



## INNOVATE GREEN OFFICE THORPE PARK

HIGHEST EVER BREEAM SCORE (87.55%) ACHIEVED  
PLUS OVER 80% REDUCTION IN CO<sub>2</sub> EMISSIONS

IES Consulting is delighted to have worked closely with King Shaw Associates as the building performance analysts on the low energy Innovate Green Office project at Thorpe Park, Leeds. The building, which has been awarded the highest ever BREEAM score of 87.55%, opened for business in July 2007. It is a £5.5 million, 45,000sq ft development of managed green offices for small, medium and large sized businesses, and features many novel techniques for reducing resource consumption and CO<sub>2</sub> emissions.

**“The challenge for the design team was to prototype an energy efficient building that would stand up to the scrutiny of the institutional funding markets.” said the architect Richard Roberts of RIO Architects.**

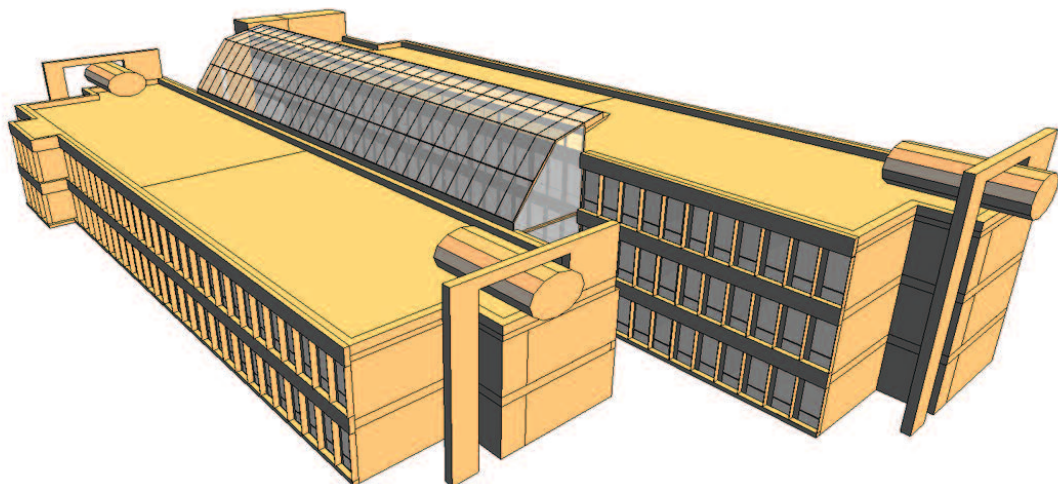
The project team used a fresh design approach. An engineering design exercise, led by King Shaw Associates, produced an environmentally friendly and commercially sustainable prototype building design which was then applied to the specific plot at Thorpe Park.

IES Consulting, experts in building performance analysis and simulation, were engaged to test and validate the internal comfort conditions and energy performance of the design. This gave assurance to the client and all involved in the design process that the building would offer the energy savings predicted and would still meet the comfort and operational performance parameters required.

IES Consulting used the highly acclaimed IES **<Virtual Environment>** suite of integrated building simulation software to achieve these results, undertaking dynamic thermal, bulk airflow and daylight simulation studies. It provided the expertise and tools required to gain an integrated understanding of how the building performed as a whole, and how the different elements interacted within it.

In particular, IES Consulting undertook detailed studies on the contribution of the Tarmac TermoDeck system to the thermal performance of the building, which required special modelling of the heat exchange within the TermoDeck slabs. This was of particular use to King Shaw Associates, as it allowed the consultant to develop an innovative plant operating strategy which utilised the thermal storage capacity of the system to maximise plant efficiency.

TermoDeck is a fan-assisted ventilation system that uses the high thermal mass of structural, hollowcore concrete slabs to warm or cool fresh air before it's distributed into the room spaces of a building. In this case, using the detail provided by IES Consulting, King Shaw Associates was able to develop a system that used an absorption chiller, fired by CHP and heat recovery AHUs to store cooling energy in the Termodeck to be drawn on at times of peak demand.



