

HIGHER TECHNICAL INSTITUTE

MECHANICAL ENGINEERING COURSE

DIPLOMA PROJECT

DESIGN OF A CENTRAL HEATING AND HOT
WATER SERVICES FOR A BLOCK OF FLATS

M/893

BY: CHARALAMBOUS CONSTANTIA

JUNE 2000

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MECHANICAL ENGINEERING DEPARTMENT

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by

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Project Report

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SUMMARY

The objective of this project is to design a Central Heating and Hot Water Services for a Block of Flats consisting of five floors.

The architectural drawings were supplied by *S & P ARCHITECTURAL & DESIGN LTD.*

It must be mentioned that the ground, first and second floor consist of three flats and the others of one.

The whole work is divided into five chapters.

The first chapter is about the estimation of heat requirements of the Block of Flats.

The second chapter involves the system of space heating as the third describes the system for the hot water services.

Fourth chapter includes the sizing and selection of the equipment's, from various catalogues the equipment, which are going to be used in this project.

Finally, the last chapter includes the cost analysis, which is made for the whole design.

INTRODUCTION

The principal objective of the environmental engineer designing the services of an occupied space should be to enable the occupants of that space to pursue their normal activities in comfort.

In any subjective assessment of the whole environment, thermal, acoustic and visual factors all play a part.

So, the purpose of a heating system is to produce and maintain comfortable space concerned when the outside temperature has dropped below the comfort level.

In this project the heating system, which is designed, should excellent thermal comfort conditions at the internal space of all flats. To achieve this, a lot of factors should be taken into consideration, like:

- (1) The building construction – optimum wall thickness materials used.
- (2) Inside and outside temperatures.
- (3) Building exposure (sheltered, normal severe).
- (4) Air changes, (infiltration losses).
- (5) Orientation etc.

By an accurate calculation of all heat losses and also by selecting the most appropriate equipments the design will succeed.

The space heating (in this project) is selected to be achieved by central system with common heat source. (Central heating system).

Central heating system, which results from the combination of a boiler and a burner, is circulated through a system of pipes and heat emitting appliances, thus heating the space where an appliance is present. Also the system is consisted of fittings, elbows, valves, unions, manifolds expansion tank, water circulators etc. All these are called equipment and they form a central heating system.

In addition to the above system, a hot water supply system will be introduced.

Finally a good designer is the one who:

- Designs a system, which is able to maintain the desired internal conditions.
- Manages to reduce the total cost as low as possible.

To achieve these two Basic requirements, the major factor in the design of the system should be the conservation of energy.