Royal HaskoningDHV
Enhancing Society Together

client | Briggs & Forrester

"Hazeley School required an innovative approach in order to meet the stringent sustainability expectations imposed by the local authority. Royal HaskoningDHV's design expertise and understanding of complex building regulations enabled Briggs & Forrester not only to exceed these targets but ensured sufficient flexibility for the design to adapt with the project as it evolved."

Chris Stafford, Briggs & Forrester

Achieving sustainable excellence at Hazeley School

Originally built in 2005, Hazeley Secondary School has been growing to meet the demands of an expanding community. Phases 2B and 3 of a four part building programme were completed in June 2009, providing the school with an additional two new buildings. These included a three-storey teaching block, a sports pavilion, and state of the art training kitchen.

Subsequent remodelling of existing general classroom areas to provide space for science laboratories and music studios was also introduced to the project. The completion of this work means the school is now able to develop its post 16 range of courses, offer dedicated sixth form areas, and remain on course to reach a capacity of 1500 students by 2010.

Royal HaskoningDHV's senior engineers Ben Freck and Matt Loffman were involved in carrying out detail design of building services for Phases 2B and 3 of the construction works on behalf of sub-contractor Briggs & Forrester. "We were initially invited to assist Briggs & Forrester with the tender design concepts, as part of their overall bid to secure the M&E contract," explains senior electrical engineer, Matt Loffman.

"This input helped them secure the project and they appointed us in September 2008 to undertake the detail design of building services for the new buildings, the changing facilities in the sports pavilion and the subsequent classroom change of use. "In addition, our remit included making recommendations regarding construction, quality, health and safety (CDM), supply and ongoing maintenance of plant."

Senior mechanical engineer Ben Freck outlined why compliance with specific building and planning regulations was vital to the success of this phase. "A major requirement of the contract was to work within specific regulations for modern sustainable buildings. These included BREEAM, which emphasises high indoor quality, good natural daylight, occupant control and low ambient noise levels; the appropriate DfES Building Bulletin framework, which sets out guidelines for design in secondary school buildings; and Milton Keynes' D4 planning regulations. "To comply, our design needed to include sustainable solutions for the provision of heating, cooling, ventilation, domestic water, power supplies and lighting systems.

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Designing sustainable solutions

Milton Keynes' local policy (D4) sets specific challenging guidelines for the sustainable construction of all new buildings. Royal HaskoningDHV had to interpret the guidelines and provide viable solutions. Innovative solutions were recommended, offering the school ongoing savings and environmental benefits, which included utilising renewable energy to heat the buildings and the collection of rainwater.

Senior mechanical engineer Ben Freck was responsible for evaluating the D4 planning guidelines. "Once we had carried out the evaluation, we were able to recommend new low energy systems compliant with Building Bulletins, BREEAM and D4 planning requirements," Ben explained. "We achieved this by specifying a thermal led CHP unit as the lead heat source supplemented by gas fired condensing boilers. The CHP runs on locally sourced bio-diesel. The CHP unit also produces electrical energy which is utilised on site to reduce the requirements on the electrical infrastructure." A solar powered hot water generation system was designed for phase 2B, to supplement the direct gas fired hot water generator. This reduces the overall CO_2 emissions."

Domestic water

A further benefit to the school is a rainwater harvesting system which delivers a renewable water source. Ben explains: "Rainwater is discharged from the roof via rainwater down pipes to ground level. From there it seeps through a semi-permeable membrane into an underground SUDS tank, it is then transferred up to a high-level rainwater storage tank where it is used to flush the ground and first floor WC's and urinals."

Ventilation

Ben explains how the Dynamic Simulation Modelling (DSM) software helped review the natural ventilation strategy to ensure it complied with building regulations. "The project gave us the opportunity to use the DSM software to demonstrate compliance with Building Regulations summertime overheating criteria. Classrooms receive natural ventilation via wind catchers, builders work ducts, diffusers and motorised dampers controlled by temperature and CO_2 sensors."

The mechanical ventilation systems designed also benefit from heat recovery which is achieved via plate heat exchangers located within ventilation units, enabling the heat extracted to be reused within the building.

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