WORD OF FAITH BIBLE INSTITUTE, GOSHEN, ABUJA.

THE USE OF MODERN BUILDING MATERIALS FOR SUSTAINABLE ARCHITECTURE IN NIGERIA.

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ARC/06/9473

A THESIS IN THE DEPARTMENT OF ARCHITECTURE

SUMBITTED TO THE SCHOOL OF POSTGRADUATE STUDIES,

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD

OF MASTER OF TECHNOLOGY DEGREE IN ARCHITECTURE OF THE

FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE, ONDO STATE,

NIGERIA.

JUNE 2015

DECLARATION

I, ALADE, John Morakinyo (ARC/06/9473), hereby declare that this thesis entitled Word of Faith Bible Institute, Goshen – The use of modern building materials for sustainable architecture in Nigeria is my personal research work and has not been presented elsewhere for the award of a degree, or any other purpose before.

All resource materials are dully acknowledged.

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CERTIFICATION

We certify that this work was carried out by Mr. Alade, John Morakinyo in the Department of Architecture of the Federal University of Technology Degree in Architecture of the School of Postgraduate Studies, Federal University of Technology, Akure and is approved for its contributions to knowledge and literary presentation.

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ACKNOWLEDGEMENT

First, God the almighty, the all-knowing and the only wise God who guided all the researches, reasoning, analysis and coordination that went into this thesis.

Secondly, the person of the Holy Spirit who is the custodian of all "The deep things of God" for quickening the understanding of all who involve in this thesis.

My profound gratitude goes to my Supervisor and Head of Department Dr. (Arc). Abraham A. Taiwo for priceless contribution to this humble achievement. I thank my Mentor Professor (Arc). Ekundayo Adeyinka Adeyemi for his fatherly role in my life, Professor (Arc). Olu Ola Ogunsote, and Dr. (Arc) Odeyale, the Post graduate studies coordinator for this usual support. I am sincerely grateful to Professor (Arc). Abiodun Olotuah, for his kind love and support through the courses.

I cherished and deeply appreciate the privileges given to me by Bishop David O. Oyedepo, the Presiding Bishop of Living Faith Church worldwide, Bishop David O. Abioye, First Vice-President, Pastor (Mrs.) Mary Abiodun Abioye for her Motherly role from the beginning, Pastor Triumphant Obamoh, Executive Secretary of Living Faith Church worldwide for all their love and prayer through the course of program. And also Pastor Dele Bamgboye, Pastor Joseph Ajibade, vice-president – Foreign Mission for all their advice in the course of this program. I thank you all for making my dream come Lime Light. My gratitude also goes to Pastor Nwoke Azubuike, Pastor Femi James, Pastor Femi Oluwalana, Pastor Jesse Gbenga and Pastor Adedeji Okubanjo for their great help and advice.

Much thanks goes to all Institutions and Establishment that offered assistance of valuable information for this work.

Special appreciation goes to Engr. Gbenga Ajayi, Arc G. Fowora, and Arc. Olusola

Olarewaju for their love, advice and encouragement. I acknowledge, Arc. Nicolas, Arc. Adeyanju, for their contribution towards my welfare.

With deep sense of esteem and profound gratitude, I acknowledge the understanding, sacrifice, love, care and ceaseless prayer of my wife and daughter, my Father (a.k.a Baba Teacher), my Mother and my Uncle, Alade Samuel Alao, Who greatly motivated me.

Thank you all and God bless you richly.

John, Morakinyo Alade.

DEDICATION

To the Almighty God, the Alpha and the Omega.

ABSTRACT

This Thesis is entitled "World of Faith Bible Institute, Goshen. – The use of modern building materials for sustainable Architecture in Nigeria

….And when Abram heard that his brother was taken captive, he armed his trained Servants, Gen 14:14. It takes training to triumph and no one arms a man who is not trained. That is what WOFBI stands for: to train and raise men and women for exploits. The word of Faith Bible Institute is a spiritual Training School where "Kingdom Soldiers" are trained and made. This is a leadership training Institute. This leadership department is a central to all organizations particularly Christian Organization like Living Faith Church, aka "Winners" whose wealth abounds in Leadership training. This work is an architectural response to these issues. It is conceptualized as a variant of Christian Seminary or Institute aimed at providing facilities for increasing short-term training of a visionary church. It seeks to evolve a unique architectural environment with striking scenery and structures conducive for deep meditation and capable of stimulating inspiration, which is central in true Spiritual leadership development. The study captures the mission and uniqueness of the church, Living Faith Church and identifies short time drawing and re-training as its indispensable tool for sustainable success in mission. Via in depth library search, case studies, end users brief and inputs and mentor's contribution, the work exploits nature, landscape potentials, planning, scale and forms in architecture to create a befitting centre for leadership development. The study reveals that environmental planning is one of the determinant that guarantee a good learning environment especially in spiritual environment while the structure should include the Administrative block, Lecture Theatres, Library, Canteen, Prayer ground (alone with God), Accommodation for Students.

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CHAPTER ONE

1.0 INTRODUCTION

In the school of life, education whether formal or non-formal empowers people to have impact in their society, and enhances their resourcefulness. Datta (1987) defines it as the process through which a person's mind and character are developed through teaching and training. It is learning structure that determines the strength, growth, stability and efficiency of any organization, without a viable learning structure, there can be no enviable future for any ministry or organization. Efficient learning is what sustains the impact, continuity and relevance of any organization. The viability of leadership training is the determinant to the limit of the ministry. Every establishment thus places great premium on human development and training. The Christian faith shows this commitment.

The Bible underlines the practice and highlights the strategy for sustainable and continuity by its injunction which says "and the things thou has heard of me among many witnesses, the same commit them to faithful men, who shall be able to teach others also", 2 Timothy 2:2. In the Christian faith, there were many people that have undergone training in their native or outside their native country, Paul the Apostle spent three years in Arabia (where he contacted the heavy weight revelations he operated in, Samuel was also apprenticed to prophet Eli (1 Samuel 2:11) for Jesus Christ, the founder of the New Testament Faith ordained twelve men that they may be with Him for training as incoming proponents of the faith (Mark 3:13) in short Jesus Christ gave them commandments:

"Go ye therefore and teach all nations baptizing them in the name of the Father, and of the Son and of the Holy Ghost; teaching them to observed all things whatsoever I have commanded ye…(Matthew 28:19-20).

…." And when Abram heard that his brother was taken captive, he armed is trained Servants born in his own house, three hundred and eighteen, and pursued them into Dan" Gen. 14:14. The word of Faith Bible Institute (WOFBI) is the training arm of Living Faith Church worldwide. It takes training to triumph and no one arms a man who is not trained. That is what WOFBI stands for; to train and raise men and women for exploits. The institute is a spiritual training school where "Kingdom soldiers" are trained and made.

Pursuant to this great commission and in view of its scope, training and leadership development become imperative as leadership is globally recognized as being central to all human enterprise, nations, missions, movements, organizations, Churches and families indeed rise and fall with leadership. Sanders (1987) asserted that through overriding need of the church, if it is to discharge its obligations to the rising generation, is for a leadership that is authoritative, spiritual and sacrificial.

Nikalaus Ludwing, count von Zimzendorf, a religious and social reformer of the German Pietist movement, a leader of the Moravian church (Unitas Fratrum), in 1747 on his return to Europe between 1741 – 1743 established a training arm of his church called Zimzendorf ecumenical center with passion to train Christians Communication, Sermons, hymns, litanies and religious characters.

We live in an age of competing faiths and conflicting philosophies of education. The modern day institution of learning, Avery (2005) observed that it only adds to world confusion with their dribbles, of humanistic reasoning that seek to destroy the fundamental truth upon which the church is anchored and civilization is built. Spiritual growth is ebbing against the strong tide of unrighteousness. There is need for leadership rebirth, through radical and systematic culture of training includes men and women in flourishing Christian ministries, Armed Forces, Entrepreneurs,

Managers and directors of organizations, Career men and women, business men and women, professionals, skilled and unskilled workers. Finally, a compelling response to this genuine need necessitates the development of a training centre that will provide a unique inspirational setting for spiritual leadership development.

1.1 STATEMENT OF THE PROBLEM

Training is a natural component of every human enterprise…. "Every good enterprise is built on a good training". Educationalists agree that training environment profoundly affects responses. Rabinowitz (1979) confirm a direct relationship between physical environment and behaviour while secular leadership training may be feasible in just any available architectural environment spiritual leadership training requires a unique and serene architectural environment (earthly paradise) that will enhance meditation and foster inspiration that will result to mental and spiritual development.

This desired setting is in a consonance with devices from biblical antecedents that Godly people often retired into the wood (forest) for personal meditation, supplication and spiritual refreshing. But with the todays architecture i.e. modern architecture in Nigeria, the use of modern materials will give us satisfaction that will flow with the expected environment for Christian Training Center.

1.2 AIM AND OBJECTIVES

1.2.1 Aim

The aim of this work is to design or create a good and befitting architectural WOFBI centre for spiritual (Leadership) learning (training) through a modern architectural edifice.

1.2.2 Objectives.

The major objectives of the project include:

(i) To provide facilities that will satisfy the explicit and implicit requirements for short term leadership training Word of Faith Bible Institute for Living Faith Church, Goshen and also for Christian research studies.

(ii) To articulate building design concept and form capable of enhancing better outputs for students and occupants;

(iii) To create positive indoor and outdoor climate that will encourage devotional study and communion through the use of effective modern building material and technique.

(iv) To create a design that will give rise to adequate circulation network within the institute by the use of adequate anthropometrics of space for sitting in the lecture theater, moving and also with a proper acoustics and lighting solution via the use of acoustics materials and adequate fenestration.

1.3 SCOPE OF PROJECT

The scope of this work is primarily targeted and limited to its end user requirements and distinctiveness that emphasizes facilities for short term intensive training through the following facilities;

- Administrative/ Training centre
- Accommodation facilities
- Auxiliary facilities

1.4 LIMITATION OF STUDY

The most potent limitation in this study is the dearth of documentation on spiritual leadership training centres that is proposed – built across the globe while with internet sources providing work based on a formal school structure as against short-term facilities. Constraints of time and money also presented formidable limitation in the research process.

1.5 CONTRIBUTION TO KNOWLEDGE

This proposal provides the much needed and appropriate brief or manual for short-term training centres and establishes a conducive architectural setting expressive of the serenity and environmental climate, use of modern materials, modern techniques of construction for effective impartation in a spiritual leadership training centre. It presents the essential parameters to be explored in the direction of enhancing inspiration.

1.6 RESEARCH METHODOLOGY

The two basic sources of generating data were exploited for this work namely:

(i) Primary Source

(ii) Secondary Source

1.6.1 PRIMARY SOURCE

Primary data from primary source were generated by:

(a) The use of oral interview to obtain direct user inputs with the aid of research schedule to elicit such vital requirements like functions and activities anticipated management structure, facilities, future requirement etc.

(b) Site investigation, inventory, characteristics and environment analysis.

(c) Interviews of professionals in related fields.

(d) Familiarization with Goshen city built environment.

1.6.2 SECONDARY SOURCES.

Secondary data were generated for the project through the following approach:

(a) Book review on similar projects, journals etc.

(b) Information or data exploration on the internet.

(c) Visits and study of existing similar projects.

The data generated will subsequently be analyzed and appropriately synthesized to produce this work following the enhanced understanding they will produce.

CHAPTER TWO

2.0 LITERATURE REVIEW.

The preceding chapter established the concern of this project as the creation of an architectural environment (indoor and outdoor), via modern architecture capable of enhancing impartation and inspiration that are central to Spiritual training/Leadership development. This chapter seeks to provide necessary framework and explanation of basic concepts and principles for the work through the review of relevant available literature.

2.1 MAN AND RELIGION

Ever since the history of mankind began, man has been practicing different forms of worship and piety. There was no nation on the earth unattached to a religion and performing its rites in one-way or another. This piety is an instinct, a natural feeling deeply rooted in man being. It can neither be hushed nor muted in an individual, nor prevented from sensing it or going towards it.

Yet, the instinct of piety and worship have not always being guided by soundness and purity; rather they, in most instance, have been deviated expressions and abnormal practices of worship; religion, in its pure state, is that which represented by monotheism, the path announced by the prophets and heralded by the apostles, for maintaining the correct mode of worship and to lead the caravan of mankind towards the shores of goodness and peace. So, the observer of the history of religious myth, and of devious worship in man's life, finds a variety of religious expressions. He finds heliolatry, astrolatry, idolatry, zoolatry, pyrolatry and worship of manacles etc. means of reaching out with God, fellowshipping and communicating with God

Encyclopedia Britannica (Macropaedia) defines religion as "**human being's relations to which they regard as holy, sacred, spiritual or divine**". It is figured as consisting of personal relationship with God, or to gods or spirits. Sociologists and human scientists see it as system of behavioural patterns, which a group of people undertake in dealing with the ultimate problems of life. Religions, according to Okuwobi (1977), encompass every aspect of human endeavour and thus can be said to be a way of life that an individual or people devote themselves to.

The most basic element of religion is worship while other include(s) belief in supernatural powers, belief in the holy or sacred, system of rituals, sinful acts, and the method of salvation, liturgy and ideology and finally place of worship.

Akinduro (2002), according to him, religion is expressed in two major ways namely; mediation and ritual. There are two distinct lines of religious traditions across the world, they are;

(i) Monotheism – belief in one God which stems from Judaism and includes others like Zoroastrianism, Christianity and Islam.
(ii) Polytheism – belief anchored in pluralism of gods, they include Indian religions like Hinduism, Buddhism, Sikhism, Eastern religion such as Taoism, Confucianism and Shintoism, African religions and those of North Americans Indians and Australians etc.

2.2 CHRISTIANITY

Christianity is a religion based on the person and teaching of Jesus Christ, or its beliefs and practice. Christianity goes beyond following the teachings of Jesus Christ…. Anybody can follow His teachings but Christianity is believing in your heart that Jesus Christ is God who came to us in the flesh, died and rose again so that

we can however, live with God permanently when we leave this earth. Christianity teaches that there is only one God in all existence, that God is seen in the Trinity, that Jesus Christ is God in flesh, that, salvation is by grace through faith alone, that Jesus died on the Cross and that Jesus rose from the dead in a glorified, physical body. Christianity is a monotheism religion whose adherents believe that Jesus of Nazareth is the son of God and Saviour. Christianity developed out of a sect of Judaism that believed Jesus was the Messiah prophesied in the Old Testament. The main tenet of Christianity is that Jesus resurrected from the dead.

Notable sects are the orthodox that is Roman Catholic, the Protestants and the new generation of Pentecostals. The Church is a place of worship or agent of the spread of Christianity and was established as a result of Jesus disciples' obedience to the great commission or the royal charter given by Christ in Matthew 28:18-20 …. "but ye shall receive power, after the Holy Ghost is come upon you and ye shall be witness unto me both in Jerusalem and in all Judea, Samaria and unto the uttermost part of the earth (Acts 1:8).

So faithful and committed were the adherents that in spite of fierce persecution, the faith spread significantly across the nation of Israel and the rest of the world.

2.2.1 CHRISTIANITY IN NIGERIA

The first Christian contact in Nigeria occurred in the fifteenth (15^{th}) century when the Portuguese introduced Roman Catholicism. However, it was virtually extinguished over the following 200 years until Roman Catholic Church Missionaries returned in the 1800s. Since then, the Catholic Church has grown and now claims approximately 19 million members and adherents; mainly in the Southern part of Nigeria.

The first Protestant missionaries to Nigeria were Wesleyan Methodist; they began work in the Southwest among the Yoruba in 1842. Other Protestant group followed: Church Missionary Society (Evangelical Anglican, it was not until the 19th Century that there was a re-entry occasioned by many factors including Evangelical wave of piety surging through Britain and beyond the political revolution and France and America and the abolition of slave trade. Prominent among the early sects in Nigeria were:

(i) The Baptist (1845) through the pioneering work of Rev. Alfred Saker, Rev. Thomas Bowen and Rev. Hope Masterton Waddell.
(ii) Methodist (1842) by Thomas Birch Freeman.
(iii) Anglican (1845) by Rev. & Mrs. Townsend, Rev. & Mrs. C.A. Golimev and Rev. & Mrs. Samuel Ajayi Crowder.
(iv) Roman Catholic (1860).

The Church in Nigeria today is a Conglomeration of many denominations including the Orthodox, Protestants, Syncretic and Pentecostals. Despite ecumenical tides, unification has largely been impossible on the ground of divergent views such as the:

- Liturgy
- Church order
- Ministry

Although there are avenues of cooperation like the Bible Society of Nigeria, Christian Association of Nigeria and Pentecostal Fellowship of Nigeria to mention a few, each sect strongly guards its own distinctive peculiarities.

2.2.2. **LIVING FAITH CHURCH WORLDWIDE (A.K.A WINNERS).**

HOW IT ALL BEGAN AS TOLD BY THE FOUNDER

The emergency of the church is called Liberation Mandate.

The Liberation Mandate is what they refer to as the commission**,** everything started from there. It was delivered on a most dramatic and awesome platform. The following was how the mandate was delivered:

Bishop David O. Oyedepo on a trip to Ilesha, now in Osun State of Nigeria on May 1st, 1981, to check on how a Christian friend fairs. For he had not heard from him, for some time. He was concerned, not knowing if he needed any form of attention. This was how he came into his place of encounter. He got to this brother's place, but he wasn't there. There was a note on his door announcing that he had travelled. Something gracious came out of him – he said all things work together to the advantage of them that love the Lord. It was soothing; he felt no disappointment at all!

He said the Holy Spirit told him to **look out for a quiet place, that he wants to talk to him.** This became a timely instruction, because he had quite a lot of Christian friends in that town and he could have had a lot of fun being with them that day. However, He obeyed the voice of the Holy Spirit, and asked a passerby if there was any hotel on the outskirts of the town, where he could lodge. And that was how he met with his destiny! The quiet place he got was one International Hotel, Ilesha. It was a deteriorating hotel, and he disliked the state of both the building and in particular the room. But he said he knew from his heart that he had to be there. As he knelt down, to give thanks in that unfit room, the encounter began. This lasted for eighteen hours. He had a great vision, where he saw a lineup of the afflicted and

Oppressed, broken, beaten, and battered, the blind, the lame and the wretched. He said he saw all kinds of deformities, that he was greatly bewildered. He heard their wailing as they filed past him he said. Their groaning was so intense that he could feel their pains.

