

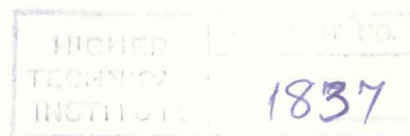
**DESIGN OF THE ELECTRICAL SERVICES
OF A SHOPPING CENTRE**

Project Report Submitted by

THEODOSIS THEODOSIOU

In partial fulfilment of the requirements for the award of
Diploma of Technician Engineer in Electrical Engineering of
the Higher Technical Institute, Nicosia, Cyprus.

JUNE 1991



ACKNOWLEDGMENTS

I would like to express my sincere thanks to my project supervisor Mr.S.Anastasiou for his valuable guidance and assistance throughout the project period.

My thanks and appreciation to Mr.C.Loizou for his valuable help concerning the telephone distribution system.

Finally I would like to express my thanks to all those who in any way helped me during the project period, and especially to my mother who has undertaken the typing of this project.

SUMMARY

DESIGN OF THE ELECTRICAL SERVICES OF A SHOPPING CENTRE

Submitted by: Theodosis Theodosiou

This project deals with the design of electrical and telecommunication services of a shopping centre.

The design of electrical services includes

- (a) Illumination
- (b) Lighting
- (c) Power
- (d) Emergency lighting
- (e) Fire alarm system

The design of telecommunication services includes

- (a) Telephone systems

The project includes typical calculations for each part of design and tables with the results of the relevant part. Also detailed drawings for all part of design are included.

The whole design was made in accordance to the relevant regulations which are currently applicable to each part.

CONTENTS

SUMMARY

INTRODUCTION

PART A

CHAPTER I:	ILLUMINATION DESIGN	
1.1:	Introduction	1
1.2:	Definitions and symbols used in illumination design by lamens method	1
1.3:	Typical calculations	3
1.4:	Illumination design results	6
CHAPTER II:	METHODS OF PROTECTION	
2.1:	Earthing system	9
2.2:	Protection against earth leakage currents	9
2.3:	Protection against short circuit currents	10
2.4:	Protection against overload currents	11
CHAPTER III:		
3.1:	LIGHTING DESIGN	
3.1a:	Typical calculations	12
3.1b:	Lighting design results	16
3.2:	POWER DESIGN	
3.2a:	Typical calculations	17
3.2b:	Further protection of ring circuits	23
3.2c:	Power design results	24
3.3:	AIR-CONDITIONING	
3.3a:	Typical calculations	26
3.3b:	Air conditioning results	29
3.4:	MAIN SUPPLY CABLE DESIGN	
3.4a:	Typical calculations	30
3.4b:	Main supply cable design results	34

3.5:	CIRCUITS FEEDING AUXILIARY DISTRIBUTION BOARDS FROM MAIN DISTRIBUTION BOARD A	
3.5a:	Typical calculations	36
3.5b:	Auxiliary supply cable results	38
3.6:	THREE PHASE BALANCING	39
CHAPTER IV:		
4.1:	EMERGENCY LIGHTING	
4.1a:	Introduction	42
4.1b:	Maintenance Procedures for emergency lighting luminaires	43
4.1c:	Recommended test circuits	43
4.1d:	Wiring	43
4.2:	FIRE ALARM SYSTEM	
4.2a:	General	45
4.2b:	Control and indicating equipment	45
4.2c:	Alarm indicating points	45
4.2d:	Alarm bells	46
4.2e:	Schematic diagram	47
CHAPTER V: INSPECTION AND TESTING		
5.1:	Visual inspection	48
5.2:	Testing	48
PART B:		
TELEPHONE INSTALLATION		
CHAPTER I: RELEVANT THEORY		
1.1:	Introduction	51
1.2:	External line plant	51
1.3:	Definitions of the terms used	52
1.4:	Installation of access cable	53
1.5:	Conduits and conduit sizes	54
1.6:	Installation of the distribution cases	55
CHAPTER II: ACTUAL DESIGN OF THE TELECOMMUNICATION NETWORK		

2.1:	Telephone points distribution	59
2.2:	Conduit size	60
2.3:	Conduit diagram	61
2.4:	Wiring diagram	62
2.5:	List of connection	63
	CONCLUSIONS	69
	REFERENCES	70
	APPENDICES	71