PROPOSED REHABILITATION CENTRE, OKE-IGBO, ONDO STATE.

(EVALUATING IDEAL STANDARDS IN REHABILITATION CENTRES)

BY

AJILEYE, TOMISIN RAPHAEL

ARC/08/3974

MAY, 2015

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A THESIS SUBMITTED TO

THE DEPARTMENT OF ARCHITECTURE, SCHOOL OF POSTGRADUATE STUDIES FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE, ONDO STATE, NIGERIA.

IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF MASTER OF TECHNOLOGY (MTECH) IN ARCHITECTURE.

MAY, 2015

DECLARATION

I, AJILEYE, TOMISIN RAPHAEL of the Department of Architecture, Federal University of Technology, Akure, hereby declare that this independent research work was carried out by me under the supervision of **Dr Igbekele Daodu** in partial fulfilment of the requirement for the award of Master of Technology, (M. Tech) Degree in Architecture. All sources of information quoted and otherwise were duly acknowledged.

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Ajileye Tomisin Raphael Date.

CERTIFICATION

This is to certify that this project research work "Design of Ultra-Modern Shopping Mall, Akure (Achieving Security and Safety in Public Buildings) was diligently carried out by **AJILEYE, TOMISIN RAPHAEL** with the matriculation number **ARC/08/3974** as part of the requirements for the award of Master of Technology in Architecture, Federal University of Technology Akure under the supervision of **Dr Igbekele Daodu.**

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DEDICATION

This research work is gratefully dedicated to the Almighty God, who was, who is and who is to come. He is the Almighty Architect who fashioned us all. He designed and constructed what was, what is and what will be, visible and invisible. To Him be all the Glory forever.

ACKNOWLEDGEMENT

First, I want to acknowledge the Almighty God, who is my Maker, my Lord, and my Role Model for making this thesis a success. My warm appreciation goes to my wonderful supervisor Dr Igbekele Daodu, who despite his incredibly tight schedule coupled with his multifarious commitments still carved out time to go through my work and guide me diligently all through this thesis; for these I say a big thank you. Moreover, my profound gratitude goes to the Head of Department, Dr A.A. Taiwo for creating the zeal to finish this thesis on time. The part played by the immediate past Head of Department is not to be overlooked, who was there when this work was initiated. Also worthy of acknowledgement are all the members of staff of the Department of Architecture who directly or indirectly contributed to the success of this project. May God bless you all richly.

I equally want to acknowledge my parents: Pastor and Mrs Gabriel O. Ajileye. I am very grateful for all the love and care you have bestowed upon me all through these eight years academic career here in FUTA; for allowing God to use you remarkably for the provision of my needs; thanks for your prayer and moral supports. To my best friend and partner in life and destiny, Ogundele Adetutu; thank you for your support, encouragement and prayers for me throughout the time of working on this project. And to all my friends, classmates, colleagues and close companions: Joseph Olusola, Abegunde Ayomide, Oviosa Vera, among several others; you are highly appreciated. May the good Lord grant us all to eat the fruit of our labour.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF PLATES

LIST OF TABLES

ABSTRACT

Rehabilitation centres generally serve people who have a physical disability, an intellectual disability, a pervasive development disorder, an addiction problem or behavioural, psychosocial or family difficulties; with the purpose of restoring them to a useful place in the society. The vocational aspect of rehabilitation is a set of services provided to individuals who suffer from mental or physical disorders, but still have the ability and desire to learn and function productively. Everyone deserves to get equal opportunity in the most suitable environment to develop their personality either they are healthy or disabled, to prevent great wastage of human resources. The aim of this study is to evaluate ideal standards in rehabilitation centres with the view of highlighting best practices to imbibe in designing for people living with disabilities. Case studies were carried out on existing local and international rehabilitation centers to understanding the building type and most especially evaluate their adherence to standards. Findings from the case studies include: understanding of more spaces to be created in the center, areas of emphasis, and general failures to avoid. It is recommended that the behavioural aspect of architectural design should be considered *to aid the quality of users' thinking and self*-esteem as well as designing to standard.

Keywords: Rehabilitation, rehabilitation center, vocational center, disability, standards and disabled.

CHAPTER ONE

1.0. INTRODUCTION

1.1.BACKGROUND TO THE STUDY

In the society, everybody should get equal opportunities to develop his or her personality either healthy or disabled. So for disabled people, special education program should be offered to enhance their personality and to develop their career. If we do not make provisions for their educational and vocational training, their potentialities will remain undeveloped resulting in great wastage of human resources. (Shahid, Naheed, Tariq, and Javed, 2013)

Disabilities is an umbrella term, covering impairments, activity limitations, and participation restrictions. An impairment is a problem in body function or structure; an activity limitation is a difficulty encountered by an individual in executing a task or action; while a participation restriction is a problem experienced by an individual in involvement in life situations (World Health Organization, 2012)

Disability is one of the important causes of dependency. It is not known how many disabled persons in Nigeria are self-supporting through living on saving, income from saving or investments, pensions or insurance payments. Neither is information available as to the number of disabled persons who are supported wholly or in part by their families, relatives, friends, or private social charitable and religious organizations. The disabled person frequently experiences a deterioration of his basic skills and a loss of self-confidence, resulting in despondency. Unable to participate in the normal life of the family and the community, he may become maladjusted because of a feeling of inequality, lack of prestige and other concomitants of “not belonging”. In spite of the seemingly gloomy existence of the disabled, there are numerous career opportunities for them in our nation. (Adima, 2013)

It is important to note the difference between impairment, disabilities and handicap as these are sometimes used interchangeably. Jebasingh, (2012) explains the difference: an impairment is any loss or abnormality of psychological, physiological or anatomical structure or function; Disabilities is any restriction or lack (resulting from an impairment) of ability to perform an

activity in the manner or within the range considered normal for a human being; while Handicaps is a disadvantage for a given individual, resulting from an impairment or a disability, that limits or prevents the fulfilment of a "survival" role that is normal (depending on age, sex, and social and cultural factors) for that individual.

People living with disability have become thus as a result of nature, accident, or several other hazards either imposed by self or by environment. Many of them are victims of circumstance. They should be able to live quality life like every other person despite their disability. Instead, they are pushed to the lowest level and society is not making that difficult. Many of them have not only been physically distorted but have also being altered in the mind. Rehabilitation thus becomes a subject to be looked into.

Rehabilitation is an integrated program of interventions that empower individuals with disabilities and chronic health conditions to achieve "personally fulfilling, socially meaningful, and functionally effective interaction" in their daily contexts (American Psychological Association, 2008). Rehabilitation is a process to restore or helping an individual achieve the highest level of independence and quality of life possible physically, emotionally, socially and spiritually (Siemionow, 2011).

In her essay, Obinna (2013) explained how the environment of health facilities can be jeopardizing to the users. She described the crisis faced by patients some of which are direct results of the design of the spaces and other components. Ultrich et al (2004) in their publication stated how these health facilities can be dangerous and stressful for patients. Karlin and Zeiss, (2006) stated that "Research findings reported over the past 50 years indicate that intervening environmentally through clinically reformed, patient-centred design can improve functioning both among and between patients and staff." This is to say that facilities designated for rehabilitation can itself become a more jeopardizing environment for dwellers.

1.2.STATEMENT OF THE PROBLEM

People living with disability face several challenges in their day to day living. It is therefore important that the short time they will spend in a rehabilitation centre be a complete time of restoration and preparation for them. The part architecture has to play in this cannot be overemphasized. A rehabilitation centre should not be designed to constitute more discomfort and

inconvenience for people living with disabilities as it is the case in some. When deliberately designed rehabilitation centres are short in necessary standards, then it becomes a problem to deal with. This essay seeks to evaluating adherence to standards in Nigerian based rehabilitation centres with the view of recommending best practices in rehabilitation centre design in Nigeria.

1.3. AIM AND OBJECTIVES

The aim of this study is to evaluate ideal standards in rehabilitation centres with the view of highlighting best practices to imbibe in designing for people living with disabilities for quality rehabilitation.

The objectives of this research include:

i. To analyse the existing conditions of local rehabilitation centres
ii. To collate existing standards and requirement for people living with disabilities
iii. To evaluate compliance of existing rehabilitation centres to standards
iv. To identify necessary standards that can be incorporated in new design of rehabilitation centres.
v. To recommend best practices for subsequent rehabilitation centres to suit the comfort of people living with disabilities.

1.4. SCOPE OF THE STUDY

There are different types of rehabilitation centres. This study is more focused on rehabilitation centres where people living with disabilities can acquire skills, education and adequate training in preparation for the outside world. This study will also consider some aspects of medical rehabilitation centres. Researchers have already spelt out necessary standards for spaces used by people living with disabilities. This research will look closely into these standards and how they are relevant in the design of rehabilitation centres.

1.5. LIMITATION OF STUDY

Limitations encountered during the course of this project include:

i. Cost of travel and gathering of relevant materials necessary for the study,

ii. Erratic power supply
iii. High cost of fuel at period of study.

1.6.JUSTIFICATION FOR THE STUDY

Not until recently, the welfare and consideration of people living with disabilities has not been an important subject. People living with disabilities live all their days unable to access several facilities people like them have access to. Their pains and complain ought to be heard and attended to like every other citizen of the country. As a matter of fact, they deserve to be better treated than others, due to their condition. When it now comes to their own centre for rehabilitation, there is need for such to be designed to suit them to maximum, such that the space is adjusted completely to their way of life, but more than that it should also prepare them for the outside world.

1.7. RESEARCH METHODOLOGY

The procedure of generating information for this research work is based on the use of both primary and secondary sources. Primary sources will include: information gotten through direct observations, questionnaire and oral interviews. Further information will be gotten from the analytical study of conditions obtained in various study area with photographs taken to show their existing situations. Also this research information will be provided from secondary sources which may include: web library, textbooks, encyclopedia, past projects, journals, and manuals.

1.8. DEFINITION OF TERMS

1. **An impairment:** is any loss or abnormality of psychological, physiological or anatomical structure or function.
2. **Disability:** is any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being. Also defined as inability of an affected person to carry out certain activities considered normal for his age, sex etc. because of impairment.
3. **Handicaps:** is a disadvantage for a given individual, resulting from an impairment or a disability, that limits or prevents the fulfilment of a “survival” role that is normal

(depending on age, sex, and social and cultural factors) for that individual i.e. such is not able to discharge the obligations required of him and play the role expected of him in the society.

4. **Rehabilitation:** is a process to restore or helping an individual achieve the highest level of independence and quality of life possible physically, emotionally, socially and spiritually.
5. **PwD:** People with Disabilities.
6. **Rehabilitation centre:** a facility providing therapy and training for rehabilitation. The centre may offer occupational therapy, physical therapy, vocational training, and special training such as speech therapy.

CHAPTER TWO

2.0. LITERATURE REVIEW

2.1.DISABILITY IN VIEW

Disability is part of the human condition. Almost everyone will be temporarily or permanently impaired at some point in life, and those who survive to old age will experience increasing difficulties in functioning. Most extended families have a disabled member, and many non-disabled people take responsibility for supporting and caring for their relatives and friends with disabilities. Every epoch has faced the moral and political issue of how best to include and support people with disabilities. This issue will become more acute as the demographics of societies change and more people live to an old age (World Health Organization, 2011)

2.1.1. WHAT IS DISABILITY?

World Health Organization, (2011) defines disability as difficulties encountered in any or all three areas of functioning. These areas of functioning includes: impairments, activity limitations, and participation restrictions.

Impairments are problems in body function or alterations in body structure – for example, paralysis or blindness;

Activity limitations are difficulties in executing activities – for example, walking or eating;

Participation restrictions are problems with involvement in any area of life – for example, facing discrimination in employment or transportation.

Nagi (1969) defines disability as:

Pathology that interrupts physical or mental processes; Impairment that limits a person's ability to function and that may result in; Functional limitation relative to the ability to perform or engage in life task and; Disability to perform socially expected activities.

2.1.2. MEDICAL AND SOCIAL MODEL ON DISABILITY

Disability is complex, dynamic, multidimensional, and contested. Over recent decades, the disabled people's movement – together with numerous researchers from the social and health sciences have identified the role of social and physical barriers in disability. The transition from

an individual, medical perspective to a structural, social perspective has been described as the shift from a "medical model" to a "social model" in which people are viewed as being disabled by society rather than by their bodies (World Health Organization, 2011)

The way the medical view disability is different from the way the social world view it. Figures 1 and 2 defines the difference between this models.

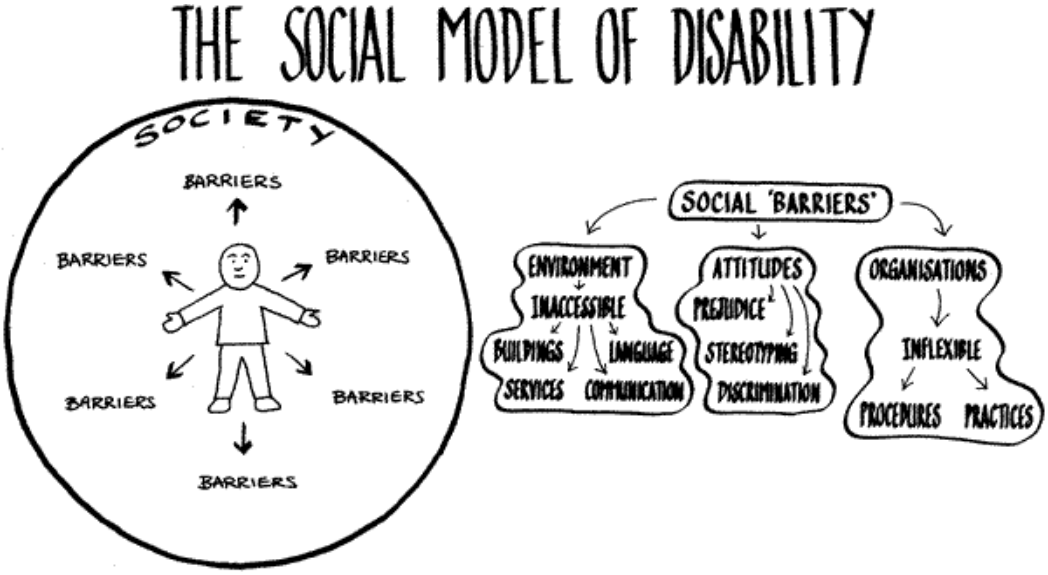

Figure 1: The social model of disability.

Source: (Pena, 2012)

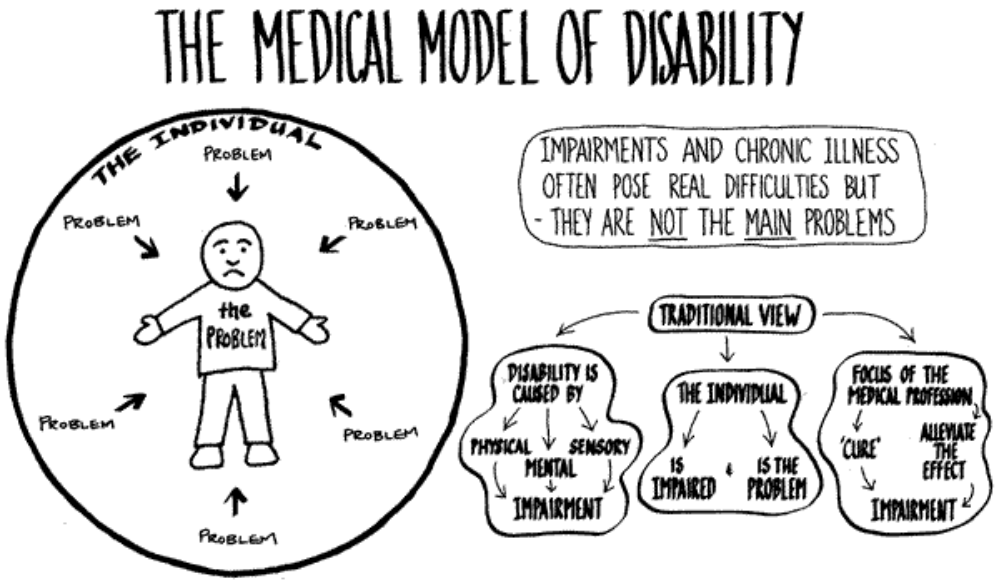

Figure 2: The Medical model of disability.

Source: (Pena, 2012)

According to Pena (2012), the medical see people living with disabilities as lacking physical, sensory or mental functioning. They described disabled to have: low self-esteem, undeveloped life skills, poor education, and poor relationship with families and society. The Social approach is to see disability as not a medical problem but an exclusion from everyday life. The social model stated that the disabled do not need treatment primarily but: acceptance, change to society, accessibility to public places etc.

Pena (2012) went on to discuss words to avoid when dealing with disabilities.

Table 1: Culture language with disabilities.

Source: Pena (2012)

Words to avoid	Preferred
Disabled	Disabled people (People with disabilities)
The deaf	People with hearing impairment
Dumb or mute	Persons without speech or speech impairment
The blind	People with visual impairment
Confined to wheelchair	Wheelchair user
Mentally handicapped, crazy, mad man, mentally ill,	Person with cerebral palsy or mental health issues

2.1.3. CLASSIFICATIONS OF DISABILITY

Afolayan, (2007) classified disability into three broad categories:

1. **Neurological Disability:** are classic disabilities resulting from sensory impairment e.g. blindness, deafness, mental retardation, speech defects, epilepsy, cerebral palsy.
2. **Neuromuscular Disability:** these are disabilities resulting from damage to the muscles e.g. monoplegic, paraplegic, quadriplegic, hemiplegic, polio, leprosy, cerebral palsy etc.
3. **Orthopedic Disability:** these are disabilities, which has to do with deformities of the body, e.g. amputation, arthritis, cosmetic surgery, old age etc.

The Individuals with Disabilities Education Act (IDEA) also classified disabilities into the following: sensory impairments, communication disorders, medical, physical and multiple disabilities, behaviour disabilities, learning disabilities and cognitive disabilities (Afolayan, 2007)

2.2. HISTORY OF DISABILITY

Disabilities throughout history have always been seen in a negative manner:

1. Neolithic tribes believed disabilities were caused by evil spirits, they performed skull surgeries to release the supernatural entities.
2. Greeks believed the disabled were inhuman
3. Romans abandoned disabled babies to die.
4. Persians wanted a perfect world without the disabled.
5. The Disabled were banned from even practicing their faith in Temples in Ancient Hebrew times.
6. Blindness was seen as a punishment for sin.
7. 1924 under BUCK vs. Bell, the Supreme Court passed forced sterilization of Disabled people.
8. In 1912 a French noble prize winner in medicine created the “Humane Disposal” or euthanasia of Disabled people.
9. The Holocaust is well known for the extermination of the Jews but little for the “perfection plan” of Hitler's large extermination of the disabled. Between 75,000 - 200,000 Disabled Germans were killed (Pena, 2012)

In order to appreciate the problems and prospects of disabled persons in contemporary Nigeria, it is important to summarize the history of disability in some parts of the world. The earliest recorded attempts to rehabilitate the handicapped involved education of the blind and the deaf (Afolayan, 2007)

The first special institutions for the blind were established in Palestine, Syria and Paris. The French hospitals were used as an asylum for blind soldiers who lost their sight during the crusades. A man from Alexandria, Didymus, invented block letters employed in teaching the blind to react. Later, wax tablets were invented by a German, Harsdoffer, and this device enabled them blind to write. A French man, Valentine Huay, opened the first school for the blind in Paris in 1784. Louis Braille,

a blind instructor, modified a method of writing with embossed dots (introduced earlier by Charles Barbier) by reducing the number of dots from twelve to six. Thus, the Braille system came into being in 1929. The earliest attempt at establishing a rehabilitation workshop for blind people in England was made by Henry Dannett, an English man who opened an institution "The School of Instruction for the Indigent Blind", in Liverpool in 1915. This was graded to "The Asylum for the Blind", established by David Miller and David Johnston in Edinburgh (Afolayan, 2007)

Educational rehabilitation of crippled children developed much later than education of the deaf or the blind. Alms-begging which is characteristic of many cripples in Nigeria today, was practiced in Europe on a large scale. In 1832, however, John Nepinak opened the first educational institution for the Crippled in Bavaria (Afolayan, 2007)

Educational rehabilitation of handicapped children in Nigeria began in 1936 when Oji River Rehabilitation centre was founded by Dr. T.D.F. Money. The main purpose was to treat leprosy patients, including those who were blind, deaf and physically handicapped. In 1938, the Church Missionary Society established the physically handicapped unit at the special Education centre Oji River, with an initial intake of 123 pupils. Special school for the blind was also founded by Church Missionary Society in 1960 at Oji River. This was followed in 1961 by a school for the deaf, started by A.F.C. Savory. In 1933, Kano State has established a reformatory school in Kano to cater for juvenile offenders sent in the courts. It is noteworthy that during this period, there was a clear distinction between special schools and healthcare centres, but presently rehabilitation centres are different set-up from special schools for the handicapped. A Directory of Social and Vocational Resources of Nigeria listed 98 social rehabilitation centres which provide services to the blind, the deaf, the mentally retarded, the physically handicapped and leprosy patients. These centres are located in Borno, Oyo, Ogun, Lagos, Anambra, Imo, Cross River and Akwa Ibom States (Afolayan, 2007)

The International Labour Office (ILO) as giving number and categories of handicapped persons in the centres as: 465 blind persons; 890 physically handicapped, 344 learning disabled; 437 hearing-impaired, 575 leprosy patients, 500 mentally retarded; 450-600 beggars and 10,000 veterans. The Centres provide training in various trades, including tailoring, carpentry, soap-making, book-

binding, shoe-making farming, animal husbandry, watch repairing, power laundry, sewing, weaving and typing (Afolayan, 2007)

From the above, it can be seen that early education and rehabilitation centres for the handicapped were founded by the early Missionaries to Nigeria. It was not until seventies that various Governments in Nigeria started to establish schools for the handicapped. Such Examples of such schools are the Kwara State School for the Handicapped, Ilorin and Ondo State School for the Blind. Others are Ondo State School for the Deaf and then School for the Handicapped, Minna, Niger State (Afolayan, 2007)

2.3. ANTHROPOMETRIC STUDY OF DISABILITY

Anthropometry is the measurement and analysis of body characteristics, including stature, sizes of body parts and the space in which the body functions, e.g. reach limits and clearances for movement. An environment for disabled people needs to be designed to accommodate wheelchairs and allow sufficient space for moving around in safety and for dimensions and area requirements. All switches, handles, window fittings, telephone points, paper roll or towel holders, lift controls, etc. must be within reach of an outstretched arm. The layout of the WC in particular, requires careful planning: assess how many doors, light switches etc. are needed. Consider technical aids (e.g. magnetic catches on doors and remote controls) (Steinfeld, et al, 2010)

Access paths to the building should be 1.20-2.00m wide and be as short as possible. Ramps should ideally be straight, with a maximum incline of 5-7%, and should be no longer than 6m (The ramp width between the handrails should be 1.20m. Corridors should be at least 1.30m (preferably 2.00m) wide: clear opening of doors, 0.95 m; height of light switches and electrical sockets, 1.00-1.05m (use switches and control devices which have large buttons or surfaces) (Neufert and Neufert, 2002)

2.3.1. THE STUDY OF ANTHROPOMETRY

Anthropometry is important for a variety of professional disciplines. It is used extensively in product design, particularly when usability and safety require a close fit between people and their environment. For example, detailed anthropometric studies should be completed in automobile design to make sure that people with a range of statures can have an adequate field of view through windows and mirrors, reach the pedals and hand controls, fit comfortably in the seats and not be

exposed to avoidable safety risks in collisions. In architectural and interior design, anthropometry is the basis for many code requirements including those related to accessibility and fire safety. For example, the width of wheelchairs and their occupants is a key determinant of minimum clearances and spaces for reserved seating (Steinfeld, et al, 2010)

In the rehabilitation fields, anthropometry is very important for design of Assistive Technology (AT). It comes into play in design of mass produced AT as well as in the custom fabrication of adaptive equipment. Because of the large variability in body and ability characteristics of many people with disabilities, the anthropometry of disability poses some major challenges and the need for departures from conventional practices.

