



UNIVERSITY OF
KWAZULU-NATAL

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**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

BY

Aadila Jinnah

212522875

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for the degree of
Master of Architecture

Supervised By

Lawrence Ogunsanya

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
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DECLARATION:

I declare that this dissertation is my own, unaided work and carried out exclusively by me under the supervision of Lawrence Ogunsanya. It is being submitted for the degree of Master in Architecture at the University of KwaZulu-Natal. It has not been submitted before for any degree or examination in any other university.

.....

Aadila Jinnah

.....day of.....year.....

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
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ACKNOWLEDGEMENTS:

Bismilla-hi-rrahman-i-rrahim – “In the name of God the most gracious, the most merciful.”

Firstly I would like to thank the Almighty, He has given me this wonderful opportunity to further my studies and conduct this research. It is His work and guidance that has brought me thus far in life.

I would like to thank my Parents Ismail and Ruxana for their love and support.

I am thankful and extremely appreciative to you Junaid, I cannot thank you enough for being the amazing husband you are and my pillar of strength.

To my in-laws Mahomed and Khatija Moolla thank you for the continued love and support.

To my sister Naadira, You have shown me that distance means little when you are so close to my heart. Thank you for the love and encouragement when I needed it the most.

To the Asmal and Jinnah family, thank you for the love and prayers.

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My supervisor Mr Lawrence Ogunsanya who has motivated and believed in me and encouraged me to pursue my passion and guided me throughout my dissertation.

To all of you, *Jazakallahu khairun* (May the Almighty reward you with GOODNESS)

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

DEDICATION

I dedicate this dissertation to my parents, Ismail and Ruxana Jinnah.

Mom & Dad

How could I possibly thank you enough, to the ones who made me whole?
The ones to whom I owe my life, the forming of my soul.
The ones who tucked me in at night, the ones who stopped my crying.

The ones who were experts, at knowing when I was lying,
the ones who made such sacrifices, to always put me first.
Who let me test my broken wings, in spite of how it hurt.
Who painted the world a rainbow, when it was filled with broken dreams.
Who explained it all so clearly, when nothing was what it seemed.

What way is there to thank you, for your heart, sweat, your tears,
for ten thousand little things you did, for so many years.
For changing with me as I changed, accepting all my flaws.
Not loving because you had to, but loving “just because”.
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For always being proud of me, for being my most reliable friends.

And so we come to realize, the only way to say.
The only thank you that’s enough, is clean in just one way.
Look before you, and see what I’ve become. Do you see yourselves in me?
The job that you have done?
All your hopes and all your dreams, the strength you show each day.

The best of you was passed to me in each and every way.
Thank you for the gifts you give, for everything you do.
But most of all, thank you for making my dreams come true.

Author: Unknown

Love and Duas (prayers) Aadila

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

Abstract

South Africa is a developing country with a rich heritage and a past etched in the lives of its people. The year 2018 marks 24 years into a new democracy yet the country still faces a multitude of challenges. One of these challenges being government funded healthcare, more so healthcare for the physically disabled with mobility impairments. Focusing on the Greater Durban Metropolitan Area it is clear that the current community is divided into two extremes these being a small population of the elite and a large population of the poor. In current times the gap between these two groups is increasing rapidly. This meaning that proper healthcare is easily accessible to one group whereas the other is left with little hope of recovery.

This dissertation is aimed at developing an understanding of the needs of the physically disabled during their recovery process, and how meaningful architecture can aid in this process. This study specifically explores how the needs of the physically disabled can be incorporated into the architectural design process and in turn work towards physical rehabilitation. The research conducted explores theories and concepts related to the physical and psychological healing process. It identifies architectural spaces and elements that should be incorporated into these centres of healing to encourage rehabilitation and promote revitalization.

This study critically analyses the current level of facilities provided for physically disabled people with mobility impairments in the Durban area. It also analyses successful international models which can be adapted to South Africa and in turn initiate the path to better healthcare. Lastly, the data acquired from both primary and secondary sources are compared and various conclusions and recommendations are drawn up. These can be used as design guidelines for buildings which focus on architecture that promotes healing for the physically disabled.

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

TABLE OF CONTENTS

DECLARATION.....	2
ACKNOWLEDGEMENT.....	3
DEDICATION.....	4
ABSTRACT.....	5
TABLE OF CONTENTS.....	6 to 10

PART ONE

BACKGROUND RESEARCH ON ISSUES

CHAPTER 1: INTRODUCTION.....	11
1.1 BACKGROUND AND JUSTIFICATION OF THE STUDY	
1.1.1 Background.....	11
1.1.2 Motivation.....	12
1.2 DEFINITION OF THE PROBLEM, AIMS AND OBJECTIVES.....	13
1.2.1 Definition of the problem.....	13
1.2.2 Aims.....	14
1.2.3 Objectives	14
1.3 SETTING OUT THE SCOPE	15
1.3.1 Delimitation of research problem.....	15
1.3.2 Definition of terms.....	15, 16
1.3.3 Research Questions.....	17
1.4 THEORETICAL FRAMEWORK.....	17, 18
1.5 RESEARCH METHODS AND MATERIALS.....	
1.5.1 Introduction.....	18
1.5.2 Research Methods.....	18
1.5.3 Research Materials.....	19
1.5.4 Sampling.....	19
1.6 OUTLINE OF CHAPTERS.....	20
1.7 THEORETICAL FRAMEWORK	21

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

CHAPTER 2: CONCEPTUALIZING PHYSICAL DISABILITY WITHIN THE LOCAL COMMUNITY.....	22
2.1.1 Introduction.....	23
2.1.2 Prevalence of Disability in South Africa & the Greater Durban Municipal Area	24
2.1.3 South African Legislation & Policy Relating to Disability.....	25
2.1.4 Conclusion.....	26, 27
CHAPTER 3 UNDERSTANDING DISABILITIES AND THE BUILT ENVIRONMENT.....	28
3.1 DISABILITY WITHIN THE BUILT ENVIRONMENT.....	29
3.1.1 Introduction.....	29
3.1.2 Perceptions of the Built Environment.....	29
3.1.3 Physical aspects of disability and the environment.....	30
3.1.4 Social aspects of disability and the environment.....	31, 32
3.1.5 Participation, Empowerment.....	33
3.1.6 Vocational Training.....	34
3.1.7 Conclusion.....	35
3.2 THE IMPACT OF THE BUILT ENVIRONMENT ON HUMAN PSYCHOLOGY	35
3.2.1 Introduction.....	35, 36
3.2.2 Architectural psychology.....	37
3.2.3 Sensory Architecture.....	38
3.2.3 Impact of the built environment on human senses.....	39
3.2.4 Impact of the built environment on the healing process.....	40, 41
3.2.5 Conclusion.....	42
CHAPTER 4: DESIGNING THE BUILT ENVIRONMENT AROUND THE PHYSICALLY CHALLENGED.....	43
4.1. INTRODUCTION.....	44
4.2 IDENTIFYING AN ARCHITECTURAL MODEL OF DISABILITY WITHIN THE BUILT ENVIRONMENT- SALUTOGENIC ARCHITECTURE IN HEALTHCARE SETTINGS.....	44
4.2.1 Introduction.....	45

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

4.2.2 The sense of coherence and the generalised resistance resources.....	45
4.2.4 Architecture and patient manageability.....	46
4.2.5 Architecture for patient comprehensibility.....	46, 47
4.2.6 Architecture for patient meaningfulness.....	48
4.3 AESTHETICS, THE BUILT ENVIRONMENT AND HEALTH.....	49
4.3.1 Legibility and wayfinding.....	50, 51
4.3.2 Connections with nature.....	52, 53
4.3.3 Interior design factors.....	54
4.3.3.1 Improving the experiential nature of the building.....	54
4.3.3.2 Views of the outdoors.....	55
4.3.3.3 The effects of lighting.....	56
4.3.3.4 The psychological effects of colour	57, 58
4.3.3.5 Materials and textures.....	58
4.4 UNIVERSAL DESIGN.....	59
4.4.1 Introduction.....	60
4.4.2 Universal access regulations and strategies.....	60
4.4.3 Universal design principles as a driver for user comfort.....	61
4. 4.3.1 Equitable use.....	61
4. 4.3.2 Simple and intuitive.....	61
4. 4.3.3 Low physical effort.....	61
4. 4.3.4 Translating universal design into spaces.....	61
4.5 GENIUS LOCI AND SENSE OF PLACE.....	62
4.6 CONCLUSION.....	62

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

CHAPTER 5: PRECEDENT STUDIES.....	63
5.1 PRECEDENT STUDY ONE - PETER ROSEGGER NURSING HOME.....	64
5.1.1 INTRODUCTION.....	65
5.1.2 ANALYSIS.....	66
5.1.2.1 Legibility and wayfinding.....	66 to 68
5.1.2.2 Contact with nature.....	69
5.1.2.3 Enhancing experience in the building.....	69
5.1.2.4 The psychological effects of colour and use of materials.....	70
5.1.2.5 A home like environment.....	71, 72
5.1.3 CONCLUSION.....	72
5.2 PRECEDENT STUDY TWO - THE SPAULDING REHABILITATION HOSPITAL	
5.2.1 INTRODUCTION.....	73, 74
5.2.2 ANALYSIS.....	75
5.2.2.1 Legibility and wayfinding.....	75
5.2.2.2 Contact with nature.....	76
5.2.2.3 Enhancing experience in the building.....	76
5.2.2.4 The psychological effects of colour and use of materials.....	77
5.2.2.5 A home like environment.....	78
5.2.3 CONCLUSION.....	78, 79
CHAPTER 6: CASE STUDY.....	81
6.1 CASE STUDY ONE - SAINT GILES	82
6.1.1 INTRODUCTION.....	83
6.1.2 ANALYSIS.....	84
6.1.2.1 Legibility and wayfinding.....	84
6.1.2.2 Contact with nature.....	84, 85
6.1.2.3 Enhancing experience in the building.....	85
6.1.2.4 The psychological effects of colour and use of materials.....	86
6.1.3 CONCLUSION.....	86

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

6.2 CASE STUDY TWO - THE BROWNS SCHOOL.....	87
6.2.1 INTRODUCTION.....	88
6.2.2 ANALYSIS.....	88
6.2.2.1 Legibility and wayfinding.....	88
6.2.2.2 Contact with nature.....	89
6.2.2.3 Enhancing experience in the building.....	90
6.2.2.4 The psychological effects of colour and use of materials.....	91, 92
6.2.3 CONCLUSION.....	93
CHAPTER 7: DATA ANALYSIS AND DISCUSSION.....	94
7.1 Introduction.....	95
7.2.1 Qualitative Study Analysis.....	96
7.2.1 Staff and Healthcare Professionals.....	96, 97
7.2.2 Summarised Interview Questions.....	98
7.3. Summary.....	99
CHAPTER 8: DESIGN DEVELOPMENT AND RECOMMENDATIONS.....	100
8.1. Conclusion.....	101
8.2 Outcomes of Research Questions.....	102
8.3 Recommendations.....	103, 104
PART B- DESIGN DEVELOPMENT.....	105
8.4 Client Brief and Requirements.....	105
8.5 Building Typology.....	106
8.6 Schedule of Accommodation.....	106 to 108
8.7 Criteria for Site Selection.....	108 to 111
8.8 Final Design Proposal.....	112 to 118
REFERENCES.....	119 to 122
LIST OF FIGURES.....	123 to 126
APPENDIX A (interview Questions)	127,128
APPENDIX B (Ethical Clearance).....	129

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

1.1 INTRODUCTION

1.1.1 Background

The built environment is designed by man, and man interacts and lives within it, and so, is it not safe to say that the built environment should comply with the needs of the occupant? All individuals have constant contact with the built environment, and the buildings they interact with shapes their lives both physically and psychologically. When physically disabled people with mobility impairments are brought into the equation of the built form verses user comfort the results are somewhat disappointing. Buildings today are not entirely designed based on inclusively both on a practical and social level and in most cases the occupant or user pays the price.

Physical disability is one of the most common human conditions, and more pervasive than many people realize. Statistically, it is likely that everyone will experience some form of disability in their lifetime, even if only temporarily. (TCUD, 1998) According to official statistics 7.5% of South Africans live with disability, this figure sits at 15% thorough the rest of the world. (Health 24, 2016) Amongst the many problems faced by physically challenged people, healthcare is a major topic of concern.

There is relatively sparse data on how persons with disabilities access health care in Durban. Within the GDMA a number of hospitals and clinics do not often have the proper facilities to rehabilitate patients for extended periods. More often than not these public healthcare facilities cannot cope with patient numbers and as a result persons with disabilities are often rushed back into their old lives not knowing how to deal with their new challenges. As unique individuals we may be unable to change certain circumstances like a physical disability for example, but what we can do is adapt the environment to cater for these specific needs so that the person lives in relative comfort and ease.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

1.1.2 Motivation

The physically disabled community have specific needs when it comes to healing and social interaction. More often than not the conventional methods of treatment often deal with only the medical aspect of the healing and neglect the psychological implications. The built environment plays a vital role in the patient's recuperation process. Most of the existing facilities lack the stimulation patients need in order to make a full recovery. A further challenge arises where health service planning as a whole overlooks rehabilitation as an element of primary health care. (Sherry, 2013)

This special care facility is aimed at aiding in the healing process of the physically challenged through an architectural model which will promote user comfort for all people despite their impairment.

Primary motivations for this study are:

- The built environment directly affects disabled people with mobility impairments as well as their perception of space and their interaction with it. This study will test how the built form can promote holistic healing.
- A facility is needed to educate rehabilitees and give them the skills they need to be reintegrated into society.
- This rehabilitation facility will facilitate a change of perception that majority of the community has about disabled people and their perceived 'inability' to contribute to society.

The challenges and aims outlined above justify the need for research in this specific field of study. It is vital that an architectural model be designed that relates to building accessibility for the physically challenged, their needs and to effectively revitalise the concept of healthcare for the physically challenged in the built environment.

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

1.2 DEFINITION OF THE PROBLEM, AIMS AND OBJECTIVES

1.2.1 Definition of the problem

To better put into context the extensiveness of disability in South Africa a Report from Stats SA (2005) is briefly analysed and broken down to interoperate the facts and figures. (Stats SA, 2005) According to statistics the total number of disabled people in South Africa sits at 5% of the national population. This growing percentage has increased from 4.7% in the year 1998 and later increased to 4.8% in the year 2002. These statistics clearly illustrate an increase in disabled people in South Africa. The report determined that within the KwaZulu-Natal province a total of 470,588 people are disable. This number represents 5% of the provinces people. Stats SA totalled the percentage of people with physical disabilities to 29.6%. (Stats SA, 2005)

These statistics indicate the importance of addressing the topic of disability in South Africa sooner rather than later. Highlighting the issues surrounding disability is the key to overcoming these challenges. The growing number of disabled people in South Africa means that the infrastructure of the country has to develop and adjust accordingly. It is clear that if our current built environment does not adapt, it will continue to hinder the healing process of disabled people in the community. Amongst the many concerns when it comes to facilities for the physically disabled, healthcare is at the top of the list.

There are two major concerns with regard to the healthcare of the physically challenged. The first being that general hospitals are not equipped to deal with the specific care required by the physically disabled for extended periods of time, nor can they cope with the number of patients they receive. The second challenge being that environments under which this care takes place is not optimally suited to its purpose.

Most rehabilitation facilities are part of general hospitals and as a result have a very cold and clinical feel to them. This atmosphere builds up negative perceptions and that is not conducive to rehabilitation. Current facilities also limit interaction with the outside world, this initiates forms of depression and mild levels of anxiety. These so called healing environments defeat their intended purpose of healing the body and have the opposite effect on the mind.

The proposed special care centre will be conducive to healing and will deal specifically with stroke, amputees and paralysis patients. It will be equipped with the trained personnel and facilities to address the above and related problems. Furthermore, this dissertation explores the process of recovery and reintegration of the physically disabled, and their influence on the architectural built form. It will examine the different

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

methods of healing the body through medical and natural healing processes. A strong emphasis will be placed on both conceptual and theoretical frameworks to analyse the problem.

1.2.2 Aims

The intended aim of the research is as follows:

- The fundamental aim of this care facility is to provide a design guide line for future projects of this nature, incorporating universal design and sensory architecture to aid in the healing process.
- The secondary aim of this research is to investigate how the physically challenged perceive and interact with the build form and how architecture can aid in the reformation of the physically disabled.

1.2.3 Objectives

It is intended that the research conducted in this dissertation will enable future projects of this nature to be more responsive to the needs of the physically disabled. The focuses is on how the built form can aid in the rehabilitation process of the physically disabled and how this process will enable them to be reintegrated into society.

The intended objectives are as follows:

- To underpin the fundamental concepts related to physical disability and how these can drive an architectural model. Focusing on universal access Salutogenic architectural design and sensory architecture.
- To better understand the requirements of the disabled by establishing specific spacial design principles which are necessary to create a sensitive environment.
- To translate these needs into a successful environment which promotes the recovery process both on a physical and mental level.
- To seek advice from professionals in the field as well as families of those who are physically challenged, to better understand what they need out of a facility of this nature and how they perceive the current built environment.
- To study and assess current architectural models of rehabilitation and how they have responded to these requirements through analysing pertinent precedent studies and case studies.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

The research method is a qualitative one, based on the fact that the research is focused on gaining a better understanding of the varied experience during the recovery process of the physically disabled through the eyes of the professionals involved.

1.3 SETTING OUT THE SCOPE

1.3.1 Delimitation of research problem

The research has been conducted with the end result being a special care centre for the physically challenged in the city of Durban. The research carried out is of an experiential nature and therefore methods of obtaining information will be on a qualitative basis.

The research will not be responsible for rectifying the current facilities available for the physically disabled, but merely analysing their shortcomings within the built forms. To limit the scope of this study, the research deals primarily with better understanding of the recovery process of the physically disabled and the environment that best encourages the healing process. This research conducted in this study shall not commit to any constructions, recommendations or conclusions that exceed the boundary of the field of architecture. The various specifications are to be strictly dealt with by the specialists and qualified medical practitioners in the field of study related to physical disability.

This centre will not provide permanent residency to physically disabled people. Patients will be housed for a maximum of three months wherein they will reach a point of recovery enabling someone to take care of them or they can take care of themselves. It will only cater for physical disabilities such as stroke, paralysis and amputee and no other disabilities such as mental disability etc.

1.3.2 Definition of terms

- *Disability*

Disability can be defined as the disadvantage some members of society face it can also refer to the restriction of various activities based on individual limitations which can be a result of actions taken by social organizations. Disability also refers to physical impairments that individuals may face such as paralysis, blindness or deafness.

- *Universal design*

Universal Design or UD for short is a design approach which ensures individuals receive the best quality of life despite their ability. Universal design is the design process which enables and empowers a multitude of

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

the population by improving their capabilities within an environment as well as their health and wellness, thus improving their social interaction and participation (Steinfeld and Maisel, 2012)

- ***Salutogenic Architectural Design***

The salutogenic model of healthcare focuses on the concept that healthcare research should have the ability to identify the numerous factors that cause a positive healthcare environment in order to aid existing knowledge on the prevention, treatment and management of existing negative healthcare environments. (Antonovsky, 1979)

- ***Healing***

To restore or be restored to health (www.dictionary.com)

- ***Psychology***

Psychology can be defined as the scientific approach to studying the human mind and how the mind functions in relation to different situations. This takes a closer look at how situations affect an individual's behaviour. (www.prezi.com)

- ***Holistic***

The term holistic defines the treatment of an individual from all points of view be it mentally, socially and even physically. This focuses of healing the person from dimensions other than merely the symptoms of a specific disease.. (www.dictionary.com)

- ***Impairment***

The concept of impairment simply means to lack a part of a limb of a limb entirely. It can also define some cases where an individual has a defective limb.

- ***Rehabilitation***

According to the UN definition on rehabilitation, rehabilitation can be defined as a process which is aimed at enabling an individual who has various disabilities to reach their desired and optimal ability despite their disability. This is done through various means such as giving them the tools they require to improve their standard of living and give them the skills they need to live a better life.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

1.3.3 Research Questions

Key question

- How can the rehabilitation and reintegration of disabled people inform an architectural design process?

Sub questions

- What are the needs of physically disabled people?
- How do people with physical disabilities perceive their built environment?
- Does nature (the outdoors) play a part in the healing process?

1.4 Concepts and theories

There are a number of theories and concepts linked to rehabilitative spaces and sensory design. Through an analysis of these theories and concepts a framework will be established which will serve as the basis of the research. The work of some authors and theorists such as Selwyn Goldsmith, Roger S. Ulrich, Joye Yannick, Juhani Pallasmaa and Christian Norberg Schulz. A Theoretical framework is vital in exploring how a topic can in fact relate to the social world. Various concepts of theoretical value determine approaches to different situations, and define questions and how to best answer them. In reality there is no single theory that answers or explains everything however they do aid in understanding inter disciplinary challenges as well as social relevance. (Eyles,1997).

The following concepts and theories are discussed in detail further in the dissertation:

1. Inclusive/ Universal architectural design is designing buildings which are accessible to everyone despite their age or ability. This dissertation unpacks the principles of universal design and how it aids in the design process.
2. Salutogenic theory is a means of understanding the entire spectrum of the healthcare profession. It provides an overarching narrative structure that transcends the various individual differences between people. Salutogenic architectural theory provides a foundation for informed decision making where specific knowledge is not accessible.
3. Architectural psychology is a theory which explores the field of environmental psychology. It highlights the link between human beings and the natural elements of different environments. This theory is explored further in chapter two as it has also been found to promote positive effects on human functioning and can reduce anxiety and stress (Yannick, 2007)

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

4. Genius- loci or sense of place is a concept within the philosophical division of ‘architectural phenomenology.’ Within this field of the architectural discourse, a theorist by the name of Christian Norberg-Schulz highlights many interesting concepts in his book, *Genius Loci: Towards a Phenomenology of Architecture*. In today’s times, the human aspect of buildings is often ignored, and more emphasis is placed on architectural form. However, it is imperative that there is a shift in focus so that a building better suits its users.

5. Sensory architecture also known as responsive architecture is design that interacts with people. It engages directly with building users and makes them interact with their environment. This type of design evokes the senses and impacts on the way people feel, think, and behave. It takes careful consideration of the occupant and how they use spaces. It pays careful attention to the way a space may impact the occupant both in the short and long term.

This chapter provided a basic overview of key concepts and theories underpinned in this study. These ideas promote an architectural typology which is sensory-rich and accommodates for the physical, mental and psychological experiences which are assisted by nature. When it comes to nature and architecture the idea that a beautiful garden can in fact create healing benefits that exceed the walls of a healthcare building. The main aim of this study is to understand both the physical and psychological experiences encounter by people with physical disabilities and understanding how they can be incorporated it into all aspects of architectural design process. The above mention theories can be combined in order to create an environment that is conducive to healing and rehabilitation.

1.5 RESEARCH METHODS AND MATERIALS

1.5.1 Introduction

This section highlights and breaks down the range of methods used during the data collection process and what materials were used to collect the relevant data which support this dissertation topic. This chapter also identifies the methods of sampling used to better understand the research.

1.5.2 Research Methods

Due to the aims and objectives of this dissertation the method of research is of a qualitative nature. The information required questioned the relevant people based on their life experiences. The qualitative research methods were specifically designed to reveal characteristics of the target audience’s behaviour and their perceptions with regard to different topics addressed in this dissertation. This in-depth study targeted various specialists who deal with disabled people as well as families of disabled people. To gain their knowledge

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

and perceptions on the topic. Qualitative research was the most applicable as it is a form of inquiry that analyses information conveyed through language and behaviour in natural settings (Berkwits, 1998).

1.5.3 Research Materials

This study involved obtaining data from both primary and secondary sources. The primary qualitative methods of research included in the study were in-depth interviews with individuals, group discussions and diary and journal exercises; as well as in-context observations. Sessions with interviewees were conducted in person, by telephone and via email where necessary. Due to strict ethical purposes enforced by the research and ethics committee, no physically disabled people were interviewed, all relevant service providers involved in the study were briefed in detail and provided with consent forms and were given the option to remain anonymous. Utilising this method will peruse the experiences of people with physical disabilities by the use of alternate means, however this approach still provides first-hand knowledge and experiences on the issue being addressed. The secondary data collection methods used were in the form of literature, reports, newspapers, magazines and journals as well as government documents were also used to support the research and to gain an in depth understanding of the research being addressed.

1.5.4 Sampling

The type of sampling used was purposive, this form of gaining information was selected to create a better understanding of the research problem of the study.

