

**PROPOSED DRUG REHABILITATION CENTRE OKOLOBIRI, BAYELSA STATE,
NIGERIA:**

ADOPTING THERAPEUTIC ARCHITECTURE FOR PATIENTS' RECOVERY

By

PASE OLUBUKUNOLA CHIBUZOR

(Matric No: 12CA014081)

MAY, 2018

**PROPOSED DRUG REHABILITATION CENTRE OKOLOBIRI, BAYELSA STATE,
NIGERIA:**

ADOPTING THERAPEUTIC ARCHITECTURE FOR PATIENTS' RECOVERY

By

PASE OLUBUKUNOLA CHIBUZOR

(Matric No: 12CA014081)

B.Sc

**BEING A THESIS SUBMITTED TO THE DEPARTMENT OF ARCHITECTURE,
COLLEGE OF SCIENCE AND TECHNOLOGY, COVENANT UNIVERSITY, OTA,
NIGERIA, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF
DEGREE OF MASTER OF SCIENCE IN ARCHITECTURE (M.SC. ARCH)**

MAY 2018

DECLARATION

I, Pase, Olubukunola Chibuzor of the Department of Architecture, Covenant University, Ota, Ogun State, hereby declare the information contained in this thesis work is the result of an honest academic research undertaken by me and that no part of it had been accepted for publication in any journal or magazine.

I therefore state that all information and data are fully acknowledged via proper referencing.

Pase Olubukunola Chibuzor

.....

Signature & Date

CERTIFICATION

It is hereby certified, that this dissertation was written by **PASE, OLUBUKUNOLA CHIBUZOR**, supervised by Dr. Oladunni Izobo-Martins and submitted to the School of Post Graduate studies and the Department of Architecture, College of Science and Technology, Covenant University, Ota, Ogun State.

Supervisor

Dr. Oladunni Izobo-Martins

.....

Signature & Date

Head of Department

Dr. Oluwole Alagbe

.....

Signature & Date

DEDICATION.

This project is dedicated to GOD.

ACKNOWLEDGEMENTS

This project without the help of the Lord would not have amounted to anything, He started, continued and ended with me, thank you God. A big thank you to my wonderful and supportive parents Mr and Mrs Pase, that were with me every step of the way and also for their strong words of encouragement towards the completion of this project. I also want to acknowledge my Lumiere for your love; my siblings and friends for their encouragements throughout this project.

I would also like to appreciate Bishop David Oyedepo and the entire Covenant University management for the scholarship granted to me for this masters program.

To my supervisor Dr. Oladunni Izobo-Martins, I say a very big thank you. To all the lecturers in my department; Prof. Adeboye, Prof. Ibem, Dr. Alagbe, Dr. Aderonmu, Dr. Oluwatayo, Dr. Aduwo, Dr. Fulani, Dr. Adewale, Dr. Ekhaese, Dr. Opoko, Dr. Babalola, Dr. Ediae, Dr. Alalade, Arc. Ezema, Arc. Jegede, Arc. Obi, Arc. Owoseni, Arc. Sholanke and Arc. Erebo thank you for your constant open doors.

God bless you.

TABLE OF CONTENTS

Declaration.....	I
Certification.....	II
Dedication.....	III
Acknowledgements	IV
Table of Contents	V
List of Maps.....	XII
List of Figures.....	x
List of Plates	XVIII
List of Abbreviations And Acronyms	XXI
Abstract.....	XXII
CHAPTER 1	1
1.1 BACKGROUND OF STUDY	1
1.1.1 Brief Description of Building Type	3
1.2 PROBLEM STATEMENT.....	3
1.2.1 RESEARCH QUESTIONS	4

1.3 AIMS AND OBJECTIVES	4
1.4 RATIONALE AND JUSTIFICATION OF STUDY	5
1.5 THE CLIENT/USERS	5
1.6 SCOPE OF STUDY	6
1.7 LOCATION	6
1.8 METHODOLOGY	6
CHAPTER 2	7
2.1 DEFINITIONS AND DESCRIPTIONS	7
2.1.1 Drug Abuse and Drug Addiction	7
2.1.2 Drug Rehabilitation and Drug Rehabilitation Centres	8
2.2 HISTORY OF DRUG REHABILITATION CENTRES	11
2.3 TYPES OF DRUG REHABILITATION CENTRES.....	13
2.4 FUNCTIONS AND SPACES IN A DRUG REHABILITATION CENTRE.....	15
2.5 UNIQUE SOLUTIONS TO PROBLEMS IN A DRUG REHABILITATION CENTRE.....	16
2.6 TECHNOLOGICAL AND ENVIRONMENTAL SOLUTIONS IN A DRUG REHABILITATION CENTRE.....	17
2.7 CONCEPTUAL APPROACHES TO THE DESIGN OF A DRUG REHABILITATION CENTRE.....	19
2.7 MAJOR DESIGN PROBLEMS IN A DRUG REHABILITATION CENTRE.....	30
2.8 GAPS IN LITERATURE.....	31
CHAPTER 3	33
3.1 INTRODUCTION	33

