

FACULTY OF ARCHITECTURE, PLANNING & SURVEY
BUILDING SURVEY DEPARTMENT

A STUDY ON ADDRESSABLE FIRE ALARM SYSTEM AT CONVENTIONAL
HIGH RISE BUILDING

The prepared dissertation was apart of
the requirements to full fill for awarding
Bachelor in Building Survey (Hons)

PREPARED BY : ZULKIFLI BIN AHMAD
SESSION : FINAL YEAR
(2006/2007)
2005631808

LIST OF CONTENT

ABSTRACT

ACKNOWLEDGEMENTS

CHAPTER 1: INTRODUCTION

1.0	INTRODUCTION	1
1.1	ISSUES	2
	1.1.1 ISSUES 1 - SUMMARY OF ARTICLE	
	1.1.2 ISSUES 2	
1.2	OBJECTIVE OF THE STUDY	5
1.3	SCOPE OF STUDY / LIMITATION	6
1.4	METHODOLOGY	6

CHAPTER 2: LITERATURE

2.1	FIRE HAZARD	8
	2.1.1 INTRODUCTION	8
	2.1.2 FIRE	9
	2.1.3 CLASSES OF FIRE	11
2.2	FIRE PROTECTION SYSTEM	12
	2.2.1 INTRODUCTION	12
	2.2.2 DESIGN FOR FIRE RESISTANCE OBJECTIVES IN FIRE SAFETY	13
	2.2.3 FIRE PROTECTION MAJOR GOALS	14
	2.2.3 FIRE PROTECTION COMPONENT	17
2.3	PASSIVE FIRE PROTECTION	19
	2.3.1 INTRODUCTION	19
	2.3.2 MAIN CHARACTERISTIC OF PASSIVE FIRE PROTECTION	19
	2.3.3 COMPARTMENTALIZATION	23
2.4	ACTIVE FIRE PROTECTION	24
	2.4.1 INTRODUCTION	24
	2.4.2 DETECTION	25
	2.4.3 ALARM	26
	2.4.4 PROTECTION	27

2.5	CONVENTIONAL HIGHRISE BUILDING	27
2.5.1	INTRODUCTION CONVENTIONAL	27
2.5.2	INTRODUCTION HIGH RISE BUILDING	28
2.5.3	MINIMUM HEIGHT	29
2.5.4	HIGH-RISE OFFICE BUILDING FIRE ALARM SYSTEMS	30
2.5.5	COMMERCIAL AND INSTITUTIONAL BUILDING ALARM SYSTEMS	32

CHAPTER 3: FIRE ALARM SYSTEM

3.0	FIRE ALARM SYSTEM	33
3.1	FIRE ALARM DEFINITIONS AND TERMS	33
3.2	TYPES OF FIRE ALARM SYSTEMS	39
3.2.1	CIRCUIT SUPERVISION	44
3.2.2	SYSTEM CODING	44
3.2.3	SIGNAL PROCESSING	
3.3	CONVENTIONAL FIRE ALARM SYSTEMS	49
3.3.1	DEFINITION	49
3.4	ADDRESSABLE FIRE ALARM SYSTEMS	53
3.4.1	DEFINITION	53
3.4.2	ADDRESSABLE ANALOG SYSTEM	56
3.5	FIRE ALARM PANEL	59
3.5.1	INTRODUCTION	59
3.5.2	CONVENTIONAL PANEL	60
3.5.3	ADDRESSABLE PANEL	62
3.5.4	DEVICES	63
3.5.3a	MANUAL CALL POINT	64
3.5.3b	SMOKE DETECTOR	65
3.5.3c	WATER FLOW SWITCH	67
3.5.3d	HEAT DETECTOR	68
3.5.3e	VALVE POSITION SWITCH	69
3.5.3g	HORNS/STROBES	70
3.5.3h	MAGNETIC DOOR HOLDER	70
3.5.3i	FLAME DETECTOR	71
3.5.4	AUDIO EVACUATION SYSTEM	71
3.5.5	FALSE ALARM	75

CHAPTER 4: TECHNICAL SPECIFICATION AND REGULATION ACT

4.0	TECHNICAL SPECIFICATION AND REGULATION ACT	77
4.1.	TECHNICAL AND INSTALATION SPECIFICATION FOR ADDRESABLE FIRE ALARM SYSTEM (BOMBA STANDARD)	77
4.1.1	DESCRIPTION	
4.1.2	SCOPE	77
4.1.3	APPLICABLE STANDARDS AND SPECIFICATIONS	79
4.1.4	APPROVALS	
4.2	PRODUCTS	80
4.2.1	EQUIPMENT AND MATERIAL, GENERAL	80
4.2.2	CONDUIT AND WIRE	80
4.2.3	MAIN FIRE ALARM CONTROL PANEL OR NETWORK NODE	83
4.2.4	OPERATOR CONTROL	87
4.2.5	SYSTEM CAPACITY AND GENERAL OPERATION	89
4.2.6	NETWORK COMMUNICATION	89
4.2.7	CENTRAL MICROPROCESSOR	90
4.2.8	DISPLAY	91
4.2.9	SIGNALING LINE CIRCUITS (SLC) / ADDRESSABLE LOOPING CIRCUIT	92
4.2.10	NOTIFICATION APPLIANCE CIRCUIT (NAC) MODULE (CONTROL MODULE)	93
4.2.11	CONTROL RELAY MODULE/TRANSOONDER	94
4.2.12	ENCLOSURES	95
4.2.13	POWER SUPPLY	95
4.2.14	FIELD PROGRAMING	96
4.3	SYSTEM COMPONENTS	
	ADDRESSABLE DEVICES	97
4.3.1	ADDRESSABLE DEVICES - GENERAL	97
4.3.2	ADDRESSABLE MANUAL PULL STATION	98
4.3.3	INTELLIGENT THERMAL/HEAT DETECTORS	99
4.3.4	SMOKE DETECTOR	100
4.3.5	TWO WIRE DETECTOR MONITOR MODULE (DUAL MONITOR MODULE)	101
4.3.6	Addressable Control Module	102
4.3.7	ADDRESSABLE RELAY MODULE	102
4.3.8	ISOLATOR MODULE	103
4.3.9	BATTERIES	103

ABSTRACT

Addressable fire alarm system will provide high technology system which one the latest system in fire alarm system. This system had been used widely in commercial buildings. The typical system uses a microprocessor based fully addressable fire alarm system. This means that the system is self-supervising to detect any transmission wire breakage, unauthorized detectors, alarm bells and manual break glass units. This research focused on nature condition of the system in applying to conventional high rise building. In addition a planning approach including problems and additional cost for installation works for the system. To support this research, three (2) building that was apply addressable system has been taken as case studies at around Shah Alam. In addition, the data were gathered through structured interview and adopted information. From the analysis, it can be found that the most commonly this system used for building with large scale facilities or with several ancillary building or extensions with many level of operation for example high rise building, intelligent building or shopping mall. Nevertheless this system not the best approach in current user. Its must considered the cost because this system is very expensive. This dissertation gives clear perception to the reader on the quality of addressable fire alarm system and the information from this analysis can help the reader to choose what the suitable system for fire protection.