The following professionals were interviewed:

Iqbal Naroth of Naroth Architects - An architect with vast knowledge in the field

Mrs Colleen Bailey – Principal of Browns School

Mr Noel Moodley – Principal of Browns School

Mr Christy Moothusamy –DMC Orthotics and Prosthetics

Miss Brenda Craig – Saint Giles

Mrs Ruxana Jinnah – City Hospital

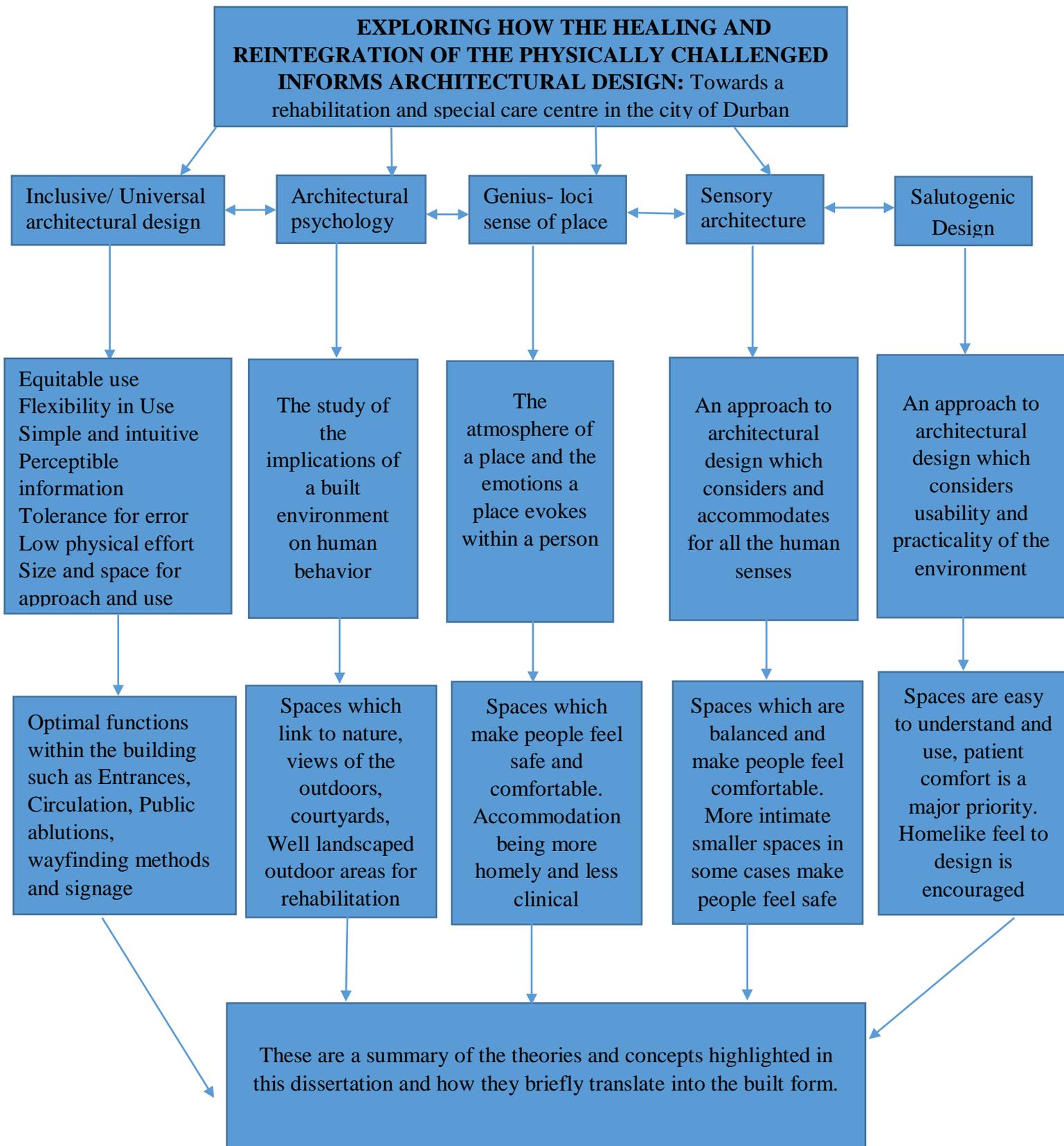
**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

1.6 OUTLINE OF CHAPTERS

This dissertation is divided into four main sections. The First section consists of chapter one which breaks down the methodology of understanding and the theoretical frameworks that underpin this dissertation. The second section breaks down the core of the dissertation. It is divided into four chapters which present the theoretical framework in great detail as well as the literature review aspect. Section three provides case studies through empirical research as well as related precedent studies. This section analyses existing examples from a local and international point of view and evaluates them based on the framework drawn up in the previous chapter. The fourth and final section aims to analyse and sum up the research presented and draw conclusions to the topic as well as recommendations for future projects.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

1.7 THEORETICAL FRAMEWORK



**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

**CHAPTER 2:
CONCEPTUALIZING PHYSICAL DISABILITY WITHIN THE LOCAL COMMUNITY**

CHAPTER 2: CONCEPTUALIZING PHYSICAL DISABILITY WITHIN THE LOCAL COMMUNITY

2.1.1 Introduction

South Africa is known to have a heterogeneous society with vast inequalities, class conflict and social segregation due to the inadequate institutional and planning policies of the past. It is clear that the apartheid ideology has resulted in an unbalanced distribution of services. This is closely related to the unequal funding of virtually sparse facilities and inadequate access to health services for the disadvantaged population. Citizens' rights are governed and supported by South African Constitution in connection with the United Nations Convention on the Rights of Persons with Disabilities. These governing bodies regulate the rights to health for physically disabled people in South Africa however, to this very date, the health care service planning sector tends to overlook the rehabilitation process as an element of primary health care. There is plenty of evidence which clearly suggests that physically disabled people as well as their families experience even greater health risks and as a result relatively worse access to care. (Sherry, 2013)

In South Africa alone, "4.3% of the South African population is disabled." With acknowledgement of the current unemployment rate of 27.7% of people with disability find it more difficult to secure employment. -
STATS SA

Before delving into the depths of physical disability in Durban it is crucial to understand the term 'Disability'. According to the definition provided by the World Health Organisation's (WHO) International classification of impairments, disabilities and handicaps (2002), disability is defined as 'any restriction (resulting from an impairment or lack of ability to perform an activity in the manner or within the range considered normal for a human being'. This definition clearly highlights disability as a functional limitation for example the inability to walk, resulting from an impairment such as spinal cord injury or amputation.

Disability is perceived in many different ways, most not so encouraging. The local community often misconstrues the concepts disability with inability. More often than not people who are physically challenged still have a sound mind and have the capabilities of abled- bodied people. The day-to-day activities which the able-bodied person takes for granted are usually out of reach, or unavailable, to the wheelchair-bound person (Imrie, 1996). It is then safe to say that if provided with the necessary amenities physically challenged people can actually be contributing members of society.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

2.1.2 Prevalence of Disability in South Africa & the GDMA

Racism, economic deprivation and political repression are many of the key contradictions around the world and are ever so prevalent in the South African social system, which was based on the policies of apartheid. It is clear that the nation's health was inseparable from the economic, social and political structure of the country. The many years of great oppression have torn apart the social fabric of South African society leading to a major crisis, especially with regard to people's health and the healthcare system. (Sherry, 2013)

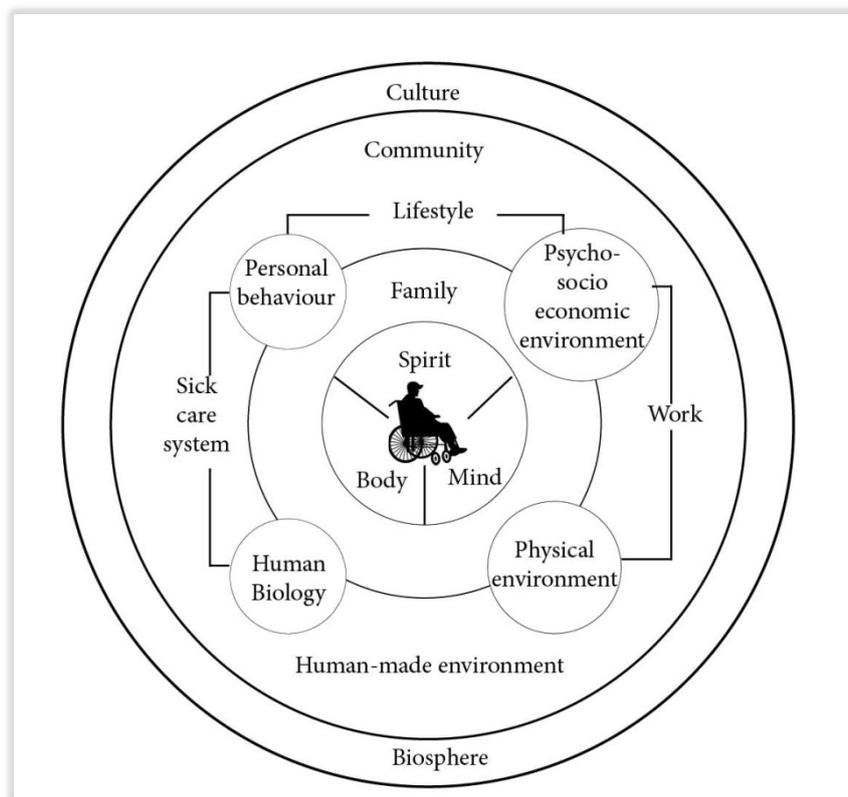


Figure 2.1.2.1: The human ecosystem (Adapted form Hancock, 1993:18)

When analysing health care within the local context it is clear that the concept is not one dimensional. The figure above illustrates the human ecosystem adapted from Hancock, 1993, it clearly exemplifies how the individual relates to their environment. This model recognises that the determinants of health are multi-factorial. It includes different variables such as the physical and social environment, as well as culture, at the individual level and moves to the global ecosystem. The model signifies that the determinants of health are more than just the provision of hospital and medical services. It is noted that a broad range of public policies at the local and nation levels determine the quality of the health care system. The model recognises that local government can play a vital role in improving the health and wellbeing of many individuals and even communities as a whole. (Sherry, 2013)

2.1.3 South African Legislation & Policy Relating to Disability

A nation's health policy is commonly part of its general overall social policy. A vital part of any healthcare policy is to improve the health status of the population. A great concern raised by Gwatkin and Guillot (2000) is that the health care systems is dominated by the government, the medical profession as well as business interests. These institutions and various structures assist in maintaining the system that disseminates underdevelopment and ill health. There is a pressing need to transform the nature of the medical sector.

Since 1994 the South African health care system has undergone numerous changes. During this period communications with the disability sector were still very prominent, which led to the development of the Integrated National Disability Strategy (INDS). This was seen as the backbone of integrated rights for the physically disabled. During Nelson Mandela's presidency disability was categorised as a priority focus area for government. (NCPD 2016)

During the first term of the former president Jacob Zuma "Disability" was moved to the Department of Women, Children and Persons with Disabilities. Over time Disability was classified under various categories which portrayed it as less important. Disability was later moved to the Department of Social Development this was seen as the final straw. This move rendered the efforts of previous pioneers useless and left the entire Disability sector feeling as though they had moved back decades. (NCPD 2016)

Latest developments suggest that government has taken the lead in developing a much stronger Disability Rights Policy for South Africa which is based on The United Nations Convention on the Rights of Persons with Disabilities (UNCRPD). Although it seems conflicting to establish a separate policy for the disabled, especially when government is trying to promote equality and inclusiveness, it is imperative. (NCPD 2016).

During the last two decades the development of legislation and policies aimed at protecting the rights of disabled people have been developed. The government of today has firmly engrained issues on disability in the constitution by proclaiming that no one in South Africa can be discriminated against on the basis of being disabled. There are a number of legislative acts which focus specifically on disability discrimination.

These include and are not limited to:

The Promotion of Equality and Prevention of Unfair Discrimination Act 2000:

This Act deals primarily with the prevention, prohibition and elimination of unfair discrimination guaranteeing equality before the law. The conditions of this Act state that neither the government nor any

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

person may unfairly discriminate against any person on the basis of disability. Significantly, the Act rules that the promotion of equality is the responsibility of persons operating in the public and private domains which include and are not limited to the government, the private sector, parastatals and the community at large (South African Human Rights Commission (SAHRC) Report, 2002, p. 21)

Skills Development Act (SDA), No. 97 of 1998

The aim of this Act was to implement structures and processes which transform the process of skills development in South Africa. The main purposes of the Act is to develop the employment opportunities of people previously disadvantaged by unfair discrimination, and to redress those disadvantaged through training and education.

Social Assistance Development Act, No.59 of 1992

This Act makes provisions for assessments for disability and care-dependency grants. These are conducted by various medical practitioners who evaluate information and determine whether a person qualifies for the disability grant. The government provides successful candidates with a sum of R940 on a monthly.

These are just a few pieces of legislation which provide for an excellent basis for promoting the human rights of disabled people. However this challenge is on-going and needs more support from the community at large.

2.1.4 Conclusion

How different people come to terms with their disabilities depends very much on the context of their personal biographies. Their experiences are invariably influenced by the cultural values of the society in which they live (Williams, 1984; Radley, 1993; Bozo, 2009). It can be said that disability in is a negative function of a unaccommodating society which fails to embrace and acknowledge people with various impairments. It is evident that disability is a by-product of the current society where negative attitudes of people and uninviting environment prevail.

It is clear then that, disability not only deals with the physical inabilities of an individual but it is very much built up by social norms and opinions. It is often presumed that people who have disabilities such as blindness, deafness, or even restricted mobility due to loss of limbs or paralysis have special needs. However these needs only become “special” within a broader context which ignores, relegates or fails to

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

take these individuals into consideration in the first place. The topic of disability can sometimes be challenging and sensitive. It is a category of discussion which comprises of a diverse group of individuals. It is imperative that values, goals and opinions of society have to be changed. (Kurawa, 2010)

New behaviours have to be learnt in order to face new challenges introduced by disability. From observations it has been noted that although physical disability deals with an individual it occurs within a social context. Factors such as health care, poverty, cultural deprivation, lack of education, and a dejected job market directly influence and impact on a disabled person (Kurawa, 2010).

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

**CHAPTER: 3
UNDERSTANDING DISABILITIES AND BUILT ENVIRONMENT**

CHAPTER: 3 UNDERSTANDING DISABILITIES AND BUILT ENVIRONMENT

3.1 DISABILITY WITHIN THE BUILT ENVIRONMENT

3.1.1 Introduction

People often ask the question ‘How many disabled people are there?’ a statistic taken from the OPCS (Classification of Interventions and Procedures code) in response to this question, is somewhat 6 million people around the world, which is roughly 10 percent of the total population. Applying this logic to the built form it is supposed that 10 percent of public building users are disabled people. Although not all age groups of disabled people would use the same functions within the built form. Take a hotel for example it is used more significantly by middle-aged adults and less by children. Whereas a local shopping store is possibly more frequented by elderly people, middle age people as well as children. Is it therefore safe to say the all buildings should cater for people with disabilities despite the function of the building? (Williams,1984)

3.1.2 Perceptions of the Built Environment

The United Nations Convention on the Rights of Persons with disabilities strongly emphasizes that disabled people have equal rights to participation. The built environment in many ways defines how people with disabilities interact, communicate and live. The various factors of the environment such as social, physical and psychological dimensions are significant to the experience of a place. (Marie,2016)

Maurice Merleau-Ponty a French phenomenological philosopher looks at the bond between the world and one’s self as an inseparable one. He believes that as the world confronts our body, our body is immediately responsive to it. (Shirazi; 2009) Merleau-Ponty thereafter goes on to explain that the movement of the body is what provides one with the perception of the world. If our body is responsible for orientation and perception, it is safe to say that physical disability will in some way affect the way in which a person experiences the environment.

From a statistical point of view an analysis of a survey done with regard to the accessibility of the public environment, a large proportion of the respondents in the GDMA (80%) noted that their environment was rather inaccessible thereby restricting movement. When people were questioned with regard to the public realm, three main areas of concern stood out. These were mainly access to roads and pavements, entry points to public buildings and the outdoor environment in general. (Konar,2008)

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

Majority of the people felt that both public and commercial buildings do have an opportunity to create conditions for universal access. Many people noted that access to buildings including banking institutions, schools, shopping malls, libraries and public recreational buildings within the GDMA is very limited as it can only be accessed via stairs. This limited access adversely affects the mobility of majority of the respondents and is clearly a stumbling block in their daily lives. (Konar,2008)

The above findings clearly correspond with the strong view that most buildings, facilities and equipment within the GDMA are designed predominantly for the average able-bodied person. It is quite evident that the disabled person is not catered for. In order to make public spaces more accessible greater consideration needs to be taken with regard to mobility and user comfort, it is therefore imperative to make public spaces and outdoor environments more accessible to disabled people in the GDMA. By enabling them it would significantly improve the quality their lives and in turn the lives of people in general.

3.1.3 Physical aspects of disability and the environment



Figure 3.1.3.1: The physical environment and disability (Source: www.jeffpreston.ac)

There are numerous effects physical disability has on people and majority of these effects have to do with the environment in which the person interacts. Factors such as the economic, cultural, physical, institutional and social norms within the environment can either be responsible for success or failure when it comes to the participation of physically disabled people in society . Taking the physical environment as an example, it ideally caters for the needs of the “average” person and not a person with special needs. As a result, many people with physical impairments face restrictive environments on a daily basis and more often than not are unable to interact and socialise with the broader community. (Law, 1999)

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

There are various causes of physical disability, one being congenital disability (Which are disabilities from birth as a result of genes and secondly an environmentally determined disability as result of a tragic accident. The degree and type of disability varies from one individual to another based on their circumstances. Here age plays a major role as people from various age groups all face different challenges with regard to their physical environment. As physically disabled people age they are exposed to greater challenges within the physical environment.

Adolescents are faced with a different set of environmental challenges, the healthcare environment, housing, transport and the working world to name a few. For people with physical disabilities these dynamic changes and the decisions they make are strongly influenced by the physical environment. (Coetzee, 1999) Housing is considered as one of the few most basic provisions a human needs and often determines their quality of life. It is noted that in order for people to participate fully in society, disabled people should be able to live and interact inclusively (Konar, 2008). Transportation is another great concern, much of the public transportation facilities available in the GDMA are not always accessible for people with physical disabilities, and is seen as one of the largest barriers to their independence.

3.1.4 Social aspects of disability and the environment



Figure 3.1.4.1: Does the social environment really cater for the physically disabled or is it a pretence? (Source asdteacher.com)

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

There are many complex details behind the manner in which a community functions. The various relationships between the history of the area, the people, their social groups as well as public institutions all play a role. In order to develop or change any aspect of the community the complexity of these interrelationships have to be understood. “What happens to the effort will in large measure be determined by the degree to which it is based on, a realistic conception of the complexity and distinctiveness of that community” (Sarason,1974).

The social environment is a major contributor to a disabled person’s rehabilitation process and negative interactions can limit their progress. Social attitudes of the community can in fact be the biggest handicap. Physical disability has an effect on both the mind and the body. Statistics show that people with disabilities are more prone to having psychiatric disorders and the chances of them being socially isolated increases by five. People with physical disabilities may suffer from severe mental breakdowns and even depression. (World report on disability)

This is where a sense of community has a major role to play, having a sense of community creates the feeling of belonging. The traditional concept of a ‘community’ refers to the geographical location for example, a neighbourhood, town or city. However, the essence of the term from a social standpoint reflects the reality of a society in which people actually relate to each other based on their shared interests and skills (Butterworth, 2000).

The concept of a community embracing every individual despite their social standing can be a complex task to achieve. The United Nations Convention on the Rights of Persons with Disabilities (2007) is noted as one of the latest international effort to tackle social exclusion. One of the driving principles include ‘full and effective participation and inclusion in society’ of persons with disabilities. The elimination of discrimination on the grounds of disability is one of the main focal points. However the implementation of these actions may not necessarily change societal customs and practices (McConkey ,2015).

Dealing with social inclusion as an adult can prove to be more difficult and require a great deal of effort. It has been identified that there are three essential ways in which individuals react and respond to how the public labels their disability. The first is that they can deny its existence, this deals with the recent stages of disability, secondly they learn to accept it, or lastly they can seek indirect benefits from the situation. (Clinard, 1974). Socially the community can play a vital role in helping to reintegrate people with physical disabilities starting by simple accepting them for who they are.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

3.1.5 Participation and Empowerment and vocational training



Figure 3.1.5.1: Empowering physically challenged people within the workplace (Source: passionatepeople.invacare.eu.com)

Individuals despite their ability or inability all have different experiences and attitudes about disability inclusion. In most cases people with disabilities seek the same opportunities and lifestyles as people without disabilities. They want to attend school, develop skills, acquire a job, build a home and establish roots from which they can grow. What they do not want to be segregated or isolated from society. They want to be able to participate fully in daily activities with their families and friends. This is what the concept of inclusion means to them. (ILO, 2015)

The common misconception made about people with physical disabilities is their inability to contribute to the working world. As an adult one of the biggest accomplishments in life is the surety of employment. Employment essentially translates into self-reliance, boosts self-esteem, builds social status, and of course generates an income (MassMutual, 2011). The lack of their inclusion is simply brought down to the inadequate physical working environment and the poor attitudes of employers. The incorporation of disabled people into the working environment and their subsequent vocational adjustment is a critical social and economic responsibility (Schoeman, 1980) and should be catered for.

Participating in civil life has been identified as one of the core human needs, it is seen as essential to the psychological health of both individuals and the community. There are various aspects of the built environment that influence people's levels of participation, for example architectural design, environmental stressors, the characteristic of geographical and built areas, the diversity of a community's demographic profile, current sociocultural norms, customs and traditions, and even social and neighbourhood networks.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

The concept of meaningful participation plays an important role in the numerous decisions that affect people's lives and is an integral component of their empowerment. (Butterworth, 2000)

3.1.6 Vocational Training



Figure 3.1.6.1: Vocational training could help South Africa to reach its goals, as outlined in the National Development Plan, to reduce unemployment. (Source: Brand South Africa)

Vocational Education and Training (VET) provides various forms of technical training for work in the trades. These integrated programs generally focus on providing individuals with hands-on instruction. In developing countries Vocational Education and Training (VET) as well as the training sector is a crucial form of gaining knowledge. According to UNESCO Vocational Education and Training should be a vital aspect of the various educational processes in all countries (UNESCO, 2001). Within communities that are under-privileged and marginalised VET provides them with access to skills as well as entry routes into the labour market. (Gardner, 2009) Vocational Education and Training develops integral skills within an individual namely craftsmanship, practical experience and practical problem-solving. When it comes to incorporating people with physical disabilities into the working world, vocational training is an ideal route as it equips these individuals with skills that there is a demand for within the community. A report published by Media Club Stories indicates that vocational education can bridge the skills gaps within the South African community as well as boost productivity, enhance industries and increase employment.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

3.1.7 Conclusion

The interplay between human interaction and the built environment varies in many ways, due to the diversity of our people and the difficulties we face. It is clear that disabled people in general are marginalized and excluded from the mainstream society bracket. (Kitchin, 2010). However in order to develop a clear understanding about barriers of physical disability and the challenges of accessibility, it needs to be understood from new and diverse perspectives. Research and ideas need to be followed up by theories which focus on both the individual and the environment. Individuals need to be understood from a physical, psychological and social dimension. (Marie,2016)

The ability of an individual to cope with their disability will depend very much on the degree and type of disability as well as the individual's circumstances. The propensity of a person to negotiate reality is a fairly cognitive process, it has been found to have various adaptive links among people in common places and traumatic situations (Janoff-Bulman, 1989). People with disabilities face a number of barriers in terms of performing everyday activities. The impact of disability on their life can be major, in particular cases where an individual has multiple disabilities or even paralysis. (Profile of disability in Western Australia, 2018) This can be frustrating for the individual and lead to self-doubt and severe depression. It is noted that depressive symptoms and disorders can result from functional limitations with everyday activities and adversely even cause them (Wells et al.1989, Penninx et al.1998, Heikkinen et al. 2004).

