HIGHER TECHNICAL INSTITUTE

ELECTRICAL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

DESIGN OF THE ELECTRICAL SERVICES OF A LUXIARY HOUSE

E.1440

NEKTARIOS GEROLEMOU

JUNE 2009

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INTRODUCTION

TECHNICAL INSTRUCTIONS AND INFORMATION FOR ELECTRICAL INSTALLATION

The execution of work will be done in accordance with the Regulations of the 16th edition of the British Institute of Electrical Engineering.

Provision Of Electricity

- This study conducted for the earthing system TT
- The operating voltage must be AC single phase 50Hz, 240V, or 50Hz 240V/415V three-phase
- The Loop impedance earth short circuit outside the plant should be *about* 1 Ohm without taking into account the earth electrode of the consumer.
- The electric power supply will enter from the main distribution board of the position which seems in the projects
- Distribution boards shall be insulated Class II minimum.
- Where protection against indirect contact would be using RCD, then the total impedance of the short loops of the earth must be less than 200 Ohm. We want it approximately 1 ohm
- The resistance of the electrode shall be such as to satisfy the above conditions.

Insulators (isolator)

- The insulators at a TT system must discontinue all conductors (phase and neutral)
- The insulators must be able to lock the open or closed state to prevent the disabling or activating them accidentally.

The method 3 with single core wire enclosed in conduit is preferable. We assume that Ca, Ci, Cg are equal to 1.

Excepts the standard circuit, in this house will contain lightning protection circuit, decorative lighting, air conditions, security system, fire and bugler alarm, storage heater, central antennas and satellite circuit and motor for swimming pool.

Equipotential bondig is required to connect water pipes, gas pipes to the main earthing terminals.

From the nearest transformer of E.A.C which will provides to the house electricity, its output is 6 kA. So we are going to use mcb's of 6 kA protection fault current.

The electricians have to insert several earth electrodes to earth and connect them together. With that way we try to have resistance to the electrode approximately to 1 ohm. Adding that resistance with the resistance of the wire, we have Zexternal equals 1 ohms.

Distances of the points from the finished floor:

1. Distribution board - - - > 1.5m
2. Cooker unit - - - > 1.2m
3. Socket outlet - - - > 0.5m
4. Water heater - - - > 1.2m
5. Switches - - - > 1.2m
6. Bell point - - - > 2.2m
7. Bell switch - - - > 1.5m
8. sound surround - - - > 2 m
9. tv points - - - > 0.5m
10. ip points - - - > 0.5m

CHAPTER 1

CHAPTER 1: ILLUMINATION DESIGN

1.1 Introduction

Illumination is the process of lighting an area or an object. Each area need different amount of light.
The reason for having good illumination is very important, such as:

- Safety
- Production efficiency
- Comfort
- Accuracy improvement

1.2 Units And Definitions

- **Luminous flux, F (Lm):** is the quantity which express the capacity of radiated power to produce visual sense.
- **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.
- **Quantity of light, Q (Lm/h):** is the product of luminous flux and the time during which is maintain.
- **Illumination or luminance, E (Lm/m²):** is the luminous flux reaching a surface per unit of that surface.
- **Maintenance factor, Nm:** the ratio of illumination from a dirty installation to that from the same installation when is clean.
- **Coefficient of utilization, Nu:** the total flux reaching the working place divided by the total flux.
- **Room index, K:** an index derived from the dimensions of the room and used when calculating the coefficient of utilization of a lighting installation, and it can be found by the formula