

**UNIVERSITI TEKNOLOGI MARA**

**PLANNING AND CONTROL OF SAFETY IN THE  
CONSTRUCTION REFURBISHMENT PROJECT**

**AHMAD EZANEE BIN HASHIM**

Thesis submitted in fulfillment of the requirements  
for the degree of  
**Doctor of Philosophy**

**Faculty of Architecture, Planning & Surveying**

**October 2004**

## ACKNOWLEDGEMENTS

The time required to carry out the major academic research of this nature educated me in the necessary interest, confidence, patience and perseverance. I would like to thank all those who participated, assisted and gave encouragement and support in carrying out this research study.

Firstly, to my supervisor, Professor Dr Johan Victor B. Torrance. My sincere appreciation and deepest gratitude for his valuable intellectual input, creative suggestions and criticisms and understanding offered throughout the research study. Due recognition must also be given to his patience in spending precious time willingly to check the English.

I am also thankful to Associate Professor Dr Ismail Rahmat as my second supervisor, for his insightful supervision, valuable assistance and guidance given.

This research would not have been possible without the support and information received from the refurbishment construction firms willingly to spend their time in filling in the questionnaire and especially the 14 construction firms who shared their valuable time to be interviewed. My sincere thank is due to them.

I am also thankful to University Technology MARA, and the Government of Malaysia for the financial support and the moral encouragement from the Faculty of Architecture Planning & Surveying together with the Department of Building Surveying.

Finally, *ALFATIHAH* to my late wife, thankful for her patience and encouragement even during her illness. May ALLAH grant her all peace and tranquility. Certainly not least, to my family, children, Mie and Abah, my sincere gratitude is due to them. To my dearest wife, Eda I am indebted for the untiring help, encouragement and affection. The love and care given enabled me to be sustained and to progress even at times when things were difficult and discouraging.

## TABLE OF CONTENTS

<b>ACKNOWLEDGEMENTS</b>	<b>i</b>
<b>TABLE OF CONTENTS</b>	<b>ii</b>
<b>LIST OF TABLES</b>	<b>viii</b>
<b>LIST OF FIGURES</b>	<b>xiii</b>
<b>ABSTRACT</b>	<b>xv</b>

### **CHAPTER 1 INTRODUCTION**

1.0	Chapter Introduction	1
1.2	Research Background	2
1.3	Rationale for Improving Safety Planning and Control Process	7
1.4	Improvement Areas in the Management Techniques of Safety in Refurbishment projects	13
1.5	The Research Aims and Objectives	19
1.6	The Research Hypotheses	21
1.7	The Relative Significance of The Research	21
1.8	Scope and Limitations	22
1.9	The Research Preview	24
1.10	Summary	25

### **CHAPTER 2 RESEARCH METHODOLOGY**

2.0	Chapter Introduction	26
2.1	The Strategy and general Proposition	26

2.2	The Research Method	30
2.3	The Research Methodology Rationale	35
2.4	Data Collection Techniques	37
2.5	Sample Identification and Recruitment	39
2.6	The Research Sample	42
2.7	Preliminary Postal Questionnaire Survey	45
2.8	The Exploratory Interview	52
2.9	Final Postal Questionnaire Survey	54
2.9.1	Preliminary Postal Questionnaire Assessment	62
2.9.2	Selection of Sub-Sample for Semi-Structured Interviews and Archive Documents	67
2.9.3	Statistical Analysis Techniques	74
2.9.4	Summary	76

### **CHAPTER 3      REFURBISHMENT CHARACTERISTICS AND PLANNING PERFORMANCE**

3.0	Chapter Introduction	77
3.1	Construction Projects	78
3.2	Refurbishment Characteristics and Growth	84
3.3	Planning Performance	89
3.4	Refurbishment safety Planning Performance	96
3.5	Summary	121

## ABSTRACT

This study discusses a critical investigation into the needs for and interest in planning and control of safety in large refurbishment construction projects. The investigation attempted to determine from the viewpoint of large scale contractors, those critical factors which affected and influenced the safety planning and control process as well as identifying areas that affected safety of construction projects.

This study also highlights the influence of the integrative mechanisms employed by refurbishment firms and their influence in safety planning performance. The integrative mechanisms include recording information, supervision and monitoring, work schedules, training and orientation and information technology systems.

In addition, this study also discusses how the management organization structure of the construction firms influences the extent of the integrative mechanism used in safety planning performance. Further, it also examines the effects of employees' interest that affect and influence the safety planning and control process.

A preliminary postal survey was sent to large construction firms initially, followed by semi-structured interviews with safety planning managers and supervisors of the construction firms. A final postal survey was distributed to 45-safety planning and control managers of refurbishment construction firms within the Klang valley. A total of 30 completed questionnaires were analyzed in detail and formed the database for the quantitative analysis. In addition, 14 semi-structured interviews were carried out on managers from the 30 responding construction firms. In this study both qualitative and quantitative studies were used.

The result of the study indicated that there was a general lack of safety interest attitude among employees in the sample studied. The lack of safety interest was due to safety ignorance, negligence, lack of safety experience, violation of safety procedures and attitudes.

This study showed that the control of safety performance level depends upon controlling the interfaces between the various stages of the refurbishment construction process, i.e. pre-bid, post-bid and construction process. The planning performance measurements this study used were, cost variance, loss time variance, accidents and the extent of planning in the refurbishment projects.

This study also identified that the integration mechanisms to be adopted in the safety planning and control process were equally based on the complexity of refurbishment projects, the management safety accountability of the refurbishment organizations and the safety performance targeted.