



## Keeping cool without air conditioning

On the outside, you'd be forgiven for missing the key factor that makes The Courtyard an energy efficient development. Walking into the complex you'll see twelve open plan office buildings on two floors set in a landscaped environment. But the signs are there if you look closer, the louvers adjacent to the windows offer the first clue.

These extruded aluminium slatted panels give away the real benefit of this contemporary office space. Even in the hottest summer months these buildings are effectively ventilated by these unique louvers. They make air-conditioning office space a thing of the past, saving energy and money for businesses in The Courtyard.

### How it works

The main benefit of this ventilation system is how easy it is to use. The ventilated louvers are backed by doors into the office which are simply opened at the beginning of the Summer to let the cool night air in, and closed in the Autumn. Situated on the first floor, where hot air builds up, they cool the structure of the building overnight.

### Why it works

The exposed heavy structure absorbs heat as it builds up during the day, and releases it into the cool air that flows across it at night. This is a fine idea to improve energy efficiency, but how could it work in practice?

Bill Reed Architecture commissioned BRE to model the buildings. They found that, with reasonable assumptions about heat gains from people and lighting, and provided the louvers were opened to allow six air changes per hour in hot weather and overnight, the temperature would indeed be at 25°C or below for 95% of the occupied period over the year. This matches the British Council for Offices comfort recommendation for naturally ventilated buildings.





## What were the risks?

The main potential risk was security. If these vents were open all night, they had to be secure, especially when each office would contain expensive IT equipment. This was taken into consideration at every stage of the project. Which is why the louvers are made from thick, extruded aluminium, and curl at the top and bottom, making it next to impossible to pull the slats apart. The openings are also smaller than conventional louvers, discouraging break-ins from the start, and there is a stainless steel mesh at the rear to keep birds and insects out.

## How effective has it been?

Since it was finished in March 2003, The Courtyard faced its toughest test: the Summer of 2003, one of the hottest on record. As the temperatures soared, the occupants found that comfort was maintained, in some cases better than they had experienced with ineffectual air conditioning systems in previous buildings, which not only broke down but also pushed up running costs. Whilst the buildings have not been objectively monitored, anecdotal evidence from occupiers suggests that the system has been very effective.

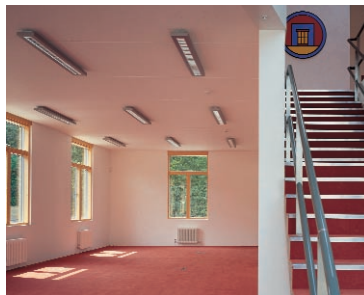
With occupants who understand the simple operation of the system, this concept has great potential to provide cooling without the capital and running costs of air conditioning, not to mention the associated reduced carbon emissions.



## Other energy efficient features you'll find at The Courtyard

This unique ventilation system isn't the only energy efficient feature you'll find at The Courtyard:

- **Saving electricity:** Individual daylight sensors are fitted on each light fitting. These are sensitive enough to adjust the lights when enough daylight is present. Also borrowed daylight is used whenever possible, even in toilets and lobbies.
- **Ideal for summer:** The heavy structure of the building, made from exposed engineering bricks and concrete floors, keeps the building cool in the day, and warm at night.
- **Letting in the light:** The positions and sizes of the windows and roof lights were calculated to optimise the use of daylight, avoiding unnecessary use of electricity.
- **Keeping out the heat:** Windows are made from specialist glass which lets in the light, and keeps out the heat. It's a vital balance in offices fitted with the latest computer equipment.



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