

ROOF COVERING AS A ENERGY SAVING ATTRIBUTE IN TROPICAL CLIMATE

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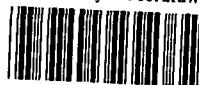
The dissertation presented to the faculty of
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the royal institute of British architects for R.I.B.A.
part (11) examination

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University of Moratuwa



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CHAPTER BRAKE DOWN

INTRODUCTION

- (I) Topic explanation.
- (II) Need of the study.
- (III) Architectural problem / Rationale.
- (IV) Limitatioons
- (V) Aims and objectives.
- (VI) Methodology.

(1.0) CHAPTER ONE

(1.10) Energy and buildings.

(1.1.1) Environmental issues in energy use of buildings.

- (1.1.1.1) Ozone depletion and buildings.
- (1.1.1.2) Global warming and buildings.
- (1.1.1.3) Acid rains and buildings.

(1.1.2) Energy efficient building forms and layouts.

- (1.1.2.1) In warm humid climates close to equator
- (1.1.2.2) In hot dry climates.

(1.1.3) Energy conservation and working with climates.

- (1.1.3.1) St. George's school, Wallasey Cheshire.
- (1.1.3.2) Guest house, Dar-es, Salam

(1.1.4) Energy and air conditioning.

- (1.1.4.1) Usage of natural lightning can reduce energy for
Air-conditionings.
- (1.1.4.2) The efficient use of air-conditioning in buildings.



(1.2.0.) The relation between climate and thermal comfort.

(1.2.1.) Requirement for comfort.

(1.2.2.) Quality of comfort.

(1.2.3) Designing for comfort

(1.2.4) Indoor climate.

(1.3.0.) The nature of heat.

(1.3.1.) The kinetic theory

(1.3.2.) The difference between heat and temperature.

(1.3.3.) Mode of heat transfer.

2.0)CHAPTER TWO



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2.1) roof as a determining factor of the thermal comfort.

2.1.1) Introduction to the roof

2.1.2) The importance of the roof

2.1.3) The roof covering types

2.1.4) Thermal properties of roofing elements

2.1.5) relationship between traditional roofing materials in Sri Lanka, and thermal comfort

2.1.6) Problems of roof with relation to thermal performance.

2.2) Thermal design of roofs.

2.2.1) Shape and pitch as a solar heat-minimizing factor

2.2.2) Texture, pattern, and colour as a solar heat minimizing factor.

2.2.3) Mass of the roof as a solar heat-minimizing factor.

2.2.4) Various roof designs to minimize solar heat factor.

2.2.4.1) Sod roofs

2.2.4.2) Air-cooled roofs

CHAPTER THREE - CASE STUDIES

3.0) Analysis of the relationship, between roofs and thermal comfort.

3.1) Back ground to the case studies

3.1.1) Introduction

3.1.2) Analytical techniques

3.1.3) Methodology of the research

a) Research equipment

b) Method of using the equipment.

3.1.4) Research data

3.1.4.1) Materials and their properties

3.1.4.2) Materials and building elements

3.1.4.3) Climatic data

3.1.4.4) Metabolic rates

3.1.4.5) Clothing data

3.2) Case studies

3.2.1) Case study one- school buildings

3.2.2) Case study two -residential buildings

3.2.3) Case study three - office buildings

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