

Information Paper

Locating ventilation inlets to reduce ingress of external pollutants into buildings

A new methodology

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Effective ventilation of buildings to provide optimum indoor air quality relies on good outdoor air quality in the locality of the building. However, in practice, outdoor air is often contaminated by pollutants from external sources. A new methodology giving a Pollutant Ingress Index has been developed to identify the areas of a building where pollutant ingress is most likely to occur and to determine the relative magnitude of this ingress. Application of the methodology will assist with:

- optimum placement of building ventilation inlets so that pollution from local sources can be minimised, thereby providing improved indoor air quality
- carrying out more effective air quality assessments in relation to indoor air quality, thereby ensuring successful planning applications for new developments and refurbishment projects
- developing strategies to protect building occupants from external toxic contaminant releases, whether accidentally (eg from storage tanks and fires) or intentionally (eg from chemical, biological, radiological and explosive incidents).

The methodology is intended for use by building industry professionals (eg architects, developers, planners and building services engineers) and regulatory authorities (eg environmental health, building control and planning officers and public health departments).

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Figure 1: Air pollution in cities can be a problem

Introduction

Studies have shown that the general population typically spends 90% or more of their time indoors and that the most susceptible individuals, such as the elderly and those with pre-existing medical conditions, spend almost all of their time indoors (Hancock, 2002; Jenkins et al, 1992). Therefore, the quality of the indoor air is of great importance to their health, comfort and well-being.

Effective ventilation of buildings to provide optimum indoor air quality relies on good outdoor air quality in the locality of the building. However, in practice, outdoor air is often contaminated by pollutants from external sources. For example, in the UK, there are many areas, in particular in major cities such as London, where UK air quality standards for nitrogen dioxide and fine particles (PM₁₀) are regularly breached (GLA, 2010). As a result, indoor air is likely to experience higher concentrations of common air pollutants from outdoor sources, especially if buildings have not been designed effectively to reduce their ingress (Kukadia and Palmer, 1998).