3.2 THE IMPACT OF THE BUILT ENVIRONMENT ON HUMAN PSYCHOLOGY

3.2.1 Introduction

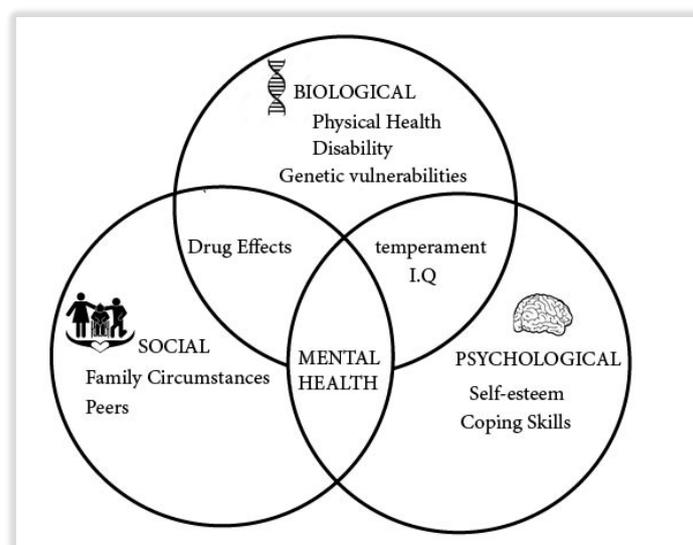


Figure 3.2.1.1: Integrating mental health with overall wellness (Source: Author Sketch)

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

Rapoport (1995) states that the "design of any environment must be based on the psychological impact of such an environment on people, their moods, behaviour and social interaction." He emphasizes the inclusion of the human aspect of design.

While trying to understand human psychology it is important to note its origin, which goes back times further than recorded history. The concept of understanding the invisible dimension of the human mind has always been a field of interest. Going back to the fourth and fifth centuries a Greek scientist Aristotle dealt with the intriguing issues that are trying to be understood even today. (Schulz, 1991: 19). It is stated that the literal meaning of psyche is the soul, however in psychology it defines cognitive elements such as perceptions and feelings. These perceptions and feelings are expressed through the body and it is therefore affected by the surrounding environments. (Rasoulpour, 2017)

To better perceive the role the built environment plays in people's lives it is crucial to first understand what the meaning of environment is. The definition of the environment is fairly in-depth and is linked to what is expected of that environment. Geographers define the environment as land and weather. Whereas psychologists define the environment by the people within it and their individual characteristics. Architects are known to define the environment as the buildings, open spaces and landscapes which encompass it. (Porteous 1977). Within any definition of the built environment, there is a drawn up set of capabilities in which human activities take place and these environments directly influence the human psyche. (Rasoulpour, 2017)

According to (Bickenbach, 2012) the concept of disability has various definitions and more often than not the society chooses how to define it. Firstly it can be defined as "a multidimensional phenomenon that includes intrinsic features of both the human body and mind; secondly it can be seen as the outcome of an interaction between features of the person (physical impairments and functional limitations) and features of the overall built environment and lastly disability is a universal human condition, rather than the distinguishing mark of a discrete minority" (Bickenbach, 2012).

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

3.2.2 Architectural psychology

“The conceptions which people have of the places in which they find themselves, are frequently the scientific key which will unlock the processes by which those places have their impact.” (Canter, 1970)

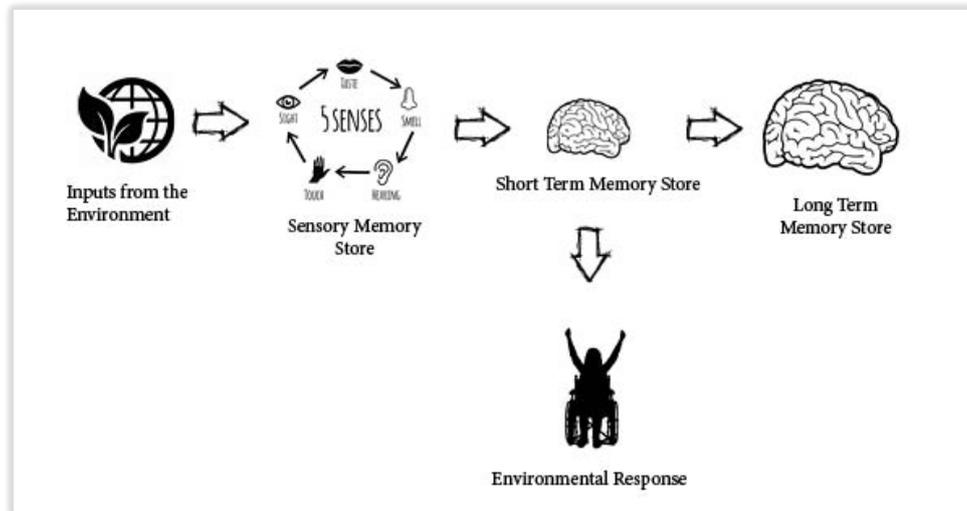


Figure 3.2.2.1: How people process environmental activities (Source: Author sketch)

Architectural psychology can be defined as “The study of the implications of a built environment on human behavior.” (Nugent, 2013) The further exploration of the field of architectural psychology indicates that human beings are drawn to various natural elements and landscapes. According to Kaplan (1995) Natural settings are often the preferred destinations for extended restorative opportunities. Research suggests that this theory promotes a positive effect on the human body and mind. Although interaction with nature has such a positive effect on the human psyche in today’s times it has been considerably reduced. This can be seen as a driver of the fact that modern evolution has an underlying effect on psychological and physiological health. (Yannick, 2007)

It is clear that the role played by the natural environment in the healing process is vital. Therefore the architectural design of buildings should encourage views of the outdoors. Relaxing spaces should have windows which open up to well landscaped gardens. Courtyards also facilitate the idea of being outside but still within a controlled environment.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

2.2.3 Sensory architecture



Figure 2.2.3.1: Sense of Sight, Sound, Smell, Taste and Touch (Source: [www. worldatlas.com](http://www.worldatlas.com))

Sensory architecture makes reference to an approach to architectural design which considers and accommodates for all the human senses. This approach has a close link to architectural psychology based on the fact that the senses transmit information to the mind, which receives this information and thereafter reciprocates the appropriate response. Psychology relates closely to the senses and how human beings understand and perceive various components of architecture: texture, form, light, colour, materials, scale and patterns (Canter, 1970).

What are the human senses? It is common for people to respond to this with words such as touching, tasting, smelling, seeing, and hearing. These are the senses which people have a good understanding of. When it comes to the experience of architecture human beings interact with the built environment in all forms and architecture directly affects our senses.

Focusing on the physically challenged, these being people who suffer from strokes, paralysis or are amputees the senses that affect them in most cases will be balance and movement. Balance within the human body is as critical as balance within the environment. A balanced environment means that the people using this space enjoy the environment they are in. Movement can refer to how people experience and interact within their environment. Movement of people have a very real effect on the environment and in fact shape their environment by defining how they use it. People express themselves with body language and movement. This can often be used to judge how comfortable a person is in a space.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

3.2.4 Impact of the built environment on human senses

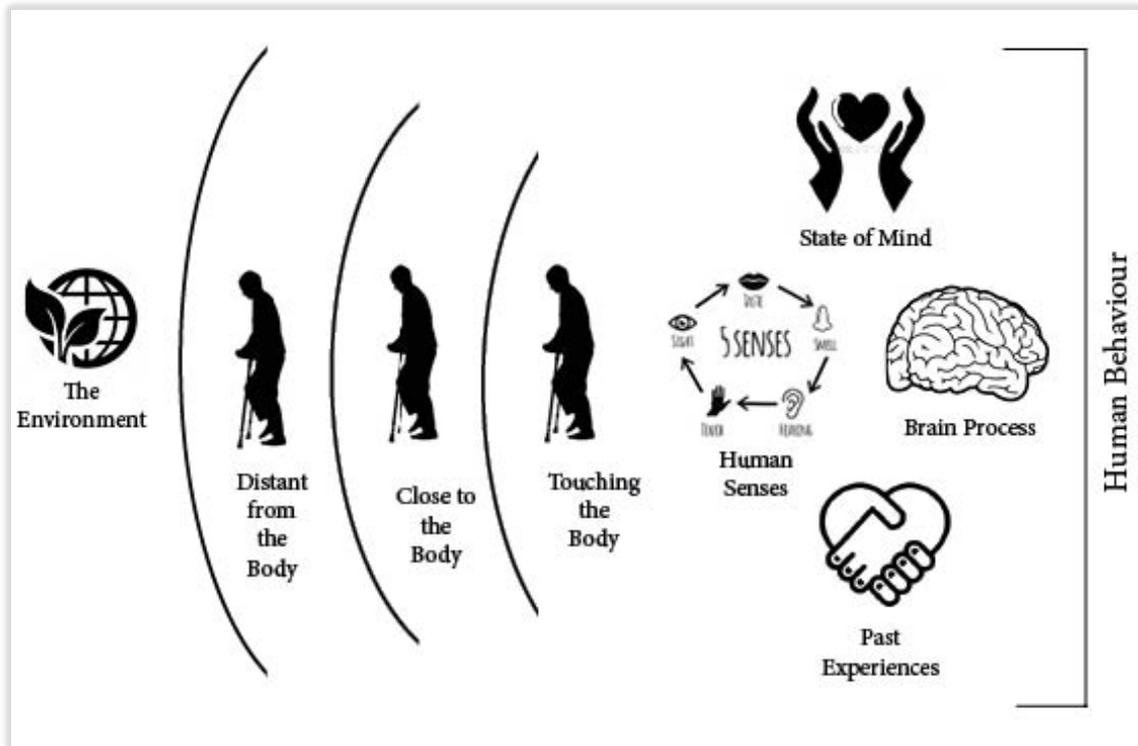


Figure 3.2.4.1: How the environment affects human behaviour (Author Sketch)

“It is evident that ‘life-enhancing’ architecture has to address all the senses simultaneously and fuse our image of self with our experience of the world... Architecture articulates the experiences of being in-the-world and strengthens our sense of reality and self; it does not make us inhabit a world of mere fabrication and fantasy.” (Pallasmaa, 2005; pp. 11)

Does design in actual fact affect human senses? This may be perceived as a fairly simple question so in actual fact it should have a relatively simple answer. It is understandable that the senses are what enable man to interoperate the world around them. The eyes visualize it, the ears hear it, the nose takes in the smell, and the mouth tastes it. These are the five predominant senses they allow humans to take in new environments and recognise familiar ones. The process of understanding spaces stimulates sensations within the body and mind which later influence opinions of that space.

Generally people are familiar with the five senses these being touching, tasting, smelling, seeing, and hearing. These are the common senses which people have a good understanding of. “The five senses are each gateways of healing. The eyes which give us sight are gateway to colour healing; the ears which give

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

us hearing are a gateway for music therapy; the sense of touch lends itself to massage; the sense of smell to aromatherapy and the sense of taste to our diet.” (Gimbel, 1993.) This emphasises the massive effect the environment has on the user both on a mental and physical level. Human behaviour is essentially determined by how the senses are affected by architectural spaces.

“We shape our buildings and afterwards our buildings shape us” a comment made by Winston Churchill, a British politician in his speech at the House of Commons in 1944 is rather apt till today. People design and build their environment around their needs, preferences and functionality of day to day life, however the built environment intern influences how people live their lives within these spaces. Professor Roger Ulrich, whose study focus is concerned with the effects of built environment on the well-being of its users, strongly agrees with the above and says: “There is increasing scientific evidence that poor design works against the well-being of patients” (Ulrich, 1995). According to the Gestalt School of Psychologists, there is an important relationships between stimuli for the senses, and the surrounding context. “The most crucial property is that our experience of our environment is notably temporal and sequential” (Canter, 1975)

3.2.5 Influences of built environment on the healing process

The concept of health refers to not only the physical well- being of a person but very much the state of their social and mental well-being. Healthcare facilities are institutions where people seek treatment, provided by specialists in the field. In current times it has been noted that the various effects the physical environment has on the healing process as well as peoples well-being have become increasingly relevant (Huisman, 2012). The physical environment plays a vital role in supporting care facilities, as well as individuals and their social interactions. However it is challenging to determine the proportion of health outcomes which can be directly attributed to the physical environment (Stichler, 2001).

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban



Figure 3.2.5.1: Facilities which limit patients to being patients can in fact be detrimental to their recovery process (Source: www.hospitalcare.com)

Healthcare facilities are designed with specific criteria in order to optimise care, however what is often forgotten is that architecture itself has the power to impact on a patient's recovery. Christopher Alexander highlights the emphasis hospitals put on sickness, the absorbent costs they involve and the fact that hospitals create sickness as opposed to curing it due to the fact that doctors only get paid when people are unwell. Alexander firmly believes in order for a system of healthcare to be successful in maintaining people's good health both physically and mentally it has to focus on health not sickness. He also draws attention to the fact that healthcare facilities need to be in close proximity to where people actually live so they are in fact accessible. Alexander continued that the ideal model of healthcare should focus on activities which heal and develop where healthcare is only an incidental addition. (Alexander, 1977).

Healthcare facilities are run based on a system of hierarchy, there are the doctors at the top, the matrons, nurses and lastly the patients. This is the first error these facilities emphasise. *"Patients are kept as patients, they understand themselves to be patients; in certain cases they reveal themselves as patients. They have no useful occupation, no work, nothing useful they can show at the end of the day, nothing to be proud of."* This statement emphasizes the fact that healthcare facilities constantly reinforce a patient's illness thus promoting it. (Alexander, 1977).

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

A new term 'healing architecture' describes the physical setting and the organizational culture within healthcare environments which support patients as well as their families through traumatic medical incidents. It highlights that the built environment using creative design strategies can positively affect patient recovery in various less evasive ways.

The main aim of healing architecture is to engage patients during their healing process as a result spaces are specifically designed to be nurturing and therapeutic.

Some of the key aims of healing architecture is as follows:

- The reduction in stress levels within healthcare facilities can promote healing benefits for its users.
- To connect patients to nature by providing outdoor views.
- Enhance the patient's ability to make choices and feel in control by offering options such as lighting levels, privacy and socialization.
- Encouraging the opportunity for social support by providing seating in patient rooms, privacy for small groups and even overnight accommodation facilities in patient rooms.
- Providing activities which are positive distractions such as interactive art, music and even internet connections.

Healing architecture encourages the improvement of patient's experiences in order to bring architecture to life within healthcare facilities. It is fundamental that a holistic approach be taken to ensure the most effective results.

3.2.6 Conclusion

Everyday life is 'framed' within the cityscape. Over time these places may seem invisible in the greater context of life (Dovey, 1999). However the built environment provides the backdrop in which people live their lives. It impacts on their senses, emotions, participation in society, choice of physical activities, the sense of community and overall their wellbeing. Life is given meaning by spaces generated within the built environment (Butterworth, 2000) it is for this reason that careful considerations have to be made when designing environments which shape people's lives. Healthcare design is multidimensional and aiding the mind to heal inevitably heals the body.

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

**CHAPTER 4: DESIGNING THE BUILT ENVIRONMENT AROUND THE PHYSICALLY
CHALLENGED**

CHAPTER 4: DESIGNING THE BUILT ENVIRONMENT AROUND THE PHYSICALLY CHALLENGED

4.1. INTRODUCTION

When unpacking architectural disability the focus is on how the architect designs in order to empower and enable the building user. There are many factors to consider in design and there are various elements one can make use of which minimize the discomfort for all building users. The rudimentary issues surrounding the built environment and its role in human life stems from the meaning of environment. In literal terms the environment is seen as the surrounding space in which all creation lives. The environment has great influences on man's behaviour and interaction. Humans draw information from the environment through cognitive processes which help them comprehend their surroundings. These methods of interpretation are both innate and learnable and aid in making a link between cognition and perception. (Gibson, 1966).

4.2 IDENTIFYING AN ARCHITECTURAL MODEL OF DISABILITY WITHIN THE BUILT ENVIRONMENT- SALUTOGENIC ARCHITECTURE IN HEALTHCARE SETTINGS

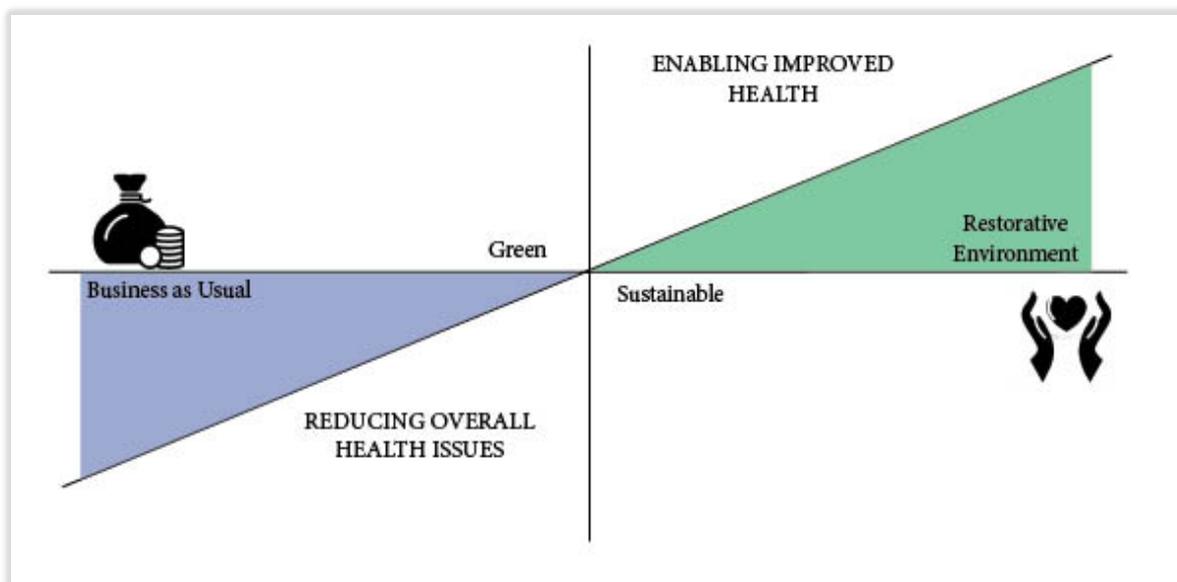


Figure 4.2.1: Salutogenesis through healthy buildings, focusing on factors that support human health

(Source: Author Sketch)

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

4.2.1 INTRODUCTION

The concept of salutogenic theory is widely used in the design of healthcare facilities and incorporating this design method has yielded exemplary results. The term best describes a model for the various socio-environmental influences on the healthcare environment. The salutogenic theory is a very powerful tool for understanding the numerous impacts the design process has on the healthcare environment. There is substantial evidence which shows that aesthetic design factors in the healthcare environment can in fact improve the outcomes of patients. There are a number of supporting theories such as “views of nature” (Ulrich 1991), colour, lighting and seating layouts (Hurst 1960; Vaaler, Morken, & Linaker 2005). Although these are all essential to hospital design what can't be ignored is the fact that architecture can actually be psychologically manipulative, in a positive or negative manner. The built environment does this by creating a perceptive narrative for the user. (Golembiewski 2016).

According to Mittelmark & Bull the salutogenic theory is not entirely a perfect model of health however it is the steppingstone to understanding what current facilities of this nature lacks. (Antonovsky 1996). To narrow it down salutogenesis is a method of understanding the wellness and illness spectrum and provides an overarching narrative of a structure which transcends all individual differences.

4.2.2 THE SENSE OF COHERENCE AND THE GENERALISED RESISTANCE RESOURCES

Salutogenesis essentially proposes that if a person's emotional, psychiatric and somatic health is constantly maintained their ability to adapt to life changing circumstances is fairly strong. However the opposing view is also true, where the demand exceeds ones capabilities and they succumb to their illness or disability (Antonovsky, 1972). In the world of health and wellness stress plays an integral role in the healing process. Causes of stress are relatively subjective and there are various solutions which can in fact help people to deal with them. These forces are labelled 'sense of coherence' (Antonovsky, 1979). The sense of coherence is noted as the sum of all the generalized resistance resources minus all the generalized resistance defects (Antonovsky, 1987).

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

Resources can be divided into three interrelated categories resources that can enhance comprehensibility, those that enhance the manageability of situations, and those that enhance meaningfulness of life.

Comprehensibility deals with a person's ability to make sense of their environment and negotiate through life's challenges. Manageability deals with a person's ability to carry out day to day activities to the extent of maintaining homeostasis within the body. Lastly the idea of meaningfulness which according to Antonovsky (1979) and Frankl (1963), is the foundation of a person's desire to live. The concept of meaningfulness is very personal and draws from peoples individual connections with their environment.

4.2.3 ARCHITECTURE AND PATIENT MANAGEABILITY

In the traditional healthcare setting the concept of manageability is important. Healthcare facilities take extra precautions to ensure that the environment is more manageable for all building users from the staff to the cleaners and patients. The previously the concept of manageability looks directly at the functioning of the facility such as infection control, patient oversight and efficient catering and less at the aesthetics. However incorporating the concept of Salutogenesis can ensure that the facility runs further by paying great attention to how design aspects can enhance a patient's recovery and resources (Golembiewski 2010).

4.2.4 ARCHITECTURE FOR PATIENT COMPREHENSIBILITY

The aims of salutogenic design in contrast to traditional approaches to architecture for healthcare facilities is twofold. Firstly it aims to improve manageability for the institution itself, but simultaneously improve the manageability, comprehensibility and meaningfulness of all patients. Comprehensibility focuses on the ability of a person to understand and negotiate their environment for themselves. Traditionally patients were unaware of their circumstances and it was expected that the doctor would treat them accordingly. However in today's times this is changing. People are now being exposed to tools that allow self-diagnosis and even treatment. This awareness to some extent has brought about a positive change in healthcare industry as people can identify illness early. (Parker 2000).

After centuries of neglect, architectural design has begun taking an initiative towards providing patient comprehensibility in an evocative way. The centre for Respite and Recovery illustrates how the centre is designed around reassuring patients that they are in the best possible facility for their recovery and it is indicated that given this knowledge assists in their recovery (Golembiewski 2016). Here a great emphasis is placed on intuitive wayfinding on a minor scale for patients to help themselves.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

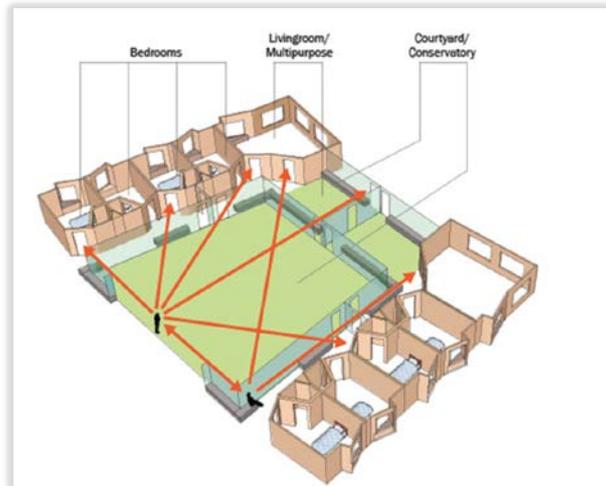


Figure 4.2.4.1: Facilities where everyone has good observation, not only the staff. This is an essential response to recovery centred models of care. (Source: MAAP- Aecom and Makower Architects)



Figure 4.2.4.2 : The plan of The Centre for Respite and Recovery. The Design incorporates gardens and an aviary also, where patients can keep and train birds. These rehabilitation facilities aim to maximise opportunities for self-empowerment. (Source: MAAP, Aecom and Makower Architects)

Comprehensibility from a salutogenic point of view is more in-depth than patients merely understanding their medical conditions. Patients are given purpose by enabling them to learn and develop skills and enhance their personal success. The question is then posed as to how healthcare architecture can enhance a person's sense of personal growth. The fundamental aspect of comprehensibility within the healthcare setting surrounds the narrative of a patient's overall experience during their journey to recovery. Generally during this process patients find themselves drawing up narratives about the results of their treatment and are naturally inclined to perceive the worst. The hospital environment echoes the same negativity with its clinical appearances rooms with no windows, vinyl curtains and machines with flashing lights just to name a few.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

The hospital environment should rather encourage a sense of comfort and healing. To better understand the idea of comprehensibility within the built environment Golembiewski uses examples from Centre for Respite and Recovery here there are private bedrooms with larger beds which open onto natural gardens, where lights can be adjusted to suite the mood and windows and doors are actually usable. Material finishes are used to suite their purpose and soften surfaces where need be. The building was dynamically designed in order to give patients a confident feeling in their internal and external environments. (Antonovsky 1987).

