Breathing Buildings

Consultancy Services

Breathing Buildings is the UK's leading provider of natural and low-energy ventilation systems. In addition to a thriving equipment supply business, our experienced design team offers consultancy services to architects, project managers, M&E consultants and contractors.

With over 50 years of combined experience designing sustainable buildings throughout the UK and abroad, Breathing Buildings broad range of expertise and design services is unique in the industry, and is proven in supporting design teams on complex, challenging projects.

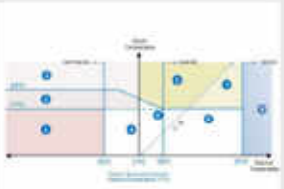
Overheating Analysis

- Dynamic thermal modelling, optimised to meet TM52, CIBSE Guide A, PSBP/ FOS, BB101 or bespoke overheating compliance
- Thermal modelling to meet BREAAM 2014
- Overheating risk assessments and reports - full design responsibility & PI insurance

Powered by 4DFlo
Dynamic thermal mass simulation

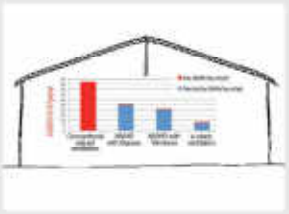
Intelligent Controls

- Development of standard and bespoke ventilation schemes
- Textual description of operations for implementation by BMS specialists
- Use of monitored building data to inform control strategy



System Energy Modelling

- In-house and IES energy modelling to optimise heating, ventilation and cooling scenarios
- Advice on payback period when implementing natural or mechanical ventilation solutions



Physical Experiments

- Laboratory-scale analogue water-bath modelling
- Simulation and visualisation of natural ventilation flows

CFD Modelling

- Prediction and visualisation of air distribution patterns
- Modelling of detailed spatial variations in temperature, CO_2 levels and air velocities

Wintertime Ventilation

- Numerical modelling of CO_2 build up within each space
- Application of theoretical plume modelling to determine temperature and velocity of air at the occupied zone

Breathing Buildings

EDUCATION

Fulston Manor Secondary School, Kent

Our Client: Morgan Sindall

Design Team: Lee Evans Partnership, PCS Consulting

Brief:

- Meet BB101 and BREAAM summertime overheating requirements with an atrium scheme
- Ensure provision of BB101 minimum ventilation and CO_2 levels in the teaching spaces
- Demonstrate air distribution within the atrium to determine voids required between ground floor and first floor

Breathing Buildings Services:

CFD modelling of temperature and CO_2, overheating analysis using 4DFlo dynamic thermal modelling software, theoretical/ numerical modelling of CO_2 concentration

PUBLIC

Fitzwilliam Museum Cambridge

Our Client: AECOM

Design team: SOS, PA Collacott

Brief:

- Reduce energy demand for conditioning the gallery whilst maintaining strict internal conditions: T_{INT}: 18-24°C & RH_{INT}: 40-60%

Breathing Buildings Services:

Bespoke overheating analysis and relative humidity modelling, control strategy description of operations, on-site witnessing

COMMERCIAL

New Office Building, Central London

Our Client: Foster + Partners

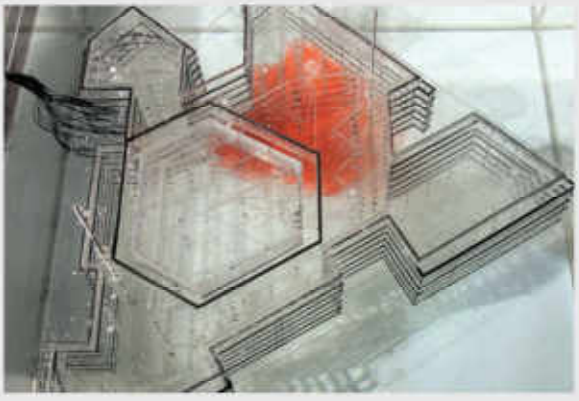
Design Team: Sir Robert McAlpine, Grontmij

Brief:

- Determine potential air pathways through the building
- Compare natural and hybrid ventilation for maintaining acceptable thermal comfort and reducing energy consumption

Breathing Buildings Services:

Laboratory-scale water-bath modelling for visualisation of airflow pathways, energy modelling to determine whole-building energy consumption, façade design advice, control strategy description of operations



Case Studies

Office Building Refurbishment, Central London

REFURBISHMENT

Our Client: CLSH Management Ltd

Design Team: Smith Caradoc-Hodgkins Architects

Brief:

- Compare natural, hybrid and mixed-mode ventilation options
- Determine ventilation openings, peak cooling load and hours of cooling required under each option
- Report predicted annual energy consumption and capital costs

Breathing Buildings Services:
Overheating analysis using 4DFlo dynamic thermal modelling software, product performance analysis, energy modelling, capital cost analysis

Houghton-Le-Spring Primary Care Centre

HEALTHCARE

Our Client: Sunderland Primary Care Trust

Design Team: P+HS Architects, Wilmott Dixon, LJJ

Brief:

- During occupied hours, the internal air temperature should not exceed 25°C for more than 200 hours per year
- Find innovative ways to incorporate thermal mass

Breathing Buildings Services:
Laboratory water-bath modelling to demonstrate flow regimes, thermal mass and air flow modelling, control strategy design and implementation, equipment supply

Oracle Shopping Centre, Reading

RETAIL

Our Client: Hammerson UK

Design Team: Max Fordham, HFM Architects, Workman, Wates Retail, IBMS

Brief:

- Justify removal of mechanical plant nearing its design life
- Improve thermal comfort during summer and winter

Breathing Buildings Services:
Natural ventilation feasibility study, waterbath modelling to assess airflow directions, overheating analysis including mall-store cooling interaction, entranceway improvement recommendations, control strategy design, witnessing, monitoring