He could not help it, and so he began to cry and sobbed along with them. He asked from the Lord, what is this? And he heard God said to him, **that from the beginning it was not so.** Then he broke down in tears. In the midst of all that he kept asking, the lord, but why?" And God said to him that, **from the beginning it was not so and that now, the hour has come to liberate the world from all oppressions of the devil, through the preaching of the word of faith; and that he is sending him to undertake this task.**

He said his sobbing became more intense, and he asked the lord why him. He said he had always thought he would remain in the helping ministry, where he would be a blessing to the kingdom through his giving and services. However, he rose from the eighteen-hour long vision fully persuaded of God's call upon his life into the ministry. This was how Bishop David O. Oyedepo received the Liberation Mandate.

He spent the next few days analyzing the content of the vision, and for him to understand its import, so as to know how to carry it out.

He came to discover that the Liberation Mandate defined four vital issues:

The task: To liberate mankind from all oppressions of the devil;

The target: the world;

The tool: The preaching of the Word of Faith; and

The time: Now – And now the hour has come.

Therefore, the church is clearly a word of Faith Ministry.

By the 8th of May, 1981, He convened a meeting of some friends, to share this heavenly vision with them, so as to ask them to join in prayers for the execution of this heavenly mandate. This meeting was held in one of the lecture rooms, at United Missionary Theological Chapel in Ilorin, Kwara State, Nigeria. They were about eighteen in number.

It was that group that metamorphosed into what came to be known as **"Power House"**, they were made up of about seventy young men and women that formed a prayer and fasting chain. They served as a forum for vision sharing, monitoring and other spiritual engagement towards driving the vision.

There are a number of the Power House faithful's who are still very much active in the church till date. Prominent among them is Faith Oyedepo, the first one to ever hear the vision shared and who has been standing with him since then (they were in courtship then and preparing to get married).

Another member of the Power House is David Abioye, his most consistent, faithful and profitable son in the gospel for over 30 years now. He said, others who are ministers and leaders in the church today include Olatunji Adeyemi, Nathan and Charity Ichor, Olufemi Modupe, and Isaac Oladapo.

Also, he had the understanding that it was vision for the now and not for the future. So he took immediate steps to see how to establish a weekly faith-based fellowship and by the Hand of the Lord, they secured the ECWA Youth Centre facility in Ilorin for a weekly Friday fellowship.

The inaugural fellowship known as Faith Liberation Hour was held on the 24th of May, 1981. They also held a monthly weekend seminar every Friday and

Saturday. Within a year, the Faith Liberation Hour had become a household name particularly among youths and young adults in Ilorin where they began.

The Power House was in place from May 1981 until September 1983 when the church was officially commissioned.

The Church has a compelling vision and passion for world evangelism and is committed to establishing model worship centers in every culture and community of the world. The Church strictly believes in the divine inspiration of the Bible and takes the Bible as a final authority and basis for Christian conduct and work. It demonstrates an unyielding faith in holiness, discipline, integrity and evangelism. These have today made the church as an icon. Thus, besides the need to train its various category of church members, for effectiveness and missions, the church also has the challenge, and ministry of helping in the training of members/workers of other denominations. Teaching ministry has been indisputable, and proven ministry of the church, which is being pursued without distraction, and with a profound sense of accountability, irrespective of the cost.

Finally, World of Faith Bible Institute (WOFBI), as one of the arm of Liberation Hour, becomes a central project for the church, in view of the enormous size of its membership, and to make training accessible to the majority, without sacrificing standards and uniformity, a good and feasible option is to decentralize the training outlet, to the states of the federation but Goshen centre to take care of indigenous and foreign students to Nigeria, either Full time or Part-time training being the Mission Headquarter.

2.3. HISTORICAL BACKGROUND OF CAMPING

Mattson (1980) documented that the first church camp was by the Reverend George W. Hinkey in 1880 when he took seven boys on a camping trip to Gardner's

Island near Wakefield: Rhode Island. Vash (1982) reported that Judea Christians used wilderness sojourns for retreat and purification as did their sage (Moses, Isaac, John the Baptist as well as the Lord Jesus Christ).

Camping offers a number of privileges including:

- ✓ A learning environment;
- ✓ Freedom of distraction and disturbances;
- ✓ Full concentration and meditation;
- ✓ Prayer and renewal;
- ✓ Inspiration and revelation; and
- ✓ Counselling and teaching.

Omofade (2002) stressed the requirement for Christian camp saying that it is believed that camp architecture should reward quests expectations of escaping everybody environment to "a place apart". Thus it should be a place that will leave a lasting impression in the minds of students.

2.4.0 TRAINING CENTRE

A site/facility accommodating specific training programmes that are small/large group oriented and provided primarily for interpersonal, educational, and individual reflective experiences. Typically, programmes are for designed duration depending on the purpose and nature of training. It can be short, medium, or long term training (Bible school, Seminary or Theological University).

Facilities are characterized by a qunt, non-active environment, comfortable housing, and small-group orientation.

2.4.1 LEADERSHIP TRAINING CENTRE

This is a version of Christian camping of formal and specified nature. Knapp (1990) reported that school camping dates back to 1823 when the First was established in North Hampton Massachusetts.

Leadership has been described as “a process of social influence in which a person can enlist the aid and support of others in the accomplishment of a common task”. Studies of leadership have produced theories involving traits, situational interaction, function, behaviour, power, vision and values, charisma and intelligence, among others. Leadership to some, leadership is determined by distinctive dispositional characteristics present at birth e.g. extraversion, intelligence, ingenuity. However, according to Forsyth (2009) there is evidence to show that leadership also develops through hard work and careful observation. Thus, effective leadership can result from nature as well as nurture (i.e. acquired skills).

In religions and spiritual use, training may refer to the purification of mind, heart, understanding and actions to obtain a variety of spiritual goals such as (for example) closeness to God or freedom from suffering. Note for example the institutionalized spiritual training of threefold training in Buddhism, meditation in Hinduism or discipleship in Christianity. These aspect of training can be short term or last a lifetime depending on the context of the training.

Training is teaching, or development in oneself or others, any skills and knowledge that relate to specific useful competencies. Training has specific goals of improving one’s capability, capacity, productivity and performance.

The school’s leadership and training centre is further expression of the school’s commitment to growing successful people across and beyond the school training but express Leadership Development.

3.0 CHAPTER THREE

3.1 INTRODUCTION

The experience of using modern building materials for sustainable architecture in Nigeria is no longer doubt. However, the call to evolve it into a "Nigeria Architecture" remains central amongst professionals in the building industry.

Via case study, it was reveals that modern building materials for sustainable architecture has not been fully understood and applied in many developing nations, Nigeria inclusive but the move for modern materials for sustainable architecture in Nigeria is on exponential order of movement.

The "New" or "Modern post war architecture engendered new attitude to architectures such as volume and not mass, the reliance on new materials like reinforced concrete, steel and glass which rendered conventional construction absolute and the emergence of machine esthetics among other (Kostof 1995).

The architecture is concerned with the planning, design and construction of buildings of any kind, and the provision of physical/social amenities for convenient human use. With the purpose that they seemingly contribute to the mental health, power and pleasure of the users.

3.1.1 WHAT IS BUILDING MATERIALS

Building materials is any materials which is used for construction purposes. Many naturally occurring substances, such as clay, rocks, and wood even twigs and leaves, have been used to construct buildings. Apart from naturally occurring materials, many man-made products are in use, some more and some less synthetic. The manufacture of building materials is established industry in many countries and the

Use of these materials is typically segmented into specific trades, such as carpentry, insulation, plumbing and roofing work.

Building materials can be generally categorized into two sources, Natural and Synthetic. Natural building materials are those that are unprocessed or minimally processed by industry, such as lumber or glass. Synthetic materials are made in industrial settings after much human manipulations, such as plastics and petroleum based paints. Both have their uses. Mud, stone, and fibrous plants are the most basic building materials, aside from tents made of flexible materials such as cloth or skins, people all over the world have used these three materials together to create homes to suit their local weather condition (The constructor). In general stone and/or brush are used as basic structural components in these buildings, while mud is used to fill in the space between, acting as a concrete insulation.

3.1.2 NATURALLY OCCURING BUILDING MATERIALS

Brush

Brush structures are built entirely from plant parts and were used in primitive cultures such as Native Americans,[2] pygmy peoples in Africa[3] These are built mostly with branches, twigs and leaves, and bark, similar to a beaver's lodge. These were variously named wikiups, lean-tos, and so forth.

An extension on the brush building idea is the wattle and daub process in which clay soils or dung, usually cow, are used to fill in and cover a woven brush structure. This gives the structure more thermal mass and strength. Wattle and daub is one of the oldest building techniques.[4] Many older timber frame buildings incorporate wattle and daub as non-load bearing walls between the timber frames.

Ice and snow

Snow and occasionally ice were used by the Inuit peoples for igloos and snow is used to build a shelter called a quinzhee. Ice has also been used for ice hotels as a tourist attraction in northern climates.

Mud and clay

Clay based buildings usually come in two distinct types. One being when the walls are made directly with the mud mixture, and the other being walls built by stacking air-dried building blocks called mud bricks.

Other uses of clay in building is combined with straws to create light clay, wattle and daub, and mud plaster.

Wet-laid clay walls

Wet-laid, or damp, walls are made by using the mud or clay mixture directly without forming blocks and drying them first. The amount of and type of each material in the mixture used leads to different styles of buildings. The deciding factor is usually connected with the quality of the soil being used. Larger amounts of clay are usually employed in building with cob, while low-clay soil is usually associated with sod house or sod roof construction. The other main ingredients include more or less sand/gravel and straw/grasses. Rammed earth is both an old and newer take on creating walls, once made by compacting clay soils between planks by hand; nowadays forms and mechanical pneumatic compressors are used.

Soil, and especially clay, provides good thermal mass; it is very good at keeping temperatures at a constant level. Homes built with earth tend to be naturally cool in the summer heat and warm in cold weather. Clay holds heat or cold, releasing it over a period of time like stone. Earthen walls change temperature slowly, so artificially

raising or lowering the temperature can use more resources than in say a wood built house, but the heat/coolness stays longer.

Peoples building with mostly dirt and clay, such as cob, sod, and adobe, created homes that have been built for centuries in western and northern Europe, Asia, as well as the rest of the world, and continue to be built, though on a smaller scale. Some of these buildings have remained habitable for hundreds of years.

Structural clay blocks and bricks

Mud-bricks, also known by their Spanish name adobe are ancient building materials with evidence dating back thousands of years BC. Compressed earth blocks are a more modern type of brick used for building more frequently in industrialized society since the building blocks can be manufactured off site in a centralized location at a brickworks and transported to multiple building locations. These blocks can also be monetized more easily and sold.

Structural mud bricks are almost always made using clay, often clay soil and a binder are the only ingredients used, but other ingredients can include sand, lime, concrete, stone and other binders. The formed or compressed block is then air dried and can be laid dry or with a mortar or clay slip.

Sand

Sand is used with cement, and sometimes lime, to make mortar for masonry work and plaster. Sand is also used as a part of the concrete mix. An important low-cost building material in countries with high sand content soils is the Sandcrete block, which is weaker but cheaper than fired clay bricks.

Stone or Rock

Rock structures have existed for as long as history can recall. It is the longest lasting building material available, and is usually readily available. There are many types of rock throughout the world, all with differing attributes that make them better or worse for particular uses. Rock is a very dense material so it gives a lot of protection too; its main drawback as a material is its weight and awkwardness. Its energy density is also considered a big drawback, as stone is hard to keep warm without using large amounts of heating resources.

Dry-stone walls have been built for as long as humans have put one stone on top of another. Eventually, different forms of mortar were used to hold the stones together, cement being the most commonplace now.

The granite-strewn uplands of Dartmoor National Park, United Kingdom, for example, provided ample resources for early settlers. Circular huts were constructed from loose granite rocks throughout the Neolithic and early Bronze Age, and the remains of an estimated 5,000 can still be seen today. Granite continued to be used throughout the medieval period (see Dartmoor longhouse) and into modern times. Slate is another stone type, commonly used as roofing material in the United Kingdom and other parts of the world where it is found.

Stone buildings can be seen in most major cities; some civilizations built entirely with stone such as the Egyptian and Aztec pyramids and the structures of the Inca civilization.

Thatch

Thatch is one of the oldest of building materials known; grass is a good insulator and easily harvested.

Many African tribes have lived in homes made completely of grasses and sand year-round. In Europe, thatch roofs on homes were once prevalent but the material fell out of favor as industrialization and improved transport increased the availability of other materials. Today, though, the practice is undergoing a revival. In the Netherlands, for instance, many new buildings have thatched roofs with special ridge tiles on top.

Wood and timber

Wood has been used as a building material for thousands of years in its natural state. Today, engineered wood is becoming very common in industrialized countries.

Wood is a product of trees, and sometimes other fibrous plants, used for construction purposes when cut or pressed into lumber and timber, such as boards, planks and similar materials. It is a generic building material and is used in building just about any type of structure in most climates. Wood can be very flexible under loads, keeping strength while bending, and is incredibly strong when compressed vertically. There are many differing qualities to the different types of wood, even among same tree species. This means specific species are better suited for various uses than others. And growing conditions are important for deciding quality.

"Timber" is the term used for construction purposes except the term "lumber" is used in the United States. Raw wood (a log, trunk, bole) becomes timber when the wood has been "converted" (sawn, hewn, split) in the forms of minimally-processed logs stacked on top of each other, timber frame construction, and light-frame construction. The main problems with timber structures are fire risk and moisture-related problems.

In modern times softwood is used as a lower-value bulk material, whereas hardwood is usually used for finishing and furniture. Historically timber frame structures were built with oak in Western Europe, recently Douglas has become the most popular wood for most types of structural building.

Many families or communities, in rural areas, have a personal woodlot from which the family or community will grow and harvest trees to build with or sell. These lots are tended to like a garden. This was much more prevalent in pre-industrial times, when laws existed as to the amount of wood one could cut at any one time to ensure there would be a supply of timber for the future, but is still a viable form of agriculture.

3.1.3 MAN-MADE SUBSTANCES

Fired bricks and clay blocks

Bricks are made in a similar way to mud-bricks except without the fibrous binder such as straw and are fired ("burned" in a brick clamp or kiln) after they have air-dried to permanently harden them. Kiln fired clay bricks are a ceramic material. Fired bricks can be solid or have hollow cavities to aid in drying and make them lighter and easier to transport. The individual bricks are placed upon each other in courses using mortar. Successive courses being used to build up walls, arches, and other architectural elements. Fired brick walls are usually substantially thinner than cob/adobe while keeping the same vertical strength. They require more energy to create but are easier to transport and store, and are lighter than stone blocks. Romans extensively used fired brick of a shape and type now called Roman bricks.[11] Building with brick gained much popularity in the mid-18th century and

19th centuries. This was due to lower costs with increases in brick manufacturing and fire-safety in the ever crowding cities.

The cinder block supplemented or replaced fired bricks in the late 20th century often being used for the inner parts of masonry walls and by themselves.

Structural clay tiles (clay blocks) are clay or terracotta and typically are perforated with holes.

Cement composites

Cement bonded composites are made of hydrated cement paste that binds wood, particles, or fibers to make pre-cast building components. Various fiberous materials, including paper, fiberglass, and carbon-fiber have been used as binders.

Wood and natural fibers are composed of various soluble organic compounds like carbohydrates, glycosides and phenolic. These compounds are known to retard cement setting. Therefore, before using a wood in making cement bonded composites, its compatibility with cement is assessed.

Wood-cement compatibility is the ratio of a parameter related to the property of a wood-cement composite to that of a neat cement paste. The compatibility is often expressed as a percentage value. To determine wood-cement compatibility, methods based on different properties are used, such as, hydration characteristics, strength, interfacial bond and morphology. Various methods are used by researchers such as the measurement of hydration characteristics of a cement-aggregate mix; the comparison of the mechanical properties of cement-aggregate mixes and the visual assessment of microstructural properties of the wood-cement mixes. It has been found that the hydration test by measuring the change in hydration temperature with time is the most convenient method. Recently, Karade et al. have reviewed these

Methods of compatibility assessment and suggested a method based on the ‘maturity concept’ i.e. taking in consideration both time and temperature of cement hydration reaction.

Bricks were laid in lime mortar from the time of the Romans until supplanted by Portland cement mortar in the early 20th century. Cement blocks also sometimes are filled with grout or covered with a parge coat.

Concrete

Concrete is a composite building material made from the combination of aggregate and a binder such as cement. The most common form of concrete is Portland cement concrete, which consists of mineral aggregate (generally gravel and sand), Portland cement and water.

After mixing, the cement hydrates and eventually hardens into a stone-like material. When used in the generic sense, this is the material referred to by the term "concrete".

For a concrete construction of any size, as concrete has a rather low tensile strength, it is generally strengthened using steel rods or bars (known as rebars). This strengthened concrete is then referred to as reinforced concrete. In order to minimize any air bubbles that would weaken the structure, a vibrator is used to eliminate any air that has been entrained when the liquid concrete mix is poured around the ironwork. Concrete has been the predominant building material in the modern age due to its longevity, formability, and ease of transport. Recent advancements, such as insulating concrete forms, combine the concrete forming and other construction steps (installation of insulation). All materials must be taken in required proportions as described in standards.

Fabric

The tent is the home of choice among nomadic groups all over the world. Two well-known types include the conical teepee and the circular yurt. The tent has been revived as a major construction technique with the development of tensile architecture and synthetic fabrics. Modern buildings can be made of flexible material such as fabric membranes, and supported by a system of steel cables, rigid or internal, or by air pressure.

Foam

Recently, synthetic polystyrene or polyurethane foam has been used in combination with structural materials, such as concrete. It is lightweight, easily shaped, and an excellent insulator. Foam is usually used as part of a structural insulated panel, wherein the foam is sandwiched between wood and cement or insulating concrete forms.