4.2.5 ARCHITECTURE FOR PATIENT MEANINGFULNESS

A person's coherence is strongly defined by their concept of life and its meaning. Taking this into consideration architects and designers should pay careful attention when designing new and improved healthcare facilities. Although meaningfulness is an imperative consideration within the healthcare facility it is very closely linked to the real-world. According to Golembiewski the significant thoughts people have are likely to surround religion, politics, family, music, literature and art. He reiterates that the hospital environment is not one of the most ideal places to support the concept of meaning due to the fact that patients are from their so called meaningful environments. The hospital setting is synonymous with social isolation where visiting hours are restricted amongst the numerous other restrictions. Here Golembiewski proposes a different form of creating meaningfulness. He gives the example of The Khoo Teck Puat Hospital in Singapore which provides a variety of plant species, encouraging the exposure to forms of wildlife in the public areas. They even have a butterfly register which is intended to inspire the patients with the wonders of the world.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban



Figure 4.2.5.1: The patient relaxation spaces at Khoo Teck Puat Hospital, the environment encourages wildlife with the intention to enrich meaningfulness in patients. (Source: CPG Consultants)

4.3 AESTHETICS, THE BUILT ENVIRONMENT AND HEALTH

For thousands of years man has found ways of building structures as protection from danger, social threats and as a means of easing discomfort. The role architecture plays in terms of its protective nature is as fundamental as its effect on human psychology. (Golembiewski2013) The built environment is designed around the needs of man and as a result experiences are created within the built environment. Once a safe living environment is established man continues to customise spaces to a more aesthetically pleasing and comfortable level.

The notion that aesthetics impact on health has brought about significant studies and has been tested numerous times (Dijkstra, Pieterse, & Pruyn 2006). In order to understand this concept it is critical to establish the relationships the body has with the outside world. From a salutogenic point of view: when people are in good health their responses to resources are in excess therefore aesthetic improvements are redundant, however when people are unwell they are on the border line of deterioration and recovery, here improvements in the environment would reflect an outcome (Golembiewski, 2017).

There are numerous relationships that the human body has with the outside world (Golembiewski, 2017) as a result different experiences are encountered within the built environment. Day (2002) believes that daily experiences within the built environment is what separates arbitrary architecture from extraordinary architecture. The built form draws on the senses and peaks the users interest, when nature and the built environment come together harmoniously is provides the pathway towards a comfortable journey through the building.

4.3.1 LEGIBILITY AND WAYFINDING

Kevin Lynch in the phenomenon of place highlights the importance of being able to orientate oneself within the built environment. ". . . *the terror of being lost comes from the necessity that a mobile organism be oriented in its surroundings.*" (Lynch, 1960: 125) the idea of being lost within ones environment brings about feelings of vulnerability which opposes the concept of security and stability that the built environment it intended to provide. In *A Pattern Language*, Christopher Alexander expresses the same view as Lynch. Alexander is of the opinion that if an environment requires its user to pay constant attention in order to find their way around that environment fails to provide the user with time for reflection, thought and tranquil contemplation. A successful environment is one which is relatively easy to read and understand with very little effort. (Alexander,1977)

Day to day living requires navigating through spaces, these spaces contain information which is transferred using various systems. It is important to understand how humans perceive information as it helps them to comprehend spaces better. The process of navigating oneself through spaces within the built environment is known as wayfinding. Wayfinding is a process of creating various links to destinations via different routes to reach a destination fairly efficiently (Mosaic, 2011). "*A complex of buildings with no centre is like a man without a head.*" Alexander (1977) Highlights that buildings should allow people to draw up a mental map of places and how to get there, where major and minor entrances are legible and major and minor realms are clearly identifiable.

Modern methods of wayfinding have developed and adapted over time keeping the same core principles intact. Today wayfinding methodology uses sensory cues to guide people to their respective destinations. A successful wayfinding method is essentially intuitive and self-negotiable. Primary wayfinding methods make use of various elements such as maps of building layouts, signage, informational displays, help desks as well as other architectural features including light, colour, materials and textures.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

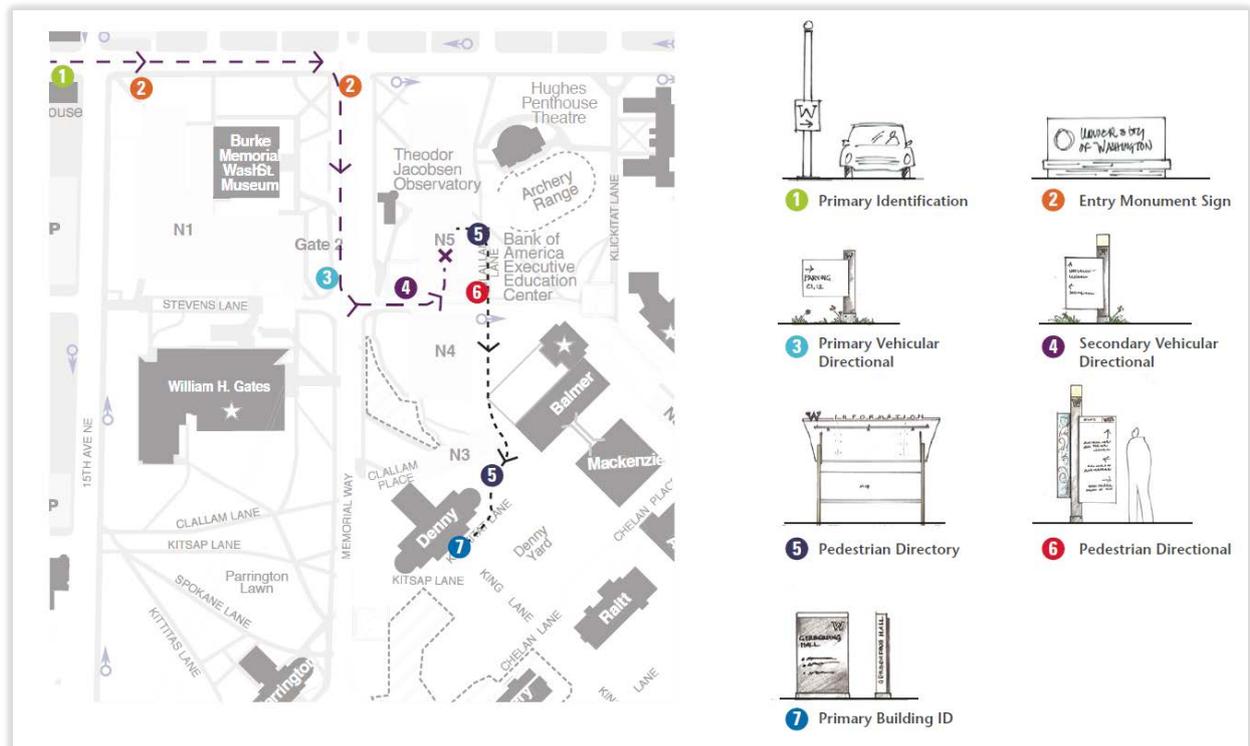


Figure 4.3.1.1: The above image relates modern wayfinding methods to their positioning in the real-world setting. (Source: Wayfinding, Signage & Masterplan 2010)



Figure 4.3.1.2: The image above illustrates how modern floor and ceiling design can incorporate wayfinding methods. (Source: www.lightart.com)

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

4.3.2 CONNECTIONS WITH NATURE

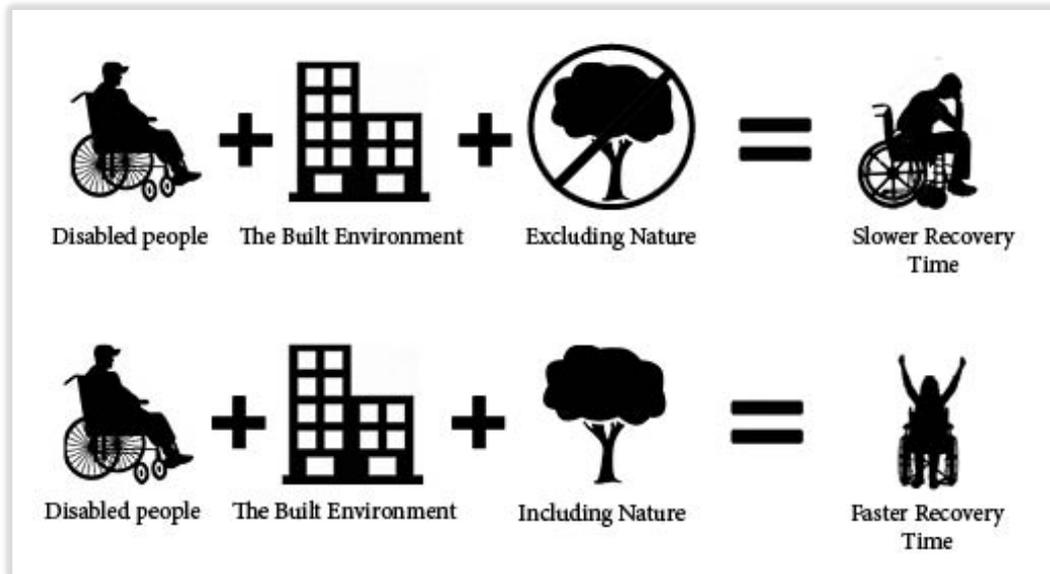


Figure 4.3.2.1: Incorporating nature into the built form (Source: Author Sketch)

There is a strong connection between every living creature and the environment that surrounds it. Kellert, Heerwagen and Mador (2008) aim to mend the predominant breach existing within society between the built environment and the human need for interaction with the natural world. To begin this argument it has to be understood that the advancements in technology have led man to believe that they can in fact transcend their natural and genetic heritage. This illusion has brought about an architectural practice that involves overexploitation and environmental degradation. However the recognition of this issue has opened doors for change in the industry. Significant efforts are now being made to mitigate the adverse impacts modern development has made on both the environment and human health. Kellert (2008) suggests that humanity has designed their way into this predicament and therefore can design their way out of it.

Ulrich introduces the link between the natural and healthcare. Where healthcare settings reduce stress and promote better health outcomes. Ulrich argues that the notion that biophilia is an inherent part of man's psyche relates to the idea that earlier man related to and responded to nature in order to survive and thrive in the natural environment. Alexander (1977) also touches on the importance of green spaces within the city. "People need green open places to go to; when they are close they use them, but if the greens are more than three minutes away, the distance overwhelms the need." Public health researchers Stamatakis and Mitchell strongly believe that spending time in natural settings, or even viewing scenes of nature, significantly

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

reduces anger, stress, fear, and encourages pleasant feelings. They note that exposure to the natural environment not only improves ones emotional health by also contributes to overall physical wellbeing by reducing blood pressure, muscle tension and heart rate.

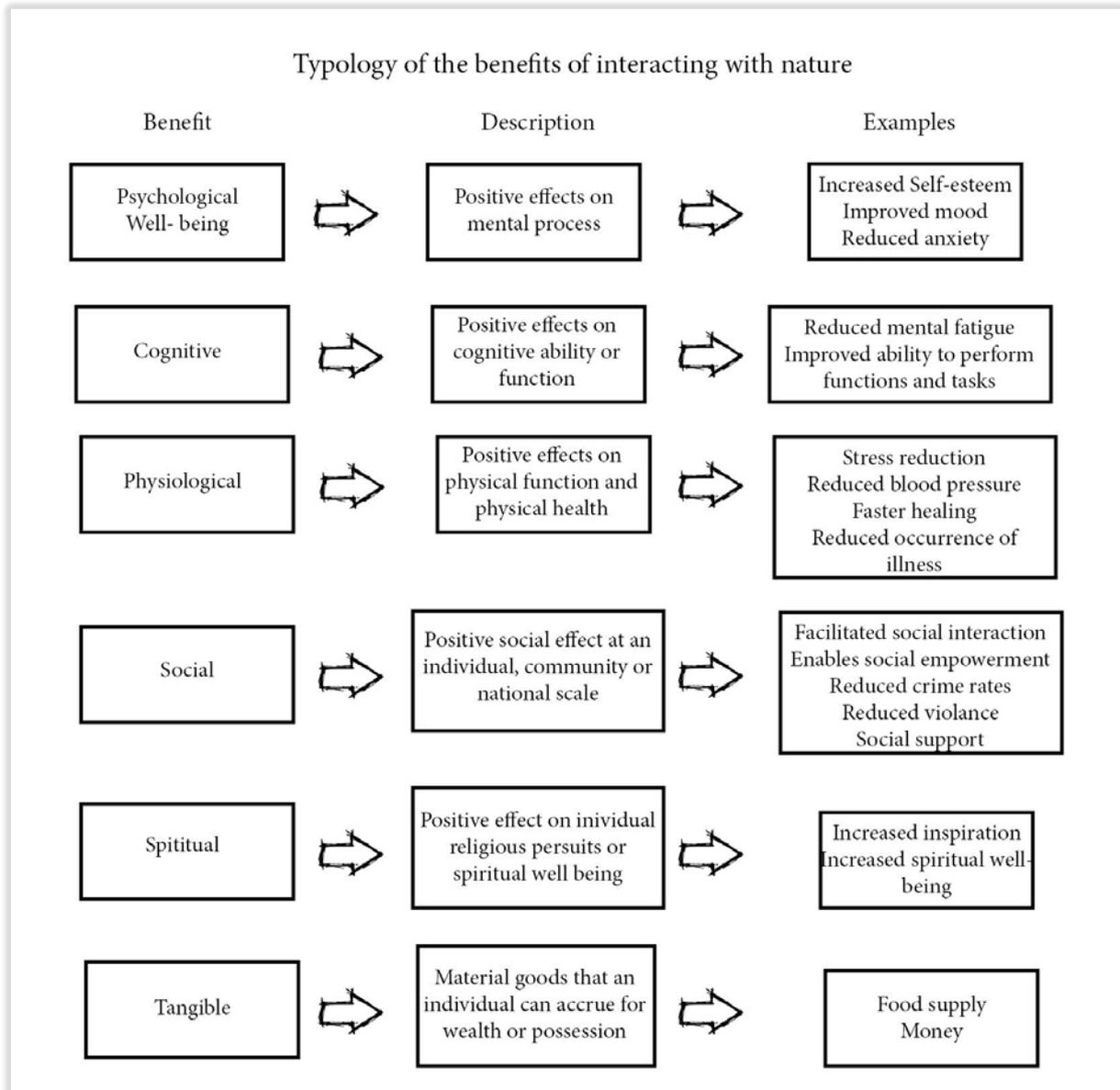


Table 4.3.2.2: The benefits that have stemmed from interacting with nature. From peoples physical health and mental wellbeing to their spiritual upliftment.

(Source: Author Sketch adapted from Int. J. Environ. Res. Public Health, 2013)

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

4.3.3. INTERIOR DESIGN FACTORS

4.3.3.1 IMPROVING THE EXPERIENTIAL NATURE OF THE BUILDING

For many people the environment exists through the manner in which they interact with it. As a result the environment can't be seen from a passive or "out there" point of view but rather as something that people participate in. Looking at the environmental context within the building, this too shapes how people interact and being a patient the healthcare environment can be very definitive. It is a place where people go to heal in privacy yet need not be socially excluded. It's an environment that needs to be within healthcare boundaries but comfortable enough to feel a little homely.



Figure 4.3.3.1.1: Waiting areas which are less clinical and more homely. Making it comfortable for the families of patients. (Source pinterest.com)

According to Alexander (1977) any building that that is of a social nature supports a contract by providing common areas of interaction on various levels. When buildings provide their users with areas that echo calmness, beauty and familiarity the user feels safe and welcomed. There are a number of elements which can enhance the experiential nature of a building such as texture, light, views and even the pathways (Day,2002). Alexander further explains the concept of transitioning through spaces and how this can be the link to a successful experience. For example building with generous passages incorporating sunlight, seating and views echo a positive vibe within the spaces as people move through them.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban



Figure 4.3.3.1.2: Wider corridors which allow people to stop rest and interact

(Source pinterest.com)

4.3.3.2 VIEWS OF THE OUTDOORS.

“Rooms without a view are prisons for people who have to stay in them.”
Alexander (1977)

In the healthcare setting patients are often placed in rooms without views or very little sunlight. According to Alexander (1977) when people are in a particular place for lengthy periods of time, it is essential to have a change of scenery in this case windows looking onto life provides stimulation and refreshment from their room. Porter (2004) emphasises the significance of windows based on the views and light they provide. Horizontal windows are classified as 'picture windows' they appear to emphasise the view and allow extra light into the room. Vertical windows on the other hand seem to contrast '*induce a kind of cinematic motion parallax*' (Porter, 2004: 60). Drawing from this Alexander (1977) encourages the use of windows as an escape from a person's environment and believes that a window can also be used to create a feeling within a place. Alexander (1977) continues with the idea of incorporating seating within a window space to allow people to relax while still keeping a visual relationship with the outdoors.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban



Figure 4.3.3.2.1: Windows with a view, allowing people to relax within a space while getting a change of scenery. (Source pinterest.com)

4.3.3.3 THE EFFECTS OF LIGHTING

Prior to the 1940s, daylight was known to be the primary light source used in buildings and artificial lights were used as a supplementary source. However over the last three decades electric lighting has transformed the architectural environment drastically. In the recent years energy resources as well as environmental concerns have rediscovered the use of daylighting as a design aspect within buildings. Although the physics of daylighting is relatively the same since its original use, design aesthetics has modified how it is used. Modern architectural design integrates daylighting as a statement as well as for its energy saving purposes. The use of daylighting is so rich and in-depth that its use transcends beyond the architectural and energy uses. (Edwards and Torcellini, 2003)

According to Robbins (1986) there are various psychological and physiological effects natural lighting has on humans and these are evoked by the different spectrums various lights give off. It has been proven that daylighting is associated with a number of positive effects such as lower fatigue, improved moods and even enhanced morale (Robbins 1986). Dr.Ott (Ott Biolight Systems, Inc. 1997a) explained that the human body absorbs light as a nutrient used in a metabolic process, similar to food and water. During this process natural light stimulates the essential biological functions within the brain which is then divided into colours. This relates to why moods are affected on cloudy days or in spaces with poor lighting. Architect Louis Kahn was well known for his creative use of natural lighting and believed that “*No space, architecturally, is a space unless it has natural light*” (Kahn, Loud, 1989: 262).

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban



Figure 4.3.3.3.1: The effect of light and shadow in Louis Kahn's National Parliament of Bangladesh (www.fischerlighting.wordpress.com)

4.3.3.4 THE PSYCHOLOGICAL EFFECTS OF COLOUR

Colour plays a very important role in both the natural and built environments. Gerstner (1986) emphasises the fact that colour is in fact a sensation that the brain perceives. Tofle (2004) also believes that colour plays a fundamental role in environmental design and that it is linked to the physiological, psychological, aesthetic, visual and technical aspects of the manmade environments. The choice of colour palettes are rather specific and depend on different variables. These include the potential users and their characteristics, the geographical location, the culture within the place, the age group involved as well as the activities and uses of that particular space. (Tofle, 2004)

Numerous professionals in the field have questioned the connection between colour and its effect on human behaviour. Most believed that colour is a psychotherapeutic aid and sort after empirical reasons for the use of colour guidelines within the healthcare environment. The colour spectrum is broken up into two groups of colours these being warm and cool colours. The cooler colours being blue and colours closely related to a blue undertone and warm colours being red and colours closely related to a red undertone. Cheskin (1948) notes that colours have varying effects on the human mind but it is believed that cooler colours generally have a calming effect on the mind whereas warmer colours tend to stimulate the mind.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

Human responses to colour	
Physiological:	Changes in blood pressure, pulse rate, automatic nervous system, hormonal activity, rate of tissue oxidation and growth.
Within the eye:	Change in size of pupil, shape of lens, position of eyeball, chemical response of retinal nerve endings.
Cognitive:	Memory and recall illusion and perceptive confusion, values judgment, associative response
Mood:	Stimulating, irritating, cheerful, relaxing, boring, exciting, melancholy, gay
Impressionistic:	Space seems larger, smaller, warmer, cooler, clean or dirty, bright or drab; people appear healthy or unhealthy, food is appetizing or not, older, younger, old, new
Associative:	With nature, with technology, religious and cultural traditions, with art and science, typical or atypical

Table 4.3.3.4.1: The human response to colour (Source : www.etd.fcla.edu, Edge, 2003)

“Colour is a sensation, produced in the brain, by the light which enters the eye; and that while a sensation of a particular colour is usually triggered off by our eye receiving light of a particular composition, many other physiological and psychological factors also combine.” Rossotti (1983) Cheskin (1947) and Scheurle (1971) all conducted studies with regard to patients experiencing rooms in different colours. Their studies both correlated in that when patients entered the red room they were unable to work efficiently, they felt flustered and aroused with heightened blood pressure. Results also matched up when patients entered the blue room they experienced a decline in blood pressure and pulse as well as a calmness of emotions. It is clear that colour does have an effect on the human mind.

4.3.3.5 MATERIALS AND TEXTURES

The use of texture has assisted architects to create life and definition to their buildings. All buildings have a unique design aesthetic in order to create a desired experience for the occupants. Here materials are expressed in their true quality to evoke the user’s senses while within a space. (Lehma, 2018) Texture is the simplest way to “mark” certain areas so they can be identified as different spaces. Lehma poses the question, what happens when you place texture in such a way that it becomes more of an interactive experience? Here evoking further senses rather than just visual stimulation by inviting building users to touch, hear and visualise spaces with more meaningful effects can drastically change the users experience. (Lehma, 2018)

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

Focusing on the healthcare approach to texture and design, in recent times healthcare designers have changed their perspectives of healthcare design by incorporating textures, windows, fresh air, and natural light. These changes were to ensure that patients felt safe without causing claustrophobia. (Feil, 2001). The home-like approach to environments ensures that patients feel more comfortable. The use of lighting, colours, floor finishes and furniture all contribute to a relaxing environment that promotes a sense of healing and comfort. (Carpenter, M, 2009).

4.4 UNIVERSAL DESIGN

4.4.1 Introduction

Over the past 35 years, the concept of disability has been defined and transformed a number of times. The World Health Organization (WHO, 2002) has drastically changed their definition from defining it as an exclusively medical model, that indicates that disability is a characteristic of a person, to the social model which regards disability within the environment (Ostroff, 2010). Universal Design is one of the main topics and primary drivers for this dissertation. The regulations and principles set out in the universal design framework are intended to eliminate certain physical barriers that limit the usability of environments for people with disabilities. (CIDEA) Universal design is an approach to design that ensures individuals are given the opportunity to an improved standard of living. The universal design process gives empowerment to a diverse population through the improvement of individual performance as well as encouraged social interaction (Steinfeld and Maisel, 2012). It involves creating environments to be as usable as possible by as many people as possible regardless of age, ability or situation. Under the bracket of universal design the common goal is that of social inclusion transcending national laws, policies, and practices.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

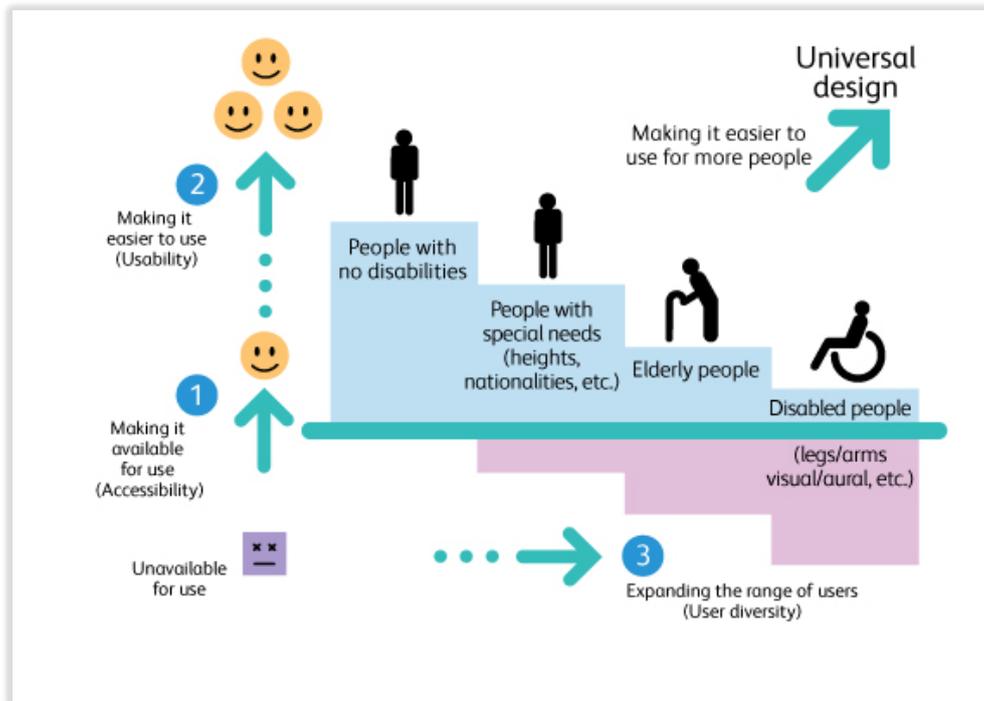


Figure 4.4.1.1: Illustrating the aims and objectives of Universal Design (Source www.dol.gov.za)

4.4.2 Universal access regulations and strategies

Across the world there are two predominant and distinctive threads that are traced back to universal design. The first is the legislative measures which includes the specialized requirements that accommodate people with various needs. The second being a non-regulated market-driven responses to an aging society (Ostroff, 2010). Universal Design highlights a new found relationship between a diverse group of users and the manmade physical environments. Universal Design goes above and beyond the mere provision of special features for certain segments of the population. Instead it highlights and emphasizes a creative, inclusive and practical approach to make the built environment more sustainable for everyone. (Better *Gestalt* quality). There are seven principles of universal design these are equitable use, flexibility in use, simple and intuitive use, perceptible information, tolerance for error, low physical effort, and size and space for approach and use.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

4.4.3 Universal design principles as a driver for user comfort

4. 4.3.1 Equitable use



Figure 4.4.3.1.1 Adaptation of universal design in public buildings (Source: www.slideshare.net)

This element ensures that design is useful to people with diverse abilities. For example powered doors at entrances that open with sensors benefit people in wheelchairs as well as a person who has their hands full.