Anthropometry is, at first glance, a relatively simple scientific endeavor. However, when it is better understood, like all science, it has many complexities. The first step in this process is defining landmarks on the human body that can be reliably identified by data collection personnel. Variations in selection of landmarks can make a significant difference in results between studies, which challenge those who must interpret the information when making design decisions or decisions about design standards for products or environments. How do you estimate the position of internal points like the hip socket from measurements made on the surface of the body? How do you measure soft body tissue that deforms when pressure is applied to it like the posterior? These are not easy problems to solve (Steinfeld, et al, 2010)

There are a great many other issues that add to the complexity of anthropometry and influence the validity and accuracy of this work. Some include:

1. What measurements should be taken
2. What are the most accurate and efficient measurement methods
3. Posture to be used when taking measurements
4. Who to select for measurement when everyone in a target population cannot be measured
5. How many people are needed to represent the target population
6. How to recruit participants including how much to pay them and how to get them to the research site
7. How to measure sensitive parts of the body

8. What type(s) of clothing should be worn during measurement (Steinfeld, et al, 2010)

2.3.2. TYPES OF ANTHROPOMETRY

Steinfeld, et al, (2010) described two types of anthropometry, they include: the

1. **Structural anthropometry:** (often called "static anthropometry"). It is the measurement of the body at rest including overall measurements like total stature and weight, measurements of links or circumferences like wrist to elbow, knee to hip, circumference of head and measurement of specific landmarks in reference to some other point, like the floor, e.g. eye height. Static anthropometry includes the measurement of assistive devices like canes and wheelchairs either alone or in relationship to the body.
2. **Functional anthropometry:** (often called "dynamic anthropometry"). It is the measurement of the body in motion like the reach envelope of seated work, the movement of body parts in relationship to one another or the space required to turn a wheelchair. Functional anthropometry includes the measurement of assistive devices or other objects used by people as they move. It also includes measures of strength (e.g. grip or pull strength)

Today there is an increasing emphasis on functional anthropometry because it has been established that structural measurements alone cannot fully predict human performance in real world settings where the body is usually in motion or under stress of some sort.

2.3.3. WHEELED MOBILITY REQUIREMENTS

Wheel chair users require more focus of anthropometry. This is due to their numerical frequency and the fact that any space and measurement that suites wheel chair users will satisfy most of other disability requiring specific use of space.

There are four major areas where anthropometry needs to be considered for wheeled mobility (Steinfeld, et al, 2010). These include:

1. **Functional Reach**: this includes the use of the wheel chair user's hand in several heights and directions within a space and fixed position.

2. **Maneuverability:** this describes different types of turns they may want to make. There are four basic types of turns: 90-degree turn; 180-degree turn with no restrictions on length of the maneuver; 180-degree turn with a centre barrier; and 360-degree rotation within a space with four walls.
3. **Grip strength:** this describes the ability to carry loads and how it is carried within a space comfortably. Maximum strength needs to be considered for an average wheel chair user. This may relate to age and medical condition.
4. **Door use:** different door sizes and weight, door latch location and efficiency, pose different challenges to wheeled mobility and other disability. Thus it must be considered in designing for anthropometry.

2.3.4. STANDARDS AND DESIGNS

There are various standards and designs which are necessary for consideration when designing for disability. Some of the most vital will be discussed. Nevertheless, it must be noted that there is no one-size-fits-all approach to anthropometrics as there are differences in weight, height, sizes, medical conditions, disability, and age (Steinfeld, et al, 2010)

Table 2: Comparison of Accessibility Standards across Four Countries.

Source: Steinfeld, et al (2010)

Measurement Dimension	Country & Standards Document			
	Australia	Canada*	U.K.	USA
	AS 1428.2 (mm)	B651-04 (mm)	BS8300:2001 (mm)	ICC/ANSI A117.1 (mm & in.)
Wheelchair Dimensions				
Unoccupied Device Width	-	660	-	660 (26)
Unoccupied Device Length	-	-	-	1065 (42)
Seat Height, maximum	480	480	-	485 (19)
Clear Floor Space				
Width, minimum	800	750	900	760 (30)
Length, minimum	1300	1200	1350	1220 (48)
Knee and Toe Clearances				
Knee Clearance Height, minimum	640-650	680	700	685 (27)
Toe Clearance Height, minimum	280	230	300	230 (9)
Knee Clearance Depth, minimum	230	200	260	280 (11)
Toe Clearance Depth, maximum	190	230	-	150 (6)
Reach Ranges				
Forward Reach - Unobstructed	250-1220	380-1220	-	380 (15) - 1220 (48)
Side Reach – Unobstructed	230-1350	230-1400	630-1170	380 (15) - 1370 (54)
Side Reach – between 255-610 obstruction depth	-	-	-	Max. 1170 (46)
Maneuvering Spaces (minimum)				
90-Degree Turn	-	920	-	915 (36)
180-Degree Turn	1540x2070	1500	1500	1525 (60)
180-Degree Turn around Barrier	-	-	-	1065 (42)
360-Degree Turn	1540x2070	1500	1500	1525 (60)
Hand Force for Operating Controls, maximum	-	-	-	5 lb-f.

* This standard also includes an appendix with information on device size and maneuvering spaces for power chairs and scooters derived from the UDI research.

2.3.4.1.CLEAR FLOOR AREA

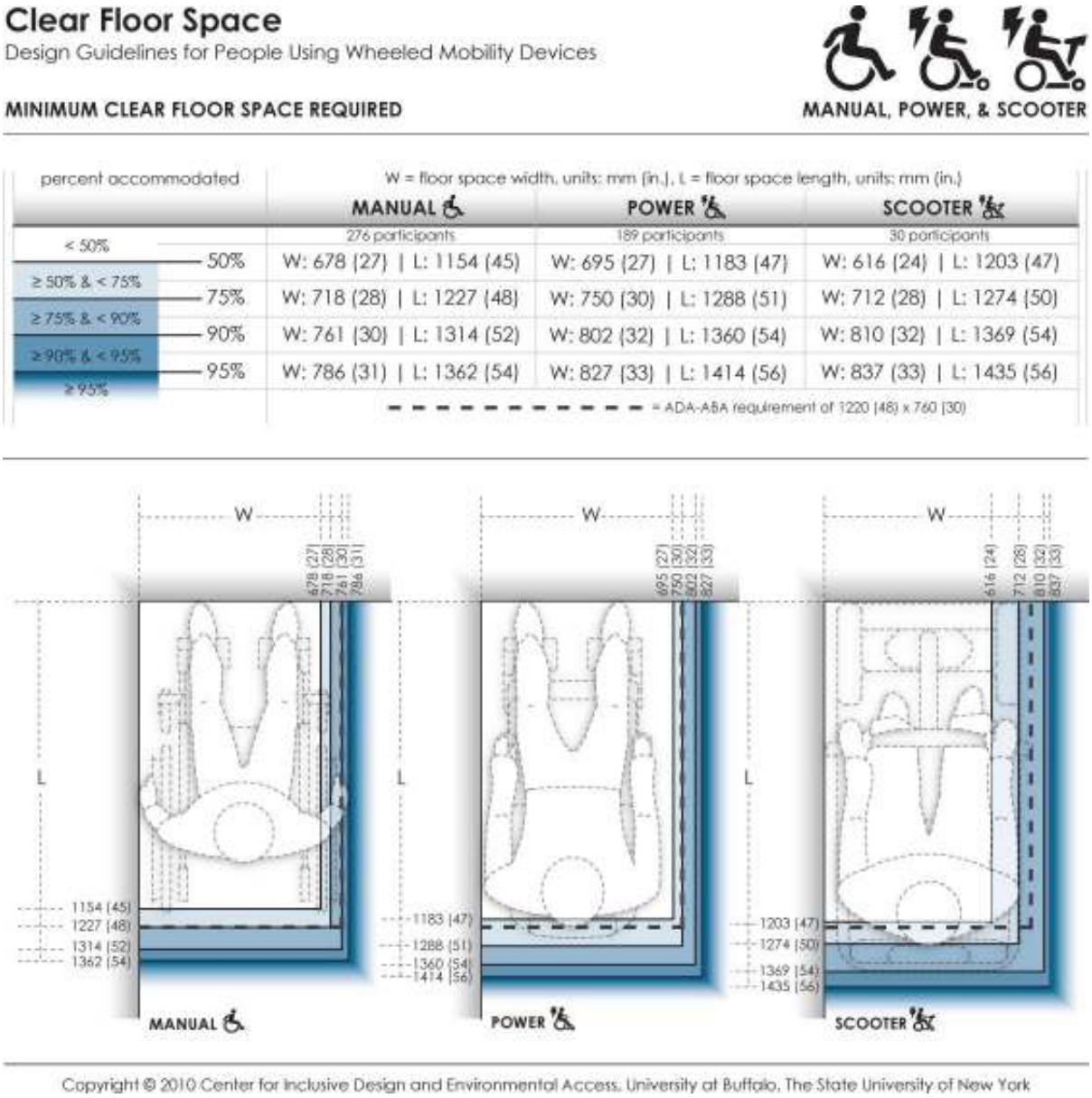

Figure 3: Accommodation model depicting the clear floor space for users of manual wheelchairs, powered wheelchairs, and scooters.

Source: Steinfeld, et al (2010)

Clear floor area dimensions are the basis for the minimum required size of spaces used by wheeled mobility users. The clear floor area width also informs the minimum clearance width for successful passage through corridors, doorways and ramps. In some of these applications, adding more space for manoeuvring may be required. The minimum clear floor area dimensions recommended for accommodating 95% of the wheel chair users are: 820 mm x 1420 mm (32 in. x 56 in.) for manual

chair users, 850 mm x 1480 mm (33.5 in. x 58 in.) for powered chair users, and 860 mm x 1440 mm (34 in. x 57 in.) for scooter users.

2.3.4.2.TURNING CLEARANCE

There are four major turning manoeuvres. They include: the 360-degree turn, the 180-degree turn, the 180-degree turn around a barrier, and a 90-degree turn. There is a T-shaped turning space also, it will not be considered because its requirement can be satisfied in a 90-degree turn.

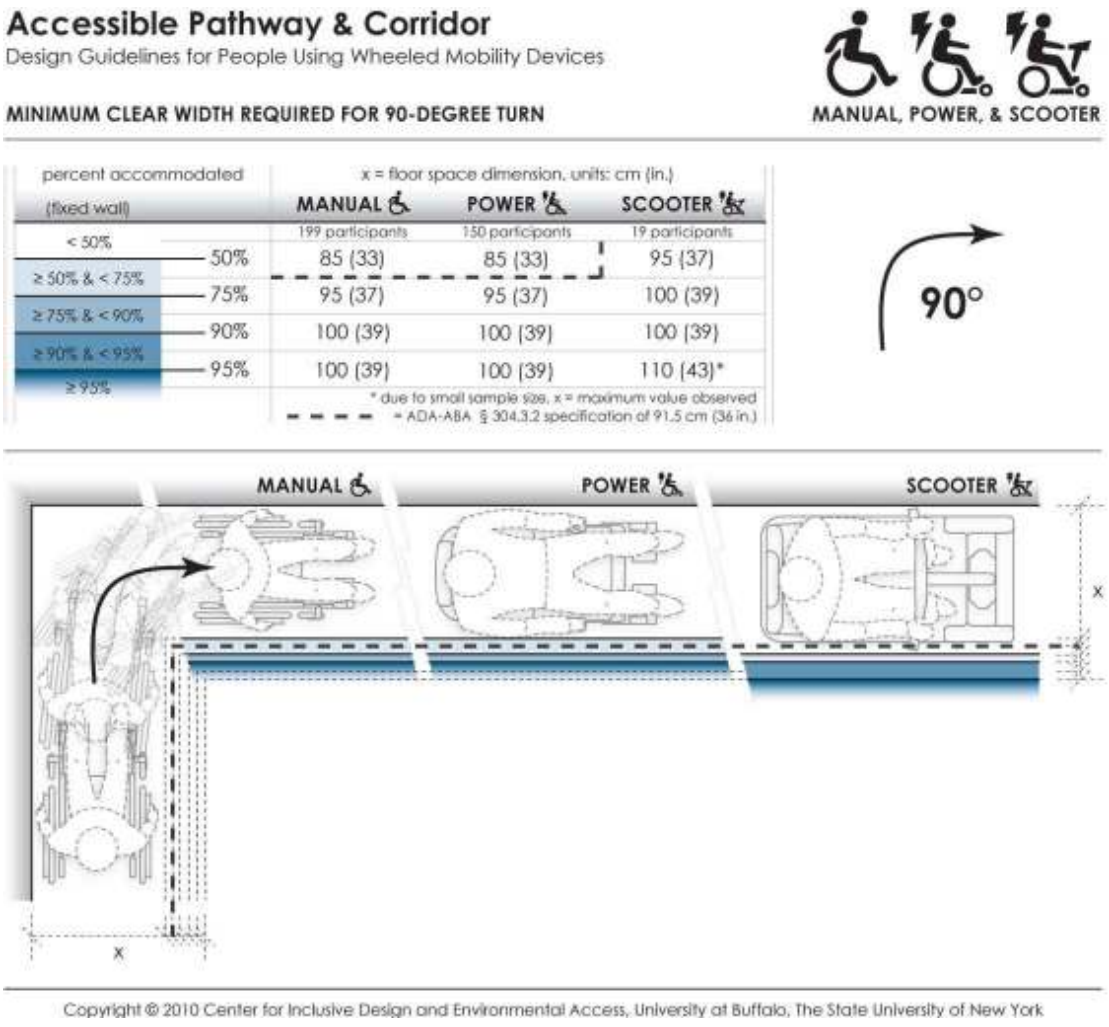

Figure 4: Minimum clearance width required for 90-degree turn.

Source: Steinfeld, et al (2010)

1. 90 degree turn: 1000mm
2. 180-degree turn: 1700mm
3. 180-degree turn around an obstacle: 1095mm

4. 360-degree turn: 2500mm

2.3.4.3. REACH LIMITS

This is about the ability of disabled (wheel chair user) to relate and interact with objects and other things around them, either in front of them or beside them. When designing environments for tasks that require lifting objects, avoid designs that require people to reach to objects above counter height. Adjustable storage units that building occupants can customize to their own needs can improve usability. Devices like sliding shelves that reduce the length of reach tasks are another beneficial strategy. Side reach access is far more preferable to forward reach access, which is quite restricted among the wheelchair user population. Targets at locations along the plane of the anterior most point will not be within the reach of a majority of wheeled mobility users, even if the maximum reach height limit were reduced to shoulder height (Steinfeld, et al, 2002)

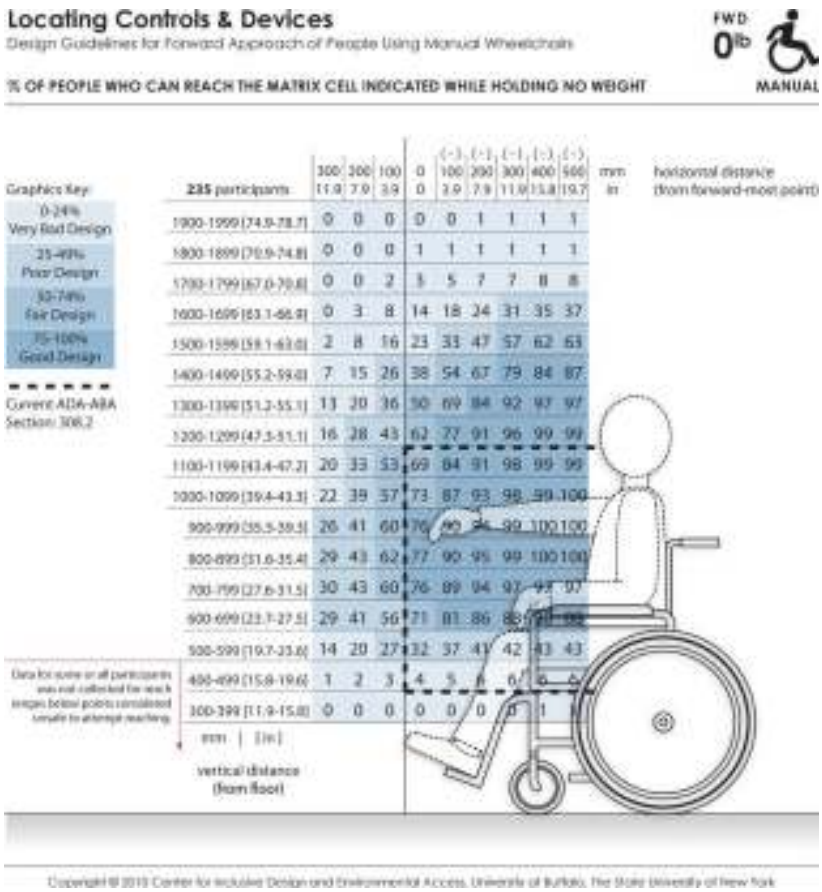

Figure 5: An accommodation model showing the abilities of the manual wheelchair users to complete a forward reach without lifting weight.

Source: Steinfeld, et al, 2002

2.3.4.4.SEAT HEIGHT

Seat height is an important dimension for establishing the height of built-in seating, toilet heights, tub heights, shower seat heights and other transfer related surfaces. Keeping the height of a transfer surface close to the height of a wheelchair seat reduces the effort necessary to transfer and provides a safer environment, especially in bathing and toilet rooms. Seat heights for transfer surfaces can be 430 mm 485 mm for water closets, shower seats and tub seats. It must be noted that this dimension would be best suited for wheel chair users; thus such measurement can be used in spaces designed only for them as such general design can cause discomfort and hamper safety level. A more accommodating dimension would be 430 mm 635 mm when use will be more general for various forms of disability.

Table 3: Seat height: research findings versus the standards.

Source: Steinfeld, et al, 2002

Data Source	Sample Size	Min	5%ile	Mean	80%ile	90%ile	95%ile	Max
UDI, Canada								
Power chairs and scooters*	50	420	-	528	-	-	639	650
IDeA Center, U.S.								
Manual chairs	276	414	434	496	530	547	567	608
Power chairs	189	412	465	539	574	599	628	734
Scooters	30	472	475	550	582	595	636	643
All Device Types*	495	412	440	516	556	575	597	734

2.3.4.5.DOORWAY DESIGN

Table 4: Characteristics of door tested.

Source: Steinfeld, et al, 2002

	Door type		
	Door 1	**Door 2**	**Door 3**
Clear opening	825 mm	1040 mm	755 mm
Closer	No	No	Yes
Resistance to open the door	≤ 2 lbf. (9 N)	< 2 lbf. (9 N)	7 to 8 lbf. (31 to 36 N)
Threshold	3 mm	0	6 mm
Latch	Yes	Yes	Yes
Push side clearance	> 1525 mm	> 1525 mm	> 1525 mm
Pull side clearance	> 1525 mm	> 1525 mm	> 1525 mm
Push side latch side clearance	3 in.	> 1525 mm	> 1525 mm
Pull side latch side clearance	800 mm	406 mm	508 mm

Adopting a clear opening width of 860 mm (34 in.) would accommodate the widest occupied devices in our sample. This would also be small enough to allow a 91 cm (36 in.) door leaf, a size that is already used extensively for accessibility and fire safety. The normal metric 900mm is slightly smaller than 910mm, but it would be advisable to consider the standard. The very wide door that was tested 1041 mm clear opening did not increase the difficulty of using doors. The findings demonstrate that wider doors are better for accessibility and there is no need to put an upper limit on the size of doors in regulations at this time, although doors wider than this could pose some problems. The latch can be kept within shoulder height, which can be between 800mm 1100mm (Steinfeld et al, 2002)

Plate 1: Example of good location of door latch.

Source: Steinfeld et al (2002)

Disabled persons have special requirements. The minimum convenient door width for the ambulant disabled is 80cm. This is too narrow (or wheelchair users, but 90cm is usually adequate. There should be adequate space to position a wheelchair beside the door. Corridors should be not less than 120cm wide so that wheelchair users can position themselves to open a door in the end wall of a corridor or at the side. An end door should be offset to give maximum Space beside the handle. Similarly, when a door is located in the corner of a room, it should be hinged at the side nearer the corner (Neufert and Neufert, 2002)

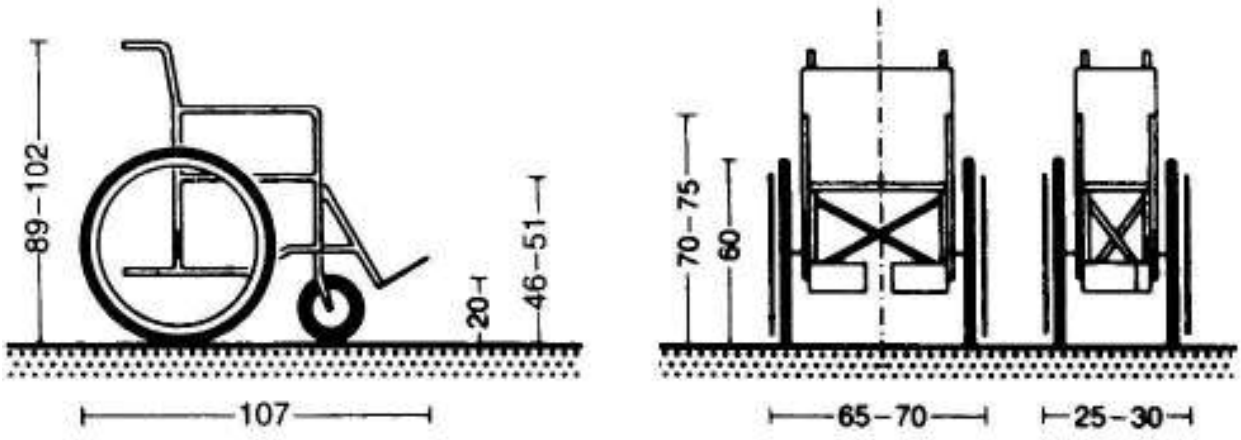

Figure 6: Side view and front view (and folded) of a standard wheelchair.

Source: Neufert and Neufert, 2002

2.4. GLOBAL TRENDS ON DISABILITY

Disabled people comprise approximately 10% of the world's population, 75% of whom live in developing countries, and constitute one of the most poor, marginalized and socially excluded groups in any society (DFID, 2005, Barron & Amerena ed. 2007). Disabled people, irrespective of where they live, are statistically more likely to be unemployed, illiterate, to have less formal education, and have less access to developed support networks and social capital than their able-bodied counterparts. Consequently, disability is both a cause and consequence of poverty (Yeo, 2005).

The past 40 years have witnessed, throughout developed and developing countries, the emergence of the international disability movement. Disabled People's Organizations (DPOs) now constitute a critical and essential component of civil society. Typically, DPOs are ran and managed by disabled people. During the past decade, DPOs have become increasingly instrumental in working with national governments, as well as the bilateral and multilateral institutions, in developing policies and operational modalities for the effective social inclusion of disabled people in the societies in which the live (Lang and Upah, 2008)

2.4.1. DISABILITY AND POVERTY

The relationship between disability, poverty and international cooperation is complex, but it is crucial to understand these relational dynamics if bilateral and multilateral agencies are to be in a position to make a long-term, sustainable impact on improving the lives of disabled people, by

developing appropriate polices and implementing well-grounded, strategic interventions in low-income countries (Lang and Upah, 2008)

According to Mji et al (2009) as stated by Amusat (2009) disability in Nigeria is both a cause and consequence of poverty. He stated that "there is a strong relationship between disability and poverty with a cynical tendency – poverty makes people vulnerable to disability and disability reinforces and deepens poverty. Disability is an important factor, along with gender, race and caste that interacts to impoverish people and keep them poor." It is increasingly being recognized that bringing people with disabilities into the development mainstream will have significant effect in any plan to cut poverty in the developing world (Wolfensohn, 2002). This is especially true, given that disability affects not only individual, but also family and the larger society. In Africa, previous efforts to put disability in the forefront of the development agenda has not yielded all the expected results. This was as a result of the poor resources, blamed partly on the lack of commitment on the part of governments (Mji et al, 2009)

Hence, if one is poor, there is a greater likelihood of being disabled, due to the fact that those who are poor often live in physical and environmental conditions, (such as inadequate sanitary conditions and lack of access to health care provision), that will result in disability and the onset of impairments. Similarly, a disabled person has a greater statistical probability of being poor than their able-bodied counterparts, because of lack of access to education and employment opportunities. This mutually self-reinforcing negative cycle is driven and fuelled by underlining structural factors, the most prominent of which are social exclusion, negative social attitudes and human rights violations. In order to break this negative cycle, governments, NGOs and disabled people's organizations can undertake a range of activities. For example, in many countries, including Nigeria, disabled people's organizations lack sufficient organizational capacity to effectively lobby their respective governments to claim their basic human rights. Furthermore, in many low-income countries, there is a paucity of appropriate, sustainable services that are affordable and that facilitate the effective social inclusion of disabled people. In many instances, if not for the activities undertaken by international NGOs, many disabled people would not receive any service whatsoever (Lang and Upah, 2008)

2.5. INTERNATIONAL MANDATES ON DISABIILITY

United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), 2006 sets out the legal obligation on States Parties to promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedom by all persons with disabilities, and to protect for their inherent dignity.