Glass

Glassmaking is considered an art form as well as an industrial process or material.

Clear windows have been used since the invention of glass to cover small openings in a building. Glass panes provided humans with the ability to both let light into rooms while at the same time keeping inclement weather outside.

Glass is generally made from mixtures of sand and silicates, in a very hot fire stove called a kiln, and is very brittle. Additives are often included the mixture used to produce glass with shades of colors or various characteristics (such as bulletproof glass or light remittance).

The use of glass in architectural buildings has become very popular in the modern culture. Glass "curtain walls" can be used to cover the entire facade of a building, or it can be used to span over a wide roof structure in a "space frame". These uses though require some sort of frame to hold sections of glass together, as glass by itself is too brittle and would require an overly large kiln to be used to span such large areas by itself.

Glass bricks were invented in the early 20th century.

Gypcrete

Gypcrete is a mixture of gypsum plaster and fibre glass rovings. Although plaster and fibres fibrous plaster have been used for many years, especially for ceilings, it was not until the early 1990s that serious studies of the strength and qualities of a walling system Rapid wall, using a mixture of gypsum plaster and 300mm plus fibre glass rovings, were investigated. It was discovered, through testing at the University of Adelaide, that these walls had significant, load bearing, shear and lateral resistance together with earthquake-resistance, fire-resistance, and thermal properties. With an abundance of gypsum (naturally occurring and by-product chemical FGD and phospho gypsums) available worldwide, gypcrete-based building products, which are fully recyclable, offer significant environmental benefits.

Metal

Metal is used as structural framework for larger buildings such as skyscrapers, or as an external surface covering. There are many types of metals used for building. Metal figures quite prominently in prefabricated structures such as the Quonset hut, and can be seen used in most cosmopolitan cities. It requires a great deal of human labor to produce metal, especially in the large amounts needed for the building industries. Corrosion is metal's prime enemy when it comes to longevity.

- Steel is a metal alloy whose major component is iron, and is the usual choice for metal structural building materials. It is strong, flexible, and if refined well and/or treated lasts a long time.

- The lower density and better corrosion resistance of aluminum alloys and tin sometimes overcome their greater cost.
- Copper is a valued building material because of its advantageous properties (see: Copper in architecture). These include corrosion resistance, durability, low thermal movement, light weight, radio frequency shielding, lightning protection, sustainability, recyclability, and a wide range of finishes. Copper is incorporated into roofing, flashing, gutters, downspouts, domes, spires, vaults, wall cladding, building expansion joints, and indoor design elements.
- Other metals used include chrome, gold, silver, and titanium. Titanium can be used for structural purposes, but it is much more expensive than steel. Chrome, gold, and silver are used as decoration, because these materials are expensive and lack structural qualities such as tensile strength or hardness.

Plastics

The term "plastics" covers a range of synthetic or semi-synthetic organic condensation or polymerization products that can be molded or extruded into objects, films, or fibers. Their name is derived from the fact that in their semi-liquid state they are malleable, or have the property of plasticity. Plastics vary immensely in heat tolerance, hardness, and resiliency. Combined with this adaptability, the general uniformity of composition and lightness of plastics ensures their use in almost all industrial applications today.

Papers and Membranes

Building papers and membranes are used for many reasons in construction. One of the oldest building papers is red rosin paper which was known to be in use before 1850 and was used as an underlayment in exterior walls, roofs, and floors and for protecting a jobsite during construction. Tar paper was invented late in the 19th century and was used for similar purposes as rosin paper and for gravel roofs. Tar paper has largely fallen out of use supplanted by asphalt felt paper. Felt paper has been supplanted in some uses by synthetic underlayment, particularly in roofing by synthetic underlayment and siding by house wraps.

There are a wide variety of damp proofing and waterproofing membranes used for roofing, basement waterproofing, and geomembranes.

Ceramics

Fired clay bricks have been used since the time of the Romans. Special tiles are used for roofing, siding, flooring, ceilings, pipes, flue liners, and more.

3.1.4 SUSTAINABLE MODERN MATERIALS IN NIGERIA

Natural and man-made building materials are good for building construction. It can be difficult to assess exactly how a product is and which materials are preferable to others. The evaluation tools such as life-cycle analysis, embodied energy, Environmental labelling, other criteria, Renewable resources, sustainable resources,

local resources, toxicity, quality, Re-use and recycling are used in choosing a sustainable building materials.

The concept of sustainable building incorporates and integrates a variety of strategies during the design of a building, construction and operation of building projects. The use of modern sustainable building materials and products represents are important strategy in the design of a building especially the design of public building like World of Faith Bible Institute (WOFBI).

In design concept, the choosing of building materials is very paramount for the design, the modern sustainable building materials offer specific benefits to the building owner and the end users.

- Reduced maintenance/replacement cost over the life of the building.
- Energy conservation.
- Improved occupant health and productivity.
- Lower costs associated with changing space configurations.
- Greater design flexibility.

In the school of architecture, building and construction activities worldwide consume 3 Billion tons of raw materials each year or 40 percent of total global use (Roodman and Lenssen, 1995.) using sustainable building materials and products promotes conservation of dwindling non-renewable resources internally. Finally, integrating modern sustainable building materials into building project can help reduce the environmental impacts associated with the following:

- Extraction
- Transportation
- Processing

- Fabrication
- Installation
- Re-use
- Recycling
- And disposal of these building industry source materials.

3.2 DESIGNS WITH CLIMATE

Climate is a major factor influencing building form, orientation and design. The objective of designing with climate is to ensure thermal comfort, which varies climate. Ajibola and Adunola (2002) argued that generalized zonal climate characteristics are inadequate for use. The variation in micro climate conditions is necessary as they can negate generalized design solutions thus there is need according to Ogunsote (1991) basic climate data for every project should be obtained and analyze such date for appropriate climate design. Waston (1982) observed that a wide variation of climate conditions can occur as a function of:

- Local water bodies;
- Changes in elevation; and
- Vegetation and land contours.

The required data for analyses include: temperature, humidity, vapour pressure, precipitation, wind, solar radiation, cloud cover and other phenomena usually available from meteorological stations. Ogunsote (ibid) stressed that what is needed about these data are average for at least 5-10 years. From these analyses, an effective temperature Isopleth must be prepared and periods of over headings identified for optimum solar control it is necessary to determine when controls are exactly needed. The effective temperature Isopleth gives graphic display of the impact of solar radiation on environmental comfort, which can be very profound in the tropics.

Koenigsberger et al (1973) pointed out that the aim of climate based design is to ensure the best possible indoor thermal conditions by relying on structural controls to obviate the need for mechanical controls. Four methods of reducing solar heat gain through opening include:

- Orientation and window size;
- Internal blinds;
- Special glasses;
- External shading devices in the form of
  - Horizontal
  - Vertical and
  - Eggerate

These data provide a reliable idea of external condition outside the building enclosure. In modern architecture the used of new materials for design is very common, according to Prucimal - Ogunsote (AACHES journal volume 1, No.6) high top architecture is an architecture of glass boxes. The building in that trend is extra modern and the use of high technologies, reflective glass and central air conditioning are considered in design of such building.

3.2.1 SOLAR RADIATION AND THE DESIGN PROCESS

The behaviour of the sun and its radiation is of great importance to the architect in terms of the effects on architecture, building materials and the environment. The fundamental rules for orientation and solar control require the precise study of solar angle of incidence. Each façade of a building must be studied separately to achieve solar control. The roofs, walls, openings and the surrounding environment of a building are the exposed surfaces to the incident rays of the sun.

Major problems arising from this include:

- Penetration of solar rays into the building interior
- Glare
- Heat transmission to the building by surrounding surfaces
- Internal heat build-up through roofs, walls and other building elements exposed to the sun
- Deterioration and behaviour of building materials exposed to direct sunrays.

  Effects of external climatic variables such as outdoor temperatures, humidity, air velocity, solar radiation etc. on exposed building materials are quite considerable.

  They impinge on the durability, aesthetic value and the maintenance of such Items.

  Hence the properties and adaptability of materials to the climate must be confirmed before their recommendation for use. Some of the effects include:
- Degrading of plastic materials and surface finishes like paints.
- Warping
- Corrosion of metals
- Fungi
- Attack by micro-organisms and termites
- Cracking and movement in concrete

3.2.2 SOLAR RADIATION CONTROLS

The most important part of a tropical building that must be protected from solar radiation according to Adeyemi-Adegboye (1996) includes:

- The roof

- The wall and
- The openings

None of these building components will, significantly, enhance thermal within the building structure.

Roof Protection

By its location at the zenith of the building structure, the roof is the component of the building that first encounters solar radiation directly. It is the most intensely hit and, depending by the qualities of the roofing materials, the amount of heat gain and transmitted can vary. Devices adopted for thermal control include:

- Use of water pool on concrete tops
- Use of high fenestration to vamp rising hot air in the interior
- Use of double roofs
- Use of high reflective roofing materials and colours
- Use of solar slabs on roof tops

Wall Protection

Devices for its protection include

- Use of projected eaves, cantilevered and deep verandahs
- Use of vertical screens
- Use of trees and vegetal items
- Use of cladding material

Protection of Openings

For the protection of openings, a number of solar penetration controls are

available and choice of a most suitable one is a product of careful consideration. An efficient control device therefore should take the following into consideration:

- Minimizing of glare and reduction of eye-strain
- Maximization of solar heat entering rooms in winter
- Protection against rain and wind
- Provision of adequate ventilation at all times
- Control of insects, dirt and dust
- Provision of privacy where needed
- Adequate exterior view
- Maintenance cost versus original cost of sum control device
- Exterior appearance of the chosen devices

3.2.3 Methods of Curbing Solar Radiation

Methods employed in curbing solar radiation can be classified broadly into:

Natural Devices – These include the effective use of building orientation, trees, shrubs and landscaping in general

Internal Devices - These involve the use of curtains, metal venetian blinds, application of various film coatings or chemical spray on glasses used as in-filling.

External Devices – These entail the use of structural elements like roof overhangs, louvers, sun shading like horizontal, vertical or a combination of both to form egg crate.

3.3 FACTORS AFFECTING THERMAL COMFORT – MODERN ARCHITECTURE.

Thermal comfort inside the building according to Ogunsote (ibid) is a product of six factors including:

- Air temperature;
- Mean radiant temperature;
- Air velocity;
- Relative humidity;
- Intrinsic clothing; and
- Level of activity.

The first four are factors of the thermal environment.

3.3.1 Thermal Indices

For practical design purposes, a scale that will give the combined effect of the six thermal comfort factors is required and referred to as thermal index. There are many developed indices but mostly commonly used is the Effective temperature (ET) index.

3.3.2 DESIGN OF SHADING DEVICES

Ogunsote (ibid) put forward four (4) major steps to be taken in the design of shading devices

(a) **Step One**

Determination of when shading is required that is at what times of the and at what hours of the day. This is done by defining the overheated sand under

heated periods using the effective temperature monogram

(b) **Step Two**

Identification of the position of the sun at the times when shading is required using the sun-path diagram.

(c) **Step Three**

Determining the dimensions and proportion of the shading device required using the shadow angle protector

(d) **Step Four**

Choosing between pre-fabricated devices or designing new ones taking cognizance of aesthetic and structural factors.

3.4 VENTILATION AND AIR FLOW IN BUILDINGS

Ventilation is the replacement of used inside air within an enclosure by outside air and it serves three major purposes:

- Supply of fresh air
- Body cooling and;
- Structural cooling or heating

Thus ventilation is a major design consideration that can significantly affect thermal comfort within the enclosure. Natural ventilation is ventilation achieved without mechanical aids, but by stack effect and wind pressure. It is enhanced by placing openings in openings in opposite or adjacent walls of the enclosure. Air movement through buildings can be induced by stack effect, wind pressure or mechanical means. Ogunsote (ibid) identified factors that affect air flow through buildings to include:

- External features and factors
- Number and size of openings
- Position of openings and;
- Opening components.

Air flow around buildings is determined by the:

- Shape
- Height
- Orientation
- Planning of buildings

3.5 CLIMATE SITE ANALYSIS

The first step is the design process involves pre-design analysis including site analysis. The site analysis helps in two ways;

- Determining the best of available site options for a project
- Optimizing the use of site advantages and mitigating the disadvantages

Site analyses that can be beneficial to good site planning according to Ogunsote (ibid) include:

- Physical site analysis – analysis of type, depth and strength of soil for foundation purposes.
- Infrastructural site analysis – existing buildings, roads, path, and services.
- Ecological site analysis - mapping of ground cover/trees, plant and animal community pattern.

- Cultural site analysis – studies of the resident population
- Aesthetic site analysis – studies of the character of site, vistas, viewpoints, etc.
- Acoustic site analysis – mapping out sources of noise and means of protection.
- Climate site analysis – site climate details.

3.6 OUTDOOR SPACES AND LANDSCAPING

Fadamiro (2000) posited that provision of outdoor spaces in physical developments is very important as extensions of indoor spaces and as integral contributions to the quality of life in the neighborhood. The outdoor spaces must be well considered and ordered from the planning and design stage to understand in what manner they can complement interior activities.

Fairbrother (1920) put landscapes as the physical expression of land-use by man and posited that the designer must identify and remove all conflicting uses and amenities to create a pleasant composition. Mcartwright (1971) identified three dimension functions of open spaces to include provision of:

- Access to buildings;
- Light, sunshine and air; and
- Spots for people to converge for interaction.

Landscaping depends on the availability of such relevant natural resources as natural water, type of bedrock, existing plant species, buildings or scenes of architectural and historic interests, all of which should be used to the best advantage.

3.7 LANDSCAPE EFFECTS ON AIR FLOW

The landscape elements surrounding building structures (e.g. trees, shrubs,

Hedges, fences, hill etc.) have significant effects on the air flow pattern as well as the wind velocities. They tend to create low and high-pressure areas around the building in relation to the position of openings in them. It is therefore important to bear in mind the following factors when trying to control climatic effects via landscaping.

- In areas where the sun's warmth in winter is needed, deciduous trees should be used.
- If planted near a house, trees and grass allow the heavier cool air to flow inside, provided the house has low opening. High strip winds are therefore not desirable in such situation.
- The greater the number and size of trees and the larger the lawn, the more cooling there is.
- Shrubs may even increase heat levels if air circulation is cut off. Very low shrubs are therefore recommended.
- Wind-breaks may be necessary in order to keep out hot, dry winds in summer and winds in winter.
- Deciduous vines can be used to keep the sun out
- Radiation may be partially stopped by the use of a wall covered with vines. This creates a cool air space between the foliage and the wall.
- A roof can be covered in the same manner as wall and this has the effect of a double roof.
- Paving should be shaded as much as possible by trees and vines to prevent heat absorption and radiation
- Paving or any other type of artificial surfaces should be kept to a minimum in hot climates set away from openings and walls.

3.7.0 MECHANICAL FITTING EFFECT ON AIR CIRCULATION

The use of mechanical fitting like air-conditioning, cooling fan.

3.8 ARCHITECTURE AND SETTINGS

Settings are specific locations designed or non-designed generated by ecological, technological or cultural influences and experienced by people who encode and decode meaning from it. Relationships between designed settings and their context affect meaning. Most site project contains existing and or planned buildings. These buildings can serve as sculpture or can enclose space through the shaping of individual buildings or the arrangement of multiple buildings. Building and site can be designed to read as one entity, as the dynamic interplay between architecture and nature of the site, or as discrete entities (Motloch, 2001). Site and architecture work together to build common theme, sense of place and setting.

A successful setting is designed to promote intended use and desired behaviours. It achieves rapport with its physical and cultural context. It explores people – Environment relationships that promote landscape of high relevance and deep meaning. Placeness is the mental construct of the temporal – spatial experience as the individual ascribes meaning to settings, through environmental perception. It is the ability of the setting to evoke strong mental images and be remembered over extended periods of time.

This people – environment synergy is capable of stimulating deep personal spiritual meditation and intercourse in residents. Antecedents of these characteristics are common biblical features.

3.8.1 Spatial Feeding

While individuals interpret space differently, some generalizations can be made about emotional responses or feelings and characteristics of spaces that engender them.

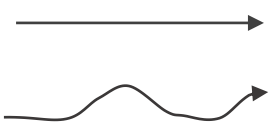
(a) Satisfaction: When spatial strata and elements of a space relate to one another the space feels unified or resolved. When its character is also appropriate to intended use and context, a feeling of satisfaction is evoked.
(b) Spiritually: Scale exaggeration, vertical thrusting to heaven, basic geometric shapes, pure white colour, excessively smooth textures, shafts of light and so on stimulate spirituality.
(c) Serenity and Solemnity Completely resolved relationships combined with dark, receding colours of low saturation can include solemnity, introspection and encourage one to reflect.

3.8.2 Circulation as Ordering Mechanism

Circulation can be explored as a means of structuring experience and as a generator of form.

Pedestrian Circulation

The design of pedestrian circulation can be considered in ways that include manner of movement, surfaces for movement, visual, spatial and temporal issues. Example of flow patterns:


direct

fluid

For spatial setting, pedestrian precinct must be distinct and separate from vehicular. Perception is formed as one move from place to another and the manner of movement affects the mental construct of the scenery.

Vehicular Circulation

Vehicular is to be deliberately restrictive and peripheral in concept to enhance pedestrian domination and serenity.

3.9 SUMMARY

Research findings regarding basic concepts and principles underlying the theme sub-theme of this project have been succinctly presented for relevant application in the conceptualization and actualization of the design proposal. The body of knowledge will enhance the quality of the project performance.

The experience of Sustainable Architecture in Nigeria is no longer in doubt. However, the call to evolve it into a "Nigeria Architecture" remains central amongst professionals in the building industry.

Via case study, it was reveals that sustainable Architecture has not been fully understood and applied in many developing nations, Nigeria inclusive but the move for sustainable Architecture in Nigeria is on exponential order of movement.

The foundation of sustainable Architecture was laid in Europe in the second decade of the 28th century in term of "CONCEPT" "MATERIALS" and "METHODOLOGIES". The "New" post war architecture engendered new attitudes to architecture such as volume and not mass, the reliance on new materials like reinforced concrete, steel and glass which rendered conventional construction absolute and the emergence of machine esthetics among other (Kostof 1995).