4. 4.3.2 Simple and intuitive

This ensures that the building is designed to be easily legible for the building user. This means that they can navigate through the spaces with ease and understand where they are at any given time. This relates back to the concept of wayfinding and how a building should be easy to read.

4. 4.3.3 Low physical effort

The idea of low physical effort ensures that the design can be used efficiently and comfortably with a minimum of fatigue.

4. 4.4 Translating universal design into spaces

Ostroff (2010) suggests that designers with disabilities should participate in the planning and designing stages. Their insight coupled with their personal experience creates a pluralism in functional use of both structures and products. Ostroff (2010) believes that from an aesthetic point of view, the pluralistic world is in need new challenges and new ideas that incorporate both beauty and function. The concepts of universal design are adaptable to all buildings despite their function. It is imperative that designers start to rethink their approach and start to design for the broader public. Within the healthcare setting the elements of universal design make the usage of spaces easier.

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

4.5 Genius- loci sense of place

The concept of Genius Loci is open to various interpretations. It is primarily understood as the power of a place to evoke emotion. Jackson (1994) states that in classical times Genius loci meant not so much the place itself but rather the guardian divinity of that place. In today's times its definition has been narrowed down to describe the atmosphere of a place and the quality of its environment. (Jackson, 1994, pp. 157–158)

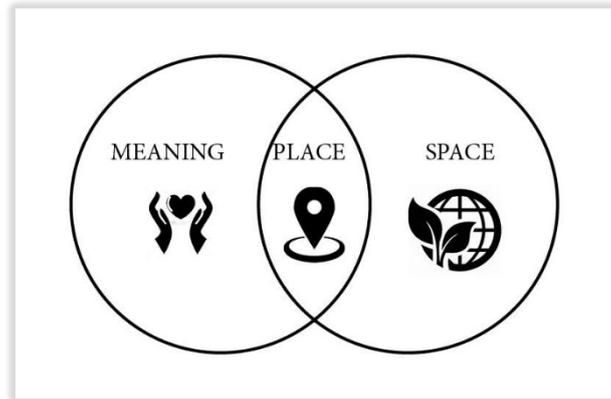


Figure 4.5.1 Place is the balance between meaning and space: (Source: Author Sketch)

Theorist Christian Norberg-Schulz in his book, *Genius Loci: Towards a Phenomenology of Architecture* looks into great depth the human aspect of buildings. The concept of genius loci falls within the 'philosophical division' of architectural phenomenology. In today's times the human aspect of design is often ignored. Designers seem to focus more on the grand form, which is essentially incorrect. According to Norberg- Schulz the human experience is the fundamental aspect of design and it should shape the built form.

It can therefore be said that the architect has the power to design in such a manner that it captures the essence of the place. In order to design these places, various elements need to be carefully considered. Incorporating the human element into the built environment creates an experiences which goes beyond the physical boundaries of design. (Norberg-Schulz, 1980). When designing for the physically challenged it is of the utmost importance to create meaningful spaces that evoke feelings such as safety, warmth and inner peace. The psychological effects a space has on an individual should form positive emotions and create a sense of wellbeing.

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

**CHAPTER FIVE:
PRECEDENT STUDIES**

CHAPTER 5: PRECEDENT STUDIES

5.1 INTRODUCTION

This chapter includes precedent studies which relate to the research topic. These precedents highlight specific design aspects as well as facilities a rehabilitation and special care centre should cater for. The precedents are analysed based on key aspects and issues highlighted within the literature review in the preceding chapter. These projects are analysed based on their relevance to the topic and will not be analysed in their entirety. This chapter will focus on the facilities provided within these buildings as well as the design concepts that were utilised in order to make them successful. These precedent studies represent a modern approach to care facilities which address certain issues mentioned in the previous chapter. The purpose of this chapter is to exhibit the application of theory and understand how it has been implemented in the built environment. Precedent one focuses on design of a facility of this nature whereas precedent two focuses on the operational procedures of this kind of facility.

The criteria in which these precedent studies will be analysed stems from the research in the previous chapters. The key design considerations are set as a guideline to measure the success or failure of these facilities. The criteria range from broader design considerations to more user specific criteria in order to better understand the improvement which need to be made in order to create an ideal facility of this nature. Some of the criteria for this analysis are listed below:

1. Legibility and wayfinding elements of paths, circulation, zones, nodes, edges
2. Contact with nature both visually and physically
3. Enhancing experience in the building to ensure user comfort
4. The psychological effects of colour and use of materials to evoke a sensory experience for the user
5. A home like environment to add a level of comfort

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

5.1 Precedent Study One

PETER ROSEGGER NURSING HOME

Project Completion: 2014

Location: Austria, Graz

Architect: Dietger Wissounig Architekten

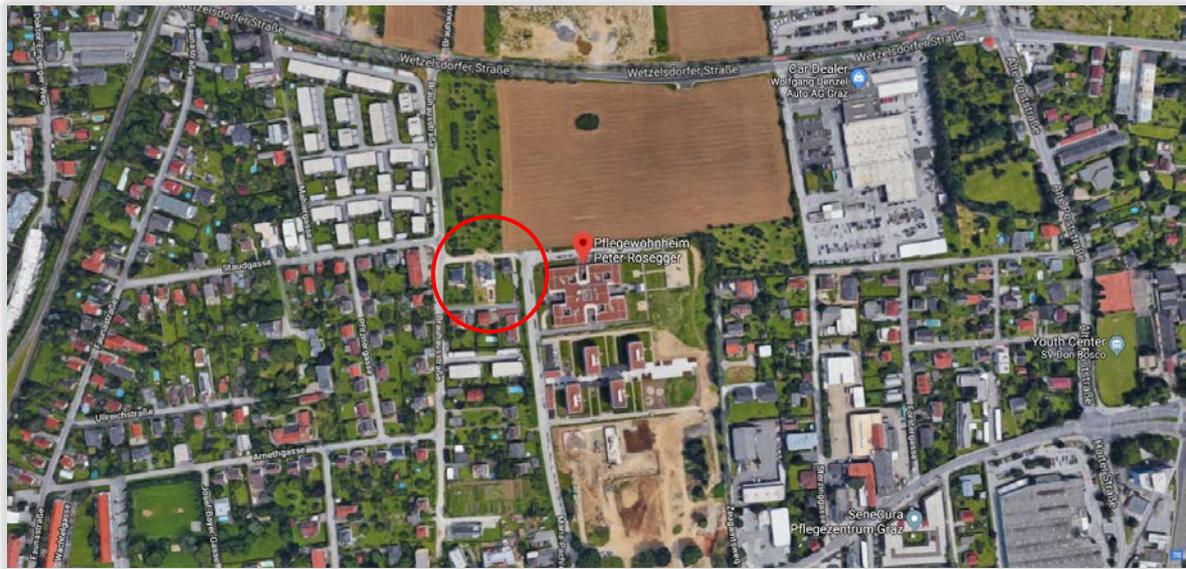


Figure 5.1.1 – Google Maps location of the Peter Rosegger nursing home (source: www.googlemaps.com)

5.1.1 INTRODUCTION

The Peter Rosegger Nursing Home is a two-floor nursing home on the grounds of the old Hummelkaserne barracks. It was founded by Peter Rosegger, (born July 31, 1843, Alpl, Austria—died June 26, 1918, Krieglach), He was an Austrian writer known for his novels describing provincial life. The building stands in a part of the city with diverse urban surrounding. The nursing home is rather compact with a fairly square-shaped plan. The asymmetrical cut-outs aim to divide the house into a broad spatial concept of eight housing communities, these being four on each floor. The home is associated with a “village square” theme which stretches from one side of the first floor all the way through to the other side and is partly covered by a roof terrace. At right angles to the open public axis, sit two gardens for the residents, these are designed to cut into the building. The further open spaces include four atria scattered on the second floor as well as a direct access to the public park which was planned by the City of Graz to the east of the premises.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban



Figure 5.1.1.1 – Front perspective of the building showcasing the social garden (Source: www.archdaily.com)

5.1.2 ANALYSIS

5.1.2.1 LEGIBILITY AND WAYFINDING

The main entry is clearly located at the centre of the building which can be accessed from the promenade. The administration desk is at the front and clearly visible for anyone who requires assistance. Circulation between spaces is provided via wide corridors which frame the central courtyards, these are glassed to ensure that there is a constant visual connection to spaces at any given time. The hierarchy of 'gateways' which lead from one 'realm' to the next, transcend from public spaces to private spaces. The corridors from the main entrance lobby leading to residential nodes and public social nodes are legible and straight forward. There are central nodes created with social spaces for people to interact this takes them away from their isolated frame of mind and encourages interaction. The negative aspect of this design would be the lack of incorporating a ramp for people with wheelchairs. Each housing community is developed around a different color concept in order to help residents to better orient themselves. Colour is a key aspect under wayfinding and is one of the easiest ways for a person to identify with where they are.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban



Figure 5.1.2.1.1: Ground Floor Plan of residential zones as well as public social spaces located on the ground floor (Source: www.archdaily.com)

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban



Figure 5.1.2.1.2: First Floor Plan of residential zones as well as public social spaces located on the ground floor (Source: www.archdaily.com)

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

5.1.2.2 CONTACT WITH NATURE



Figure 5.1.2.2.1: Connections with nature
(Source: www.archdaily.com)



Figure 5.1.2.2.2: Connections with nature
(Source: www.archdaily.com)

As understood from the research analysed under the literature review, nature is a key aspect of the healing process. The fact that man has an innate connection with nature is a sure sign that it should be incorporated into the building design. The overall design of the Peter Rosegger Nursing Home prides itself on its connections with the outdoor environment. The overall design features a connection to the existing park environment maintaining the idea of inclusivity. This encourages residents to go out and socialise in a natural context. The private gardens within the building itself are accentuated within the design by internal spaces wrapping around them creating courtyards. This allows the residents to experience nature at their doorstep and in all sensory forms, visually they see the beauty of nature, they can smell the freshness and even touch the plants. This all relates back to how nature can uplift the human spirit. The concept of forming social spaces with seating activates these areas and allows for people to relax and enjoy the surroundings.

5.1.2.3 ENHANCING EXPERIENCE IN THE BUILDING

Looking at the housing aspect of the building, it consists of residential rooms, a kitchen and a dining area for approximately 13 residents and an environment which promotes manageability of care and a familiar atmosphere. The large balconies and a variety of paths and views which can be seen through to other parts of the house provide a stimulating environment. The internal functions of the building that wrap around the central courtyard have beautiful views of a garden. This allows for relaxing transitions from one space to the other as opposed to a lifeless corridor. Overall majority of the building functions appear to either relate directly to the landscaped central courtyards or offer a view of it.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban



Figure 5.1.2.3.1: visual link between a corridor and the central courtyard (Source: www.archdaily.com)

5.1.2.4 THE PSYCHOLOGICAL EFFECTS OF COLOUR AND USE OF MATERIALS

The main structure of the building is constructed with a pre-fabricated passive house wooden construction method where the two upper floors of the building are constructed entirely of laminated timber and wooden beams apart from the main stairway. The use of cross laminated timber in the walls and ceiling are considered to be the load-bearing aspect of the construction. Throughout the building the use of exposed wooden surfaces remain a constant theme. To achieve the cosy yet spacious atmosphere, the designer incorporated timber beams which are also used for the ceilings of the common rooms. The outer walls of the building are constructed from a wooden frame with rock wool insulation, with external wooden panelling. The use of materials can extenuate a design as well as evoke feelings within the building user. The wooden look creates a feeling of warmth and security and is less clinical like most facilities of this nature. The idea that the wood concept is carried out from structure through to the finishes also relates back to the connection to nature. The building itself feels like an extension of the natural landscape. The large glass facades lining the corridors add the constant visual connections to the central green courtyards and creates a feeling of openness and transparency. The subtle neutral tones of the wood is easy on the eye and encourages a calming effect on the building user.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban



Figure 5.1.2.4.1: The structure and materials used (Source: www.archdaily.com)

5.1.2.5 A HOME LIKE ENVIRONMENT



Figure 5.1.2.5.1: A room expressing the beautiful homelike setting and windows with views of the outdoors. (Source: www.archdaily.com)

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

The homelike feel is carried out thorough the building with the warmth of the materials to the subtleness of the colour palate. When it comes to the residential aspect the homelike feel takes precedence, the various rooms offer a degree of uniqueness in terms of their relation to location and the direction they face, however each room has been designed with a casement window as well as larger window with a low, heated parapet which can serve as a seat with a view of the outdoors. This allows for some variety in terms of private seating within the room and ensures that residents can rest privately but still maintain a connection with the outdoors. The large windows allow for excellent natural ventilation and make the building user feel as if they are actually outside. The use of materials is carried through to the finishing details with wood being the predominant material used. This ensures that rooms are given a warm and cozy feel. Homelike elements are incorporated into the room layout with open cabinets for storage of personal items, seating for multiple people to encourage guests to visit and artwork on the walls for residents to add their personal touch to their room. The design layout of the rooms along central corridors are to ensure that they are easily accessible. The rooms dedicated to special care are located centrally, to allow easy access and promote efficient care.

5.1.3 Conclusion



Figure 5.1.3.1 :The circulation on the first floor. (Source: www.archdaily.com)

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

The Peter Rosegger Nursing Home is an excellent example of a facility which combines healing, residential aspects as well as maintaining strong connections to nature. The characteristics of the materials, the splendid views, and the range of seating arrangements inter-leading to the central courtyards and gardens all contribute to the comfortable and friendly ambience of the home. The careful attention to fire safety and compensatory measures ensures the success of the material of choice. The constant visual links to the outdoor environment has positive psychological measures beyond measure. This facility highlights the elements that a facility of a similar nature should incorporate in order to be successful within its context.

5.2 PRECEDENT STUDY TWO THE SPAULDING REHABILITATION HOSPITAL

Project Completion: 2014

Location: Charlestown, Boston, Massachusetts, United States

Architect: Perkins and Will

Project year: 2013

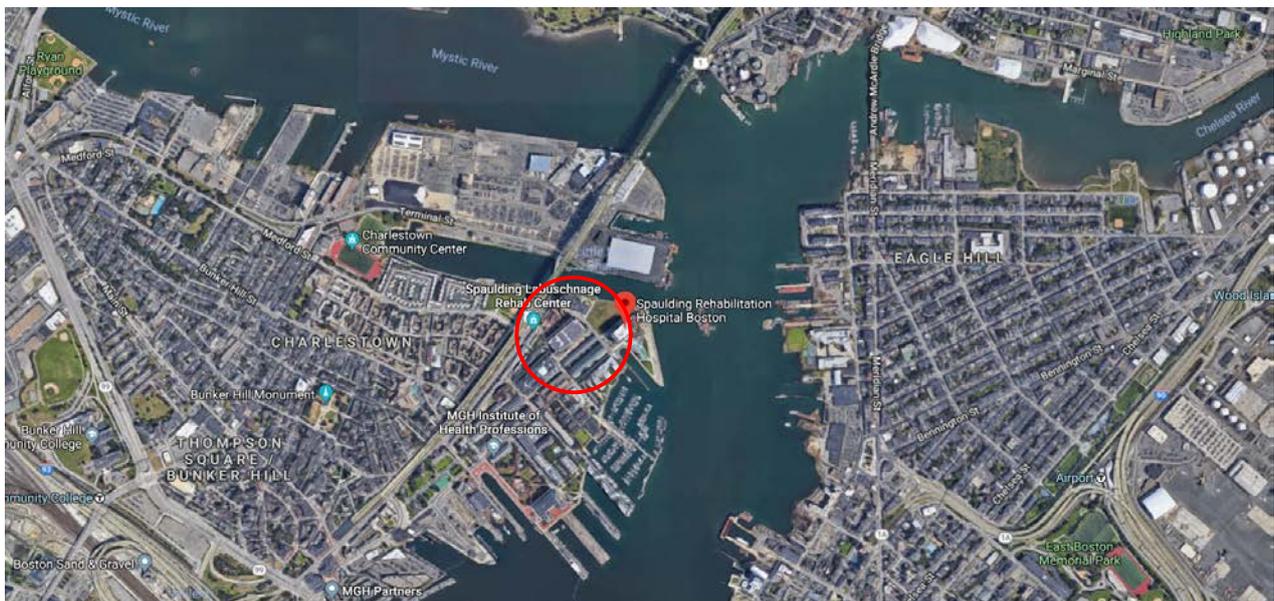


Figure 5.2.1 – Google Maps location of The Spaulding Rehabilitation Hospital (source: www.googlemaps.com)

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

5.2.1 INTRODUCTION

The Spaulding Rehabilitation Hospital was opened in April 2013, it is located in the Charlestown neighbourhood of Boston. The hospital was immediately put to the test and some of the very first patients included survivors from the 32 Boston Marathon bombing. The state-of-the-art hospital designed by Perkins and Will, equipped the hospital with all the necessary treatment facilities for victims to receive the necessary care and gain mobility and independence to go home.

The Spaulding Rehabilitation Hospital is one of the largest inpatient rehabilitation facilities in the United States. The hospital was awarded best in the acute care category of the 2013 Healthcare Environment Awards. The hospital is 237,600-square-meters and comprises of two connected structures the first being an eight-story patient tower and the second being a three-story building near the water which is home to a therapeutic gymnasium and pool. The Spaulding Rehabilitation Hospital is the official teaching hospital of the Harvard Medical School's Department of Physical Medicine and Rehabilitation. The new hospital replaced its previous facility which was located in close proximity but the design was based on the concept of a nursing home and was inadequate in most ways. Doctor David Storto states that the mission of the hospital is about improving the quality of life of patients, both at the hospital and when they return home. Patients stay an average of 20 days which is much longer than stays at regular hospitals. The president of Spaulding Rehabilitation Hospital strongly emphasizes that the hospital was a model of sustainability, inclusiveness, and patient care.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

The primary motivation behind this was the level of detail and effort put in by designers to understand who they are designing for. Stebbins and her team approached the design process by first spending a day in wheelchairs to better understand the needs of Spaulding’s patients. Their aim was to exceed healthcare expectations and go beyond the compliance bracket which in this case is the Americans with Disabilities Act. Their ultimate goal was to set a new standard for accessibility. The new building incorporates a program that is complex and varied. There are 132 beds including 12 paediatric beds, a full aquatic and group therapy spaces that reflects the latest thinking in physical rehabilitation, the facility includes two small libraries, a non-denominational meditation space, as well as research areas for doctors and staff, the hospital also ensures that patients are fully accustomed to the activities of daily living before leaving the hospital. This is done through the setup of a mock “apartment” here patients can spend their last inpatient night to ensure their comfort.



Figure 5.2.1.1 –The Spaulding Rehabilitation Gym (Source: www.archdaily.com)

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban



Figure 5.2.1.2 –The Spaulding Rehabilitation Pool (Source: www.archdaily.com)

5.2.2 ANALYSIS

5.2.2.1 LEGIBILITY AND WAYFINDING

On the outside the building connects to its surroundings through an extensive waterfront walk and the Boston Harbor walk. This outdoor environment is complete with bioswales to cleanse storm water as well as provide educational and recreational amenities for patients and visitors to the hospital. There are many archeological artifacts located on and around the site, like wooden ship timbers, and various other nautical themed sculptures which have been incorporated into the landscape and the buildings interior. Public accessibility was key element for The Spaulding Rehabilitation Hospital on the waterfront side. The city of Boston set requirement for public accessibility and at least 50 percent of the hospital's outdoor grounds and 75 percent of the first floor spaces had to be accessible to the public at all times. Perkins & Will designed the outdoors in such a manner that the spaces extended into the interior. The vehicle entrance canopy for example extends into the main interior lobby and becomes a soffit. Panels of Douglas fir wrap interior surfaces and are placed strategically to serve as subtle wayfinding elements to guide patients through interior spaces.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

5.2.2.2 CONTACT WITH NATURE



Figure 5.2.2.2.1 –The Roof garden as seen from the upper floors (Source: www.archdaily.com)

The Spaulding Rehabilitation Hospital incorporates contact with nature both on a visual and physical level. The large glass facades around the building ensure that visitors and patients have a constant visual connection with the outdoors. The large outdoor balcony on the eighth floor is a total of 8,500 square meters and is accessible to patients and visitors. The green roofs are an important therapeutic element within the hospital. This roof garden serves as a pleasant sight for people looking down from the upper floors of the building as well.

5.2.2.3 ENHANCING EXPERIENCE IN THE BUILDING

The Spaulding Rehabilitation Hospital prides itself in the ease of usability within the building as well as the degree of comfort provided for all building users. In terms of functionality and practicality of design, the smallest of details are taken into consideration. For example, in bathrooms, sculpted Corian countertops and recessed plumbing make the spaces accessible and comfortable for wheelchair-bound patients. Bathroom doors open with the wave of a hand. The counter tops are U-shaped at reception desks as well as nurses' stations allow wheelchair users to use the spaces with ease. Rooms are fitted with custom wood cabinets that open at 180 degrees for easy access to belongings. Operable windows throughout the building are fitted with

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

sensors, there are connected to a central climate control system, these are designed to specifically shut off the HVAC system allowing fresh air to be admit into the rooms and therapeutic spaces.

Robin Guenther, Sustainable Healthcare Leader at Perkins+Will's emphasized the concept of resiliency planning and sustainable design. The design responds to climate change as well as probable rising sea levels. The design ensured that the main floor was raised one foot off the ground and all HVAC equipment was located on the roof. The Gymnasiums, multi-purpose rooms, as well as educational rooms all utilize automatic operable windows to allow for natural ventilation. The numerous operable windows allow the building to remain in operation even if mechanical systems are temporarily interrupted. The vegetated roofs also mitigate a great deal of storm water runoff and reduce cooling loads and heat-island effect. The therapeutic terraces and gardens on the third and fourth floors both serve as places of respite for patients, the hospital staff and families.

5.2.2.4 THE PSYCHOLOGICAL EFFECTS OF COLOUR AND USE OF MATERIALS

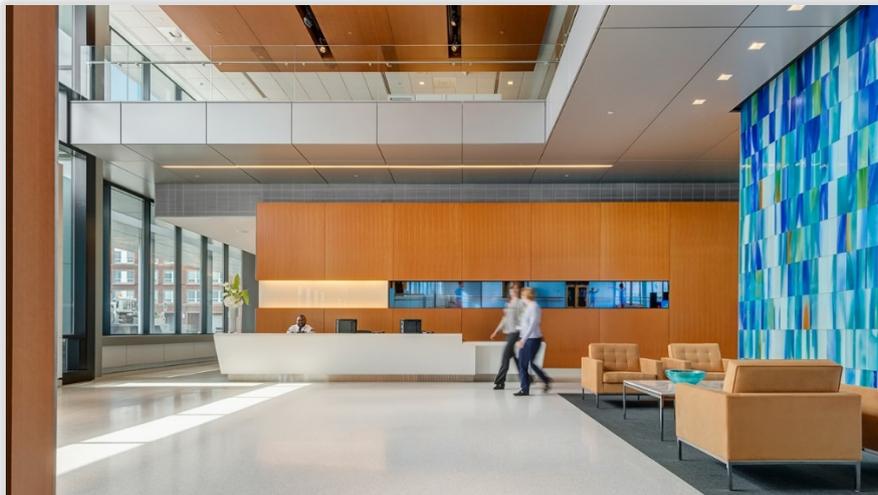


Figure 5.2.2.4.1 –The Reception area showcasing a variety of materials and colour (Source: www.archdaily.com)

The building makes use of a variety of materials, textures and colours to add a modern yet practical feel. The building itself is portrayed as a battleship clad in gray aluminum. According to associate principal at Perkins & Will Jessica Stebbins, one of their primary goals was to totally integrate the interior and exterior of the building, to create a sense of transparency between the hospital and the community. This also aimed at breaking down the stereotypes that the community has of people with disabilities.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

5.2.2.5 A HOME LIKE ENVIRONMENT



Figure 5.2.2.5.1 –Patient rooms with a homelike feel and views of nature (Source: www.archdaily.com)

The homelike approach to patient rooms within this facility takes on a more clinical approach however it does give room to some elements of personalization. The accommodation for patient and visitor seating allows for a more comfortable setting. The patient rooms within the hospital all incorporate windows that overlook the beautiful surroundings. This links back to connections with nature and the concept of nature contributing to healing. Wood is a strong aesthetic material used within the room to create a warmer feel. Small tables and flowers create a more homelike feel to the room. The rooms are also spacious which gives the patient a bit more room to breathe and not feel claustrophobic and depressed.

