



INDOOR AIR QUALITY IN AN OCCUPIED DOUBLE STOREY TERRACE HOUSE


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“ I declared that this thesis is the result of our my work except the ideas and summaries which I have clarified their sources. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of degree. “

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ABSTRACT

The energy-efficient movement that started during the oil crisis in the 70's has resulted in new construction practices and building materials. Unfortunately, these new practices have caused the Sick Building Syndrome (SBS) as new buildings are no longer able to "breathe" or have resulted in the lack of air movement between indoor spaces. As the air inside buildings is recirculated, it has become the breeding ground for air contaminants resulting in air-related diseases. SBS occurs when the occupants experience acute health and comfort effects which are related to the time spent in the buildings. Symptoms associated with SBS include headaches, nausea, dizziness, coughing, skin, throat and nose irritations, wheezing and even asthma (Meixner, 1995).

The indoor air may be more than five times more contaminated than the outside air. The most common airborne contaminants are divided into odour (smells), chemical gases and microorganisms (Anon, 2002). It has been reported (Meixner, 1995) that Americans spend 90% of their time indoors (i.e. at home, workplace or entertainment areas). Strategies to reduce or eliminate these contaminants must start first by analyzing the contents of indoor air and the microclimatic parameters. The major sources of indoor air pollutants are household cleaners, pesticides, building materials and a natural radiation, radon (EPA, 2002). Pets, animals and human are also sources of gases like carbon dioxide and sulfur dioxide. To address the indoor air quality (IAQ) issues, studies over a 24-hour period should be done to identify the components such as carbon dioxide, carbon monoxide, radon, humidity and temperature. The humidity and temperature readings are important because molds cannot grow at RH values of

between 30 and 50%. Smells and gases dissipate if the airflow is regulated and the air change regular.

In a country like Malaysia, which has a hot and humid climate, is developing at a rapid rate with many housing development taking place especially in the industrialized cities of Kuala Lumpur, Shah Alam, Penang and Johor Bharu. Little is known about the air quality inside the homes of families. Much time is spent indoors for growing children and they are most susceptible to diseases and sicknesses due to the inhalation of unhealthy air. This study proposes to identify the level of pollution by the main polluters of air and where they are concentrated most in the modern home. This identification will make housing designers and builders to be more aware of the result of their building projects on the fundamental health of the human population. Eventually, when more data and information is made known on IAQ in Malaysian homes, there is the possible creation of standards and guidelines for healthy tropical buildings. In the United States, building guidelines have been published to aid building designers, engineers and architects in producing clean and healthy buildings (SBIC, 2001 and Johnston, 2002).