Building form is the major factors that brought about the use of modern building materials for sustainable architecture in Nigeria.

3.10 BUILDING DESIGN

It is important that building form, architectural style, detailing and materials contribute to the character of an area. This should contribute towards distinctiveness and avoid development that could be found anywhere. Particular attention should be given to landscape and building traditions, boundary treatments, mix of materials, scale and proportion. New buildings with sustainable building materials should fit in and make a positive contribution to their surroundings. The basis for any development should be to combine concerns for both sustainability and local distinctiveness.

3.11 BUILDING FORM

INTRODUCTION

Forms refers to the shape or configuration of a building. Form and its opposite, space, constitute primary elements of architecture. The reciprocal relationship is essential, given the intention of architecture to provide internal sheltered space for human occupation. Both form and space are given shape and scale in the design process. In addition, the replacement of a building form in relation to its immediate site, choice of building materials and neighboring buildings is another crucial aspect of this form/space relationship. Just as internal space is created by voids in building form, exterior space can be defined or poorly defined by the building form as well.

For instance, consider the difference between an infill building that fits tightly within

Its' site boundaries (leaving no unoccupied space on the site, except perhaps a defined outdoor courtyard) and a freestanding building located within a large expanse of parking. Without the aid of other space-defining forms such as trees, fence, level changes, and so forth, it is very difficult for a large space to be defined or satisfactorily articulated by most singular forms.

A number of aspects must be considered in order to analyze or design an architectural form, including shape, mass/size, scale, proportion, rhythm, articulation, texture, colour and light.

3.11.1 DESCRIPTION- SHAPE

1. Shape refers to the configuration of surfaces and edges of a two- or three-dimensional object. We perceive shape by contour or silhouette, rather than by detail.
2. Primary shapes, the circle, triangle and square, are used generate volumes known as "Platonic solids". A circle generates the sphere and cylinder, the triangle produces the cone and pyramid, and the square forms the cube. Combinations of these platonic solids establish the basis for most architectural shapes and forms. Recent advances in digital technology have promoted the design and representation of more complex, non-platonic forms.
3. Volumetric shapes contain both solids and voids, or exteriors and interiors. Some shapes are formed through an additive process, while other shapes are conceptually subtracted from other solids.
4. Shape preferences may be culturally based or rooted in personal memory, or convention, for example, a dome or steeple may connote religious architecture in some cultures, while an American child's drawing of a house often depicts a square shape with pitched roof-a shape that many houses do not pass in our culture.

3.11.2 MASS/SIZE

Mass combines with shape to define form. Mass refers to the size or physical bulk of a building, and can be understood as the actual size, or size relative to context. This is where scale comes into play in our perception of mass.

3.11.3 SCALE

1. Scale is not the same size, but refers to relative size as perceived by the viewer. “Whenever the word scale is being used, something is being compared with something else”. (Moore: 17) this relation is typically established between either familiar building elements (doors, handrails) or the human figure. Scale may be manipulated by the architect to make a building appear smaller or larger than it actual size. Multiple scale may exist within a single building façade, in order to achieve a higher level of visual complexity.
2. The term “Human Scale” is frequently used to describe building dimensions based on the size of the human body. Human scale is sometimes referred to as “anthropomorphic scale”. Human scale may vary by culture and occupant age. For example, buildings occupied primarily by children, such as schools and child development centers (/design/child centers.php), should be scaled in relation to the actual size of children. The roadside service station depicted combines human and vehicular scale in a single façade.

3.11.4 PROPORTION

In general, proportion in architecture refers to the relationship of one part to the other parts, and to the whole building. Numerous architectural proportioning systems have developed over time and in diverse cultures, but just a few specific examples are listed below.

3.11.4.1 PROPORTIONING SYSTEMS

Since Antiquity, architects have devised proportioning systems to visually unify all the parts of a building through the same set of proportions. This process creates an internal coherence and sense of order apparent in the building, even if the underlying proportioning system is not known to the observer, these systems can be arithmetic, geometric, or harmonic.

1. Arithmetic: The Ancient Greeks used clear mathematical ratios for both visible and auditory phenomena, such as architecture and music. For instance Pythagoras emphasized the importance of numbers. Originating in Antiquity, the "Golden Section" has been used by Renaissance theorists, modern and contemporary architects. The Golden Section of Golden Mean is both arithmetic and geometrical, and is prevalent in both the natural world and classical architectural design. It may be expressed as a:b = b (a+b). This relationship can be verbally described as: a is to b, as b is to the whole. The Golden Section is also apparent in the Fibonacci series of integers: 1,1,2,3,5,8,13,21,34,55, etc. each succeeding number is the sum of two previous numbers. This series forms the basis for a spiral, as found in the snail's shell or the spiral volutes of ionic column capitals.
2. Geometric: In classical architecture, the diameter of a classical column provided a unit of measurement that established all the dimensions of building, from overall dimensions to the detail. This system works for any size of building, since the column unit fluctuates while the internal relationships remain constant. Drawings of the "classical orders" explain this set of relationships geometrically.
3. Harmonic: The ancient discovery of harmonic proportion in music was

translated to architectural proportion. For instance, this system posits that when the ratio of 1:2, 2:3, or 3:4 is applied to buildings or rooms, harmonious proportion results. The early Renaissance architect Alberti credited the harmony of Roman architecture and the universe to this system. The Renaissance architect Palladio, along with Venetian musical theorists, developed a more complex system of harmonic proportion based on the major and minor third – resulting in the ratio of 5:6 or 4:5.

3.11.5 MATERIAL AND MANUFACTURED PROPORTIONS

Most contemporary buildings are proportioned according to the industry standard unit size of the primary mass-produced building materials employed. Based on the inherent properties of each material, conventional sizes and proportions have resulted. For instance, bricks, concrete masonry units, light wood members, plywood, and gypsum wallboard are always fabricated and sold in conventional sizes. The dimensions of these elements form another unit of measurement within the building.

3.11.6 STRUCTURAL PROPORTIONS

The structural capacity of a particular material results in distinct proportions. The maximum span and depth of a stone lintel is very different than a steel lintel because of different structural properties.

3.11.7 RHYTHM

The reoccurrence or repetition of architectural elements, shapes, structural bays, windows, etc. establishes a rhythm, which may be regular or complex. A static building possesses a rhythm, while the movement of inhabitants through a building may establish a pattern or rhythm of human movement.

For example of how adjacent individual building rhythms also create a larger street wall rhythm.

3.11.8 ARTICULATION

How building surfaces come together to define form is often described as "articulation." The treatment of edges, corners, surface articulation of windows (horizontal, vertical, static field), and the visual weight of a building all contribute to the articulation of the form.

3.11.9 TEXTURE AND COLOUR

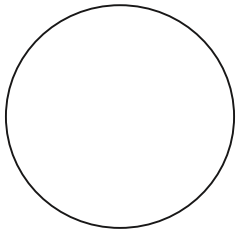
Both texture and color are inherently linked to materials, and can be used to alter the perception of any given form. Consider how shift from a light to dark paint color can radically reduce the apparent size of a room, or how a smooth stucco or rough brick finish can alter the size and visual weight of a house. As illustrated in fig 15, the same stone rendered smooth, rusticated, or intricately carved, results in different textures and colours.

3.11.10 LIGHT

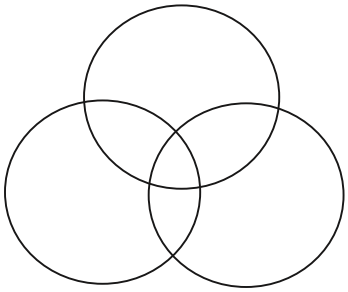
Form is perceived differently depending on the light conditions within which the building is viewed. The prominent modern architect Le Corbusier emphasized the important relationship between light and form in his famous statement, "Architecture is the masterly, correct, and magnificent play of masses brought together in light. Our eyes are made to see forms in light; light and shade reveal these forms." (Le Corbusier: 29)

3.11.11 SYMBOLISM: Is also veritable design tool in religions architecture, which can be used to strengthen the theme of the project with success.

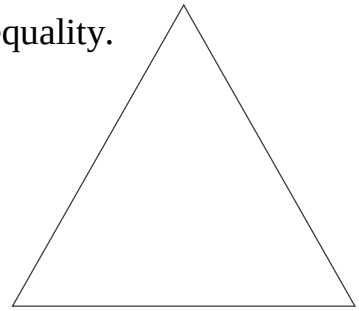
Some geometrical symbols related to religion architecture include:



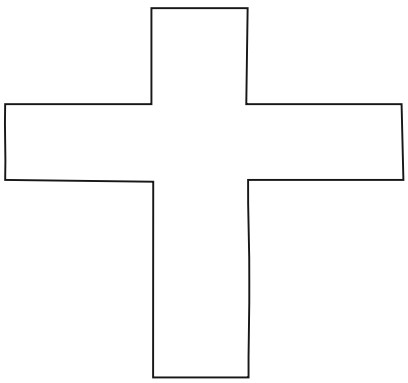
Circle: This symbolizes eternity because it has no beginning or end.



Intertwined Circles: Symbolizes the trinity and thus can stand for unity and equality.



Equilateral Triangles: Symbolizes the Trinity



Latin cross: Symbolizes the cross of Christ

CHAPTER FOUR

4.0 CASE STUDY

4.1 INTRODUCTION

As the term case study suggests, it is the study of a particular case that is similar to your topic of the project. Doing a case study will help you understand the various aspects that you have to consider designing. This case study was carefully and thoroughly conducted well, undoubtedly shed more light on the subject matter where adequate knowledge regarding the matter could be achieved. Meanwhile, case study conducted in this Thesis has entirely loftily helped in acquiring knowledge of fundamental needs of the WOFBI Institute, design faults and when the existing leadership training were established. A related training centers of varied origin and believe were selected for study.

They were evaluated along basic parameter such as:

- Environment and micro-climate,
- User behavior and requirement studying,
- Utility and space enhancement,
- Form and function,
- Horizontal and vertical gradation,
- Site planning and landscape detailing,
- Structural details,
- Building services,
- Design detailing considering barrier-free environment,
- Social-economic of user group,
- Parking details and standards.

4.2 WORD OF FAITH BIBLE INSTITUTE, CANAANLAND.

The word of Faith Bible Institute is the training arm of the Living Faith Church Worldwide. It was established in May 11, 1983 in fulfillment of the mandate God gave to the Founder, David Oyedepo, saying "I will through this Ministry raise the foundations of many other ministries".

The center was declared opened by Bishop David Oyedepo in 2010.

World of Faith Bible Institute comprises of 6 members

The President – Bishop David O. Oyedepo

First Vice President – Bishop David O. Abioye

Vice President – Pastor (Mrs.) Faith A. Oyedepo

Executive Secretary – Pastor Triumphant Obamoh

Mission Secretary – Pastor Shiyanbade

4.2.1 SITE LOCATION CRITERIA

Criteria considered for the siting include:

- Available facilities to augment the WOFBI complex.
- User behaviour and requirement studying
- Building services and design details considering barrier-free environment.
- Closeness to Faith tabernacle and covenant university
- Positive disposition of the native community
- The natural setting of place of worship or ecclesial town or city.

4.2.2. FACILITIES PROVIDED

The WOFBI complex comprises of:

- Lecture theatres
- Conference Halls
- Library
- Seminar Rooms
- Indoor space for spiritual intercourse (Alone with God)
- The following available facilities were servicing as dual purpose of function in the church environment;
- Canaan Guest House Type B
- Faith Tabernacle (50,000 seater's auditorium).

4.2.3. SITE AND SETTING

A two storey building complex complement its function and all the adjoining building like Faith Tabernacle (50,000) 'Seaters auditorium' which serve as a place of worship for the students and also the siting of other adjoining building like Cafeteria and Guest House B which serve as student accommodation chalet. The areolation orientation of the building to other adjoining structures are well oriented to optimize the advantage of the prevailing wind direction.

4.2.4. MERITS AND DEMERITS

Merits include:

- The circulation/relationship with other adjoining structures are interrelated which help the student movement without direction.
- Availability of cross ventilation and high level of illumination in the complex via adequate openings.
- Architecture and structures conform to technology level of the adjoining structure cum architectural evolution.
- The building is mainly linear expressive (concrete) but partially sculptured
- Compartmentalized, distinguished main entrance with free flow of circulation.

Demerits

- The don't have a befitting/ designated cafeteria, library, student accommodation and accommodation chalet for minister which resulted in distraction and lack of concentration on the part of students and minister.

Plate 4.1: World of Faith Bible Institute, Lecture Theatre 1, Cannanland

Plate 4.2: World of Faith Bible Institute, Lecture Theatre 2, Cannanland

Plate 4.3: World of Faith Bible Institute, Lecture Theatre 3, Cannanland

Plate 4.4: World of Faith Bible Institute, court yard, Cannanland

Plate 4.5: World of Faith Bible Institute, Passage, Cannanland

Plate 4.6: World of Faith Bible Institute, Passage and Stall hall, Cannanland

Plate 4.7: World of Faith Bible Institute, front elevation, Cannanland

4.3 WORD OF FAITH BIBLE INSTITUTE IYANA-IPAJA LAGOS CENTRE

Word of Faith Bible Institute, Iyana-Ipaja centre took off in 1992 under the ministration of David Oyedepo ministries. The centre is located at 46 Raji-oba

Street, Alimoso Iyana Ipaja Lagos. Iyana Ipaja WOFBI centre is design to give training only, no accommodation is provided for the student while they foreign students are advice to go to Canaanland centre.

4.3.1 SITE AND SETTING

The Iyana-Ipaja WOFBI Centre is at the core centre of Alimoso local government. The centre is surrounded with residential building and close to Gown estate.

4.3.2 DESIGN CONCEPT AND CHARACTERISTICS

The layout concept of the training centre is shown below:

4.3.3 FACILITIES PROVIDED

In consonance with intended used, facilities provided include:

- Lecture theatres
- Administrative block
- Library
- Conference Hall
- Offices
- Book shop
- Place of Worship
- Baptistery
- Alone with God
- Generator House

- Seminary House
- Children hall for Junior Bible School (JBS)

4.3.4 MERITS AND DEMERITS

MERITS

- The orientation of the buildings are in conformity with thermal comfort.
- The location of at the centre of form which help in enrollment of student.
- The circulations /Functional flow of the centre are friendly.
- The chapel seating arrangement is in order with obstruction.

DEMERITS

- Due to Inadequate land area the training centre is lack of greenery, future expansion which make the centre look overcrowded at the peak period.

Figure 4.2: Master Plan of Raji Oba Campus

Plate 4.8: Word of Faith Bible Institute, Front Elevation and Administrative block Iyana-Ipaja, Lagos centre.

Plate 4.9: Word of Faith Bible Institute, Site Elevation and Sectional Photograph Iyana-Ipaja, Lagos Centre.

Plate 4.10: Word of Faith Bible Institute, Chapel Internal Photograph, Iyana-Ipaja

Plate 4.11: Word of Faith Bible Institute, Chapel Altar, Iyana-Ipaja

Plate 4.12: Word of Faith Bible Institute, Lecture Theatre, Iyana-Ipaja

Plate 4.13: Word of Faith Bible Institute, Baptismal Pool, Iyana-Ipaja

Plate 4.14: Word of Faith Bible Institute, Sides Elevation, Iyana-Ipaja

Plate 4.15: Word of Faith Bible Institute, Chapel, Iyana-Ipaja

Plate 4.16: Word of Faith Bible Institute, Campus Front view, Iyana-Ipaja

4.4.0 CASE STUDY 3: Nigeria Baptist Leadership Training Centre Ikogosi

4.4.1 Introduction of Leadership Training Centre

Sequel to the report of an Advisory Board set up in in Nigeria Baptist Convention in 1951 to facilitate the building of a camp for training leaders for the church, this leadership training centre was sited and built at Ikogosi. It was initiated by Rev. J.S. McGee, from United State of America. The centre was declared opened by him in 1963.

Members of the Advisory Board include:

Rev. J.O. Omoniyi	Chairman
Rev. E.O. Agboola	Member
Rev. J.O. Adeosun	Member
Pastor T.A. Akande	Member
Dr. J.T Ayorinde	Member
Mr. D.J Ogunkuade	Member
Miss F. Knight	Member – USA
Miss R.A. Hall	Member – USA
Rev. J.S. McGee	Member – USA
Pastor I.O. Otegbola	Secretary

4.4.2 Site Location Criteria

Criteria considered for the sitting of the training centre in Ikogosi by interview includes;

– The natural setting of the environment

– The proximity to Ikogosi Warm Spring and the prospect of integrating the two sites together.

– The distance away from the usual busy city atmosphere.

– Position disposition of the native community.

Plate 4.17: Nigeria Baptist Leadership Training Centre, Worship Hall, Ikogosi

Plate 4.18: Nigeria Baptist Leadership Training Centre, Administrative chapel Ikogosi

Plate 4.19: Nigeria Baptist Leadership Training Centre, Quarter and Office, Ikogosi

4.4.3. Facilities Provided

The camp facilities included the following in the proportion of the level of church development at the inception:

- Conference hall/ Place of worship
- Accommodation (chalets)
- Cafeteria
- Outdoor space for spiritual intercourse

4.4.4 Site and Setting

The small sized centre utilized building of no special architecture set in a serene atmosphere with purely natural setting. The eleven structures (buildings) are well dominated by nature, which enhance the prospect of meditation and inspiration. The conference hall was given a traditional church outlook to focus participants' attention on spiritual matters. Ventilation was generously ensured in all the buildings with the conference hall and the accommodation well oriented.

4.4.5 Merits and Demerits

Merits include:

- The buildings are appropriately located in the layout.
- Adequate openings which give rise to high level of ventilation and lighting.
- Architecture and structures conform to technology level of the area.

Demerits

- This is largely a foresight problem in that the size of the facilities have been overrun by population.
- Administration office was not provided.

- Lack of seminar or extra lecture room provided along with the conference hall.

