HIGHER TECHNICAL INSTITUTE

ELECTRICAL ENGINEERING

DEPARTMENT

DIPLOMA PROJECT

# DESIGN OF THE ELECTRICAL SERVICES OF A LUXURY HOUSE

E, 1443

NEOPHYTOU MARIOS

JUNE 2009

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**BY**

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# DESIGN OF THE ELECTRICAL SERVICES OF A LUXURY HOUSE


## BY

## NEOPHYTOU MARIOS


**In partial fulfillment of the requirements for the award of the diploma of the Technician Engineer in Electrical Engineering Department of the Higher Technical Institute**

**Nicosia – Cyprus**

**Project Supervisor: Mr. J. Demetriou**

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# Acknowledgements

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# SUMMARY


Project Title: DESIGN OF THE ELECTRICAL SERVICES OF A LUXURY HOUSE

Student: Neophytou Marios

The purpose of this project is to design electrical services in a luxury house. The whole project must be carried out abiding by all the safety rules, in order to provide a safe working environment.

The electrical design of the building is carried out according to IEE regulations of the 16$^{th}$ edition.

For the telephone installation, CYTA regulations were considered.

The design of the electrical services of the house is explained in the main body of the report. At the end of the report appendices are included giving specifications for the devices and equipment used. Finally, detailed architectural drawings are provided, showing the location of the different equipment.

# INTRODUCTION

The objectives of this project are:

- Power
- Lighting
- Telecommunication
- Data distribution

Terms and conditions:

1. Architectural drawing will be provided.
2. The phase supply 415V, 50Hz and TT earthing system must be used.
3. The IEE regulation 16$^{th}$ edition and all related local EAC conditions of supply should be considered.
4. Levels of illuminations must be in according with the CIBS code.
5. Telecommunications must confine with CYTA requirements.
6. In the design of the specialized services all appropriate standards and regulations must be considered.

Distances shown on the schematic diagram include:

1. Height of distribution board =1.6m
2. Height of cooker unit switch =1.5m
3. Height of water heater switch =1.6m
4. Height of socket outlet =0.5m
5. Height of switches =1.6m

TO MY FAMILY

# Chapter 1
## Illumination

# CHAPTER 1
# ILLUMINATION DESIGN

## 1.1. Introduction

Illumination is the process of lighting an area or an object. Different areas need different amount of light. In order to find out the right amount of light required, we use illumination design.

The reasons for having good illumination are very important, such as:

- Safety
- Production Efficiency
- Comfort
- Accuracy Improvement
- Sales Promotion

## 1.2. Definitions and units

a) **Luminous flux, F:** is the quality, which expresses the capacity of radiated power to produce visual sensation. The unit is the lumen, lm.

b) **Luminous Intensity, I:** in a given direction is the quotient of the luminous flux emitted by a source in an infinitesimal cone containing the given direction, and the solid angle of that cone.

c) **Quantity of light, Q:** is the product of the luminous flux and the time during which it is maintained. The unit is lumen per hour, lm/h.

d) **Illumination or Illuminance, E:** is the luminous flux reaching a surface per unit area of that surface. The unit is $lm/m^2$.

e) **Maintenance Factor, Nm:** The ratio of illumination from dirty installation to that from the same installation when clean. It is expressed as a decimal.