# INNOVATE GREEN OFFICE IES CONSULTING CASE STUDY

July 2007 | UK



**INTEGRATED  
ENVIRONMENTAL  
SOLUTIONS**



*“The contribution IES Consulting made to the project was invaluable, it provided independent validation that our design would work as predicted without committing to bricks and mortar”*  
*Doug King, Principle, King Shaw Associates*

King Shaw Associates was also able to derive a novel operating strategy for the BMS system through detailed analysis of hourly thermal data exported from the IES **<Virtual Environment>** simulation. This further analysis revealed the inter-relationships between the different heating and cooling loads and the capacity of the building to store energy and was used to identify the optimum operating times for the systems.

During the construction stages, as the design was fine tuned and value engineered, IES Consulting was able to keep the simulation up to date, allowing the Design Team to make decisions informed by building performance. This helped ensure that the integrity of the building's performance was maintained without incurring unnecessary extra costs on-site.

A striking commercial office building at the cutting edge of sustainable design has been achieved. It combines a standard developer specification with extremely low carbon emissions, and all at a commercially viable rate. Being one of the first speculative, genuinely sustainable serviced office buildings in the UK, the Innovate Green Office is a benchmark for the future of serviced office accommodation.

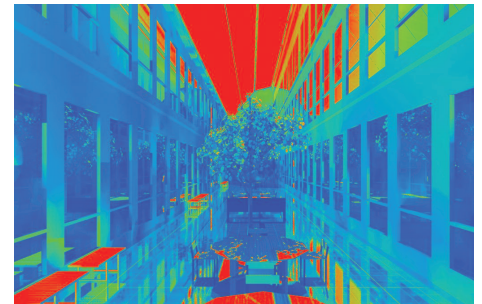
Accommodating a workforce of up to 420 the annual emissions from the building services are predicted to be less than 22KgCO<sub>2</sub>/m<sup>2</sup>, a reduction of over 80% compared to a typical conventionally air conditioned office, saving over 350 tonnes of CO<sub>2</sub> per year. It also features a raft of resource saving features and technologies.

“The contribution IES Consulting made to the project was invaluable, it provided independent validation that our design would work as predicted without committing to bricks and mortar,” commented Doug King, Principal of King Shaw Associates, the Environmental and Building Services Consultants.

“This gave both the Client and the Contractor confidence to proceed with what for them was a venture into uncharted territory.”

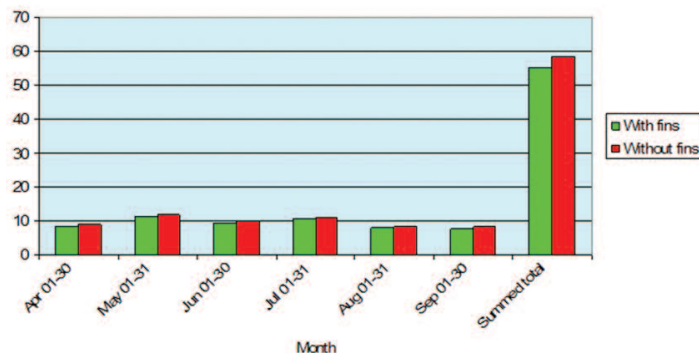
“In an ideal world I would have liked to use the **<Virtual Environment>** tool more fully to rationalise different design options at feasibility stage, which I believe could have added at least another 5% in efficiencies.”

King Shaw Associates had previously been trialling the IES **<Virtual Environment>** suite and following the success of this project has purchased the software for use in-house. “In my opinion the IES **<VE>** system provides an invaluable tool by which we can evaluate the relative advantages of novel designs without committing our clients to being guinea pigs.” continued Doug King.



Internal glare contour analysis within the central atrium.

Solar gain all offices (MWh)



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