4.5.0 **CASE STUDY 4: ARCHBISHOP VINING OF THEOLOGY, AKURE**

4.5.1 **Background**

Archbishop vining college of theology, Akure dates back to 1971 when it was founded by the church missionary Society (C.M.S) and named Akure Training Centre (A.T.C). It was founded mainly to train girls to become good house-wives. The first principal was Miss Boyton and she was succeeded by Miss Mars in whose time the centre had remarkable development and became a very popular Girl's Institution in the then Southern Nigeria. Many of the girls obtained the first School Leaving Certificate from the Centre. The popular Government 'Certificate of Merit' then awarded to the students of the centre formed foundation stone of many successful women and house-wives in this country. In 1958 the normal programme run at the centre came to an end.

Between 1960 and 1963 the Catechist Training Centre at Owo (Bishop Philip's Hall), at Oshogbo (Mackay Hall) and at Abeokuta (Catechist Training Centre Ake Abeokuta) were merged and re-established at the site of the old Akure Training Centre and named Vining Christian Leadership Centre in memory of the late Archbishop Leslie Gordon Vining, Bishop of Lagos (1940-1955) and the first Archbishop of the Province of West Africa (1951-1955). However on 3rd June/1983 at the meeting of the Supra Diocesan Board of Finance (West) it was decided:

(a) That the Vining Leadership Centre which hitherto has been training Catechists be upgraded into a full Theological College starting not later than September, 1983;

(b) That the Centre shall have about 100 ordained and 50 Catechist in all classes;

(c) That the training of the wives of the Clergy and Catechists shall continue at the Centre.

Thus, on September 23, 1983 the first batch of ordination candidates to run a 3-year course and Catechist was admitted. At the statutory meeting of the Board of Governor held on Thursday 13th October 1983, the Board decided to change the name from Vining Christian Leadership Centre, Akure, to Vining College of Theology, Akure until on October 26, 1996. The then primate of the Church of Nigeria (Anglican Communion) the most Revd. J.A Adetiloye amplified it into Archbishop Vining College of Theology, Akure.

Furthermore, the college was affiliated to the University of Ibadan in the year 1992, and now awarded the Diploma in Religious Studies of the University of Ibadan in addition to the Diploma in Theology awarded by the College. In 1999, the College was granted a degree –awarding status by the same University of Ibadan.

4.5.2 **Objective of the College**

- To train men and women for the ordained and lay ministry of the Church;
- To be a Theological Centre for Christian doctrine and research;
- To be an institution for ecumenical research;

- To train men and women and to equip them to play active roles in leading others to know and accept the Lord Jesus Christ in the life and work of the Church of Nigeria (Anglican communion)

4.5.3 **Layout, Site and Setting**

Archbishop Vining College of Theology, Akure is set on the crown of a large hill behind the ‘‘A’’ Division of the Police Formation in Akure. It takes its access from the Oba Adesida Road along the side of the Bank of the North. The access road runs straight into the large expanse of land for the college. It has a pronounced entrance gate with a gatehouse. It runs through a long stretch of foreground with the road lined by trees on both sides before taking a bend to the college area while the chapel is located at the bend to take care of its immediate community alongside, the road provides a beautiful scenery associated with ecclesiastical centre and provides every guest with the privilege of meditation and reflection to and from the centre. The entire centre is characterized by dense vegetation; both planted and preserved ones with buildings dotting the landscape. The planning of the site is lacking in orderly sequence and the road network lacks definite pattern. The setting of the centre rests in the profuse vegetation and hill top advantage of the location. No further advantage was taken of the good location and site. The site imposes adequate serenity on the centre, which is a primary requirement.

Figure 4.3: Archbishop vining College of Theology, Location and Layout, Akure.

4.5.4 **Design Concept and Characteristics**

Building of the modern architecture have almost virtually replaced the erstwhile traditional buildings that made the centre. No prominent concept or characteristic were discernible. The buildings had low pitch roofs, even the chapel was denied of the characteristic high pitch roof.

4.5.5 **Facilities provided**

The college offers facilities that can adequately cope with the intend function of the centre. These facilities include:

- Conference hall
- Administration
- Lecture rooms
- Library
- Students' accommodation
- Staff accommodation
- Place of worship
- Health facilities

4.5.6 **Merits and Demerits**

Merits

- Low population density
- Large land area
- Quiet location
- Conducive site climate

Demerits

- No clear separation of pedestrian walkways
- No ordered planning
- Mixed land uses

4.6.0 CASE STUDY 5: ALLIANCE THEOLOGICAL SEMINARY, NYACK, NEW YORK, USA.

4.6.1 Case Study Overview

Alliance Theological Seminary is an evangelical Christian Seminary affiliated with Nyack College and the Christian and Missionary Alliance, located in Nyack, New York.

The Seminary is a Missionary Training Institute, established in the year 1979 by A.B Simpson to train missionaries for world service.

The school eventually became Nyack College, and seminary stemmed out of its graduate programme, founded in 1960 as the Jaffray School of Missions.

4.6.2 Programs of the institute

The seminary offers a variety of graduate degrees including M.A in intercultural studies or biblical literature, M.P.S, M.Div., and Min. in addition to the main campus

in Nyack, there is a large satellite campus located in Manhattan and an extension in Puerto Rico. The 2012 enrollment was approximately 800 students.

4.6.3 Facilities Provided

Facilities provided includes:

1. General
2. Hostels
3. Administrative block
4. Chapel
5. Dining Hall
6. Prayer room
7. Meeting room for Ministers and Students
8. Others.

4.6.4 Merit and demerit

Merit

a) General composition of the entire institute is very good.
b) Building is highly functional as optimum spaces are provided for learning
c) Space and function relationships are resolved in the design
d) Site planning is users friendly
e) Facility location is easily accessible to the users
f) Site is recreationally friendly and it's been incorporated
g) Space and activities performed therein are compatible

Demerit

a) In peak of the session/periods faculty is overcrowded
b) No activity Hall provided for all student convergence
c) Maintenance cost is much because of the contemporary finishing materials used
d) Inadequate parking during the peak of the school session.

Plate 4.20: Alliance Theological seminary, the Perspective View of the Seminary

Plate 4.21: Alliance Theological seminary, Prayer Room

Plate 4.22: Alliance Theological seminary, Meeting Room

Figure 4.4: Alliance Theological Seminary, floor plan of the gallery, Nyack, New York

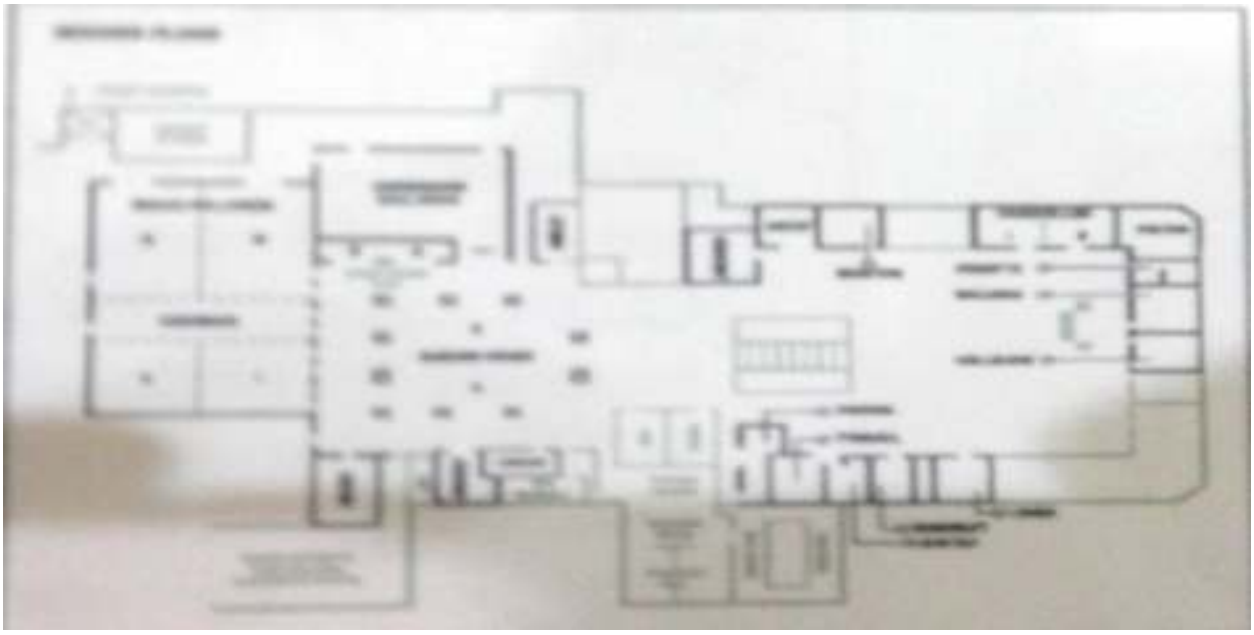


Figure 4.5: Alliance Theological Seminary, floor plan of the Seminary, Nyack, New York

4.7.0 CASE STUDY 6: ABILENE CHRISTIAN UNIVERSITY, TEXAS USA

4.7.1 CASE STUDY OVERVIEW

Abilene Christian University (ACU) is a private university located in Abilene, in the U.S State, Texas, affiliated with Churches of Christ. ACU was founded in 1906, as Childers Classical Institute. Abilene Christian University's fall 2014 enrollment is 4427 students of which 777 are graduate students. The number of students enrolled down to 1112 freshmen, 806 sophomores, 762 junior, 892 seniors, 78 "non-traditional" students and 777 graduate students.

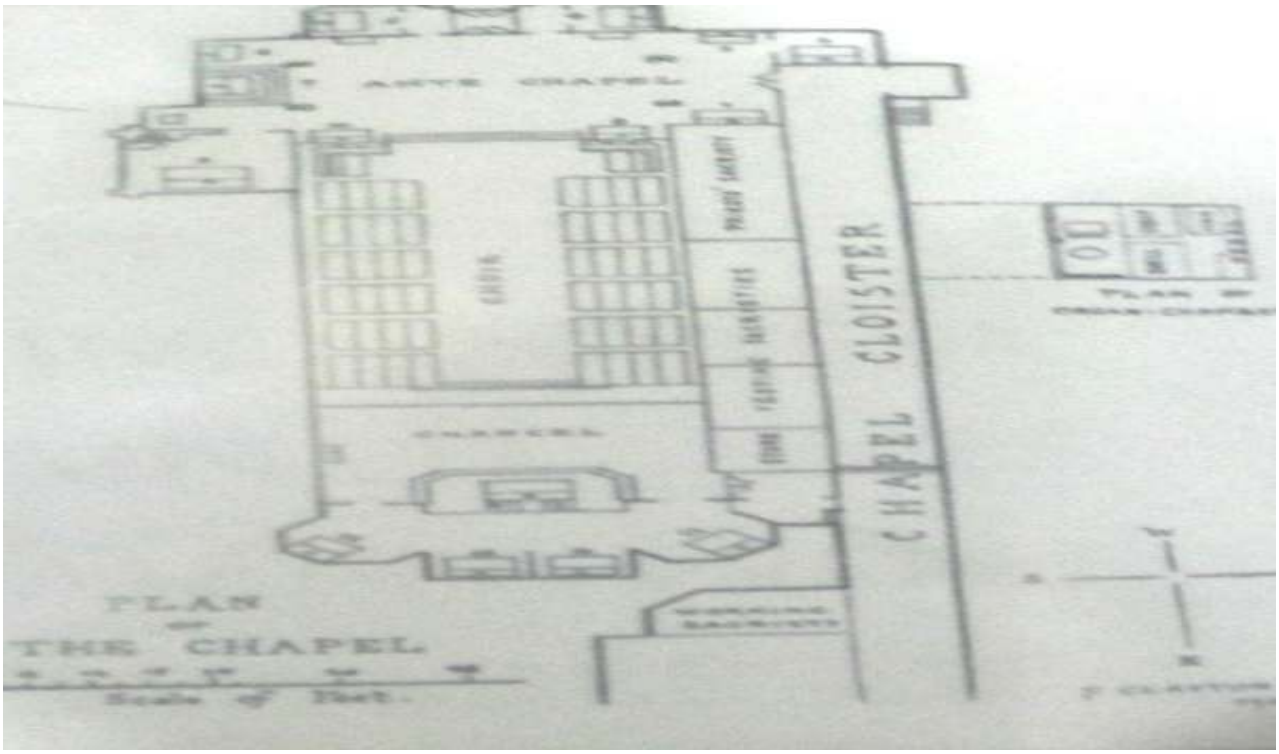


Figure 4.6: Abilene Christian University, master plan of the chapel, Texas

Plate 4.23: Abilene Christian University, Approach of the chapel, Texas

Plate 4.24: Abilene Christian University, interior view of the Library, Texas

Plate 4.25: Abilene Christian University, Seminar Room, Texas

CHAPTER FIVE

5.0 LOCATION ANALYSIS

5.1 THE STUDY AREA.

The project is located in Goshen city, Auta Baleifi in Karu Local Government Area of Nasarawa state. Karu is a local government area in Nasarawa State, central Nigeria. It is close in proximity to the Federal capital. It has an area of 2,640km^2. Karu local government has its headquarters in New Karu town. According to 2006 census, the population of mainly New Karu town was 205,477. It was originally built to house the capital's civil servants and lower income families, but has no running water or good sanitation system. It is one of the fastest growing urban area in the world, with a growing rate of 40 percent recorded annually. From the west to east, the urban area includes towns like Kurunduma, New Nyanya, Mararaba, New Karu, Ado, Masaka and Gidan Zakara. (James Uzondu (2011-02-15).

Karu area has the tropical savannah climate of central Nigeria, with alternating rainy and dry seasons. The rainy season begins in April and ends November, Rainfall in Karu area is high owing to its location on the windward side of the Jos Plateau and zone of the rising air masses. The annual total rainfall is in the range 1100-1600mm.

Figure 5.1: Map of Nigeria Showing Nasarawa State

Figure 5.2: Map of Nasarawa State

In October 2nd 2010, Living Faith Church Abuja moved to Goshen as the National Mission Headquarters (seat of Pastoral, Administrative and Technical of the Ministry). Auta Baleifi is dominated by indigenes of Gbayi, Mada, and Gwandara with pockets of other tribal groups like Yoruba, Igbo, Ebira, Tiv, Idoma and Hausa etc who engage in diverse economic activities ranging from farming to trading. The predominant primary occupation of the indigenes is farming while trading is secondary.

5.2 SITE LOCATION

The project site is situated kilometer 26 Abuja-Keffi express road Auta Baleifi, Goshen city. The site was strategically selected to be away from city distractions and providing a central, easily accessible location to all part of the state and of low traffic to offer complementary characteristics to the desired setting of the intended use (Ecclesiastical city) the has a good topographical terrain sloping very gently from both ends of the longer axis.

Figure 5.3: Map of Goshen showing the site.

The site was previously a farmland with a number of economic trees but intensive farming activities have been discourage in that area of the Goshen community feeling the movement of Living Faith Church Abuja to the area. The land Goshen city is approximately 346 hectares of land, the front of the proposed land is bounded with buffer zone land. Goshen is adjoining with Amadiyah Muslim Association of

Nigeria natural nation mosque, also adjacent with Redeemed Christian Church, Abuja Redemption and Bingham University, Nigeria.

5.3 SITE LOCATION CRITERIA.

The commission policy backup of the training Centre sites it is the Mission Headquarters for obvious reasons based on:

- Central administrative structure of the commission for proximity to coordinating of local and foreign students.
- Availability of highly skilled personnel/pastoral for lecturing.
- Central location, prospect and potentials of the Goshen city church.

From case studies and review of Literatures on identified objectives of the training centre, the choice site within Goshen city resulted from due consideration of pertinent factors namely:

- ❖ Approved Master Plan of Goshen.
- ❖ Security and safety
- ❖ Quiet environment away from city tension
- ❖ Availability of adequate land size
- ❖ Access to basic infrastructure: church auditorium, other basic infrastructure within Goshen city.
- ❖ Pollution free environment
- ❖ Proximity to regular transportation and communication
- ❖ Land form and national setting conform to proposed projects.
- ❖ Conducive adjoining land uses/purpose.

5.4 SITE ANALYSIS/INVENTORY

Since site is the determinant to design concept or the perfect, as at the time of the site inventory, it was found that the soil is firmly stable which can support the imposed load of the proposed building, load ways and plants. There is no existing structure on the site, by the site towards the east, an existing Police station and Police staff quarters is located the complete understanding of the topography structure was studies to give an insight into the location of road ways revealing the spatial configuration on the site, via the site inventory, it was discover the type of structure be adopted on the entire area, also help in design consideration to avoid wastes, save cost and ease design. The analysis done are as reflected below (fig5.4)

Figure 5.4: Site concept diagram

5.4.1 PHYSICAL SITE CHARACTERISTICS

The site location away from city tension and noise to enhance inspiration and solitary space for prayer equally enhance the serenity of the environment. Its location outside the town centre will equally enhance unhindered development and insulate

the training environment from distractions of the city life. The site is accessible by road from Living Faith main auditorium.

Central administrative structure of the commission for proximity to coordinating of local and foreign students. Availability of highly skilled personnel/pastoral for lecturing. Central location, prospect and potentials of the Goshen city church.

Topography

The site has very interesting topography and the soil is firmly stable which can support the imposed load of the proposed buildings. To this effect, the main access as a major communication network will be designed to take advantage of this condition in order to create interesting visual effect of the campus.

Landscape Character

Nature provides a good setting for meditation and spiritual inspiration. A blend of well-ordered landscaping and the building structures will potentially contribute to the culturation of the residents and depth of training impartation.

5.4.2 CLIMATIC SITE ANALYSIS

Climate

The climate is typically of humid tropics characterized by wet and dry seasons. The humid climate of the site may need to be ameliorated by various design means to provide a conducive environment for human comfort.

