

HIGHER TECHNICAL INSTITUTE

ELECTRICAL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

Design of The Electrical Services of A Clinic

6

**Design By
KARAYIANNIS CONSTANTINOS**

June 2000

HIGHER TECHNICAL INSTITUTE	PROJECT NO. 3128
----------------------------------	---------------------

INTRODUCTION

This project deals with the design of the Electrical Services of a clinic named IPPOKRATI'S situated in Limassol.

It consists of the Ground floor, other four floors and the roof.

The whole installation is carried out by the following requirements:

- The 16th edition of the IEE wiring regulations and additional local Regulations.
- EAC Conditions and Supply
- CIBS code of Interior Lighting
- Interior Lighting Design
- CYTA regulations.

ASSUMPTIONS

- Supply Voltage: 415V vms 50Hz
- Wiring Method: PVC'S conduit (method 3)
- Cables:
 - (a) PVC copper single cores
 - (b) PVC/SNA/PVC
- Earth conduit carries out one circuit only so grouping factor $C_g=1$

CONTENTS

AKNOWLEDGEMENTS	1
CONTENTS	2
INTRODUCTION	4
ASSUMPTIONS	4
<i>ILLUMINATION</i>	7
1.1 Introduction	8
1.2 Electric Lamps	8
1.3 Units and Definitions	9
1.4 Methods of Illumination Calculations	11
1.5 Actual Illumination Design	13
1.6 Results of Illumination Design	16
<i>LIGHTNING AND POWER REQUIREMENTS</i>	19
2.1 Objects and Effect	20
2.2 Fundamental Requirements for Safety	20
2.3 Design Procedure	21
2.4 Actual Design Procedure	24
2.5 High Power Circuit	37
<i>SAFETY AND EARTHING</i>	39
3.1 General	40
3.2 Situation Where Special Precautions are Used	41
3.3 Definitions	41
3.4 Protection for Safety	43
<i>INSPECTION AND TESTING</i>	46
4.1 Introduction	47
4.2 Visual Inspection	47
4.3 Testing	47
4.4 Certification	53
<i>TELEPHONY</i>	54
5.0 Telephony Distribution	55
5.1 Definitions	55
5.2 Conduits and Conduit Sizes	56
5.3 Installation of the Distribution case	57
5.4 Installation of Telephony Lines	58
5.5 Earthing	59
<i>LIGHTNING PROTECTION</i>	62
6.1 Definition	63
6.2 Creation of Lightning	63
6.3 Effects of Lightning	63

6.4	Location of Lightning	64
6.5	Lightning Protection Systems	64
6.6	How it Works	65
6.7	Materials	65
6.8	The Principal Components of a Lightning Protection System	66
6.9	Methods to Provide Protection	66
6.10	Need for Protection	67
6.11	Bonding	67
6.12	Earth Electrodes	68
6.13	Down Conductors	68
6.14	Calculation of Overall Risk Factor	68
 <i>FIRE ALARM</i>		 71
7.1	Fire Detection and Alarm System	71
7.2	Automatic F.A.S.	71
7.3	Fire Alarm Detector	74
7.4	Manual Call Points	75
7.5	Audible and Visual Alarms	75
7.6	Power Supplies	76
7.7	Type of Wiring	77
 APPENDICES		 78