HIGHER TECHNICAL INSTITUTE

MECHANICAL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

DESIGN OF A CENTRAL HEATING AND HOT WATER SUPPLY SYSTEM FOR A BUILDING

M / 882

BY: KYRIACOU PARASKEVAS

JUNE 2000

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PROJECT REPORT
SUBMITTED TO
THE DEPARTMENT OF MECHANICAL
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IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS
FOR THE DIPLOMA OF
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This project is dedicated to Helena
who has offered me so much.

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CHAPTER 4: EQUIPMENT AND SIZING SELECTION

ACKNOWLEDGEMENT

SUMMARY

The purpose of this project is to design a central heating and hot water system for a building consisting of four floors located at Nicosia.

It must be mentioned that each floor consist of four flats. Yet the basement is used as a parking place for the owners.

Basically this project is divided into five chapters. The first chapter is about the estimation of heat requirements of the building, the second chapter involves the system of the space heating, whereas the third chapter describes the system for the water services.

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

Finally in the last chapter the cost analysis of the whole design is described.

INTODUCTION

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

The heating system to be designed in this project should create thermal comfort conditions at the internal space for all flats. To achieve this, the heat requirements of all rooms must be determined so as to be able to select the appropriate equipment that will satisfy these requirements. In practice calculations for heat requirements are based upon the difference between design external air temperature and design internal air temperature.

The space heating can be achieved either by individual heating units, separately for each room (local heating) or (central heating system).

Local heating means the actual generation of heat in the room and it can be accomplished in various ways such as, the open fire place, stove, gas fires, electric heaters, electric convectors, electric panels, electric oil filled, radiators etc.

On the other hand in central heating systems hot water which is produced from boiler and is circulated through a system of pipes and heat emitting units, thus heating the space where unit is present. Furthermore the circulation can be achieved using circulating pumps (forced circulation) or using a thermosyphon (gravity circulation).

The system chosen to be used in this project is the central heating. This system will required a boiler and a burner in order to heat up the water.

Furthermore the heat emitting units will be radiators placed at each space to be heated, and they will be connected with the boiler by means of pipes. Finally the hot water will be circulates in the pipes by the aid of circulating pumps.

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

Finally apart from the fact that the system should be able to create and maintain the desired internal conditions and also to supply at all times hot water, its total cost should be kept as low as possible.

in order to achieve these two basic requirements, the major factor in the design of the system is the conservation of energy.