UNCRPD recognizes various international covenants on the rights of persons with disabilities as well as the importance of the principles and policy guidelines contained in the World Program of Action Concerning PWDs (1982) and in the Standard Rules on the Equalization of Persons with Disabilities (1994) in influencing the promotion, formulation and evaluation of the policies, plans, programs and actions at the national, regional and international levels. UNCRPD defines persons with disabilities as those who have long-term physical, mental, intellectual or sensory impairments in which interaction with various barriers may hinder their full and effective participation in society on an equal basis with others

The United Nation Convention on the Rights of Persons with Disabilities in several articles explicitly stated the Rights of PWDs, (Delgado, 2014). They include:

1. Equality before the law without discrimination (Art. 5)
2. Right to life, liberty and security of the person (Arts. 10 & 14)
3. Equal recognition before the law and legal capacity (Art. 12)
4. Freedom from torture (Art. 15) Freedom from exploitation, violence and abuse (Art. 16)
5. Right to respect physical and mental integrity (Art. 17)
6. Freedom of movement and nationality (Art. 18)
7. Right to live in the community (Art. 19)
8. Freedom of expression and opinion (Art. 21)
9. Respect for privacy (Art. 22)
10. Respect for home and the family (Art. 23)
11. Right to education (Art. 24)
12. Right to health (Art. 25)
13. Right to work (Art. 27)
14. Right to an adequate standard of living (Art. 28)

15. Right to participate in political and public life (Art. 29)
16. Right to participate in cultural life (Art. 30)

2.6. DISABILITY ISSUES IN NIGERIA

Within contemporary Nigerian society, there is little appreciation that disability is fundamentally an issue inexorably link to and rooted in human rights. The common perception, held by policy-makers and the public at large, is that disabled people and disability issues are viewed in terms of charity and welfare. Consequently, this viewpoint is a significant, entrenched factor that seriously militates against the social inclusion of disabled people within the country. This is manifested in a number of ways. Firstly, at national level, there is no disability discrimination legislation that has been enacted within Nigeria, despite the fact that two bills have been introduced into the National Assembly. Secondly, there is no form of social protection for disabled people in Nigeria which exacerbates the level of poverty that they encounter. Thirdly, the Ministry of Women Affairs and Social Development is the lead government department for disability issues in Nigeria. However, the services that they provide are based on a charity/welfare approach to disability issues, with demand for such services far outstripping supply. There are some international NGOs that do supply services to disabled people, but their geographical coverage is very limited. Consequently, for the vast majority of disabled people living in Nigeria, particularly those living in rural areas, there is no access to disability services whatsoever. Again, this situation compounds the level of social exclusion that they experience (Lang and Upah, 2008)

There are a plethora of disabled people's organizations (DPOs) that exist in Nigeria that operate at the national, state and local levels. However, with a few notable exceptions, the vast majority of DPOs have themselves adopted a charity/welfare approach to disability issues, and have little understanding of a rights-based agenda or the principles of the social model of disability. Furthermore, within Nigeria there are two national umbrella DPOs, (the Joint National Association of Persons with Disabilities (JONAWPD), and the Association for the Comprehensive Empowerment of Nigerians with Disabilities (ASCEND), each perceives itself to be the authentic and representative voice of disabled people. However, there is a great deal of conflict that exists between these two organizations, which has a serious negative impact upon their ability to effectively lobby the Nigerian Government to implement a rights-based agenda to disability issues. In addition, the vast majority of the leaders of the disability movement are based in urban areas,

and have little comprehension of the issues encountered why disabled people living in rural communities (Lang and Upah, 2008)

2.6.1. THE NIGERIAN POLICY AND DISABILITY ISSUES

The World Health Organization (WHO) estimates that there are approximately 19 million disabled people living in Nigeria, (equivalent to 20% of the country's total population), although there are no robust, statistical data that either confirms or refutes this estimate. However, what is very apparent is that disabled people constitute one of the poorest, socially excluded and marginalized groups within Nigerian society. Meetings held with the National Planning Commission and the National Bureau for Statistics confirmed that there are no reliable statistics on disability in Nigeria, which compounds the problems of planning and evaluating any services provided by the public sector (Lang and Upah, 2008)

An additional confounding factor, that is a direct result of Nigeria's checkered history of military dictatorships, is that the ideals of democratic governance, together with the need for an administrative infrastructure that promotes an accountable and transparent delivery of public services, has not sufficient time to develop and mature. This is particularly the case at State and local level, where over 50% of all public expenditure is spent. For example, from the key informant interviews at the Ministry of Women Affairs and Social Development, it was clear that no robust monitoring and evaluation frameworks have been developed for assessing the impact of the activities undertaken by the Rehabilitation Department. This general lack of an efficient administrative infrastructure is readily acknowledged by DFID (Lang and Upah, 2008)

2.6.2. NATIONAL POLICY FRAMEWORK ON DISABILITY

2.6.2.1.OBJECTIVES

It is important that a sound and comprehensive national policy on rehabilitation of persons with disabilities is developed, for the following reasons (Federal Ministry of Women affairs and social development, 2012):-

i. To ensure that disability issues are on the agenda in all spheres of social, economic and political life.
ii. To ensure maximum access of people with disabilities to all mainstream Services and facilities.

iii. To promote the coordination of services and avoid unnecessary duplication. To develop appropriate disability prevention and rehabilitation programs throughout the nation.
iv. To promote coordination between rehabilitation services and all other sectors.
v. To promote an equitable national distribution of services.
vi. To prevent discrimination against persons with disabilities in all spheres.
vii. To provide persons with disabilities with the tools to change their lives and to give them a greater degree of independence.
viii. To take into account the specific needs of different disability groupings.
ix. To increase awareness on disability issues and support national/international advocacy for persons with disabilities.

2.6.2.2. OLDER PERSONS WITH DISABILITIES

The prevalence of disability increases drastically with the onset of old age. It follows that, as the life expectancy of Nigerian population increases, so too will the prevalence of disability among the older persons in our society. The problems of older Persons with Disabilities in Nigeria are increasing for the Following reasons (Federal Ministry of Women affairs and social development, 2012):

- There is increasing number of older Persons with Disabilities in the population as life expectancy increases.
- Urbanization and rural-urban migratory labour mean that many older persons with disabilities are left to look after subsistence farms with inadequate support from the younger generation.
- Few older Persons with Disabilities have adequate State or any other social security, pension or savings, even after a lifetime in employment.
- Nigeria is increasingly experiencing intensified hardship which disproportionately affects vulnerable groups such as the elderly persons with disabilities. The social security is being further eroded by prevailing economic realities.
- Poor access to home-based health and social services, especially in rural communities, means that older Persons with Disabilities are often confined and neglected.

2.6.2.3. CHILDREN WITH DISABILITIES

Nigerian children with disabilities have over the years suffered neglect owing to the fact that they are perceived to be incapable, ill, misfit and a burden to their families and the society at large. Their case represents a problem to be dealt with differently from other children issues.

The fact that such children are unable to defend themselves, they are often left alone at home and are undervalued by those around them hence they become vulnerable to physical, sexual and emotional abuse. Such children, when born into families of poor social-economic backgrounds, are often confronted with many problems, which tend to have negative effect on their emotional growth and development (Federal Ministry of Women affairs and social development, 2012)

2.6.2.4. WOMEN WITH DISABILITIES

Women with disabilities in general unlike their male counterpart suffer double jeopardy; first as women and second, as women with disabilities. They have continued to experience a lot of setbacks in all spheres of life not only because they lack educational opportunities, but also because of negative attitudes, stereotypes and lack of understanding which exist among the larger non-disabled group in the society.

Many Nigerian Women with disabilities still live in obscurity, silent misery, and socio-economic dependency. One of the most serious obstacles preventing the participation and integration of women with disabilities is the fact that the greater majority of them have not yet been encouraged to take on their duties as citizens which is an essential measure of claims to success. They are entitled to love and family life.

2.6.3. THE DISABILITY MOVEMENT IN NIGERIA

Notwithstanding the deep-seated institutional barriers that militate against the development and implementation of a rights-based agenda to disability issues, it is nevertheless the case that within Nigerian society, there is a vibrant disability movement, populated by a plethora of disabled people's organizations (DPOs), who are operating at a national, state and local level. What is most interesting is that within Nigeria, there are two separate national umbrella DPOs which each sees itself to be the "authentic, representative" of all disabled people who are living within the country. These are the Joint National Association of Persons with Disabilities (JONAWPD) and the Association for Comprehensive Empowerment of Nigerians with Disabilities (ASCEND).

Table 5: Barriers to the Social Inclusion of Disabled People in Nigeria.

Source: Federal Ministry of Women affairs and social development, (2012)

• Inaccessible public buildings • Inaccessible transport system; • Lack of access to computers & the internet • Poor lighting • Lack of accessible • information,	• Lack of disability legislation; • Lack of robust and reliable disability statistics • No social protection; • Inadequate provision of medical and rehabilitation services; • Lack of access to micro-finance and banking services • Inaccessibility to mainstream public • services, (especially education)	• The cause of impairment often attributed to a "curse"; • Disability issues are predominantly perceived in terms of charity/welfare – not in terms of human rights • Lack of understanding of disability issues by the general public

2.6.4. DISABILITY IN ONDO STATE

According to 2006 census, the total number of 'Disabled' persons of both sexes is 56,941 or 1.65% comprising of 28953 males and 27988 female. The Disability rate for males is slightly higher at 1.7% while for females, it was 1.6% (Department of Research and Statistics, 2009)

Out of the 6 Types of Disability captured in the 2006 census, about 26.95% of the 'Disabled' population reported seeing Disability, 17.79% reported Hearing, 23.15% reported speaking, 16.17% reported Mobility, 5.23% reported mental while 10.71% reported other type of Disability. Comparative analysis of Disability population shows that absolute disabled population increase from 2249548 in 1991 to 3460877 in 2006 (Department of Research and Statistics, 2009)

Table 6: Distribution of Population in 2006 by Sex and Type of Disability in Ondo State.

Source: Department of Research and Statistics, (2009)

S/N	SEX	TOTAL	TYPE OF DISABILITY						None
			Seeing	Hearing	Speaking	Mobility	Mental	Other	
1	Male	1745057	8389	4780	6580	4752	1574	2878	1716104
2	Female	1715820	6958	5348	6600	4456	1403	3223	1687832
	Total	**3460877**	**15347**	**10128**	**13180**	**9208**	**2977**	**6101**	**3403936**
	%	**100**	**0.44**	**0.29**	**0.38**	**0.27**	**0.09**	**0.18**	**9.35**

2.7. REHABILITATION CENTRE

2.7.1. REHABILITATION AND TREATMENT

What is the difference between rehabilitation and treatment? According to National Drug Law Enforcement Agency (2009): Treatment is an organized means of assisting drug dependent persons either in a hospital setting or outside the hospital with the aim of making the client or patient recover his or her normal status and state of health. Rehabilitation on the other hand is defined as a process of improving the residual functional capacity of a drug dependent person such that the individual can resume his or her expected role within the society.

Many people understand rehabilitation to mean the activities which prepare patients to take their place in the community after medical treatment has been completed (Davis, Eshelman, and Mckay, 2003). On the other hand, some people perceive rehabilitation as a single continuing process and do not make any distinction between medical treatments and the training activities which follow (Greenblatt and Simon, 1999). They declare that rehabilitation starts the very moment a patient enters hospital and may continue even after he has been discharged from hospital (Hector, 2001). Example of this continuous process can be seen in community nursing. Nurses may be engaged in regular visits to a patient's home long after his discharge from the hospital. The purpose of the

visits by the community nurse is to administer to a patient his regular medication, offer counselling, monitor behaviour and report all observations to the appropriate member of the team (Owusu, 2010).

Rehabilitation is a building activity which restores a person's physical and mental capacities and improve the quality of his or her life to a level which is as near as possible to that which existed prior to his illness (Greenblatt and Simon, 1999). The way to achieve this is called therapy, which means treatment to heal. This presupposes that the purpose of rehabilitation involves instilling or the restitution of positive skills or attitudes in a person to provide him/her with more contributing and fulfilling role in society (Butler, 1985).

With these it can be concluded that rehabilitation is not only required for drug dependent persons as earlier stated by NDLEA; it is also not always carried out by administering drug.

2.7.2. WHAT IS A REHABILITATION CENTRE

Rehabilitation is restoring someone to a useful place in society. As such, a rehabilitation centre is a location in which rehabilitation can occur. People get displaced from society for a variety of reasons. Some may experience an accident or illness that temporarily makes them unable to function the way they used to. Others may have an addiction that handicaps them. A rehabilitation centre provides a support system to help restore people to their place in society. (Sherwood, 2009)

Rehabilitation centres serve people who have a physical disability, an intellectual disability (ID), a pervasive development disorder (PDD), an addiction problem (alcohol, drugs, gambling) or behavioural, psychosocial or family difficulties. Generally speaking, rehabilitation centres offer adaptation, rehabilitation, social integration and accompaniment, as well as support services for family and friends. Their services may be provided on the centres' premises, in schools, at work or at home, as need be (Quebec, 2015)

While there are different types of rehabilitation center, the type to be studied is can be otherwise called a Vocational Rehabilitation center. Vocational rehabilitation, at its core, is a set of services provided to individuals who suffer from mental or physical disorders, but who still have the ability and desire to learn and function productively. These services include education, job training and skills that will be needed to get and keep a job. Vocational rehabilitation services are sometimes

offered to those who have undergone an injury, or who have endured a mental disorder to try and retrain them for work again. (Litherland, 2009)

The function of a rehabilitation centre is to provide the means and space to help in the recovery process. This process varies depending on the rehabilitation that is needed. Rehabilitation centres use a combination of therapy, small groups, individual sessions and highly structured living. The function of a rehabilitation centre is to both increase the quality of life and to help the patient integrate back into the community. Rehabilitation centres typically fall into one of four categories: occupational, physical, addiction and psych-social (Sherwood, 2009).

There are certain standards that a person must meet in order to be enrolled into a vocational rehabilitation program. Requirements can include a participant's age (usually 16 years old and up), having a disability that is a significant barrier to employment (like a psychotic disorder, learning disorders, etc.), being unemployed or under employed, among others. (Litherland, 2009)

2.8. REHABILITATION IN NIGERIA

2.8.1. EXISITING DISABILITY STRUCTURE

Over the years, the Government of Nigeria has undertaken important initiatives towards the development of a number of policy statements, which address the demands and rights of people with disabilities. Disability issues in Nigeria have been taken care of by the three tiers of Government, Voluntary Organizations for and of persons with disabilities. At the Federal leve1 all the line Ministries collaborates with the Federal Ministry responsible for rehabilitation of Persons with Disabilities towards achieving the goals of rehabilitation. The line Ministries and Agencies are:-

i. Federal Ministry of Education,
ii. Federal Ministry of Health,
iii. Federal Ministry of Labour and Productivity.
iv. Federal Ministry of Justice,
v. Federal Ministry of Women Affairs and Youth Development,
vi. Federal Ministry of information and National Orientation,
vii. Federal Ministry of Works &Housing,
viii. Federal Ministry of Transportation,

ix. National Poverty Eradication Program me (NAPEP), etc.

2.8.2. NIGERIA POLICY ON TREATMENT AND THERAPEUTIC AIDS.

The Government of Federal Republic of Nigeria set a structure that ensure the development and supply of support services, including assistive devices for Persons with Disabilities in order to minimize the consequences of disability and to increase their level of independence.

1. To ensure that all Persons with Disabilities shall have full access to rehabilitation, the therapeutic aids and orthopaedics technical services within their communities as part of Community-Based Rehabilitation. Their families, their families, where possible, will informed and involved in these rehabilitation programs.
2. To design a program for the provision and supply of appropriate prosthesis, orthoses and technical aids.
3. To ensure treatment, provision of therapeutic aids and orthopaedics services for persons with disabilities.
4. Provide regular medical treatment and medicine, persons with disabilities may need to preserve or improve their level of functioning.
5. Provide prostheses, orthoses and technical aids to Persons with Disabilities.
6. Provide Community-Based Rehabilitation Program.

2.8.3. REHABILITATION CENTRES IN NIGERIA

According to the Federal Ministry of Women affairs and social development, (2012) there are about 180 rehabilitation centres in Nigeria. Some of which includes:

1. Hopevile Rehabilitation Centre, Uturu, P.O.Box 16, Okigwe, Abia state
2. Centre for Mental-ill, Amaudo-Itumba-Uzo Amaudo-Itumba-Uzo, Uturu Itumba Uzo Abia State
3. Psychiatric Hospital, Aba, P.M.B 7032, Aba, Abia State
4. Vocational Rehabilitation Centre, Michika LGA, Adamawa State
5. Itu Leprosy Clinic, C/o Ministry of Health, Leprosy Control Unit, Rural Health Services, Itu, Akwa Ibom state
6. St Louis's Centre for the Deaf and Mentally Handicapped No.3, Queen Street, P.O.Box 1311, ikot Ekpene, Akwa-Ibom State.

7. Rehabiliatation Centre for the Disabled, Ozubulu. LGA. Agbainodida Eziora Village, Ozubulu Ekwusigo L.G.A Anambra State.
8. Azare Rehabilitation Centre. Azare L.G.A, Bauchi State
9. Comprehensive Rehabilitation Centre, Kpansia near Yenagoa, Bayelsa State
10. Mkar Rehabilitation Centre, Mkar. Mkar, Gboko L.G.A, Benue State
11. Vocational Rehabilitation Centre for the Disabled Bulum-Kuttu-Maiduguri. Bulum-Kuttu ward, Maiduguri
12. Presbyterian Leprosy Hospital, Mbember. C/o Ekori Yakurr Obubra, Cross River State
13. St Joseph's Centre for the visually Handicapped, Obudu. P.O.Box 120, Obudu, Cross River State.
14. School for the Blind, Asaba, Off Okpanam Road, Asaba, Delta State.
15. School for the Blind, Benin. 49, Aruosa Street, Benin-City
16. Edo State School for the Physically Handicapped. Ikpoba Hill, Benin City, Edo State
17. Relief and Rehabilitation Centre. Owo Road, Ado Ekiti, Ekiti State
18. The Salvation Army Rehabilitation Centre for Physically Handicapped Children. The Salvation Army, Oji-River, Enugu State
19. Akpodim Rehabilitation Centre, Akpodim. Ezinhite Mbaise LGA, Imo State
20. Birniwa rehabilitation Centre, Birniwa, LGA, Jigawa State
21. Rehabilitation Centre Kaduna. Nassarawa, Kaduna South
22. Kano State Torrey Home for the Mentally Retarded.
23. Torrey Home, Tudun Maliki-Opposite Zoo Kano, Kano State.
24. Rehabilitation Centre Bakori. Bakori, Funtua LGA, Katsina State
25. Rehabilitation Centre, Zango LGA, Katsina State
26. Rehabilitation Centre for Disabled Persons, Argungu Town, Argungu LGA, Kebbi State
27. Ibrahim Abacha Rehabilitation Centre, Lokoja, Kogi State
28. School for the Handicapped, Ilorin. P.M.B 1474, Kilo 8, Jebba Road, Ilorin, Kwara State
29. Rehabilitation and Training Centre, Majidun Ikorodu , Lagos State
30. Alushi Medical and Rehabilitation Centre, Gudi. PMB Gudi Station Nassarawa State
31. Leprosy Rehabilitation Centre, Iberekodo, Abeokuta. C/o Ministry of Health, Ogun State
32. Otun-Ireti School for the Physically Handicapped, Ikare Akoko, Ondo State.
33. Oyo Rehabilitation Centre, Moniya, Ibadan, Oyo Road, Ibadan, Oyo State

34. Christian Centre for the Deaf, Ibadan. P.O.Box 808, Ibadan, Oyo State.
35. Rehabilitation Centre, Jos. Zaria Road, Jos, Plateau State
36. Obioma Cheshire Home, No 2, Churchhill Road, Port Harcourt, Rivers State
37. Workshop for the Blind, Goniri LGA, Yobe State
38. Zamfara State rehabilitation Centre. Tashar Magani, Gusau, Zamfara State
39. School for the Blind, Zuba, Gwagwalada Local Council, FCT, Abuja.

Though there are other hospitals with rehabilitation department and services. It has been stated earlier that according to Lang and Upah, (2008) that "The Ministry of Women Affairs and Social Development is the lead government department for disability issues in Nigeria", as a result, there figures and data are most trusted. According to Vconnect (2012), there are 52 other hospitals with rehabilitation centre department as one of their dominant services. This statistics is definitely not all inclusive, there are many more which may not be accounted for.

Many of the rehabilitation centres accounted for by the Woman Affairs are specialist in the psychiatry, leprosy, blind workshops, art and craft rehabilitations, deaf, schools of deaf and blinds, vocational rehabilitations, among others.

According to this 2012 record, many states are seen to have an average of four to five rehabilitation centres, with a range of fourteen (14) units. There are some states with over ten rehabilitation centres and some with just one. Plateau state is the state with the highest number of fifteen (15) rehabilitation centres. Ogun state has ten (10); Lagos has nine (9); Jigawa has eleven (11) among others. Some states with relatively small numbers are Ekiti, Ondo, Osun, Sokoto, and Bayelsa with just one (1) each; Ebonyi, Nasarawa, and Kebbi state has just two (2) each. This report however may not be the same this last three years. But this gives an overview of the situation at some time (Federal Ministry of Women affairs and social development, 2012)

2.9. STANDARDS IN A REHABILITATION CENTRE

The anthropometric aspects, general qualities, and factors for disability have been studied. Other standards peculiar to a rehabilitation centre will now be reviewed. The following standards are according to The American Institute of Architects (2001)

2.9.1. COMMON ELEMENTS

According to The American Institute of Architects (2001), these are the common elements expected in any rehabilitation centre intended for any type of therapy. Each rehabilitative therapy department shall include the following, which may be shared or provided as separate units for each service

1. All offices and clerical space are to be provided with filing and retrieval of patient records.
2. The Reception and control station(s) are to allow visual control of waiting and activities areas (This may be combined with office and clerical space.)
3. The patient waiting area(s) are to be out of traffic with provision for wheelchairs.
4. The patient toilets are to be furnished with hand washing stations accessible to wheelchair patients.
5. The space(s) for storing wheelchairs and stretchers are to be free from traffic while patients are using the services (These spaces may be separate from the service area but in that case be conveniently located.)
6. The housekeeping room is to be conveniently accessible and service sink for housekeeping use.
7. Locking closets or cabinets are to be fixed within the vicinity of each work area for securing staff personal effects.
8. Convenient access to toilets and lockers are required.
9. Convenient access to a demonstration/conference room is to be included.

2.9.2. PHYSICAL THERAPY

The following will also be included since physical therapy is the specialization (The American Institute of Architects, 2001).

1. Individual treatment area(s) are to be furnished with privacy screens or curtains. Each such space are to have not less than 70 square feet (6.51 square meters) of clear floor area.
2. Hand washing stations are to be provided for staff either within or at each treatment space (One hand washing station may serve several treatment stations.)
3. Exercise area and facilities are to be made available.
4. Clean linen and towel storage are to be made available in design.

5. Storage for equipment and supplies are to be made available.
6. Separate storage for soiled linen, towels, and supplies are to be included in design of spaces..
7. If required by the functional program, patient dressing areas, showers, and lockers are to be included in space design. These are to be accessible and usable by the disabled.
8. Provisions are to be made for thermotherapy, diathermy, ultrasonics, and hydrotherapy when required by the functional program.

Others areas that are needed to be provided include: Treatment area, office space, waiting area, an exercise area, storage for clean linen, supplies, and equipment, wheelchair and stretcher storage.

2.9.3. OCCUPATIONAL THERAPY

If this service is provided, the following, at least, shall be included (The American Institute of Architects, 2001):

1. Work areas and counters are to be suitable for wheelchair access.
2. Hand-washing stations are to be provided in all facilities.
3. Storage for supplies and equipment are necessary in design.
4. An area for teaching daily living activities is to be provided. It is to contain an area for a bed, kitchen counter with appliances and sink, bathroom, and a table/chair.

