

HIGHER TECHNICAL INSTITUTE

ELECTRICAL ENGINEERING COURSE

DIPLOMA PROJECT

DESIGN OF THE ELECTRICAL
SERVICES OF AN OFFICE BLOCK

BY: SANYIKA BEVEN T

JUNE 1996

**DESIGN OF THE ELECTRICAL
SERVICES OF AN OFFICE
BLOCK**

**BY
SANYIKA BEVEN T**

PROJECT REPORT

**Submitted to the Department of Electrical Engineering
of**

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In partial fulfilment of the requirements for the diploma

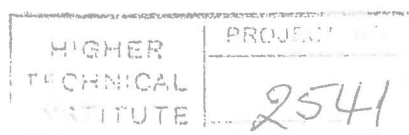
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DEDICATED TO THE SANYIKAŞ
FOR THE SUPPORT THEY HAVE
ALWAYS BEEN GIVING.

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SUMMARY

PROJECT TITLE: DESIGN OF THE ELECTRICAL SERVICES OF AN OFFICE BLOCK
SUBMITTED BY: BEVEN T. SANYIKA

The objectives of this project are;

- 1) To design the complete electrical services installation of an office block (given the architectural drawings). These electrical services are
 - a. lighting
 - b. Power
 - c. Telephone distribution

The above mentioned design deals with the investigation, assessment and determination of the services access points and their respective distribution Networks. (conduits, wiring, control gear, etc)

- 2) To analyse and illustrate the schedule of the materials and labour cost.

According to the objectives, the project was carried out and the best, possible solution given.

Firstly the illumination design was investigated and assessed in accordance with the CIBS code and according to this assessment all the lighting points were marked on the drawings with their respective conduit Networks.

In accordance to the regulations as currently amended by the 16th edition of the IEE wiring regulations the electrical (lighting & power) was designed and all circuit calculations made, illustrated and tabulated.

The telephone distribution Network was then designed in accordance to the Cyprus Telecommunications Authority requirements and also shown on the attached drawings.

All necessary regulations, references, definitions and abbreviations have been stated defined accordingly.

The project was not only looked at from a theoretical point of view but also from a practical one with the aid of a twelve weeks' practical training with Nicos G Damiarou electrical contractors. LTD.

PREFACE

This project aims at the designing of a safe, efficient, compatible technical competent, presentable and cost effective distribution network for electrical energy for the various purposes in a multistorey building partianing to an office block. This block incorporates shops on the ground floor, offices, a parking lot and a small residential flat on the top floor.

Electricity, all over the world, is much more than a national asset. It has been the main influence for good in the field of improvement in our standards of living. Electricity has been proven as the most flexible form of power in existence i.e. it is easily generated and transmitted to whatever or whomever requires it, and in whatever quantity it may be required. But for all the above to be fulfilled, the electrical energy has to be distributed properly i.e. its distribution does not only call for the successful conduction of this energy from one point to the other but also at the safety of the installer, all those coming in corfctact with its services and the equipment utilising it both directly and indirectly. Also the installation must be as technically competent as is possible at a reasonable cost i.e. to ensure that it is used in the most efficient way, so increasing productivity in the application and maintenance aspects. Therefore for a successful and satisfactory solution to this project all the above factors are greatly put into consideration.

Basically the lighting and power distribution design part was carried out in accordance to the IEE wiring regulations as currently ammended by the 16th Edition. The telephone distribution was done in accordance to CYTA requirements.

The project design is not only carried out from the theoretical point of view because, for example, there are some dimensions not shown on the architectural drawings which are essential and need a brief practical exposure to for a reasonable assumption of them. Eg the power points mounting heights and ceiling heights etc. And this was accounted for by an attachment to Nicos G. DAMIANOU electrical contractors Ltd for practical experience.

TERMS AND CONDITIONS

1. Three-phase, 415 Vrms, 50Hz, T.T earthing system
2. lighting and power design in accordance with IEE wiring regulations (16th Edition), CIBS code and E.A.C. requirements
3. The telephone distribution design in accordance to CYTA requirements

ASSUMPTIONS

To ensure accurate measurements of conduit and cable run lengths, the practical routes need to be known i.e. the mounting heights of the services access points and room dimensions.

The following dimensions are to be used and are measured from the floor.

- | | |
|--|---------|
| (1) Ceiling heights of offices | = 3m |
| (2) Ceiling heights of shops | = 4m |
| (3) Ceiling heights of mezzanines | = 3m |
| (4) Mounting heights of D.B's | = 1.65m |
| (5) Mounting heights of socket outlets | = 0.4m |
| (6) Mounting heights of control switches | = 1.35m |
| (7) Mounting heights of cooker control units | = 1.15 |

- | | |
|--|-----|
| ■ Grouping factor | = 1 |
| ■ Ambient temperature factor | = 1 |
| ■ Thermal insulation factor | = 1 |
| ■ Method of installation : enclosed in conduit | |
| ■ Wiring : copper conductors - PVC insulated single core | |
| ■ External earth fault loop impedance = 1Ω | |
| ■ Prospective fault current at the origin = 9KA at a P.f of 0.85 | |