3.2 COMPONENTS AND ARCHITECTURAL SOLUTIONS OF THERAPEUTIC ARCHITECTURE	34
3.2.1 NATURE	34
3.2.1.1 Healing Gardens.....	35
3.2.1.2 Power of the Window	39
3.2.1.3 Indoor Plants	39
3.2.2 PLAN LAYOUT	40
3.2.2.1 Privacy	40
3.2.2.2 Spaciousness	41
3.2.2.3 Wayfinding	42
3.2.2.4 Ventilation.....	42
3.2.3 INTERIOR DESIGN	47
3.2.3.1 Lighting.....	47
3.2.3.2 Colour	53
3.2.3.3 Positive Distractions	56
3.2.3.4 Furniture.....	58
3.2.3.5 Noise	59
3.3 RELATIONSHIP BETWEEN THERAPEUTIC ARCHITECTURE AND THE DESIGN OF A DRUG REHABILITATION CENTRE.....	61
CHAPTER 4	63
4.1 INTRODUCTION.....	63
4.2 FEDERAL NEUROPSYCHIATRIC HOSPITAL (DRUG WARD)	63
4.2.1 The Brief	64

4.2.2 Concept	65
4.2.3 Building Form and Circulation System	65
4.2.4 Finishes	66
4.2.5 Energy Requirements.....	67
4.2.6 Critique	68
4.3 NDLEA BAYELSA STATE COMMAND	70
4.3.1 The Brief	71
4.3.2 Concept	72
4.3.3 Building Form and Circulation System	72
4.4 Finishes	73
4.3.5 Energy Requirements.....	75
4.3.6 Critique	75
4.4 REHABILITATION CENTRE GROOT KLIMMENDAAL.....	77
4.4.1The Brief	78
4.4.2 Concept	79
4.4.3 Building Form and Circulation System	82
4.4.4 Finishes	83
4.4.5 Energy Requirements.....	85
4.4.6 Critique	86
4.5 REDBRIDGE WELCOME CENTRE.....	88
4.5.1 The Brief	88
4.5.2 Concept	89
4.5.3 Building Form and Circulation System	92

4.5.4	Finishes	93
4.5.5	Energy Requirements.....	93
4.5.6	Critique	94
4.6	ALTA MIRA RECOVERY PROGRAM	96
4.6.1	The Brief	96
4.6.2	Concept	97
4.6.3	Building Form and Circulation System	98
4.6.4	Finishes	98
4.6.5	Energy Requirements.....	99
4.6.6	Critique	100
CHAPTER 5	103
5.1	INTRODUCTION	103
5.1.1	GEOGRAPHICAL LOCATION.....	103
5.2	THE CRITERIA FOR CHOOSING A SITE	105
5.2.1	LANDMARKS	106
5.2.2	ACCESSIBILITY TO THE SITE	108
5.3	SITE ANALYSIS	109
5.3.1	CLIMATE.....	109
5.3.2	RAINFALL.....	109
5.3.3	TEMPERATURE	109
5.3.3.1	Maximum Temperature	110
5.3.3.2	Precipitation Amounts.	111
5.3.4	RELATIVE HUMIDITY.....	111

5.3.5 WIND.....	111
5.3.6 MINERALS	112
5.3.7 CLOUDY AND SUNNY DAYS.....	112
5.3.8 EXISTING STRUCTURES ON SITE	113
5.3.10 SOCIAL INFRASTRUCTURE.....	114
5.3.10.1 Transportation	114
5.3.10.2 Electricity	114
5.3.10.3 Communication.....	114
5.3.10.4 Drainage.....	114
CHAPTER 6	115
6.0 PROJECT GOALS AND OBJECTIVES.....	115
6.1 FUNCTIONAL AND SPACE CRITERIA	115
6.1.1 Communal Space	116
6.1.2 Residential Space.....	120
6.1.3 Administrative Space.....	123
6.1.4 Circulation Space.....	126
6.1.5 Service Space.....	128
6.1.6 Recreational Space.....	134
6.1.7 Commercial Space	135
6.1.8 Landscape	136
6.2 TECHNOLOGICAL AND ENVIRONMENTAL CRITERIA	141
6.2.1 Security	141
6.2.2 Building Materials and Finishes	141

