IES appointed as sole energy and environmental modeling consultant from concept through to production design
Heathrow Terminal 5 is by far and away the largest project ever undertaken by BAA, and the move into a state-of-the-art terminal will transform the flying experience of the 30 million passengers who will pass through it each year.

The Project

Designed by the Richard Rogers Partnership, not only is the sheer scale of the building both imposing and impressive, but the sweeping waveform roof, which is a single span, provides a building interior with a vast and flexible space that can easily be adapted according to changing needs.

Initially IES Consulting was commissioned to assess the concept design of the building but as the project progressed, IES’s role on the shell and core of the main terminal and satellite buildings continued and expanded into other areas of the design like the analysis of the new Visual Control Room and the Rail Interchange.

IES was asked to apply the <Virtual Environment> software to analyse critical design factors including: the building’s thermal comfort, airflow, energy consumption, daylight and glare, from concept through to production design. The <Virtual Environment> software provided the design team with accurate performance information on aspects of the building’s design such as form and fabric of the roof, facade and solar shading. The selection and sizing of the heating, cooling and ventilation system design could also be examined. Finally, at a later stage, the <Virtual Environment> was used to check and provide compliance with Part L of the Building Regulations.

Daylight levels and glare were assessed throughout the main terminal building.
DSSR and BAA selected IES Consulting and the IES Virtual Environment building simulation software for a number of important reasons. These included:

- the Virtual Environment was the most powerful modelling tool available.
- the unique integrated data model meant that the simulation processed faster and the data and analyses were managed in a controlled and structured manner.
- the software allowed DSSR to view, query and edit the model and simulation results at any time, providing tremendous flexibility.

In addition, IES was the only organisation which could provide the level of expertise and staff to handle the wide range of design and performance issues involved in such a consultancy role. Although no special customisation was required, IES had the capability of adapting the software if the needs of the project demanded.

IES and DSSR collaborated to create and manage the model and its outputs throughout the different stages of the design. As users of the Virtual Environment, DSSR was able to clearly understand the inputs to the model and funnel information through to IES for interpretation and application to the model.

This meant that the model was based on realistic information and all elements of the building's design and operations were accounted for.

The Terminal 5 project is an enormous building simulation model and one which pushed the tools to their limits. Very few projects are as large and complex as Terminal 5, however this project demonstrates what is possible with the Virtual Environment and how building projects of any size can be implemented and benefit from the integrated approach that it offers.

"IES and their Virtual Environment software proved themselves over a long period during the concept and definition stages of the services design. Their knowledge of software allowed the level of definition to be easily altered as more information became available culminating in detailed energy, environmental and daylighting models of each major facility. Many complex issues were investigated and the software enabled these to be evaluated and more easily explained to other members of the team using the in built reporting tools. In particular the software made a significant contribution in the calculations to demonstrate Part L2 compliance."

IES PRODUCTS USED
ApacheSim, ApacheHVAC, MacroFlo, MicroFlo, ModeliT, Radiance, SunCast.

For Further Information
Contact us at enquires@iesve.com, or call 0141 945 8500.

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