EXPLORATION OF UNIVERSAL DESIGN PRINCIPLES IN THE DESIGN OF COMMUNITY CENTRE AT SHUARIN FOR JIGAWA STATE

BY

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DECLARATION

I hereby declare that all the work carried out in this project was done by me under the supervision of Dr. A. Ango and Dr. M. L. Sagada and to the best of my knowledge, has not been carried out anywhere for the award of masters degree. All sources of information have been duly acknowledged by means of references and the responsibility of any mistake is entirely mine.

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CERTIFICATION

The thesis titled "**EXPLORATION OF UNIVERSAL DESIGN PRINCIPLE IN THE DESIGN OF A COMMUNITY CENTRE AT SHUARIN FOR JIGAWA STATE"** by Ado Rabiu meets the requirements governing the award of Masters of Architecture Degree in the Department of Architecture, Ahmadu Bello University, Zaria.

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DEDICATION

To Allah, to the world and to Architecture.

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First and foremost, I would like to acknowledge specially, my supervisors for their noble support, assistance and guidance in the course of this thesis. May the Almighty Allah bless you all richly and increase you beyond your imagination. Also, to my highly esteemed lecturers in the Department of Architecture, for the knowledge and understanding they have imparted to me as well as the moral support and encouragement. May the Almighty Allah continue to bless you all richly and grant all your heart desires, amin.

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ABSTRACT

This research outlines the perception of a community centre regarding the impact of implementing universal design principles. To examine how the concept of the universal design principle can add value to the planning and design of a community centre such that it is accessible and can be used by all. The thesis develops a responsive community centre that applies universal design strategies in order to tackle the problem of segregation, isolation or tolerance among users. Literature review and case studies were carried out to evaluate the extent at which universal design principles are implemented in the design of existing community centres and to identify conditions for optimizing participant usability. The results of these studies, published in various resources, were analyzed discretely using different techniques, and were reported using different basis for comparison. The results from the case studies showed that with the right techniques, a community centre can be designed to be accessible and require less physical effort by users. The study concludes with the proposition that proper implementation of universal design principles will generate more income and the flexibility in the design will also enhance fluidity.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF STUDY

A community centre is an organized meeting place for members of a community regardless of age or sex. It provides spaces for all or most communal activities including education, recreation, culture and welfare irrespective of age, sex, religion, ethnic or any other difference.

Universal design principle were first introduced in the field of Architecture to address the economic, functional and aesthetic challenges associated with designing physical spaces for all people, including individuals with physical cognitive disabilities, (Story, Mueller, & Mace, 1998).

The influence of these design principle is evident throughout our communities: curb cuts and entrance ramps, elevators with voice announcements and automatic doors at store entrances.

At first these design applications may seem solely intended for people with disabilities. But developers of the universal design framework recognized that usability would increase as special needs features began to serve all. People who use wheelchairs benefit from curb cuts and ramps, but so do bicycle riders, parents pushing strollers, and travelers pulling wheeled luggage. Elevators that announce floor numbers assist individuals with impaired sight along with shorter people who may not be able to see the light indicators when the elevator is crowded with riders. Doors that open automatically aid those not strong enough to open them as well as individuals whose arms hold packages or young children.

Universal design is also a design philosophy that aims to create an inclusive, sustainable society, where every person can participate to the greatest extent possible (Preiser and

Ostroff, 2001; Council of Europe, 2007). The design and composition of the environment can be accessed, understood and used to the greatest extent possible by all people regardless of age, size, ability or disability.

In practical terms, there is no one method to achieve universal design. rather, universal design offers a frame work within which a range of different user centred, human - centred ,user led and participatory design approaches are used with design tools to empower the designer towards design solutions in line with Universal Design Principles. It has been described to comprise the following three key elements (Christophersen, 2002).

i. User - Designer interaction:

Any design tool or technique, applied by designers, which aims to more close align the requirements of the end user and the resulting end products.

ii. Understanding people:

Information which promotes further understanding of the target market (i.e. the entire population), such as information on demographics, statistical data, descriptive information of the range of human abilities and the consequences of impairment in any of these abilities, an understanding of how human's interact with their surrounding environment, and so on.

iii. Evidence - based findings:

Any retrospective information on experiences (positive and negative) of existing products or environments, such as the results of post - occupancy evaluations, can be fed back into the design process to better inform future designs.

The Universal Design Principles recognizes the changes that everyone experience during his or her lifetime, taking all people: young, old, tall, short, and persons with various disabilities into consideration. It assumes that disability or variation in human ability is not special but normal and design should be able to accommodate each user without segregation or stigmatisation. The concept of creating appropriate spaces originated in the field of architecture as a response to concerns about the inefficiency of individualized retrofitted solutions in buildings, and the inappropriateness of placing the burden of adaptation on individuals (Bremer et al., 2002). It should be borne in mind that the design approach is about making provision for variations that occur in the human physical abilities throughout man's life.

1.2 STATEMENT OF THE PROBLEM

In many countries especially in the developed countries, public centre is known for its commitment to incorporating universal design into public institution but in Nigeria such public spaces lacks incorporation of universal design. In Nigeria, there are quite number of people living with various disabilities and can also be participant in such public spaces, therefore our public spaces should incorporate a design principles that will cater for all.

Public spaces such as community centre where several functions take place lack accessibility, flexibility and adaptability there by making it difficult for the people with different disabilities to participate or interact in such gatherings. In such centres the means by which people use the spaces and the facilities should be the same (Winter, 2006)

However the design of most community centre's in Nigeria does not take into cognizance that its users do have varying abilities. This lack of consideration for the variation in human abilities and changing physical ability in life makes the degree of pleasurable

experiences that the centre intends to give to its users limited only to a particular group of people. Therefore there is a need to explore Universal Design Principles in the design of such centre's so as to be efficiently utilised by all.

This research is intended to check the extent to which universal design principles can be applied in the design of a community centre and how exploration of the principle will influence communal usage.

1.3 RESEARCH QUESTIONS

This research intends to answer three basic questions which are:

i. What are universal design principles?

ii. What forms of universal design principle need to be explored in the research?

iii. How can the exploration of these principles influence community centre design?

1.4 AIMAND OBJECTIVES

The aim of this study is to examine how the concept of universal design principle can add value to the planning and design of a community centre such that it can be used by all irrespective of age, sex, abilities and disabilities.

The aim mentioned above will be achieved through the following objectives;

i. To identify and promote appropriate space for all users with regard to universal design of built and external environment .

ii. To provide a flexible designed spaces to be accessed and used by all.

iii. To make community centres a pleasurable experience rather than a boring one and to improve people’s mentality through universal design principles.

1.5 JUSTIFICATION

The importance of community centres where cultural, educational, recreational and social facilities are made available to people cannot be over emphasized. The need to create spaces that will cater for all and sundry will enhance the activities of the centre. The centre besides civic activities needs to be established in every urban landscape to:

i. inspire a distinctive architectural approach for communal facilities,
ii. create a social, commercial and recreational arena that will enhance human, interaction in an urban setting and reduce fear of social exclusion, a human rights issue (Young, 1990),
iii. direct employment creation and source of revenue to the city authority,
iv. re-enforce city image.
v. Stimulate and participate in the civic and individual activities by all citizens.

This study will contribute to the knowledge in the field of architectural history, of socio economic, cultural and religious wellbeing of an important existing palace of Jigawa state. It will also provide a literature of the community for research purposes.

1.6 MOTIVATION

In Nigeria today most of the public buildings design does not fully incorporate the universal design principles, thereby making public spaces not accessible for some set or group of users. Since our population comprises of both physically fit and physically challenged people. Therefore, public spaces should be designed in such a way that it can be accessible and visible to all users irrespective of age, gender and disabilities. There is need for the designers and all others who help in shaping the built environment to have people of all abilities in mind. The right to use of space of the mobility impaired people as an integral part of the society must be respected.

1.7 SCOPE AND DELIMITATION

This research hinges on the provision of accessible community centre for the old, the young, the disabled (focusing more on exploration of universal design principles) and the able through the use of planning and building materials. The planning and building materials are meant to create human interaction, inclusion and integration as against segregation.

From a well defined concept and analysis of the various functional and space needs; a detailed architectural design shall be made through a design process.

The proposed Community centre in Jigawa state will cover the following services:

i. Administrative offices for the whole complex.
ii. Socio-cultural complex (museum, exhibition area).
iii. Educational complex (library, lecture rooms and possibly workshop for vocational training).
iv. Recreational/welfare complex (multi-purpose hall, clinic and shops).

Lack of sufficient information of the selected case studies because there are few community centers with adequate facilities as listed in the scope.

1.8 ARCHITECTURAL SIGNIFICANCE

Generally the needs of people are changing as a result of different ability, leading to different consumption patterns with different implications for environmental designers and planner. As our life expectancy increases, needs to be met by the built environment change. We are more likely to experience disability as a result of aging and other cause, and live with it for many years to come. Our built environment, however, may not be so easily or inexpensively modified to suit our changing needs in the future. Moreover, the future of architecture shall greatly benefit from this emerging trend that makes architectural products usable and accessible by wide range of people.

1.9 RESEARCH METHODOLOGY

A project is likely not to be successful as an exercise if a good research approach is not adopted. The aim of this research methodology is not only to unveil the unknown but also to state and clarify the known. The research for this project will be based on descriptive research method.

The research methodology is grouped into three:

i. **Literature review**

Review of existing literature: government policy documents (considerations for choice of site and location of building), publications on community center design and universal design, architectural magazines, architectural data books (useful for obtaining design guides, functional flows, space requirements), journal articles unpublished thesis projects in the research area (to review contributions of research).

ii. Case study

Basically, qualitative research method will be used in the case study. Which include the following methods;

Visit of the building and careful observation of its features

Structured interview: Interview of administrative technical staff on several aspects of community center to get detailed and precise information on the functionality of the center.

iii. Analytical and comparative study

Comparative analysis of community center using independent variables and dependent variables extracted from civic design and universal design.

CHAPTER TWO

2.1 UNIVERSAL DESIGN PRINCIPLE GUIDE LINES

An important factor in the design of properly accessible environments is a sound understanding of the principles and guidelines involved. The principles are not without their critics. Some consider them vague and difficult to understand, (Bowe, 2007). Others

argue that they are more applicable to product and graphic design than building design. And yet, as evidenced by their growing international acknowledgement, these principles continue to maintain their status as the definitive statement of what constitutes universal design. This guidebook also acknowledges the seven Principles of Universal Design by explaining and illustrating their applicability to the universal design of the built environment, (Imre and Hall, 2001). The following guidelines will be used to achieve a Universal Design for all.

2.1.1 Guideline One: Simple and Intuitive Use

The building should make it easy for everyone to understand the purpose of each design feature and how to use it (e.g., providing washroom lavatory faucets that make their method of operation readily apparent and relatively easy). Moreover, its means of use should be intuitively obvious so that it operates as anticipated and, therefore, can be used spontaneous, (Tauke, 2006).



Plate I: Non-traditional elevator call button.
Source: http://www.nea.gov/resources/Accessibility/artsnUdesign_top.html

Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level. The guidelines are:

i. Eliminate unnecessary complexity

ii. Be consistent with user's expectations and intuition

iii. Accommodate a wide range of literacy and language skills

iv. Arrange information consistently with its importance

v. Provide effective prompting and feedback during and after task completion. (Preiser and Ostroff, 2001).

2.1.2 Guideline Two: Equitable Use

The building's design should make it equally usable by everyone. Ideally, the means by which people use the building should be the same (e.g., providing one means of entry to the building that works well for everyone). Winter, (2006) says if it cannot be identical, the several means provided must be equivalent in terms of their privacy, security, safety and convenience. The building must never employ means that isolate or stigmatize any group of users or privilege one group over another.

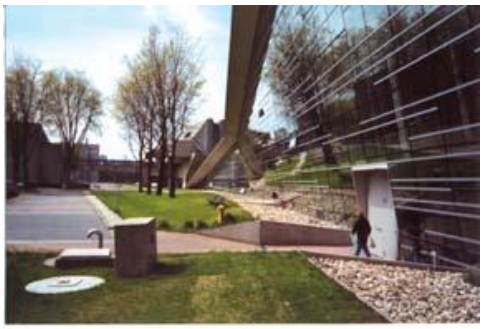


Plate II: Accessible entrance should not be exiled to a remote delivery area.
Source: http://www.nea.gov/resources/Accessibility/artsnUdesign_top.html

The design does not disadvantage or stigmatize any group of users. The guidelines laid out are as follows:

i. Avoid segregating of stigmatizing any users.

ii. Provisions for privacy, security, and safety should be equally available to all users.

iii. Make the design appealing to all users. (Presiser & Ostroff, 2001).

2.1.3 Guideline Three: Perceptible Information

The building should provide all essential information in a variety of modes (e.g., written, symbolic, tactile, verbal) to ensure effective communication with all users regardless of their sensory abilities, (Christoferson,2002). The information provided must be presented with sufficient contrast to surrounding conditions so that it is distinguishable from its context and decipherable in all its various modes of presentation.



Plate III: This high-contrast directional signage uses both text and pictograms to communicate to a wide group of users.
Source: http://www.nea.gov/resources/Accessibility/artsnUdesign_top.html

The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities. This can be majorly translated to way finding. The guidelines are:

i. Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
ii. Provision adequate contrast between essential information and its surroundings.
iii. Maximize "legibility" of essential information.
iv. Different elements in ways that can be described (i.e., make it easy to give instructions or directions).
v. Provide compatibility with a variety of techniques or devices used by people with sensory limitations. (Preiser & Ostroff, 2001).

2.1.4 Guideline Four: Tolerance for Error

Ideally, the building's design should eliminate, isolate or shield any design features that could prove hazardous to or inconvenience any user. When potentially dangerous conditions are unavoidable, users should receive warnings as they approach the design feature (e.g., providing proximity warnings in a variety of sensory modes near the top of stairs.) The building's design should also anticipate accidental or unintended actions by any user to minimize the inconvenience and/or protect the user from harm,(Individuals with Disabilities Education Improvement, 2004).



Plate IV: The boardwalk has raised edges to prevent users from accidentally leaving the path of travel.
Source: http://www.nea.gov/resources/Accessibility/artsnUdesign_top.html

The design minimizes hazards and the adverse consequences of accidental or unintended fatigue. The guidelines laid out for this are:

i. Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded
ii. Provide warnings of hazards and errors
iii. Provide fail-safe features
iv. Discourage unconscious action in tasks that require vigilance. (Preiser & OStroff, , 2001).

2.1.5 Guideline Five: Flexibility in Use

The building's design should allow people to use its design features in more than one prescribed way (e.g., providing a countertop orientation map that is viewable from either a seated or standing position). It should accommodate both right and left-handed use and be adaptable to the individual user's pace, (Louis, 2005). The building's design should have the built-in flexibility to be usable even when it is employed in an unconventional.



Plate V: A toilet seat that is height-adjustable can be used by people of all sizes and ages.
Source: http://www.nea.gov/resources/Accessibility/artsnUdesign_top.html

The design accommodates a wide range of individual preferences and abilities. The guidelines for this are:

i. Provided choice in methods of use
ii. Accommodate right-or left-handed access and use
iii. Facilitate the user's accuracy and precision
iv. Provide adaptability to the user's pace (Preiser and Ostroff, 2001)

2.1.6 Guideline Six: Low Physical Effort

The building's design should employ design features that require little or no physical force to use them (e.g., replacing a traditional door knob with a lever handle that doesn't require the ability to grasp and turn the wrist). Winter, (2006) says if a low level of force

is required, any user should be able to engage the feature without assuming an awkward or hazardous body position (e.g., providing a smooth travel surface with minimal slope along the path of travel leading to the entrance).



Plate VI: This lavatory has up and down controls that allow each user to adjust its height.
Source: http://www.nea.gov/resources/Accessibility/artsnUdesign_top.html

The design can be used efficiently and comfortably and with a minimum of fatigue. Guidelines for this are:

i. Allow user to maintain a neutral body position

ii. Use reasonable operating forces

iii. Minimize repetitive actions

iv. Minimize sustained physical effort. (Preiser and Ostroff,2001).

2.1.7 Guideline Seven: Size and Space for Approach and Use

A building's design features should provide an adequate amount of space that is appropriately arranged to enable anyone to use them (e.g., providing knee space under a washroom lavatory to enable use by someone in a seated position). In addition, the space needs to be arranged to provide a clear path of travel to and from important design features for all users, (Maisel, 2004).



Plate VII: The height of the concession stand counter permits convenient use by customers of varying heights.
Source: http://www.nea.gov/resources/Accessibility/artsnUdesign_top.html

Appropriate size and space is provided for approach, reach, manipulation, and use, regardless of the user's body size, posture, or mobility. Henry Dreyfuss Association (1993) provides a number of templates for ergonomic analysis of hand and body for design of furniture and environmental settings. The guidelines are as follows:

i. Provide a clear line of sight to important elements for any seated or standing user.
ii. Make reach to all components comfortable for any seated or standing user
iii. Accommodate variations in hand and grip size
iv. Provide adequate space for the use of assistive devices or personal assistance. (Preiser & Ostroff, 2001).

2.2 WAYFINDING IN UNIVERSAL DESIGN

Inclusive access is an integral part of inclusive design and includes more than addressing physical barriers. It is critical to look beyond physical barriers in the built environment to uncover the hidden barriers to universal access. One hidden barrier to universal access is inadequate and inappropriate wayfinding information. Wayfinding (the process individuals use to navigate in unfamiliar surroundings) is necessary to living one's life

and something that most people do every day. Wayfinding information is instrumental in finding a desired destination.

