THERMAL IMPACT OF RETROFITTING FACADES BY LIVING WALL SYSTEM

REFERRING TO THE OFFICE BUILDINGS AT SMART VILLAGE, EGYPT

By

Ali Abdelhakim Ali Hassan Badawy

A Thesis Submitted to the
Faculty of Engineering at Cairo University
In Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE
In
Architectural Engineering

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Under the Supervision of

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Title of Thesis:

THERMAL IMPACT OF RETROFITTING FACADES BY LIVING WALL SYSTEM REFERRING TO THE OFFICE BUILDINGS AT SMART VILLAGE, EGYPT

Key Words:
Smart village office buildings, Thermal comfort, Urban heat island, Living wall system, Energy efficiency.

Summary:

The thesis aims to study and evaluate the internal and external thermal impact and behavior of retrofitting facades by living wall system, with a practical study for two office buildings at the Smart Village in Egypt.
The scientific content of the thesis illustrate in three main sectors,
The conceptual, theoretical and operational frameworks.

The conceptual framework – illustrates the main idea of the thesis, scope, hypothesis, limitation and the objective to evaluate the thermal impact of retrofitting facades by living wall system.

The theoretical framework – illustrates the previous studies which related with main idea of the thesis. A brief for the historical development of buildings in Egypt and the analysis of the smart village project, thermal comfort and living wall system.

The operational framework - illustrates the practical study of the thesis, the assessment of thermal impact inside and outside the case studies before and after the retrofitting process, taking into consideration the regulations of the Egyptian codes for façade openings.
The results discussion, conclusions and recommendations for the thesis.

Disclaimer

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute.

I further declare that I have appropriately acknowledged all sources used and I have cited them in the references section.

Name: Ali Abdelhakim Ali Hassan Badawy Date: / / 2019

Signature:

Dedication

I would like to dedicate my thesis for,

- My supervisors Prof. Dr. Ahmed Fekry and Asst. Prof. Dr. Reham El-Dessuky.
- My father Mr. Abdelhakim Badawy and my mother Mrs. Amal Eid.
- My father in law G. Eng. Ahmed Alsrogy and mother in law Mrs. Hwayda Negm.
- My wife Arch. Alshimaa Alsrogy, my son Yassin and my daughter Laila.
- To the soul of deceased Eng. Tarek Karara.

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