

**HIGHER TECHNICAL INSTITUTE
MECHANICAL ENGINEERING COURSE**

DIPLOMA PROJECT

**NATURAL VENTILATION MEASUREMENTS
IN BUILDINGS**

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JUNE 2000

NATURAL VENTILATION MEASUREMENTS IN BUILDINGS

by

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Project Report

Submitted to

the Department of Mechanical Engineering

of the Higher Technical Institute

Nicosia Cyprus

In partial fulfilment of the of the requirements

for the diploma of

TECHNICIAN ENGINEER

in

MECHANICAL ENGINEERING

June 2000

HIGHER TECHNICAL INSTITUTE	PROJECT NO. 3193
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ACKNOWLEDGMENTS

I would like to dedicate this project to my parents for supporting and guiding me during these years of studying in H.T.I
So I take this opportunity, by accomplished this project to express my great thanks to them.

THANK YOU !!!

SUMMARY

The purpose of this project was to investigate the Natural ventilation in buildings and its application and appreciate importance.

Among others, a more important purpose was to indicate that mechanical ventilation is not always the best solution.

So someone who is interested to achieve and maintain its resident by natural ways, this project would be very helpful to him.

Firstly this project starts with the detailed approach of the natural ventilation with **C.I.B.S** and **ASHRAE** standards. Thus, the effects of wind pressure airflow, infiltration e.t.c. are discussed in PartA.

Then by studying some references on proper design and construction of residential structures and moreover the suitable handling of window types and sizes and also the effect of plants around the resident.

Furthermore some typical examples of Natural ventilation in buildings abroad are presented which provide natural cooling. These techniques were discussed detailed so someone who is interested may adopt them and used them.

Finally an effort was made to study behavior of wind in Natural ventilation in Cyprus in a form of an experiment in H.T.I premises, showing this effect and also air change effectiveness in a classroom. Ending, some reference in the form of tables and maps showing the wind direction and effect among the four cardinal directions (south, north, east, and west) for Cyprus.

INTRODUCTION

Is well known that before the inventions of mechanical equipments and machinery, human beings, tried to simplify as much as it could its way of living.

So, among other factors concerning humanity, another one, and the proper conditions of supply fresh air into buildings was concern. In other words, the term “Natural Ventilation” describes completely that attempt.

So, in this project research Natural Ventilation will be analysed in detailed.

By choosing to deal with the whole factors, information’s and background, concerning Natural ventilation, such as: wind and stack pressure, airflow, infiltration rates, air change effectiveness and theoretical calculations its more easier to get familiarized with the whole idea and utilization in Natural Ventilation.

In addition to that some suggestions and comments dealt with residents construction, would be very helpful. These are: the type and orientation of buildings, the type and size of windows, the effect of shading of windows and plants around the buildings, are among other great factors to be concerned in order to achieve proper Natural Ventilation conditions. Also some applications of Natural Ventilation in structures abroad e.g. (Iran, Italy), are discussed in detailed.

Finally an experiment held on an H.T.I. classroom, in order to visualize the importance of the rate of airflow, as well of course, air changes per hour significance.

By performing this simple experiment an effort made to demonstrate not only how air changes per hour are measured in a classroom for example, but also the more important was to compare the experimental results with standard results measured and listed in tables, by expert people in the field of Natural ventilation conditions. Certainly the difference of course, in knowledge cannot reach the degree of knowledge and experience of those expert people, but this attempt was performed in order to realize that air changes per hour in any living space plays vital role for human beings.

Ending some reference tables and figures concerning Cyprus conditions with more emphasis in Nicosia and Athalassa areas were the experiment was performed.