

Oxford Earth, Maths and SAID



A University Campus Case Study

Executive Summary

GI Energy was involved throughout the design process and was commissioned to deliver the scheme. GI Energy were contracted to provide base load heating and cooling within a defined performance envelope to optimise CO₂ savings on an ongoing basis.

Challenges

Minimising CO₂ was identified as a key client objective. Not only was ground source the optimum technical solution for heating and cooling the building, but it was also relevant for the Earth Sciences building from an interest point of view and Professor Phillip England, the Head of Faculty, took an active role with the project team in the development of a scheme which resulted in 63 boreholes to 64m depth underneath the new building.

GI Energy installed a hybrid ground source heat pump system directly underneath the building. This part of Oxford is geologically challenging, since it sits above a high-pressure aquifer. Although care and attention is always paramount when drilling into the ground to depth, in this case, extra diligence was required to ensure that the artesian aquifer was not breached.

- Heating Load: 208 kW
- Heating Load: 208 kW
- Cooling Load: 398 kW
- Completed in 2010

Institute of Maths

The design of the Institute has sought to realise the aims of the University's sustainability strategy by achieving a BREEAM rating of 'Excellent' and achieving a carbon saving of circa 20% beyond that required by building regulations through the use of passive design and energy efficient systems. The application of heat pumps within the energy centre by GI Energy is core to achieving the carbon savings required within the building design.

The system installed by GI Energy consists of a large ground loop of 130 boreholes beneath the basement of the building which provides a heat source and sink to four large Clivet heat pumps. The system provides up to over half a megawatt of heating or cooling, and handles large simultaneous loads. The new Mathematical Institute facility, the Andrew Wiles Building, was officially opened in October 2013.



SAİD Business School

The west wing extension, which formally opened in February 2013, is heated and cooled by a hybrid system consisting of ground source heating and cooling, drawn from the structural foundations of the building, using Waterfurnace heat pumps.

Conventional heating and cooling supplements the ground source system. GI Energy, working for the main contractor, designed, installed and commissioned the energy pile system and the associated ground source heat pump system. The energy piles and heat pumps are capable of providing approximately 160kW of both heating and cooling, delivering a predicted annual saving of over 110 tonnes of carbon dioxide.