2.2.1 Cognitive Mapping and Wayfinding

Wayfinding and cognitive mapping are inseparable and most humans carry many cognitive maps in their head at any one time. The cognitive map is person's internal spatial representation of points, lines, areas, and surfaces that are learned, experienced, and recorded in quantitative and qualitative forms serving to spatially orient the wayfinder (Golledge, 1999). Without the process of cognitive mapping and the subsequent development of cognitive maps, individuals would need to re-learn wayfinding information about a particular space each time they visited it.

Furthermore, cognitive maps assist the wayfinder in determining paths in new, never visited spaces because individuals can apply previously learned information from a particular environment to a new but similar environment.

2.3 HUMAN FACTORS, ERGONOMICS AND SOCIAL EQUITY

Inclusion and integration of everyone in family, work and community life are major goals of universal design. However, the primary social equity instrument among the universal design principles is found in *Principle 1: Equitable Use, The design is useful and marketable to people with diverse abilities*. In fact, without Principle 1 being represented in combination with other principles, (and Guideline 1d. specifically: *Make the design appealing to all users*) a universal result is difficult to accomplish. The emphasis on design integration and mainstreaming of features found in Principle 1 should serve as a primary mechanism to leverage universal design into common usage and common acceptance.

Thus Universal design is heavily based on ergonomic design with the overlay of social goals, yet, neither the definition nor the principles of Universal Design explicitly reference the human factors literature and they do not make the social goals explicit.

2.3.1 Universal Design as a Practical Policy

The intent of universal design is to simplify life for everyone by making products, communications, and the built environment more usable by as many people as possible at little or no extra cost. Universal design benefits people of all ages and abilities, (Mace, 1988).

2.3.2 The Application of Universal Design

Universal design is now being applied to numerous disciplines and domains. It is not clear that such broad applications were actively considered when universal design was first conceived. At its inception, domains included products, graphics, public buildings, housing, and outdoor spaces. However, at the time of universal design's inception in the 1980's, a number of still-developing areas were untested or unknown. The Internet was not envisioned. Widespread personal computer use was new and untested. Now, it is regarded as being applicable at all scales of the built environment, information technology, and to systems and processes. Today, universal design is considered so broadly that few areas seem beyond its reach.

2.3.3 Challenges

An unfortunate response to the challenge of more accessible environments is to gravitate toward one of two extremes. One path is to mistakenly attempt to make everything "fully usable by everyone" by abandoning creative, interesting and challenging designs. The

other path that is sometimes followed is an unfortunate refusal to meaningfully engage the issue by assuming that nothing can be done and that implementing an accessibility or universal design scheme will ruin the integrity of an existing building or proposed design. For example, a challenge is posed in large or complex environments, where it is sometimes not possible for each element to be universal in all respects. The inclination to make all outdoor play spaces fully accessible to children and adults with serious mobility problems is probably misplaced. It is important to be creative about making as much as accessible as possible, keeping in mind all users - parents, grandparents, other family members - within the constraints of a particular project. Where physical access is not always possible, alternate means should be employed to provide comparable meaningful experiences. So a playground or recreation area might be quite universal while not having every place or every experience fully usable by all.

2.3.4 Beneficiaries of Universal Design

The world's altered demographics have strengthened the relevance of accessible and universal design. The aging of many societies and the increased numbers of people with disabilities creates an undeniably larger number of people who are obvious, immediate and significant beneficiaries of a more supportive environment. Often cited as the reason for considering a universal design approach in recent years, the changing demographics instead offer the occasion for focusing on improved usability, safety and inclusion.

As outlined earlier, the success of the accessibility movement in the US has created certain unintended challenges for universal design. The clear societal imperative to end discrimination against people with disabilities leaves a concept that is not particularly useful for the design process. A more useful way to consider the users of design is to understand the reality that we all exists along a continuum of human performance and

other characteristics, we all vary widely in height, strength, visual ability, hearing aculty, mobility, balance etc, this can vary over time.

2.3.5 Boundaries of Universal Design

Universal design is gradually permeating the collective awareness and finding its way into design practice. However, the dominance of accessibility have created a number of specific means to balance accessibility and non discrimination goals against other Governmental and private interests.

It is generally agreed that universal design may not always be 100% achievable in a single product, feature, or element. This realization should not be used to opt out of grappling with the many challenges of achieving a universal outcome. Challenges are not hard to find, for example: establishing universal characteristics while still ensuring maximum affordability, achieving context sensitive solutions, providing greater usability in wilderness recreation areas and finding appropriate solutions in historic structures or places. A key process oriented step in this regard is to assure that designers and others are creatively engaged to think through challenges.

2.3.6 Relationship to Assistive Technology

Universal Design as defined is nothing more than assistive technology for the masses. It is true that many ideas for Universal Design emerge from assistive technology. In fact, it has historically been a source of innovative ideas for products. The telephone, email and voice recognition products all had their origins in assistive technology. But Universal Design requires more than just functional benefit. It extend the concept of inclusion to

consumer "appeal" and benefit to people beyond those who have disabilities. A Universal Design would not be successful if other users found its appearance to be stigmatizing or it was awkward to use. As an example, consider the built up handles commonly used by occupational therapist to adapt silverware and utensils for people who have gripping limitations.

2.3.7 Language

Another focus has been the language and form of the definition and principles. The definition itself seems so general that it is criticized as being too obvious. Moreover, if taken literally, it seems utopian and unrealistic. Everyone knows, for example that there will always be someone who will not be able to use a product or environment but the definition does not explicitly convey the message of evolutionary design. The emphasis should be on a verb form "Universal Designing" rather than a noun to communicate this idea. With regard to the principles, at least two of them to do not translate well into other languages and some of the title are not clear. For example, "Tolerance for Error" seems to imply that errors can actually be tolerated whereas the intent of this principle is to reduce errors in the use of a product and environment . " Equitable in Use" translates literally in at least one language (Japanese) to "Equal Opportunity" which is a legal term related to civil rights, although it is a related concept.

2.3.8 Clarity of Goals

The Principles and Guidelines also lack clarity in the goals they embody. Equitable in Use, focuses on a social justice goal. Flexibility in Use seems to promote a design strategy; and the rest focus on performance goals. There has been criticism that the concept of social participation as an outcome of intervention, as incorporated in the

international classification of function (WHO, 2000), the authoritative definition of disablement is not explicit in the definition and the principles. Thus an important goal of universal design practice seems slighted.

2.3.9 Generality

In attempt to develop guidelines that could be used by the widest range of practitioners, the authors deliberately cast them in a general form. But the principles are perceived by many to be too general. And, they are perceived to be more useful for product design than other domains of design like Architecture, graphic design and urban planning.

2.4 COMMUNITY

In the social context, a community is a body of people communicating, living together and sharing some interest common amongst them. They socialise, harmonise to have a united community for the development of all with no limit to the participating individual for example ethnic, religious, academic, metropolitan, agricultural communities and so forth. As such communal spaces that range from such other things as tree shades and sitting places are strategically located in the centre or otherwise of a town.

2.4.1 COMMUNITY CENTRE

A community centre is an organised meeting place for members of a community regardless of age or sex. It provide spaces for all or most communal activities. In

education, recreation, culture and welfare irrespective of age, sex, religion, ethnic, or any other difference.

In Hausa land, the idea of communal spaces, (Dandali) comes from the concept of courtyard in dwellings, where it function socially as a dynamic spaces which people gather to socialise in an open, but yet private living setting while environmentally the courtyard effectively modified climatic conditions.

Boys and girls gather at night at the communal space to play, sing and dance to pass the time. As the space becomes a focus of attention, it eventually developed into a centre of social, business and educational activities of the locality depending on the population and facilities available.

Areas with centralised facilities or service tend to inspired greater communal and emotional attachment to themselves that may even lead to greater local pride or symbolic identity. A report published by the British Ministry of Education in 1945 said community centres exist so that neighbourss can come together on an equal footing to enjoy social, recreational and educational activities either as members of groups following particular hobbies and pursuits or on the basis of their common needs and interest as human begins living in the same locality.

Community centres came about from the desire of middle class communities to do something for themselves. In developing countries, community centre's are primarily to make the most essential service and education available to members of the community, health clinics and training in the basic skills needed for physical, economic growth and survival.

2.4.2 CITY CENTRE

This was the principal civic and community gathering space, the surrounding rural areas regarded it as the seat of administrative, social and economic activities.

The Emir's palace were usually centrally located within the city centre mosque and central market close-by. In the city, the palace was the focus of infrastructure such as road network, the culture and lifestyle of the people and also of the handicraft.

2.4.3 TYPES OF COMMUNITY CENTRE

Community centre's are basically divided into groups to which they could be approached in terms of design:

2.4.3.1 Village Centre

The nucleus of the community is the multi-purpose hall round which all other activities are carried out. Expansion takes place by simply adding a building to the centralised hall.

2.4.3.2 Neighborhood Centre

There are two approaches; Central courtyard to serve as the focal point of all activities and a situation where all activities are under one roof. An example is the Droten Agora, Holland which is under a glass that is heated and ventilated mechanically during winter and summer respectively.

2.4.4 AN IDEAL COMMUNITY CENTRE

This should be a place for stimulating architectural form, in the sense that the structural outlook is appealing to the minds of the community. There should be as many institutions

as possible such that it acts as easy transition from passive to many kind of active involvement so that it becomes a place where everyone of the community can go to when they feels like and is in the mood to meet other people. Fittings and equipment should be kept to a maximum and flexible such that no sharp boundaries between the various activities if at all they do exist.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. INTRODUCTION

The theoretical assumptions underlying this research come from the qualitative tradition, which deals in interpretation of contemporary situations, the research strategy adopted was to conduct multiple case studies in different regions. The main data collection techniques use in this research study will be case studies, participant observation, group discussion, and documentation analysis.

This chapter aims to provide an overview of the methodological approaches and research selected for creating appropriate spaces to cater for the mobility impaired in the design of community centre for Jigawa state.

3.2 RESEARCH DESIGN

The primary research method used in this study is case study, in order to assess and evaluate the current status of the community centres and how planning and design of the community facilities are being re-thought to support the needs of the modern day user.

This qualitative research method is used to assess the selected cases based on the Evaluative Case Studies model. Evaluative case studies are used in testing the effectiveness of policies or programs in order to suggest modifications or alternatives (Veal, 2006).

3.3 SELECTION OF RESEARCH METHOD

In its evaluation of the phenomenon of the metamorphosis in community facilities and design strategies, the chapter shall investigate cases of selected local community centre's which reflect these changes and techniques through space requirement for the modern day user, and seek to answer the question of why they are designed differently and whether or not they serve as models for accommodating the changes in the community.

Secondly, and in light of the comparatively poor performance of the community centres in Nigeria, the study shall investigate the implementation of services, functionalities, planning, and designing of two indigenous community centres or buildings.

This method of research will provide information and inspiration on the best design practices in community centre design and planning while learning from the successes and failures of each case.

3.4 CASE STUDIES

The case studies carried out on this research were based on purposive sampling of selected Community facilities that can serve as a major component unit of a Community centre. The case studies were used applied and assessed through the variables and elements of cultural identity of the community.

The method of study was carried out using case studies and Interviews.

3.4.1 Case study Analysis:

Case study analysis was achieved through the use of table that analyze the variable elements and the characteristic features in designing a community centre to create appropriate spaces for the mobility impaired. The aim was to analyze each community and civic building type and ascertain level of patronage by the mobility impaired that will provide data in the proposed design.

3.4.2 Case Study Assessment.

An assessment table on design guidelines to create appropriate spaces was used to conduct a comparative analysis of all the studied community centre in order to find out the extent of how these guidelines or variables have been applied to their designs and construction.

3.5 SAMPLE AND SAMPLING TECHNIQUE

The random sampling technique was used during the research so as to have an accurate and straight-forward result.

3.6 DATA COLLECTION

The main data collection techniques used in this research was case studies (local and international), visual survey, oral interview and literature review on community centre's and space design requirement for the mobility impaired.

3.6.1 Instruments for data collection

The instruments used for collection of data for the research were: Photographs, Tables, Internet, Sketches and Notes.

3.6.2 Procedure for data collection

The information of this research proposal was obtained from the following procedure for data collection.

i. **visual survey:** This was done by looking and identifying what has been achieved by existing community centres or buildings where universal design approach has been used.

ii. **Literature review**: this involved consultation of textbooks, journals, magazines, newsletters, government policy documents, seminar and paper that were written on community centres and appropriate space requirement for the physically challenged.

iii. **Case studies:** this involved the visitation to notable community centrres within Nigeria for personal observation of facilities, services rendered, problems, functional flow of activities within the facility at large.

iv. **Oral interview**: Interview of users under case study to acquire information on several aspects of the building: its history, construction, administration and other relevant information. These interviews are required to get detailed and precise information on the functionality of the building.

v. **Internet**: this involved browsing the related website of the research topic under study.

3.6.3 DATA ANALYSIS AND PRESENTATION

Data collected for the research were analyzed and represented in different forms which include:

i. **Photographs**: Pictures of the existing community centres were taken and documented showing the facilities and spaces have been used were used considering all and sundry.

ii. **Tables:** Data collected on this research were documented and presented on the case study assessment tables.

iii. **Figures:** Data collected on the case studies and literature reviews were also documented in form of drawings.

iv. **Descriptive Analysis:** This is use to show how elements, features and some design guidelines have been applied to achieved a suitable civic environment . This can be viewed under the case study summary and conclusion sheets.

3.7 VARIABLES OF STUDY

Scientists tend to call the properties they study variables Osuala, (1987). The variables of study in this research will be found under the following:

VARIABLES	**LEVEL OF REFLECTION**				**REMARK**
	Absent	**Low**	**Moderate**	**High**	
Simple and intuitive use					
Equitable use					

Perceptible information					
Tolerance for error					
Flexibility in use					

VARIABLES	**LEVEL OF REFLECTION**				**REMARK**
	Absent	**Low**	**Moderate**	**High**	
Low physical effort					
Size and space for approach and use					

Table 3.1: Case study assessment variables.

Source: Author, 2014

CHAPTER FOUR

4.0 FINDINGS AND DISCUSSIONS

The findings from the case studies carried out have been discussed under the following sub-headings: Background, site planning and landscaping, structure and materials, assessment of the exploration of universal design principles in the Architectural design of the of a community centre.

CASE STUDY

The case studies were selected based on the site location and the geo political zone that has some similarities and slight differences in the climatic condition.

4.1 Case Study One:

Shehu Musa Yar'Adua International Centre, Abuja.

4.1.1 Background

Shehu Musa Yar'Adua International centre was established in March, 2002. It was located in the central area of Abuja . The objective for its establishment is to provide or create a conducive atmosphere for events such as exhibitions and holding conferences. It was also meant to celebrate the life story and achievements of Shehu Musa Yar'Adua. At inception, the centre has a floor area of approximately 10,000 sqm.



Plate VIII: Approach view to Shehu Musa Yar'Adua Centre
Source: Author, 2014

4.1.2 Site Planning and Landscaping

The Shehu Musa Yar'Adua centre is located within the heart of Abuja. The site consist of both vehicular and pedestrian access with large open spaces. The land is relatively flat, there is no existing building on the site. The layout is simple with the main entrance to the centre from the parking lots.



Plate IX: Green outdoor of the Shehu Musa Yar'Adua Centre
Source: Author, 2014

The outdoor spaces of the centre is well landscaped with plants and the surface is treated with concrete paving. The central atrium provide adequate lighting required in the interior of the building under which is a fountain to welcome and cool the interior space. The atrium is well supported with columns at specific intervals.



Plate X: Central Atrium of the Shehu Musa Yar'Adua Centre
Source: Author, 2014

4.1.3 Structure and Materials

The main building materials used were sandcrete blocks, reinforced concrete, glass and aluminum.



Plate XI: The reception of the Shehu Musa Yar'Adua Centre
Source: Author, 2014

4.1.4 Assessment of the exploration of universal design

VARIABLES OF STUDY		WEIGHT FACTOR	REMARKS
Simple and Intuitive use	The Design features is simple and easy to understand, but not intuitively obvious.	3	Good
Equitable Use	Some parts of the design incorporate features (use of ramps) that makes the facilities used by all.	3	Good
Perceptible Information	The design partially incorporates communication of necessary information via different modes (Pictorial, verbal or tactile) effectively to users.	2	Fair
Tolerance for Error	The design minimizes hazards and adverse consequences of accidental or unintended fatigue.	3	Good

Flexibility in Use	The design partially accommodates users accuracy and precision, it also partially provide adaptability to the users pace.	2	Fair
Low physical effort	No provision of features with no physical force to use them	-	Poor
Size and space for approach and use	No provision for adequate space for the use of assistive devices or personal assistance.	-	Poor

Table 4.1: Case Study 1 Assessment Table
Source: Author, 2014
Weight Factor: Excellent = 5, Very Good = 4, Good = 3, Fair = 2, and Poor = 1.

4.1.5 CONCLUSION

It was observed that the design of the Shehu Musa Yar'Adua centre obey almost all the universal design principles but there is need for improvement in the facilities so that it can be used by all regardless of the gender, age and inabilities.

4.2 Case Study Two:

Sani Abacha Ultra Modern Youth Centre, Kano .

4.2.1 Background

Sani Abacha ultra modern youth centre was established in 1999. It was located at Panshekara , Madobi Raod Kano . The objective for its establishment is to provide and create a conducive environment for the youth to participate in activities such as skill acquisition, sports and entrepreneurship.

At inception, the centre acquired approximately 1,000 hectares of land.



Plate XII: Entrance Gate to the Sani Abacha Youth Centre
Source: Author, 2014

4.2.2 Site Planning and Landscaping

The Sani Abacha youth centre is located at the out skirt of Kano, the site consist of both vehicular and pedestrian access though, not well distinguished with large open spaces. The land is relatively flat, the existing buildings on the site are Workshop, open Cinema, hostels, sport arenas etc . The layout is simple with the main entrance to the centre can easily be located from the entrance gate.



