

CASE STUDY 9 - GROUND SOURCE HEAT PUMP

Old St. Lawrence Church, Yerbeston

Jill Simpson decided to restore and convert St Lawrence Church into a dwelling in 2003 and was granted permission to change its use in March 2004.

As well as restoring the building using traditional sustainable methods, Jill wanted to install a renewable energy system that would provide heating.

She decided to go for a ground source heat pump to power her under-floor heating. This system provides a constant temperature and is less visible than some renewable systems such as solar panels, which would not be given permission on this listed building.

Installation involved digging trenches through the graveyard (without disturbing graves) for the slinky-like coils of piping that take liquid through the earth, drawing out the constant temperature found below the surface. The pipes are connected to a heat pump which exchanges the heat into the under-floor heating system.

There is also a wood burning stove in the building and Jill has used lime plaster and lime wash on the interior walls. The flooring is mainly traditional Llangolman slate and the timber is local larch.

She has found the system very effective and the building feels warm and pleasant to live in.



The Heat Pump Manifold at Old St. Lawrence

HEATING SYSTEM COSTS:

Kensa Engineering - Slinkies (2 x 40m) Twin Manifold	£987
8kw Single Phase Heat Pump & 50 litres of Anti-freeze	£3,498.60
51 tons 10mm Pea Gravel (<i>to fill in the trench</i>)	£838.95
Labour & equipment hire for trench digging	£921
TOTAL (<i>less builders time</i>)	£6,245.55

Archaeologist's Survey..... £347

USEFUL CONTACTS:

Kensa Engineering	01326 377627
Calch Ty-Mawr Lime	01874 65800
Andrew Ravenscroft Joinery, Penally.....	01834 849101
Ian Hartshorn, Martletwy	07967 113204
David Winters Plumbing & Electrical Services, Whitland	01994 448428

Old St. Lawrence Church is a private residence and is NOT open to the public

HOW THE SYSTEM WORKS

Heat pumps extract solar energy stored in the ground, water courses and in the air and convert this to a higher temperature to use in a building's heating distribution system. They work in a similar manner to a fridge in reverse, where the inside of the fridge is the heat source and the grill at the back of the fridge is the heating system.

A ground source heat pump (GSHP) extracts heat from the ground by circulating a cold solution of water and antifreeze (brine) around pipes buried in the ground.

GSHPs are an extremely energy efficient technology, with every unit of electricity used (to drive the pumps and compressor) producing between 3 and 4 units of heat.

