

Green Architecture in Built Environment

Mohd Ramzi Mohd Hussain
Izawati Tukiman
Asiah Abdul Rahim
Shamzani Affendy Mohd Din



IIUM PRESS

INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

GREEN ARCHITECTURE IN BUILT ENVIRONMENT

Edited By

Mohd Ramzi Mohd Hussain
Izawati Tukiman
Asiah Abdul Rahim
Shamzani Affendy Mohd Din



*KAED Universal Design Unit, KAED
International Islamic University Malaysia (IIUM) Kuala Lumpur MALAYSIA*



IIUM Press

Published by:
IUM Press
International Islamic University Malaysia

First Edition, 2011
©IUM Press, IUM

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without any prior written permission of the publisher.

Perpustakaan Negara Malaysia

Cataloguing-in-Publication Data

Mohd Ramzi Mohd Hussain, Izawati Tukiman, Asiah Abdul Rahim &
Shamzani Affendy Mohd Din: Green Architecture in Built Environment

ISBN: 978-967-418-039-3

Member of Majlis Penerbitan Ilmiah Malaysia – MAPIM
(Malaysian Scholarly Publishing Council)

Printed by :
IUM PRINTING SDN. BHD.
No. 1, Jalan Industri Batu Caves 1/3
Taman Perindustrian Batu Caves
Batu Caves Centre Point
68100 Batu Caves
Selangor Darul Ehsan

Contents

Acknowledgements	v	
Preface	vi	
Chapter 1	Adaptability and Modularity in Housing: A Case Study of Raines Court and Next21 Zulkefle Ismail and Asiah Abdul Rahim	1
Chapter 2	Strength Comparison of Lightweight Foam Concrete of High Density Using Three (3) Different Water Cement Ratio Alonge O. Richard and Mahyudin Ramli	33
✓ Chapter 3	Landscape Design as Part of Green and Sustainable Building Design Norhanis Diyana Nizarudin, Mohd Ramzi Mohd Hussain and Izawati Tukiman	43
✓ Chapter 4	The Acceptability of Four Dimension (4D) Virtual Construction in Malaysia Maisarah Ali and Julia Mohd Nor	53
✓ Chapter 5	Reflected Radiation Intensity Estimation Using Artificial Neural Network Muhammad Abu Eusuf and S. Adebayo-Aminu	71
Chapter 6	Evaluation of Affordable Urban-Mass House Design Based on Islamic Principles Ahmad Bashri Sulaiman and Fakhriah Muhsin	83
✓ Chapter 7	The Idea of Maqasid Al-Shari'ah in the Planning of Gated Community Scheme in Malaysia Sharifah Fadylawaty Syed Abdullah, Azila Ahmad Sarkawi and Syahriah Bachok	95
Chapter 8	Effect of Airborne Particulates Towards Historical Heritage at Manjung, Perak Darul Ridzuan and National Museum. Kuala Lumpur Norsyamimi Hanapi and Shamzani Affendy Mohd Din	115

REFLECTED RADIATION INTENSITY ESTIMATION USING ARTIFICIAL NEURAL NETWORK

Muhammad Abu Eusuf¹ and S. Adebayo-Aminu¹
¹Kulliyah Of Architecture & Environmental Design
International Islamic University (IIUM)
Gombak, Malaysia
Adesarat@Yahoo.Com , Eusuf2005@Gmail.Com

ABSTRACT

In most urban areas, buildings and paved surfaces using concrete materials have gradually replaced preexisting natural landscape. This new surfaces and materials absorbs solar energy thereby leading to an increase in the surface temperature of urban areas relative to the ambient air temperatures sometimes leading to urban heat island phenomenon. In this paper, the use of artificial neural network (ANN) for the estimation of reflected radiation on concrete surface in and around urban areas has been proposed. Measured radiation intensity acquired from location around city center serves as input data to a 1-3-1 ANN system. The system was trained using back propagation algorithm and upon convergence the system has been able to estimate reflected radiation intensity on a concrete floor and average relative error obtained is about 5%.

Keywords: Artificial neural network, Concrete, Radiation, Temperature, Urban Heat Island

I. INTRODUCTION

Human settlement is becoming increasingly urbanized in all countries of the world. The number of urban dwellers has increased from about 600 million in 1890 to about 2 billion in 1986 [1]. This surge in rural-urban migration relies to a greater extent on intensive use of non-renewable energy for the operation of equipment and space conditioning (cooling and heating) facilities. However, the production and consumption of energy using currently available technology have long-term environmental effects on a global scale, such as contributing to the build-up greenhouse gases (GHG) in the atmosphere. These factors are also responsible for altering the environment of cities, contributing directly to the urban heat island effect.

An urban heat island is a metropolitan area which is significantly warmer and hotter than its surrounding rural and undeveloped areas. In this urban heat island process, solar energy is absorbed by rooftops, pavements, structures, and facades which is then converted and released as heat energy into the air. Since the spacing of man-made structures is much denser in urban areas, more heat is released causing the outside temperature in a city to be increased thus hotter than rural areas. Howard (1818) pointed out that the description of the very first report of the Urban