The following area are also to be included: office space, waiting space, activity areas, storage for supplies and equipment, provisions shall be made for a sink or lavatory and for the collection of waste products prior to disposal. Patients' dressing areas, showers, lockers, and toilet rooms shall be provided as required by the functional program.

2.9.4. SPEECH, HEARING, PROSTHETICS AND ORTHOTICS

If this service is provided, the following, at least, shall be included (The American Institute of Architects, 2001):

1. Workspace for technicians.
2. Space for evaluating and fitting, with provision for privacy.
3. Space for equipment, supplies, and storage.
4. Space for evaluation and treatment.
5. Space for equipment and storage.

2.9.5. DETAILS

Patients in a rehabilitation facility will be disabled to differing degrees. Therefore, high standards of safety for the occupants shall be provided to minimize accidents. All details for renovation projects as well as for new construction should comply with the following requirements insofar as they affect patient services (The American Institute of Architects, 2001):

1. Items such as drinking fountains, telephone booths, vending machines, and portable equipment shall not restrict corridor traffic or reduce the corridor width below the required minimum.
2. Rooms containing bathtubs, sitz baths, showers, and water closets subject to patient use shall be equipped with doors and hardware that will permit access from the outside in an emergency. When such rooms have only one opening or are small, the doors shall open outward or be otherwise designed to open without pressing against a patient who may have collapsed within the room.
3. Minimum width of all doors to rooms needing access for beds shall be 3 feet 8 inches (1.12 meters). Doors to rooms requiring access for stretchers and doors to patient toilet rooms and other rooms needing access for wheelchairs shall have a minimum width of 2 feet 10 inches (.86 meter). Where the functional program states that the sleeping facility will be for residential use (and therefore not subject to in-bed patient transport), patient room doors may be 3 feet (0.91 meter) wide, if approved by the local authority having jurisdiction.
4. Doors between corridors and rooms or those leading into spaces subject to occupancy, except elevator doors, shall be swing-type. Openings to showers, baths, patient toilets, and other small, wet type areas not subject to fire hazard are exempt from this requirement.
5. Doors, except those to spaces such as small closets not subject to occupancy, shall not swing into corridors in a manner that obstructs traffic flow or reduces the required corridor width.
6. Windows shall be designed to prevent accidental falls when open, or shall be provided with security screens where deemed necessary by the functional program.
7. Windows and outer doors that may be frequently left open shall be provided with insect screens.
8. Patient rooms intended for 24-hour occupancy shall have windows that operate without the use of tools and shall have sills not more than 3 feet (0.91 meter) above the floor.

9. Doors, sidelights, borrowed lights, and windows glazed to within 18 inches (457.2 millimetres) of the floor shall be constructed of safety glass, wired glass, or plastic glazing material that resists breaking or creates no dangerous cutting edges when broken. Similar materials shall be used in wall openings of playrooms and exercise rooms. Safety glass or plastic glazing material shall be used for shower doors and bath enclosures.
10. Thresholds and expansion joint covers shall be flush with the floor surface to facilitate use of wheelchairs and carts in new facilities.
11. Grab bars shall be provided at all patient toilets, bathtubs, showers, and sitz baths. The bars shall have 1-1/2 inches (38.1 millimetres) clearance to walls and shall be sufficiently anchored to sustain a concentrated load of 250 pounds (113.4 kilograms). Special consideration shall be given to shower curtain rods which may be momentarily used for support
12. Recessed soap dishes shall be provided in showers and bathrooms.
13. Handrails shall be provided on both sides of corridors used by patients. A clear distance of 1-1/2 inches (38.1 millimetres) shall be provided between the handrail and the wall, and the top of the rail shall be about 32 inches (812.8 millimetres) above the floor, except for special care areas such as those serving children.
14. Ends of handrails and grab bars shall be constructed to prevent snagging the clothes of patients.
15. Location and arrangement of hand-washing stations shall permit proper use and operation. Particular care should be given to clearance required for blade-type operating handles. Lavatories intended for use by disabled patients shall be installed to permit wheelchairs to slide under them.
16. Mirrors shall be arranged for convenient use by wheelchair patients as well as by patients in a standing position.
17. The minimum ceiling height shall be 7 feet 10 inches (2.39 meters) with the following exceptions:
    - Boiler rooms shall have a ceiling clearance not less than 2 feet 6 inches (762 millimetres) above the main boiler header and connecting piping.
    - Ceilings of radiographic and other rooms containing ceiling-mounted equipment, including those with ceiling-mounted surgical light fixtures, shall have sufficient height to accommodate the equipment and/or fixtures.

- Ceilings in corridors, storage rooms, toilet rooms, and other minor rooms may be not less than 7 feet 8 inches (2.34 meters).
- Suspended tracks, rails, and pipes located in the path of normal traffic shall be not less than 6 feet 8 inches (2.03 meters) above the floor.

18. Recreation rooms, exercise rooms, and similar spaces where impact noises may be generated shall not be located directly over patient bed areas unless special provisions are made to minimize such noise.
19. Rooms containing heat-producing equipment (such as boiler or heater rooms and laundries) shall be insulated and ventilated to prevent any floor surface above from exceeding a temperature 10˚F (6˚C) above the ambient room temperature.

2.9.6. FINISHES

Patients in a rehabilitation facility will be disabled to differing degrees. Therefore, high standards of safety for the occupants shall be provided to minimize accidents. All finishes for renovation projects as well as for new construction should comply with the following requirements insofar as they affect patient services (The American Institute of Architects, 2001):

1. Floor materials shall be readily cleanable and appropriately wear-resistant for the location. Floor surfaces in patient areas shall be smooth and without irregular surfaces to prevent tripping by patients using orthotic devices. Floors in food preparation or assembly areas shall be water-resistant. Joints in tile and similar material in such areas shall also be resistant to food acids. In all areas frequently subject to wet cleaning methods, floor materials shall not be physically affected by germicidal and cleaning solutions. Floors subject to traffic while wet, such as shower and bath areas, kitchens, and similar work areas, shall have a nonslip surface.
2. Wall bases in kitchens, soiled workrooms and other areas that are frequently subject to wet cleaning methods shall be monolithic and coved with the floor, tightly sealed within the wall, and constructed without voids that can harbour insects.
3. Wall finishes shall be washable and, in the proximity of plumbing fixtures, shall be smooth and moisture-resistant. Finish, trim, and floor and wall construction in dietary and food preparation areas shall be free from spaces that can harbour pests.

4. Floor and wall areas penetrated by pipes, ducts, and conduits shall be tightly sealed to minimize entry of pests. Joints of structural elements shall be similarly sealed.
5. Ceilings throughout shall be readily clean- able. All overhead piping and ductwork in the dietary and food preparation area shall be concealed behind a finished ceiling. Finished ceilings may be omitted in mechanical and equipment spaces, shops, general storage areas, and similar spaces, unless required for fire-resistive purposes.
6. Acoustical ceilings shall be provided for corridors in patient areas, nurse stations, day rooms, recreational rooms, dining areas, and waiting areas.

2.10. HEALING GARDENS IN REHABILITATION CENTRE

The "healing garden" is an evolving concept gaining popularity today. What does the word heal mean in the context of a garden? According to environmental psychologist Roger Ulrich, a garden "should contain prominent amounts of real nature content such as green vegetation, flowers, and water." (Marcus and Barnes, 1999) He further states that by labelling a garden as a "healing" garden, "the garden should have therapeutic or beneficial effects on the great majority of its users." (Marcus and Barnes, 1999) Ulrich's definition of a healing garden is rather simple and allows for a variety of forms that the garden may take on as well as the various levels of healing that may be achieved. The idea that a garden should contain elements such as green vegetation, flowering plants and water is open to dispute (Vapaa, 2002)

In their book, Healing Gardens, Marcus and Barnes (1999) did a typological study of outdoor spaces in hospital settings. The outdoor spaces they defined in their study are: Landscaped Grounds, Landscaped Setback, The Front Porch, Entry Garden, Courtyard, Plaza, Roof Garden, Roof Terrace, Healing Garden, Meditation Garden, Viewing Garden, the Viewing/Walk-in Garden, A Tucked-Away Garden, Borrowed Landscape, Nature Trails and Nature Preserves, and Atrium Garden. As a part of these typologies they studied some existing healing gardens as a part of healthcare settings and looked at how they were designed as well as whether or not they have been successful. In cases where the gardens have been successful they have pointed out certain elements that should be included as well as elements to avoid (Vapaa, 2002)

2.10.1. HISTORY OF HEALING GARDENS

Healing Gardens are gaining popularity today however the idea of a healing garden is not a new one. "Restorative or healing gardens for the sick have been part of the landscape of healing since

medieval times. Such gardens have been parts of hospitals, hospices, rehabilitation centres, and more recently nursing homes for the infirm and elderly." (Gerlach-Spriggs, Kaufman, and Warner, 1998) "The idea of a healing garden is both ancient and modern. Long after humans had begun to erect dwellings, local healing places were nearly always found in nature – a healing spring, a sacred grove, a special rock or cave." (Marcus and Barnes, 1999) In the twentieth century things changed yet again within the healthcare world. Hospital design changed and low- rise pavilion hospitals were replaced with multistory complexes. Loss of garden space as well as "pressure from insurance companies to minimize hospital stays have largely worked against the provision of actual usable gardens in new or refurbished medical complexes." (Marcus and Barnes, 1999)

The advantages to having a nature trail or preserve on site are many-fold. On one hand these types of spaces:

- "Can take advantage of the natural landscape surrounding a hospital when it is located in a out-of-town setting.
- A wide variety of species provides interesting views for hospitalized patients
- Can provide an exercise route that may entice staff outdoors during breaks.
- Can provide an educational and community resource." (Marcus and Barnes, pg. 150, 1999)

Kaplans' (1989) has explored how having a view of a landscape from a hospital window or even paintings of landscape and nature scenes can have beneficial effects on patients: "In his most well-known study, Ulrich investigated the effect that views from windows had on patients recovering from abdominal surgery. He discovered that patients whose hospital rooms overlooked trees had an easier time recovering than those whose rooms overlooked brick walls. Patients able to see nature got out of the hospital faster, had fewer complications and required less pain medication than those forced to stare at a wall."

The relationship between nature and health began to dwindle as new technology became available. "The idea that access to nature could assist in healing was all but lost." (Marcus and Barnes, 1999) Not until recently (1990's) has the idea of a healing garden once again been considered in research. Unfortunately "the value of a garden and the role of the psyche in healing are both difficult to quantify or prove." (Marcus and Barnes, 1999) Gardens can be emotionally healing as well as physically healing. Studies have shown that not only are people who work with gardens healthier

but those people surrounded by gardens feel better. For example Roger Ulrich's studies have shown that simply by having a view from a window to a garden or some natural scene patients tend to recover faster from surgery (Ulrich, 1984)

2.10.2. DISTINGUISHING FACTORS IN A HEALING GARDEN

At some level all gardens are healing, but what are the distinguishing characteristics that allow certain gardens to function as a healing garden? According to Colette Parsons, "a healing environment is ultimately a sanctuary that allows for active involvement or passivity." (Francis, Lindsey, and Stone Rice, 1994) A healing garden is one where the designer pays close attention to the needs and likes of the user(s) or client(s) and is able to provide therapeutic qualities in the space that addresses them. The level at which the garden will function as a healing garden will vary according to its location. A hospital healing garden will be more broadly based and less personal than a private residence but they can each be places for healing if certain universal qualities are incorporated in the designs. All humans respond to certain parts of the natural world that provide healing qualities to them. Some of these include the cycle of life, enclosure and security and relief from stress. The healing garden can provide all of these elements in a variety of ways (Vapaa, 2002)

Although each garden design will be individual there are some universal qualities that should be incorporated into all healing gardens. There are certain qualities and elements in nature to which most humans respond to regardless of cultural background, religious beliefs, or place of origin. To what do we all respond? The cycle of life is one aspect of nature that impacts everyone. It may be expressed in a variety of ways such as the changing of the seasons. Many herbaceous plants require only one season to complete their life cycle while others such as trees take several seasons to change from a young seedling to a mature tree (Vapaa, 2002)

2.11. EFFECTS OF COLOR ON HUMAN MINDS

The human eye can see 7 million colours and all those colours can affect the mind and body. Colour can alter moods, influence behaviours and even cause physical reactions like blood pressure or suppressing appetite, headache, nausea or tiredness. Bright colours reflect more light and as a result they excessively stimulate the eyes. Colours also have positive effect on people. For instance, blue soothe illness, pain and relaxes a person's mood (Lynn, 2006). Green is a cool colour that symbolizes nature and the natural world. Green stipulates rest, soothing, cheerful and

health giving (Kendra, 2007). White represents purity or innocence, creates a sense of space and adds highlights. White is also described as cold, bland and sterile. Rooms may seems spacious and can be unfriendly and empty (Kendra, 2007). This research therefore helped in choosing blue, green and white as the domineering colours used at the spare; green for roof, blue and white used for the walls.

2.12. BARRIER FREE SCHOOL FACILITIES

The primary considerations in the design of school facility serving disabled children or adults focus on four major principles: (United Nations, 2001).

1. The range of movement available to most physically disabled people
2. The strength of the physically disabled subject
3. The dimensions of prosthetic devices especially wheelchairs must be considered
4. Due to the fact that many prosthetic devices including wheelchairs braces and crutches are made of hard materials ,materials that show minimum sign of wear and tear should be used

The target group is composed of five major categories (Sethi et al, 2015):

1. Wheelchair users
2. People with limited walking abilities
3. The sightless
4. The partially sighted
5. The hearing impaired

Other categories that may benefit to some extent from the proposed measures include the mentally disabled, people susceptible to physical fits, people with extreme physical proportions, and people with functional disabilities of the arm or hand (ESCWA, 2007)

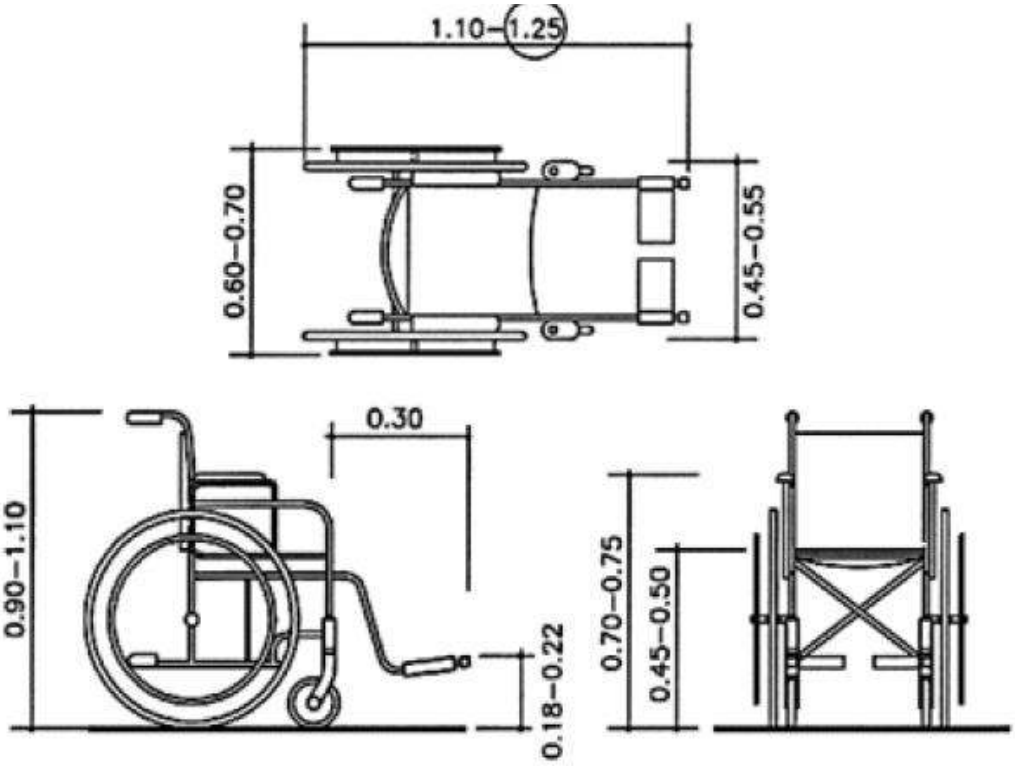

Figure 7: Dimension of a wheel chair.

Source: Sethi et al, (2015)

1. The size of a classroom on a per pupil basis in a school including disabled students should be at least one third larger than in a conventional school. There must be extra space in classroom for manoeuvring wheelchairs walking with crutches and for storage.
2. All electrical switches should be conveniently located where adjacent to doors switches should be the same level as door handles at a height 32 and 42 inches above floor level
3. If floor length windows are used a railing in front of the window be installed to prevent disabled children from falling or stumbling it seems preferable to have the lower edge of each window 12 to 14 inches above ground level.
4. Blackboards may be installed with the lowest edges approximately 2 feet from the floor for use by seated student, vertical and horizontal support railings may be provide at the edges for the student who can stand. (Sethi et al, 2015)

2.13. URBAN DESIGN CONSIDERATION FOR PEOPLE WITH DISABILITY

This section deals with the design requirements of open spaces, recreational areas and pedestrian routes. It introduces solutions to the principal problems in the design of an accessible outdoor environment (United Nations, 2001). Some of the consideration include:

1. Obstructions
2. Signage
3. Pathways
4. Pedestrian crossings
5. Ramps

2.13.1. OBSTRUCTION

The common problems include: Obstacles and protruding elements in the path of travel. Low overhanging signs. Lack of warning signs around obstructions. The planning principle is to design a barrier-free path for the safety and independence of disabled people, especially the sightless.

1. **General:** Obstructions include street furniture, traffic signs, direction signs, street plans, bollards, plants, trees, shop awnings and advertising signs, etc. Obstructions should be placed outside the path of travel wherever possible. Obstructions in the pathway should be easy to detect, and if possible, should be placed along one continuous line. Protruding elements should be avoided. The minimum width of a clear unobstructed path should be 0.90 m.
2. **Obstructions on the pathway surface:** Obstructions on the pathway surface should have one of the following design features in order to be detected by the cane of a sightless person: A straight shape rising from the pathway surface; A 0.10 m raised platform and; Tactile warning markings on the ground around the obstruction. The warning markings should extend over a width of at least 0.60 m outside the projected area at the base of the obstacle.
3. **Spaces below ramps and stairs:** Spaces below ramps and stairs should be blocked out completely by protective rails or raised curbs or marked with a tactile surface (United Nations, 2001).

2.13.2. SIGNAGE

The common problems include: Orientation difficulties resulting from illegible directional signs, street names and numbering and/or the lack of them. Pedestrian accidents due to badly positioned

signs. Hazards due to lack of warning and traffic signals. Non-identification of access routes and accessible facilities. The planning principle is to facilitate orientation mainly for the disabled.

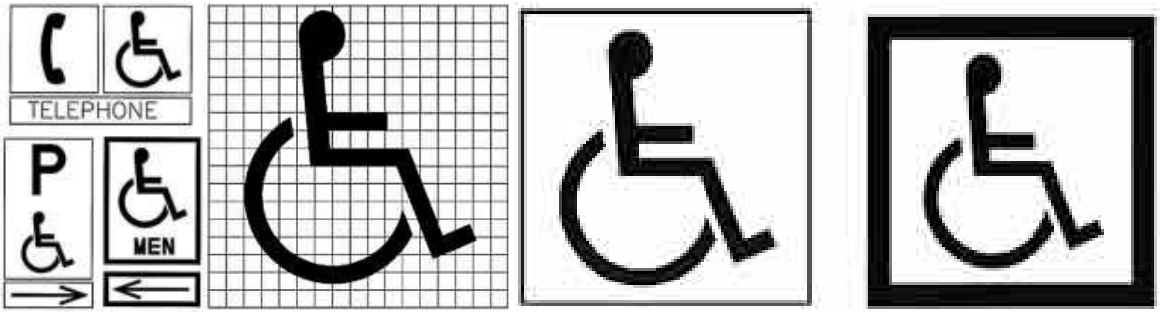

Figure 8: Example of Signage.

Source: United Nation (2001)

1. **General:** Signage include direction signs, signs of locality, street names and numbering, information signs, etc. All types of signs should be visible, clear, simple, easy to read and understand, and properly lit at night. In general, signs should not be placed behind glass because of possible reflection. Signage placed on the pedestrian path of travel are considered obstructions; thus, they should be detectable.

2.13.3. PATHWAYS

Common problems include: uneven curbs with obstacles and holes. Inconvenient or dangerous interruptions in the path of travel; insufficient width and; Changes in level. The planning principle is to provide clear, obstruction-free, level and wide pathways for the convenience of all users, especially the sightless and people with mobility problems. (Sethi et al, 2015)

1. **General:** Street pavements, pedestrian passages in open spaces and recreational areas, pedestrian underpasses and overpasses are all considered pathways or ramps.
2. **Curbs:** The height of a curb should be between 0.07 m and 0.15m. Stepped curbs should be avoided, as they are hazardous to all pedestrians, especially in darkness.
3. **Width:** The minimum width of an unobstructed pathway should be 0.90m. The minimum width of a two-way wheelchair traffic passage is 1.50 m. The preferable width is 1.80 m.
4. **Surface:** The surface of an accessible pathway should be smooth, continuous, non-slip and even. Pathways which are level and even with adjacent surfaces should be given a different texture and colour finish for differentiation. Intersecting pathways should blend at one common level.

5. **Guards:** For changes in level of more than 13 mm between the pathway and the surrounding surface, guards, upstands or other types of barriers should be used. Guards with a minimum height of 0.15 m should be used to separate pathways from planting areas, pools and landscape features.
6. **Landscaping:** Plant varieties and locations within the travel route should be chosen with caution. Thorny and poisonous plants should not be used immediately adjacent to pedestrian paths. Plants that drop seeds and leaves creating a hazard underfoot should be avoided. Trees with shallow roots are hazardous as the roots may breakthrough the pathway surface. (Sethi et al, 2015)

2.13.4. PEDESTRIAN CROSSINGS

Common problems include: Uneven road surface. Lack of guide strips. Lack of warning marking for crossings. Gratings on the road surface. Planning principles to facilitate the safe and independent crossing of disabled people.

1. **General:** Pedestrian crossings should be equipped with traffic control signals. Low-traffic crossings frequently used by disabled people can be controlled by a pedestrian push-button system. Constructing traffic islands to reduce the length of the crossing is recommended for the safety of all road users.
2. **Road hump:** The road surface at pedestrian crossings can be raised to the same level as the pathway so that wheelchair users do not have to overcome differences in height. (ESCWA, 2007)

2.13.5. RAMPS

Common problems includes: Inaccessible building entrances due to difference between indoor and outdoor levels. Inaccessible routes due to differences in level. Lack of or improper design of ramps. Very steep and/or long ramps with no resting landings. The planning principle is to provide ramps wherever stairs obstruct the free passage of pedestrians, mainly wheelchair users and people with mobility problems. (United Nations, 2001).

1. **General:** An exterior location is preferred for ramps. Indoor ramps are not recommended because they take up a great deal of space. Ideally, the entrance to a ramp should be immediately adjacent to the stairs.

2. **Ramp configuration:** Ramps can have one of the following configurations:

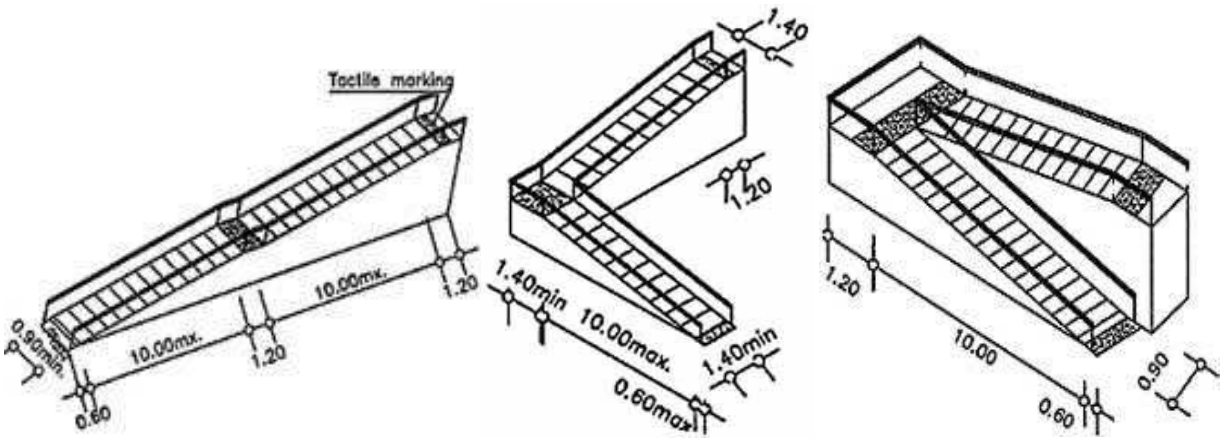

Figure 9: Ramp configuration.

