FIRE SAFETY IN HIGH RISE RESIDENTIAL BUILDING IN MALAYSIA

SEYED MOHAMMAD HASHEMIAN

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This project report is dedicated to My respected family

Thanks for your pray, attention and spiritual support

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ABSTRACT

With the increase in the high number of tall buildings being constructed in Malaysia, the building owners face many challenges. Not only the building owners will have to look after the maintenance of the buildings but they have also to consider the safety of the occupants, especially, in case there is a fire break out. The fire department will need the necessary equipment to 'fight' the fire and they need to be updated in the construction of these buildings. The aim of this study is to assess the fire safety regulation and also the factors taken into consideration in designing the fire safety requirements. The objectives of the study are to study the requirements of By-Laws 1984 (Malaysia) regarding the fire i.e. escape staircase, to identify the factors taken into consideration by building owners in term of fire regulation requirements, to assess the risk of fire in building and to evaluate the perception and behavior of occupants in case of fire outbreak. The study is focused on high-rise residential buildings with minimum of five storey's height. The data was gathered from observing five numbers of selected high-rise residential buildings in Kuala Lumpur. The data is also collected through questionnaires. From the study, the staircase width and intermediate floor depth are designed and constructed using different dimensions. There are five basic steps to carry out a fire safety risk assessment in buildings i.e. to identify fire hazards, identify people at risk, 'evaluate, remove, reduce and protect from risk', 'record, plan, inform, instruct and train' and review. The perception and behavior of occupants in case of fire outbreak is that they will immediately evacuate the building if the fire alarm goes off. The occupants wish to evacuate the building using the staircase instead of the elevator.

ABSTRAK

Dengan peningkatan dalam bilangan yang tinggi bangunan tinggi yang dibina di Malaysia, pemilik bangunan menghadapi banyak cabaran. Bukan sahaja pemilik bangunan perlu menjaga penyelenggaraan bangunan tetapi mereka mempunyai juga menimbangkan keselamatan penghuni , terutamanya, dalam kes kebakaran. Jabatan bomba akan memerlukan peralatan yang diperlukan supaya boleh memadamkan api dan mereka perlu sentiasa memeriksa pembinaan bangunan-bangunan . Tujuan kajian ini adalah untuk menilai peraturan keselamatan kebakaran dan juga faktor-faktor yang diambil kira dalam mereka bentuk keperluan keselamatan kebakaran. Objektif kajian ini adalah untuk mengkaji keperluan Undang-undang 1984 Malaysia mengenai kebakaran iaitu tangga kecemasan , untuk mengenal pasti faktor-faktor yang diambil kira oleh pemilik bangunan dari segi syarat peraturan kebakaran , dan menilai risiko kebakaran di bangunan untuk menilai persepsi dan tingkah laku penghuni dalam kes kebakaran. Kajian ini memberi tumpuan kepada bertingkat tinggi bangunan kediaman dengan sekurang-kurangnya ketinggian lima tingkat itu. Data yang telah dikumpulkan dari memerhatikan lima bangunan kediaman bertingkat tinggi terpilih di Kuala Lumpur. Dari kajian tersebut, lebar tangga dan reka bentuk lantai dibina menggunakan dimensi yang berbeza. Persepsi dan tingkah laku penghuni dalam kes wabak api adalah bahawa mereka akan segera mengosongkan bangunan itu jika penggera kebakaran padam. Penghuni ingin keluar dari bangunan dengan menggunakan tangga daripada lif .

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INTRODUCTION

1.1 Introduction

There have been numerous studies about fire safety in buildings and skyscrapers and have continued to be developed by many researchers for a considerable period of time, especially fire safety in the workplaces. Although there were some studies devoted on fire safety in tall buildings, there is still a gap on research about fire safety in high-rise buildings. Subsequently, the first seminar on human behavior in relation to fire incidents was held in 1977 at the University of Surrey, and eventually the seminar proceedings became the first published comprehensive book on human behavior relating to fire incidents [1]. Owing to the significance on the fire safety of building occupants, a second seminar was conducted in October 1978 by the National Bureau of Standards in the United States. Both meetings gave importance and focus on the examination and development of the various methods for the investigation of the occupants' behavior in times of fire incidents. Basically, the emphasis of this study is to define the behavior of the occupants during the occurrences of fire, the examination of the concept of *Panic Behavior*, and to explore the process of evacuation primarily on high-rise buildings [1]. In Malaysia, studies about fire safety of high-rise residential buildings are quite

new and very limited; thus, literature resources are scarce for review purposes in establishing a comprehensive assessment.

1.2 Background of study

There have been numerous studies about fire safety in buildings and skyscrapers and have continued to be developed by many researchers for a considerable period of time, especially fire safety in the workplaces. Although there were some studies devoted on fire safety in tall buildings, there is still a gap on research about fire safety in high-rise buildings. The first seminar on human behavior in relation to fire incidents was held in 1977 at the University of Surrey, and eventually the seminar proceedings became the first published comprehensive book on human behavior relating to fire incidents [1]. Owing to the significance on the fire safety of building occupants, a second seminar was conducted in October 1978 by the National Bureau of Standards in the United States. Both meetings gave importance and focus on the examination and development of the various methods for the investigation of the occupants' behavior in times of fire incidents. Basically, the emphasis of this study is to define the behavior of the occupants during the occurrences of fire, the examination of the concept of Panic Behavior, and to explore the process of evacuation primarily on high-rise buildings. In Malaysia, studies about fire safety of high-rise residential buildings are quite new and very limited; thus, literature resources are scarce for review purposes in establishing a comprehensive assessment.

1.3 Problem statement

In Malaysia, study on fire safety is very new, particularly research on provision of fire safety in high-rise residential buildings. The number of fire cases involved residential buildings is significantly high compared to other building types. Thus, escape routes in high-rise residential buildings should be designed and constructed to enable the occupants to evacuate the building as soon as fire has been detected.

By adopting observations approach, to investigate the issues and problems encountered in high-rise residential buildings. The numbers of high-rise residential buildings located in Kuala Lumpur observed so we should focus on the actual condition and problems encountered in escape routes in high-rise residential buildings in Malaysia.

However, discussion will be focused on the categorized issues which were highlighted during the research exploration, without mentioning a particular building where the problem was encountered. This is to avoid some degree of sensitivity in certain aspects especially when the rules and legislations are involved. Uniform Building By-Laws were used to consider the aspects of the requirements as they relate to escape route evaluate and fire safety in buildings. If we can understand the fire safety aspects, and we know what are the actual problems encountered in those buildings, appropriate measures can be taken to enhance fire safety standards.

1.4 Aim and Objectives

The aim of this study is to assess the fire safety regulation and also the factors taken into consideration in designing the fire safety requirements by means of following objectives:

1. To study the requirements of By-Laws 1984 (Malaysia) regarding the fire scape i.e.stair cases.

2. To identify the factors taken into consideration by building owners in term of fire regulation requirements.

3. To assess the risk of fire in building.

4. To evaluate the perception and behavior of occupants in case of fire outbreak.

1.5 Scope of study

The scope of this research is:

1. Only escape routes components i.e. staircase, corridor, fire door and intermediate floor are considered in analysis.

2. The study is focused on high-rise residential buildings with minimum of five storey's height.

3. Risk factors in building will be analysed according to the personal and damage hazards of fire as ruled out by Jabatan Bomba dan Penyelamat Malaysia.

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