CHAPTER SIX

6.0 PROJECT ANALYSIS AND DESIGN SYNTHESIS

6.1 INTRODUCTION

The project analysis and design synthesis that formed the basis for the proposal derived from four major sources namely;

- Knowledge from library search/internet
- End product of case studies of similar projects
- Use design methodology/requirement
- End users requirement

It is important to note that Word of Faith Bible Institute (WOFBI) is a leadership training centre that offer:

- Short time and longtime intensive training for different categories of Christian workers and members of different denomination in three tiers:

1. Basic Certificate Course (BCC)
2. Leadership Certificate Course (LCC)
3. Leadership Diploma Course (LDC)

- Training in excellence in Christian ministry mutiny and model worship
- Compulsory residential training for foreign students and for local trainees
- Christians leader's camping for spiritual empowerment
- Christian leader's development/research centre
- Church aide outreaches for other ministries can be assisted in leadership training and resources supply
- Christian counselling centre for both church member and other member of any denomination.

6.1.1 Central Planning and Design Consideration

The design task is to provide a conducive "physical space" (for training in spiritual discipleship, maturity and service) that is capable of provoking meditation and inspiration in its residents thereby enhancing commitment and maturity through the use of sustainable architectural materials.

To achieve this, recourse to the Bible is mandatory, as it is replete with incidents of patriarchs that got inspiration as they retired into solitary places (in the woods or forest) and meditated. Jesus Christ, the Lord, rising up a great while before day, went into a solitary place and there prayed (Mark 1:35). John, the beloved, got deep revelation in the solitary Island of Patmos (Revelation 1). Moses got to the back of the desert and saw great revelation as well as a call to service (Exodus 3). Thus, inspiration, revelation and call to service are well associated with solitary meditation. Finally the central planning and design consideration therefore must give prime place to creating an environment that will enhance solitary meditation while the structures are also spirit lifting through the use of sustainable building materials.

6.1.2 Population Density

In order to enhance the solitary nature required of the environment, population density which is a function of the total number of residents to the land area, has to be kept very low while buildings are also not crowded together. Overcrowded in population in any structure reduces the life span, the number of user determined the life span of any fitting especially mechanical or electrical fittings in a building.

6.1.3 Target Population

Pursuant to the foregoing, the target population for the centre is put at a maximum of one Thousand Two Hundred and Fifty (1250) people comprising of trainees and two hundred (200) members of staff of the centre.

6.1.4 Interaction Concourse and Spots

Interaction is an integral part of education and a vital tool in leadership training with emerging advancement in audio-visual technology, interaction concourse and spots can be positively explored to enrich residents' experiences and profits.

6.1.5 Landscaping

Nature provides a good setting for meditation and spiritual inspiration. A blend of well-ordered landscaping and the building structures will potentially contribute to the culturation of the residents and depth of training impartation.

6.2 ESSENTIAL FACILITIES

Essential facilities for the centre fall into three main groups or zones including:

- Primary facilities
  - Administrative Block
  - Training Block
- Secondary facilities
  - trainees' Hostel
  - Alone with God
  - Ministers' Hostel
- Support facilities
  - Cafeteria
  - Plant and Electrical Maintenance Unit
  - Gate/Security House

6.2.1 Administrative Block

The administrative block is the management centre for the training school. It provides essential facilities along two lines namely (i) Programmes Training and Coordination (ii) Counseling and Ministry Development.

i) **Programmes and Training Coordination**

- Central Reception/souvenir
- Public Relations
- Accounts
- Management
- Research Resources Centre
- Cyber café

ii) Counseling/Ministry Development

- Common Waiting
- Pastoral Ministry Department

6.2.2 Accommodation Facilities

All facilities for housing the residents of the centre fall into this group and they include:

- Hostels for male trainees
- Hostels for female trainees
- Chalet accommodation for Executive trainee
- Ministers' Quarters (resident and guest.)
- Special accommodation for trainees for special/privilege students.

6.2.3 Training Facilities

Training facilities comprise of:

- Auditorium/Worship Centre/Devotion Hall
- Seminar Rooms
- Committee Rooms
- Offices and W/C for Resource Persons.

6.2.4 Services Facilities

These include facilities such as:

- Cafeteria
- Maintenance Department
- Gate House
- Bank – cash point
- ATM
- Tuck shop for daily consumable
- Public toilet

6.3 DESIGN PHILOSOPHY

The philosophy that underlines this proposal is drawn from Rapport (1976). It is "Architectural Space as a symbolic Space". That is components of the architectural space including the environment, building components/specification and artifacts symbolizing something to the occupants and others that view them.

6.4 DESIGN CRITERIA

Three basic design criteria are relevant and crucial to this design; they are:

- Limiting Control Guidelines
- Building Design Criteria
- Site Criteria.

6.4.1 Limiting Control Guidelines

The limiting control guidelines applicable to this project include the Development Control Measures operative in FCT and Nasarawa State in general and Karu metropolis in particular, with reference to Training Institutes. They cover such areas as:

- Land use and zoning regulations
- Site coverage and minimum set back standards
- Access and parking requirements
- Air space around buildings
- Boundary wall height specification
- Traffic flow in the zone
- Waste Disposal
- Noise level
- Geological requirements

- Firefighting requirements
- Rights of neighbours – Easement.
- Approval and construction requirements.
- Structural requirements.
- Engineering infra-structural services requirement.

6.4.2 Building Design Criteria

The design proposal took into consideration a number of criteria, factors and analyses that have to interplay in a pragmatic synthesis to determine the building form and spatial relationship.

These include:

- Design Brief Analysis
- Space Analysis
- Space Allocation and Schedule of Accommodation
- Functional Analysis and Relationships
- Schematic Concept.

(i) **Design Brief Analysis**

For the centre to fulfil its goals and objectives, it must provide facilities for four major functions namely: Administration, Training, Accommodation and Service.

Administration/Training Facilities

Facilities and functions that are central to effective administration will cover the following.

- Entrance Concourse

- Reception or Information/Souvenir.

- Coordination Offices
- Resource Centre
- Account Unit
- Plenary Auditorium
- Seminar Auditoria
- Committee Rooms
- Ministers' Offices
- Atrium
- Waiting Area Lobby
- Security office
- Lecture Theatres
- Library
- Bookshops
- Cybercafé
- Conveniences
- Utility Rooms
- Stores
- Meeting Rooms.

Accommodation

This includes all residential facilities for accommodating residents at the centre. They are:

- Chalets Accommodation for Ministers
- Chalets Accommodation for Residents and Guests

- Hostel for Female Trainers

- Hostel for Male Trainers
- Special Accommodation for trainers

Ancillary Facilities

These are support services for the centre and they include:

- Public Toilet
- Maintenance Department
- Gate House
- Serene Area for Personal Encounter with God (Alone with God)
- Green Area
- Baptistery
- Activity Hall - Chapel

CHAPTER SEVEN

7.0 PROJECT APPRAISAL

7.1 LOCATION AND GENERAL LAYOUT

The Word of Faith Bible Institute centre provides a distinct, small and quiet ecclesiastical "Village" set away from the hectic city business environment reminiscent of biblical mount Olives where Christ resorted to and preached His longest message at a time to the disciples, its location within adjoining quiet activity land use neighborhood contributes positively to the serene characteristics of the centre. The place of Goshen added value to the training Centre.

A prominent distinction from the neighborhood and the city centre is emphasized by the celebrated gate house and the well landscaped dual carriage way that introduce the in-comer to the training centre where kingdom soldiers are trained and made. At the end of the road is the imposing monumental structure of the training centre that takes the symbolic form of an alighting cross conceived to "announce" to guests the descent of the Cross of Christ.

Commuters are provided with pedestrian walkway from the commuters' drop off along the street road through the gatehouse into the inspiring and awesome land of training. The walkway leads to the in-comer to all parts of the centre. The road network runs into well-designated parking lots in the administration, training/cafeteria and accommodation areas.

The layout concept adopts a restrictive vehicular movement that confines vehicular traffic to therefore ground while inner circulation is entirely pedestrian.

This is a deliberate design to limit noise, pollution and conflicting circulation, thus enhancing serenity, peace of mind and meditation that are essential for inspiration.

Adequate space is planned round the site to provide necessary vegetal buffer screen against noise, dust and stormy wind.

The centre divides naturally into three main sections namely: Primary facilities area for business district) comprising the training and administrative areas, the secondary facilities comprising accommodation for trainees and ministers residential facilities as well as the support facilities (cafeteria and maintenance/power house) located according to their functional relationships. Their evocative structures are set in a landscape, which combines the natural topography and vegetation with hard and soft landscapes.

Pursuant to the philosophy of the design, symbolic natural and enrichment artifacts are employed to provoke learning, meditation and inspiration. These include the use of fountains to depict that there shall be showers of blessing and unrestricted flow of God's words which the Bible teaches as a cleansing agent. Others are the cross of Christ with His crucified body, the statue of a praying human figure and the natural stream with a fish pond (reminiscent of the still waters of Psalm 23).

The trainees' residential area is located to the Northcentral of the core business or working area. Which occupies the central area of the site. It comprises of two blocks of male trainee hostels and two block of female trainee hostels. The trainers' residential area is sited to the Northeast of the central core and provides a cluster of twelve staff quarters made up of two prototypes. One prototype is adopted for senior ministers and the other for the remaining ministers including guest ministers. The houses are located on very generous plots of land, which are demarcated with hedges of flowers and trees to provide attractive environment.

An interactive concourse is provided separately for the trainees and the ministers of trainers with each of them overlooking each other but separately by the central prayer garden at the back of the training area and between the two residential areas.

This enhances mutual spiritual intercourse among residents and helps in stimulating prayer passion in them as it overlooks the prayer garden that provides a terrain for all manners of spiritual exercises.

7.2 COMPONENT FACILITIES

This proposal provides facilities along three identified functional lines to march the target end-user requirements. They are:

- Primary Facilities - Training Unit.
- Secondary Facilities - Male Trainee Hostel
  - Female Trainee Hostel
  - Trainers' Quarters
- Support Facilities - Cafeteria
  - Maintenance

The Training and Administrative units together with the Cafeteria constitute the nodal structures of the centre and are thus conceptualized as monumental structures that must be of striking symbolism.

7.2.1 TRAINING FACILITIES

Consequently, the training facility takes the form of Latin cross with His crucified body, the statue of a praying human figure with spread out wings symbolizing the crucified body and Holy Spirit, on one Hand, and the Biblical truth

That they wait upon the Lord shall mount up with wings as eagles, on the other, it consists of a plenary auditorium to accommodate all residents with a capacity of 1200 people. The seminar room will, with the aid of electric transmission technology, take care of long term population growth for plenary session besides the primary purposes. Board rooms with a capacity of 25 people and offices for ministers are provided by the training facility. Participants and ministers toilets are also adequately provided for the convenience of all. The planning of the facilities helps in diffusing and distributing the large number of people in the centre to enhance concentration and meditation.

7.2.2 ADMINISTRATIVE BLOCK

The administration block is also symbolic, depicting stability that is anchored in God with 3 lecture theatres of 350 capacity each. This is expressed by the stable form of the structure with the trapezium vertical circulation element on either side as the anchor. The block is of six floors and offers facilities for three main functions namely:

(ii) General Administration,
(iii) Ministry Development and Counseling as well as
(iv) Research and Resources Centre.

The General Administration Department provides for a Director, Secretary, Administrative Officers, Accounts Staff, Clerks and messengers plus conveniences.

The Ministry Development and Counseling Department provides for four main streams or units in line with the church peculiarities and needs. These units include Pastoral Ministry, Women Ministry, Youth Ministry and Children Ministry.

Each is provided with accommodation for the Pastor in charge, Secretary, waiting spaces, store and an administrative coordinator.

The research and Resources centre offers reference materials, classified documents and electronic resources for ministers and members. Facilities are thus provided along these lines.

7.2.3 CAFETERIA

The cafeteria is strategically located between the Pastor chalets and the training area because of the intensive nature of short-term training of the centre which makes trainees spend more of their day time in the training area. The structure of the building is conceptualized to depict strength (as food naturally give strength) and stability while a number of elemental forms in the Administrative and Training buildings are reflected in it for complementary effects since they all fall in the nodal area of the centre.

7.2.4 TRAINEES' HOSTEL

A prototypes block of four floors for 512 trainees consisting of porter's offices, common lounge, steward office/store, laundry, and suites, each for two people is proposed with well landscape courtyard. This is multiplied and orderly arranged to provide for the male trainees and female trainees. When there are two blocks for male the female have two based on projected need and data on the target church.

7.2.5 TRAINERS' QUARTERS

A prototypes are presented for trainers. In the tradition of suburban planning or indeed the colonial Government Residential Area, the quarters are bungalows set in well landscaped environments with lawns, trees and flowers adorning the entire neighbor cluster.

7.2.6 MAINTENANCE FACILITIES

An electrical and plant maintenance block is sited together with the power generating house to the southeast of the centre such that noise and air pollution do not affect the nodal and residential areas.

7.3 CONSTRUCTION METHODOLOGY AND MATERIALS

Prime factors with overriding consideration in the planning and implementation of any physical development includes available technology or construction methodology and sustainable materials. These factors are given due considerations in this proposal for purposes of feasibility, cost control, functionality and sustainability or maintenance. Planning has thus been done to facilitate easy construction, use of conventional materials and phase construction.

7.3.1 CONSTRUCTION METHOD

The basic structural forms and framework put in use to realize (build) the conceived (design) proposal utilizes structural frame construction of columns and beams laid out in grids with walls serving as infillings. The single floor spaces of the trainers' residential quarters with moderate headroom and roof weight are the only exception allows for great spanning of roof without intermediate supports as required in the main structures of the centre.

The training facilities adopt folded plate roof for complementary effects to achieve the symbolic imagery of an alighting Latin cross that is synonymous with Crucification and Holy Spirit, the teacher of the church, in ecclesiastical circles. Suspended ceiling held in space to designed ceiling shapes is made possible by the use of steel hangers anchored into the folded plates. In the cafeteria, they are anchored to the steel trusses. Other buildings (Residential) of shorter spans use timber trusses for economic reasons. Construction methods and details borrow

largely from manufacturers' and engineering specifications in line with design concepts.

The use of concrete gutters is a deliberate effort to secure the building roofs against adverse effects of stormy winds that have assumed a phenomenal dimension across Abuja climate zone. High roof pitches of trusses are also employed for the same reason.

7.3.2 MATERIALS

The use of sustainable materials are employed for all aspects of the project to ensure standard construction within an economical time frame while avoiding undue variations and fluctuations. These materials also ensure climatic compliance, which is an index of durability, maintainability and sustainability.

Foundation works requires mass concrete for continuous or strip foundation and reinforced concrete for pad or isolated foundations of columns and retaining walls. Reinforced structures like beams, upper floors, concrete gutters and others also require reinforced concrete for effectiveness. External Walls are of sandcrete blocks and in some cases faced with timber finish or acoustic plaster for reasons of acoustics and the use of Aluminum and Aluco bond materials for internal partitions.

On the outside, walls are treated with materials as stucco. Floor finishes are made of marble. Glass curtain walls in administration/ training area areas. They are used in double glazed forms to take care of the double requirements for internal and external considerations in relation to solar control.

Table 6.1 Schedule of Materials

Element	Materials
Wall	Reinforced concrete columns, beams and 9''sandcrete hollow blocks

Internal partition	Aluminum composite profile with tinted wire glass, alucobond panel, mbf plywood
Foundation	Mass concrete and reinforced concrete pad foundation
Floor	Mass concrete for ground floors and reinforced concrete for suspended floor slab for upper floors (1-5 floors).
Roof	Steel roof trusses, high pitch timber trusses and reinforced concrete folded plate, stone coated aluminum roofing sheet
Door	Gmp Aluminum products doors, American steel doors, standard security doors
Window	Tinted, coloured and plain glass panels in aluminum frames
Finishes	i) Internal walls – Plaster, decorative paints, etc. ii) External walls – Plaster, b12 wall treatment / screeding , water resistant paints iii) Ceiling – Acoustic ceiling tiles, fibre glass, gypsum board ceiling, plaster of Paris (pop) ceiling etc. iv) Floor – marble tiles, etc.

7.4 SERVICES

A number of basic utility services are essential to support building capacity performance. These services are well conceived and incorporated in this proposal. The use of central sewage which gives room for recycling.

7.4.1 WATER SUPPLY

The project site offers water supply advantage to the project. Lying along the route of the main water supply within Goshen City, Thus, adequate storage facilities

That will distribute water to points of use all over the centre are strategically located across the site to ensure all round water supply at all seasons.

7.4.2 ELECTRICITY SUPPLY

Deriving also from its location on the road to a neighboring small town, power distribution lines runs along the site to the town with the transformer located within Goshen City. This guarantees public power supply to the training centre. Besides, 1400 KVA with 850 KVA heavy duty generators are installed for purposes of

offering a standby alternative supply in case of failure in the adequate power supply for both day and night requirements.

7.4.3 SEWAGE DISPOSAL

Sewage disposal is to be facilitated through well-laid out pipes to achieve clean building facades. Since there is central public sewer for the training centre, adequately central sized septic tanks attached within recycling equipment, which can be serviced by roads, are employed to serve as deposit points for various sections of the centre.

7.4.4 REFUSE STORAGE AND DISPOSAL

Provision of garbage collection from all units in the complex and an organized disposal system to achieve a hygiene and pollution-free environment is incorporated in the planning. The public collection facility is to be exploited unit such times that the centre will be able to acquire a dumping truck for its use.

7.4.5 CIRCULATION

Vertical circulation is virtually by means of stairs as and the use of elevators. Only in training centre does the number of floors rise beyond two.

Besides the centre offers only short-term programs not exceeding three -week duration only.

7.4.6 VENTILATION

The services to be rendered by this facility as a training centre coupled with the goal of enhancing meditation and inspiration make the need for adequate ventilation within its component spaces mandatory. The need for ventilation increases with room size, occupancy ratio and nature of activity within the space among other things. Air flows into a building through openings like windows and

gaps around doors and windows. It is necessary for breathing, maintaining reasonable body temperature and conducive relative humidity. Thus adequate cross ventilation is ensured in most spaces in the South-North direction while sun penetration is cut off in the West-East direction.

7.4.7 LIGHTING

Good lighting makes for good vision inside the building. At the same time, lighting is used to enhance the beauty of the architecture, create different moods and to focus attention on important features. Thus adequate lighting in ensured by generous openings and liberal use of glasses. Well planned artificial lighting is also integral in the concept of lighting for the centre. It is used to lit the landscape and focus enrichment artifacts for positive effects. Appropriate levels of illumination are ensured for all spaces.