Plate XIII: Approach view of the Administrative block of the Sani Abacha Youth Centre
Source: Author, 2014

The outdoor spaces of the centre is poorly landscaped and the surface is not treated with concrete paving, the pedestrian and the vehicular accesses are not well distinguished. Virtually all the buildings have a central court yard and there was no use of ramps.



Plate XIV: The Hostel of the Sani Abacha Youth Centre
Source: Author, 2014

4.2.3 Structure and Materials

The main building materials used were sandcrete blocks, reinforced concrete, glass and aluminum.



Plate XV: The open cinema of the Sani Abacha Youth Centre
Source: Author, 2014

The structure is basically made of massive reinforced concrete and it is located within the centre core of activities in the premises.



Plate XVI: The rear view of the open cinema of the Sani Abacha Youth Centre
Source: Author, 2014

4.2.4 Assessment of the exploration of universal design

VARIABLES OF STUDY		WEIGHT FACTOR	REMARKS
Simple and Intuitive use	The Design features is simple and easy to understand, but not intuitively.	3	Good
Equitable Use	No use of ramp in all the facilities	-	Poor
Perceptible Information	The design partially incorporates communication of necessary information via different modes (Pictorial, verbal or tactile) effectively to users.	2	Fair
Tolerance for Error	The design does not incorporate measures to minimize hazards and adverse consequences of accidental or unintended fatigue.	-	Poor
Flexibility Use	The design is rigid not flexible.	-	Poor

Low physical effort	No provision of features with no physical force to use them	-	Poor
Size and space for approach and use	No provision for adequate space for the use of assistive devices or personal assistance.	-	Poor

Table 4.2: Case Study 2 Assessment Table
Source: Author, 2014

Weight Factor: Excellent = 5, Very Good = 4, Good = 3, Fair = 2, and Poor = 1.

4.2.5 CONCLUSION

It was observed that the design of the Sani Abacha youth centre disobeys virtually all the universal design principles and for such all users to participate in activities taking place in such centre, the design has to incorporate Universal design principles.

4.3 Case Study Three:

International Conference Centre, Abuja .

4.3.1 Background

The International conference centre, Abuja was established in 1999. It was located at Herbert Macaulay way, Abuja . The objective for its establishment is to provide and create a conducive environment of international standard to host some renowned national and international events At inception, the centre acquired approximately 1,000 hectares of land.



Plate XVII: Approach of the International conference centre, Abuja
Source: Author, 2014

4.3.2 Site Planning and Landscaping

The international conference centre is located at within the central district Abuja, the site consist of both vehicular and pedestrian access well landscaped with large open spaces. The land is relatively flat, it is the only building on the site. The layout is simple with the main entrance to the centre can easily be located from the drop off.



Plate XVIII: Approach of the International conference centre, Abuja

Source: Author, 2014

The outdoor spaces of the centre is well landscaped and the surface is treated with concrete paving, the pedestrian and the vehicular accesses are well defined..

4.3.3 Structure and Materials

The main building materials used were sandcrete blocks, reinforced concrete, extensive use of glass and steel.



Plate XIX : Interior of the International conference centre, Abuja
Source: Author, 2014

The design is flexible and it is use for different events.



Plate XX: The Podium of the International conference centre, Abuja

Source: Author, 2014

4.3.4 Assessment of the exploration of universal design

VARIABLES OF STUDY		WEIGHT FACTOR	REMARKS
Simple and Intuitive use	The Design features is simple and easy to understand and intuitive.	5	Excellent
Equitable Use	No use of ramp in all the facilities	-	Poor
Perceptible Information	The design partially incorporates communication of necessary information via different modes (Pictorial, verbal or tactile) effectively to users.	2	Fair
Tolerance for Error	The design does not incorporate measures to minimize hazards and adverse consequences of accidental or unintended fatigue.	-	Poor
Flexibility Use	The design is flexible.	-	Poor
Low physical effort	No provision of features with no physical force to use them	-	Poor
Size and space for approach and use	No provision for adequate space for the use of assistive devices or personal assistance.	-	Poor

Table 4.3: Case Study 3 Assessment Table
Source: Author, 2014

Weight Factor: Excellent = 5, Very Good = 4, Good = 3, Fair = 2, and Poor = 1.

4.3.5 CONCLUSION

It was observed that the design of the Sani Abacha youth centre disobeys virtually all the universal design principles and for such all users to participate in activities taking place in such centre, the design has to incorporate Universal design principles.

4.4 GENERAL SUMMARY

It was observed during the fieldwork that the case studies had some element of universal design principles in their design and there is need for improvement of the facilities so that it can be suitable for all users regardless of age, gender or inabilities.

4.5 RECOMENDATION

For universal design principles to be fully implemented in such communal building, such building design should incorporate the followings:

i. The use of ramp at every change in level.

ii. The design must be simple in terms of form.

iii. The design must avoid segregating of stigmatizing any users.

iv. Maximize “legibility” of essential information.

v. Provide fail-safe features such as adjustable water closets.

vi. Use reasonable operating forces i.e. use of lever for openings.

If the above listed elements can be properly and practically implemented in such building, then such building can be accessed by all users.

CHAPTER FIVE
SITE STUDY

5.1 AREA OF STUDY

Jigawa State is one of thirty-six states that constitute Federal Republic of Nigeria. It is situated in the north-western part of the country between latitudes 11.00°N to 13.00°N and longitudes 8.00°E to 10.15°E. Kano State and Katsina State border Jigawa to the west, Bauchi State to the east and Yobe State to the northeast. To the north, Jigawa shares an international border with Zinder Region in The Republic of Niger, which is a unique opportunity for cross-border trading activities.



Fig. 5.1: Location of Jigawa State in Nigeria Map
Source: goggle.com

5.2 POPULATION OF JIGAWA STATE

According to the 2006 census, the State has a total population of 4,348,649 million inhabitants. The population growth of the state is estimated at 3.5 % with about 48 % of the population falling under the age of fifteen. Out of the estimation about 2.9 million are considered to be productive adults. Eighty per cent (80%) of the population is found in the rural areas and is made up of mostly Hausa, Fulani and Manga (a Kanuri dialect). The pattern of human settlement is nucleated, with defined population centers.

5.3 GEOGRAPHY OF JIGAWA STATE

5.3.1 Topography

The state has a total land area of approximately 22,410 square kilometres. Its topography is characterized by undulating land, with sand dunes of various sizes spanning several kilometres in parts of the State. The southern part of Jigawa comprises the Basement Complex while the northeast is made up of sedimentary rocks of the Chad Formation. The main rivers are Hadejia, Kafin Hausa and Iggi Rivers with a number of tributaries feeding extensive marshlands in north-eastern part of the State. Hadejia – Kafin Hausa River traverses the State from west to east through the Hadejia-Nguru wetlands and empties into the Lake Chad Basin.

5.3.2 Vegetation

Most parts of Jigawa lie within the Sudan Savannah with elements of Guinea Savannah in the southern part. Total forest cover in the State is very much below national average of 14.8%. Due to both natural and human factors, forest cover is being depleted, making northern part of the State highly vulnerable to desert encroachment. The State enjoys vast fertile arable land to which almost all tropical crops could adapt, thus constituting one of its highly prized natural resources. The Sudan Savannah vegetation zone is also made up of vast grazing lands suitable for livestock production.

5.3.3 Climate

The climate of Jigawa is typical of the guinea savannah. Two different types of air masses passes through Jigawa, one from the north mostly dry and dusty (continental in origin) blowing from the sahara desert called the north-east trade winds and the other from the Atlantic in the south, brings rainfall, mostly cool and desirable for human comfort.

5.3.4 Temperature

Fluctuations in daily November temperature are from 16 º C to 23 º C clear skies, visibility becomes poor and the sun's rays do not reach the surface. This lowers the minimum temperature to 14 º C in January. Nights and mornings are cool but temperature increases 14 º C to 31 º C giving a variation of 16 º C which is the highest during the year. Maximum temperature occurs in April which reaches 27.9 º C but generally does not last more than two to three months.

5.3.5 Sunshine

November sunshine hours vary from 8.9 to 9 hours per day. January sunshine hours are quite high, 8.7 to 9.5 hours. Minimum sunshine hours per day occur in August with as low as 5.1 hours per day.

Date	Sunrise	Sunset	Length	Change	Dawn	Dusk	Length	Change
22/11/2008	06.21	18.41	12.20		05:59	19:03	13:04	
+ 1 day	06.21	18.41	12.20	00:00 equal length	05:59	19:02	13:02	00:01 shorter
+ 1 week	06.21	18.37	12.16	00:04 shorter	05:59	18:58	12:59	00:05 shorter
+ 2 weeks	06.20	18.33	12.13	00:07 shorter	05:59	18:54	12:55	00:09 shorter
+ 1 month	06.19	18.22	12.03	00:17 shorter	05:58	18:43	12:45	00:19 shorter
+ 2 months	06.21	18.07	11.46	00:34 shorter	05:59	18:29	12:30	00:34 shorter
+ 3 months	06.31	18.05	11.34	00:46 shorter	06:08	18:28	12:20	00:44 shorter
+ 6 months	06.46	18.40	11.54	00:26 shorter	06:25	19:03	12:36	00:28 shorter

Table 5.1: Jigawa - sunrise and sunset.

Source: NASA Langley Research Center Atmospheric Science Data Center, 2008

5.3.6 Relative Humidity

At the start of the dry season, relative humidity falls from 68% in October to 36% in November with the stabilization of the easterly winds. It further falls to 35% in January and 20% in February. Mean relative humidity reaches its maximum value of 80% in the month of August.

Variable	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Insolation, kWh/m²/day	5.66	6.49	6.72	6.63	6.41	6.03	5.44	5.03	5.47	5.76	5.80	5.40
Clearness, 0 - 1	0.65	0.69	0.66	0.63	0.61	0.58	0.53	0.48	0.54	0.60	0.66	0.64
Temperature, °C	23.31	25.17	27.67	27.36	26.11	24.61	23.63	23.56	24.22	24.95	25.65	23.87
Wind speed, m/s	3.99	3.86	4.30	4.31	4.21	3.60	3.43	3.24	2.96	3.17	3.69	4.17
Precipitation, mm	0	1	7	56	120	160	218	275	243	71	2	0
Wet days, d	0.1	0.1	0.7	3.6	8.2	11.8	15.3	16.8	13.8	4.6	0.0	0.0

Table 5.2: Jigawa - Solar energy and surface meteorology
Source: NASA Langley Research Center Atmospheric Science Data Center; New et al. 2008

5.3.7 Rainfall

Rainfall starts in April and increases from 161.5mm in June to 281.6mm in August to its maximum throughout the year. Annual total rainfall lies within a range of 960mm to 1150mm.

5.3.8 Trade Winds

The prevailing winds in Jigawa state are the southwestern and northeastern trade wind patterns. The former originates from the Atlantic Ocean and it brings moist cool breeze and rainfall; and the latter originates from the Sahara desert and it brings dusty breeze and harmattan. The wind speed ranges from 2.96 to 4.31 meters per second, varying from month to month as shown in the table; to this effect barriers should be used and also the

building shall be oriented so as to achieve the south western wind and wind breakers shall be introduced to reduce the effect of the harmmattan wind.

5.4 SITE SELECTION CRITERIA

In selecting a site for a community center, one has to consider some factors that are very essential to the effective actualization of the project. The criteria for the site selection are:

i. Accessibility to site: The site should be easily accessible from the main access routes. Access to the site should be such that it is free of traffic jam. The main access into the site should be strategically located to enhance free flow of both vehicles and pedestrians.

ii. Proximity to targeted population: The selected site has to be located in close proximity to the targeted population.

iii. Availability of services: The basic services like water supply and drainage, electricity and the like have to be available to a site before it can qualify as a good site to locate a community centre.

iv. Size of the site: The size of the site is very important criteria for selecting a site to locate a community centre. The site has to be spacious enough to accommodate the construction of the mall and its accompanying facilities. It has to have room for future development due to increase in population.

Two sites have been selected. The first is located at Fatara district. The second site is in Fanisau, Dutse local government area of Jigawa state. The siting of this project in this areas will thus, reduce the burdens and pressure of patients moving continuously to developed nation for civic activities.

The following under listed criteria shall be used to weigh the suitability of each of the site and thus the most appropriate site shall be selected. They are:

i. Site location/Accessibility

ii. Proximity to leisure and recreation features

iii. Vicinity of a research district.

iv. Land use compliance

v. Possibility for expansion, suitability and availability

vi. Size and terrain of site,

vii. Location away from the loud noises of township life

viii. Availability of services

ix. Availability of social amenities

x. Proximity to existing settlements

CRITERIA	SITE 1 (FATARA DISTRICT)	SITE 2 (FANISAU)	REMARKS
Site location/ Accessibility	3	4	Site 2 is closer to state capital and secondary road
Proximity to leisure and recreation features	4	3	Site 1 is closer to recreation
Proximity to state capital and central business district	3	5	Site 2 is more accessible to state capital and central business district.
Land use compliance	3	5	Site 2 is more compliant
Size of site, Possibility for expansion, suitability and availability	2	5	Site 2 is more spacious

Location away from the loud noises of township life	3	5	Site 2 is more sited away from noise
Availability of services and social amenities and Proximity to existing settlements	4	3	Site 1 is nearer to amenities
Total	22	30	

Table 5.3: shows the comparisons of site selection criteria between chosen sites.

Source: Author, 2014

Weighing scale: Excellent- 5, Very good- 4, Strong-3, Weak- 2, Very Weak -1.

5.5 SITE ANALYSIS

The site has the following characteristic

5.5.1 Topography

The area is characterized by a relatively flat gently sloping to the north-western part of the site. Site drainage would take this direction in order to use the concept of natural gravity. While the water supply should come from south-eastern direction in order to also use the principle of natural gravity. Low lying strip of land with 0.5% gradient sloping towards the north-west end of the site. Earthwork to be carried out and table tops created for parking spaces.



Plate XXI: Topography of the site.

Source: Author, 2014

5.5.2 Soils

The soils underlying the Dutse city of Jigawa state are the brown and reddish soils. Their suitability for development land uses varies with depth, texture, run-off potential and drainage. Severe constraints for foundations, streets and underground utilities occur when soils are shallow, strong, locally high in swelling clays or poorly drained.



Plate XXII: Topography of the site.

Source: Author, 2014

5.5.3 Vegetation

The natural vegetation consists of the Sudan and the guinea savannah both having been replaced by secondary vegetation. Four fifth of the state is now composed of farmed parkland, dotted with patches of shrub savannah. The savannah woodland, which is the second largest zone, is typified by the Falgore Game Reserve.



Plate XXIII: vegetation distribution on the site.

Source: Author, 2014

5.5.4 Scenic quality

Trees, plants, shrubs, and small mass of red-granite are found on the site, which serve to give cooling effects. The effect of these trees and the microclimate provide a conducive and optimal working condition for employees and staff. The trees help to provide noise and sound barrier and acts as absorbent to direct solar radiation.



Plate XXIV: Scenic view of the site.

Source: Author, 2014

5.5.5 Access

The site is readily accessible from Main Primary road leading to Dutse. Major access to be provided from south west end of site and alternative access from the North West side.



Plate XXV: Topography of the site.

Source: Author, 2014

5.5.6 Utilities

There is electricity supply on and around the site. The electricity supply system is three-phase four wire grid systems. Water supply is readily available from the central city water supply system. The surrounding/adjoining properties are well serviced with water. Both telephone service line and G.S.M can be easily connected to the site.

However, a central sewage disposal system (soil and water) can be constructed to collects sewage from the site and channel to the central collection points.

5.5.7 Environmental problems.

The only problem that can be encountered on the site will be noise pollution from the road; this can be checked by planting of trees which will serve as sound barrier. Also noise control measures will be taken within the building structure.

5.5.8 Predominant site characteristics affecting the design.

The gentle slope of the site towards the North West will affect the floor levels of the departments of the community centre. The structures at the north-west part will have their floor level to the natural ground higher than those at the other part. The level of sewer will be adequately considered.

5.6 SUMMARY

The site being removed from excess noise takes care of the possible acoustic problems that could pose a major challenge to the comfort of the users. The availability of the Natural features will serves as wind breaker, sun shading device which improve the scenic quality of the centre and reduce the impact of built environment on users. The architectural design of the centre itself must provide solution to the problem. This solution will be an inherent characteristic of the building itself, and dependent on landscaping instruments.

CHAPTER SIX

DESIGN REPORT

6.1 DESIGN BRIEF

The Brief is to design a community centre where communal activities as well as entrepreneurship and vocational activities can take place and also create an Architectural icon within the community that incorporate in its design universal design principles.

The Design should have the ability to satisfy the numerous demands and needs of the users and its proposed location makes it within easy reach. The design should however, be functional, flexibility and accessible for all.

6.2 DESIGN CONCEPT

The plan concept chosen for this design is the "Dagi" from popularly known as the Arewa symbol.



Fig 6.1 Arewa Logo

Source: Google images

The Arewa symbol chose signifies peace and harmony in the northern region, since the proposed community centre will be situated in the north, the concept complements the tradition trend.

Therefore, since "Dagi" signifies peace and harmony, the concept enhance easy connectivity of the different functional spaces on the plan.

