

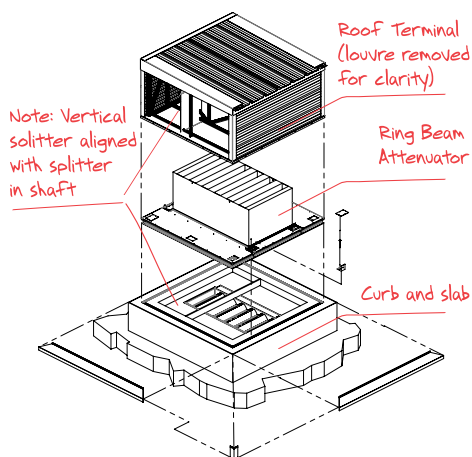
Case Study - University of Hertfordshire Law Court Building

Breathing Buildings' unique modelling and design work enabled them to effectively meet the ventilation, acoustic attenuation requirements of this stringent and challenging project.



PROJECT	University of Hertfordshire Law Court Building
LOCATION	Hatfield, Hertfordshire
SECTOR	Further Education
FEATURES	Classrooms, full-scale courtroom with public gallery and offices
HISTORY	Project began 2009. System delivered 2011

University of Hertfordshire attenuated roof terminal



Overview

Breathing Buildings worked with the University of Hertfordshire and their appointed consultants, Architects RMJM and Consulting Engineers AECOM, on this three year project, delivering natural ventilation to the unique and dynamic University of Hertfordshire Law Court Building.

Introduction

The University of Hertfordshire Law Court Building is designed as an innovative building with advanced facilities, including a full-scale courtroom with public gallery, a working law clinic, a purpose-built mediation centre and a dedicated CPD suite, as well as a large number of offices and classrooms.

RMJM architects wanted to work with Breathing Buildings as specialist ventilation partners on the

University of Hertfordshire Law Court Building due to their expertise, first-rate knowledge of providing controlled natural ventilation solutions in dynamic environments and their ability to react quickly and effectively to changes in the building design.

The Challenge

- Effectively and efficiently ventilate the building
- Meet BB101 summertime overheating criteria
- Deliver fresh air and a quiet environment so that students can concentrate
- Ensure minimal energy consumption.

The University of Hertfordshire Law Court Building presented unique challenges, the first of these being the location of the site adjacent to a bus route. This meant that any natural ventilation pathways needed to be acoustically

RMJM Architects say:

“Due to the complex nature of the ventilation requirements for the building we used Breathing Buildings expertise in natural ventilation strategies to help us develop a low energy solution. Working closely with AECOM and Breathing Buildings we developed a comprehensive integrated system for the building and delivered a low energy natural ventilation design despite the acoustic challenges.”

attenuated to ensure quiet conditions within the teaching spaces.

The architectural design of the building required the air inflow to come under the floor. However, there were a number of obstacles - weather louvre, bird mesh, damper, acoustic attenuator, heating element and a floor grille - which restricted the airflow into the building before it even reached the room. It was imperative, therefore, that the openings were correctly sized and that the ventilation system and acoustic attenuator did not overly restrict the airflow.

The specification and design of the system had to enable the rooms to meet strict temperature criteria to avoid overheating in summer. This was particularly challenging with the inlets through the floor void rather than the typical approach of through the wall.

The final challenge was adapting the system to cater for the differing ventilation requirements of the spaces using a centrally controlled system linked to the building management system (BMS). The law court, for example, is a much larger space with a higher ceiling. This typically leads to large variances in temperature between the top of

the space and the occupied area. This means in summer less ventilation per person is required than for other parts of the building.

The Solution

Due to the complexity of the architecture and ventilation requirements, Breathing Buildings was involved in the specification of the whole building.

Having worked on the original modelling in conjunction with AECOM, Breathing Buildings went on to consult at the contracting stage to ensure that any design changes in the building were accounted for in the natural ventilation design. This included changes in occupancy patterns, the amount of electrical equipment and amount of glazing; all of which change the amount of heat gain and hence ventilation requirements in the summer.

Natural Ventilation Delivered

As well as providing e-stack atrium units for the ground floor rooms, Breathing Buildings provided R-Series units for the first floor rooms. These units provide all the ventilation to the rooms in cooler weather. The control system for the e-stack atrium units serving the ground floor rooms is also linked to the high level dampers

in the atrium. These dampers are located in architect-designed triangular roof turrets to provide air intake and exhaust for the atrium in winter and pure outflow in summer.

Client Partnership

Breathing Buildings Managing Director

Shaun Fitzgerald says:

“This project was unique in the modelling work which we carried out with RMJM and AECOM. The model involved a nested network of resistors to air flow which link in a non-linear fashion. Breathing Buildings explained the principles of the modelling approach to AECOM who welcomed the detailed analysis we provided. I am proud of the solutions we have delivered – it really shows that the e-stack natural ventilation system we have developed can be adapted to complex and dynamic architecture.”

The University of Hertfordshire Law Court Building has recently been awarded ‘The Most Sustainable Construction Award 2011’ by Building Futures and has been short listed for several other awards.”

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