7.4.8 ACOUSTICS

While the eye is capable of adjusting quickly to changes in light intensity, the ear is much less respond to alteration in sound intensity, prevention of unwanted sound is a central need of the project as underscored by the biblical saying that

"If the trumpet (speaker) gives an uncertain sound who shall prepare himself (respond) to the battle (challenge)" – 1 Cor. 14:8. Clear hearing facilitates positive responses.

Thus planning ensures the following:

i) Quiet environment
ii) Good sound distribution within internal spaces
iii) Avoidance of disturbing echoes
iv) Avoidance of overlapping and confusion by short reverberation time to give proper blending of sounds.

General acoustic requirements for good hearing conditions in auditoria include:

i) Choice of materials, dimensions and shape of auditoria
ii) Design of ceiling as reflector of sound from original source
iii) Design of wall surfaces and finishes as very important consideration in either reflecting or absorbing sound according to their relationship to the stage.

7.4.9 FIRE SERVICES AND PROTECTION

Fire outbreak in public buildings of this nature must be prevented. For effective control, the causes and possible growth must be identified.

Fire is often caused by:

- Carelessness and negligence
- Equipment failure and deficiency
- Chemical reaction
- Arson

Growth of fire depends on the amount, disposition of combustible within the building and the fire protection measures in the building. Fire protection measured include the following systems:

- Fire alarm system
- Fire prevention measure
- Fire extinguishing system
- Timely smoke removal.

This proposal employs the use of automatic flame detector for fire prevention while it also provides for portable extinguishers within the buildings.

7.4.10 ETERNAL WORKS

This project involves a lot of external works particularly as it seeks to express and impact deep meanings to complement those of physical structures. Thus it proposes detailed plans to facilitate this goal. The overall quality of the environment rests in the actualization of the external works.

CHAPTER EIGHT

8.0 RECOMMEDATIONS AND CONCLUSION

Educational (formal, informal and non-formal) is very important, it empowers people to have impact in their society and also enhances their resourcefulness. It is the process through which a person's mind and character are developed through teaching and training. It is learning structure that determine the strength, growth, stability and efficiency of any organization especially in the school of spiritual, without a viable learning structure, there can be no enviable future for the ministry. The viability of leadership training is the determinant to the limit of the ministry.

Buildings do not exist in isolation, rather they exist in spiritual behaviour and perceptual context. The use of modern building materials for sustainable Architecture in this project will enhance the quality and impact of training on trainee. This intrinsic relationship offers opportunity for exploration in enhancing the central theme of this project. Appropriate use of sustainable building materials cum building designs. The building site and the environment will promote and proclaim the purpose of this project and it becomes the central task.

This project thus identifies the benefit of using sustainable modern materials to the building owners and building occupants, reduced maintenance and replacement cost over the life of the building; energy conservation, improve occupant health and productivity and greater design flexibility. They recommend themselves as appropriate criterial for consideration in the design of all ecclesiastical centres while the entire report provides a reference manual for all stakeholders in similar projects.

Finally, the leadership centre will provide edifice for uplifting of Word of Faith Bible Institute in the entire commission of Living Faith Church Worldwide, a.k.a Winners' Chapel international and also offering of design solution conscious of aesthetic and maintenance requirement.

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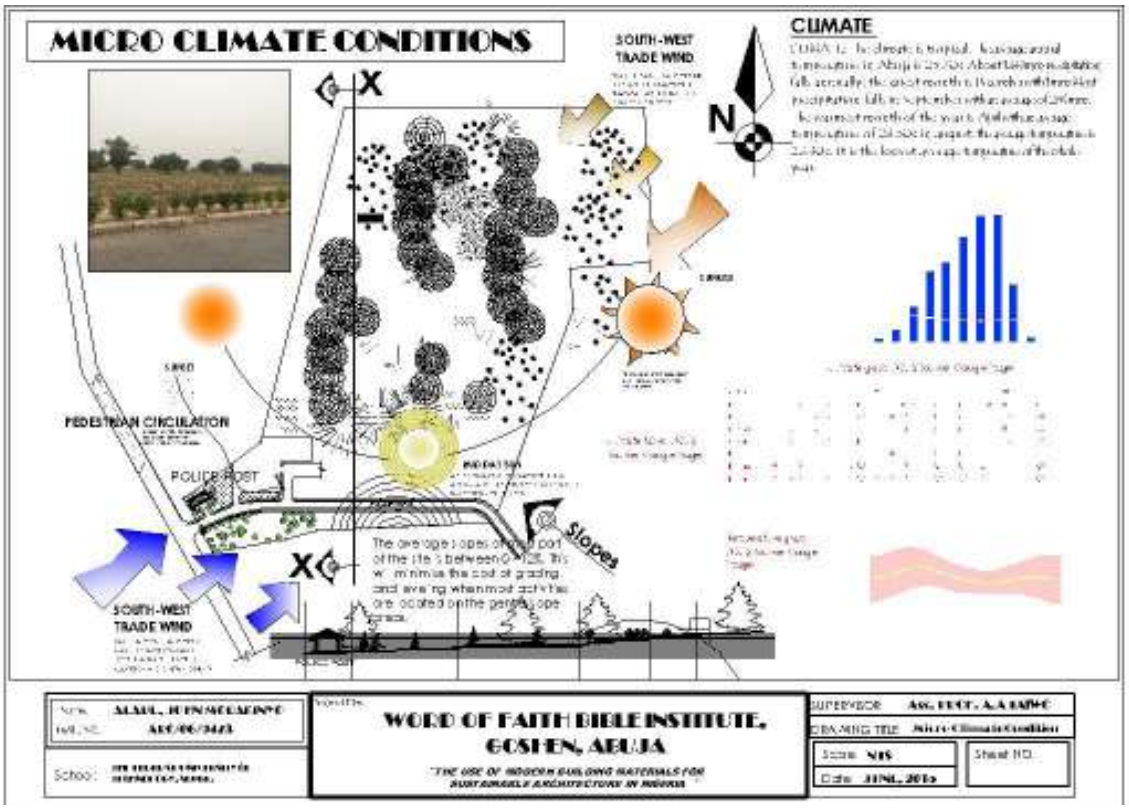
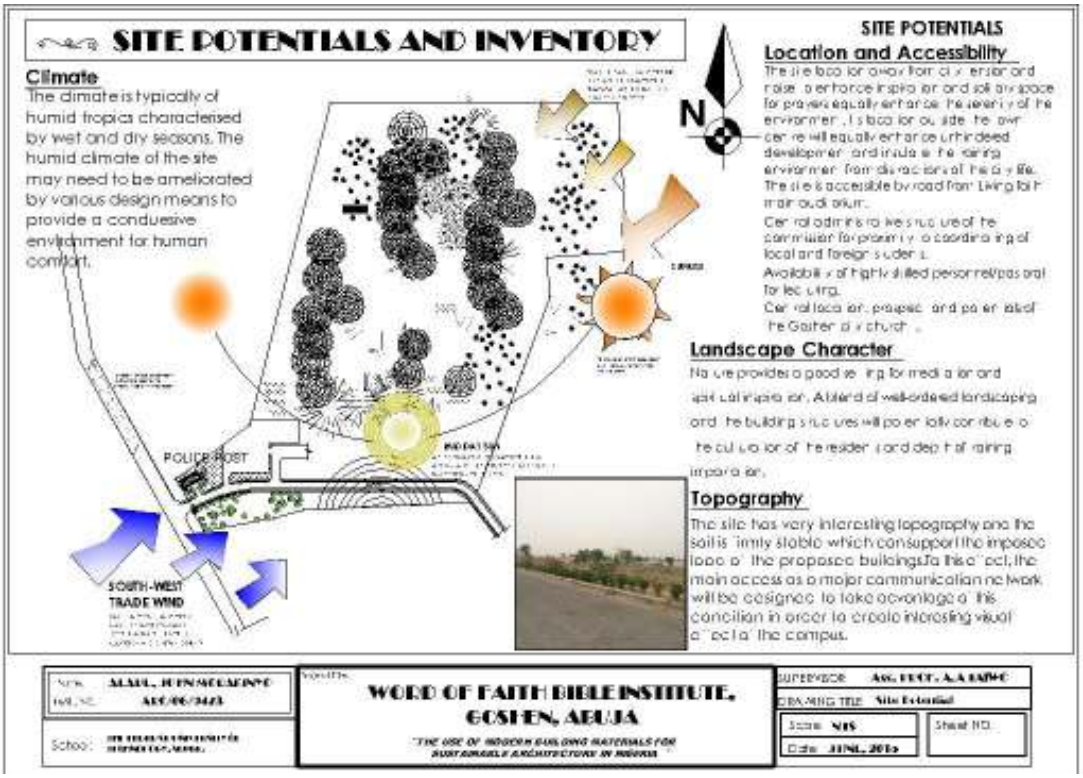
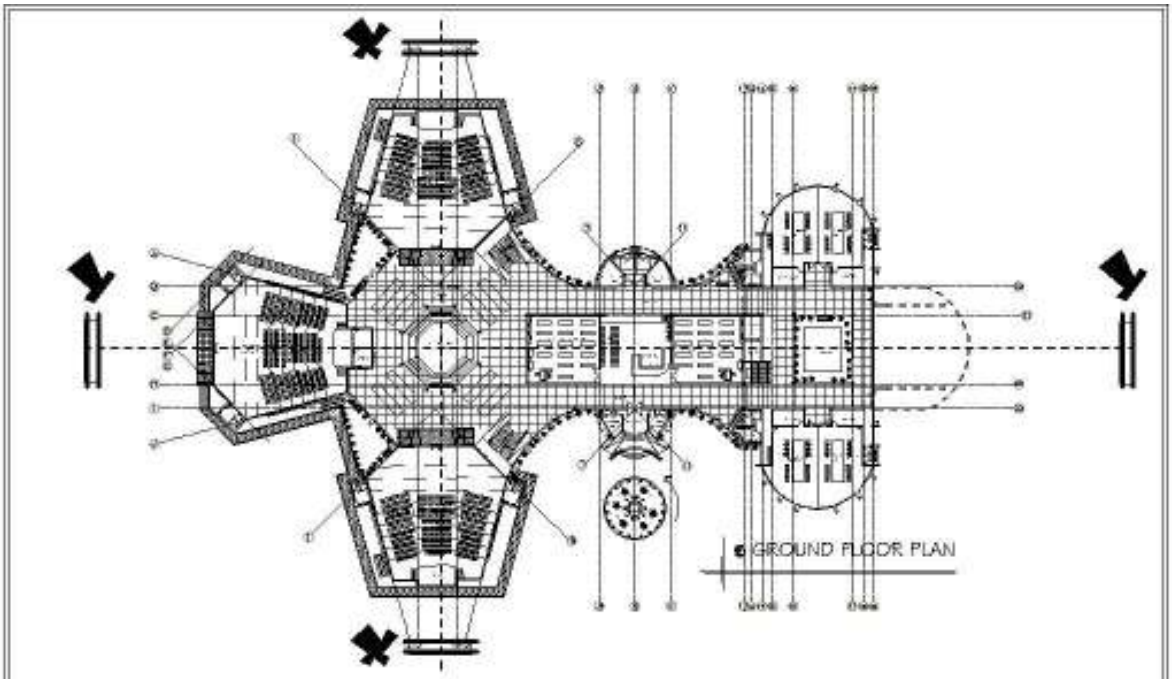
APPENDIX

SITE CLIMATIC CONDITIONS





THE SITE PLAN



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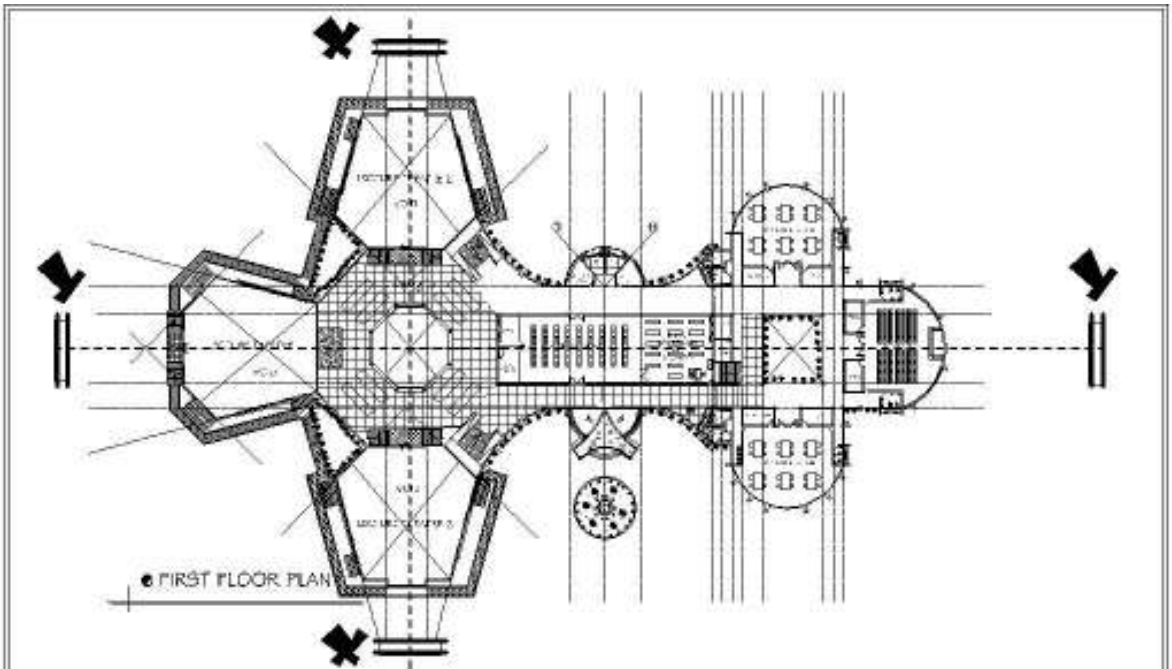

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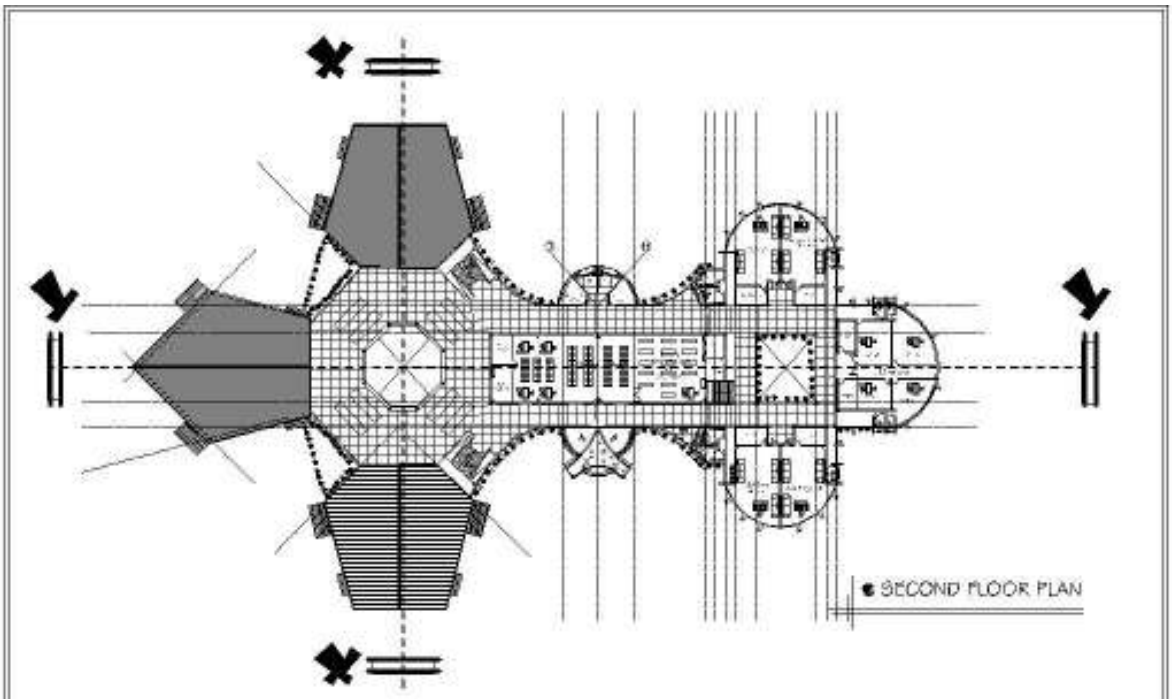

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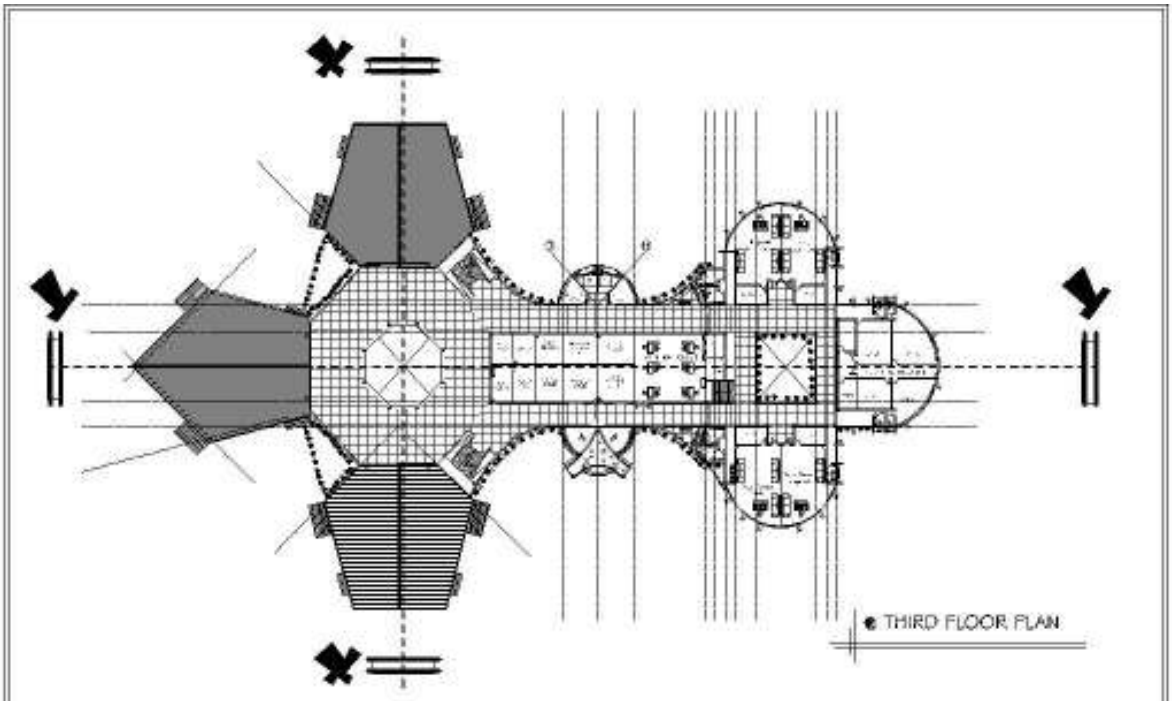