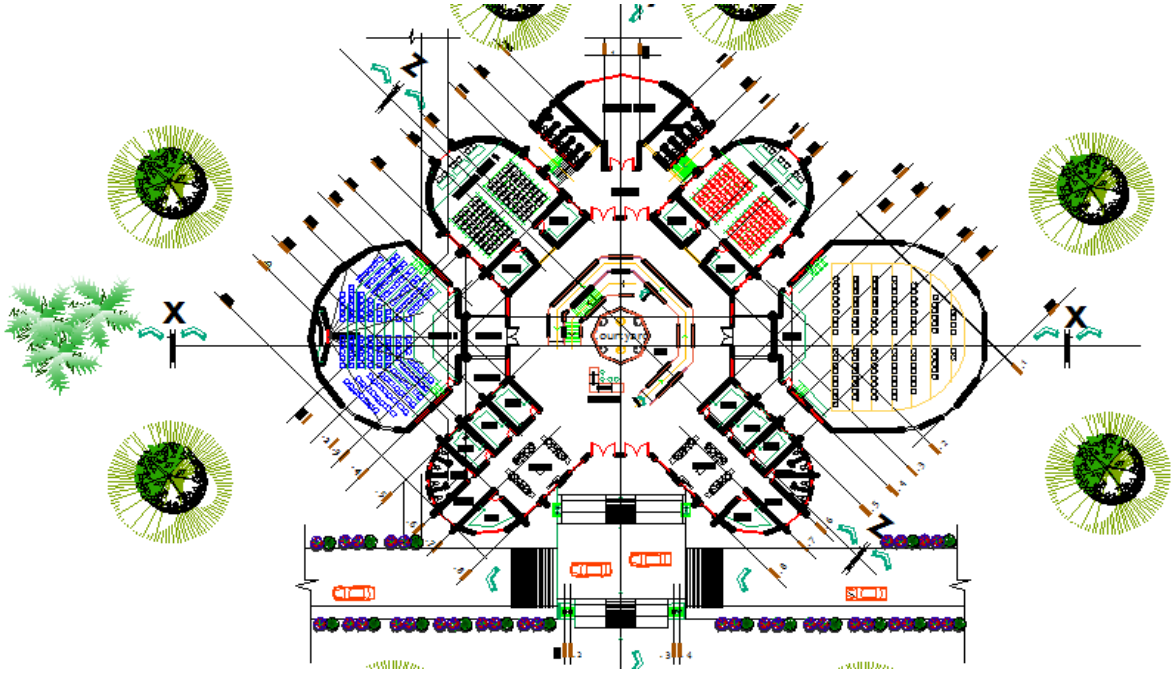


Fig 6.2: Ground floor plan of the conference centre.

Source: Author, 2014.

6.3 BUILDING MATERIALS AND TECHNOLOGY

Reinforced concrete, aluminium panel roofing and glass shall be the dominant building materials for the construction of the edifice.

6.3.1 Reinforced concrete

The fluidity of reinforced concrete makes it a good construction material for the swooping curves and columns.

6.3.2 PTFE Polytetrafluoroethylene

PTFE is a coated fiberglass with high strength and long service life. PTFE shall be used for the aquarium envelop and roofing covering for the atrium.



Fig 6.3: Conference Centre Approach Elevation.

Source: Author, 2014.

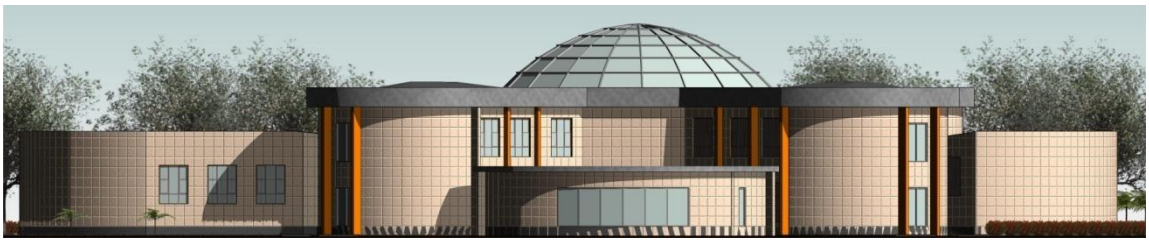


Fig 6.4: Conference Centre Rear Elevation.

Source: Author, 2014.

6.4 DESIGN REQUIREMENTS

6.4.1 General planning considerations

Planning considerations principles are general rules and guidelines, intended to be enduring and seldom amended that inform and support the way in which the design is set to perform. The fundamental principle in planning a shopping center may be defined as a rational determination of all the activities, functions, requirements to be provided for to achieve a predetermined goal.

This is not an easy task because all the complex configurations of the shopping center will be critically looked into.

Universal design principles are employed in the design of the community centre and it is made up of three facilities.

The conference centre, training, program and accommodation facilities.

6.4.2 DESIGN CONSIDERATIONS

The following site planning, building planning, and construction considerations to be considered are intended to provide a framework for the character and the development of the proposed centre. The criteria define the general mandates for a comprehensive development concept for the community centre.

The choice of site for a community centre is of great public importance and should not be made without careful consideration of all relevant issues including the following:

- Ease of public access
- Availability of public transportation and parking
- Provision of physically challenged pathway such as use of Zebra crossing, signage's, tactile among others.
- Expansion potential
- Site amenities
- Physical constraints of the site
- Site use restrictions

6.4.3 VEHICULAR/PEDESTRIAN MOVEMENT

To ensure adequate movement and traffic for both pedestrian and carrying of goods and services the shopping complex must provide efficient traffic circulation within the site. The

pedestrian circulation must be catered for to ensure their protection from car traffic and also to guide there pathway. Special considerations must be made in the design of the pedestrian ways so that it can serve all the users irrespective of the disabilities.

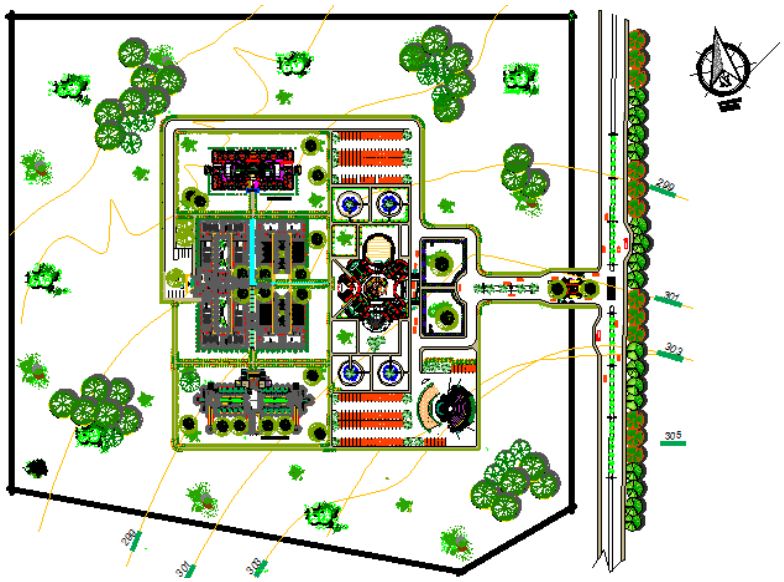


Fig 6.5: Site plan of the community centre.

Source: Author, 2014.

Traffic planning: an integral part of planning the site and the surrounding area, plays an important role in the proper functioning and success of the community centre. The service and the general entrances needs to be properly separated and planned to be able to serve its purposes effectively. There should be separate entrances into the site for delivery vehicles from the general entrance. Proper traffic planning aims at the following:

Even and an effective distribution of traffic on the site. The customer should be free to drive to any of the parking areas that surround the center so that he may come as close as possible to the store as he wishes. Secondary traffic movements within the parking area must be facilitated.

Walk ways for pedestrians provide greater safety and protection for users and must be self explanatory with the use of signage's, tactile among others. The pedestrian traffic will lead from the entrance of the site to every part of the premises.

6.4.4 VENTILATION

Ventilation in a simple term is a phenomenon that involves air movement to remove used air to replace with fresh and new air. This process (replacement of still air with fresh air) will help to maintain a steady and healthy supply of oxygen within the shopping center and aid in the diffusion of stale air. With ventilation, thermal comfort (comfortable temperature) will be achieved. Ventilation will also reduce the effect of high level of humidity prevalent in hot-humid zones. Ventilation is achieved by natural and artificial means.

Natural ventilation is produced by forces that results from air changes carried by difference in temperature stack effect, where warmer and lighter indoor air is displaced by cooler and denser outdoor air, and by air movement produced by pressure differences. These forces are rarely sufficient to create the appreciable air movement required to provide thermal comfort. The dynamic effect of wind, therefore, is the only natural force that can be relied on and every effort must be made to capture it into the court building. Some factors (which may be prevalent on the site may affect natural ventilation: topography, orientation of building on site, grouping of buildings, and distance between buildings.

Other factors like size of openings and their position, building interior plan, design of inlet and landscape may arise from design decisions. When wind pressure is very high, some measure of control can be employed. Natural elements such as landscaping (planting of trees) and the use of structural devise like fins overhang serve as wind breakers.

6.4.5 LIGHTING

Lighting of the shopping plaza is a very important consideration in the design. By this we refer to the amount of illumination and the quality of illumination the interior of a building receives at a particular time or period of the day. To achieve and maintain proper and adequate admittance of light in a building, natural and artificial means are employed.

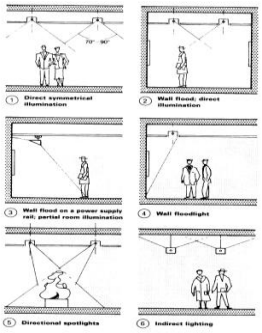


Fig. 6.6: Lighting arrangement

Source: neuferts architects data

Natural Lighting

This deals with the lighting up of an interior space without artificial aids. In other words, it involves the admission of natural light source (sunlight) into the interior of the court building. The factor that explains this natural phenomenon is called Day lighting. It is the ratio of indoor luminance to outdoor luminance and it is given as "percentage". Admittance of natural light is generally made up of three components:

- Direct light from the sky falling on the point in question (also referred to as "sky component). Light received directly from the sky is usually very bright and can cause glare when looked at directly.
- Reflected light from external surfaces (also referred to as externally "reflected component"). It is the light that results from reflection of direct light by an externally luminous surface into the interior building. Quality of reflected light depends on the nature and quality of the surface.

- Light received by reflection from the internal surfaces from the room (the internally reflected component).
- Some factors or conditions, either by nature or architects decision, may influence daylight admittance. They include:
- Location of building on the site with reference to the sun path as it rises and sets.
- Time: This refers to the time of the day the sun reaches a particular altitude or the time of the year when there is more cloud cover in the sky (cloud cover affects the quality of daylights).
- Season: There is an alteration of sunshine and rainfall during the raining season thus more cloud-cover is likely to be experienced than clear skies. The harmattan haze of the dry season diffuses the light from the sun thereby reducing the brightness of the weather.
- Position and size of in let in the building facades
- Material used for in let: this will also have an effect on the intensity of light to be admitted into a space. Materials may be of reflective substance or absorbent substance.

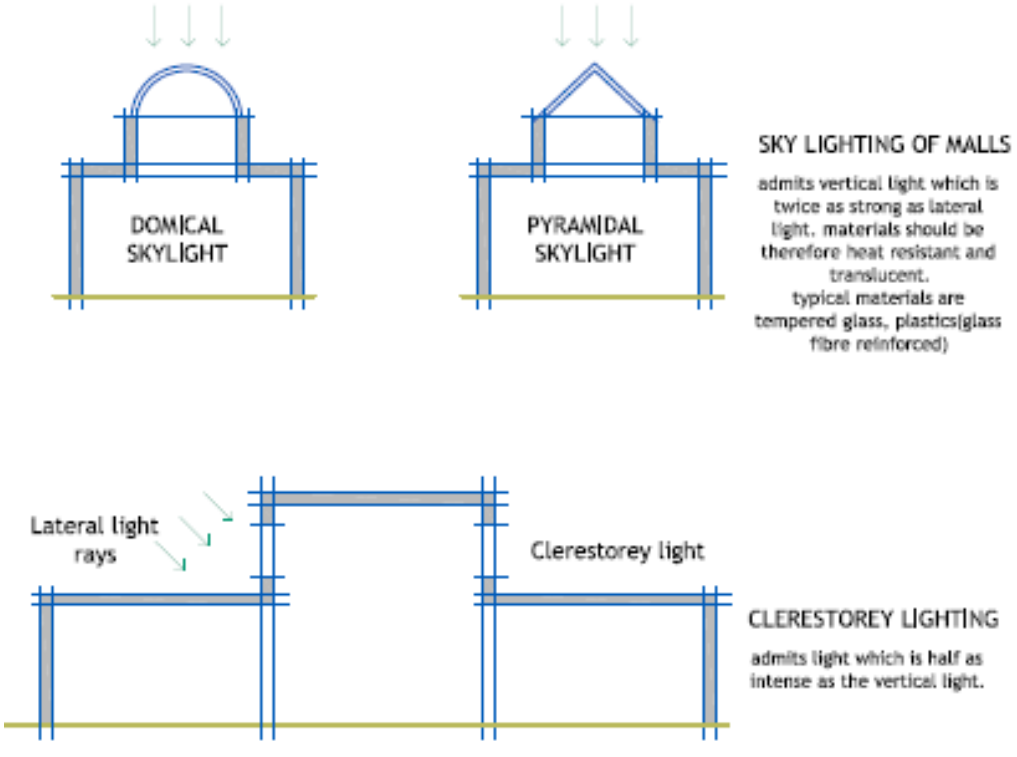


Fig 6.7: Natural lighting methods

Source: Tutt, P

- **Artificial Lighting**
- This is the use of incandescent flood lights, bulbs, fluorescent lights in lighting the building: Interiors and exteriors. Apart from providing adequate lighting in the building, the light fittings and fixtures can be used as decorative features of the building. This improves the aesthetic value of the building if properly applied.

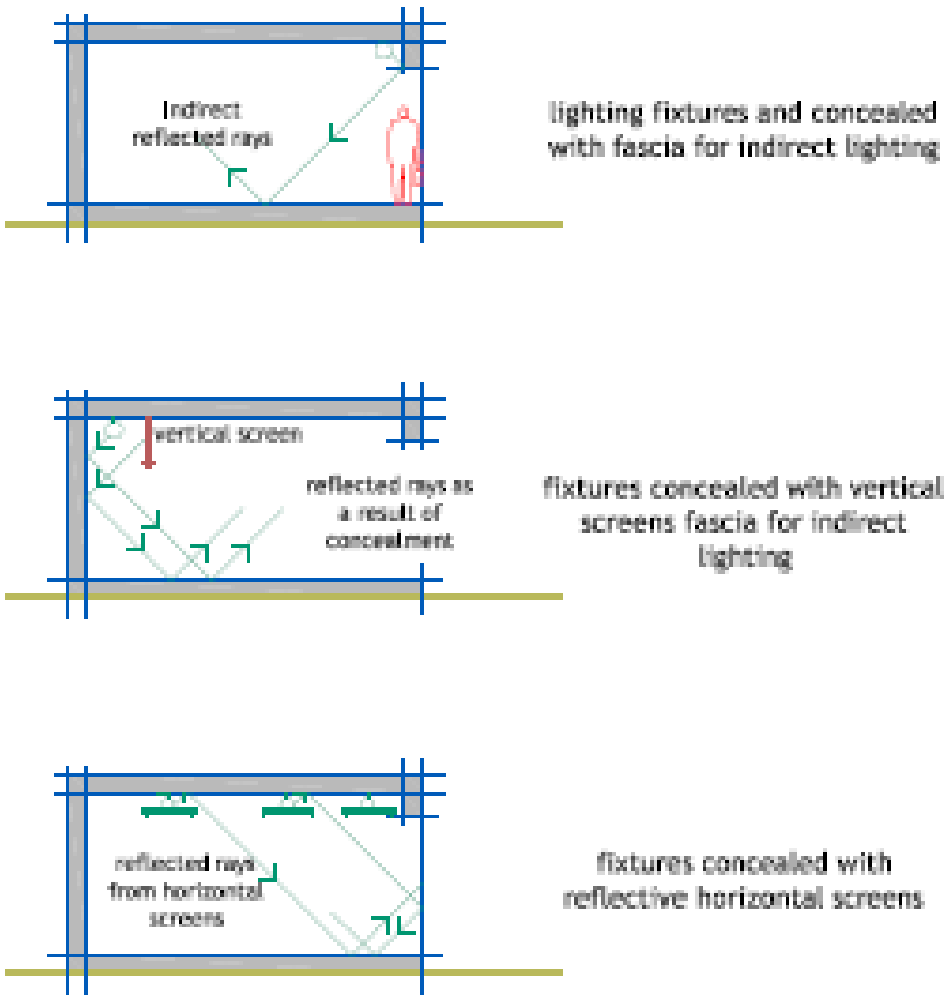


Fig. 6.8: Artificial lighting

Source: Ernst and Neufert architectural data

For the exterior envelope, artificial lighting includes security lighting of the building, lighting of the parking lots and the lighting of the dock yard and service areas. These are necessary at night. They are positioned at regular intervals and spacing with a reasonable height from the ground.

For the interior environment, the public area and the sales area should be well lit. The intensity of the lighting should be uniform throughout the centre.

Artificial lighting can be used to create various effects. Special incandescent fixtures combine with interesting color to provide desired effects.

6.4.6 FIRE SAFETY

It is a thing of importance to consider fire precautions in a building. The major causes of fire out-breaks are usually the result of negligence ranging from direct acts such as petrol or kerosene leakage and indirectly from poor installation and maintenance of electric wiring.

This involves the safety of both human and material content of the building, the retention of the structural stability of the structure.

