Higher Technical Institute

ELECTRICAL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

DESIGN OF THE ELECTRICAL SERVICES AND SPECIALISED ELECTRICAL SERVICES OF HOTEL APPARTMENTS

BY

CHRISTAKIS SOPHOCLEOUS

E/1131

JUNE 1999

HIGHER TECHNICAL INSTITUTE

ELECTRICAL ENGINEERING COURSE

DIPLOMA PROJECT

DESIGN OF THE ELECTRICAL SERVICES AND SPECIALISED ELECTRICAL SERVICES OF HOTEL APPARTMENTS

No. E.1131

Sophocleous Christakis

In partial fulfillment of the requirements for the award of the diploma of Technician Engineer, in Electrical Engineering of the Higher Technical Institute of Cyprus.

JUNE 1998

dedicated to my family…

CONTENTS

AKNOWLEDGEMENTS

I would like to express my sincere thanks to my project's supervisor Mr. Avraam Georgiou for his valuable help and guidance given to me throughout the project period.

I would also like to thank the Head of the Electrical Department Mr. Constantinos Loizou for his advice on telephone installation, Mr. Kyriakos of Philios Christodoulides Co. Ltd. for his information regarding telephone systems. And Mr. Nikos Aphamis of Philios Christodoulides Co. Ltd. , for his valuable information concerning Fire Alarm Systems and TV Central Antenna Systems.

Many of my thanks also go to Mr. Loizos Christou and Dr. Georgia Christou for proof reading of my work.

Furthermore I would like to express gratitude to everyone in industry for all the relevant information and catalogues they provided me with, and to all those people who helped me in any other way.

Last but not least I thank my family, especially my parents, whom without their love , encouragement and financial support , I would have never made it this far with my studies.

SUMMARY

ELECTRICAL SERVICES AND SPECIALISED ELECTRICAL SERVICES OF HOTEL APARTMENTS

by Sophocleous Christakis

Upon construction of a building many technicians are consulted, each one on his own sector.

This diploma project deals with the Specialised Electrical Services of Hotel Apartments as indicated from the title. In order to create a proper construction, regarding electrical viewpoint, it is required to make an illumination design in order to decide on the correct quantity of light for each room or area, by selecting appropriate light - fittings from the market. Following the illumination design a lighting design must be provided, which will guide electricians on the correct installation of light-fittings using appropriate equipment, i.e. proper cables, control devices, protective devices etc., and thus provide a safe installation. A similar design must be made for power services as well.

Furthermore, a telephone design is provided since telephone has become a need in our everyday life. A short reference to the central antenna TV system is also necessary, since TV has become very important among mass media, providing also entertainment.

In addition to these, a design of a fire protection system will prevent spread of fire preventing serious damages, injuries and sometimes deaths of people. Finally, a protection against lightning strikes is provided by the design of a lightning protection system.

INTRODUCTION

This project deals with the Electrical Services and the Specialised Electrical Services of Hotel Apartments. The whole design consists of eleven chapters.

In chapter 1 a reference to the illumination design is made. Calculations' procedure is explained and samples of calculations are given followed by the tabulated results.

In chapter 2 a reference to the fundamental requirements for safety is made, following the IEE Wiring Regulations. The fundamental requirements for safety are:

(1) Protection, which refers to electric shock, thermal effects and over-current; and

(2) Proper selection of live and protective conductors.

Chapter 3 is a completion of the illumination design mentioned in chapter 1. This chapter provides proper selection of live and protective conductors for the installation of the light - fittings selected.

Chapter 4 and 5 are similar to chapter 3, but they refer to the design of the power services. Chapter 4 contains all the calculations necessary for the design of the ring and radial circuits of socket outlets, and chapter 5 contains calculations referring to the fixed appliances, (i.e. cooker units, water heaters, hair dryers, air-conditioning, illiuminance sign, refrigerator cold-room and water-pump).

Chapter 6 deals with protective systems. It contains theory as well as basic rules for the design of fire alarm systems and lightning protection systems.

Chapter 7 concerns the telephone installation. It refers to the basic principles followed for the design of the internal telecommunication network, as adopted from CY.T.A. regulations.

In chapter 9 diversity applications and balancing of phases are carried out. Following these the fault level calculations are carried out, in order to determine the prospective short current and the power factor at the origin of each circuit or sub-circuit.

For this design the TT system of supply was followed, as used in Cyprus. Chapter 10 refers to earthing requirements and earth - leakage protection that must be taken into consideration. The chapter is completed with a reference to bonding of all extraneous conductive parts.

Chapter 11 deals with the testing procedures that must be followed after completion of the installation and before it is connected to the EAC network.