

Case Study- Barnfield South Academy, Luton

The Academy's location and the highly technical nature of the acoustic attenuation requirements made this a very challenging natural ventilation project. Breathing Buildings worked closely with Cundall Johnston and Partners, Wates Construction and the Briggs & Forrester Group to deliver an effective solution.



PROJECT	Barnfield South Academy
LOCATION	Rotheram Avenue, Luton LU1 5PP
SECTOR	Education
FEATURES	Unique noise attenuation technology
HISTORY	Project begun in 2009

A school's requirement for a quiet learning environment, minimal energy consumption and high air quality to enhance student concentration, all combine to create ventilation and noise attenuation issues that pose highly specialist challenges for designers and developers.

This uniquely specialised field is one in which the innovative expertise of Breathing Buildings is widely recognised.

The Challenge

Barnfield South Academy sits close to the M1 motorway near Luton and the resulting acoustic requirements were the main challenge for the design of the ventilation system. Resolving these issues made this a unique project.

The challenges were to:

- Effectively and efficiently ventilate the school
- Meet BB101 summertime overheating criteria
- Meet acoustic requirement BB93
- Ensure minimal energy consumption via natural ventilation rather than mechanical ventilation

The Solution

Breathing Buildings' aim for the Academy was to create a holistic solution that would meet the primary goals of good air quality in the study areas, energy conservation, and the required ventilation standards.

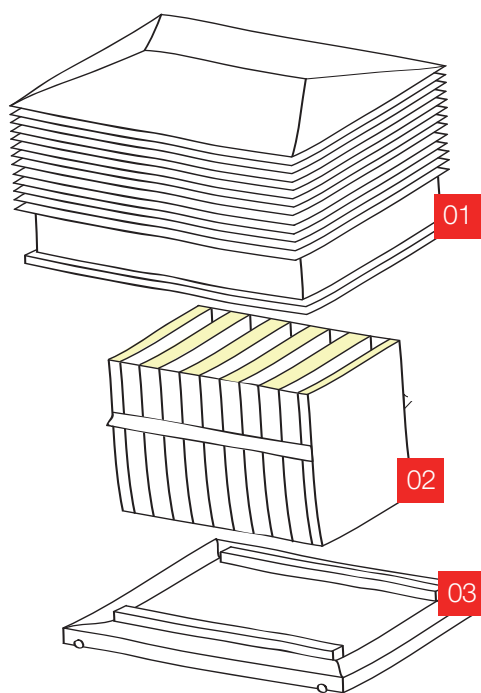
This complex challenge demanded that ventilation issues were addressed while keeping to a minimum potentially distracting noise ingress from the nearby M1 motorway.

Breathing Buildings Consulting Engineer David Hamlyn says:

“We developed our attenuated roof terminal design along with acoustic specialists, and then had it independently certificated at acoustics consultants Sound Research Laboratories in Sudbury, Suffolk.”

The expertise Breathing Buildings developed for Barnfield South Academy is now being applied to other projects.

General assembly of roof terminal and attenuator as used at Barnfield South Academy



01 Roof Terminal

Assembly constructed from extruded aluminium sections.

02 Acoustic attenuator

Constructed of 6 baffles @ 900mm high.

03 Ring Beam

Hot dip galvanised welded steel fabrication.

This was achieved by significantly reducing the ingress of high level noise through the fitment of acoustic baffles into the roof terminals and ventilation shafts.

David Hamlyn says: “Our design for Barnfield South Academy meant we not only met the BB101 summertime requirements but also the BB93 acoustic specification that we were working to, underlining the success of our design in mitigating ingress of external noise.

Natural Ventilation Delivered

This is a reasonably large project ventilating 39 classrooms. The holistic approach uses Breathing Buildings’ R Series e-stacks, one in each of the individual classrooms.

David Hamlyn adds: “What makes this initiative unique is that the shafts have within them acoustic attenuator units comprised of a series of noise-attenuating baffles. So instead of an open shaft, the baffles mean that the incoming sound rebounds around between the baffles, losing power as it does so. This results in up to 25dB Rw sound reduction* – a major reduction in noise ingress. Balancing this need for noise attenuation whilst not compromising the ventilation design proved to be a fascinating engineering challenge.”

Client Partnership

Breathing Buildings worked closely with the project’s mechanical and electrical consultants Cundall Johnston and Partners, the main contractors Wates Construction and Breathing Buildings’ actual customer the Briggs & Forrester Group.

* The Sound Reduction Index is a measure of the resistance to sound of a material in the form of a panel or building element. In effect the SRI measures how much a noise source is reduced by passing it through an attenuator.

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