HIGHER TECHNICAL INSTITUTE

ELECTRICAL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

DESIGN OF THE ELECTRICAL SERVICES OF AN INSTITUTION BUILDING

E.1360

STAVROS KALLIS

JUNE 2004

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Project No: E.1360

Project reported by **Stavros Kallis**

Project Supervisor: **Mr. A. Georgiou**

Type of project: Individual

JUNE 2004

HIGHER TECHNICAL INSTITUTE

CYPRUS-NICOSIA

DIPLOMA PROJECT

Academic Year: 2003/2004

Project Number: E.1360

Title: Design of the complete Electrical Installation of an institution building

Objectives:

1. To design the complete electrical installation of an institution 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

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 16^{th} 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: Stavros Kallis (3EL2)

Supervisor: Mr. A.Georgiou

ACKNOWLEDGEMENTS

I want to express my thanks to the people whom help was valuable for the completition of this project and dedicate them this project

Firstly I would like to thank my project supervisor **Mr. A.Georgiou** for his very useful help, supervision and guidance during the whole process of this project.

I also want to thank my family for their help and support that provide me and their patience through out these three years of my study in HTI.

Stavros kallis

INTRODUCTION – SUMMARY

The main objective of this project is to design the electrical installation for the Steliou & ioannou foundation. The electrical installation of the institution consists of the designing of lighting, socket outlets, storage heaters circuits, and the lightning protection system.
This institution consist of two separate buildings, the building of maintenance charges of space (communal Building) which accommodates three floors ,ground floor, underground and the first floor, and the residence (houseguest building) that accommodates one floor. These two buildings however are supplied by the same meter.
The project examines the theory of protection and earthing. Protection is very important because is one of the main goals that must be fulfilled in order to avoid accidents and losses of life. The project also examines the theory of inspection and testing. Inspection and testing are also very important because before supplying with power an installation, it must be first inspected and tested from the engineer and then from EAC.If our installation does not fulfill the requirements for safety during the inspection by EAC we must redesign the installation in order to have the permission to be supplied with electricity.
Theory and calculations for illumination design are also important for better lighting. The illumination calculations are carried out to find the require number of fitting to be used.
At electrical installation calculations in circuits i.e. Lighting circuits, power circuits (socket outlets and fixed appliances) we find the appropriate overcurrent protective device (type and rating), live and CPC conductors cross sectional areas and I take into consideration voltage drop limitations and thermal constrains for the CPC.
This project it also contains diversity factors and maximum demand, main single line diagrams, storage heaters design and bonding.
Calculations for the lightning protection system which is very essential in tall buildings with very high concentration of people are also included
Finally costing is carried out for the Installation of the institution.

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CHAPTER 1: PROTECTION AND ERTHING

CHAPTER 2: INSPECTION AND TESTING

CHAPTER 3: ILLUMINATION DESIGN

CHAPTER 6: STORAGE HEATERS

CHAPTER 7: BONDING

CHAPTER 8: DIVERSITY

CHAPTER 9: SINGLE LINE DIAGRAMS

CHAPTER 10: LIGTNING PROTECTION SYSTEM

CHAPTER 11: COSTING

CHAPTER 12: DRAWINGS, TAPLES AND APPENDICES