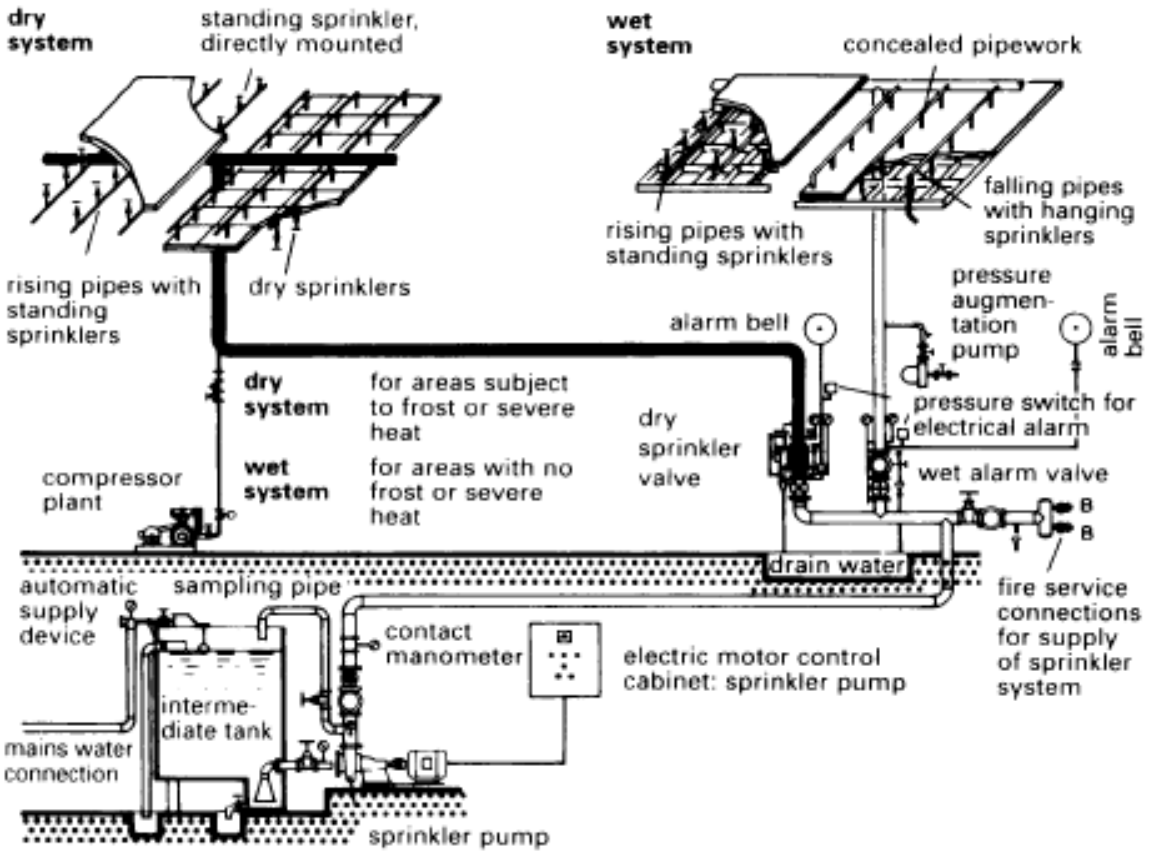


Fig. 6.9: A sprinkler system

Source: neuferts architects data

Fire Prevention and control

Fire has to be controlled so as to avoid: Injuries and loss of life due to burns, Smoke inhalation, asphyxiation, building collapse, Loss of documents, files and finally the loss of personnel. Therefore the adequate safety measures to reduce these risks should be employed.

Preventive measures to be ensured against the outbreak of fire include:

- Provision of escape routes and emergency exits at regular intervals. Distance not more than 45m apart. Such areas should not be used for storage purposes, and should be well illuminated. It should be wide and suitably identified. Exit signs should be installed indicating traffic flow in case of emergency.

Provision of fire alarm systems that will alert the fire brigade as well as ignite the automatic sprinkler device at the complex.

- Fire extinguishers and sprinklers shall be fixed in areas where the risks are high: there are several types of extinguishers such as; pressurized water loaded system and soda acid extinguishers, dry chemical and carbon dioxide (carbonated extinguishers), and foam type extinguishers. Sprinklers are fire-check devices used not only for fire detection but also for fire extinguishing. They are designed to automatically set into action by the heat generated by the fire or smoke.
- The shop units should be compartmentalized to prevent the spread of fire by raising the walls over and above the roof.
- Empting of garbage boxes and they should be made of metallic components.
- All inflammable materials: Paints, liquids, oils, acids, such materials should be stored in metal drums and containers, some acids require glass or porcelain containers. All containers must be suitably labeled. Oil and gas tanks should be protected underground. Storage areas should be well ventilated.

6.5 COMMUNITY CENTRE FACILITIES

Community centre has a lot to do with the location and grouping of event spaces such as conference centre, workshops, hostels, and amphi-theatre. The services offered by these event spaces include communal activities, vocational programs and so on.

6.5.1 CONFERENCE CENTRE

The conference centre which can also be called as the administrative block of the centre provides facilities such as shops for retailing, lecture theatres for various activities, computer centre and offices.

6.5.2 TRAINING AND WORKSHOP

These are usually the academic areas where the vocational programs take place, they are usually located within the centre core for easy accessibility. They do generate traffic due to the population of the students.

The fundamental planning guide for the workshop shows the functionality within the training area and the arrangement of the machine in relation to the required clearance for operation. They need the maximum available floor area. The head room heights must not be less than 4.5m and proper provision for service ducts must be considered. A grid of not less than 6m is adopted to allow for enough space for production and movement within the workshop.

The major accommodation elements include:

- Machine area.
- Circulation spaces.
- Technician office.
- Store.

6.5.3 HOSTEL

The hostel facility is to provide accommodation for the students which comprises of male and female hostel. The male hostel provides 44rooms with supporting facilities, the hostels comprises of two floors with the provision of stair case and ramp for easy accessibility. The headroom height must not be less than 3m and proper provision of service duct should be provided.

CHAPTER SEVEN

CONCLUSION

7.1 SUMMARY

The studies carried out in the course of this research shows that community or conference centre in Nigeria does not fully explore universal design principles, the effect on users in Nigeria is that they tend to isolate physically challenged people from visiting or

participating in the various activities within the centre. This situation makes it imperative to consider the use of sensitive strategies in the implementation of the principles.

Based on findings, universal design principles are not widely explored in the design of public buildings in Nigeria. This can be seen in the case study summary sheet in chapter four, where it shows that only few variables are applied. However some of the international proceedings have shown immense exploration of universal design principles and the viable ones in the Nigeria context were adopted so as to achieve a more accessible, simpler, functional and flexible community centre, the intent of the thesis was to examine the universal design principles, its level of exploration in architecture with particular reference to community centre.

The conclusion drawn from these findings are perhaps with an intuitive application of some of the reviewed universal design principles in community centre design in Nigeria, that community centre will become more user friendly, easy accessibility, flexibility and use by all irrespective of sex, age, or disability.

7.2 CONCLUSION

In this research, several universal design principles were reviewed and discussed with reference to their design implication and architectural interventions. Appropriate research should be aim at better understanding of the universal design principles, to understand and describe its usability, and accessibility with less physical effort required.

Studies have shown that the application of universal design principles in community centre may improve participant population. The centre will also be viable and more income will be generated due to constant use, the flexibility in the centre design will also enhance the centre to provide variety of activities which will make it more fluidity.

7.3 ARCHITECTURAL CONTRIBUTION

The architectural contributions of this research using the basis of previous findings are:

i. The study has demonstrated that, universal design principles should be considered in the design of all public buildings since public buildings are designed for all users.

ii. The study has shown that with proper consideration and full implementation of universal design principles, community centres will require less physical effort by all users to participate in the various activities within the centre.

7.4 RECOMMENDATION

This thesis can be used as starting point towards more detailed research in the implementation of universal design principles. Further investigation about the benefits of universal design principles to stimulate wide spread demand that it may be practiced. Universal design is the best way to integrate access for everyone with less or no physical effort required, although it will never be easy to design for diverse population, concerns for people should become an expected component of the process of designing any environment, product, services or policy.

The need of sensibility to usability issues will only become pressing in the coming decades as user population become more diverse. One significant trend is the increasing longevity

of the human race worldwide, another factor is improved medical technologies that allow more critically injured and seriously ill people to survive.

As population increase from day to another, there is always room for improvement on new innovation, the investigation could be further extended to investigate the impact of population and diversification.

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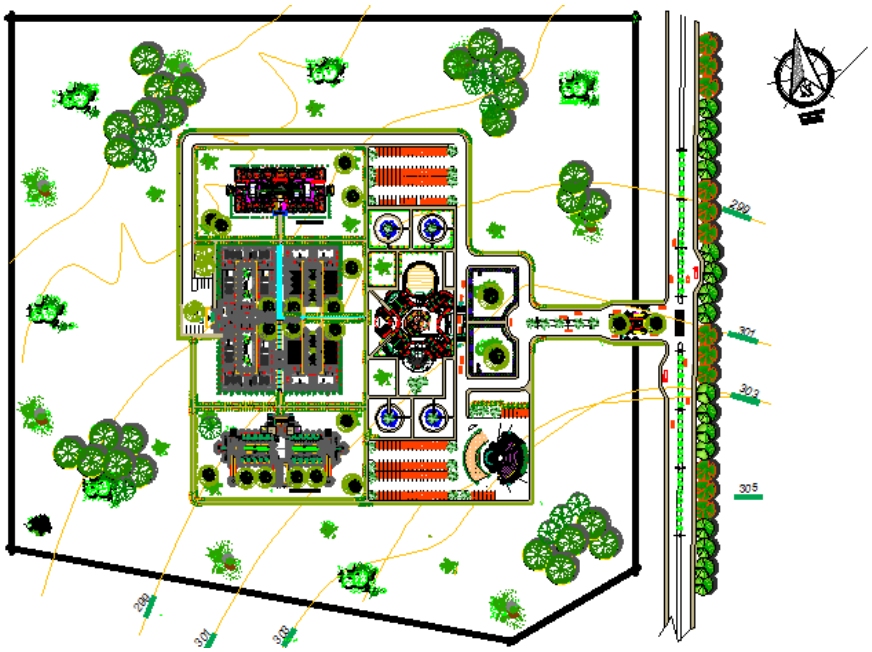
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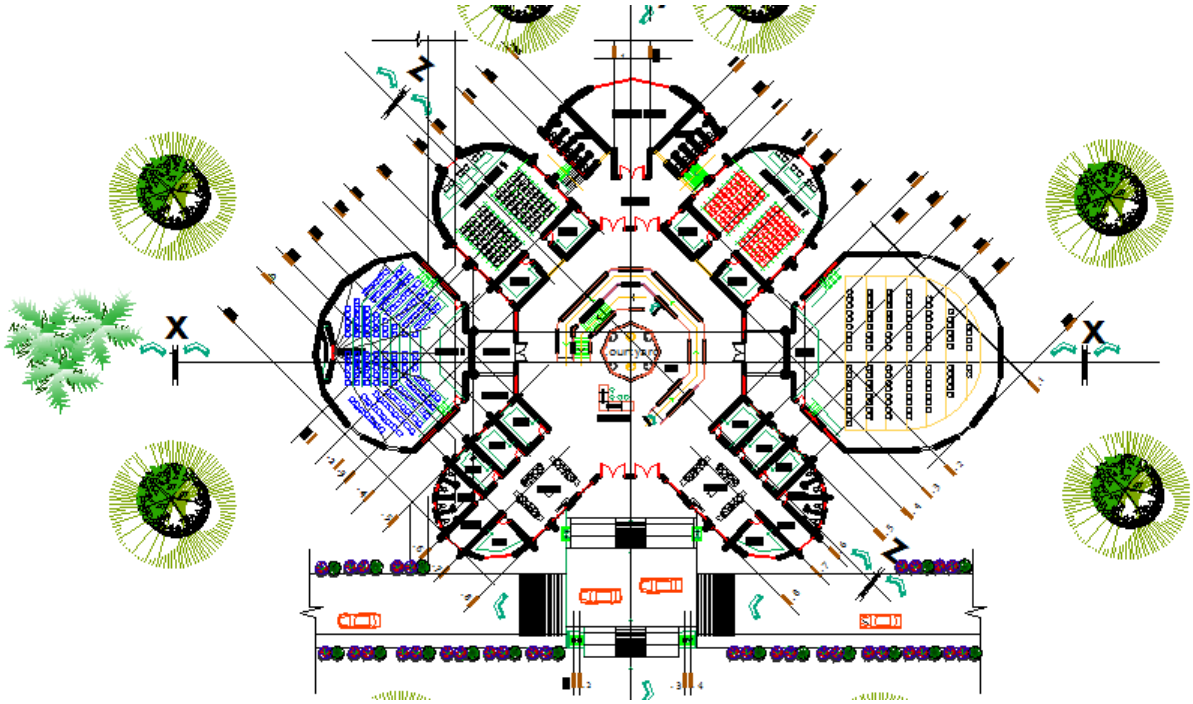
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APPENDIX

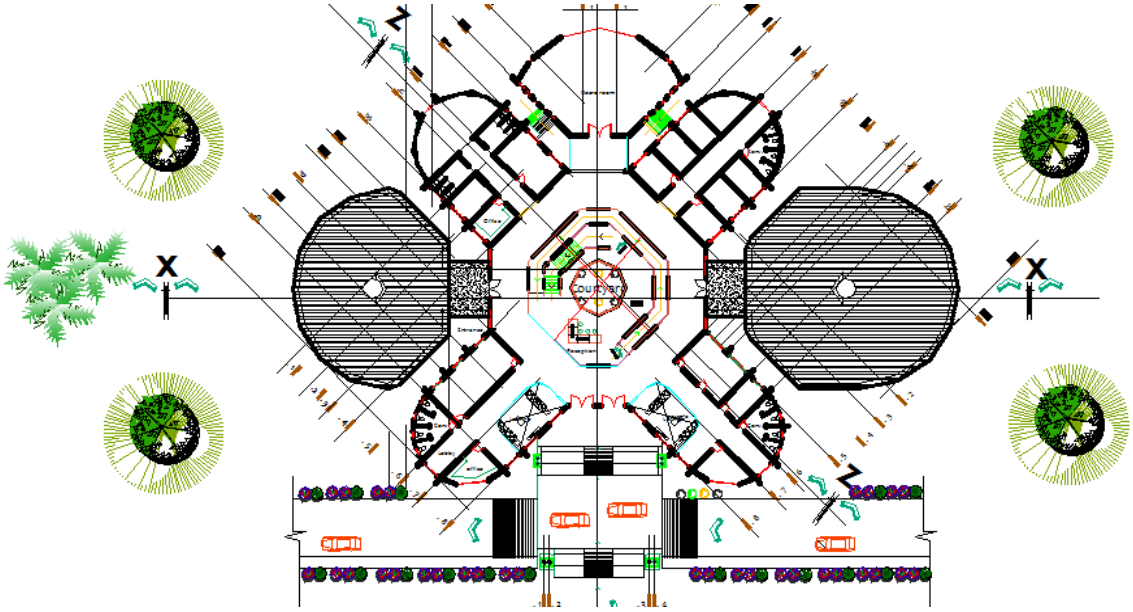


SITE PLAN



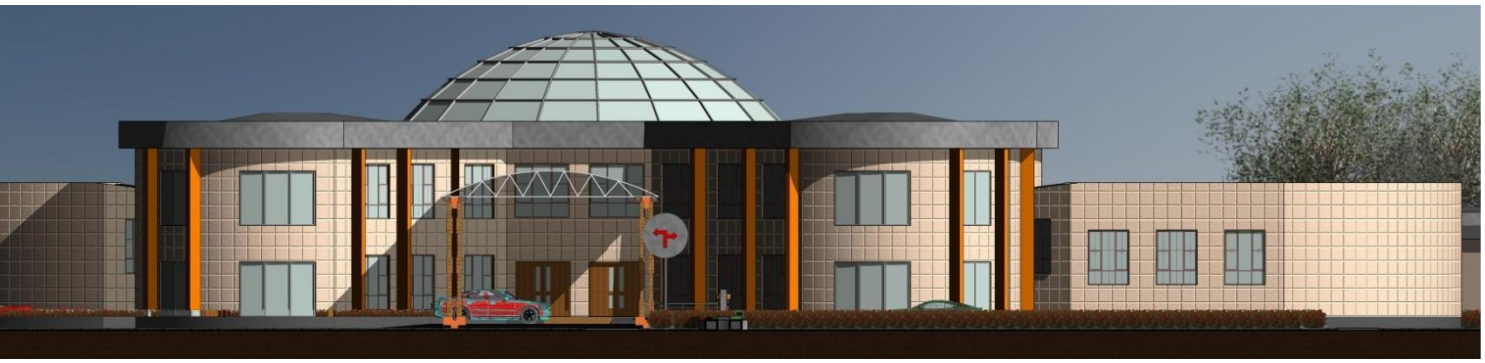
CONFERENCE CENTRE

GROUND FLOOR



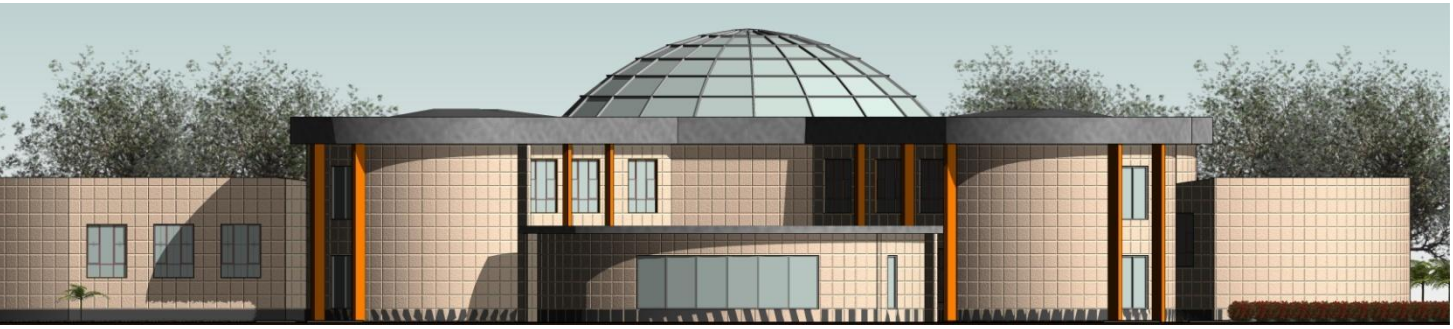
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FIRST FLOOR



