

**POST OCCUPANCY EVALUATION
IN A GREEN BUILDING – A CASE STUDY**

A.W. Lakmini Harshani Ranasinghe



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Degree of Master of Science in Construction Project Management

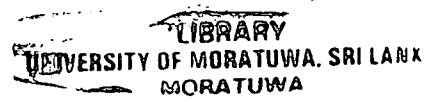
Department of Civil Engineering

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Dissertation submitted in partial fulfilment of the requirement for the
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Department of Civil Engineering

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Declaration

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The above candidate has carried out research for the Masters Dissertation under my supervision.

Signature of the supervisor:

UOM Verified Signature

Prof. A.A.D.A.J. Perera

Date: 21/10/2011

ABSTRACT

The man has forced his super powers on the natural environment to make his life more comfortable. As a result the natural environment has been responding to the man by changing the climate. We are now experiencing the repercussions of the climate change. Now the man has realized the threat that he is facing and this is the time for immediate action with total commitment. The new concept of “Sustainable Development” was innovated as a solution and “Sustainable Built Environment” plays a major role within this new innovation. As a result many world organizations have established several systems including guidelines and LEED was one of those rating systems which was established by U.S Green Building Council. Due to the reason that the man has been encouraged towards constructing of green buildings, the importance has arisen to find out whether occupants of the green buildings were truly satisfied about their workplace environment. Therefore, in this study one of the LEED platinum rated green building was deeply evaluated, with respect to “Thermal Comfort” which was known as the person’s psychological state of mind. From the analysis, it was found that the selected workplace has located within the extended comfort zone but, physically the occupants were not thermally comfortable. Then after conducting a further analysis to find out the reasons for this contradictory situation, it was found that there had been several design aspects that were lacking in the building which had to be considered in making the occupants thermally comfortable. Therefore, further studies were recommended from this research to make the workplace completely satisfied for the occupants. This research showed while ensuring the great standards within the green buildings, the designers need to be daring enough to look beyond the standards to make the occupants satisfied within their workplace.

Key Words: Climate Change, Sustainable Development, Sustainable Built Environment, Green Buildings, LEED, Post Occupancy Evaluation, Occupant’s satisfaction, Thermal Comfort.

*I dedicate this dissertation to my dear husband, son and parents
for their support, patience, understating and tolerance throughout this research.*



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LIST OF SYMBOLS

M -	Metabolic rate
E -	Evaporative cooling rate
R -	Radiant heat input or loss
Cd -	Conduction heat gain or loss
Cv -	Convection heat gain or loss
Tn -	Neutrality Temperature
To -	Annual Temperature
m -	Meters
°C -	Degree in Celsius
m/s -	Meters per seconds
Clo -	Clothing level
Met -	Metabolic equivalent
KW -	Kilo Watts
T -	Temperature
HR -	Humidity Ration
DBT -	Dry Bulb Temperature
RH -	Relative Humidity
≤ -	Is lesser than or equal to
V -	Velocity



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ABBREVIATIONS AND ACRONYMS

ANSI	-	American National Standard Institute
ASHRAE	-	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
BS EN	-	British European Standards Specification
BUS	-	Building Use Studies
CBE	-	Center for the Environmental at University of California
F.F. Council	-	Federal Facilities Council
HQ	-	Head Quarters
HSE	-	Health and Safety Executives
IEQ	-	Indoor Environmental Quality
ISO	-	International Organization for Standardization
LEED	-	The Leadership in Energy and Environmental Design
LEED NC	-	LEED for New Construction
MDF	-	Medium Density Fiberboard
MOS	-	MAS Operating System
M & S	-	Marks & Spencer
NBI	-	Norwegian Building Research Institute
POE	-	Post Occupancy Evaluation
SBS	-	Sick Building Syndrome
SET	-	Standard Effective Temperature
USGBC	-	United States Green Building Council



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