Source: United Nations (2001)

a. Straight run (figure 9a);
b. 90 turn (figure 9b);
c. Switch back or 180 turn (figure 9c)

3. **Slope:** The maximum recommended slope of ramps is 1:20. Steeper slopes may be allowed in special cases depending on the length to be covered.

Table 7: Maximum slope and maximum length of ramp slope.

Source: United Nations (2001)

Maximum slope	Maximum length	Maximum rise
1:20 i.e., 9%	--	--
1:16 i.e., 6%	8 m	0.50 m
1:14 i.e., 7%	5 m	0.35 m
1:12 i.e., 8%	2 m	0.15 m
1:10 i.e., 10%	1.25 m	0.12 m
1:08 i.e., 12%	0.5 m	0.06 m

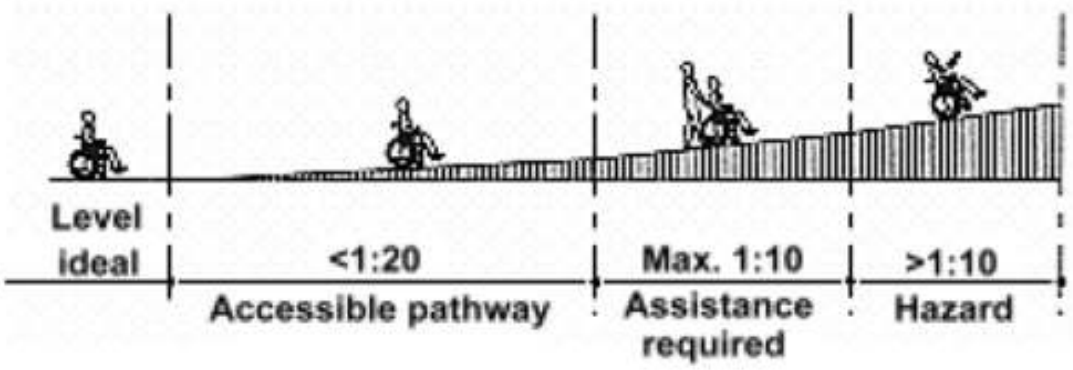

Figure 10: Maximum slope and maximum length of ramp slope.

Source: Sethi et al, (2015)

4. **Landings:** Ramps should be provided with landings for resting, manoeuvring and avoiding excessive speed. Landings should be provided every 10.00 m, at every change of direction and at the top and bottom of every ramp. The landing should have a minimum length of 1.20 m and a minimum width equal to that of the ramp. (United Nations, 2001).
5. **Handrail:** A protective handrail at least 0.40 m high must be placed along the full length of ramps. For ramps more than 3.00 m wide, an intermediate handrail could be installed. The distance between handrails when both sides are used for gripping should be between 0.90 m and 1.40 m.
6. **Surface:** The ramp surface should be hard and non-slip. Carpets should be avoided.

2.14. ARCHITECTURAL DESIGN CONSIDERATIONS FOR PEOPLE WITH DISABILITY

This section deals with the design requirements of vertical and horizontal access in both new and existing constructions. (United Nations, 2001).

1. Ramps
2. Elevators
3. Stairs
4. Railings and Handrails
5. Entrances
6. Vestibules
7. Doors

8. Corridors
9. Restrooms

2.14.1. ELEVATORS

Common problem include: Inadequate space inside the elevator cab; High position of switches, buttons and control panel; Narrow entry doors; insufficient opening time interval. The planning principle is to provide well-dimensioned elevators that disabled people can use conveniently (United Nations, 2001).

1. **General:** The accessible elevator should serve all floors normally reached by the public. Key-operated elevators should be used only in private facilities or when an elevator operator is present. Wide elevator cabs are preferable to long ones.
2. **Elevator cab:** The minimum internal elevator dimensions, allowing for one wheelchair passenger alone, are 1.00 m x 1.30 m. The door opening should not be less than 0.80 m. The inside of the elevator should have a handrail on three sides mounted 0.80 to 0.85 m from the floor. The maximum tolerance for stop precision should be 20 mm.
3. **Control panel:** The control panel can be mounted at one of the alternative locations shown in figure 3. For ease of reach, the control panel should be mounted 0.90 m to 1.20 m from the floor. Control buttons should be in an accessible location and illuminated. Their diameter should be no smaller than 20 mm. The numerals on the floor selector buttons should be embossed so as to be easily identifiable by touch.
4. **Call buttons:** For ease of reach, call buttons should be mounted 0.90 m to 1.20 m from the floor (fig. 4).
5. **Hall signal:** The elevator hall signal should be placed at an approximate height of 1.80 m
6. **Colour:** The colour of the elevator door should contrast with the surrounding surface so as to be easily distinguishable by persons with visual impairments (United Nations, 2001).

2.14.2. STAIRS

Common problems include: Steep staircases; poorly designed steps that hinder foot movement. The planning principle is to provide safe and well-dimensioned staircases for the comfort of all people, especially those with mobility problems. (United Nations, 2001).

1. **General:** Differences in level should be illuminated or minimized as much as possible for the comfort of disabled people. A complementary ramped route, elevator or lift should be provided where there are steps in an otherwise accessible path. All steps should be uniform. Circular stairs and stepped landings should be avoided. Open risers are not recommended.
2. **Width:** The minimum width of a stairway should be 0.90 m for one-way traffic and 1.50 m for two-way traffic. For indoor stairs, the riser should be between 0.12m and 0.18m, and the tread between 0.28 m and 0.35 m. For outdoor stairs, the maximum riser should be 0.15 m and the minimum tread should be 0.30 m.
3. **Landing:** An intermediate landing should be provided when the stairs cover a difference in level of more than 2.50 m. The length of the landing should be at least 1.20 m extending along the full width of the stairs.
4. **Nosing:** Sharp edges and overhanging nosing should not be used for treads. Nosing should be flush or rounded and should not project more than 40 mm.
5. **Handrails:** must be installed on both sides of the stairs and around the landing for gripping. For stairs more than 3.00 m wide, one or more intermediate handrails could be provided. The distance between the handrails when both sides are used for gripping should be between 0.90 m and 1.40 m. Handrails must extend a distance between 0.30 m and 0.45 m at the top and bottom of the stairs (see Railings and Handrails)

2.14.3. ENTRANCES

Common problems identified include: No distinct accessible entrance; inadequate space in front of the entrance. The planning principle is to provide accessible and easy-to-find building entrances (Sethi et al, 2015)

1. **General:** For new accessible constructions, all main public entrances should be accessible to an ambulant disabled person. At least one entrance per facility should be accessible to a wheelchair user. In new buildings, the accessible entrance(s) should be the main entrance(s) intended for use by the general public. Each accessible entrance should be connected by accessible pathways to accessible indoor or outdoor parking areas, local public transit stops and drop-off areas. In multi-storey buildings, the accessible entrance should permit access to a conveniently located accessible elevator or lift.

2. **Colour:** The colour of the entrance door should contrast with the surrounding surface so as to be distinguishable by people with sight problems (Sethi et al, 2015).

2.14.4. VESTIBULES

Common identified problems include: narrow doorways and vestibules. The planning principle is to provide sufficient space to manoeuvre a wheelchair between two sets of doors. (United Nations, 2001).

1. **General:** Vestibule entrance doors can be either the sliding type or the swinging type. For swinging doors, the door mechanism should allow the maximum opening swing.

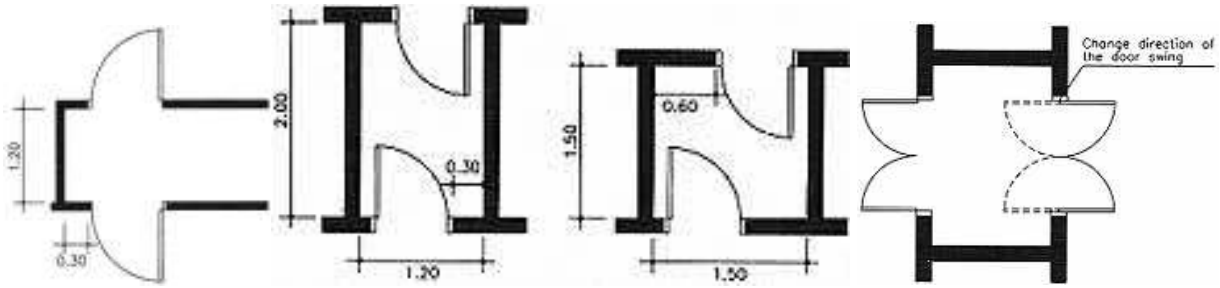

Figure 11: Vestibules.

Source: United Nation (2001)

2.14.5. DOORS

Common identified problems include: narrow doorways. Doors hinged on the wrong side, thus hindering accessibility. Doorways with high thresholds. Heavy and hard-to-operate door leaves. The planning principle is to facilitate the passage of a wheelchair user through doors (United Nations, 2001).

1. **General:** Accessible doors should be so designed as to permit operation by one person in a single motion with little effort. Power-operated doors are the best for people with disabilities. The activator system should be automatic or placed within easy reach. An accessible door should have the following features: a sign, a door handle, an extra pull handle, glazing and a kick plate.
2. **Door types:**
   a. Automatic doors: - Can be of the sliding or swinging type. In general sliding doors are preferable to swinging doors. Automatic doors are useful when traffic is heavy. Automatic doors should have an adequate opening interval. Guard-rails can be installed near double-

swinging doors to indicate a door-opening area and to prevent people from being hit by the door.

b. Revolving doors: - Revolving doors are not suitable for the use of disabled people or people with prams. Wherever there are revolving doors, an adjacent accessible swinging or sliding door should be provided.

c. Pivoted doors: - Pivoted doors should swing away from the direction of travel wherever possible. Pivoted doors in series are considered as vestibules.

d. Sliding and folding doors: - Manual sliding and folding doors are recommended for narrow spaces not heavily used by the public.

3. **Door opening:** For exterior doors, the minimum opening is 0.90 m when the door is open. For interior doors, the minimum opening is 0.80 m when the door is open. The minimum door opening can be 0.75 m if the access is straight or if the door can stay open by itself. The minimum door width of rest rooms should be 0.75 m. For doors installed in an opening more than 0.60 m in depth, the clear door opening should be at least 0.90 m. For double-leaf doors, at least one leaf should have a minimum clear width of 0.80 m.

4. **Manual door hardware:** Operational devices on doors, such as handles, pulls, latches and locks, should be easy to grasp with one hand.

   a. Handles: - Lever-type handles, push plates or pull handles are recommended for swinging doors because they are easy to open. Round knobs are not recommended. Door handles should be located at a comfortable height between 0.90 m and 1.00 m from the floor surface.

   b. Locks: Locks on entrance doors should be mounted at a comfortable height between 0.90 m and 1.00 m from the floor.

   c. Extra pull handle: To facilitate closing, a door fitted with spring closers should be equipped with an extra pull handle approximately 0.30 m in length, located between 0.20 m and 0.30 m from the hinged side of the door and mounted between 0.90 m and 1.20 m from the floor.

5. **Colour:** The door or the door frame can be painted in a colour that contrasts with the adjoining wall to facilitate its identification by people with visual impairments (United Nations, 2001).

2.14.6. CORRIDOR

Common problems include: long and narrow corridors creating orientation difficulties. The planning principle is to provide well-dimensioned corridors to facilitate the passage and manoeuvring of a wheelchair.

1. **General:** Wide corridors are useful for wheelchair users, service equipment, high traffic areas, etc.
2. **Width:** The unobstructed width of a low-traffic corridor should not be less than 0.90 m. This also allows manoeuvrability in 90 turns. The unobstructed width of a public corridor should not be less than 1.50 m. The recommended width is 1.80 m. The corridor width should allow manoeuvrability through the doors located along its length. (United Nations, 2001).

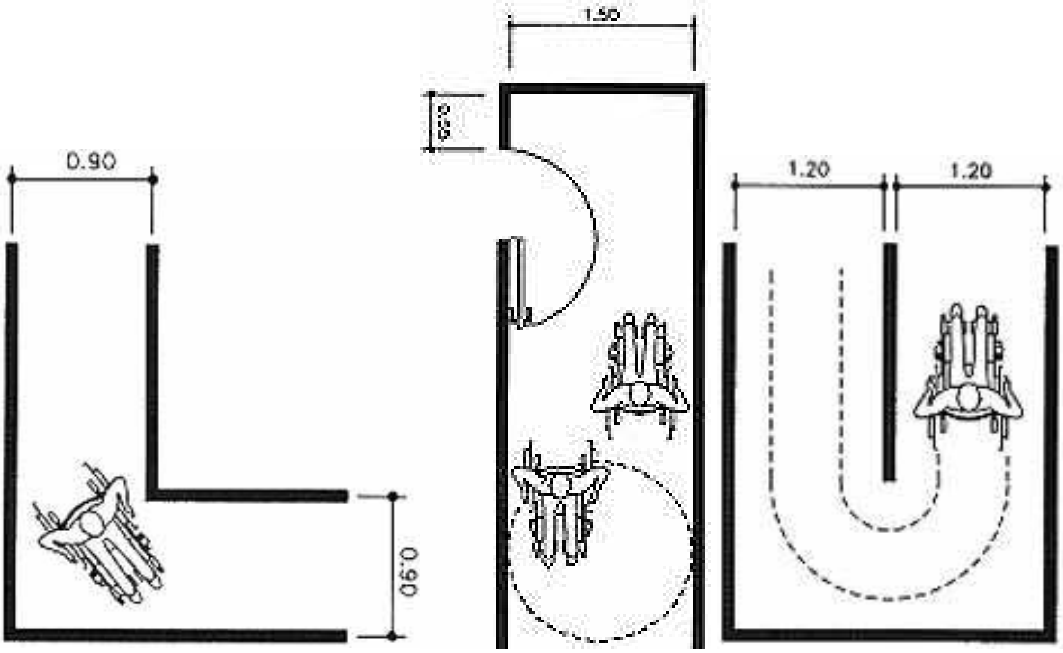

Figure 12: Corridor width.

Source: United nation (2001)

3. **Surface:** Changes in surface level of more than 13 mm should be ramped. Floor surfaces should be non-slip and even. Carpets should be securely fastened.

2.14.7. REST ROOMS

The major problem identified include: insufficient space inside a rest room; Poor design and positioning of fixtures and fittings. The planning principle is to provide sufficient accessible space inside rest rooms, with all fixtures and fittings being within easy reach. (United Nations, 2001).

1. **General:** Turning circles of 1.50 m diameter are recommended inside the rest room to allow for full-turn manoeuvring of a wheelchair.

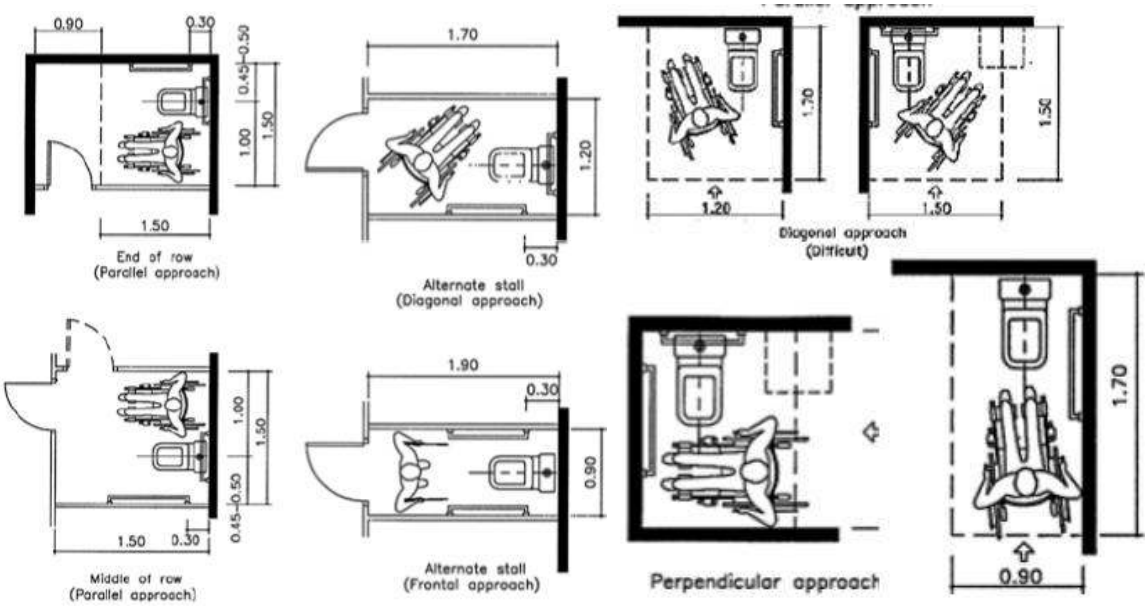

Figure 13: Showing full-turn manoeuvring of a wheelchair.

Source: Sethi et al, (2015)

2. **Residential rest rooms:** Residential rest rooms include those in private residences, health facilities, dormitories and other residential institutional settings. Residential bathrooms are usually equipped with a toilet, a bidet, a wash-basin and a bath-tub or shower. In multiple-rest-room arrangements (such as dormitories):
    a. Only one wash-basin per rest room needs to be accessible;
    b. At least one shower stall and one toilet stall should be designed for a wheelchair user.
3. **Rest room fixtures:**
    a. Water closets: The size and layout of water-closets and toilet stalls should comply with the minimum requirement. The height of the toilet seat should be between 0.45 m and 0.50 m

from the finished floor level. The distance between the centre line of the toilet seat and the adjacent wall, if provided with a grip bar, should be between 0.45 m and 0.50 m. Grab bars should be mounted on the wall behind the water closet, if it is of the tankless type, and on the side wall closest to the water closet, or mounted on the floor at the edges of the seat. Accessible hand-operated flushing controls, located on the open side of the water-closet, are recommended. Wall-mounted water closets are recommended.

b. Lavatories: The dimensions of lavatories should comply with the minimum requirements. The height of a wash basin should be between 0.80 m and 0.85 m above the finished floor level. The distance between the centre line of the wash-basin and the adjacent side wall should at least be 0.45 m. The wash-basin may be drawn forward from the wall a distance between 0.15 m and 0.20 m. No shelves must be located above the wash- basin.

c. Showers: The dimensions of showers should comply with the minimum requirements. The shower should have a seat conveniently positioned for the shower head at a height of 0.45 m and 0.50 m. A grab bar should be placed on the wall opposite the seat and around the back wall, mounted at a height between 0.85 m and 0.95 m. The floor of the shower stall should not be more than 20 mm below the level of the surrounding floor area. The shower stall should have a bevelled threshold not exceeding 13 mm above the finished floor.

4. **Rest room door:** the clear door opening should be at least 0.75 m with the door in the open position. Doors should be lockable from inside and releasable from outside under emergency situations. Regardless of the door type, a handle should be placed on the door from the inside to facilitate closing.
5. **Grab bars:** Grab bars should be installed in water-closets, bath-tubs and showers to assist disabled persons to use the facilities safely and easily. Grab bars should have a diameter of 30 mm to 40 mm. Wall-mounted grab bars should extent between 35 mm and 45 mm from the wall. Grab bars should be firmly fixed with stand loads and should have non-slip surfaces; knurled surfaces usually prevent slipping.

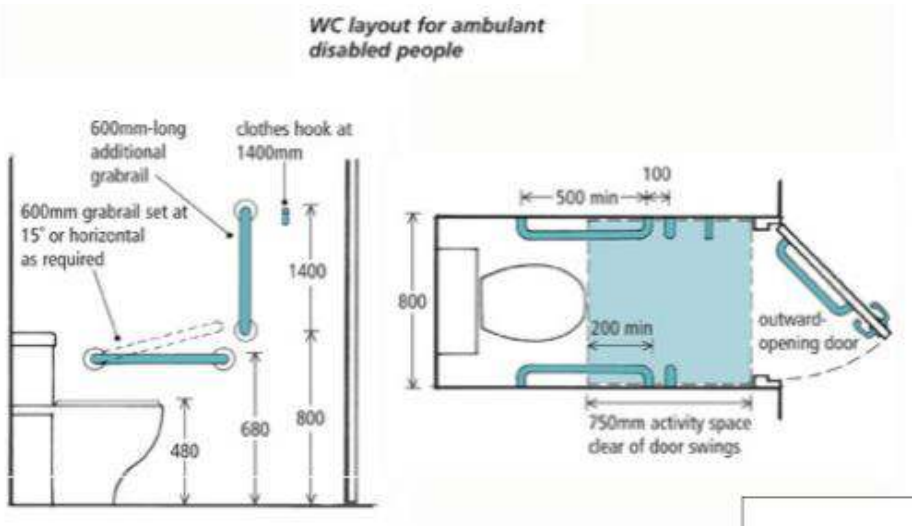

Figure 14: Grab bars.

Source: Sethi et al, (2015)

6. **Mirrors:** Mirrors should be suitable for use by both standing and seated persons. Low mirrors or downward tilted mirrors can be used. The bottom edge of mirrors should be located at a maximum height of 1.00 m from the finished floor level.
7. **Flooring:** Rest rooms must not have doorsteps. The gradient of the floor should be as low as possible. Thresholds should be avoided. When inevitable, the maximum threshold height should be 20 mm. Flooring materials should be skid-proof and easy to clean. The floor should be well-drained and provided with adequate waterproofing. (Sethi et al, 2015)

CHAPTER THREE

3.0. CASE STUDY

A case study is a research approach that is used to generate an in-depth, multi-faceted understanding of a complex issue in its real-life context. Case studies gives information about existing designs, patterns, and methods. It helps to learn best practices to imbibe and those to eliminate from the examples of others. The case studies chosen for the purpose of this study have been properly appraised to serve as tools for the realization of the set aim and objectives and enable the researcher to study their performance as a means of creating design solutions and making an assessment of their general impact and built forms. A critical analysis of the merits and demerits also helped to see such projects in retrospect and serve as a guide in the formation of new design solutions from which attempts will be made to eliminate such demerits as identified as well improving on the merits of such projects so as to arrive at a more exclusive design.

The case studies chosen for the purpose of this research includes:

1. Ekiti State Government Relief and Rehabilitation centre. Ekiti State
2. Rehabilitation centre for the disabled, Moniya, Ibadan. Oyo State.
3. Ondo State School for the Hearing Impaired, Akure. Ondo State
4. Vandhalla Egmont Rehabilitation centre. Denmark
5. Deyang School for Deaf and Intellectually Disabled Children
6. Hazelwood school, Glasgow

3.1. EKITI STATE GOVERNMENT RELIEF AND REHABILITATION CENTRE. EKITI STATE

3.1.1. LOCATION

Ekiti State Government Relief and Rehabilitation Centre is located away from the city centre although it is sited beside the Oluyemi Kayode Stadium which is the state main stadium. The site location can also be considered to be small compared to the facility expected to render.

3.1.2. BRIEF DESCRIPTION

Ekiti State Government Relief and Rehabilitation Centre is one of the established institutions under the Federal Ministry of Women Affairs and Social Development. However, the services that the

ministry provide are based on a charity/welfare approach to disability issues. Though much of the centre has fallen to a dilapidation, the centre is still functioning and serving its purpose.

3.1.3. OBJECTIVES

Unlike other rehabilitation centres, this Relief and Rehabilitation Centre is majorly a home for different variation of the challenged. Another purpose it serves is close observation. They are well observed for days and months to be able to make recommendation to their doctors who visits at set time or their parents as to the way forward regarding their condition. Those under drugs are also monitored to see how they respond. If any of them are discovered to respond to treatment, they can be reintegrated into the community but living on drugs.

