HIGHER TECHNICAL INSTITUTE

ELECTRICAL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

ELECTRICAL INSTALLATION OF AN OFFICE BLOCK

STELIOS TZIORTZIS

JUNE 2001

INTRODUCTION-SUMMARY

The main objective of this project is to design the electrical installation and main electrical services of a block of offices. The design should include the normal electrical installation, the structured cabling system including the telephone network and the cabling for the computer network and the lightning protection system.

This block of offices consists of a basement, a ground floor and other 4 floors. The ground the first and second floor have the same owner so they will feed from the same meter (M1). Third floor belongs to a different owner so it will be feed from another meter (M2) and the third floor will be feed fro meter 3 (M3). The lift and all other communal loads will be feed from meter Mk.

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. In my project I have an example calculation with the point to point method in order to show how complicated are the calculations to be done by hand. The actual illumination design of this project was done with the help of the computer program SLI.

The electrical design calculations are carried out at chapters 4 to 7.The electrical installation in cct's ie. Lighting cct's, power cct's (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.

At Chapter 8 and 9 I have designed the structured cabling system of the building. Structured cabling systems are very popular in nowadays. In a structured cabling system voice and data are transferred in a common cable (CAT5 in our case) with the help of the computer network. In the structured cabling systems the telephone network is the same as the computer network.

Finally at chapter 10 I carried out the calculations for the lightning protection system Which is very essential in tall buildings with very high concentration of people.

TERMS AND CONDITIONS

The design should include:

a) The normal electrical installation.

b) Structured cabling system including telephone installation and cabling for the computer network.

c) Lightning protection system.

USEFUL INFORMATIONS

1) Supply voltage 415/240v, 50 Hz, TT earthing system

2) Regulations and calculation are complied with IEE 16^{th} edition and EAC regulations.

3) Wiring method: enclosed in a conduit (method 3) and clipped direct (method 1).

4) Cables: PVC cooper cable single core non-armored, multicore not armored and multicore armored.

5) External earth fault loop impedance is chosen to be $0.4\Omega=Z_e$.

6) Power factor in motor cct's should consider to be 0.8.

7) All switches are mounted 1.3m above the floor and sockets (telephone and power) are mounted 0.3m above the floor.

8) False ceiling is installed 0.1m below the ceiling.

9) Floor's height's: basement=2.5m,ground floor=2.6m, 1st floor=2.7m, 2nd floor=2.6m, 3rd floor=2.6m, 4th floor=2.6m.

10) Distribution boards are mounted 1.5m above the floor.

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