

HIGHER TECHNICAL INSTITUTE

MECHANICAL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

**DESIGN OF A CENTRAL HEATING
SYSTEM AND WATER SUPPLY
SERVICES FOR A SCHOOL**

XENIOS PAPASTAVROU

M/1023

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WATER SUPPLY SERVICES FOR A SCHOOL**

(M/1023)

BY

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Project Supervisor: Mr. Theodoros Symeou

Project Report

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ABSTRACT

The main objective of this project is the design of a Central Heating System and water supply services for a school.

School consisting of two floors located in Nicosia.

The architectural drawings were supplied to me for this investigation where I had to find primary the heat losses of the specific building. Secondly, we must select the system to be employed in our school by taking in consideration the efficiency, the weather conditions of the location of the building, the hours where the school and also the cost.

Thirdly, in accordance with the heat losses calculated we choose the appropriate equipment of the system from various catalogues which are going to be used for this project.

Fourthly, come the cost analysis where there is a calculation of the expenses of the project, by taking in consideration each supply used separately, in order to find the total amount of the cost of the system to be employed.

Fifthly, there is a chapter presenting a preventive maintenance scheme for the equipment employed in our Central Space Heating System.

Finally, there are details drawing for the installation of the system which present the position of the radiators, of the boiler room, the arrangement of the piping of the system.

INTRODUCTION

The purpose of this project is to design a Central Heating System and water supply services for a school taken in consideration for needs of this project. The principle of the Central Heating System is to produce and maintain comfortable conditions in the internal space when the outside temperature has dropped below the comfortable level.

The number of heating systems is almost unlimited, if every combination of fuel, method of firing, transmission medium and type of emitting element is considered.

Since the early eighty's Central Heating System is the most applicable method in contrast to fireplaces, gas-fires, and electric heaters. The development of Central Heating System during the past years has enabled the installation for domestic use.

In Chapter one, you can observe the calculations of the heat losses and also the estimations of the U-Value of the structure item. The heat losses are due to the difference between the design internal air temperature and the design external air temperature. As lower is the external air temperature as greater will be the energy consumption.

In the second Chapter, you can find the presentation of the methods of heating systems and a selection of the methods chosen for the present project. In our system, the heat is produced by the convention of the fuel and then the heat is transferred in the water and that water is distributed by the pumps through the pipes to the radiators. So, finally the heat is transmitted in our internal space, the room in our case.

The third and fourth Chapter, contain the appropriate machinery, as radiators, pipes, cylinder, boiler and burner chosen for our system to be employed in the specific school. This selection of equipment is guided by our calculations of the heat losses above in the first chapter and also by the various catalogues of the manufactures.

In the fifth Chapter, you can observe the analysis cost, which means a detail report of the expenses of each material used in the Central Space Heating System and Water supply services for a school to be employed and a total amount of the cost is calculated for the specific building taken in consideration for the present project.

Lastly, in the sixth Chapter, there is a survey of the ways of maintaining the central heating system and the boiler room. This information is useful for the technicians who will be responsible for the maintenance of the Central Heating System in general and more precisely for the boiler room.

At the end, there is a presentation of detail drawings for the installation of the Central Heating System and Water supply services, where the arrangements of the pipes, the position of the radiators and the boiler room are shown.