3.1.4. FACILITIES PROVIDED

People are brought in from various parts of the state to the facility. Some of them are picked from the street where they are abandoned. They are not taught anything significant except for the following unstructured training:

1. Free Shelter and feeding
2. Basic education
3. Relation and communication skills
4. Medical diagnosis
5. Observation

From information gathered during the study, the following are the category of disabilities catered for in the centre:

1. Children:
    a. Physically handicapped
    b. Imbecile (moron)
    c. Epileptics
    d. Deaf and dumb

2. Adult:
    a. Mentally retarded
    b. Drug addict
    c. Epileptics
    d. Physically challenged

3.1.5. DESIGN DESCRIPTION

There are seven major structures in the facility. They include the admin and residential block, the kitchen and store, the dining hall, the relaxation shed, the kitchen, and the toilet. The compound is fenced with sufficiently high walls. It must be reiterated that most of the building facilities have fallen out of shape; they themselves require rehabilitation which is long overdue. All the buildings have been painted at one point or the other but are now already in need of repainting. The entrance welcomes with the main double-leaf gate as shown below.

Plate 2: Entrance showing double leaf gate and the gate house.

Source: Researcher's Field work, (2015)

Immediately after entrance, on the left is a building which is no longer in use. Next to it on the same left is the admin and residential block which includes the administration offices, staff lodging, PwD' hostel. The admin block is assessed through a series of 11 steps of averagely 150mm riser; this resulted from the steep terrain of the site.

Plate 3: Series of steps leading to the admin block.

Source: Researcher's Field work (2015)

This admin block is the centre of all activities in the building.

Plate 4: The Admin block. Source: Researcher's Field work (2015)

The admin block because of the dilapidation of other building have become reorganized to become multipurpose in function.

Plate 5: Showing spaces in the admin block.

Source: Researcher's Field work (2015)

Sharing wall with the admin block is the kitchen and store towards the right top corner of the block. Right ahead is the play and relaxation area where users can relax, play games and interact. The block directly opposite the gate which is also beside the relaxation shed is the dining hall. The building can be seen in Plate 3 up ahead. Sadly, it is no more in use because it is completely in bad shape.

Plate 6: Notable green surrounding features.

Source: Researcher's Field work (2015)

There are notable greenery seen around the facility which is of great advantage to the users as seem in Plates 6 and Plate 7.

Plate 7: Other greenery in surrounding.

Source: Researcher's Field work (2015)

3.1.6. ADHERENCE TO STANDARD

Ekiti State Government Relief and Rehabilitation centre is purpose built, but it is obvious that the design did not give consideration to the users of the building prior to execution. Although the corridors and verandas are compliant, many other aspect of the building are not. The toilets spaces and assess to them are not compliant to disability standard. Other aspect of the facility that are not compliant includes: circulation within the facility; door sizes, swing, and hardware; window types (casement); floor finishes; and wall finishes.

3.1.7. MERITS

1. The centre is purpose built
2. Most of the spaces are cross ventilated
3. Good day lighting
4. Pleasing green area and trees

3.1.8. DEMERITS

1. Inadequate facility to meet the demand
2. Poor aesthetic consideration
3. Maintenance is lacking
4. Inadequate accommodation for both staffs and People with Disability
5. No space for future expansion
6. Doors and walk ways are not disability standards compliant
7. No sporting facility

8. No support facility such as shops.
9. Casement windows are used which are prone to accidents especially on passage
10. Access to buildings are not compliant with wheel mobility standards
11. Though assessed by few cars, but there are no deliberate space for car parking
12. The facility is not equipped to serve its function properly.
13. Floor finishes are not readily cleanable and can be unhealthy for people with disability who spend more time on the floor.
14. Wall finish are not washable

3.2.REHABILITATION CENTRE FOR THE DISABLED, MONIYA, IBADAN. OYO STATE.

3.2.1. LOCATION

The Rehabilitation Centre for the Disabled, Moniya, Ibadan, Oyo State, though said to be in Moniya, it is sited far away from it in reality; it is about 5km away from its centre. The location is considered quiet and land area sufficient to meet demand.

3.2.2. BRIEF DESCRIPTION

The Rehabilitation Centre for the Disabled, Moniya was constructed by General Ibrahim Babangida in the year 1989 and commissioned in 1991. The inscription plaque reads: “This Rehabilitation centre for the disabled was officially opened for use by the President and commander-in-chief of the armed forces of the Federal Republic of Nigeria, Gen. Ibrahim Badamosi Babangida on Saturday, 3rd August, 1991”

Plate 8: Plaque showing the date of commission.

Source: Researcher's Field work (2015)

Information gathered says the floor area covered by the centre is 45acres. It is an occupational rehabilitation centre for the disabled. It is what can be called a vocational centre or rather a skill acquisition centre for the disabled. As at the time of visit, there are 75 persons admitted, 45 of which are male while 30 are female.

3.2.3. OBJECTIVES

The objective of the facility is to train the physically and mentally retarded with the view of making them operate fully elsewhere and properly integrated into the society as responsible citizens rather than nuisance or beggars. They are also taught to practice religion so that they can build vital life values. Students have the privilege of free training and feeding for one year after which they will be graduated. In case of failure of the students upon their final test, decisions are sometimes made to keep them for another year. Some of them are from graduation employed by the government while others are empowered to set up their own business.

3.2.4. FACILITIES PROVIDED

The Rehabilitation Centre for the Disabled, Moniya provide a one year training for People with Disability. All categories of disabilities are received and catered for, except that only those 15years of age and above are admitted. They offer basic education to some of them who are capable to learn while every other just learn vocations alone. The vocational facility offered include:

1. Information and communications technology
2. Fashion Design
3. Shoe making
4. Tie and dye
5. Animal husbandry: piggery, poultry, fishery, etc

3.2.5. DESIGN DESCRIPTION

The compound is fenced on all the major sides except for the farm area left unfenced. The main entrance has a double leaf gate with a gate house where all going in and out are checked in and out and where direction can be given to visitor.

Plate 9: Showing entrance gate and gate house.

Source: Researcher's Field work (2015)

As seen in Plate 9 above, inside the gate is the continuation of the tarred road into all the main areas in the facility. To the left of the road are buildings which include the staff quarters, the church and mosque, and the football field; while to the right are the admin block, basic education block, department (workshops), dining hall, clinic, dormitories (male and female), poultry, and lodge for SIWES and SPED students; ahead of the road are the school farm, fish pond, piggery and others. There are four semidetached staff lodges many of which stay only during week days and return to their family by weekend, except for house masters and mistresses that are permanently resident.

Plate 10: Showing staff lodges.

Source: Researcher's Field work (2015)

On the same side of the lodge and towards the far left is the centre church and mosque as shown in the Plate 11 below.

Plate 11: Showing the centre church:

Source: Researcher's Field work (2015)

To the right of the church is the mosque, they are about 15meters away from each other and separated by vegetation cover.

Plate 12: Showing the Mosque.

Source: Researcher's Field work (2015)

Their football field which doubles as the playing ground is also on the left of the road but towards the north of the site and very close to the road. It is big enough and sometimes used by outsiders for football practice.

Plate 13: Showing the football field.

Source: Researcher's Field work (2015)

On the right of the centre is the admin block where the administration of the centre is run. Next to the admin is the workshops, which is referred to as departments. The basic education block is also along that line where students who are capable are taught how to read and write and other basics of education.

Plate 14: The workshop (Department).

Source: Researcher's Field work (2015)

Plate 15: The admin block and basic education block respectively.

Source: Researcher's Field work (2015)

Other buildings include the dormitories. There is the male and female dormitories. The centre also has a reserved accommodation for SIWES and SPED students which is also constructed in form of dormitories.

Plate 16: Showing the Female and SPED/SIWES Dormitories respectively.

Source: Researcher's Field work (2015)

The Poultry and piggery is also located somewhere next to the SIWES/SPED dormitory. It is located a little away from other buildings. The male hostel is also located away from the female's. The dining hall is expected to serve its purpose but is not in use because of maintenance.

Plate 17: The Poultry and the dilapidated dining hall respectively.

Source: Researcher's Field work (2015)

Plate 18: The two male hostels.

Source: Researcher's Field work (2015)

Plate 19: The exterior and interior of the clinic respectively. Source: Researcher's Field work (2015)

The clinic is another facility in the centre as shown in Plate 19. Though the clinic is not in use as the time of visit, nevertheless, researcher was assured that it is fully in operation.

Other aspects of the centre include the farm where plants and planted and students learn farming on various levels. There is the plantation, the fish farm, etc. The centre covers a wide area many of which have been developed and in use. Many of the buildings are connected by tarred road and foot paths. There are no designated walk ways in the facility. The environment can also be termed as green as a result of various ground covers, shrubs and trees planted all around it. As seen in all the buildings above, they are all surrounded with vegetation cover.

Plate 20: Showing vegetation covers and notable trees and flowers.

Source: Researcher's Field work (2015)

Plate 21: Showing street views.

Source: Researcher's Field work (2015)

3.2.6. ADHERENCE TO STANDARD

This rehabilitation centre was designed and executed to a large extent to meet necessary standards and ideals in a rehabilitation centre. Some aspect of it that is notable is access to each building. All buildings readily accessed by students are designed with ramps with very low percentage. Only few buildings especially some of the staff lodges were not designed to have ramps, probably because the designer does not expect students to come there. Corridors and verandas are wide enough for wheel mobility. Floor materials are not considered readily cleanable. Door swing, sizes and location of hardware are compliant. Many interior standards which include wash basin, grab bars in toilet and bath among other interior specifications are not seen to comply with standards.

3.2.7. MERITS

1. The centre is purpose built
2. The buildings are functional
3. The provision of ramps for access in place of steps is available
4. Good day lighting and ventilation
5. Ample green area and trees
6. Sufficient class rooms and dormitory to meet demand
7. Good landscaping
8. Adequate space for future expansion
9. Efficient road network linkage

3.2.8. DEMERITS

1. The centre is not properly zoned
2. Few variety of vocation compared to size of the centre
3. Poor aesthetics consideration
4. The site is not properly zoned.
5. Poor maintenance scheme
6. Floor and wall finishes are not readily washable.
7. The admin block is hidden away and not readily accessible by visitors
8. Toilets are not equipped with grab bars.

3.3.ONDO STATE SCHOOL FOR THE HEARING IMPAIRED, AKURE. ONDO STATE

3.3.1. LOCATION

The Ondo State School for the Hearing Impaired, Akure is located behind stadium road. The school can be classified as properly sited as the space allocated for it can be termed as relatively large enough. It is not far from the city centre.

Plate 22: Showing the sign board and part of the street view of the area.

Source: Researcher's Field work (2015)

3.3.2. BRIEF DESCRIPTION

The school was established in April, the year 1977 – a year after Ondo state was created. It is a school for the hearing impaired. This does not imply that they all are completely deaf, but it means that their hearing is defective. It also means that they have speech impairment. The school also admits people with multiple disability, it implies a person can be suffering from more than just hearing impairment and be admitted. Some with their hearing impairment may be physically challenged or some other disability, such are still admitted. The number of students accounted for each year is an average of about 650. It is a large number of students comprising of students from both primary school age to secondary. Students come from within the state and across the country even as far as the north. The school has three main division, there is the primary, the secondary and the vocational aspect. It operates a boarding house system only. It is headed by a Principal and the vice principal. Other staff include the bursar, house master and house mistress, potters, teachers, etc. The secondary aspect of the school does not follow the conventional Junior Secondary and Senior Secondary scheme, rather it uses Special Primary 1A to Special Primary 5B as shown in the plate below.

Plate 23: Showing the signage on top of the secondary classes.

Source: Researcher's Field work (2015)

3.3.3. OBJECTIVES

The objective of the school is to give the hearing impaired an opportunity of expression of what is in them. The school seeks to create in them the will and the courage to become what they are made to become despite their disability. This is achieved by giving them basic education. This is the major focus of this school. They are given the opportunity to also have primary and secondary school education together with their peers, so that in one way or the other, they will be able to compete also in the journey of life. They are also equipped through the vocational training so as to be able to also compete in the present country where white collar jobs are next to unavailable. They are equipped to be able to set up their own mini place of work and earn so as to become responsible citizens.

3.3.4. FACILITIES PROVIDED

As state earlier, the school has provides three main services: they are the primary school, the secondary school, and the vocational training. The school is strictly a boarding house based facility, thus students are provided with both feeding and accommodation throughout their schooling period. Thus, aside from the normal training in senior secondary where they major between art, commercial and science, the vocational aspect is the main area this thesis is concerned about. The following are the vocational training rendered to students:

1. Tailoring
2. Home economics

3. Barbing
4. Hair dressing
5. Shoe making
6. Bag making
7. Bead making
8. Tie and dye
9. Arts and craft

3.3.5. DESIGN DESCRIPTION

The facility is accessed by a main double leafed gate which brings one in contact with the gate house. There are about 22 structures in this facility which are mostly properly zoned. The site is mainly divided into the class room blocks, the staff quarter, the vocational blocks, the audiological room, the dormitories, the clinic, the toilets, car parks, the library, the admin blocks, and the future development area.

Plate 24: Showing the gate and entrance area.

Source: Researcher's Field work (2015)

Many of the buildings have been constructed since the establishment of the school, some have thus become inefficient though still in use.

3.3.5.1.ADMIN BLOCKS:

There are two major blocks designated to the administration none of which include the Principal's office. They are the bursar's office and the vice principal's office which doubles as the library.

Plate 25: The Vice Principal and the Bursar's office respectively.

Source: Researcher's Field work (2015)

The principal's office is attached to the tail end of one of the class rooms which is the Special Primary 1A – Special Primary 3B. The office is spacious with its dimension (4800mm by 4800mm) enough and will be accessed through the secretary's office which is equally spacious. Other staff rooms are embedded in many of the blocks.

Plate 26: Showing the *Principal's* office and the secretary's respectively.

Source: Researcher's Field work (2015)

3.3.5.2.CLASSROOM BLOCK

There are various classroom blocks in the school due to the enormous number of students admitted per year. The primary school is from nursery to primary, one class room per class; while the primary. The various blocks include: Block 1 (crèche – Primary 6) it must be noted that the crèche is for staff's children and not for babies; Block 2 (Special Primary 1A – 3B); Block 3 (Special Primary 4A -5B)

Plate 27: Showing the Block 1 and interior of the class room.

Source: Researcher's Field work (2015)

Each class room has a store which doubles as monitoring room for sickly students. It is used for keeping students materials and teaching aids. It has a mattress where these sickly students can rest.

Plate 28: Showing the inner room and the other blocks.

Source: Researcher's Field work (2015)

3.3.5.3.DORMITORIES

There are the male and female dormitories. There are three blocks designated to the male, one of which is very old and there are two other new ones. Each of the hostels have porters who live with them and monitor their affairs.

Plate 29: One of the new blocks and the old block.

Source: Researcher's Field work (2015)

Most of the access to the hostels are not compliant with standards. Though the school as at time of study have very few wheel chair users as student, nevertheless it is not an excuse not to prepare for them and make circulation easy for them. It will be noted that many of the buildings are raised from the ground level and access through steps some of which are over 200mm.

Plate 30: The interior of the hostel and the new hostel respectively.

Source: Researcher's Field work (2015)

Plate 31: showing the three blocks designated for girls hostel.

Source: Researcher's Field work (2015)

The girls equally have three hostel blocks zoned together as shown in Plate 31. They also have a dilapidated block and some other newer ones.

3.3.5.4.DINING HALL, KITCHEN AND STORE

The dining hall is relatively small and cannot contain half of the students in one sitting. It usually doubles as their auditorium. Because of its size, the space is usually used in rations so as to cater for all the students.

Plate 32: Showing the external and internal views of the building.

Source: Researcher's Field work (2015)

The kitchen is attached towards the left side of the dining hall. It uses the traditional method of cooking to prepare the students' meals. The kitchen has no store and uses one of the house mistress' office as its food store which is located far away from the kitchen.

Plate 33: The office used as store for the kitchen.

Source: Researcher's Field work (2015)

3.3.5.5.VOCATIONAL BLOCKS

There are two buildings designated for skill acquisition. The first is the major block which comprise four major spaces for different uses. It has a store, a room for tailoring, home economics, and barbing. The other block is very close to the entrance and includes the computer lab, the shoe making, and the audiological studio.

Plate 34: The the tailoring department and barbing salon.

Source: Researcher's Field work (2015)

Plate 35: The second block, the computer lab and the shoe making area.

Source: Researcher's Field work (2015)

3.3.5.6.AUDIOLOGICAL STUDIO AND CLINIC

The audiological studio is a diagnostic facility where students with hearing impairment are tested to know their level of disability. Upon test and result, it will be determined if they can use hearing aids or not. The spaces however are deprived of ventilation and lighting for acoustic treatment, yet there is no provision for artificial ventilation.

Plate 36: The audiological studio entrance and the machine.

Source: Researcher's Field work (2015)

There are four spaces in the studio, they are: the reception, the toilet, the control room, and the testing room. The testing room is the room treated with acoustic material as shown in Plate 37b below. The student in question will stay in there while he is being tested and readings are taken from the control room.

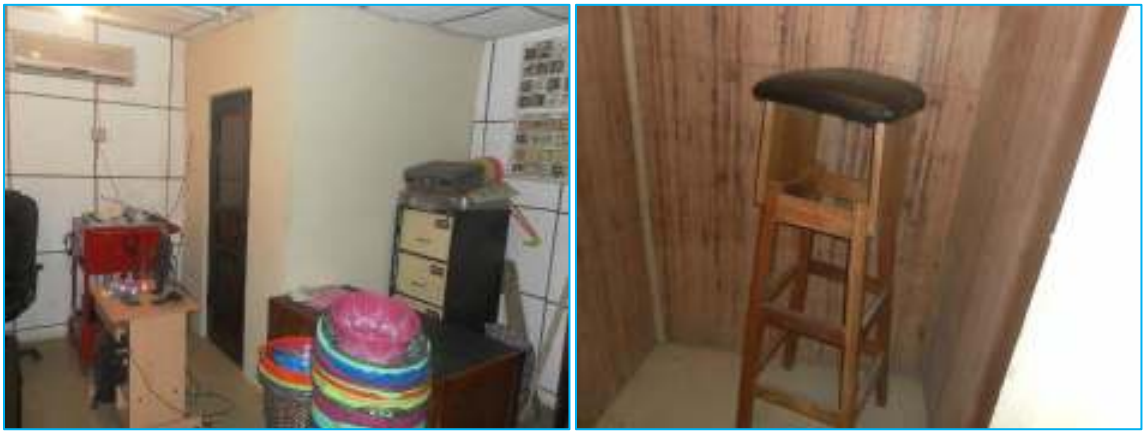

Plate 37: The audiological studio control room and the testing room with its surface with acoustic treatment.

Source: Researcher's Field work (2015)

The clinic is located beside one of the boys' hostel's block and adjacent to the dining hall and kitchen. It is by all standard not efficient in design. It is obviously not purpose built, yet cases of serious injury is very prone among students due to their mental dysfunction and severally they have to be transferred to the state hospital which is several kilometres and traffic congestions away. It is just one single building with one single space and that is all there is with the "clinic".

Plate 38: The clinic exterior and interior.

Source: Researcher's Field work (2015)

3.3.5.7.OTHERS

Other notable structures or features are the car parks, the football field, the staff quarter, the toilets, the future development, etc. The car parks are not designated, thus parking are done by drivers whim or according to common sense. There is a designated car park for the principal, others park their cars under trees or any other available space.

Plate 39*: Showing the Principal's car* park and other areas used for car park by other staffs.

Source: Researcher's Field work (2015)

Plate 40: showing the football field, the future development, and one of the external toilets.

Source: Researcher's Field work (2015)

The football field as shown in Plate 40 is big enough and is also used for several field and track events. Most of the buildings have no inbuilt toilet, thus most of the toilets are constructed apart from the buildings. There are also land area reserved for future development, some are reserved deliberate while some are not.

The building is generally characterized by green area and the presence of trees and shrubs makes the environment pleasing to the eye and healthy for living. The staff quarters compose of only a semidetached bungalow each of which is occupied by the principal and the house master.

Plate 41: Showing vegetation cover and trees ar*ound the building and the staff's lodge.*

Source: Researcher's Field work (2015)

3.3.6. ADHERENCE TO STANDARDS

The design is generally not designed to standard. Ramps are not used, the health and safety of students are not put into consideration. Many of the buildings are raised from the ground level and are not sufficiently connected with ramps. Many of the passages and veranda are not designed to accommodate wheel chair users. The doors are not to standard in both size and direction of opening. The bath rooms and toilet do not have grab bars to make its use easy.

3.3.7. MERITS

1. Though the buildings have been long constructed, it is still obvious that it is purpose built
2. Most of the buildings are functional
3. Good day lighting and cross ventilation in most of the spaces used by students, which include dormitories, classes and workshops. This is achieved by the use of louvered window.
4. Presence of greenery and trees
5. Sufficient class room spaces and dormitories
6. Efficient zoning of buildings.

7. Good variety of vocation

3.3.8. DEMERITS

1. Unavailability of ramp for access to any of the buildings
2. Dining size and facility not sufficient to meet demand.
3. Dysfunctional clinic
4. Inadequate space for future development
5. Poor maintenance scheme
6. Poor aesthetic consideration
7. Doors and walkways not compliant to disability standards
8. Floor finishes are not readily cleanable and can be unhealthy for people with disability who spend more time on the floor.
9. Wall finished are not washable
10. Grab bars not installed into toilets and baths.
11. Toilets not easily accessible from students' hostels.

3.4.VANDHALLA EGMONT REHABILITATION CENTRE, DENMARK

3.4.1. LOCATION

Vandhalla Egmont Rehabilitation Centre is located in Hou Seasportcentre, Villavej 25, Odder, Denmark. It was constructed in the year 2013 and covers an area of 4000sqm.

3.4.2. BRIEF DESCRIPTION

Plate 42: Approach view of the Vandhalla Egmont Rehabilitation Centre.

Source: www.archdaily.com

The new rehabilitation centre provides a statement, a landmark that exposes the functional needs of the school architecturally and thus provides a renewed identity to the school's old buildings. An identity that will be visible towards the main thoroughfare of the small town of Hou.

3.4.3. OBJECTIVES

Vandhalla Egmont Rehabilitation Centre do not attempt to undue individuals' illnesses or sorrows, but rather work to keep people focused on the future and overcoming current obstacles of physical, psychological or emotional capacity. It is goals-based, and help individuals develop personalized objectives that they wish to attain. There is the availability of the hot water hydrotherapy pool and other facilities which aid therapy one way or the other or allow student with disability to cope in the outside world.

3.4.4. FACILITIES PROVIDED

The school gives the opportunity to combine training of cognitive and social skills with physical training. Students are taught and allowed to learn as other students, basic education is provided. Added to that is physical training for those with physical disability.

3.4.5. DESIGN DESCRIPTION

The complex design centres around the seminal dressing room which forms a functional hub surrounded by the various leisure functions. The main feature is a waterslide accessible for wheelchair users. The top is reached either by stairs or elevator, and before sliding the 90 meters you enjoy the view of the swimming pool and the vista towards the island of Endelave. The waterslide will be used for training the sense of balance and body awareness of the students, and access to the pools is also possible via ramps and specially developed wheelchairs that can withstand chlorine.

Figure 15: Showing the site plan of the centre.

Source: www.archdaily.com

The hot water hydrotherapy pool has an adjustable bottom to support various needs for exercise and a multi-functional hall, as an enlargement of the existing, generates the dynamic roof scape together with the need of certain heights for the waterslide. Vandhalla breaks with existing standards and help to develop state of the art within the disability field.

Plate 43: The hot water hydrotherapy pool and other interior space.

Source: www.archdaily.com

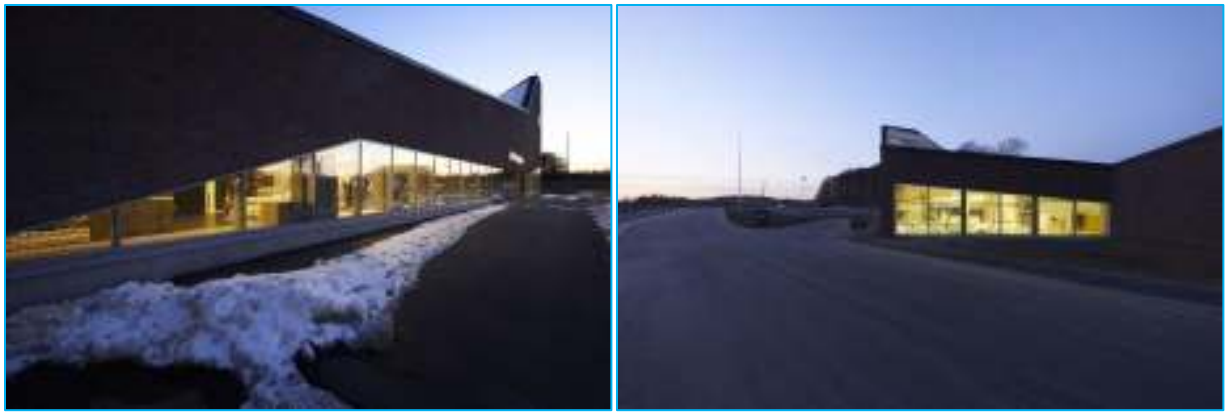

Plate 44: Other exterior views of the centre.