5.2.3 CONCLUSION

The President of Spaulding Rehabilitation Hospital has noted that for many years the concept of rehabilitative care was never a primary consideration. The Spaulding Rehabilitation Hospital makes an outstanding statement in the new era of rehabilitative healthcare, the hospital unites the elements of healthcare relating to new technology as well as the traditional values of patient oriented care. Its ability to perform has put this hospital amongst the few major healthcare centers in the world. The Spaulding Rehabilitation Hospital is located on a site which sits along the waterfront the site is a remediated brownfield called Yard's End in Boston's Charlestown Navy Yard.

The building is closely tied to the site's naval yard history which makes it extremely responsive to its context. In terms of the buildings scale, its design is reduced visually by simply dividing the overall structure into two adjoining sections. First there is the eight-story building which houses the patient tower

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

and secondly is the therapeutic gymnasium and pool which comprises of three-stories. The panoramic view of the building ensures its design is celebrated from all sides as there is no back to the site. The various sections of the buildings structure makes use of a variety of materials to demonstrate a dynamic visual interest and highlight the buildings key design features. The building prides itself on the element of transparency the glorious natural light. The ambiance of the natural light extends throughout the interior spaces creates a warm and spacious atmosphere that is rather inviting.

From an accessibility point of view The Spaulding Rehabilitation Hospital incorporates inclusive design in great detail. The Perkins+Will's design team dedicated their time to researching and testing all components of the design to ensure that the building addresses the various needs of the widest possible audience, despite their ability or disability. The design team worked extensively with various accessibility experts and conducted comprehensive research to create a hospital of the future, aspects of the building are designed with careful consideration. Examples being, the entry is at street level making accessibility easy; the patient rooms have custom designed cabinetry and automated shades, as well as patient lifts, private patient bathrooms, sleeping accommodations for family members are also accommodated for.

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

**CHAPTER 6:
CASE STUDY**

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

This chapter consist of the primary research conducted in the form of case studies. These case studies analyse how elements of the built environment should be used as a tools for Rehabilitation as well as its impact on the building users. This analysis includes two case studies, the first is Saint Giles and the second is Browns School. Both these facilities cater for different aspects of rehabilitation and have varied approaches towards physical rehabilitation.

The analysis of each case study draw parallels with the literature to maintain relevance to the overall study. The aspects of literature that are referenced in the case studies are as follows:

1. Legibility and wayfinding elements of paths, circulation, zones, nodes, edges
2. Contact with nature both visually and physically
3. Enhancing experience in the building to ensure user comfort
4. The psychological effects of colour and use of materials to evoke a sensory experience for the user
5. A home like environment to add a level of comfort

6.1 CASE STUDY ONE

SAINT GILES

Project Completion: 1962

Location: Durban South Africa

Architect: Unknown



Figure 6.1.1 – Google Maps location of Saint Giles (Source: www.googlemaps.com)

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

Saint Giles is located at the corner of Bell and Prince Street in the Durban CBD

Saint Giles is centrally located within the Durban CBD making it an accessible to the general public. It is situated along a public transportation route which means that it is easy for guests to get to and from surrounding areas to the building. The primary access road has parallel parking on both sides which often gets congested due to the residential flats opposite the building. Taxies use this road as a thoroughfare which also contributes to the business of the street. The parking on site is fairly limited which is somewhat inconvenient for visitors and limiting for people using the actual facility.

6.1.1 INTRODUCTION

In the year 1952 the Durban organisation was founded by former journalist Kerry Malt. Being disabled, Malt knew first-hand the challenges people with disabilities faced and started an initiative to visit the sick in hospitals as well as private homes. The Saint Giles organization developed over the years and was finally found its present home in 1962 on the corner of Bell and Prince Street. The mission statement of Saint Giles is to “provide services and support to disabled persons from all communities.” This worldwide organization was given its name after a seventh century hermit who was known to work amongst the disabled. According to this organisation disability is defined as persons who are affected by a condition that markedly restricts their ability to function physically, mentally or socially.

The organization is reliant completely on the generosity of the public and support is usually obtained through donations, bequests as well as the work centre customers and the charity shop. The work centre was founded by generous donations and since its establishment had increased its ability to provide employment opportunities to disabled people. At the work Centre all employees have a variety of skills and are capable of handling a broad range of work. Amongst some of the most complex work is the packing of herbs and spices for Robertsons a popular Unilever brand. This work centre has been in operation for approximately 41 years and complies with very strict quality and hygiene requirements.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban



Figure 6.1.2 – Staff at the work centre
(Source: www.saintgiles.org.za)



Figure 6.1.3 – Staff and visitors at the rehabilitation Gym
(Source: Author)

6.1.4 ANALYSIS

6.2.4.1 LEGIBILITY AND WAYFINDING

In terms of the building plan it is structured in a manner that all office facilities are on the first floor and all amenities which are accessed by people with physical disabilities are accommodated for on the ground floor. Visitors enter and are immediately asked to sign a register and state the reason for their visit, from here they are given the necessary information and taken to where they need to be. Access gates control the level of public access so visitors can't get lost within the facility. There are signs on walls telling visitors what is where. The concept of wayfinding isn't used ideally within this facility. There is no clear identification of where the building user is at a specific point. Navigating from one place to another can be confusing without asking for assistance. There is no clear indication of paths, nodes or circulation points.

6.2.4.2 CONTACT WITH NATURE

When it comes to contact with nature the building design does its users a great disservice. There is very little evidence to show that the design considers the natural elements of its surroundings. Taking into consideration it is located near the Durban beachfront, it should celebrate the outdoors more and encourage

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

more interaction with nature. The design however does make good use of large windows which allow in natural light and a good amount of natural ventilation.



Figure 6.2.4.2.1 – Work Centre depicting the amount of natural lighting (Source: Author)

6.2.4.3 ENHANCING EXPERIENCE IN THE BUILDING

To make the building more user friendly all access points within the building are automated, making it easy to move from space to space in a wheelchair. The corridors are wide to allow for wheelchairs as well as people walking. Colour is used to add life to the space however it is very bold and creates a feeling of uneasiness when in the space. The finishes are kept fairly basic more consideration is given to the practicality of materials rather than the aesthetics.



Figure 6.2.4.3.1 – Automated doors to female toilet (Source: Author)

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

6.2.4.4 THE PSYCHOLOGICAL EFFECTS OF COLOUR AND USE OF MATERIALS



Figure 6.2.4.4.1 – Rehabilitation Gym toilet (source: Author)



Figure 6.2.4.4.2 – Staff lunch room (source: (source: Author))

Both the exterior and interior facades of the building are plastered and painted with screeded floors. Bright bold colours are used on the walls in the gym to liven up the visitor's spirits. The colours can seem a bit intimidating to the building user as they are bright and bold. From the research analysed in previous chapters it was noted that bright, bold colours may actually have a negative effect on the building user making them feel less comfortable and more on edge. Mirrors are fitted on wall to add volume to the room and create a more open space. In the staff lunch room incorporates cooler colours and murals are painted on the walls that depict the ocean for a more tranquil and relaxing environment.

6.2.5 CONCLUSION

The work done at Saint Giles goes beyond the idea of healing and upliftment. Here the patients that attend the facility as well as the staff have all grown to be a family. Here people with physical disabilities are given a second chance to prove they can be contributing members of society and in some cases even the breadwinners in their family. Essentially, when it comes to the functionality of the facility the building works to some extent. The Patients, staff as well as the visitors who attend the facility seem to all operate with relative ease and comfort. However from an architectural point of view the design of the building does lack various aesthetic components which could contribute to the greater success of the facility.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

6.2 CASE STUDY TWO

BROWNS SCHOOL

Project Completion: 1979

Location: Durban, South Africa

Architects: Hesketh, Driman and Partners along with Olaf Pretorius Peckham and Partners



Figure 6.2.1 – Google Maps location of Browns School (source: www.googlemaps.com)

The Browns School is located in Pinetown, in the city of Durban. It is somewhat secluded from the street which adds to the privacy of the site. The constant connections with nature throughout the layout of the building make it a pleasant experience. The concept of a flat building layout meant that the building covers a greater area of the site which makes movement through sections confusing.

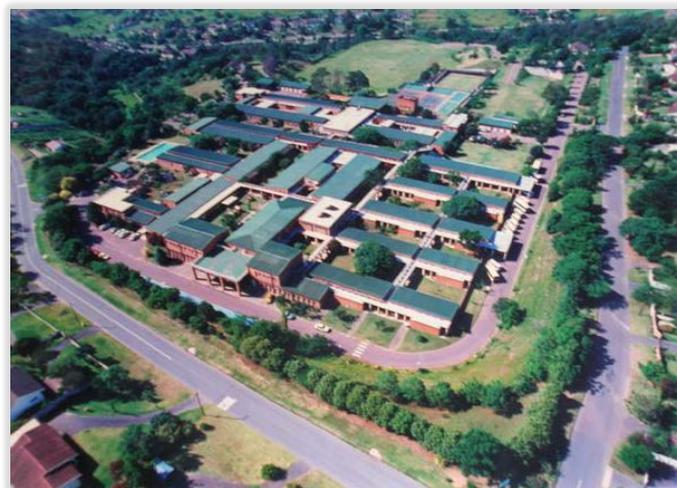


Figure 6.1.2 – Aerial photo of Browns School (source: www.googlemaps.com)

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

6.2.1 INTRODUCTION

Browns School caters for children with various special needs. The facility equips children with the physical, social and academic skills they need in order to provide holistic development. The degree of disability catered for varies from one child to the next however the most common disabilities are autism and cerebral palsy. The Browns school prides themselves on their relatively flexible curriculum which encourages team sports and music. Amongst the staff there are educators, assistant educators as well as therapists.

Looking at the Historical and Social Context the Browns School was established in 1943. It was at this time a parents committee was established to raise awareness of cerebral palsy in the community. A woman known as Mrs. Brown was said to have organized fund raising amongst other mothers in the area whose children or relatives were affected with cerebral palsy. Mrs. Browns intention was to build a care centre for these children to use during the holidays so their families could rest. The year 1957 marked a turning point in Mrs Browns initiative and the organization had raised sufficient funds to build a school. Construction was completed in the year 1959 and the facility was named “The Browns Rest Home for Cerebral Palsied Children’s Nursery”. The growing demand from the community over the years prompted a formal structure to be designed, in 1979 architects Hesketh, Driman and Partners along with Olaf Pretorius Peckham and Partners were officially commissioned for the project.

6.2.2 ANALYSIS

6.2.2.1 LEGIBILITY AND WAYFINDING

Browns School is located off Marianridge Road and is set away from the street. It sits behind a dense line of trees which obstructs views onto the site. If driving or walking past the complex the only source reference to the school is a sign board directing visitors to the entrance of the school. The dense tree line surrounding the school’s perimeter serves as a means of privacy by essentially limiting public interaction which in turn creates a safer environment. When approaching the building visitors are greeted with a parking area which is connected to the entrance. The entrance space is welcoming with double volumes and a coffered ceiling. The entrance foyer sets the tone of the schools calm environment. With the admissions office on the left Visitors have easy access to information. The school is designed in such a way that it is relatively one floor, ensuring than there is constant ease of mobility. An excellent application of wayfinding utilised by the school is coloured hand rails along all corridors, the different colours are symbolic of different grades so children can identify where they are at all times.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban



Figure 6.2.2.1.1 & 6.2.2.1.2 – Colour coded balustrades indicating the different grades (source: Author)

6.2.2.2 CONTACT WITH NATURE

The school places great emphasis on nature and embraces it to the extent that corridors and classrooms all surround courtyards that have plants and trees. These courtyards allow for both excellent natural light and ventilation to enter the corridors. The courtyard spaces have not been landscaped to great detail to ensure that they are usable for all students. The playground accommodates for children in wheelchairs as well with specialized equipment such as swings. Although the courtyards aim to create social interaction the grass areas are somewhat patchy and sand is exposed near seating areas. The courtyards are also very basic in terms of aesthetics and lack forms of art which the children can interact with.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban



Figure 6.2.2.2.1 & 6.2.2.2.1 – Central play areas with wheelchair friendly swings (source: Author)

6.2. 2.3 ENHANCING EXPERIENCE IN THE BUILDING

The site in which the Browns School is located on is fairly large and as a result architects had the liberty of designing the schools facilities predominantly on the ground floor. This however meant that moving from one space to the other had to be done via long corridors. The school utilises wide corridors to link a number of spaces such as classrooms, therapy rooms and even bathrooms along the way. These corridors are however double loaded and to visitors this can create a sense of nervousness, insecurity and vulnerability due to the unfamiliar environment. Double loaded corridors are usually inadequately lit as well as ventilated however the Browns school has incorporated various skylights along the corridors between the courtyards.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban



Figure 6.2.2.3.1 – Corridor depicting alcoves for wheelchairs to park as well as sky lights. (Source: Author)

6.2. 2.4 THE PSYCHOLOGICAL EFFECTS OF COLOUR AND USE OF MATERIALS

In terms of colours and materials, the exterior facades of the building comprises of a harsh brick texture which aren't sensitive to the nature of the building. Children are known to be honest when interacting with their environment and often experience spaces through touch. The interior spaces are designed more sensitively, with bright colours and soft textures. The library creates a very vibrant and encouraging space to make learning exciting. There are murals painted on the walls in subtle colours to add vibrancy to the space. The reading area is carpeted with ample seating spaces.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban



Figure 6.2.2.4.1 – 6.2.2.4.2 On the left the library depicting murals on the walls and on the right the reading area (source: Author)



Figure 6.2.2.4.3 – 6.2.2.4.4 On the left the library the reading area on the right corridor depicting the coldness of the brickwork. (source: Author)

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

6.2.3 CONCLUSION

The Browns School showcases the minimum requirements necessary in providing services to disabled children. The various uses of material from an economic point of view are extremely viable. The design of the school makes no specific attempt to integrate the built form into the healing or learning process. The extent of the long corridors are overwhelming to visitors and navigating through them without prior knowledge of the facility can be relatively stressful.

The human sensory experience is sadly lacking through the facility, with minimum attempts to engage the users and their senses.



Figure 6.2.3.1 – A typical courtyard between classrooms (source: V. Hashil)

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

**CHAPTER 7:
DATA ANALYSIS AND DISCUSSION**

CHAPTER 7: DATA ANALYSIS AND DISCUSSION

This chapter expresses the research conducted at Saint Giles as well as Browns school and a number of other institutions which all contribute to the overarching topic. This chapter also aims to highlight the development of the theoretical framework within the context of these case studies and interviews.

7.1 INTRODUCTION

The hypothesis drawn up in this dissertation is that the built environment has a direct impact on people with physical disabilities and affects them both psychologically and physically. Through the literature and research conducted above it is clear that the healthcare environment needs to be sensitive to the healing process. The environment has a lasting impact on individuals and the healing they are exposed to sets the tone for how they embrace the new chapter in their lives. An environment that neglects the sensitivity of the healing process can in fact hinder progress; physically, socially and even emotionally thus negatively affecting their lives in the future. It is critical to understand that every individual's experience is unique, the way they heal, the way they communicate and the way they experience spaces all relate back to their circumstances and their individual capacity to overcome them.

When designing for people with physical disabilities understanding their requirements are of the utmost importance. The built form needs to develop around their specific needs and highlight the elements which promote healing in a calm and relaxing environment. Here design elements such as colour, texture, light as well as materials all shape how a person perceives a space and if they are drawn to it or feel uncomfortable in it. People interact with a space if they feel comfortable within this is why legibility is of utmost importance. If a person can understand where they are and how to navigate from one place to another with ease it drastically improves their comfort levels.

The connection between the built form and nature is another very important link. According to (Keniger, 2013) studies have showed that interaction with nature has promoted benefits to physical health, cognitive performance as well as psychological well-being. The current decline in man's interaction with nature is proving to be detrimental to health and wellbeing. By introducing natural elements within the built environment, people are forced to interact with and experience nature, its beauty, textures as well as the scents.

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

7.2. QUALITATIVE STUDY ANALYSIS

A qualitative study was performed as part of this research project. The study involved interviews with professionals from various fields who deal with people with physical disabilities. The study interviews were conducted at the following institutions Saint Giles, the Browns School in Pinetown and City Hospital. At Saint Giles the marketing director was interviewed. At Browns School the principal was interviewed and at City Hospital Various specialists were interviewed from a theatre sister to an orthotics and prosthetics specialist.

All data presented was gathered from these interviews and informal meetings with the relevant medical professionals in the field who deal specifically with people with physical disabilities. The meetings conducted were to gain a better understanding of the rehabilitation environment from different perspectives in order to inform the researcher holistically.

7.2.1 HEALTHCARE PROFESSIONALS

During the various interviews with the relevant staff and specialists in the field the primary objective of the questions was to analyse and defragment the structure that is disabled health care. Interviewees were honest and helpful often relaying their personal experiences within their respective institutions.

Participant A - Educator

Participant A strongly emphasised the dedication an individual needs when working in this field. She highlighted the fact that there was a lack of facilities within the community for people with physical disabilities. She highlighted the lack of support received by family members and how that affects a child's healing and learning process. She emphasised the core value of a strong support structure in order for a child to develop as best they can. She also expressed the difficulties encountered with the outdoor environment and how unaccommodating it is for people with physical disabilities. Participant A also emphasised that the proposed facility go beyond healthcare and accommodate for social aspects of integration as well.

Participant B - Educator

Discussions with Participant B were insightful and touched on the sad reality that of our Governments role in rehabilitation aid. With little or no support provided from their side the situation is in a terrible state. From a healthcare perspective, care is relatively standardised and routine, patients come in and receive the treatment they require and are often not given the skills they require to fully heal and be reintegrated in to society. Participant B also touched on the sad reality of public facilities available for people with physical

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

disabilities he emphasized that unsuitable transport and housing facilities also hinder an individuals progress.

Participant C – Architect

Participant C highlighted the imperative need within the community to better understand and accommodate for physical disabilities. He emphasized the need for incorporating universal design into all buildings and spaces despite their function. He touched on the lack of healthcare facilities of this nature and that the site location is imperative and should be considered within a lower income bracket setting. He emphasized the practicality and simplicity of a facility of this nature and that user-friendliness is the core aspect of the design.

Participant D – Manager at Rehabilitation Facility

Participant D touched on various valid points when the topic was pitched to her. She emphasized the importance of a facility of this nature and that there is a definite need for it. She felt that accommodation however should be kept short term and not permanent. She emphasized the idea of vocational training and the fact that people with physical disabilities are very much active members of society.

Participant E – Orthotics and prosthetics specialist

Participant E explained the post-operation process and how patients go about healing. He touched on how prosthetics can renew peoples hope in their situation and try to give them as normal a life as possible. He explained the process involved when teaching patients how to adapt to their new situation and how to best utilise their prosthetics to ensure maximum benefit. He also touched on the cost factor involved and how the expense of it often puts patients off.

7.2.2 SUMMARISED INTERVIEW QUESTIONS

The following questions have been summarised with regard to relevance of the study and may not match the order of attached questioner (Appendix A)

1. What field are you in?

Majority of the interviewees are very familiar with the concept of disability, they either work in the healthcare profession, education sector or private practice.

2. What types of physical disabilities have you encountered/worked with?

Their day to day activities deal with various forms of disability such as amputee, Cerebral Palsy, stroke, paralysis and physical deformities. The patients and students they interact with have obtained their disabilities either through genetics or tragic accidents.

3. How long have you worked with/ lived with a person with a physical disability?

Majority of the interviewees have been in their field for over 5 or more years and therefore their experiences are invaluable. The experiences they have shared are real and open new avenues of the study that are often overlooked.

4. How has working with/ living with a person with a disability impacted on your life and what inspired you?

Interviewees unanimously answered that their field has humbled them, they have great appreciation for what they are able to do and this motivates them to give their all every day.

5. Where, to your knowledge do people with physical disabilities (blindness, deafness, loss of limbs) currently receive medical care?

Interviewees unanimously answered that the care facilities they are aware of are mostly government run and patients don't often receive the best care. They also emphasized the waiting periods for assistive operations are extensive.

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

6. In general do you feel that public facilities cater for the needs of people with physical disabilities such as malls, parks, hospitals?

Interviewees were adamant that public facilities were not accommodating at all. They stressed the difficulties they've had with transport, accommodation and access to various facilities. They stated that organizing outdoor events were such a challenge because places were not wheelchair friendly and the places that claimed they were, weren't entirely user friendly. They noted that most places catered for paraplegic parking and toilets here and there but that was about as user friendly as it got.

7. Have you come across the term Universal Design and do you know what it entails?

Most Interviewees were not familiar with the concept but once the principles of universal design were explained to them they more or less understood the meaning and strongly felt it should be incorporated into all facilities.

7.3. SUMMARY

From the theoretical and practical research done it is clear that a rehabilitation and special care centre requires complex and critical thinking. The considerations need to be sensitive and responsive to the type of people being catered for. The interview process helped shed light on the current facilities that are available to people with physical disabilities and what is lacking in them. The communication process also aided in clarifying what actually needs to be within a facility of this nature and the design elements which will aid in the overall healing process. Interviewees offered their insight on the topic and encouraged the idea of a rehabilitation and special care centre.

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

**CHAPTER 8:
DESIGN DEVELOPMENT
CONCLUSION AND RECOMMENDATIONS**

CHAPTER 8: CONCLUSION AND RECOMMENDATIONS

This chapter aims to comprehensively analyse the essence of the theoretical framework within the context of the case studies and research findings. This was done through interviews with various specialists in the field of physical disability as well as staff members at local disability facilities. The information obtained directly links to the topic and is therefore relevant to this dissertation.

8.1 CONCLUSIONS

The research finding presented in this dissertation highlights the key aspects that need to be taken into consideration when designing the built environment which positively affects its users, in this case people with physical disabilities. The focus is to create spaces that are meaningful and promote holistic healing in order to better the lives of the people who use it. The target is to make these types of facilities available to developing communities in order to give them a better standard of living and bridge the gap of inequality within the healthcare field. Rehabilitative care facilities need to extend their design paradigms beyond the pragmatic issues such as accessibility ramps and grab rails, the objective rather, is to comprehensively address the social and behavioural needs of the physically disabled. Using the built form as a response to these needs can create further meaning in people's lives.

When analysing the case studies it is clear that there is an initiative being made to assist the physically disabled within the context of Durban, however the reality is that there is still a lack of community understanding towards people with physical disabilities. The existing healthcare facilities for the physically disabled from an architectural point of view doesn't acknowledge their specific needs. These facilities lack a holistic healthcare approach and focus predominantly on the physical aspects of healing. Here the psychological and social healing aspects are neglected in the process and as a result people are not adequately equip to be reintegrated into society.

The various precedents analysed highlights the level of care facilities on an international scale. The facilities focus on theories such as biophilia, Genius loci, salutogenic design and sensory architecture. The designs of the facilities proved to be responsive to their context and even embraced it within the design. Nature is a key aspect of the design with courtyards and green roofs being incorporated and used as social spaces that encourage healing. The materials and colours used were also carefully considered and promote a positive healing and living environment. Patient facilities are given a great deal of attention and incorporate a homelike feel as opposed to the typical clinical feel of existing healthcare facilities.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

In conclusion the research has shown that healthcare architecture for the physically disabled has to essentially cater for a holistic healing approach to rehabilitation. There is an impending need by the physically disabled to be understood by the community and the people who care for them. Uplifting people with physical disabilities enables them to be a part of the city in which they belong. The only way architecture can solve the challenges faced by the physically disabled is through understanding their abilities as well as their disabilities. Only then will the concept of healing extend beyond the individual and translate into the community.

