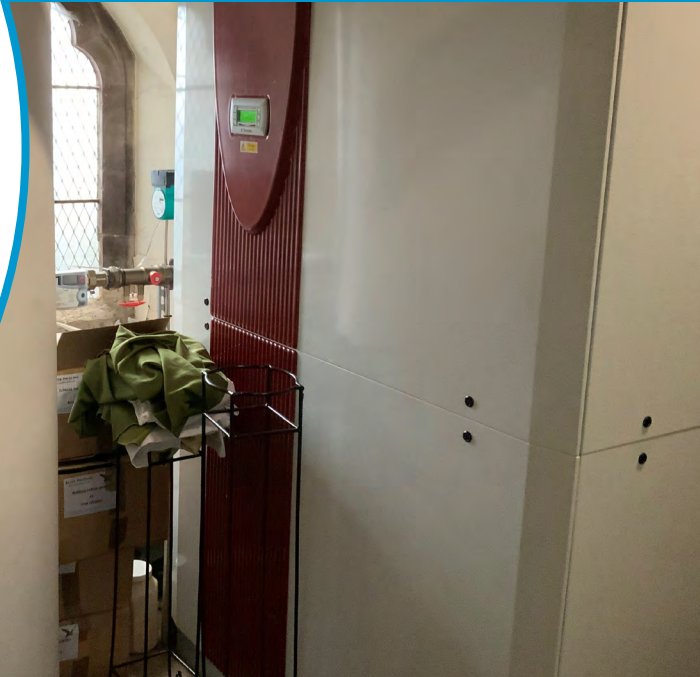


Sharing our story; Installing a Ground Source Heat Pump at St Catherine and St Peter, Burbage



This is St Catherine's Church prior to the heating system works. The old pitch pine pews stood in a wooden plinth, around which was wrapped a heating pipe which supplied five cast iron radiators installed in around 1900.



The boiler was gas-fired and it took many hours to get the building up to a reasonable temperature. The boiler never stopped firing, as the temperature was never high enough to activate the room thermostat set at around 18°C. The internal boiler thermostat would occasionally stop the boiler as it was too hot! The boiler was obsolete and parts were no longer available. We were told it would cost around £60,000 to replace the system to meet modern requirements and gas regulations.

St Catherine's is an environmentally friendly church and we hold the Gold Eco Church Award, so it was natural to look at a green source of heating. Biomass burning and air-to-air heat pumps were looked at, but ground source was considered to be the better option.

CASE STUDY



The work to install the under floor heating system took place over four months in 2011. The church was closed for the contract period. The pews were removed and the floor lifted. The 'floor' was then dug down to a depth of about three feet; a layer of hardcore was laid on which was put a layer of concrete. A layer of insulation was put upon the concrete, then the plastic heating pipes were coiled and more concrete was laid on top. It was finally finished with a York stone floor.

Six boreholes were drilled in the churchyard to a depth of 100m. These are linked together and provide the ground source heat leading to our boiler and controls room.

The heat pump has produced 72.25 MWh in two years. It is not touched from one day to the next, it is never switched off and the church is always warm. It is possible to raise the temperature and boost the heat output if required.

When the plans were drawn up, it was possible to get a government grant of 45% of the total installation cost. However, just as the contract was about to be signed, this changed, although ground source was eligible for the 'Renewable Heat Initiative' (this scheme is no longer open). It was a prolonged and complicated procedure to register with Ofgem, but once complete, a meter reading is taken once a quarter and sent off to Ofgem and a payment is received. This will continue for the next 23 years.

We have a monthly direct debit of £482 to Eon, our supplier, so for the three months from 06/11/2013 to 26/02/2014, we paid £1,446. For the same period, we received £1,397 in RHI funding, so net cost for the quarter was £49!

Initially the timings were not set up correctly and more electricity was used during the higher-rate period (the church is on an evening and weekend tariff), so consumption was high. Now the timings have been altered, so the pump works overnight to heat the floor and then it stops during the week in the daytime. There is a facility to boost the heat during the day, but we do not have to use this regularly.



COST DETAILS

The total tendered contract sum was £206,996; there was a contingency of £20,669, giving a total of £227,695:

- Boreholes **£88,000**
- York stone paving **£44,000**
- Heat pump and installation **£94,000**
- Bench pews cost approx **£40,000**. People supported the funding of the benches, and £250 paid for a brass plaque to be put on a bench.

CONTRACTOR DETAILS

The architects were Acanthus Clews, Banbury.

The main contractor was Weldon Stone Enterprises Ltd, Weldon near Corby.

The heat pump was supplied and installed by Ecovision Systems Ltd, Tetbury, Gloucestershire.

The bench seating was supplied by Bates and Lambourne, Thame, Oxfordshire.

The archaeological watching brief was undertaken by the local archaeological society, overseen by an approved archaeological consultant.