

CENTRE OF STUDIES FOR BUILDING SURVEYING
FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING
UNIVERSITI TEKNOLOGI MARA

COMFORT LEVEL IN
TUANKU MIZAN ZAINAL ABIDIN MOSQUE

SHEKHUL AMIN BIN MOHD ARIFFIN

Academic Project submitted in partial fulfillment of the requirements
for the degree of
Bachelor of Building Surveying (Hons)
Centre of Studies for Building Surveying
Faculty of Architecture, Planning & Surveying

July 2014

ABSTRACT

Malaysia is hot and humid throughout the year due to its location near to the equator of the Earth. The location has influences the climate features including temperature, humidity, rainfall and wind which then cause different in weather during the day and night. This kind of rich weather can affect the human comfort in building especially when the building design is promoting the natural ventilation. Natural ventilation is the process of supplying and changing air through an indoor space without using mechanical systems. By changing the dirty air around building with fresh air through the opening space provided on building, natural ventilation is expected to offer comfort to the interior part of a building. The effects on users and how they feel towards human comfort in the building might be different either comfortable or fussy depend upon the people themselves. The aim of this study is to determine the comfort level among the mosque's users that using natural ventilation. The objectives were first, to identify the thermal comfort in the mosque, secondly, to investigate the users' satisfaction in the mosque and thirdly, to analyze the relation between thermal comfort and users' satisfaction in the mosque. The finding revealed that the natural ventilation which contributes to thermal comfort in building is highly correlated with the users' satisfaction.

ACKNOWLEDGMENT

Assalammualaikum.

First and foremost, a praise to ALLAH S.W.T for His bless to me in finishing this Academic Project I & II. I would like to thank my supervisor, Pn Julaida Binti Kaliwon for her guidance during this process.

Special thanks goes to my beloved parent for encouraging me in completing this academic project. Without their co-operation and support I believed that it would difficult for me to complete this academic project.

Lastly, special thanks to my dearest friends for giving me some helps even though they are also in a busy situation. Thank you for sharing the information and opinion in order to complete my academic project.

TABLE OF CONTENTS

ABSTRACT.....	i
ACKNOWLEDGMENT.....	ii
LIST OF PICTURE.....	v
LIST OF PHOTO.....	vi
LIST OF FIGURE.....	vii
LIST OF TABLE.....	x
1.0 INTRODUCTION.....	1
1.1 INTRODUCTION.....	1
1.2 RESEARCH BACKGROUND.....	3
1.3 PROBLEM STATEMENT.....	5
1.3.1 Natural Ventilation.....	5
1.3.2 Cross Ventilation.....	5
1.4 AIM.....	6
1.5 OBJECTIVES OF THE STUDY.....	6
1.6 RESEARCH METHODOLOGY.....	6
1.7 LIMITATION OF THE STUDY.....	8
1.8 THESIS OUTLINE.....	8
2.0 LITERATURE REVIEW.....	9
2.1 DEFINITION OF VENTILATION.....	9
2.2 NATURAL VENTILATION.....	10
2.3 NATURAL DRIVING FORCE.....	13
2.3.1 Thermal Buoyancy.....	13
2.3.2 Wind.....	15
2.4 THERMAL COMFORT.....	16
2.4.1 Factors Affecting Thermal Comfort.....	17
2.4.2 Prediction of Thermal Comfort.....	26
3.0 RESEARCH METHODOLOGY.....	30
3.1 INTRODUCTION.....	30
3.2 CASE STUDY.....	30
3.3 RESEARCH PROCESS.....	31

3.3.1	Problem Identification.....	31
3.3.2	Objectives and Scope Identification.....	31
3.3.3	Data Collection.....	32
3.3.4	Literature Review.....	33
3.3.5	Data Analysis.....	33
3.3.6	Conclusion and recommendation.....	33
3.3	SEQUENCE OF METHODOLOGY PROCES.....	34
4.0	DATA ANALYSIS AND FINDING.....	35
4.1	INTRODUCTION.....	35
4.2	THERMAL COMFORT ON CASE STUDY.....	36
4.2.1	First Day Testing (16 th MAY 2014).....	36
4.2.2	Second Day Testing (17 th MAY 2014).....	46
4.2.3	Third Day Testing (18 th MAY 2014).....	55
4.2.4	Discussion of Testing Result.....	66
4.3	SATISFACTION OF THE OCCUPANTS.....	70
5.0	CONCLUSION AND RECOMMENDATION.....	74
5.1	INTRODUCTION.....	74
5.2	CONCLUSION.....	74
5.3	ACHIEVEMENT OF THE OBJECTIVES.....	75
5.4	RECOMMENDATION.....	76
5.5	RECOMMENDATION FOR FURTHER RESEARCH.....	76
	REFERENCES.....	77
	APPENDIX.....	79