

NOISE, VENTILATION AND OVERHEATING IN RESIDENTIAL DEVELOPMENTS

A Chilton	Association of Noise Consultants – Acoustics, Ventilation & Overheating Group
J Healey	Association of Noise Consultants – Acoustics, Ventilation & Overheating Group
M Hyden	Association of Noise Consultants – Acoustics, Ventilation & Overheating Group
J Harvie-Clark	Association of Noise Consultants – Acoustics, Ventilation & Overheating Group
D Trew	Association of Noise Consultants – Acoustics, Ventilation & Overheating Group
N Conlan	Association of Noise Consultants – Acoustics, Ventilation & Overheating Group

1 INTRODUCTION

A working group has been formed by the Association of Noise Consultants (ANC) in response to an identified urgent need to provide guidance on acoustic conditions and design when considering both the provision of ventilation and prevention of overheating. The guidance produced by the group will take the form of a design guide for acousticians. In the first instance, the design guide will consider only residential development exposed to, non-actionable, noise sources without specific character.

The need for adequate ventilation is outlined in Approved Document F and designs to achieve this have been well developed. Current Building Regulations for residential development encourage the improvement of energy efficiency through increasing air tightness and thermal insulation. However, there are no specific requirements relating to overheating in residential dwellings as part of the UK Building Regulations and the emerging consequence of increasing air tightness and thermal insulation of dwellings is leading to the potential for excessive temperatures.

The current standard method of cooling a dwelling is either:

- via the opening of a window or other façade element to allow an increase in air flow and equalisation of temperatures between inside and outside, or
- via incorporation of mechanical cooling which generally requires space allowance for an external condensing system, ongoing maintenance (and therefore cost) and is not the preferred option in terms of energy efficiency.

Where a non-acoustically-attenuated opening in the façade (e.g. a window) remains the only provision for prevention of overheating and the dwelling is located in a noisy area, the occupant is presented with a choice between uncomfortably high noise levels or uncomfortably high temperatures.

There are currently risks involved which the proposed design guide hopes to reduce, namely:

- health risks for occupants
- design risks for consultants; and
- legal risks for developers.

This design guide being developed intends to provide:

- an explanation of current definitions of ventilation and overheating;
- an indication of potential forms of acoustic criteria that could be used for design;
- examples of design solutions and case studies.

There is presently limited data on criteria and solutions and thus it is envisaged that the design guide will be an ever-evolving document, to be updated and improved as further information becomes available. This paper presents an overview of the ventilation, overheating and noise issues for residential development that will form the basis of the forthcoming design guide.