TOWARDS A DESIGN APPROACH FOR AN ENERGY SAVING BUILDINGS
(An Analytical Study at El-Arish Residential Buildings)

By

Ola Ahmed Abd El-Mageed Gelbana

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
Environmental Design & Planning and Energy

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Title of Thesis:

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Key Words:
Design Approach; Enhancing; Efficiency; Energy saving; Residential; El-Arish

Summary:

This research aims to reach Residential Building Energy Saving, respecting the Architectural Identity around El-Arish region. The importance of energy efficiency in the building has a great urgency today and the building sector has emerged as a major factor affecting the energy consumption. In developing areas like Sinai which has an architecture identity it must be respected through achieving the requirements of the environmental housing which provides energy through the evaluation of Architectural Design Efficiency using Building design tools such as Ecotect software.

This program works as a design tool for environmental principles and more effectively in simulating the design processes stages through analyzing the building solar performance (Air Temperatures, Heat Gain and Loss, Thermal Resistance), Natural lighting and ventilation and air flow in the building and thier energy consumption. And thus can determine the extent of comfort within the building spaces in order to reach the optimal design.

So the research reaches outcomes and results can be formulated in an APPROACH includes set of factors affecting on the efficiency of **A**rchitectural **S**aving **E**nergy **D**esign (ASED), which illustrates method of selection of suitable architectural features such as (orientation, materials and size of fenestration, shading devices, treatment of building envelope etc.), which on incorporation in the building's design would provide thermal comfort with minimum Consumption of Energy and maximum suitability for Architectural Identify.

Also a Design Process Flow Charts and Recommendation Matrix have been provided to allow the designers evaluate the feasibility and potential of the Architectural Saving Energy Design strategies in the research studying Zone.

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Dedication

I dedicate my thesis to my family, a special feeling of gratitude to my loving parents, my father and mother whose words of encouragement and push for tenacity ring in my ears, and have taught me to work hard for the things that I aspire to achieve.

This thesis work is dedicated to my dear husband, Mohammed, who has been a constant source of support and encouragement during the challenges of graduate school and life. I am truly thankful for having you in my life.

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