been reused, recycled or have come from sustainable sources. In addition local labour and suppliers were utilised in the construction of The Greenhouse and are still used for maintenance work, stationary and catering.

Alternative roof covering and cladding panels manufactured from 100% recycled and recyclable Aluminium.

Outside, traditional asphalt is replaced by crete for the car parks and roadways, providing surface drainage and allowing grass to grow through the surface.

Rainwater recycling system

Rainwater is collected from the roof and filtered before being collected into an underground storage tank. Rainwater is recycled for the toilets and showers. Presence detection systems are installed in the male WCs linked to the urinal flush control devices to minimise urinal flushing water consumption. A mains water supply pipe is installed to the tank which automatically feeds mains water into the tank during dry spells of weather to prevent it from running dry. In periods when rainfall exceeds rainwater usage the excess rainwater overflows into the lake.

BMS

The BMS system records data on the contributions and efficiencies of the individual natural elements such as wind, solar and geothermal which are being harnessed by the renewable technologies used in the building to power The Greenhouse.

Education

The Greenhouse Education Programme aims to increase knowledge of sustainability and biodiversity amongst community groups and young people by using the site as learning tool. Groundwork work in partnership with schools, businesses and local authorities to develop fun and informative half day education sessions.

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