Sustainable Construction CPD

Module 6/15

Ventilation & Cooling Strategies

CPD Programme by Gaia Research: Info from 0131 558 7227 and www.gaiagroup.org

Sustainable Building Design

Achieving sustainability requires us to live within the limits of the earth's capacity to provide the materials for our activities and to absorb the waste and pollution that our activities generate.

The construction, fit out, operation and ultimate demolition of buildings is a huge factor in human impact on the environment both directly; through material and energy consumption and the consequent pollution and waste, and indirectly, through the pressures on often inefficient infrastructure.

There is already a significant amount of information available to all professions on how to design buildings that are attentive to the needs of sustainable construction. But, most practice still falls radically short of applying even the most easily applicable principles in most projects. Opportunities that could bring real advantage are being missed every day. The result is that buildings and the industries which supply building designers with products, materials and services are less efficient, less economical and more polluting than they might otherwise be.

Poorly controlled mechanical ventilation systems might use a great deal of energy to little effect. Whilst poorly controlled natural ventilation systems can lead to unnecessary waste of heat or to unacceptable variability in indoor conditions. Neither approach offers a panacea. Hence the appearance in recent years of mixed mode strategies which combine approaches to meet different ventilation & cooling needs. Manageability and good control, when married with a clear design strategy produces the best results.

This concise document is intended to help the reader to develop and implement strategies for ventilation & cooling which deliver high quality buildings and contribute to meeting key objectives in government sustainable construction plans.

There is guidance already available. However, many buildings remain less comfortable and healthy than they might be and consume unnecessary energy for ventilation & cooling. No other design issue has been subject to as much dramatic change & controversy as a consequence of the requirements of sustainable building. Changes in attitudes are now being consolidated in building design strategies. There is great variety. Of the case studies selected only one has no fans, three are referred to as naturally ventilated, at least three are hybrid /mixed-mode, designs and no two use the same approach. There is a need to bring the most contemporary information affecting cooling & ventilation in the design of buildings and services to wider attention.

What follows seeks to discuss the principal issues; enable the reader to find best practice information and assist communication between the disciplines, which can follow through into better quality spaces. Careful consideration of the available options is vital. There are few absolutes.

Continuous Professional Development

This CPD module is the sixth in a series which will summarise the existing sources of best practice guidance on sustainable building design. These modules do not seek to repeat what other documents contain, except to summarise the most important environmental issues.

Each module provides information on critical aspects of a particular topic and sources of further guidance by way of an annotated bibliography. Case studies highlight best practice solutions to improve understanding and encourage implementation. Each is supplemented by seminars which will provide the opportunity to discuss design projects in interdisciplinary groups with peers and specialists.

It is hoped that the modules will act as a catalyst in the creation of distance learning opportunities and allow participants to share information on live design projects with their own and other professions.

Objectives

By the end of this module the reader should be able to:

- Appreciate that well-designed ventilation & cooling can contribute to well-being, energy efficiency, cost savings and enjoyment of buildings;
- Communicate to clients the importance of good cooling & ventilation to operational efficiency, including economy & productivity;
- Access and understand the guidance, tools, facilities & techniques available for good cooling & ventilation design;
- Understand the importance of control & maintenance;
- Appreciate the inter-relationship between cooling & ventilation and issues such as moisture management, indoor air quality, airtightness & materials selection;
- Understand the importance of achieving as much as possible passively, and how to use mechanical systems as supports;
- Understand the benefit of working with other disciplines especially at the crucial early stages.

Above: A dust mite exhibit at the Allergy Centre, Huopalahti, Finland. Photo: Gaia Research
Top left photo: The pore-ventilated Borhaug Kindergarten, Norway. Photo: Gaia Lista

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