

HIGHER TECHNICAL INSTITUTE

ELECTRICAL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

**DESIGN OF THE ELECTRICAL SERVICES
OF A MULTISTOREY BUILDING**

E.1364

EVIS NICOLAIDES

JUNE 2004

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Project No: E.1364

Project reported by *Evis Nicolaidis*

Project Supervisor: **Mr C. Chrysafiades**

Type of project: Individual

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Evis Nicolaidis

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HIGHER TECHNICAL INSTITUTE

CYPRUS-NICOSIA

DIPLOMA PROJECT

Academic Year: 2003/2004

Project Number: E.1364

Title: Design of the Electrical Services of a Multistorey building

Objectives:

1. To design the complete electrical services of a multistorey building
 - (i) Power
 - (ii) Lighting
 - (iii) Design of storage heaters installation
 - (iv) Lightning protection system
2. To provide all necessary diagrams schedule of materials and costing including labour

Terms and Conditions

1. Supply voltage: (i) Single phase 240Vrms, 50Hz, T.T earthing system.
(ii) Three phase 415Vrms, 50Hz, T.T earthing system (for Storage Heaters).
2. Architectural drawings will be provided.
3. Regulations and calculation are complied with IEE 16th edition and EAC regulations.
4. Wiring method: enclosed in a conduit (method 3).
5. The illumination design must be in accordance with the CIBS code.
6. All switches are mounted 1.5m above the floor and sockets (power) are mounted 0.5m above the floor. Distribution boards are mounted 1.7m above the floors.
7. External earth fault loop impedance is chosen to be $Z_e = 1\Omega$

Student: Evis Nicolaidis (3EL2)

Supervisor: Mr. C. Chrysafiades

INTRODUCTION – SUMMARY

The main objective of this project is to design the electrical installation, the storage heaters, and the lightning protection system.

This multistory building consists of three floors, the ground, first and second floor. Each floor consists of two flats (Flat No: 1 and Flat No: 2). Each Flat belongs to a different owner so it will be feed from a different meter. The stairs that is a communal load will be feed from a different meter.

The first Chapter of this project examines the theory of protection and earthing. This chapter is very important because protection is one of the main goals that must be fulfilled in order to avoid accidents and losses of life.

Chapter 2 examines the theory of inspection and testing. This is also a very important chapter because before feeding with power our installation, it must be first inspected and tested from us and then from EAC. If our installation does not fulfill the requirements for safety during the inspection of the EAC we must redesign the installation in order to have the permission to feed it with electricity.

Chapter 3 is based on the theory and calculations for illumination design. The illumination calculations are carried out to find the require number of fitting to be used.

The electrical design calculations are carried out at **Chapters 4 to 8**. The electrical installation in circuits ie. Lighting circuits, power circuits (socket outlets and fixed appliances). In the electrical design calculations we find the appropriate overcurrent protective device (type and rating), live and CPC conductors cross sectional areas and we take into consideration voltage drop limitations and thermal constrains for the CPC. Also these chapters contain diversity factors and maximum demand, main single line diagrams, storage heaters design and bonding.

At **Chapter 9** we carried out the calculations for the lightning protection system, which is very essential in tall buildings with very high concentration of people.

Finally at **Chapter 10** we carried out the costing of the Installation of the building.