6.2.3 Lighting.....	142
6.2.4. Climatic Factors	142
6.2.5 Acoustics.....	142
6.2.6 Emergency Exits	142
6.2.7 Plumbing.....	143
6.2.8 Electrical Services.....	143
6.2.9 Fire Safety	143
6.3 LEGAL AND PLANNING REGULATIONS.....	143
6.4 BEHAVIOURAL AND AESTHETICS CRITERIA	144
CHAPTER 7	145
7.0 DESIGN PHILOSOPHY, CONCEPTS AND ITS JUSTIFICATION.....	145
7.1 DESIGN DEVELOPMENT PROCESS	145
7.1.1 SITE ZONING.....	145
7.1.2 BUBBLE DIAGRAMS AND FLOW CHART	147
7.2 CONCLUSION.....	147
References	148

LIST OF MAPS

Map 5.1: Showing Bayelsa State	103
--------------------------------------	-----

LIST OF FIGURES

Figure 2.1: Showing the drug treatment and care process	10
Figure 2.2: Showing the functional relationship between spaces in a hospital	16
Figure 2.3: Picture showing the floor plan and elevation of the Breitfuss model	20
Figure 2.4: Picture showing the floor plan and elevation of the Double-combed structure	21
Figure 2.5: Picture showing the floor plan and elevation of the Arcade structure	23
Figure 2.6: Picture showing the floor plan and elevation of the Cross structure.....	24
Figure 2.7: Picture showing the floor plan and elevation of the Branched structure.....	26
Figure 2.8: Showing Antonius Hospital	27
Figure 2.9: Picture showing the floor plan and elevation of the Linear structure	27
Figure 2.10: Picture showing the floor plan and elevation of the Pavilion structure.....	29
Figure 2.11: Showing Isala Clinics.....	30
Figure 3.1: Showing a single side corridor design for natural ventilation.....	44
Figure 3.2: Showing a central and courtyard corridor design for natural ventilation.....	44
Figure 3.3: Showing a wind tower design for natural ventilation.....	45
Figure 3.4: Showing an atrium and a chimney design for natural ventilation	46
Figure 3.5: EN12464-1: Schedule of illuminance and recommendations related to hospitals and healthcare buildings.	50
Figure 3.6: Showing the description of the types of fixtures.....	53
Fig 3.7: Colour wheel of emotional psychology.....	54
Figure 3.8: Showing the Minimum-Maximum Design Criteria for Noises in Interior Spaces	60
Figure 4.1: Showing the ground floor plan of NDLEA-Bayelsa State Command where rehabilitation takes place.....	73

Figure 4.4: The ground floor of Rehabilitation Centre Groot Klimmendaal	80
Figure 4.5: The first floor of Rehabilitation Centre Groot Klimmendaal	80
Figure 4.6: The second floor of Rehabilitation Centre Groot Klimmendaal	81
Figure 4.7: The third floor of Rehabilitation Centre Groot Klimmendaal.....	81
Figure 4.8: The fourth floor of Rehabilitation Centre Groot Klimmendaal	82
Figure 4.9: The fifth floor of Rehabilitation Centre Groot Klimmendaal	82
Plate 4.17: The exterior view of Rehabilitation Centre Groot Klimmendaal	83
Figure 4.10: The concept sketch of Redbridge Welcome Centre	89
Figure 4.11: The ground floor of Redbridge Welcome Centre.....	90
Figure 4.12: The first floor of Redbridge Welcome Centre.....	90
Figure 4.13: The second floor of Redbridge Welcome Centre	91
Figure 4.14: The third floor of Redbridge Welcome Centre	91
Figure 4.15: A section through Redbridge Welcome Centre.....	92
Figure 4.16: A section through Redbridge Welcome Centre.....	92
Figure 5.1: Chart showing average temperature and precipitation	110
Figure 5.2: Chart showing maximum temperatures.....	110
Figure 5.3: Chart showing precipitation amounts.....	111
Figure 5.4: Chart showing wind speed	112
Figure 5.5: Chart showing cloudy, sunny and precipitation days.....	113
Figure 6.1: Showing functional layout of a restaurant kitchen.....	116
Figure 6.2: Showing floor arrangement of a café	117
Figure 6.3: Showing parallel table arrangement	117
Figure 6.4: Showing space requirements for server and diner.....	118

Figure 6.47: Showing farm type gate.....	140
Figure 6.48: Showing medium-duty car park barrier gate	140
Figure 7.1: Showing noise zoning on the site	145
Figure 7.2: Showing traffic zoning on the site.....	146
Figure 7.3: Showing zoning of functions on the site	146
Figure 7.3: Showing bubble diagram and flow of activities on the site	147

