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THE BUILDING AS AN EFFECTIVE FACTOR TO INDOOR AIR QUALITY DEFINING THE BUILDING AS A SOURCE OF INDOOR AIR POLLUTION

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ABSTRACT

Energy-efficiency improvements became one of the main design and use objectives within the building due to the 'energy crisis'. This lead, even sometimes forced, people to design, construct and use air tight buildings to reduce energy cost of heating and cooling their buildings. Also, invention of new building materials and products encouraged this movement.

Stopping draughts by sealing buildings with new insulation materials, using devices for mechanical ventilation, reducing ventilation rate in spaces, using reciculated air were some of the preventive solutions for energy conservation. However, serious health incidents on occupants of these types of buildings were recognised. Those of incidents vary from complaints of headaches, lethargy, dizziness, eye and respiratory irritation, loss of concentration to fatal diseases such as legionnaire's disease.

Number of factors which may cause health problems have been identified within the building. Poor organisation within the building, and poor hardware and environmental design of the building are main headings of those of factors which affect the indoor environmental features and their qualities. Lack of privacy, lack of control over environment, repetitive work, poor maintanence and cleaning are some examples for poor organisation. Low standards in construction and services, inappropriate building material and product selection, poor detailing are some results of poor hardware design; and inefficient lighting, noise, fluctuations of air temperature, low air quality and inadequate space planning are some examples of poor environmental design.

Indoor air quality (IAQ) is one of the major environmental features which contributes those of health complaints and may have other severe health effects such as long term suffering from lung cancer and death. And the building itself is an important factor which affects IAQ by its design, construction and organisation. Most of the indoor air pollutants are released from building materials, services, furnishings and fittings, office machines and supplies. Besides, layout of the spaces and constructional details help indoor air pollution to enter, settle and flow from one space to another space within the building.

In this paper, the building is defined as one of the major indoor air pollution sources by a systematic approach. In this systematic examination, first hardware and environments of the building are classified, and users' activities are determined. Then those of features of the building and its users' activities are correlated with the occurence of indoor air pollution. This, examination model of the building as an effective factor of IAQ enables people who are involved in the life of the building to take preventive actions and to control air pollution at source.

Keywords: IAQ, indoor air pollutants, building design, construction, user, user activities