



BREEAM Excellent and EPC B rated

CASE STUDY: NOTTINGHAM ORCHARD HOTEL

The new £20 million Orchard Hotel incorporates a business lounge, restaurant, bar area, outside terrace, gym and four meeting rooms. Other features include floor-to-ceiling windows, bespoke furniture and unique decor throughout.

SUSTAINABLE DESIGN

Sustainability was a key driver for the project, which achieved a BREEAM Excellent rating and an Energy Performance certificate of B. The building utilises a range of sustainable design features, incorporating natural materials alongside high tech renewable energy systems to deliver efficiency in use, and to create an outstanding space for occupiers and visitors.

cooling, and that systems shut down when not needed eg. when windows are opened.

High air tightness standards (of 3.0 m³/h/m²) surpassed Building Regulations, and ensure that the need for additional heating is minimised.

The building is well insulated with U-values which go well beyond Building Regulation requirements:

- Roof 0.10 W/m²k
- Walls 0.15 W/m²k
- Floor 0.10 W/m²K
- External (punch) windows 1.50 W/m²K
- Curtain walling 0.13 W/m²K

TACKLING CLIMATE CHANGE

We incorporated 50m² of solar PV into the building to provide on-site renewable energy, and ground source heat pumps are used to provide heat to the building. There are twelve boreholes 102m deep which act as energy transfer stations, and are used to control the temperature of the reception and restaurant areas.

The project beat its target for onsite CO₂ emissions by 11%, achieving a normalised emissions rate of 12.5 tCO₂e/£m project value. The team used remote metering to manage energy consumption on site and the prefabricated building elements meant less fuel being used on site.

The specification of sustainable timber, including glulam beams, also represents an embodied carbon saving. When produced sustainably, timber acts as a carbon sink (sequestering carbon into the timber over its life). Timber used at the Orchard Hotel therefore has reduced the overall carbon footprint of the building by approximately 106 tonnes of CO₂.

The ventilation of the hotel is hugely important to keep guests and staff comfortable and is a key energy requirement for building. A variable refrigerant flow system provides heating and cooling from each of the indoor units on an individual basis, allowing each room to be controlled with a separate fan coil unit, maximizing the system's efficiency.

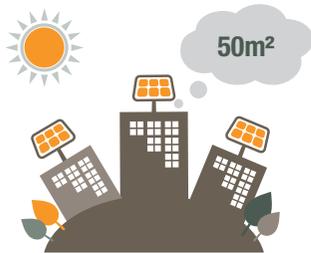
The building management system ensures that only occupied rooms are serviced with heating or

'THE KEY ASPECT IS HOW WELL [THE HOTEL] NESTLES INTO THE SURROUNDING ORCHARD HILLSIDE LANDSCAPE AND ITS ENVIRONMENTAL SUSTAINABILITY CREDENTIALS.'

Professor David Greenaway,
Vice Chancellor, University of Nottingham



Completed: October 2012
 Customer: University of Nottingham
 Architects: RHWL Architects
 Mechanical & Electrical consultants: Elementa Consulting
 Structural Engineer: Clarke Nicholls Marcell
 Project Manager: Christal Management Ltd
 Quantity Surveyor: Capita Symonds



Installed 50m² of solar panels



Saving from reusing 2,500m³ of excavation waste on site



11% below our construction CO₂ target



Green roof encourages local biodiversity



Funds raised by our team during 'Movember' events



Provided practical plumbing and heating experience for operative's NVQ

RESOURCE EFFICIENCY

Prefabricated bathroom pods were fitted into all 202 rooms. This reduced waste on site as they arrived fully operational.

The striking timber Glulam beams were also prefabricated, as well as being FSC certified.

To reduce the number of off cuts and waste from the ceiling hatches, we used tiles instead of plasterboard in the corridor ceilings. Timber paneling for the bedrooms was made to measure off-site, again reducing the potential for waste.

Approximately 2,500m³ of excavated soil and stones were reused as fill material behind retaining walls. This not only reduced waste going off-site, but also decreased transport emissions and saved around £42,000.

BIODIVERSITY

Protecting local ecology is a priority on all our projects so when operatives discovered a badger sett, an ecologist was contacted immediately. Through collaboration with the environmental specialists we managed to proceed with the construction of the hotel, whilst protecting the badger sett for future use.

We also sought to enhance biodiversity on site by installing a green roof that will connect habitats and provide a haven for wildlife. The green roof will also help with temperature regulation as the plants absorb solar radiation and also act as insulation.

SOURCING RESPONSIBLY

Glulam timber was used to create the structural frame which echoes the hills in the surrounding countryside. It is more sustainable than other alternatives such as concrete or steel, as it involves less carbon intensive processes. All of the timber used for the project (in the building and on site) was from verified legal and sustainable sources, with 94% having full chain of custody (FSC or PEFC).

COMMUNITY ENGAGEMENT

The hotel is located on the grounds of the University of Nottingham, so we invited the Civil Engineering club to visit the site during construction.

We also supported our supply chain to take on apprentices, helping them to develop their construction skills.

HEALTH AND WELLBEING

The success of our business depends on talented, motivated, professional employees. When Mario, one of the groundwork operatives was made redundant, we took him on as our operative. In his own time, Mario was studying an online NVQ in plumbing and heating. Our Project Manager Mark arranged for Mario to spend half a day each week with the plumbing team on site to get practical experience, to support his studies.