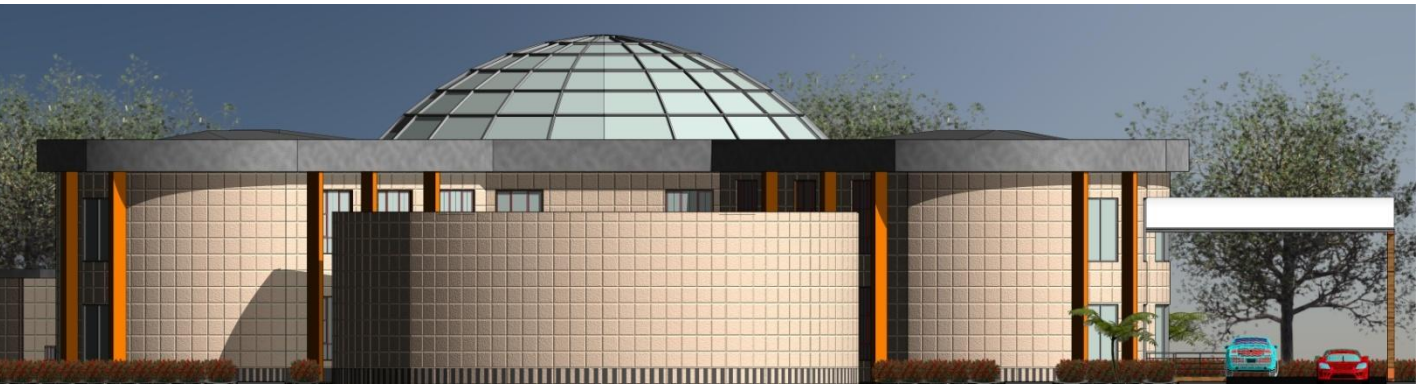
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APPROACH ELEVATION



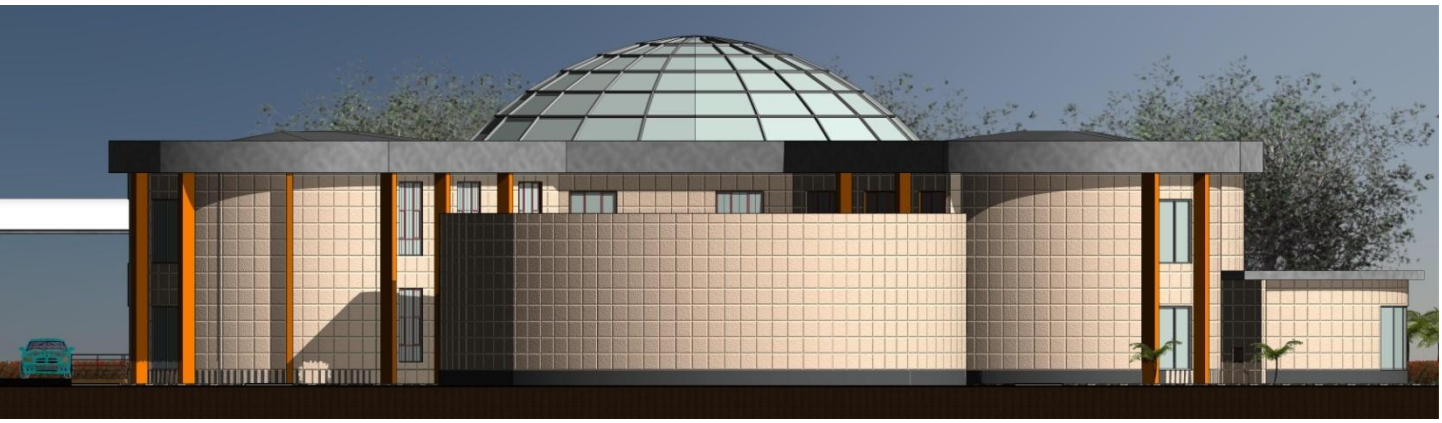
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REAR ELEVATION



