

BIGGER TECHNICAL INSTITUTE,  
ELECTRICAL ENGINEERING COURSE

DIPLOMA PROJECT

DESIGN OF THE ELECTRICAL SERVICES  
OF A COMMERCIAL CENTRE

E/1158

PART A

VIANNAKOU ANDREAS

JUNE 1998

**HIGHER TECHNICAL INSTITUTE**

**ELECTRICAL ENGINEERING COURSE**

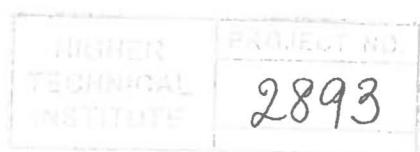
**DIPLOMA PROJECT**

**DESIGN OF THE ELECTRICAL  
SERVICES OF A COMMERCIAL CENTRE**

*E/1158*

*PART A*

**YIANNAKOU ANDREAS  
JUNE 1998**



**DESIGN OF THE ELECTRICAL  
SERVICES OF A COMMERCIAL CENTRE**

**PROJECT REPORT SUBMITTED  
BY  
YIANNAKOU ANDREAS**

**TO THE DEPARTMENT OF ELECTRICAL ENGINEERING  
OF THE HIGHER TECHNICAL INSTITUTE  
NICOSIA - CYPRUS**

**IN PARTIAL FULFILMENT OF THE  
REQUIREMENTS FOR THE DIPLOMA OF**

**TECHNICIAN - ENGINEER  
IN  
ELECTRICAL ENGINEERING**

**JUNE 1998**

**PROJECT SUPERVISOR: Mr. EFSTATHIOS MICHAEL,  
LECTURER OF THE ELECTRICAL ENGINEERING DEPARTMENT**

*2893*

I would like to  
thank you my son  
and daughter for  
help and guidance.

**DEDICATED TO MY FAMILY**

## A C K N O W L E D G M E N T S

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I would like to express my sincere appreciation and personal thanks to my project supervisor Mr Efstatios Michael, lecturer in Electrical Engineering department at HTI, for his valuable help and guidance to prepare and present this project.

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1.3. Organization

1.4. Results

1.5. Conclusions

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2.3. Limitations

2.4. Assumptions

2.5. Definitions

2.6. Abbreviations

2.7. Symbols

2.8. Units

2.9. Terminology

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2.13. Symbols

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## S U M M A R Y

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The design of the electrical services of a commercial centre is an electrical task which is performed with care, responsibility, and safety for people, livestock and property.

The design of the electrical services of a commercial centre is carried out for power circuits according to IEE Regulations 16<sup>th</sup> edition as currently amended and the EAC conditions of supply. For the telephone installation CYTA Regulations are considered. For the illumination design C.I.B.S. codes and interior lighting design codes are considered. All devices and equipment used for power circuits are selected to comply with the requirements of IEE Regulations 16<sup>th</sup> edition.

The whole design is divided into chapters to simplify the study of the project. Each part of the design is explained in detail in each chapter. At the end of the project there are 10 appendices. In each appendix there are tables and manufacturer catalogues used in the whole design of the project.

## I N T R O D U C T I O N

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This project deals with the analytical design of the electrical services of the commercial centre. The whole project is divided into twelve chapters as shown below:

### CHAPTER 1

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In this chapter illumination design takes place. Calculations of the number of luminaires are carried out.

### CHAPTER 2

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It deals with the lighting circuits. Calculations are carried out to determine the protective device rating, cable size, conduits size for the lighting installation.

### CHAPTER 3

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It deals with the socket outlet circuits. Calculations are carried out to determine the protective device rating, cables size conduits size as used in socket outlet circuits.

### CHAPTER 4

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It deals with the fixed appliances circuits. Calculations are carried out to determine the type of equipment used, the protective device rating, cables size, conduit size as used in fixed appliances circuits.

### CHAPTER 5

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It deals with the motor circuits. Calculations are carried out to determine the type of protective device rating, isolator rating, cables size, and starter type.

### CHAPTER 6

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It deals with the balancing of loads, the size of distribution boards, the size of the interconnecting cables, the protective device rating and the fault level calculations.

## CHAPTER 7

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In this chapter the type of earthing system and the particular definitions are discussed.

## CHAPTER 8

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It deals with the power factor correction.

## CHAPTER 9

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It deals with the stand-by supply. Calculation of the generator set size and cables size are carried out.

## CHAPTER 10

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It deals with the various checks of the installation in order to ensure that the IEE regulations and the EAC conditions of supply are met.

## CHAPTER 11

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It deals with the telephone installation of the commercial centre.

## CHAPTER 12

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It deals with the material and labour costing. The analytical method of costing is used. The estimation of the cost is based on the running cost of the material used and the labour rates used by electricity.