8.2 OUTCOMES OF RESEARCH QUESTIONS

- **How can the rehabilitation and reintegration of physically disabled people inform an architectural design process?**

According to the research obtained from the interviews majority of the interviewees felt that the current built environment does not cater for the physically disabled to the extent that it should. They highlighted the challenges that their patients and students faced when encountering public spaces outside of their facility. When the elements of the proposed rehabilitation centre were put forward participant B stated “Not only is there a want for a facility like that but there is a definite NEED.”

- **What are the needs of physically disabled people?**

When categorising the needs of people with physical disabilities the understanding is twofold. As participant A explained: “Rehabilitation has to do with the physical aspects of healing, but it also requires a strong and motivational support structure.” In terms of healthcare there is a definite need for more facilities which cater for people with physical disabilities. These facilities need to move away from just the literal “fixing” of the person and also incorporate their mental and social wellbeing into the recovery process. Participant B touched on the fact that the limited access to these types of facilities means that children and adults alike have to travel a substantial distance to obtain the care they need. He emphasized that lack of transportation for people with physical disabilities is another stumbling block in the process to recovery.

- **How do people with physical disabilities perceive their built environment?**

When speaking with interviewees they highlighted the fact that not sufficient thought has been put into the building from an architectural point of view but rather from a functional and locational point

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

of view. The interviewees unanimously reported that new students and patients are rather emotional when coming into a new environment. They are aware and cautious of their surroundings as well as the people they interact with.

- **Does nature (the outdoors) play a part in the healing process?**

Taking into account that current facilities don't often cater for nature as part of the healing process and it is rather clinical most participants couldn't relate very well to this notion. However once the concept was explained and examples given participants unanimously agreed that incorporating natural elements into the healing space would definitely aid in the process.

Participant D an orthotics and prosthetics specialist noted that patients usually have a tough time actually going outdoors post-surgery and incorporating natural elements into the building could serve as a transitional space for them and may even make the actual process less intimidating for the patient.

8.3 RECOMMENDATIONS

8. 3.1. UNIVERSAL DESIGN

Universal design as noted in the earlier chapters is a critical concept within the design world that needs to be incorporated into every building, despite its function or target user. The idea that small considerations made in the early stages of a design process can enable a whole community is astounding. In the case of the rehabilitation centre universal design will enable ease of use for everyone from staff to patients and their families.

8. 3.2. SALUTOGENIC ARCHITECTURAL DESIGN IN HEALTHCARE SETTINGS

The concept of salutogenic architectural design as noted previously is widely used in the design of healthcare facilities. The design methodology focuses on patient manageability, patient comprehensibility and patient meaningfulness. The salutogenic theory is a key aspect for understanding the numerous impacts the design process has on the healthcare environment. The practical and aesthetic design factors included in the healthcare environment can improve the outcomes of patients and their health. The model also focuses on the incorporation of nature which according to the research conducted can be a great assistance to health and wellbeing.

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

8. 3.3. CONNECTIONS WITH NATURE

From the research noted previously it is clear that the relationship between nature and architecture can be a harmonious one and beneficial to the building user. Establishing positive and nurturing connections between man and the built form can change people's perceptions and give them a more positive outlook. Within this intervention nature can be used as a means of healing and calming patients and even serve as a transition space for them to gain confidence when interacting with the outdoor world.

8. 3.4. THE EFFECTS OF LIGHTING

Lighting is a key aspect in design and access to natural light can either make a space beautiful or render it useless. Excellent lighting is firstly attributed to building orientation, this allows for the maximum use of natural daylight as well as solar energy collection. This translates back to the planning stages of a healthcare facility, bulks plans usually require more artificial lighting which adds to the clinical concept of a healthcare facility. Whereas the introduction of courtyard spaces cater for a more open plan where spaces can breathe. When it comes to keeping out the harsh elements of Durban weather passive solar devices can be used where need be, these include shading devices as well as louvers which allow for a more controlled interior without discarding the view of the outdoors.

8. 3.5. THE USE OF MATERIALS AND TEXTURES

During the research process it was noted that hospitals have a more clinical feel to them with their choice of materials and colour palate. It was highlighted that patients felt detached from their environment because it lacked a homelike feel to it. This can be addressed by careful considerations made to minor details such as materials and textures. Colour according to studies have shown to have an impact on the person experiencing a space therefore The use of a variety of neutral colours and natural materials can have an impact on the patients mental state and intern their health.

8. 3.6. GENIUS LOCI, SENSE OF PLACE

The Genius of a space or the term sense of place explores the way in which man perceives and experience a space. It also talks about how the elements of architectural design impact on this perception. When it comes to a design for a rehabilitation and special care centre, extra consideration has to be taken in this regard. Patients only feel comfortable in a space when they can relate to it and understand it. In order for spaces to evoke a calm and relaxing feel they need to respond to the patient's needs.

PART B- DESIGN DEVELOPMENT

The information in the following chapter will be practical recommendations/suggestions which will initiate a design response relating to the problems identified in the research above.

8.4 CLIENT BRIEF/ REQUIREMENTS

The KZN- Department of health together with the Abraaj group have established a need for a rehabilitation and special care centre for the physically disabled. The primary objective of this care facility is to provide holistic healing as well as initiate the reintegration process of individuals who are physically disabled.

The building will serve as a 24 hour care facility. It is of the utmost importance that the facility be designed in accordance with the rules and regulations of the KZN DoH and extends a premium standard of healthcare to all patients visiting the facility. The design team is to create a facility which promotes holistic medical care in a therapeutic, stress free and restorative environment. One of the key aspects to be explored within this intervention is the effects nature has on the healing process. The idea here is to break away from the conventional methods of treatment in order to explore a more responsive one.

The Medical Facilities:

- The facility should be able to accommodate +/- 45 patients at any given time. This includes specialists, long and short term stay as well as the trauma units and therapy facilities.
- Patients should be given access to private rooms, two patient rooms should be a maximum to encourage a stress free, relaxing environment.

Therapy Facilities:

- There should be a variety of therapeutic spaces, both natural and medical. Therapeutic spaces should be incorporated into the facility both for specific needs as well as transition spaces, such as internal courtyards. Therapy or quiet courtyards should also be incorporated into the design.

Public Facilities:

- Although the facility pertains to the needs of a very specific group of the community. It should incorporate facilities which also draws the attention of the general public. In order to break the current social barrier faced by people with physical disabilities.
- The facility should project an open, welcoming environment for people who require information and are interested in utilising the additional facilities.

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

Outdoor Spaces:

- The facility should incorporate a variety of open spaces for both therapeutic and social interaction.

Courtyards should be incorporated as a rest space form the built environment and allow constant connections with the outdoor environments.

Landscaping should be taken into consideration to make these spaces more peaceful.

Safety and Security:

- Safety is a major concern when it comes to a facility of this nature. The access to the facility should be relatively easy and controlled at entry points to the site and entry points into the building.

8.5 BUILDING TYPOLOGY

The chosen building typology for this dissertation is a rehabilitation and special care facility for the physically disabled. The main focus for this intervention will be on the lower income bracket but also incorporating functions that the public can use as well, to maintain the concept of inclusivity. The facility will accommodate physically disabled people with mobility impairments from a working class bracket between the ages of 18 to 65 (Retirement age) Focusing on stroke, paralysis and amputee. The idea for the location is for it to be in close proximity to an existing hospital as well as an established community in order to make is accessible. The site is located opposite the King Dinzulu Hospital complex, formally known as King George Hospital. The location is close to areas such as Clare Estate, Asherville which are established neighbourhoods.

8.6 SCHEDULE OF ACCOMMODATION

ENTRANCE

- Waiting area/ lounge/ Reception desk 330m²
- Records Room 21m²
- Admin Office 88 m²
- Managers Office 15.7m²
- Public Toilets(male, female, disabled) 45m²
- Coffee Shop 74m²

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

HEALTHCARE

- Psychologist rooms 33m²
- Psychiatrist 33m²
- Orthotics Specialist 33m²
- General Practitioner 28.8 m²
- Managers Office 19.2 m²
- Doctor On Call 27.3 m²
- Therapy courtyard 207 m²
- Pharmacy 67 m²
- Orthotics and prosthetics lab 75 m²
- Orthotics and prosthetics Workshop 36.5 m²
- X-ray rooms 64.5m²
- POP room 15.8 m²
- Store Room 27 m²
- Security Manager 15.7 m²
- Cleaning Manager 15.7 m²
- Cleaning Store 15.7 m²
- Maintenance Manager 15.7 m²
- Maintenance Store 15.7m²
- Kitchen Manager 15.7m²
- Kitchen 48 m²
- Cafeteria/ courtyard 294,5 m²

PATIENT ACCOMMODATION

- Family Stay rooms 376m²
- Single rooms 396m²
- Nurses Station 34.6 m²
- Matron office 15.7m²
- Store Room 8m²
- Stock Room 19m²
- Sluice Room 13.2m²
- Equipment cleaning 15.8 m²
- Clean and Dry Linen Store 22m²
- Laundromat 22m²
- Public Toilets 45m²
- Female Social courtyard 246 m²

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

- Male Social courtyard 323 m²

REHABILITATION

- Reception 14m²
- Waiting Area 60m²
- Games and media room 75m²
- Social Lounge 80 m²
- Outdoor pool Area 497m²
- Hot and Cold therapy 120 m²
- Rehabilitation Gym 116.8 m²
- Sauna 60m²
- Public Toilets 45m²
- Public Showers 27.9m²
- Physiotherapy 37m²
- Massage Therapy 37 m²
- Vocational Training Rooms x 3 294m²
- Meeting Room 75m²
- Admin Offices 75m²
- Social Courtyard 450m²
- Circulation 1368 m²

TOTAL: 6645 m²

8.7 CRITERIA FOR SITE SELECTION

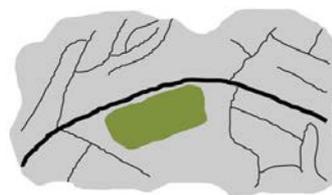
Site Location



KWA-ZULU NATAL



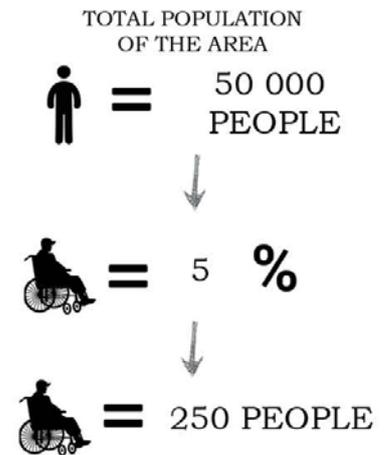
DURBAN



SPRINGFIELD

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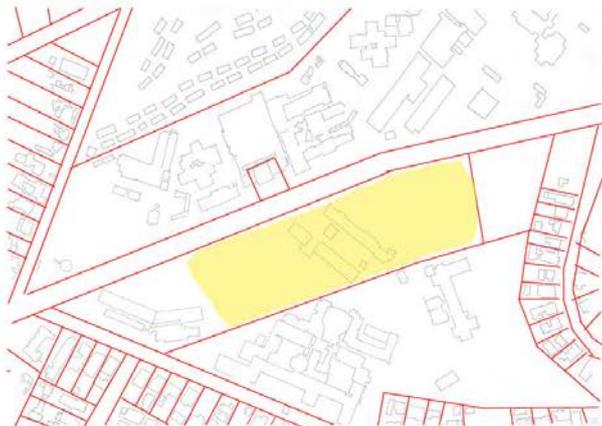
Site Selection



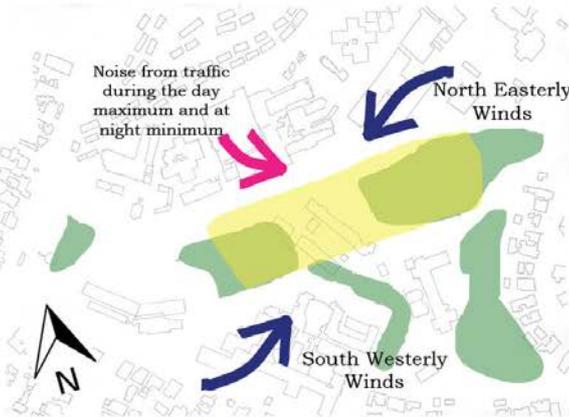
- The site sits within a well-established neighbourhood
- Easy access to public transport
- Easy access onto the site from the main road- R.D Naidu Drive
- Existing vegetation creates natural privacy
- The site is stepped down from the street which creates more privacy

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

Site Analysis



BLOCK SIZE



GREEN SPACES

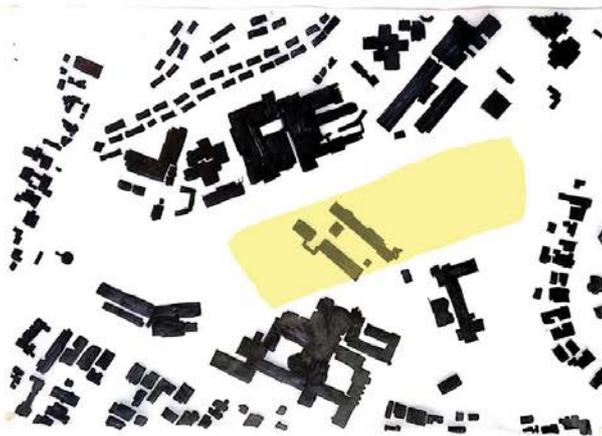
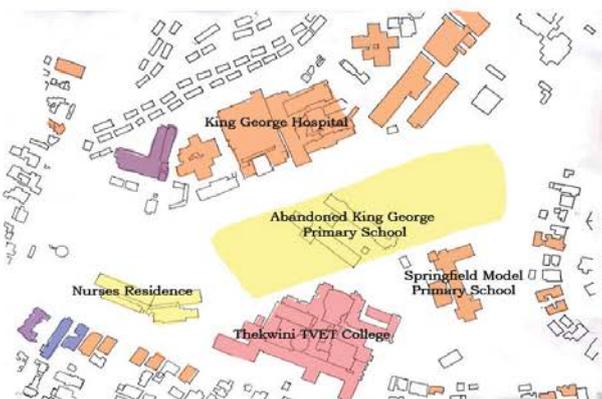


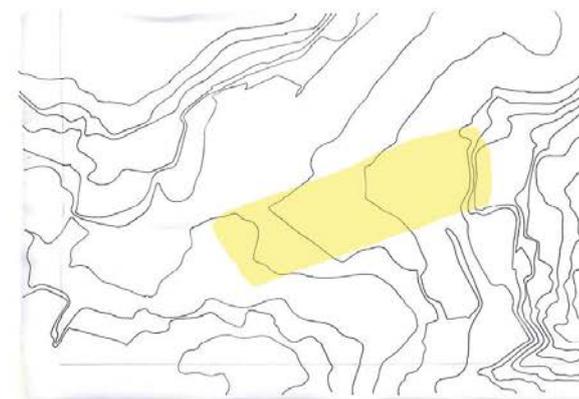
FIGURE GROUND



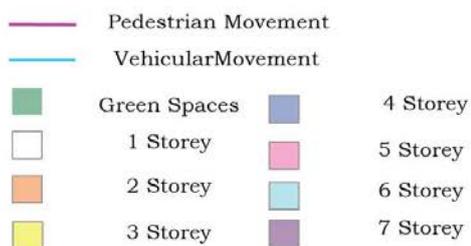
PEDESTRIAN & VEHICULAR MOVEMENT



BUILDING HEIGHTS

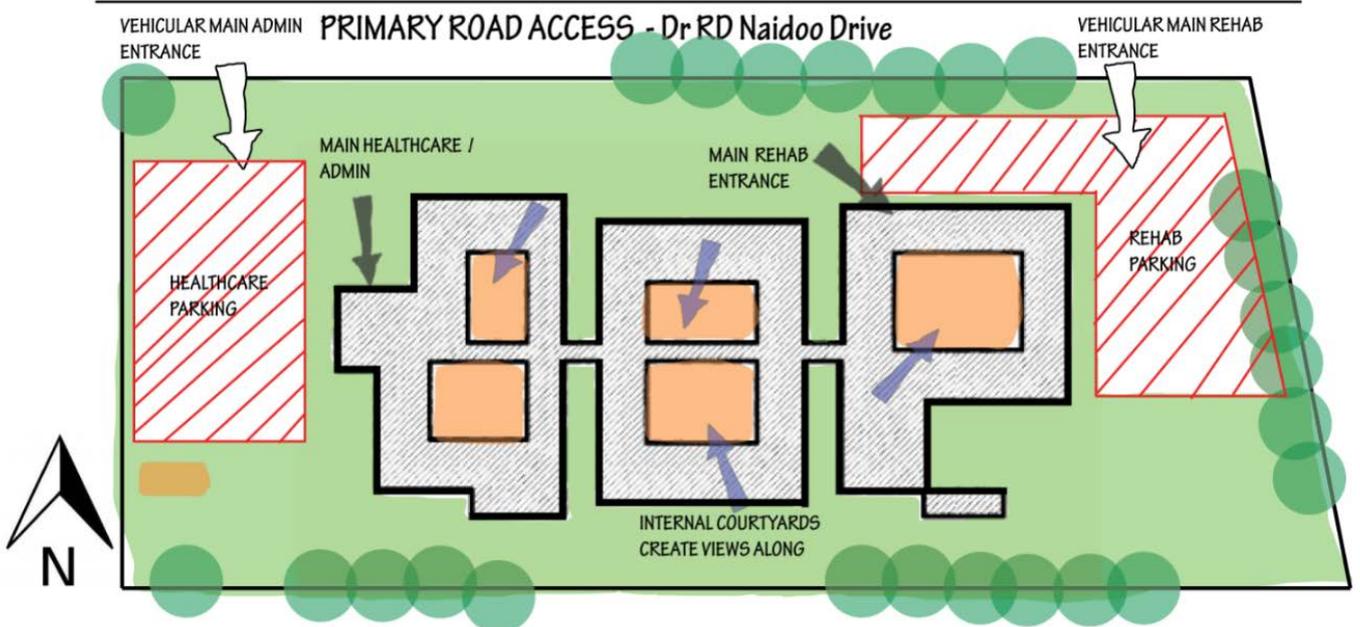
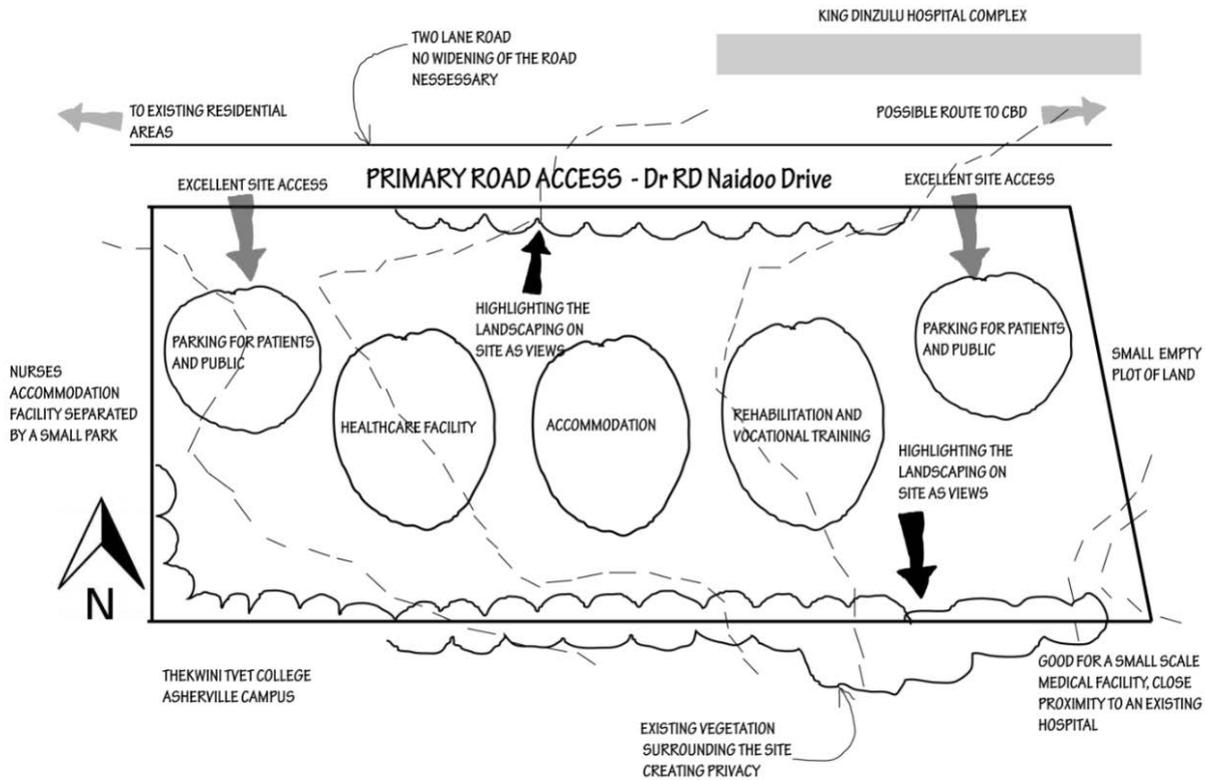


TERRAIN



EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

Site Development



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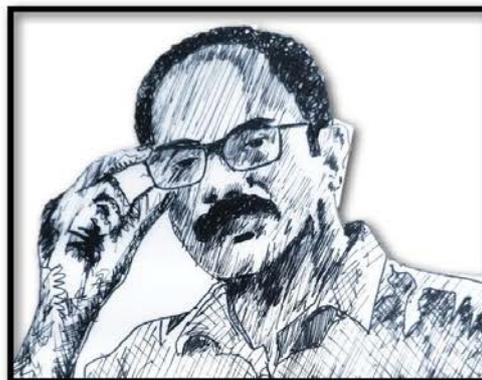
8.8 FINAL DESIGN PROPOSAL



“My ability is STRONGER than my disability” I’ve always wanted to study sports science. I never want my disability to be a limitation.



“Nature heals the mind, body and soul”
Working in a health care environment I sometimes never see the sun.



In our culture we believe that the mind is a powerful tool and can be used to heal the body.

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

ARCHITECTURAL DESIGN - MASTERS 2018 HEALING THROUGH RESPONSIVE AND INCLUSIVE ARCHITECTURE

DESIGN PRIMER

"Healing through responsive and inclusive architecture."

My ability is STRONGER. Nature heals the mind, In our culture we believe body and soul" that the mind is a powerful always wanted to study Working in a health tool and can be used to heal sports science. I never care environment! I want my disability to be a sometimes never see the sun.

DEPARTMENT OF HEALTH GUIDELINES THE ENVIRONMENT

Located close to a community

SAFETY AND SECURITY

Safety and security is a primary concern

PATIENT MOVEMENT

Primary access corridors minimum width of 2.44 meters. General corridors 1.83 meters.

A ramp shall be provided as access to the entrance of the hospital not on the same level of the site.

LIGHTING AND VENTILATION

Lighting and ventilation is key to a healthy healing environment

WASTE DISPOSAL AND SANITATION

Liquid and solid waste shall be treated and disposed of in accordance with applicable codes, laws or ordinances.

SEGREGATION

Wards shall observe segregation of sexes.

FIRE PROTECTION

Measures for detecting fire such as mandatory.

SIGNAGE

Effective graphic systems to be provided.

PARKING

1 parking space for every 35 beds.

ZONING

The different areas of a hospital shall be grouped according to zones and levels of privacy.

SUSTAINABLE PRINCIPLES

Orientation: Rainwater Harvesting

Greywater Systems: Tesla and SolarCity

MATERIALS

KEY WORDS

Short term accommodation, Accessible outdoor environment, Rehabilitative healthcare, Social Interaction, Skills development, Universal design

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WHO

- Physically disabled people with mobility impairments
- Working class bracket
- 10 to 65
- stroke, paralysis and amputees

WHAT

- A rehabilitation and special care facility for the physically disabled.

WHY

- Health service planning overlooks rehabilitation as a component of primary health care.
- 5% of the South African population is disabled.

WHERE

- Near existing hospital
- Established community (Clare Estate, Asherville)
- Accessibility
- Opposite the King Dinuzulu Hospital complex.

PROPOSED CLIENT

Department: REPUBLIC OF SOUTH AFRICA

• This is a public private partnership and the significance of this project is to enable people with disabilities to become contributing members of society.