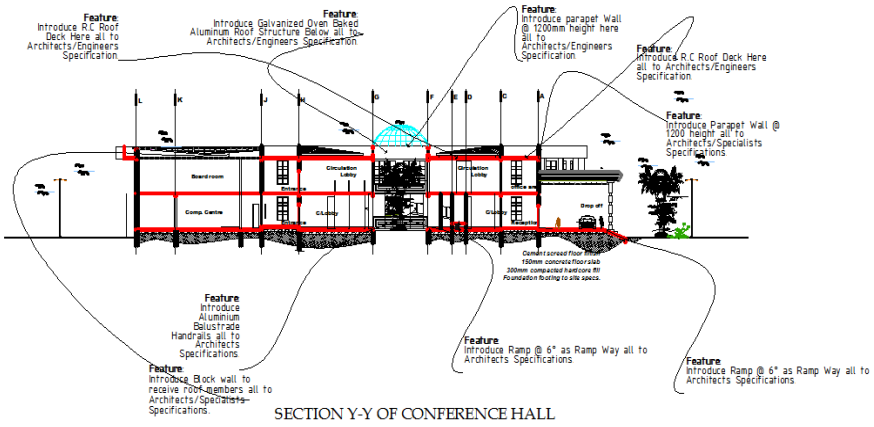
CONFERENCE CENTRE

LEFT-SIDE ELEVATION



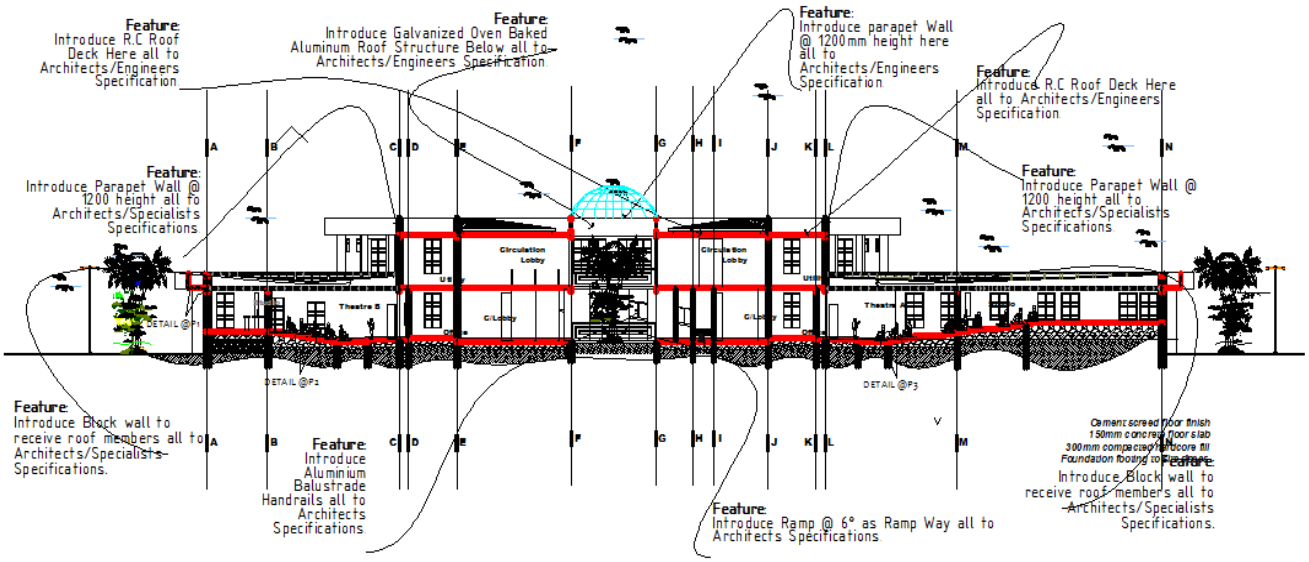
CONFERENCE CENTRE

RIGHT-SIDE ELEVATION



CONFERENCE CENTRE

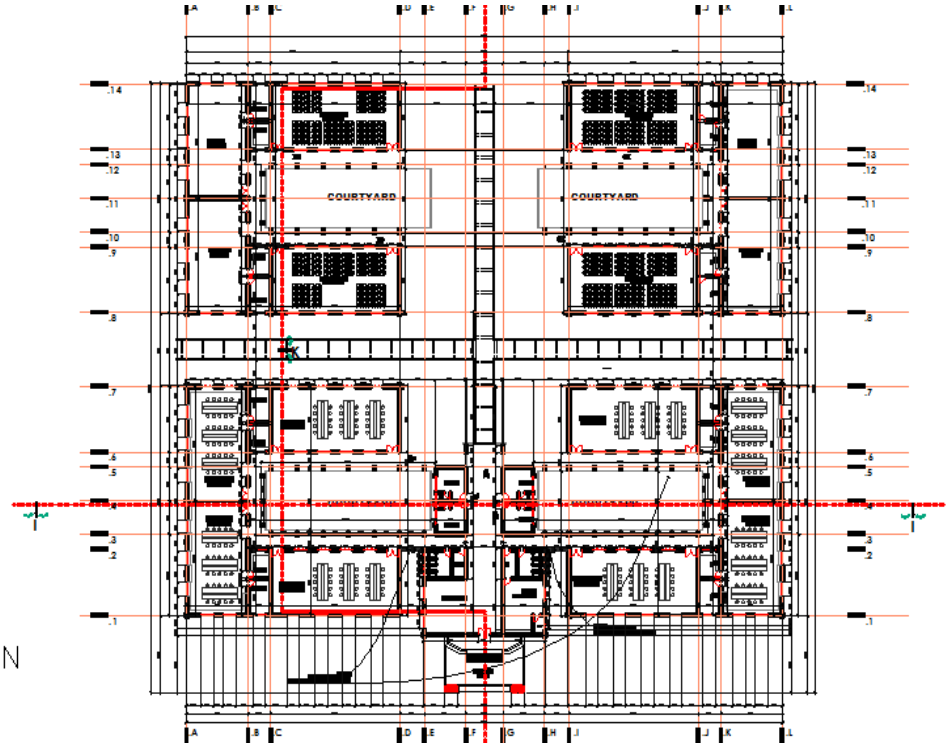
SECTION Y-Y



SECTION X-X OF CONFERENCE HALL

CONFERENCE CENTRE

SECTION X-X

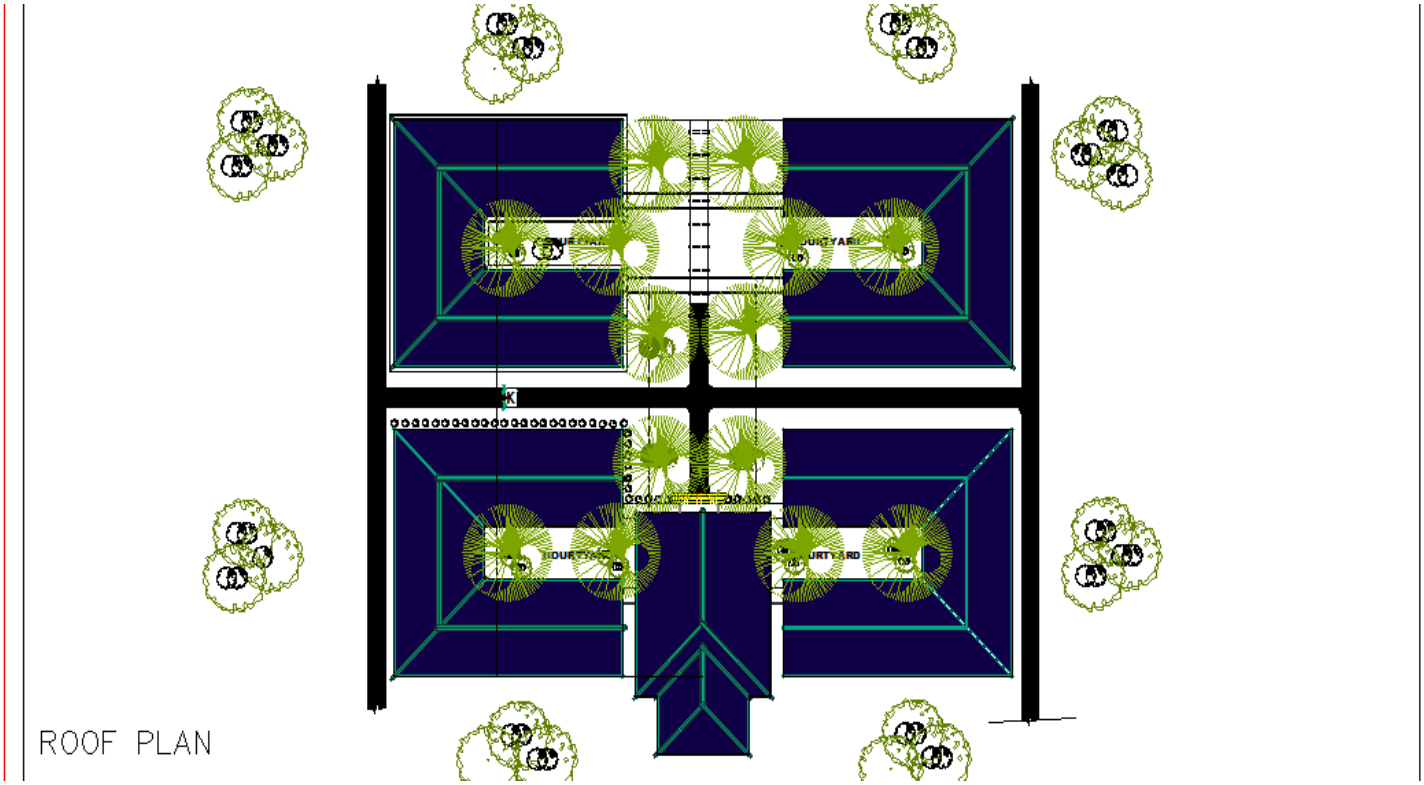


FLOOR PLAN

ROOF P

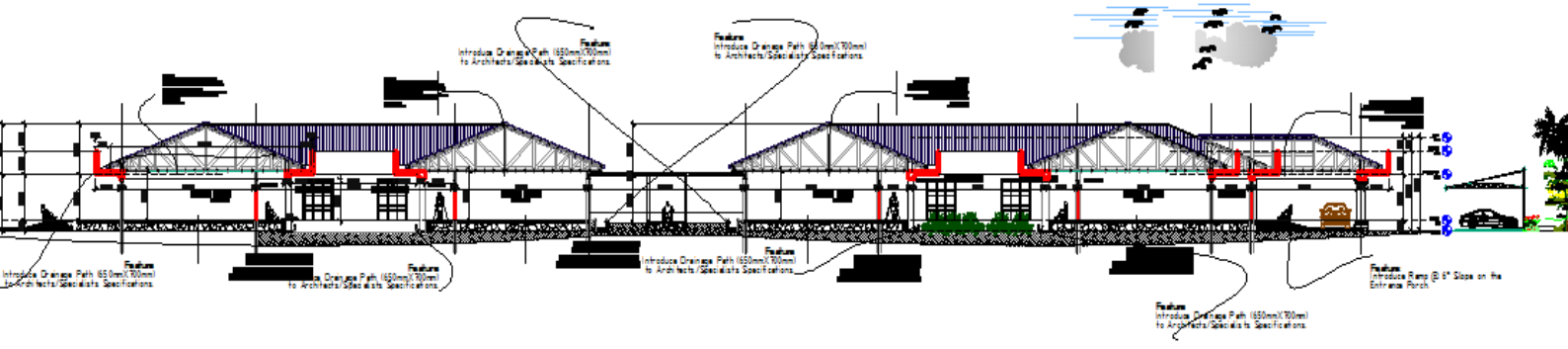
TRAINING, CLASSROOM & WORKSHOP

FLOOR PLAN



TRAINING, CLASSROOM & WORKSHOP

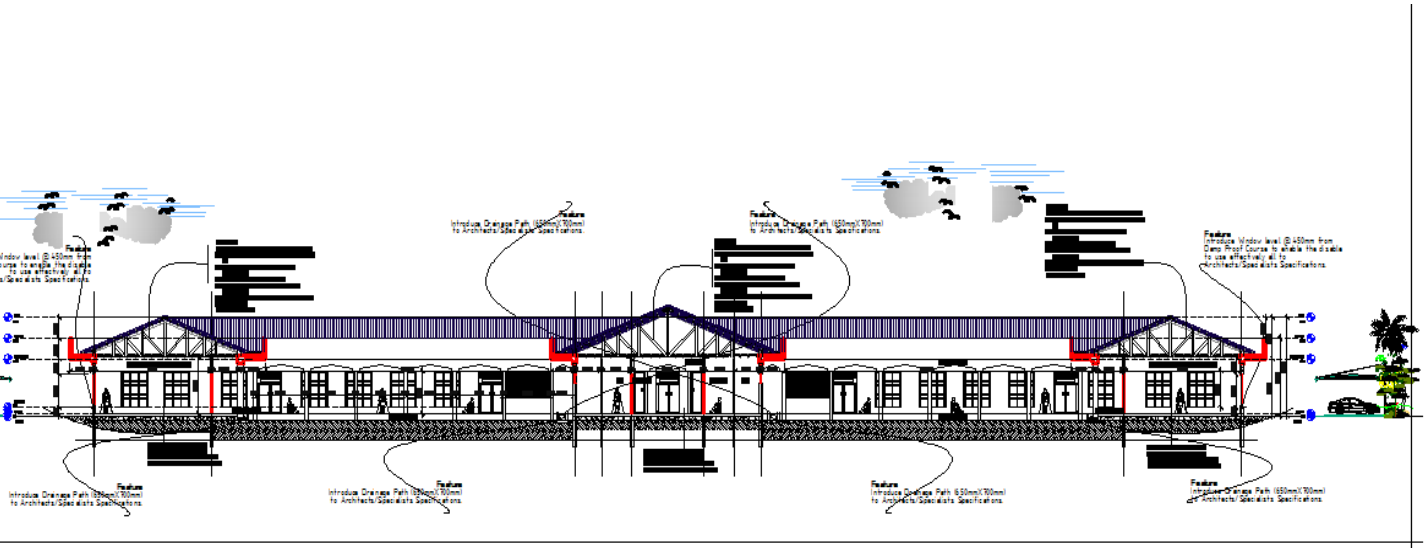
ROOF PLAN



SECTION K-K OF TRAINING, CLASSROOM & WORKSHOP

TRAINING, CLASSROOM & WORKSHOP

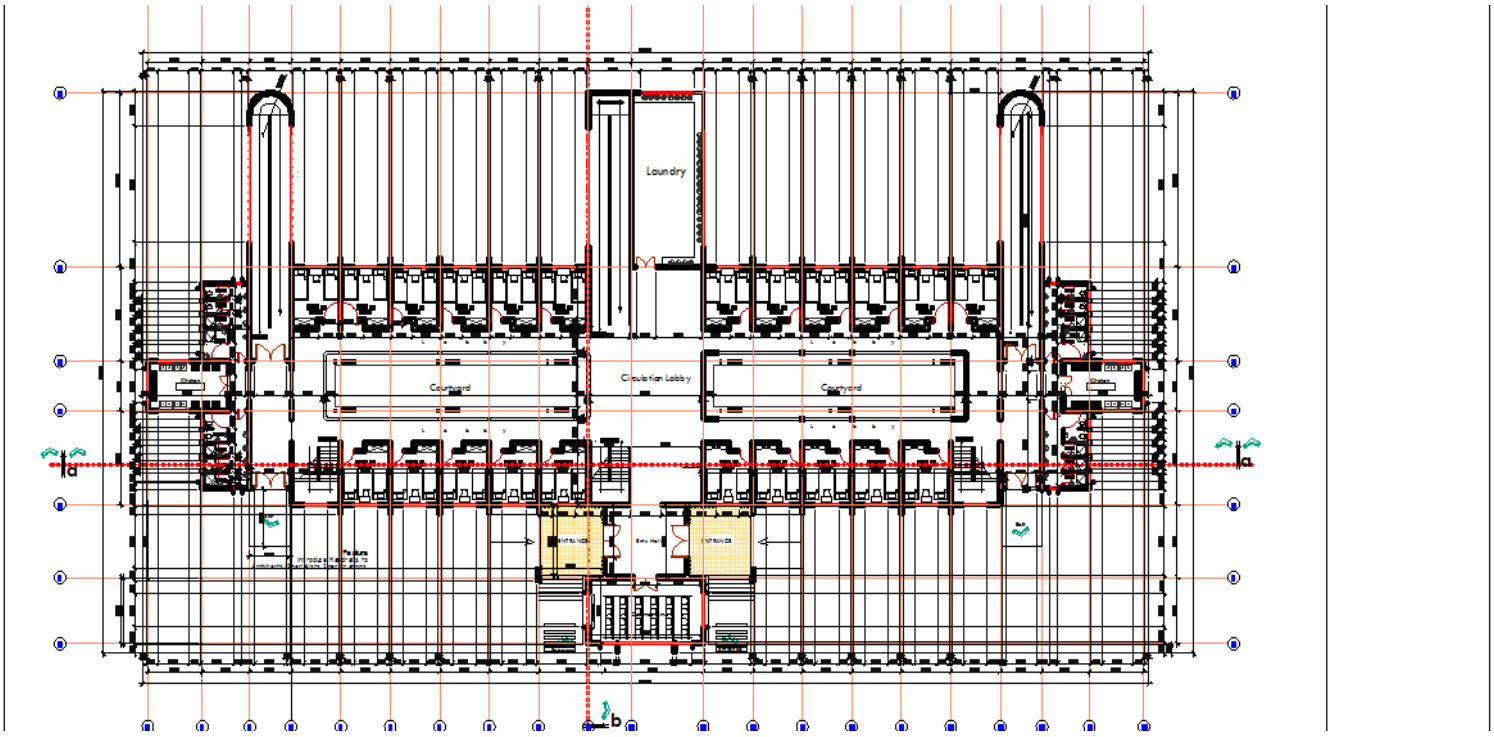
SECTION K-K



SECTION I-I OF TRAINING, CLASSROOM & WORKSHOP

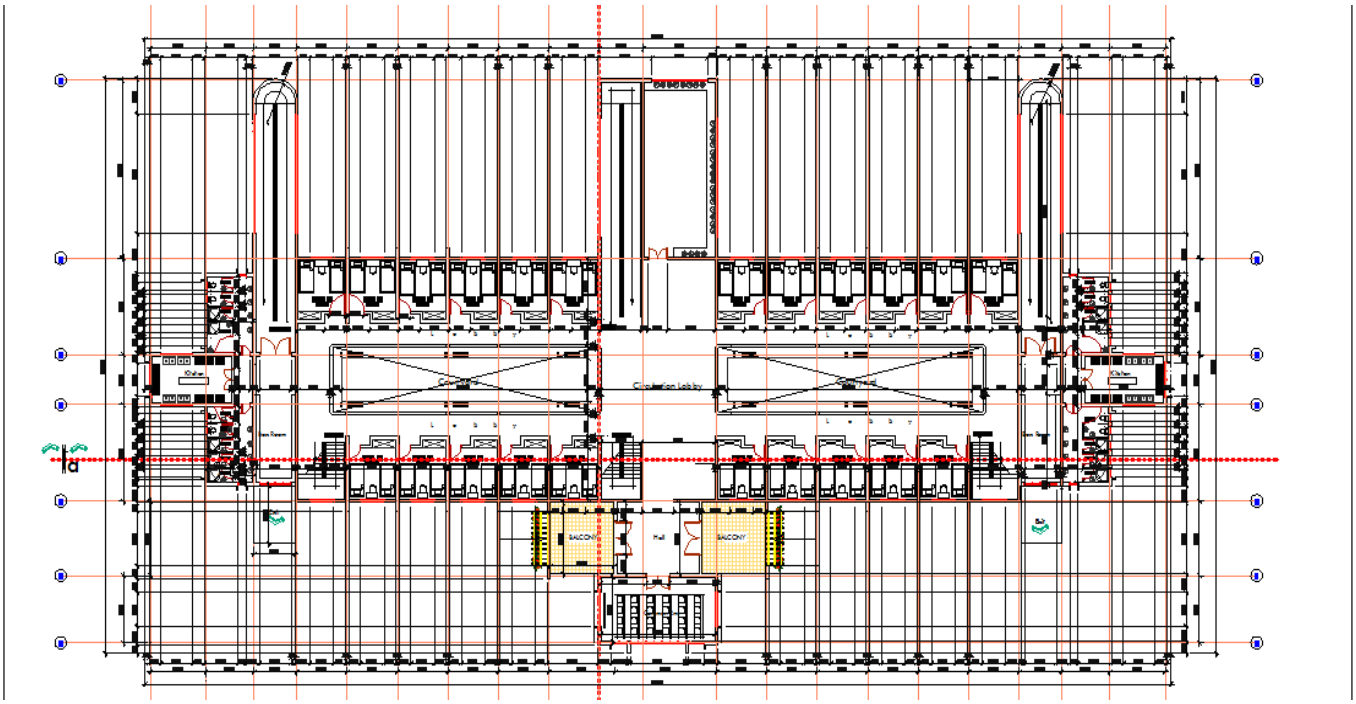
TRAINING, CLASSROOM & WORKSHOP

SECTION I-I



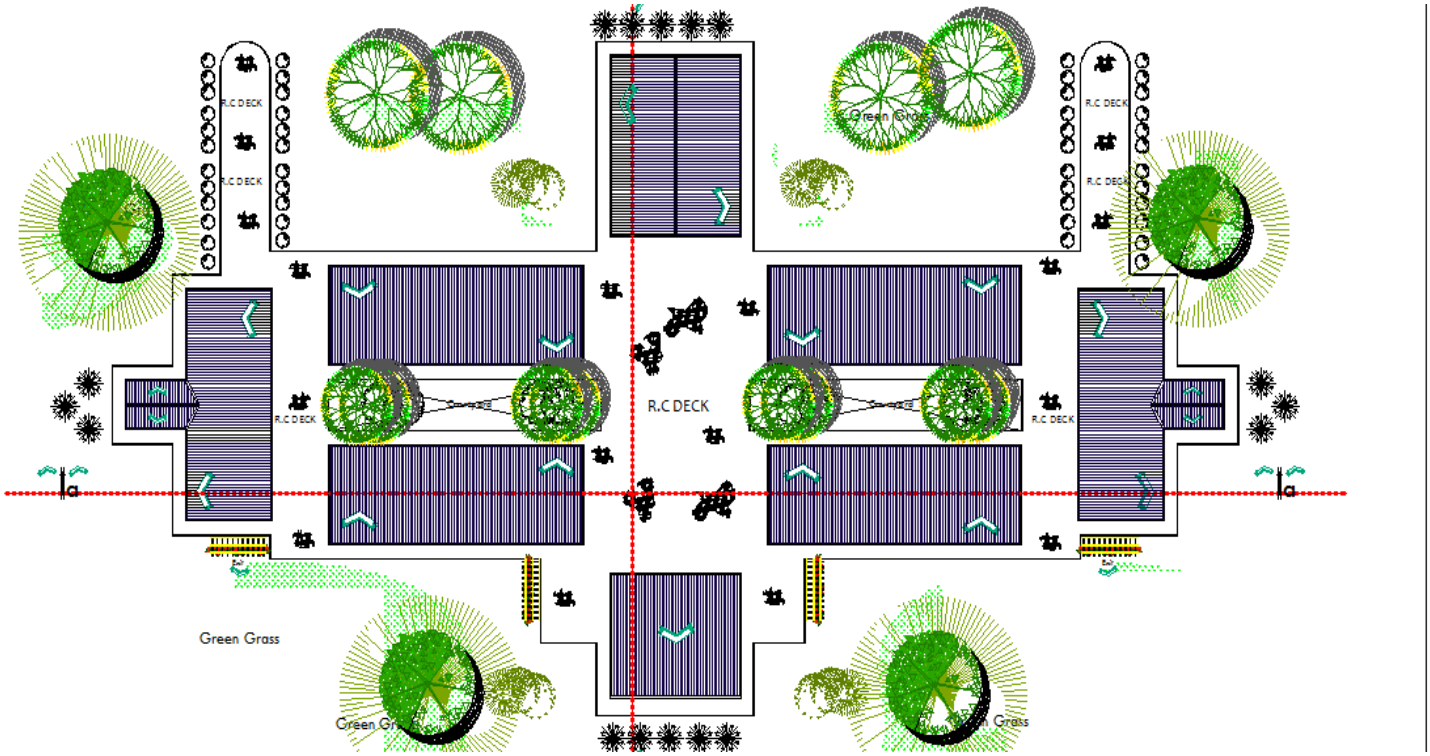
FEMALE HOSTEL

GROUND FLOOR PLAN



FEMALE HOSTEL

FIRST FLOOR PLAN



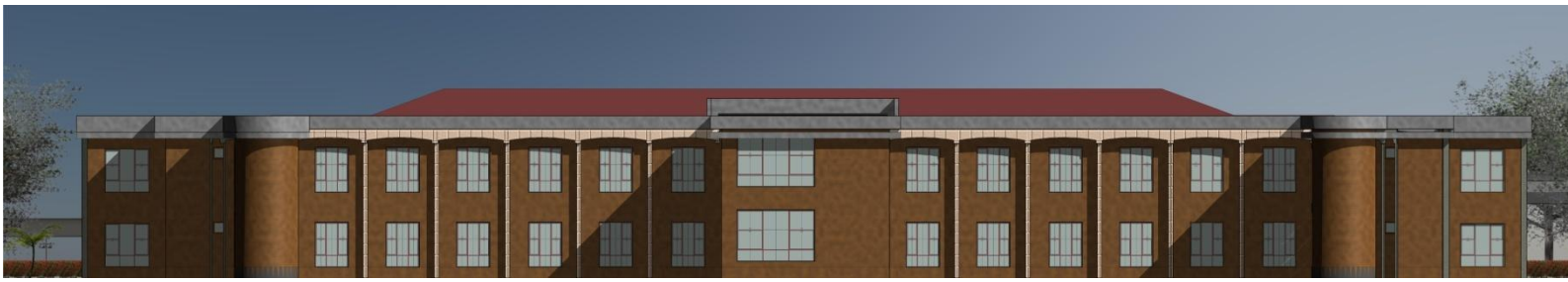
FEMALE HOSTEL

ROOF PLAN



FEMALE HOSTEL

