PLANNING OF THE TELEPHONE DISTRIBUTION IN A HOUSING COMPLEX

BY

PARANI THEOGNOSIA

Project report submitted to the Department of the Electrical Engineering of the Higher Technical Institute, Nicosia, Cyprus, in partial fulfilment of the requirements for the diploma of

> TECHNICIAN ENGINEER in ELECTRICAL ENGINEERING

> > June 1994



ACKNOWLEDGEMENTS

I would like to express my sincere appreciation to the following gentlemen who very kindly offered their knowledge and experience to me and helped me to carry out this project on planning the telephone distribution in a housing complex:

Mr. C. Loizou Mr. S. Ioakim Mr. D. Hajittofis Mr. M. Argyrou Mr. A. Yiokkas Mr. V. Mesaritis

Also the company NEDECO that kindly offered information about the EPABX used in the project report which is the Alcatel 4300M.

My thanks are also extended to all the planning department and drawing office personnel of the Cyprus Telecommunication Authority.

<u>ABSTRACT</u>

CHAPTER 1 - deals with study of external distribution

- CHAPTER 2- has to do with the internal distribution network terms used and CYTA regulations.
- CHAPTER 3- deals with the different types of earthing arrangements employed by CYTA
- CHAPTER 4- deals with private communications systems, description of types and also for their installation, operation and facilities offered.
- CHAPTER 5- has to do with work on site. How manual work is done.
- CHAPTER 6- deals with supply, installation, connection and maintenance of telephone terminal equipment.
- CHAPTER 7- deals with actual design. Implementation of this design.
- CHAPTER 8- deals with the estimate of work. It gives analytical description of the materials used, their price and quantity as well as the total cost.
- CHAPTER 9- Conclusions drawn about the actual design. Appendices for the equipment used. Drawings for external and internal distribution. Wiring and Conduit diagrams, List of Connections.

<u>CONTENTS</u>

CHAPTER 1 - EXTERNAL DISTRIBUTION NETWORK

1.1	Introduction	1
1.2	External line plant	1
1.3	The Cabinet and Pillar System	3
1.4	Basic Principles for the smooth operation of a	
	Telephone Exchange	4
1.5	Interference from power lines on telephone lines.	4
1.6	Joint Pits - Manholes	6
1.7	Ducts	6
1.8	Rigit PVC Pipes	7
1.9	Polythene Ducts	7
1.10	Plastic Conduits	7
1.11	Poles - overhead net work	8
1.12	Main types of cables	8
1.12.1	Polyethylene Twin Cables	8
1.12.2	Polyethylene Twin Unit Cables	10
1.13	Polyethylene Insulated Cables	11

CHAPTER 2 - INTERNAL DISTRIBUTION NETWORK

2.1	Definitions of the terms used	12
2.2	Basic principles governing the internal	
	Telecommunication network	17
2.3	Installation of Access Cable	20
2.4	Installation of the conduit network	23
2.4.1	Conduits and conduit sizes	25
2.5	Installation of the distribution cases	26
2.6	Installation of telephone lines	29
2.6.1	Separation from electrical circuits	30
2.7	Positioning of telephone sets	31

2.8	Fault repair and changes in the internal	
	telecommunication network	32

CHAPTER 3 - EARTHING

3.1	Protection Earth	33
3.2	Protection from lightning surges	33
3.3	Operational Earth	34
3.4	Special Earth for EPABXS	35

CHAPTER 4 - PRIVATE COMMUNICATION SYSTEMS

4.1	Private manual branch exchange	07
	-	37
4.2	Private automatic branch exchange	37
4.3.	Type of EPABXs	38
4.3.1	Facilities offered by ALCATEL 4300M	39
4.3.1.	1 Features offered	39
4.4	Parallel telephones	41
4.5	Installation of the console	41
4.6	Key systems	42
4.6.1	General	42
4.6.2	Description of units	42
4.6.3	Internal Communication	43
4.6.4	External Communication	43
4.6.5	Restrictions	43
4.6.6	Available systems	44
4.6.7	Installation	44
4.7	Telephone System T16	45
4.7.1	General	45
4.7.2	Features offered	46
4.7.3	Installation of T16	48

CHAPTER 5 - WORK ON SITE

5.1	General	50
5.2	Delivery and storage	50
5.3	Central equipment	50
5.4	Surface wiring	51
5.5	Wiring	51

CHAPTER 6 - GENERAL SPECIFICATIONS FOR TERMINAL EQUIPMENT

6.1	Definition	54
6.2	Supply of terminal equipment	54
6.3	Installation and connection of Telephone	
	Terminal Equipment	54
6.4	Maintenance of telephone terminal equipment	55
6.5	Connection of secondary telephone equipment	
	with main telephone connections	55

CHAPTER 7 - DESIGN OF THE INTERNAL WIRING FOR A TELEPHONE NETWORK

57
58
59
59
60
60 60
60
60 60

7.9	Selection of conduit for the underground cable	62
7.9.1	Conduit diameter for access cable.	62

CHAPTER 8 - ESTIMATE OF WORK

CHAPTER 9 - CONCLUSIONS

APPENDICES DRAWINGS LIST OF CONNECTIONS