## SAMPLE OF CERTIFICATION OF APPROVAL

## CERTIFICATION OF APPROVAL

Value Analysis: Study of Application in Malaysia's Construction Industry

by

Muhammad Ikhwan Bin Abdullah

A project dissertation submitted to the

**Civil Engineering Department** 

Universiti Teknologi PETRONAS

in partial fulfillment of the requirement for the

BACHELOR OF ENGINEERING (Hons)

(CIVIL ENGINEERING)

Approved by,

(Dr. Noor Amila Wan Abdullah Zawawi)

# UNIVERSITI TEKNOLOGI PETRONAS

TRONOH, PERAK

#### SEPTEMBER 2012

## CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

MUHAMMAD IKHWAN BIN ABDULLAH

#### ACKNOWLEDGEMENT

My thanks are due to many people who have been helping me in the course of my preparation of this research. A few people had contributed and helped me by giving me valuable advice and information in order for me to complete this assignment.

First of all, I would like to thank my supervisor, Dr. Noor Amila Wan Abdullah Zawawi and also Mr. Sami Mustapha for their valuable guidance, advises and their valuable time. With their valuable guidance, I was able to understand more in-depth about this report, where to collect the information that is needed and how to maximize the usage of the information collected. And therefore I was being able to complete my research on time.

I would also like to take this opportunity to express my appreciation to each person that kindly responded to my questionnaires. I would also like to thank the organizing committee of International Constructional Steel Conference (ICSC) 2012; the Malaysian Structural Steel Association (MSSA) and CIDB for allowing me to distribute my questionnaires during the event. I am grateful to all my family members. I am also indebted to Universiti Teknologi Petronas (UTP) for providing adequate facilities in supporting relevant literatures.

#### ABSTRACT

Malaysian government has realized that it is necessary to modernize the construction industry to keep in line with international practice and long term healthy growth. As a result, the use of Value Analysis as an advanced management technologies and skills was highlighted. From the previous study and interviews carried out, it was found that the participants in the construction industry lack awareness in Value Analysis. Therefore the research is carried out to study the typical Value Analysis job plan methodology, the degree of awareness and understanding of Value Analysis in construction industry, the degree of implementation and effectiveness of the Value Analysis job plan, and the drivers and obstacles in implementing Value Analysis. The study was done through qualitative methods and analyzed using average index. Then the data analysis will be carried out by using average index method. Through the study it was identified that awareness level and implementation of Value Analysis was good. However, the understanding level and effectiveness are low.

# **TABLE OF CONTENTS**

CERTIFICATION		Ι
ACKNOWLEDGEMENT		III
ABSTRACT		IV
TABLE OF CONTENTS		V
LIST OF FIGURES		VIII
LIST OF TABLES		IX
CHAPTER 1: INTR	ODUCTION	1
1.1 Backgrou	und of Study	1
1.2 Problem	Statement	2
1.3 Significat	nce of Study	2
1.4 Objective	es of Study	3
1.5 Scope of	Study	3
CHAPTER 2: LITE	RATURE REVIEW	4
2.1 What is V	Value Analysis?	4
2.2 History o	f Value Analysis	5
2.3 Value An	alysis in Construction Industry	5
2.4 Benefits of	of Value Analysis	6
2.5 Timing F	or Application	7
2.6 Composit	tion of the Value Analysis Team	9
2.7 Implementation of Value Analysis Practice		11
2.7.1	Project Selection Technique	11
	2.7.1.1 Analysis of Previous Study Areas	11
	2.7.1.2 Life Cycle Cost Impact	11
	2.7.1.3 Breakdown Analysis	13
2.8 Value Analysis Methodology		13
2.8.1	The Value Analysis Audit	13
2.8.2	The Contractor's Change Proposal	14
2.8.3	Japanese 3 hours Compact Value Engineering	14
	Program	
2.9 Value An	alysis Job Plan Methodology	14

	2.9.1	Pre-Study	15
		2.9.1.1 Identify Client's Needs	15
		2.9.1.2 Gather and Complete Data File	15
		2.9.1.3 Determine Evaluation Factors	16
		2.9.1.4 Scope of Study	16
		2.9.1.5 Build Model	16
		2.9.1.6 Determine Team Composition	16
	2.9.2	Value Analysis Study	16
		2.9.2.1 Information Stage	17
		2.9.2.2 Functional Analysis Stage	17
		2.9.2.3 Creativity / Speculation Stage	19
		2.9.2.4 Evaluation / Judgment Stage	19
		2.9.2.5 Development Stage	20
		2.9.2.6 Recommendation Stage	21
	2.9.3	Post – Study	21
2	2.10 Value A	nalysis In Malaysia	23
2	2.11 Obstacle	es in Implementing Value Analysis	24
2	2.12 Misconc	ceptions of Value Analysis	25
2	2.13 Surpassi	ng These Obstacles	26
CHAPTER 3:	MET	HODOLOGY	27
3	3.1 Collecting	g Primary and Secondary Data	29
3	3.2 Follow-up	p Interview	29
3	3.3 Data Ana	lysis	30
3	3.4 Gantt Cha	art	31
3	3.5 Key Mile	stones	33
CHAPTER 4:	RESU	ULTS AND DISCUSSION	34
4	4.1 Introducti	ons	34
4	I.2 Question	naires collected	35
4	I.3 Responde	ent's Background	36
4	4.4 Discussio	n of Result	40

CHAPTER 5:	CONCLUSIONS AND RECOMMENDATIONS	49
5.1	Conclusion	49
5.2	Recommendation	50
5.3	Suggestion for further study	51
REFERENCES		53
APPENDICES		56

# List of Figures

Figure 2.1	Potential Saving To Cost of Change	8
Figure 2.2	Constructive Overlap	9
Figure 2.3	Life Cycle Cost In Construction	12
Figure 2.4	The basic FAST diagram	18
Figure 2.5	The Timing of Application of Different Value Management Methodology	23
Figure 3.1	Methodology Flowchart	28
Figure 4.1	Return Rate of Questionnaires	35
Figure 4.2	Management Level of Respondents	36
Figure 4.3	Experience Level of Respondents	37
Figure 4.4	Education Level of Respondents	38
Figure 4.5	Type of Project Involved	39
Figure 4.6	Specialization of Respondents	40
Figure 4.7	Value Analysis Application	45
Figure 4.8	Value Analysis Methods Applied by Respondents	46
Figure 4.9	Actual Cost to Contractual Cost	49

# List of Tables

Table 2.1	Comparison of Value Management Approach	22
Table 4.1	Value Analysis Awareness	41
Table 4.2	Value Analysis Score	41
Table 4.3	VA Awareness VS. Management level	42
Table 4.4	VA Awareness VS. Education Level	42
Table 4.5	VA awareness VS. Experience	43
Table 4.6	VA awareness VS Sector of Project	43
Table 4.7	Value Analysis Understanding	44
Table 4.8	Obstacles in Implementing Value Analysis	48
Table 4.9	Drivers in Implementing Value Analysis	48