Figure 6.5: Showing optimum cinema.....	119
Figure 6.6: Showing screen formats for the same height.....	119
Figure 6.7: Showing screen formats for the same width	120
Figure 6.8: Showing the arrangement of a single bedroom in a hospital	120
Figure 6.9: Showing the arrangement of a double bedroom in a hospital	121
Figure 6.10: Showing the arrangement of a bathroom with a shower tray.....	121
Figure 6.11: Showing floor plan of a two-person open ward	122
Figure 6.12: Showing elevation of a two-person open ward	122
Figure 6.13: Showing possible layout of a small room in a combined office	123
Figure 6.14: Showing ergonomic workstation with fixed table height	123
Figure 6.15: Showing filling cabinets in a records office.....	124
Figure 6.17: Showing minimum area for doctors' consultation room.....	124
Figure 6.18: Showing minimum area for examination of a reclining patient.....	125
Figure 6.19: Showing a plan of a nurses' station.....	125
Figure 6.20: Showing the space requirements between walls allowing 10 per cent for easy movement.....	126
Figure 6.21: Showing the space requirement for a gurney and a wheelchair	126
Figure 6.22: Showing the plan and section of a staircase around a square well.....	127
Figure 6.23: Showing plan view of lift shaft with different types of door openings.....	127
Figure 6.24: Showing plan view of lift shaft that can accommodate a gurney.....	128
Figure 6.25: Showing a display of the kitchen, finishing area and servery	128
Figure 6.26: Showing a display of the kitchen	129
Figure 6.27: Showing an accessible toilet floor plan.....	129

Plate 5.2: Picture showing the proposed site of within NDUTH.....	105
Plate 5.3: Picture showing public secondary school.....	106
Plate 5.4: Picture showing church in the area.....	107
Plate 5.6: Picture showing road leading into NDUTH	108
Plate 5.7: Picture showing road within NDUTH	108
Plate 5.8: Picture showing existing site features.....	113
Plate 5.9: Picture showing drainage systems on site.....	114

LIST OF PLATES

Plate 2.1: Picture showing Layenburg Hospital.....	20
Plate 2.2: Picture showing St. Antonius Hospital.....	22
Plate 2.3: Picture showing Flevo Hospital.....	24
Plate 2.4: Picture showing Rijnstate Hospital.....	25
Plate 2.5: Picture showing Vlietland Hospital.....	28
Plate 3.1: Showing the garden of dreams in Children Cancer Centre, Southern California.....	36
Plate 3.2: Showing the friendship garden in Children Cancer Centre, Southern California.	36
Plate 3.3: Showing the buggy garden in Children Cancer Centre, Southern California.....	37
Plate 4.1: Showing entrance into the drug ward.....	63
Plate 4.2: Showing a ward in the drug ward.....	64
Plate 4.3: Showing the floor plan of the drug ward.....	65
Plate 4.4: Showing a corridor in the drug ward.....	66
Plate 4.5: Showing tiled bathroom in the drug ward.....	67
Plate 4.6: Showing barricaded windows and security camera in the drug ward.....	68
Plate 4.7: Showing the entrance into NDLEA-Bayelsa State Command.....	70
Plate 4.8: Showing the kitchen in NDLEA-Bayelsa State Command.....	71
Plate 4.9: Showing the dayroom in NDLEA-Bayelsa State Command.....	72
Plate 4.10: Showing interlocking tiles on NDLEA-Bayelsa State Command site.....	74
Plate 4.11: Showing floor tiles inside NDLEA-Bayelsa State Command building.....	74
Plate 4.12: Showing hedges around NDLEA-Bayelsa State Command site.....	75
Plate 4.13: Showing an artwork in NDLEA-Bayelsa State Command.....	76
Plate 4.14: The exterior of Rehabilitation Centre Groot Klimmendaal.....	77

LIST OF ABBREVIATIONS AND ACRONYMS

AA: Alcoholic Anonymous

AIDS: Acquired Immunodeficiency Syndrome

EuHPN: European Health Property Network

HIV: Human Immunodeficiency Virus

HCF: Health Care Facility

NIDA: National Institute of Drug Abuse

NDLEA: National Drug Law Enforcement Agency

SAD: Seasonal Affective Disorder

TC: Therapeutic Community

UN: United Nations

UNODA: United Nations Office of Drug Abuse

UNODC: United Nations Office on Drugs and Crime

WHO: World Health Organization

ABSTRACT

Drug abuse has become an issue of concern not only in Nigeria but in the world at large. The aim of this study is to design a drug rehabilitation centre for Bayelsa state by adopting the concept of therapeutic architecture with a view to creating a healing environment for its users. Information from existing literature and case studies were used to examine the effect of therapeutic architecture on patients' recovery and the unique problems in the design of drug rehabilitation centres. The study was able to identify safety, security and serenity as the major considerations in the design of a drug rehabilitation centre. However, the researcher identified that the components of therapeutic architecture were grievously lacking in the Nigerian case studies. From the findings, in order to address this issue of concern, the concept of therapeutic architecture was adopted in the design of a drug rehabilitation centre in a bid to improve patients' recovery. This was evident in the buildings floor plan, landscape design, site zoning, interior design and spatial analysis.