CLIENT'S BRIEF

The KZN Department of health together with the Abraaj group have established a need for a rehabilitation and special care centre for the physically disabled. The primary objective of this care facility is to provide holistic healing as well as include the management process of individuals who are physically disabled.

The building will serve as a 24-hour care facility. It is of the utmost importance that the facility be designed in accordance with the rules and regulations of the KZN Dept and ensure it is accessible to all. The facility should be designed in a way that it is to receive a facility which promotes holistic medical care in a therapeutic, stress free and restorative environment.

One of the key aspects to be explored within this intervention is the different centers that on the building and to build away from the conventional method of treatment in order to explore a more responsive one.

The Medical Facilities:

- There should be a variety of therapeutic spaces, both natural and medical. Therapeutic spaces should be incorporated into the facility both for specific needs as well as transition spaces, such as general therapy.
- Patients should be given access to private rooms, two patient rooms should be a maximum to encourage a stress free, relaxing environment.

Therapy Facilities:

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Public Facilities:

- Although the facility pertains to the needs of a very specific group of the community, it should be designed to be accessible to the general public. In order to break the current social barrier faced by people with physical disabilities.
- The facility should project an open, welcoming environment for people who require information and are interested in visiting the additional facilities.

Outdoor Spaces:

- The facility should incorporate a variety of open spaces for both therapeutic and social interaction.
- Landscaping should be taken into consideration to make these spaces more peaceful.

Safety and Security:

- Security is a major concern when it comes to a facility of this nature. The access to the facility should be relatively easy and controlled to entry points to the site and entry points into the building.

REQUIREMENTS DURING THE HEALING PROCESS

- A healing and responsive environment
- A strong support structure
- Stimulating and uplifting activities
- Specialized care
- Physical and mental healing
- Connections to nature
- Sensory stimulation

CONCLUSIONS AND RECOMMENDATIONS

EXISTING FACILITIES

- Universal/ Inclusive architectural design elements.
- Strong connections to nature both physically and visually.
- Designing beyond the basic requirements of healthcare.
- Specialized care for people with physical disabilities (Mobility impairments)
- Accommodating for the senses to stimulate healing.
- Consideration for physical and mental healing.
- Encouraging social interaction to enhance the healing process.
- Rooms that allow for family stay.
- Consideration for lighting, colour and texture within the building.
- Long term stay a maximum of three months.
- Enhancing healing with customized prosthetics.
- Broad range of physical rehabilitation activities.

PROPOSED FACILITY

ARCHITECTURAL DESIGN - MASTERS 2018 HEALING THROUGH RESPONSIVE AND INCLUSIVE ARCHITECTURE

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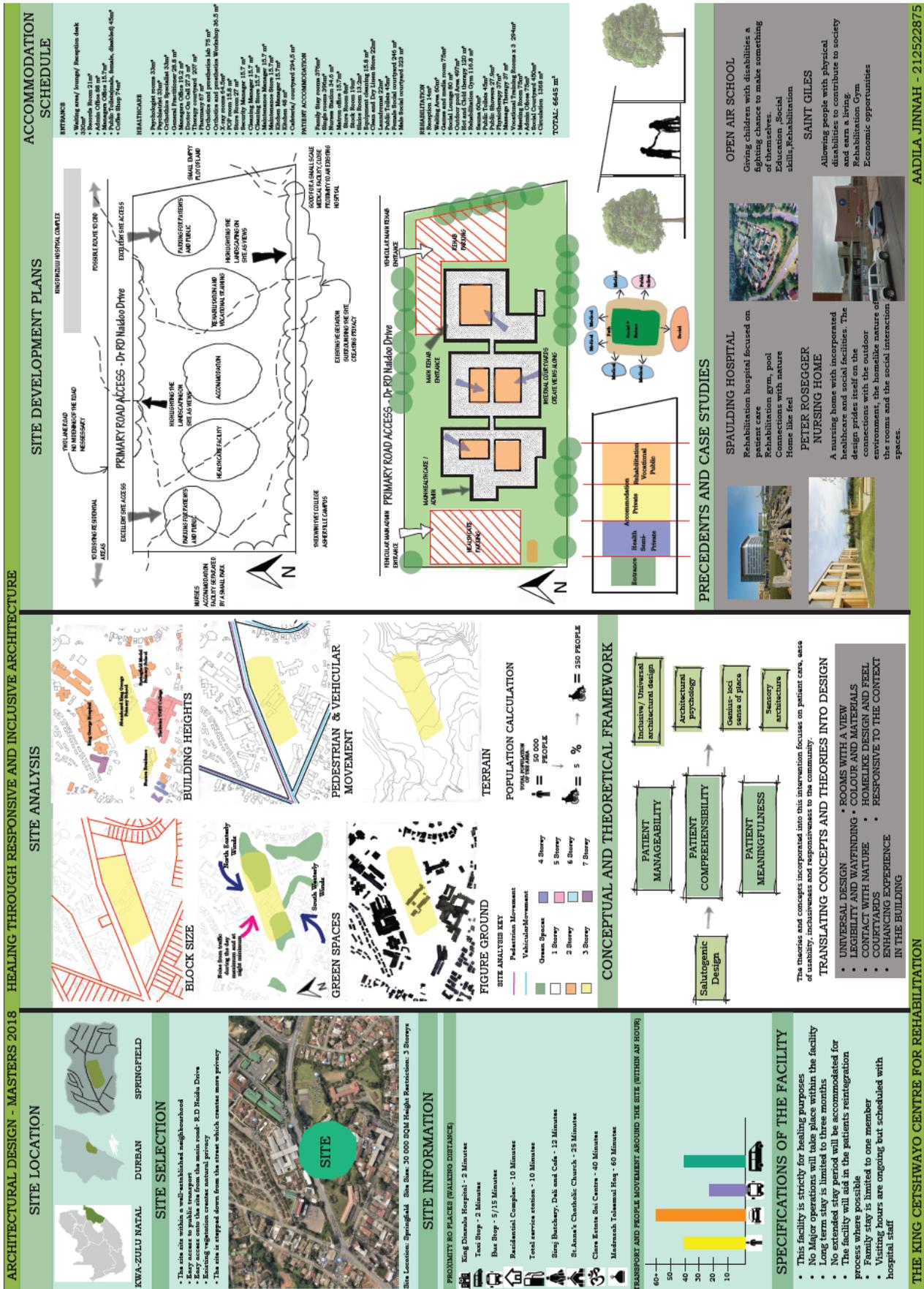
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PROPOSED FACILITY

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban



EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban



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NORTH ELEVATION Scale 1:200



SOUTH ELEVATION Scale 1:200



THREE DIMENSIONAL REPRESENTATION



EAST ELEVATION Scale 1:200



WEST ELEVATION Scale 1:200



SECTION A-A Scale 1:200



FACILITIES WITHIN EXISTING HOSPITALS

THE KING CETSHWAYO CENTRE FOR REHABILITATION

WAITING AREA



CAFETERIA



CORRIDOR



AADILA JINNAH - 212522875

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

WINDOW SCHEDULE

TYPE	NO.	DESCRIPTION	REMARKS
1	101	1000x1500mm	1000x1500mm window with 100mm gap between panes. 1000x1500mm window with 100mm gap between panes. 1000x1500mm window with 100mm gap between panes.
2	102	1000x1500mm	1000x1500mm window with 100mm gap between panes. 1000x1500mm window with 100mm gap between panes. 1000x1500mm window with 100mm gap between panes.

DEPARTMENT OF HEALTH
THE KING CETSUWAYO CENTRE FOR REHABILITATION

DOOR SCHEDULE

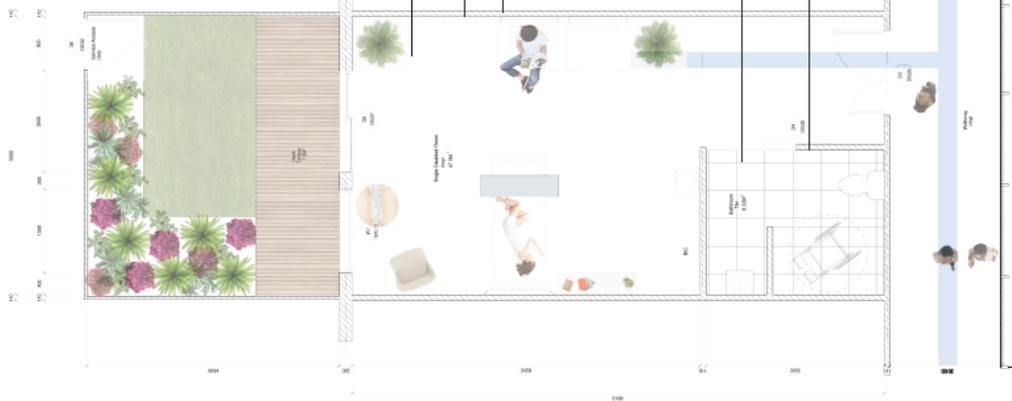
TYPE	NO.	DESCRIPTION	REMARKS
1	101	1000x2000mm	1000x2000mm door with 100mm gap between panes. 1000x2000mm door with 100mm gap between panes. 1000x2000mm door with 100mm gap between panes.
2	102	1000x2000mm	1000x2000mm door with 100mm gap between panes. 1000x2000mm door with 100mm gap between panes. 1000x2000mm door with 100mm gap between panes.

DEPARTMENT OF HEALTH
THE KING CETSUWAYO CENTRE FOR REHABILITATION

SHOPFLOOR SCHEDULE

TYPE	NO.	DESCRIPTION	REMARKS
1	101	1000x1500mm	1000x1500mm shopfloor with 100mm gap between panes. 1000x1500mm shopfloor with 100mm gap between panes. 1000x1500mm shopfloor with 100mm gap between panes.
2	102	1000x1500mm	1000x1500mm shopfloor with 100mm gap between panes. 1000x1500mm shopfloor with 100mm gap between panes. 1000x1500mm shopfloor with 100mm gap between panes.

DEPARTMENT OF HEALTH
THE KING CETSUWAYO CENTRE FOR REHABILITATION



PATIENT ROOM / SPACE ALLOCATION FOR FAMILY STAY
Scale 1:25



The use of different textures within patient rooms.

FLOOR
The floor is made of 1200x1200mm tiles with a 10mm gap between tiles. The tiles are made of a material that is easy to clean and maintain. The floor is made of a material that is easy to clean and maintain. The floor is made of a material that is easy to clean and maintain.

SHOOTING
The shooting is made of a material that is easy to clean and maintain. The shooting is made of a material that is easy to clean and maintain. The shooting is made of a material that is easy to clean and maintain.

WALL
The wall is made of a material that is easy to clean and maintain. The wall is made of a material that is easy to clean and maintain. The wall is made of a material that is easy to clean and maintain.

CEILING
The ceiling is made of a material that is easy to clean and maintain. The ceiling is made of a material that is easy to clean and maintain. The ceiling is made of a material that is easy to clean and maintain.

FLOOR
The floor is made of a material that is easy to clean and maintain. The floor is made of a material that is easy to clean and maintain. The floor is made of a material that is easy to clean and maintain.

WALL
The wall is made of a material that is easy to clean and maintain. The wall is made of a material that is easy to clean and maintain. The wall is made of a material that is easy to clean and maintain.

ELEVATOR
The elevator is made of a material that is easy to clean and maintain. The elevator is made of a material that is easy to clean and maintain. The elevator is made of a material that is easy to clean and maintain.

WALL
The wall is made of a material that is easy to clean and maintain. The wall is made of a material that is easy to clean and maintain. The wall is made of a material that is easy to clean and maintain.

STRIP SECTION B-B
Scale 1:20

SANWARE SCHEDULE

TYPE	NO.	DESCRIPTION	REMARKS
1	101	1000x1500mm	1000x1500mm sanware with 100mm gap between panes. 1000x1500mm sanware with 100mm gap between panes. 1000x1500mm sanware with 100mm gap between panes.
2	102	1000x1500mm	1000x1500mm sanware with 100mm gap between panes. 1000x1500mm sanware with 100mm gap between panes. 1000x1500mm sanware with 100mm gap between panes.

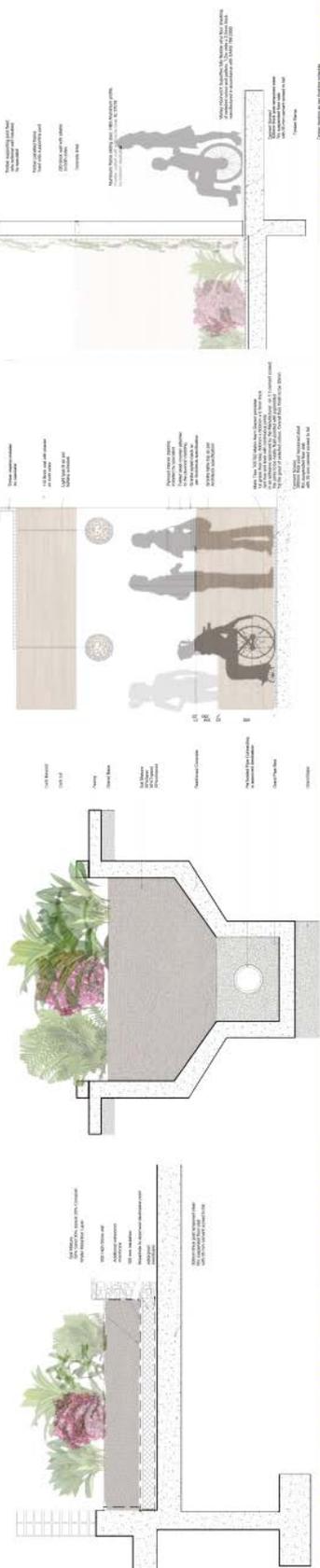
DEPARTMENT OF HEALTH
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ARCHITECTURAL DESIGN - MASTERS 2018 HEALING THROUGH RESPONSIVE AND INCLUSIVE ARCHITECTURE



SOCIAL COURTYARD Scale 1:25
 COURTYARD PLANTER DETAIL Scale 1:10
 PARKING PLANTER DETAIL Scale 1:10
 COFFEE SHOP DETAIL Scale 1:20
 PATIENT ROOM COURTYARD Scale 1:20



THE KING CETSWAYO CENTRE FOR REHABILITATION
 AADILA JINNAH - 212522875

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
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DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

List of Figures

Figure 2.1.2.1- The human ecosystem (Adapted form Hancock, 1993:18)

Figure 3.1.3.1- The physical environment and disability (Source: www.jeffpreston.ac)

Figure 3.1.4.1- Does the social environment really cater for the physically disabled or is it a pretence?
(Source asdteacher.com)

Figure 3.1.5.1- Empowering physically challenged people within the workplace (Source:
passionatepeople.invacare.eu.com)

Figure 3.1.6.1: Vocational training could help South Africa to reach its goals, as outlined in the National
Development Plan, to reduce unemployment. (Source: Brand South Africa)

Figure 3.2.1.1- Integrating mental health with overall wellness (Source: Author Sketch)

Figure 3.2.2.1- How people process environmental activities (Source: Author Sketch)

Figure 2.2.3.1- Sense of Sight, Sound, Smell, Taste and Touch (Source: www.worldatlas.com)

Figure 3.2.4.1- How the environment affects human behavior (Source: Author Sketch)

Figure 3.2.5.1- Facilities which limit patients to being patients can in fact be detrimental to their recovery
process (Source: www.hospitalcare.com)

Figure 4.2.1- Salutogenesis through healthy buildings, focusing on factors that support human health
(Source: Author Sketch)

Figure 4.2.4.1- Facilities where everyone has good observation, not only the staff. This is an essential
response to recovery centred models of care. (Source: MAAP- Aecom and Makower Architects)

Figure 4.2.4.2 - The plan of The Centre for Respite and Recovery. The Design incorporates gardens and an
aviary also, where patients can keep and train birds. These rehabilitation facilities aim to maximise
opportunities for self-empowerment. (Source: MAAP, Aecom and Makower Architects)

Figure 4.2.5.1- The patient relaxation spaces at Khoo Teck Puat Hospital, the environment encourages
wildlife with the intention to enrich meaningfulness in patients. (Source: CPG Consultants)

Figure 4.3.1.1- The above image relates modern wayfinding methods to their positioning in the real-world
setting. (Source: Wayfinding, Signage & Masterplan 2010)

Figure 4.3.1.2- The image above illustrates how modern floor and ceiling design can incorporate wayfinding
methods. (Source: www.lightart.com)

Figure 4.3.2.1- Incorporating nature into the built form (Source: Author Sketch)

Table 4.3.2.2- The benefits that have stemmed from interacting with nature. From peoples physical health
and mental wellbeing to their spiritual upliftment.
(Source: Author Sketch adapted from Int. J. Environ. Res. Public Health, 2013)

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

Figure 4.3.3.1.1- Waiting areas which are less clinical and more homely. Making it comfortable for the families of patients. (Source: pinterest.com)

Figure 4.3.3.1.2- Wider corridors which allow people to stop rest and interact

(Source: pinterest.com)

Figure 4.3.3.2.1- Windows with a view, allowing people to relax within a space while getting a change of scenery. (Source: pinterest.com)

Figure 4.3.3.3.1- The effect of light and shadow in Louis Kahn's National Parliament of Bangladesh (Source: www.fischerlighting.wordpress.com)

Table 4.3.3.4.1- The human response to colour (Source: www.etd.fcla.edu, Edge, 2003)

Figure 4.4.1.1- Illustrating the aims and objectives of Universal Design (Source: www.dol.gov.za)

Figure 4.4.3.1.1- Adaptation of universal design in public buildings (Source: www.slideshare.net)

Figure 4.5.1- Place is the balance between meaning and space (Source: Author Sketch)

Figure 5.1.1- Google Maps location of the Peter Rosegger nursing home (Source: www.googlemaps.com)

Figure 5.1.1.1- Front perspective of the building showcasing the social garden (Source: www.archdaily.com)

Figure 5.1.2.1.1- Ground Floor Plan of residential zones as well as public social spaces located on the ground floor (Source: www.archdaily.com)

Figure 5.1.2.1.2- First Floor Plan of residential zones as well as public social spaces located on the ground floor (Source: www.archdaily.com)

Figure 5.1.2.2.1- Connections with nature (Source: www.archdaily.com)

Figure 5.1.2.2.2- Connections with nature (Source: www.archdaily.com)

Figure 5.1.2.3.1- visual link between a corridor and the central courtyard (Source: www.archdaily.com)

Figure 5.1.2.4.1- The structure and materials used (Source: www.archdaily.com)

Figure 5.1.2.5.1- A room expressing the beautiful homelike setting and windows with views of the outdoors. (Source: www.archdaily.com)

Figure 5.1.3.1 -The circulation on the first floor. (Source: www.archdaily.com)

Figure 5.2.1 - Google Maps location of The Spaulding Rehabilitation Hospital (Source: www.googlemaps.com)

Figure 5.2.1.1- The Spaulding Rehabilitation Gym (Source: www.archdaily.com)

Figure 5.2.1.2 - The Spaulding Rehabilitation Pool (Source: www.archdaily.com)

Figure 5.2.2.2.1- The Roof garden as seen from the upper floors (Source: www.archdaily.com)

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

Figure 5.2.2.4.1- The Reception area showcasing a variety of materials and colour
(Source: www.archdaily.com)

Figure 5.2.2.5.1- Patient rooms with a homelike feel and views of nature
(Source: www.archdaily.com)

Figure 6.1.1- Google Maps location of Saint Giles (Source: www.googlemaps.com)

Figure 6.1.2 - Staff at the work centre (Source: www.saintgiles.org.za)

Figure 6.1.3 - Staff and visitors at the rehabilitation Gym (Source: Author)

Figure 6.2.4.2.1- Work Centre depicting the amount of natural lighting (Source: Author)

Figure 6.2.4.3.1- Automated doors to female toilet (Source: Author)

Figure 6.2.4.4.1- Rehabilitation Gym toilet (Source: Author)

Figure 6.2.4.4.2 - Staff lunch room (Source: Author)

Figure 6.2.1- Google Maps location of Browns School (Source: www.googlemaps.com)

Figure 6.1.2 - Aerial photo of Browns School (Source: www.googlemaps.com)

Figure 6.2.2.1.1- Colour coded balustrades indicating the different grades (Source: Author)

Figure 6.2.2.1.2 - Colour coded balustrades indicating the different grades (Source: Author)

Figure 6.2.2.2.1- Central play areas with wheelchair friendly swings (Source: Author)

Figure 6.2.2.2.1- Central play areas with wheelchair friendly swings (Source: Author)

Figure 6.2.2.3.1- Corridor depicting alcoves for wheelchairs to park as well as sky lights. (Source: Author)

Figure 6.2.2.4.1- The library depicting murals on the walls (Source: Author)

Figure 6.2.2.4.2- Reading area (Source: Author)

Figure 6.2.2.4.3- The library reading area (Source: Author)

Figure 6.2.2.4.4- Corridor depicting the coldness of the brickwork. (Source: Author)

Figure 6.2.3.1- A typical courtyard between classrooms (Source: V. Hashil)

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

APPENDIX A: Interview questions

Interacting with People Who Have Physical Disabilities

This form has 13 questions about your daily experiences with someone who has a physical disability. Each question has a space afterwards to write out a response. This information will be used towards the dissertation topic “**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special-care Centre in the city of Durban.**” Proposed by Aadila Jinnah.

Confidentiality:

You are not required to answer any or all of these questions if you are not comfortable to do so. All Information that you provide on this form will remain confidential and is for the sole purpose of research only.

1. What is your full name?

2. What field are you in?

3. How long has this institution been in operation?

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre in the city of Durban

4. What types of physical disabilities have you encountered/worked with?

5. How long have you worked with/ lived with a person with a physical disability?

6. How has working with/ living with a person with a disability impacted on your life and what inspired you?

7. During your time at this institution, have you seen children make progress with regard to their disability? If so, please give me an example.

8. Do you think the environment at this school maximises the children's learning and developmental potential?

9. Where, to your knowledge do people with physical disabilities (blindness, deafness, loss of limbs) currently receive medical care?

10. Did you feel that the quality of treatment was of a good standard?

**EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban**

11. Where do you know where they live?

- With me
- With family
- In a care facility
- On their own

12. Have they attempted to or do they work?

- Yes they have
- No they haven't
- I don't know
- They want to but don't have the skills
- They don't have to, their family takes care of them

13. In general do you feel that public facilities cater for the needs of people with physical disabilities such as malls, parks, hospitals?

14. In your experience have you had difficulty accessing a particular public facility with someone who is physically disabled?

15. Have you come across the term Universal Design and do you know what it entails?

16. Would you be encouraging of a rehabilitation and special care centre which will incorporate housing, healthcare specific to the needs of people with disabilities?

Thank you for your time and assistance.

Should you be willing to assist with any further information please forward any documents to:

aadilajinnah@gmail.com or call 0769035506

APPENDIX B: Ethical Clearance

EXPLORING HOW THE HEALING AND REINTEGRATION OF THE PHYSICALLY
DISABLED INFORMS ARCHITECTURAL DESIGN: Towards a rehabilitation and special care centre
in the city of Durban



21 August 2018

Ms Aadila Jinnah (212522875)
School of Built Environment & Development Studies
Howard College Campus

Dear Ms Jinnah,

Protocol reference number: HSS/0460/018M

Project Title: Exploring how the Healing and Reintegration of the Physically Disabled Informs Architectural Design:
Towards a rehabilitation and special-care Centre in the City of Durban

Approval notification – Amendment Application

This letter serves to notify you that your application for an amendment dated 16 August 2018 has now been granted **Full Approval** as follows:

- Change in Title

Any alterations to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study must be reviewed and approved through an amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

Best wishes for the successful completion of your research protocol.

Yours faithfully

.....
Professor Shenuka Singh (Chair)
Humanities & Social Sciences Research Ethics Committee

/pm

Cc Supervisor: Mr Lawrence Ogunsanya
Cc Academic Leader Research: Professor Oliver Mtapuri
Cc School Administrator: Ms Angeline Msomi

Humanities & Social Sciences Research Ethics Committee

Professor Shenuka Singh (Chair)

Westville Campus, Govan Mbeki Building

Postal Address: Private Bag X54001, Durban 4000

Telephone: +27 (0) 31 260 3587/8350/4557 Facsimile: +27 (0) 31 260 4609 Email: ximbap@ukzn.ac.za / snymam@ukzn.ac.za / mohunp@ukzn.ac.za

Website: www.ukzn.ac.za



Founding Campuses: Edgewood Howard College Medical School Pietermaritzburg Westville