

Gloucester Police Headquarters

Quedgeley, Gloucester, UK



Key Facts

- Vertical Closed Loop
- 150 Bored to 98m
- 860 kW Cooling
- 765 kW Heating
- 9 Reversible Heat Pumps
- Active CO₂ Management
- Dry Air Cooler on Loop
- Completed October 2005
- 36% Energy Savings
- £60,000 Annual Run Cost Savings



Gloucestershire Constabulary County Police Headquarters is an awarding winning PFI facility using a Ground Source Heat Pump system developed by GI Energy at its core.

The three storey building with a foot print of 8,500 m² houses purpose built facilities for policing that include: a suite of offices for County Chiefs of Police; Scientific support laboratories; incident rooms; an emergency centre with the capability of housing a strategic command centre; training facilities; a sports hall and a gymnasium.

The total build cost of £19m was funded under a Private Finance Initiative Project with main consortium partner Reliance Secure Task Management.

The Consultant's brief was to develop a building with "Suitability for purpose" incorporating a reduction of CO₂ and reduc-

tion of running costs whilst being financial viable.

Their aim was to achieve an 'Excellent' Rating according to the Building Research Establishment Environmental Assessment Method (BREEAM).

"The heat pumps combined with other energy efficiency initiatives allowed the building to qualify for a BREEAM 'excellent' rating." – McBain Cooper

The building is oriented to maximize solar gains and benefit from natural ventilation. This is complimented by a high thermal performance building fabric. Uncontrolled air infiltration due to leakage is minimized. 720 tonnes of structural steelwork is innovatively used to provide solar shading. Air handling units with thermal wheels further

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optimise the balance of heating and cooling. Space heating is via underfloor heating. All of these measures compliment the choice of Ground Source as the primary source of heating and cooling for the building.

building with an on-going maintenance relationship has enabled GI Energy to make many improvements for future systems.

The Gloucestershire Constabulary County Police Headquarters was the first major Ground Source System to be installed in the UK. GI Energy are proud to be recognised as the pioneers in this field.

The "Sliding Header" solution installed to enable simultaneous heating and cooling has formed the basis for many systems installed since 2005 – either by GI Energy or by our competitors.

Our experience in developing the control system, and continuing to attend to the

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Construction

- Project Management: UK Project Management Services
- Consortium representation: RSM Robson Rhodes LLP
- Principal Contractor: Britannia Construction
- Consultant: McBain Cooper
- M&E Systems: MITIE Engineering Services
- Geothermal Systems: GI Energy Limited

System Performance

During the first year of operation of the building a detailed study was conducted by the PFI Engineering Manager. This showed that the Electricity consumption for the year was 120% of a standard UK building in accordance with the CIBSE design guide best practice for prestige buildings.

In contrast – due to the use of the heat pumps - the fossil fuel (gas) was only 8% for the same CIBSE design guide data. This gave a total saving of approximately 600 MWh for the first year of operation.

This equates to a saving of approximately £60,000 per year in fuel costs at the time compared to traditional buildings without geothermal. A 36% saving overall.

Source: Reliance Secure Task Management



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