APPROACH ELEVATION



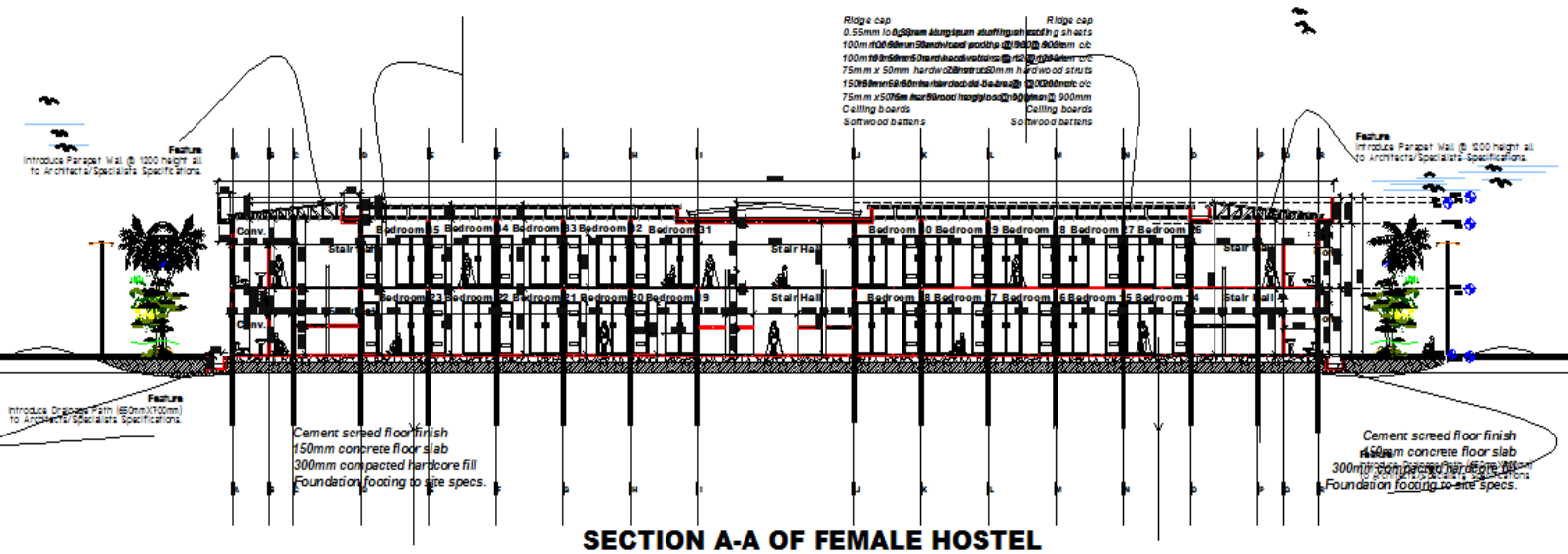
FEMALE HOSTEL

REAR ELEVATION

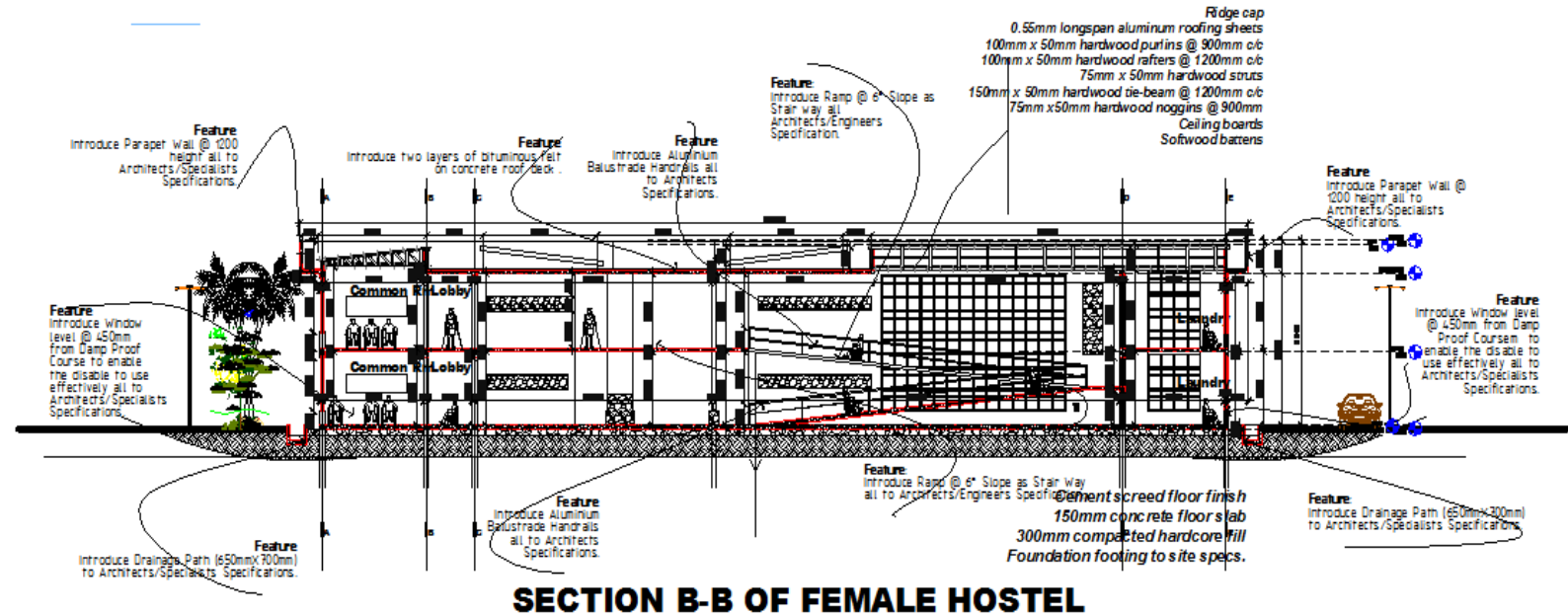


FEMALE HOSTEL

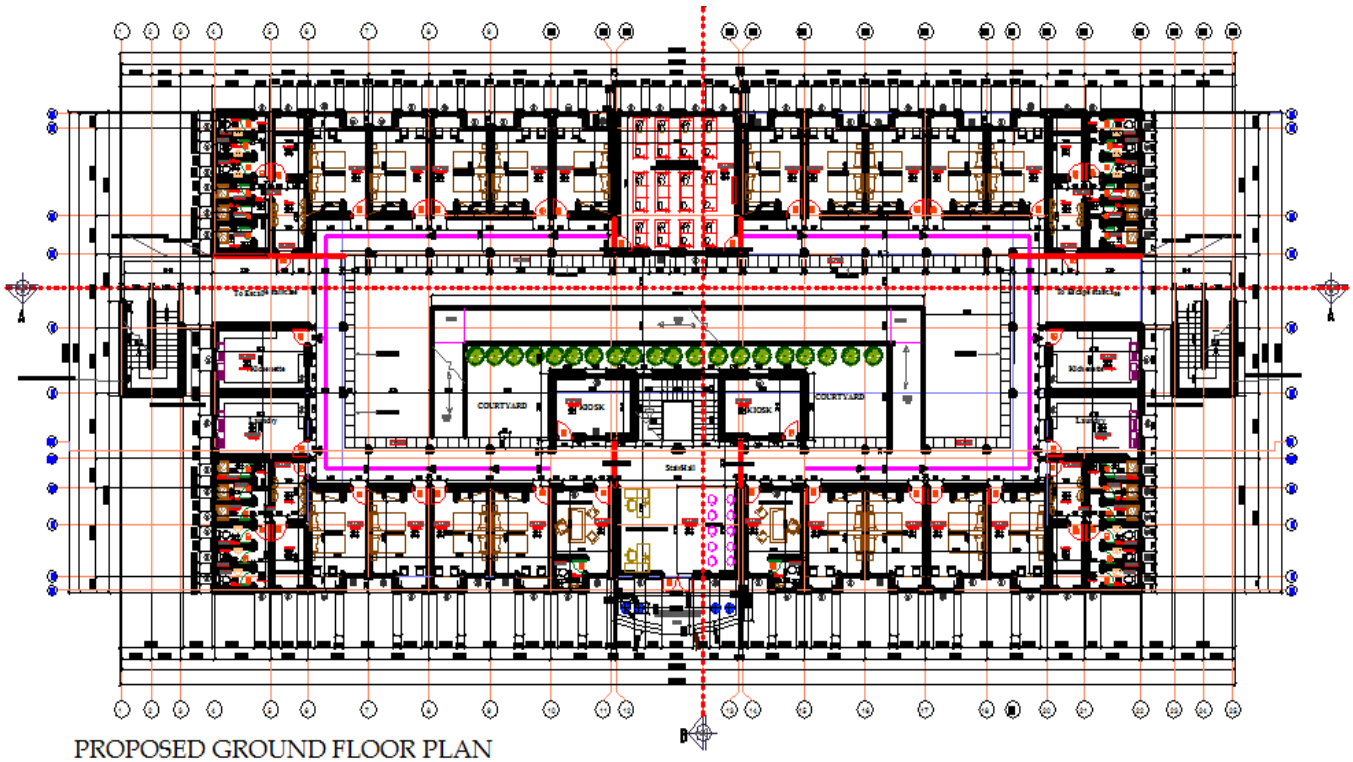
TYPICAL SIDE ELEVATION



SECTION A-A OF FEMALE HOSTEL



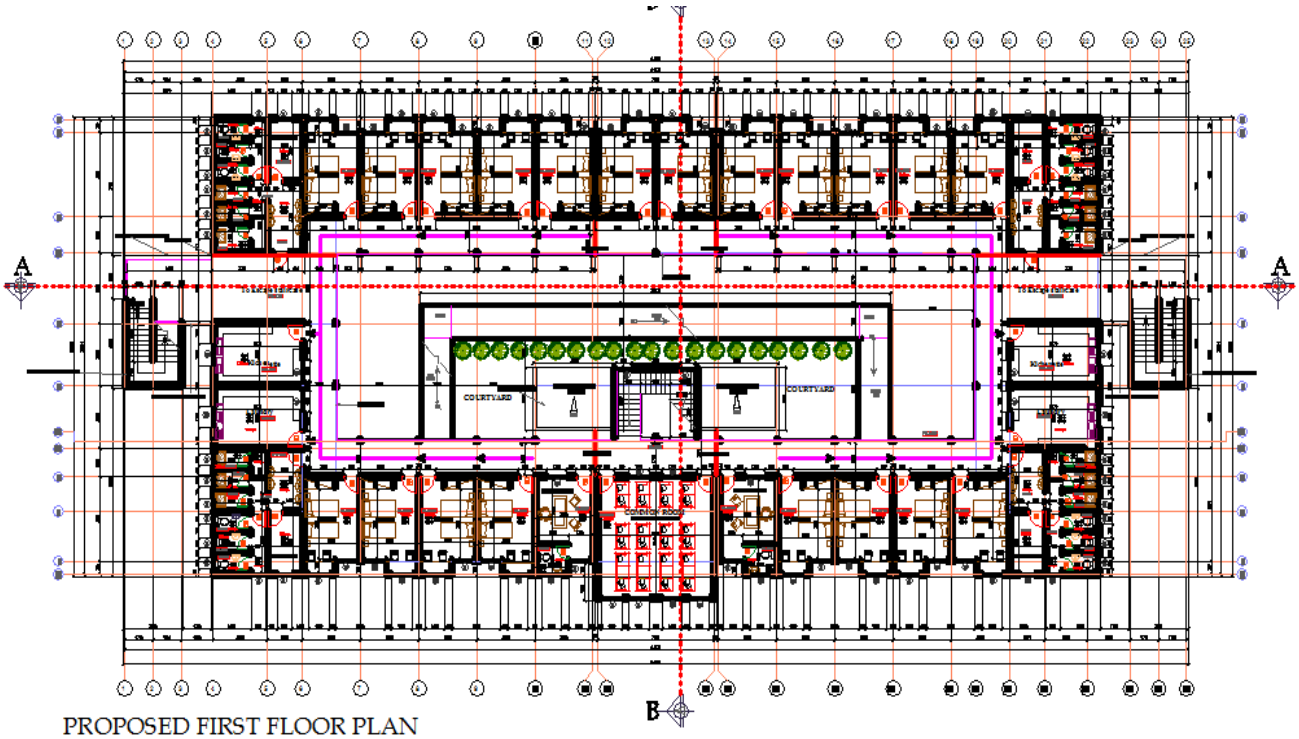
SECTION B-B OF FEMALE HOSTEL



PROPOSED GROUND FLOOR PLAN

MALE HOSTEL

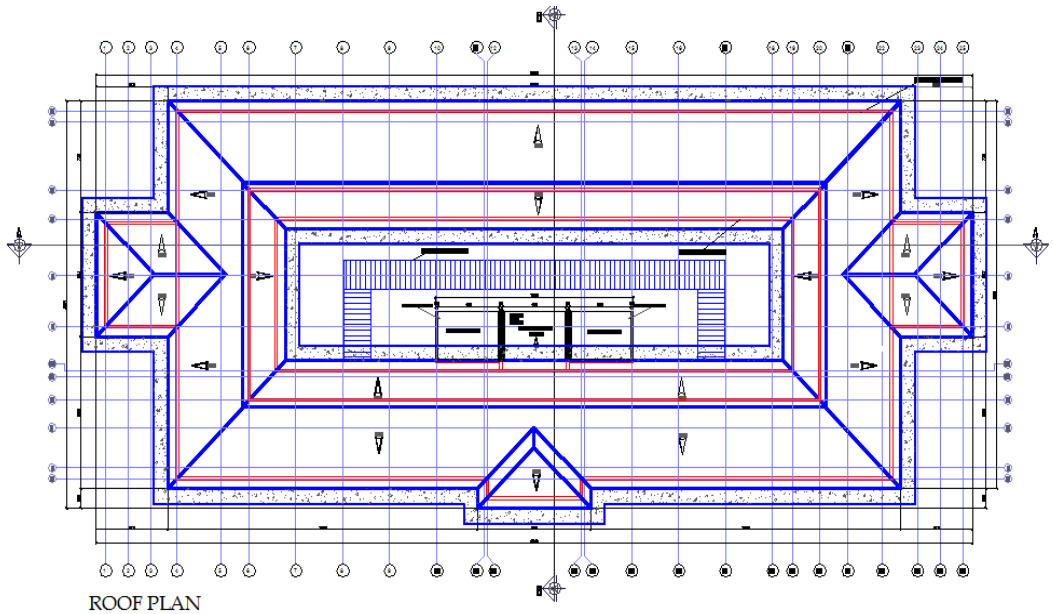
GROUND FLOOR PLAN



PROPOSED FIRST FLOOR PLAN

MALE HOSTEL

FIRST FLOOR PLAN



MALE HOSTEL

ROOF PLAN



MALE HOSTEL

APPROACH ELEVATION



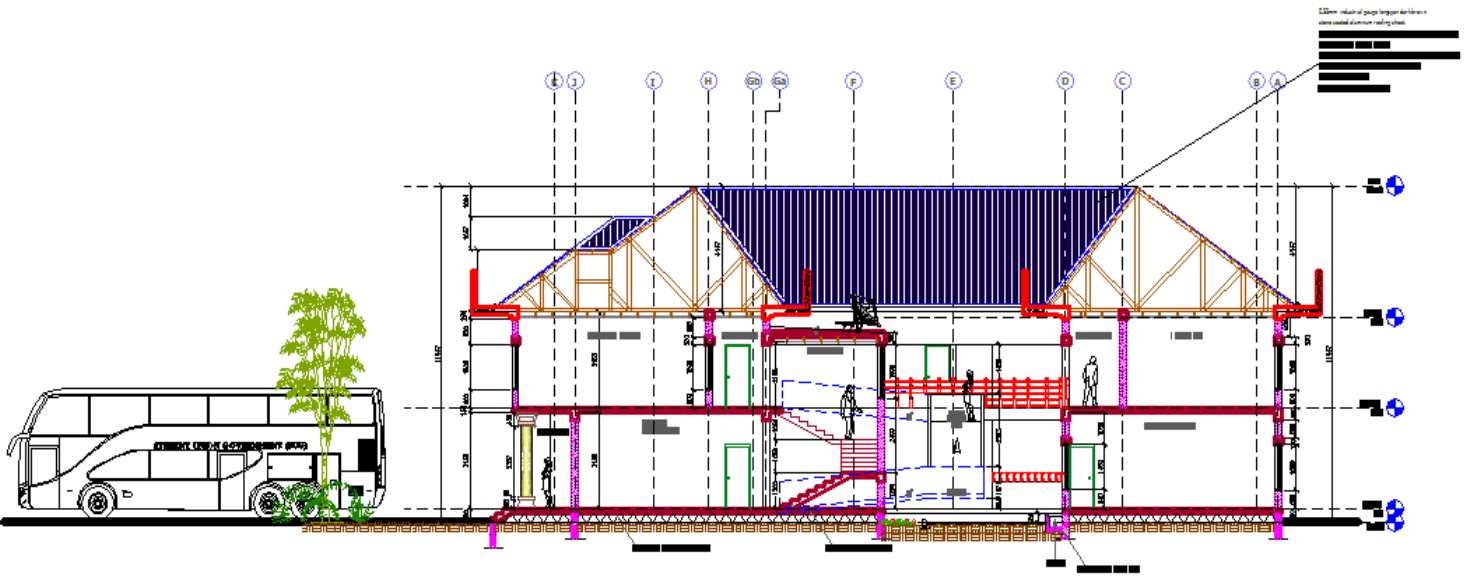
MALE HOSTEL

REAR ELEVATION



MALE HOSTEL

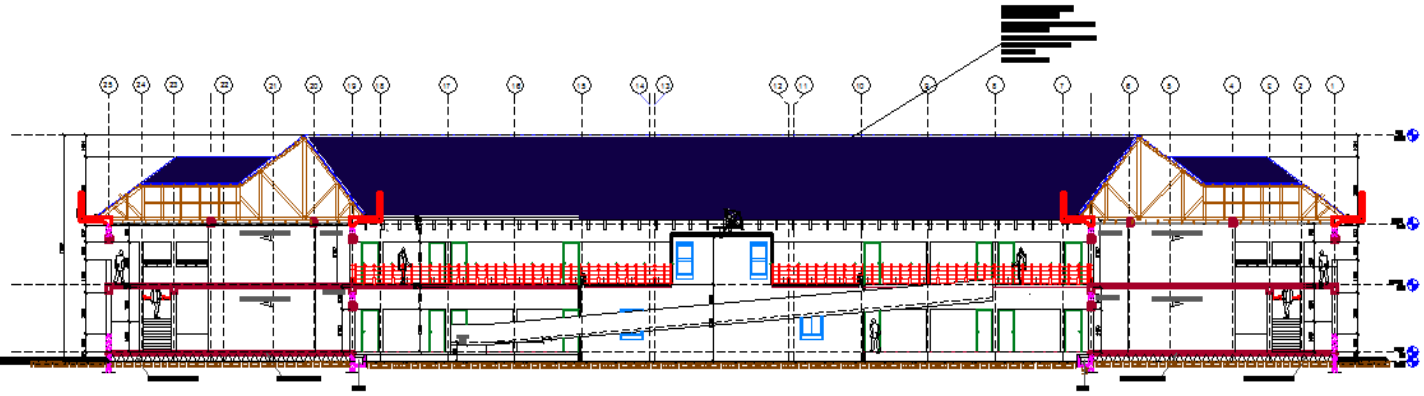
TYPICAL SIDE ELEVATION



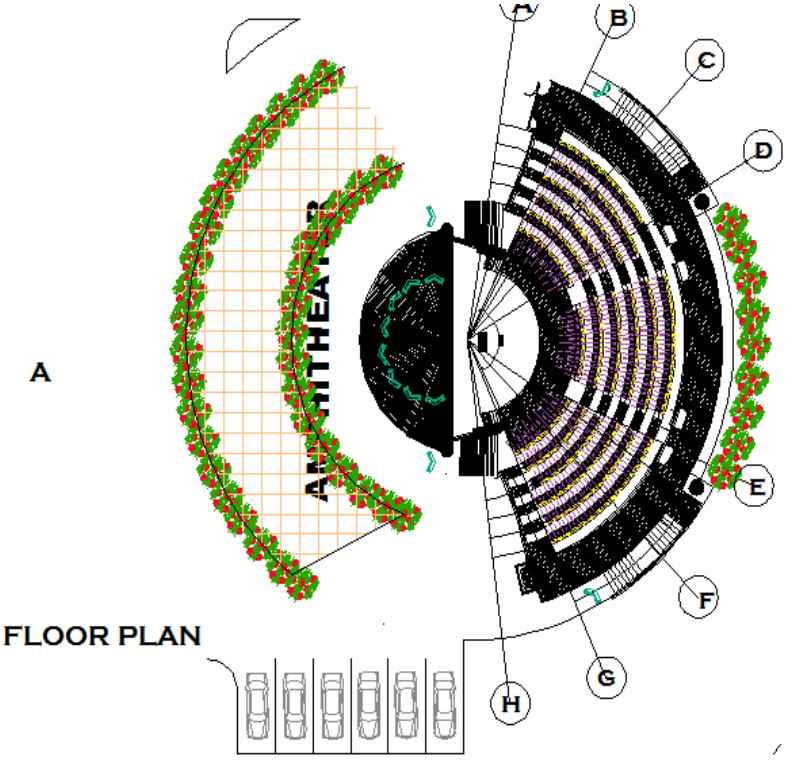
SECTION B-B OF MALE HOSTEL

MALE HOSTEL

SECTION B-B



ECTION A-A OF MALE HOSTEL



AMPHI-THEATRE

FLOOR PLAN



CONFERENCE CENTRE

3D VIEW



TRAINING, CLASSROOM & WORKSHOP

3D VIEW



MALE HOSTEL

3D VIEW



COVERED WALKWAY LINKING THE FACILITIES

3D VIEW



FEMALE HOSTEL

3D VIEW