

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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**MECHANICAL ENGINEERING COURSE**

**DIPLOMA PROJECT**

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AND HOT WATER SUPPLY SYSTEM FOR  
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**by**

**KYRICOU PARASKEVAS**

**PROJECT REPORT  
SUBMITTED TO  
THE DEPARTMENT OF MECHANICAL  
INSTITUTE  
NICOSIA CYPRUS  
IN PARTIAL FULFILLMENT OF THE  
REQUIREMENTS  
FOR THE DIPLOMA OF  
TECHNICAL ENGINEER**

**IN**

**MECHANICAL ENGINEERING**

**JUNE 2000**

HIGHER TECHNICAL INSTITUTE	PROJECT NO. 3170
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**This project is dedicated to Helena  
who has offered me so much.**

# CONTENTS

PAGE

## ACKNOWLEDGEMENT

## SUMMARY

## INTRODUCTION

### CHAPTER 1: ESTIMATION OF HEAT LOSSES

1.1	Introduction	1
1.2	Heat loss through structure	1
1.2.1	Structure of fabric losses	1
1.2.2	Infiltration or ventilation losses	3
1.3	Factors affecting heat requirements	3
1.4	Overall heat transfer coefficient	5
1.5	Assumptions made for the evaluation of U-value	6
1.5.1	Notes	6
1.6	U-value estimation	6
1.7	U-value table	7
1.8	Assumptions made for the calculations of heating loads	8
1.9	Calculation of the heating loads	8

### CHAPTER 2: SELECTION OF THE SYSTEM FOR THE SPACE HEATING

2.1	Introduction	9
2.2	Selection of the heating method	9
2.3	Selection of the method of hot water circulation	11
2.4	Selection of the type of circuit	12
2.5	Radiator selection	15
2.5.1	Design water temperature	15
2.5.2	Convention factor	16
2.5.3	Procedure for the selection of radiators	17
2.6	Pipe sizing	17
2.6.1	Pipe arrangement consideration	18
2.6.2	Pipe sizing procedure	18
2.6.3	Pipe sizing table	19

### CHAPTER 3: HOT AND COLD WATER SERVICES

3.1	Introduction	21
3.2	Types of water heating	21
3.3	Selection	21
3.4	Indirect hot water system combined with space heating	23

3.5	Determination of the hot water cylinder capacity	24
3.6	Pipe arrangement consideration	25
3.7	Determination of boiler power	25
3.8	Sizing of the primary circuit	26
3.8.1	Procedure for sizing the primary circuit	26
3.8.2	Sizing of the return pipe	27
3.9	Sizing of the secondary circuit	27

## **CHAPTER 4: EQUIPMENT AND SIZING SELECTION**

4.1	Introduction	29
4.2	Boiler sizing	29
4.2.1	Boiler selection	30
4.3	Burner sizing	32
4.3.1	Burner selection	33
4.4	Expansion vessel sizing	33
4.4.1	Expansion vessel selection	36
4.5	Chimney sizing	36
4.6	Fuel oil tank sizing	38
4.6.1	Fuel oil tank selection	39
4.7	Pumps position	40
4.7.1	Central heating system pump sizing	41
4.7.2	Pump sizing procedure	42
4.7.3	Central heating system pump selection	42
4.7.4	Sizing and selection of the hot water supply system pumps	43
4.8	Radiators selection	43
4.9	Hot water cylinders sizing	44
4.10	Copper tube selection	46
4.11	Insulation selection	46
4.12	Valves	46

## **CHAPTER 5: COST ANALYSIS** 47

## **PLANTROOM** 64

## **CONCLUSIONS**

## **APPENDICES**

## **DRAWINGS**

## **REFERENCES**

## **ACKNOWLEDGEMENT**

I would first like to express my appreciation to my project supervisor Dr. Ioanni Michaelide for his valuable assistance and guidance in completing this project. And I would also like to thank everyone that helped me to accomplish this project.

## 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.



## INTRODUCTION

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.