Source: www.archdaily.com

3.4.6. ADHERENCE TO STANDARD

Due to stable power supply, wheel chair users are not provided with ramps, they are instead provided with lifts located strategically around the building. Corridors and circulation areas are wide enough to enable ease of access by wheeled mobility. Doors are wide enough to accommodate ease of usage by wheeled mobility. There is also no need for day lighting and natural ventilation as building depend on artificial means for power.

3.4.7. MERITS

1. Good aesthetic consideration
2. Compliant with important disability standards
3. Provision of sport and recreational facilities
4. Provision of lifts to make wheel chair users move freely between levels.
5. Floor finishes and wall finishes are readily cleanable.
6. The centre is purpose built

3.4.8. DEMERITS

1. No green area around the building immediate surrounding
2. The building is not dependent on natural ventilation nor lighting

3.5. DEYANG SCHOOL FOR DEAF AND INTELLECTUALLY DISABLED CHILDREN

3.5.1. LOCATION

Deyang School for the Deaf and Intellectually Disabled Children is located in Deyang, Sichuan, China. The school covers a land area of about 7998sqm.

Plate 45: Showing the approaching view and other view of the centre.

Source: www.archdaily.com

3.5.2. BRIEF DESCRIPTION

Deyang School for Deaf and Intellectually Disabled Children is a charitable educational institution, recruiting children with talking and hearing disabilities or mentally retarded pupils. The school includes teaching, sports and accommodation facilities.

3.5.3. OBJECTIVES

The objective of the centre is to give children living with disability an opportunity of a proper education in a place like home, free from bully and bad psychosocial influences.

3.5.4. FACILITIES PROVIDED

The school provides students with academic teachings, sport and provide accommodation facilities. Students are taught in the normal curriculum. They operate boarding facilities. Students are also taught sports which give some of the students to eventually go into sport in their lives.

3.5.5. DESIGN DESCRIPTION

'Home' is as the prototype of the design, expressing the special concerns for the children on campus. The ideas of sloped roofs and square windows are originally from children's drawings,

which refers to their imaginations of homes that expressing the warmths and belonging from their hearts.

Plate 46: Showing the homelike design.

Source: www.archdaily.com

By dividing the campus into small-scaled sloped-roof different-sized buildings around a central courtyard, they form a miniature village. The rooms in each building are oriented towards the atrium that following the relationship of 'Rooms'-'atrium'-'courtyard' to create multi-level interactions between private and public spaces, which not only respect the pupils mental needs but also their activity routines.

Plate 47: Showing the courtyard, the Atrium and large number of openings.

Source: www.archdaily.com

Figure 16: The block plans.

Source: www.slideshare.net

The atriums, courtyards, as well as the different-sized windows provide various opportunities for those special children to explore the world from different heights, inspiring them enhance the interactions with each other and discover the surrounding world together, which helps developing intelligence better. Architecture is becoming the tool of education.

Plate 48: showing large openings, spacious corridors and large windows.

Source: www.slideshare.net

3.5.6. ADHERENCE TO STANDARD

The building is characterized with natural ventilation and lighting. It has large windows, courtyards and atrium that let in light on all sides of the building. It also has large corridors that makes circulation easy. It has wide doors with door hardware rightly positioned.

3.5.7. MERITS

1. The school is purpose built
2. It has the advantage of day lighting and natural ventilation
3. It is well landscaped.
4. It has good aesthetical consideration
5. Floors are readily cleanable
6. Large corridors

3.5.8. DEMERITS

1. High levels are not designed to be accessed by wheel chair users as there are no ramps and no lifts

3.6.HAZELWOOD SCHOOL, GLASGOW

3.6.1. LOCATION

Hazelwood School is located in 50 Dumbreck Court, Glasgow, Glasgow City G41 5DQ, United Kingdom. It covers an area of about 28,632square feet (2577sqm)

Plate 49: Hazelwood School.

Source: www.slideshare.net

3.6.2. BRIEF DESCRIPTION

Hazelwood is a co-educational, inter-denominational school for children and young people aged from 2-19 years. The school capacity provides for a maximum of 60 pupils. It is a purpose built school designed to meet the requirements of pupils and is set in a beautiful wooded setting adjacent to Bellahouston Park. The design of the Hazelwood building project building was pursued with a commitment to building knowledge and capacity on a building that would work with children with a very complex range of abilities. Most extant examples are schools serving the needs of children with visual limitations, or hearing limitations, or cognitive issues or physical limitations.

3.6.3. OBJECTIVES

The aim of the school read thus “We aim to provide a safe and secure learning environment for all our pupils and our curriculum is designed to help our pupils develop life skills and independence". Hazelwood School provided a high quality of education and care for its pupils within a vibrant and inclusive learning environment. The skilled and highly motivated staff provided stimulating learning experiences and effective support for pupils. Intended to be usable and easily navigated by anyone, Hazelwood provides accommodation for a maximum of 60 pupils, aged 3-18 years.

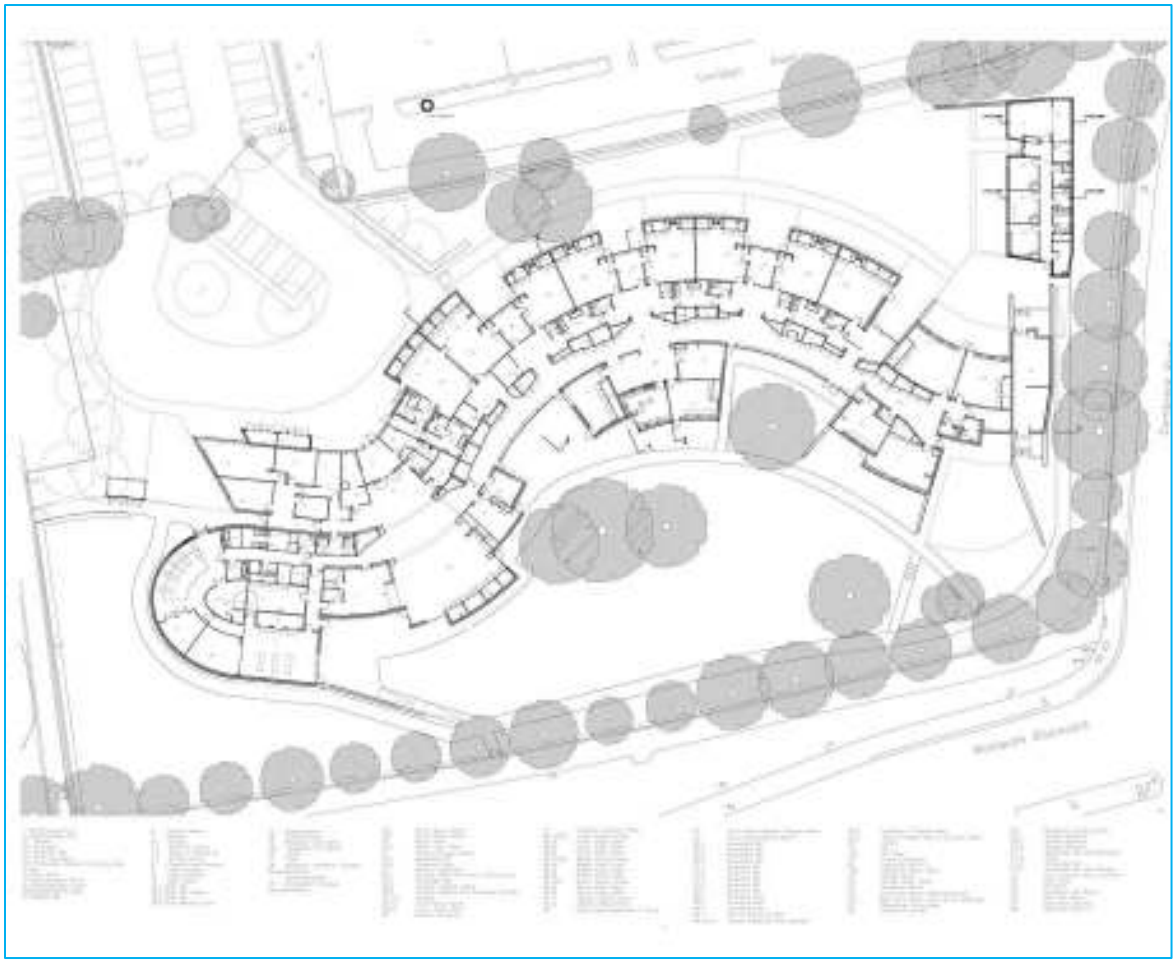

Figure 17: Site plan of Hazelwood School, Glasgow.

Source: www.slideshare.net

3.6.4. FACILITIES PROVIDED

Basically, facilities provide by the school include nursery, primary and secondary education. Some levels of therapies are also given to students. Hazelwood Nursery is an assessment centre for pre-school children where their visual and other needs are met. In the primary stage the foundations for self-help and independence skills are laid down as well as appropriate methods of language and communication. This may be pre-Braille, pre-Moon skills or augmentative methods of communication using assistive technology for those with no verbal communication. Pupils in secondary Department take part in a wide range of educational experiences which promote independence and the development of life skills. Many activities take place in the wider community through visits to supermarkets, shopping centres and local leisure centres.

3.6.5. DESIGN DESCRIPTION

The school contains eleven (11) classrooms in a single story structure, providing nursery through secondary education. All children arrive to Hazelwood by taxi or mini bus. The school entrance area was designed as a loop system to allow vehicles to rack up in a dedicated drop off area. The main entrance area opens to a large dining room, which doubles as the main assembly space.

Plate 50: External view of the school.

Source: www.slideshare.net

The main teaching spaces are located to the quiet northern edge of the site in order to escape direct sunlight. The central circulation space houses a large cork-clad storage wall to accommodate the children's equipment. Integrated into this wall is a unique "trail rail," which provides tactile cues for the children to clearly and safely navigate the building. Each bay of sensory trail wall is individually shaped. This helps children orient the length of the circulation space in the school. Coupled with the 'street' design of the corridors in the school, this layout has proven an effective device for independent navigation for all kinds of students.

Signage throughout the school is redundant: in Braille, in pictures and in Moon (a system made up of lines and curves including some ordinary letters in simplified form), and has proven effective for the communication needs of the children. The subtle colours, contrast, and adaptable lighting elements maximize use of children's residual vision.

Plate 51: Mature trees, walkways, and a play yard with wooden climbing structures and swings create a park-like setting for the school grounds.

Source: www.dev.ihcdstore.org

Large classrooms are equipped with ample built-in storage space at the back of the room, and adaptable areas between the classrooms. The lack of clutter in the classrooms and on the walls elicits a calming atmosphere where children can flourish while not being bombarded by extraneous visual information. Some rooms offer viewing for staff and visitors without disturbing the children. These areas fulfil a dual function of quiet space when needed.

Plate 52: Curved wooden walls and Larch timber boarding.

Source: www.dev.ihcdstore.org

Design of the games hall, trampoline area, and hydrotherapy pool created opportunities for children to explore, extend their skills, and gain confidence through engagement in relatively

independent activity. The playground and playground equipment allow each child the freedom to play as much as possible at his or her own level.

The external environment is an extension to the learning environment and numerous external teaching spaces are provided within the school grounds. Exterior material choices also contribute to successful navigation. A separate residential unit, the three bedroom "Life Skills House," is used to teach the children basic life skills but also provides respite accommodation.

3.6.6. ADHERENCE TO STANDARDS

Corridors are designed as streets, which also assist with orientation and mobility. The unique sensory trail wall weaves throughout the school and enables children to practice mobility and orientation skills, which lead to increased confidence, sense of mastery, and self-esteem.

Plate 53: Showing sensory trail that help build self-confidence.

Source: www.slideshare.net

Redundant signage throughout the school, in Braille and pictograph and Moon, caters for the diverse communication abilities of all of the children. The subtle colour, contrast, and adaptable lighting elements maximize use of children's residual vision

3.6.7. MERITS

1. Aesthetically pleasing environment
2. Purpose built to positively influence student's psychology and increase their independence.

3. Large classrooms with ample storage spaces.
4. Colour combination that helps children's residual vision
5. Good orientation of class rooms
6. Class rooms are located away from traffic noise
7. Acoustic ceiling are used in all teaching spaces.
8. It is designed to maximize the use of natural and durable materials, and when fiscally possible, locally sourced.

3.6.8. DEMERITS

1. Complain from teachers shows that there are insufficient storage spaces

3.7.CONCLUSION

General deductions from case studies include the following:

1. The need for ample storage in the facility.
2. The need for green building initiative
3. The need for crèche in centre for nursing mothers among staffs to keep their babies
4. The need to use architecture to build independence, self-esteem, and self-confidence in people living with disability
5. The need to create a standard clinic or preferably a hospital to cater for most medical needs of students and emergency cases.
6. The need for buildings that can be easily maintained as many rehabilitation centre in Nigeria are at the mercy of the government.
7. The need for each class to have its own storage or private room.
8. The need to have few students per class for concentration of teachers and effectiveness due to the situation of students.
9. The need for each dormitory to have multiple house masters and mistresses who will be close to students, monitor them and probably give a report on them. He will also be responsible for maintaining peace and order in a friendly manner with students in his domain. He will report emergencies in time.
10. The need for multiple and variety of vocations to be learnt.
11. The need for basic education centre for those who are capable.
12. The need to make the centre as homely as possible.

13. The need for an audiological studio where student's hearing level can be tested. This also implies that the hospital or clinic must be diagnostic enough.
14. The need to prevent students from crossing the road too often; this implies road will not be allowed to cross major students' circulation area.

CHAPTER FOUR

4.0. ANALYSIS OF SITE AND DESIGN SYNTHESIS

4.1. SITE SELECTION AREA/ STUDY AREA

The project study area is in Okeigbo, a town in Ile-Oluji/Oke-Igbo Local Government area, Ondo State of Nigeria. Its headquarters are in the town of Ile Oluji.

Figure 18: Map of Nigeria. Source:

Google images (2015)

According to the 2006 population census, the local government has 171,876 people and covers an area of 824.1sqkm which is 5.57% of the entire Ondo State land area and has a population density of 208.56 units.

Figure 19: Map of Ondo State.

Source: Google Images (2015)

4.1.1. SITE LOCATION CRITERIA

The following criteria were considered when selecting the site for the centre.

1. **Accessibility:** the site is assessable and has a major access which makes it easier to describe and locate.
2. **Disability population in the state:** There is generally a need for a standard rehabilitation centre in Ondo State. The total number of 'Disabled' persons of both sexes is 56,941 or 1.65% comprising of 28953 males and 27988 female. The "Disability rate for males is slightly higher at 1.7% while for females, it was 1.6%. Comparative analysis of Disability population shows that absolute disabled population increase from 2,249,548 in 1991 to 3,460,877 in 2006. Okeigbo by feasibility study itself has a good number of people living with disability. In 2010, Ondo State was rated top among 35 other states of the Federation and Abuja in the implementation of the National Health Insurance Scheme and Millennium

Development Goals, NHIS-MDG programs. The target was to attend to the vulnerable groups in the society like pregnant women, children below the age of five, pensioners and people with different forms of disabilities. One of the local government benefiting from this facility is Ile-Oluji/Okeigbo local government.

3. Economic effect on the town: The siting of this centre in Okeigbo will help create employment and help the town's standard of living
4. Land availability: there is a large expanse of land available for future development in Okeigbo which will prevent unnecessary demolition.
5. Ease of access from major road.
6. Sited away from sensitive land use which may form source of environmental pollution.

4.1.2. SITE DESCRIPTION

The proposed site for the project is located towards the large expanse of land at the entrance of the town. It is towards the right along the Ondo-ife road if coming from Ondo. It is about 17km from the centre of Ondo town.

Figure 20: Showing Okeigbo, Ile-oluji and Ondo town and site location map.

Source: Google map (2015)

Figure 21: Showing Site in relation to Okeigbo town centre.

Source: Google map, (2015)

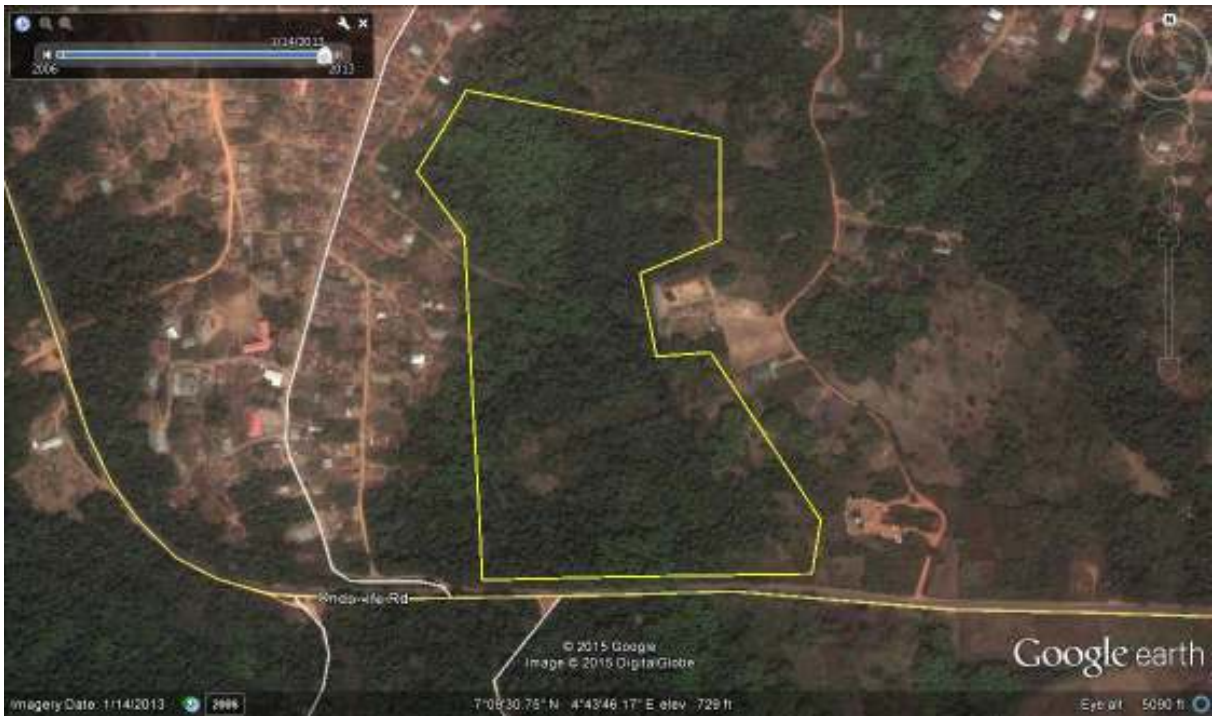

Figure 22: Showing site location.

Source: Goodgle map (2015)

4.1.3. BRIEF HISTORY OF OKEIGBO TOWN

The possibility of stating categorically the year Okeigbo was founded is still remote. The fact of history handed over from generations to generations reveal that it will be out of place to suggest a little time after the founding of Ibadan in 1830 because the two leading Ife Chiefs Derin and Kugbayigbe and their comrades who founded it were cofounders of Ibadan in 1830. In the days of yore, all land in Yoruba Country belonged to Odudua, the ancestral father of all hence the Common saying all over "ile Odudua". There was no mark of demarcation of any kind. Descendants of Odudua, brothers, sons, grandsons, great grandsons etc. settled where they thought was most suited to the cause which prompted their migration from their original home at Ile-Ife. It was only during the British administration that an attempt had ever been made to demarcate the kingdom of the Yorubas.

Okeigbo in an identical situation as many towns in Yoruba Country was founded from Ife by two Ife warriors - Derin and Kugbayigbe and other comrades-in-arms. Those two august personalities were at the same time prince of the royal houses of the Oni of Ife, The idea which some people have about the founding of Okeigbo that it was founded from Ife and Ondo is an erroneous one and cannot stand the test of history.

It got his name after a wonderful victory of a fierce battle where Derin’s army fiercely and miraculously massacred the Ondo army who suspected him of trespassing which was untrue. His army decided to found a town in memory of their conquest and they chose the present Okeigbo site where they first passed their fateful night. They named the new settlement Okeigbo that is "a hill in the bush". It was on that day that Derin earned the appellation of Ologbenla, that is, "the man with devastating cuts".S

The grouping of Okeigbo with Ondo Province at the beginning of the present century for administrative convenience was the beginning of a rape on its Independence. The British Government did it for their convenience. They would not want their District Officer (D O.) to travel the long distance from Ife to Okeigbo thirty miles away when one was stationed at Ondo, ten miles away. The Okeigbos are essentially Ife in customs and traditions and these are quite noticeable.

In March 1931, Okeigbo was divided into two. People in Okeigbo who had their cocoa farms on the Ife side of the River Oni were taxed but when Oba Aderemi ascended the throne of Ife, he felt the taxes were two high and decided to send back 50% of what the people paid. He sent the money to the District Officer's office in Ondo. The payment was grossly mismanaged and when the people complained, their leaders were jailed and in reaction, the people decided to move to the other side of the river Oni. This they did but not all of them went to settle there. The settlement was named Ifetedo and it is just a stone's throw from Okeigbo. It is now the headquarters of the Ife South Local Government Council. This development was a great drawback on Okeigbo and it had to struggle to make ends meet. Christianity was introduced into Okeigbo in 1878 and by 1880 the first Primary School was established. The first Grammar School was established in 1957.

4.1.4. SITE ANALYSIS AND INVENTORY

Site visitation, analysis and data collection are steps considered both in the site selection and planning of the proposed Rehabilitation centre, Okeigbo. The analysis of the site entails the location and geographical background of the area, vegetation, soil, topography, climate, and the prevailing winds of the site.

1. Vegetation and Soil

Okeigbo in Ondo State is situated entirely within the tropics and enjoys the tropical climate with two distinct seasons. The site contains dispersed trees and is densely vegetated. Natural soil found in the area is the loamy soil type. It has good capacity to withstand high-rise pressures and cultivations.

2. Drainage and Topography

The site has a relatively flat terrain but, slopes gently to the southern end to direct water run-off. It is necessary to have adequate foundation trenches depth, with good concrete mixture on the substructure. However, it will be necessary to retain some green areas, tree and shrubs which will be helpful in the landscaping of the environment.

3. Existing Services

The existing infrastructure in the area includes provision for power, water, sewage and access. The site is connected to a road linking Okeigbo and Ondo, accessible from every part of the State. The Ondo-ife road also links Ondo and Osun state. The area is well- connected to PHCN electricity distribution cables and transformers.

4.1.5. GEOGRAPHICAL / CLIMATIC DATA

Climate conditions typically refer to various aspects and patterns of weather in a given area, and the potential consequences and effects that such weather can create. In a nut-shell, it refers to the state of the atmosphere with regard to temperature, cloudiness, rainfall, wind, and other meteorological conditions. The area in which such conditions may be considered can be relatively small, though accurate understanding of climate in any area typically considers worldwide conditions as well.

Table 8: Tabular view for temperature and precipitation.

Source: Yr.no (2011)

	Temperature			Precipitation
Months	**Normal**	**Warmest**	**Coldest**	**Normal**
January	26.0°C	33.7°C	19.0°C	0
February	28.1°C	35.8°C	21.6°C	1
March	28.3°C	35.9°C	23.2°C	3
April	28.1°C	34.2°C	23.1°C	7
May	27.0°C	32.6°C	22.5°C	10
June	25.5°C	30.9°C	21.6°C	13
July	24.5°C	29.2°C	21.3°C	12
August	24.5°C	28.8°C	21.2°C	10
September	24.6°C	29.8°C	21.1°C	16
October	25.6°C	31.3°C	21.3°C	10
November	26.2°C	33.6°C	20.2°C	1
December	25.7°C	33.6°C	18.7°C	0

The climatic condition of Okeigbo follows the pattern of south-western Nigeria where the climate is influenced mainly by the rain-bearing southwest monsoon winds from the ocean and the dry northwest winds from the Sahara Desert. High temperatures and high humidity also characterize the climate. There are two distinct seasons, the rainy and dry seasons. The rainy season lasts for about seven months [April to October]. The rainfall is about 1524mm per year. The atmospheric temperature ranges between 28^{o}C and 31^{o}C and a mean annual relative humidity of about 80 percent.

1. Temperature and Humidity

The cloud cover influences temperature in the area, particularly the maximum temperature and the diurnal temperature range, which is as a result of the dry and wet seasons. Temperature is the degree of heat as an inherent quality of objects expressed as hotness or coldness relative to something else. Humidity is the ratio of the amount of water vapour in the air at a given temperature to the maximum amount air can hold at the same temperature, expressed as a percentage. Ondo State experiences two distinct weather conditions annually; rainy season (April-October) and the dry season (November-March) and the mean monthly temperature is about 280c with a mean monthly range of 30c while the mean relative humidity is over 75%.

2. Wind

Wind is simply defined as air in motion. The term is usually applied to the natural horizontal motion of the atmosphere; motion in a vertical, or nearly vertical, direction is called a current. Winds are produced by differences in atmospheric pressure, which are primarily attributable to differences in temperature. Variation in the distribution of pressure and temperature are caused largely by unequal distribution of heat from the sun, together with differences in the thermal properties of land and ocean surfaces. The south-westerly winds and the North east trade winds blow in the rainy and dry seasons respectively in Ondo State.

3. Rainfall

Rain can be defined as precipitation of liquid drops of water. Raindrops generally have a diameter greater than 0.5mm (0.02 in). They range in size up to about 3mm (about 0.13 in) in diameter, and their rate of fall increases, up to 7.6m (25ft) per sec with their size. Larger drops tend to be flattened and broken into smaller drops by rapid fall through the air. The precipitation of smaller drops, called drizzle, often severely restricts visibility but usually does not produce significant accumulations of water. The rainy season in Ondo State begins in April and ends in October. The mean annual total rainfall in the Ondo State is about 1800mm.

4. Sunshine

The earth crust receives solar radiation from the sun, the amount of which goes a long way in the determining the climatic conditions and vegetation cover. The amount of this solar radiation received by the earth surface is a function, mostly, of the cloud situation and duration of the day, from the sunrise to sunset. The sunshine level on the site is high, one of the characteristics of the tropics. At midday the sun is directly overhead and is usually at its highest intensity. The use of shades and shading devices is recommended.

4.2. PROJECT ANALYSIS AND DESIGN SYNTHESIS

The aim of the project is to design a Rehabilitation centre resolving the space-function relationship within the structures enclosing sixteen different vocational activities and provides basic education for capable students. It also provides residency for people living with disability, some gathered from the street while others are kept there by parents.

The design also seeks to provide a standard medical facility for the students due to the distance between the site and nearest quality medical facility. Being on a major road, the medical facility will also serve as a trauma centre for victims of accident.

The project has the potential to generate substantial economic benefits in terms of Job creation and revenue. It will also give privilege to young ones living with disability and the old to be self-made and have a means to livelihood. Its multi-use nature allows the centre to be used for almost any type of activity which involves gathering of people living with disability for Education, Recreation, and Business etc.

4.2.1. DESIGN CONSIDERATION

In other to achieve a functional and complete design, several design/architectural factors must be considered with respect to their effect on the design and construction. The factors includes;

1. Site selection
2. Structure- Economical structural spans and spacing modules
3. Ventilation/Air temperature
4. Smoke management- Mechanical system operation
5. Lighting - daylight, bright lit walls with energy efficient technology
6. Acoustic- Sound absorptive materials

7. High performance features (green Architecture)
8. School population and enrolment schedule
9. Circulation and ease of movement
10. Safety and security
11. Technical aids (lighting, sound, ventilation)
12. Psychosocial effect on users
13. Sustainability
14. Aesthetics consideration

4.2.2. BRIEF ANALYSIS

There are different types of Rehabilitation centres. This design will focus on rehabilitation centres for People with Disabilities (PwD) or as the case may be. This implies that this rehabilitation centre is for people who are physically challenged. Ondo is a growing state especially in the area of health facilities. Despite this fact, the area of physical rehabilitation is suffering a major setback. Several victims of accidents and uprisings are on their own without necessary aid and treatment. Thus, there is a need to design and construct a rehabilitation centre that will be functional and adequate enough to serve the state and diaspora. People living with disability deserve to live normal lives and should not become handicapped by their way of thinking and the society treatment. This rehabilitation centre thus seeks to educate them, empower them to become independent and increase their self-confidence and self-esteem.

4.2.3. BRIEF DEVELOPMENT

The proposed Rehabilitation centre will be a model of structures for the people of Ondo and for Nigeria at large. The design shall make fully functional facilities for Vocational Workshop, Basic education, Medical facility, Exhibition, Ancillary Spaces, Library, and Boarding House Facility. It shall provide sufficient activity spaces adequate zoning of functions. The scope of work shall include a design proposal for a Rehabilitation centre with a primary focus on space-function resolution analysing the architectural implication of designing vocational specific spaces for fourteen (14) different vocations within the centre.

1. Computer Technology and repair
2. Bead Stringing and Hat Making
3. Fashion Design and Dress Making

4. Screen/Transfer Printing technology
5. Textile Design/Tie and Dye
6. Shoe Making
7. Hair Dressing/Barbing and Cosmetology
8. Production of Stove thread and Insecticides]
9. Phone technology and repair
10. Animal husbandry
11. Music Training
12. Home economics
13. Arts and Crafts
14. ICT/Graphics/Web design

4.2.4. SPACE ALLOCATION AND SCHEDULE OF ACCOMMODATION

Usually, space allocation in the design of the Rehabilitation centre is done by considering minimum area or number of spaces per person required for a particular activity which provides optimum comfort. Below is the schedule of accommodation for the proposed Rehabilitation centre.

Table 9: Schedule of Accommodation

Source Researcher

ADMINISTRATIVE BLOCK		**HOSTEL**		**CLASS ROOM**	
SPACE	**SIZE (m^2)**	**SPACE**	**SIZE (m^2)**	**SPACE**	**SIZE (m^2)**
Entrance	43.20	Dormitory (38)	32.28	Entrance	9.70
Foyer	273.89	Bath (160)	2.42	Class Room (6)	57.95
Library	312.17	Toilets (160)	1.63	Teachers Office (12)	72.00
H.O.D Office (27)	189.00	Porter's Room (20)	10.70	Store (12)	1.76
Counsellors Office	189.00	Porter's Kitchen (20)	2.42	Conveniences (16)	2.34
Chief Counsellors Office	237.04	Porter's Bath (20)	2.59	Staff Room	56.25
Cyber Cafe	548.04	Potter's Office	15.99	Library	57.95

Cafeteria	772.26	First Aid Room	22.42	Science Laboratory	57.95
Ramp and Stairs (2)	784.46	Common Room	39.22	Special Class (3)	57.95
Chief Counsellor Office	189.00	Entrance	30.39	Computer Lab	57.95
Accommodation Office	189.00			Secretary	13.18
Games and Sports Office	189.00			Head Teacher	28.41
General Certificate and records	255.15			Assistant Head Teacher	28.41
Store	126				
SIWES and SPED Affairs Office	189.00				
Maintenance unit	189.00				
Account Department	472.50				
Exams and Records	652.23				
Conveniences (6)	148.5				
Staff Room (4)	795.65				
Board Room	485.15				
General Store	111.26				
Control Room	231.58				
CCTV Room	472.50				
Chief Counsellors Office (Medical)	237.04				
Conference Room	131.11				
Directors Office	60.10				
Secretary	188.29				

4.2.5. FUNCTIONAL RELATIONSHIP

There are various charts and diagrams used to show functional relationships among activities and spaces. The functional relationship chart shows the degree of relationships among the various spaces in the facility. It helps the designer to see at a glance which spaces are or not related to one another. This helps the designer to locate related spaces within easy proximity of each other and isolate those which are not related. It also aids zoning of spaces and functionality of the design. The flow chart is a diagram that shows the relationship between spaces using boxes to designate spaces, while the bubble diagram uses circles of varying size, depending on the size of the space represented.

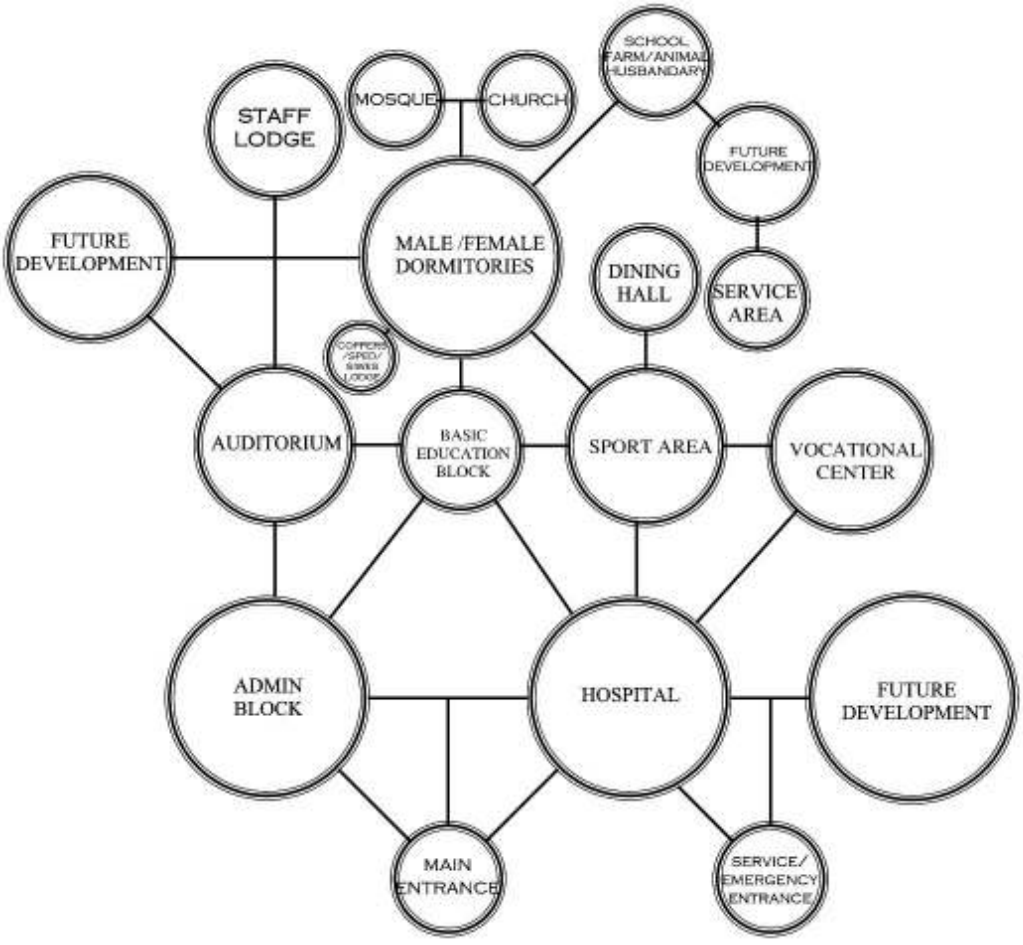

Figure 23: Site Bubble diagram.

Source: Researcher

4.2.6. CONCEPTUAL DEVELOPMENT (SITE AND BUILDING CONCEPT)

4.2.6.1.SITE CONCEPT

The site concept deals with the designer's idea behind the initial and overall planning of site activities in relation to the site's existing physical situation. The site for the proposed Rehabilitation Centre has been planned and designed to take advantage of the nature of the surrounding environment as it relates to the winds, the sun, topography and existing services. The arrangement of the site has on overall effect on the success of the facility to achieve the expected goal.

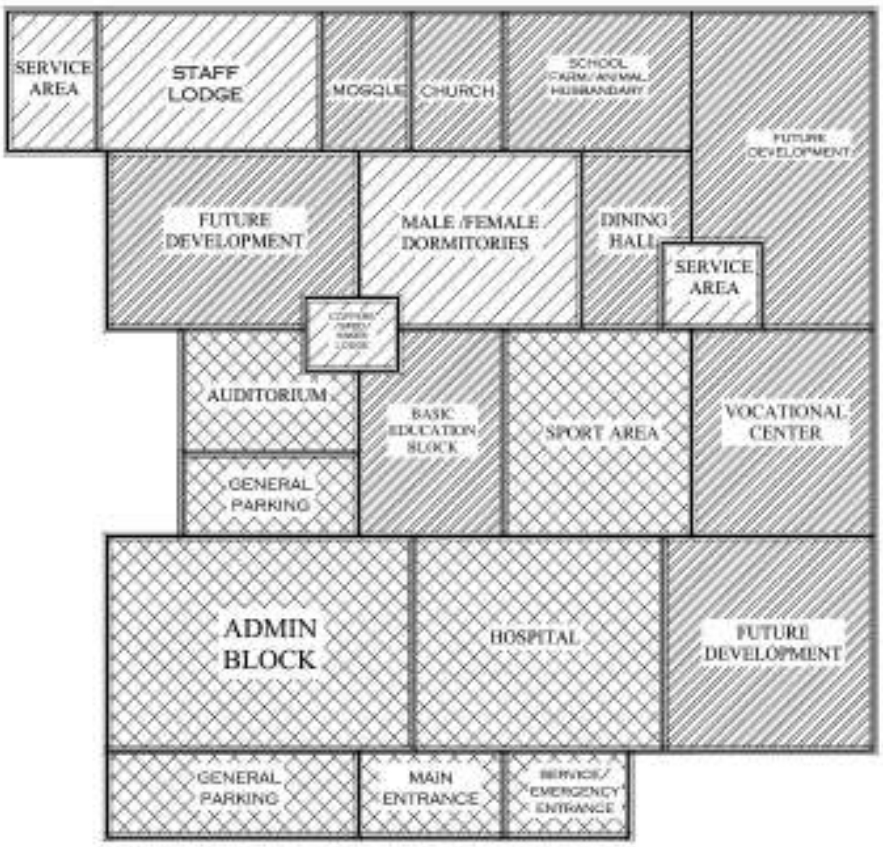

Figure 24: Site zoning diagram.

Source: Researcher

4.2.6.2. SITE CONCEPT

A pragmatic approach was taken towards the generation of the building form and arrangement of spaces. Technical requirements such as area of space per person, circulation space requirements for different activities, size of the workshops and classroom based on the nature of the works being

done, among others were considered. The design concept of the proposed Rehabilitation centre is, thus, a Form-Follow-Function with students training arranged as a Cluster Plan. The building is fragmented into volumes which can represent an independent pedagogical units. The Independent volumes are then linked by creating main atrium to serve as the gathering point of the School. Since accident is very dominant among students, the hospital facility is also zoned with the students' area and linked with the workshop and sport centre.

Another vital concept on the plan is the way roads are prevented from cross the major circulation area of the students which would have made them susceptible to road accidents in any way due to their disability. Thus, their major circulation area which includes the classrooms, the workshops, play area, dormitory, dining hall, buttery among others are zoned together and not crossed with the road in any way.

CHAPTER FIVE

5.0. PROJECT APPRAISAL

5.1. SITE SELECTION AREA/ STUDY AREA

The proposed “Rehabilitation Centre” is designed to function as the name implies. It is expected to rehabilitate its student’s spirit, soul and body. “Spirit” because it will change their meaning and concept of life; “Soul” because they will be educated and taught how to handle life challenges and become independent as they are prepared for the outside world; and “Body” because they will benefit from diagnosis, healthy environment, gymnastics, and other therapies. It is considered as a "Learning and Revitalization Community". When designing a rehabilitation centre, especially a Vocational School, it is not only to empower people with disabilities, but it eventually has positively effect on the community

The design of the Rehabilitation centre incorporates the ideas of a community school. The facility can be seen as a meeting ground for the students and the community, fostering relationships where students and the community can learn from one another, while also creating a social environment that facilitates learning, independence, self-confidence, and self-esteem.

5.2.CONSTRUCTION TECHNIQUES AND MATERIALS

5.2.1. SUB-STRUCTURE

The nature, texture and composition of the soil on the site has a high load bearing capacity. This will guarantee good structural stability but the choice of the type and depth of foundation is to be to the structural engineer’s detail. A predefined modular grid (module 3) was used for each of the buildings on the site, running from centre to centre. These aside the capacity of the soil, enhance stability and longevity of the buildings.

5.2.2. SUPER-STRUCTURE

The buildings proposed are cast in-situ reinforced concrete from foundation to load-bearing walls via a structural framework of columns and beams. This allows for external bounding walls and internal permanent walls to be non-load bearing walls. Curtain walling are used in some interior

spaces of the building based on the function of such spaces, mainly ancillary spaces to give a free glance to interior activities of such spaces.

5.2.2.1. FLOORS

Pre-stressed floor slab is used in this construction with an overall depth of 150mm. the benefit of this choice floor system is not just because of its strength, but also for the heavy load it can bear. 25mm expansion joint has been introduced at 30m interval.

5.2.2.2. WALLS

Solid external walls are 225mm hollow block-walls, non-load bearing walls. The surface of the External wall is finished with brick most especially for the ground floors while the remaining floors are painted. Glazed curtain wall systems are used in some part of the interior walls like Exhibition hall and open shop. Furthermore some internal solid walls (for workshops) are treated with acoustic wall panel to help absorb sound. No internal wall is a load bearing wall, as all loads are transmitted through reinforced concrete columns.

5.2.2.3. ROOF

The roof is a space frame structure, supported by steel and reinforced concrete columns, with 25mm thick aluminium insulated roof panel covering. The dominant roof design is a single slope shed type and butterfly roof for the vehicle maintenance building. This is to channel the water from the roof toward a common drainage around the site.

5.3. SERVICES, CIRCULATION, VENTILATION AND LIGHTING

5.3.1. SERVICES

5.3.1.1.DRAINAGE

Surface run-off water is channelled into gutters around on the site and into the main drainage system. After due consideration, four types of drainage systems were put to use:

1. Surface drainage system,
2. Enclosed underground drainage system,
3. Enclosed underground system with on-site storage, and

4. The combination system with enclosed drainage for the paved and surface drainage for unpaved areas.

The combined system was considered since it takes care of paved and unpaved areas.

5.3.1.2.PLUMBING AND ELECTRICAL INSTALLATION

Mechanical and electrical installations within the building are done through conduit pipes passed through special ducts provided beneath the finishes and through the walls. This is to ensure that services are concealed in the walls to give the walls a neater finish.

5.3.1.3.FIRE PROTECTION

Proper installation of cables and adequate power rating by the use of excessive current circuit breakers will help in minimizing the risk of fire outbreak especially through electrical fault. However, in the probable case of fire outbreak, the following shall help in quick quenching of the outbreak;

1. Installation of smoke/fire detecting alarms in all units,
2. Adoption of the sprinkler system in every unit,
3. Fire extinguishers are to be placed at strategic locations, and
4. Employment of the fire brigade services in the event of an outbreak

5.3.1.4.ACOUSTICS

The walls, especially in the workshop, have been given due acoustical considerations in terms of finishes. This is to trap sound and reduce infiltration of external sound. The use of acoustically-treated ceiling materials were also considered. Moreover, trees with large foliage are planted in front of the workshop to reduce the intensity of sound produced from the machines.

5.3.2. CIRCULATION

Effective movement of people around the building has been well managed through creation of adequate lobbies, corridors around the blocks, services corridors, stairs and external walk ways.

5.3.2.1.EXTERNAL WORKS

The walkways will be finished with interlocking paving stones to enhance the aesthetics of the surroundings. The vehicular access will be finished with asphalt for durability. Trees and shrubs will be planted at regular intervals in the car parks to serve as shades for the cars. All other spaces are landscaped with carpet-grass and randomly with trees and shrubs to absorb noise from surroundings and to reduce glare. A buffer zone of trees and shrubs are provided along the main and minor roads to reduce noise generated by moving vehicles on such roads.

5.3.3. VENTILATION

Natural and artificial ventilation systems were used in the buildings. Large air spaces and adequate openings and sit-out are some design strategies put in place to achieve proper ventilation within the building. All the buildings and their spaces will gain access to effective Natural Ventilation.

5.3.4. LIGHTING

The effect of natural lighting was greatly considered within the building. Long strip of windows are used extensively on the all the buildings most especially the Administrative/Ancillary building, curtain wall system is used in some interior spaces to complement the external windows. Roof lights is also used to light up the main atria of the administrative building. Artificial lightning has been well designed into the building wherever it may be found necessary. Solar panels will be used to generate light to save cost and ensure productive lighting. In order to reduce glare and contrast, bench tops and furniture generally will be of high reflectance i.e. light colours, likewise for the walls and ceiling.

5.4. SUMMARY OF FINDING

The design of Rehabilitation centres offers the opportunity for unique solutions, which systematize complex programs within one site. Unlike ordinary schools or vocational schools, it must organize multiple specialized spaces in a way that allows the building to be coherent, as it unifies many diverse factors under one design. The following points of note have been found to be most important;

5.4.1. SPACE

The unique and diverse program that coincides with vocational education gives the opportunity for extremely rich spatial conditions. Rather than focusing only on how program affects specific spatial environments, it is always beneficial for designers to also consider how spatial conditions can influence program. Spaces can take on many different forms, giving off many different feelings to its users. This has been considered in the design of the Rehabilitation centre, ensuring that spatial experience is satisfactory.

5.4.2. FLEXIBILITY

The design of a Rehabilitation centre must be sustainable enough to accommodate both current and evolving users. Flexibility is generally delivered by having column free space, service pits or trenches, operable walls, air conditioning, high floor loadings and rigging capability. Other items include; catwalks, operable ceilings, operable floors and operable seating.

5.4.3. SECURITY

The security of students' must be priority. The students must be protected from external bodies which may reflect in the design of spaces; they must also be protected from vehicles and extensive contact with the road; but more than that they must be protected from themselves. Accidents can be very common and rampant among people with disability as they live one with another. This can be achieved by close monitoring by adequate staffs and the use of Close Circuit Television (CCTV)

5.4.4. PSYCHOSOCIAL IMPACT

It is also important to use the design of space to build independence and self-confidence in people with disability. Many of them are coming from places where they are treated less than a human being and constrained to feel inferior. It is important to help them to see impossible as possible and expose them to quality life within their time in the facility. This can be achieved architecturally; this in its self is a form of behavioural architecture.

CHAPTER SIX

6.0. RECOMMENDATION AND CONCLUSION

6.1. RECOMMENDATIONS

This thesis focuses on a Rehabilitation Centre located in Okeigbo, Ondo State. It examines design decisions on how to resolve space and function in the centre. However, this project is to provide a future model or template of a sustainable, efficient, and sufficient educational facility to benefit Ondo State and its community. The proposed project identifies key Architectural issues and concerns, to be justified in the implementation of the project. In view of these, the following recommendations can be considered;

1. Provisions for periodical maintenance of facilities and elements in the Centre. All three of the Rehabilitation Centres visited were deficient in maintenance and have buildings that are completely dilapidated.
2. Possible future expansion should be integrated with the existing facilities.
3. Use of up-to-date technology in building materials and elements.
4. Good shading should be provided to prevent glare
5. Employment of directory maps and signage to ease movement to and through the Centre.
6. Design to facilitate close monitoring of staffs
7. Design to help students learn self-confidence and become independent
8. Design of rehabilitation centres to adhere to standards of accessibility for the disabled. (United Nation standard is recommended)
9. In general architectural and urban design, the accessibility need of the disabled should be considered.
10. The behavioural aspect of architectural design should be considered to aid the quality of users' thinking and self-esteem.

6.2.CONCLUSION

People living with disability deserve an equally good life like every other citizen of the country. They have already been denied a normal life by nature, they do not deserve to be denied a good life despite their disability. This is the whole purpose of this design: it seeks to through design of

spaces and environment influence people with disabilities as positively as possible and make them useful themselves and to the society at large.

Though there are different types of rehabilitation centres, this one in particular is supposed to serve three broad purposes: academic, vocational, psychosocial, and health. Though the aspect of health is not so emphasized, nevertheless, it has an important role to play in the centre. Ondo people are well known for knowledge and creativity, in the absence of an established resource based economy, they can get by in a knowledge-driven economy, hence, the need for Rehabilitation centre to enhance their chances of a gainful employment, pursue further tertiary education, lead to self-employment, contribute meaningfully in their own villages and community through useful life skills.

However, the intent of this thesis is to examine standards in a rehabilitation centres, considering what is affordable in the local case studies and how they can be improved upon in subsequent designs.

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