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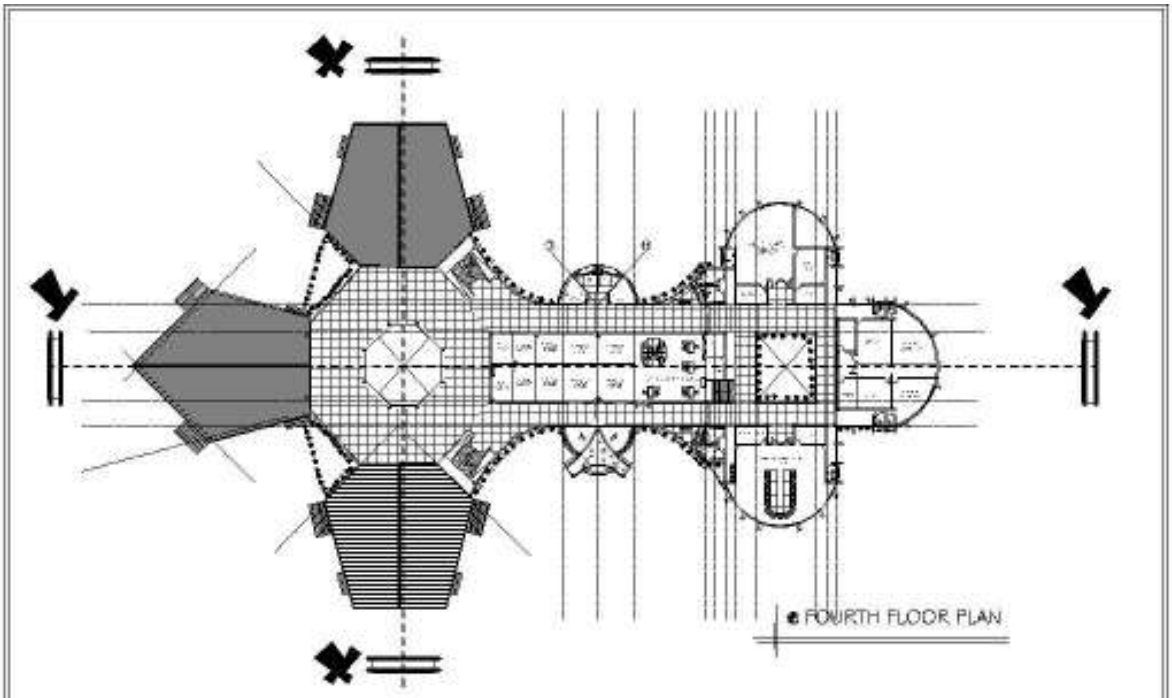

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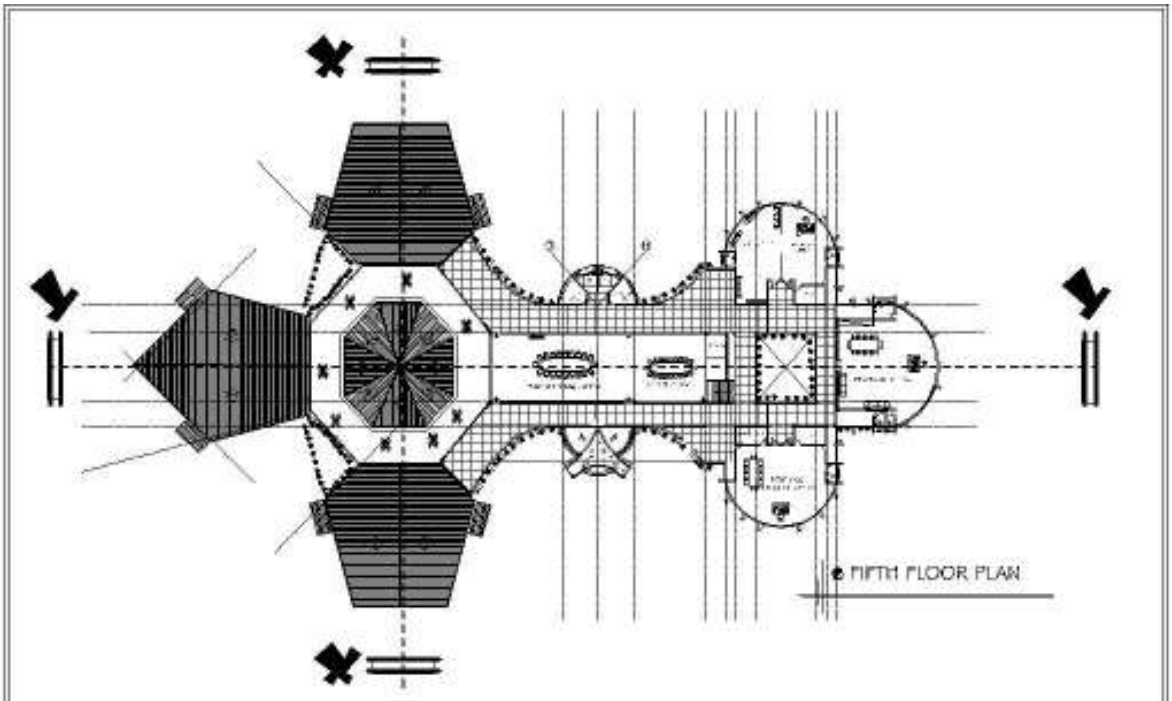

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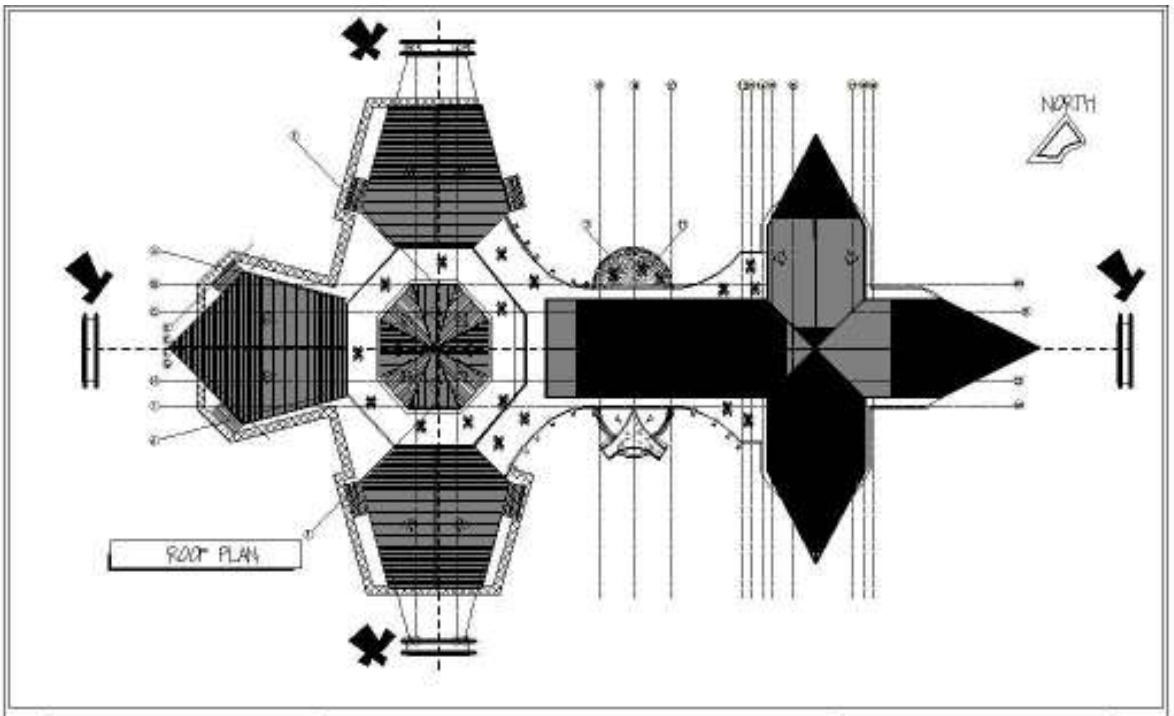

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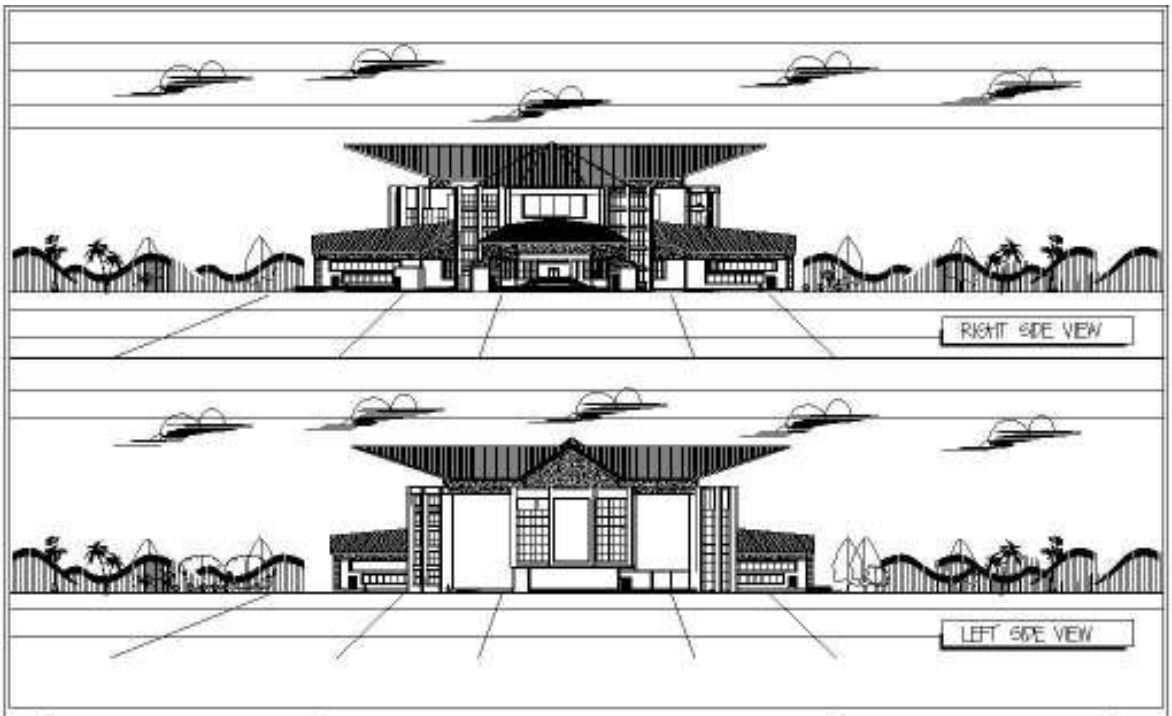
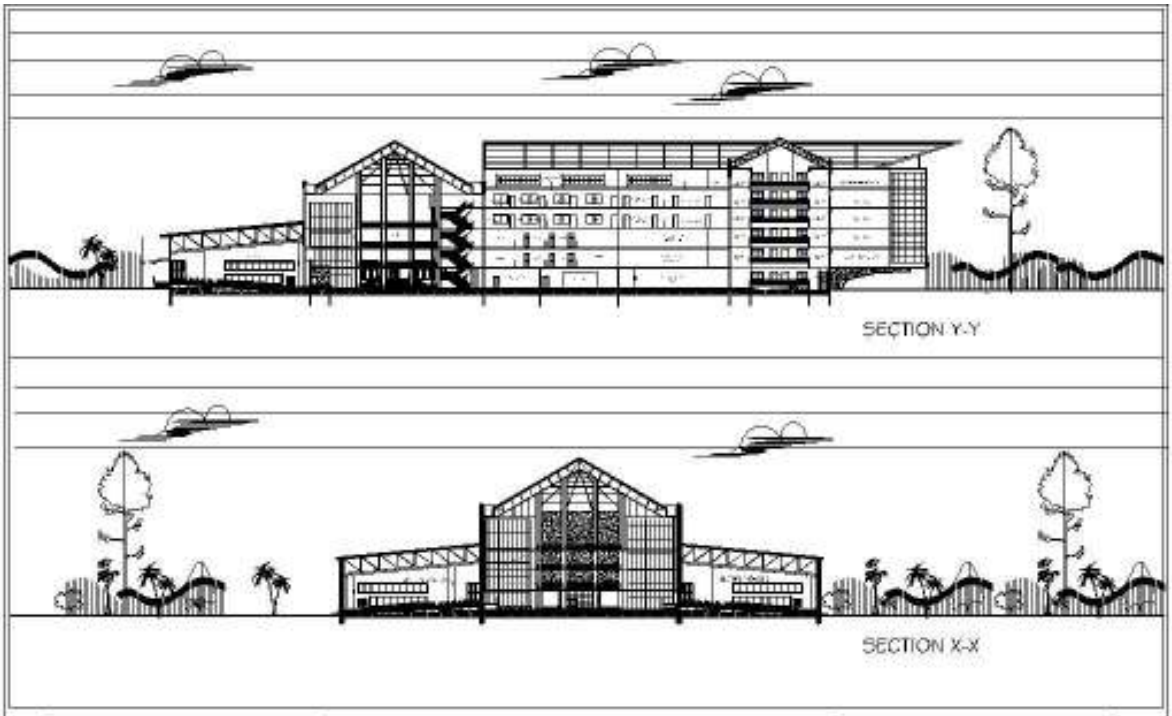
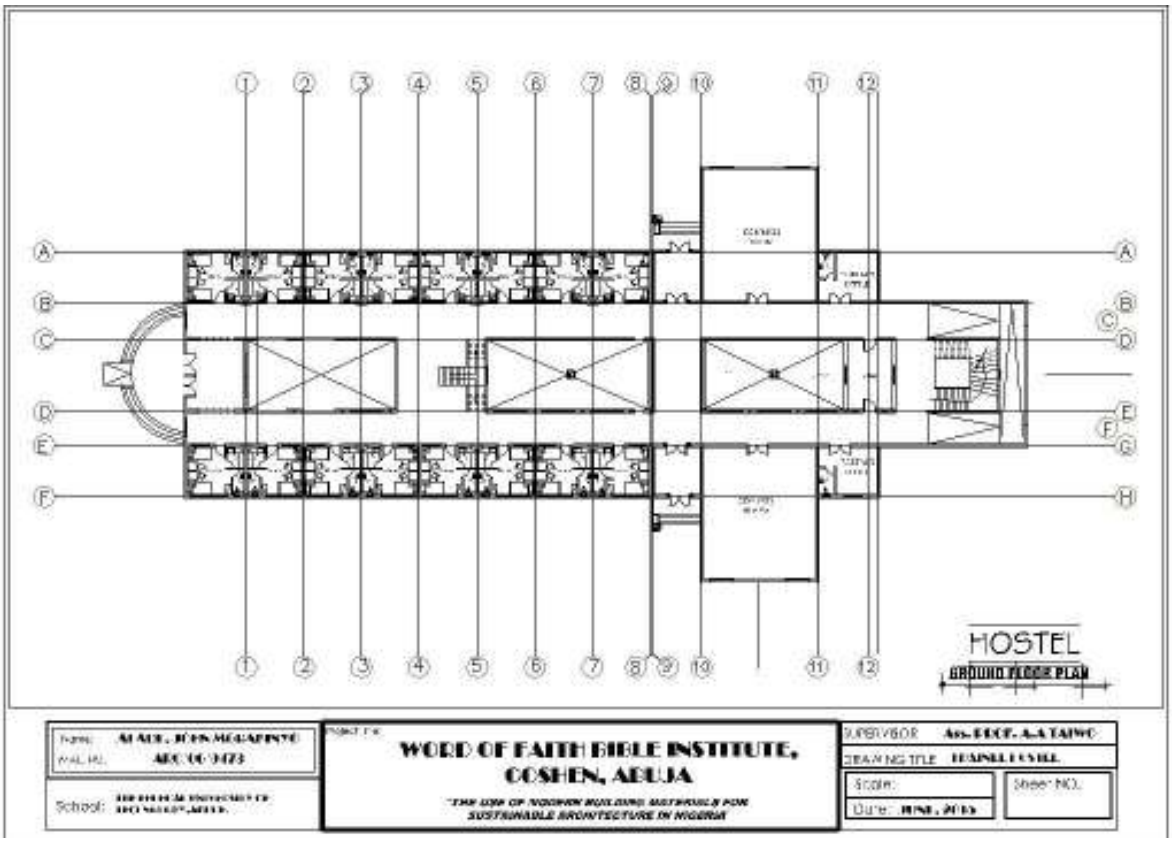
Name: ALADE, JOHN MEGAPINTO MAT. NO. ARC/06/3473 School: [illegible]	PROJECT TITLE **WORD OF FAITH BIBLE INSTITUTE, OOSHEN, ABUJA** *"THE USE OF INDIGENOUS BUILDING MATERIALS FOR SUSTAINABLE ARCHITECTURE IN NIGERIA"*	SUPERVISOR: Dr. A.A TAIWO DRAWING TITLE: ELEVATIONS Scale: 1:100 Date: JUNE, 2015 Sheet NO.:



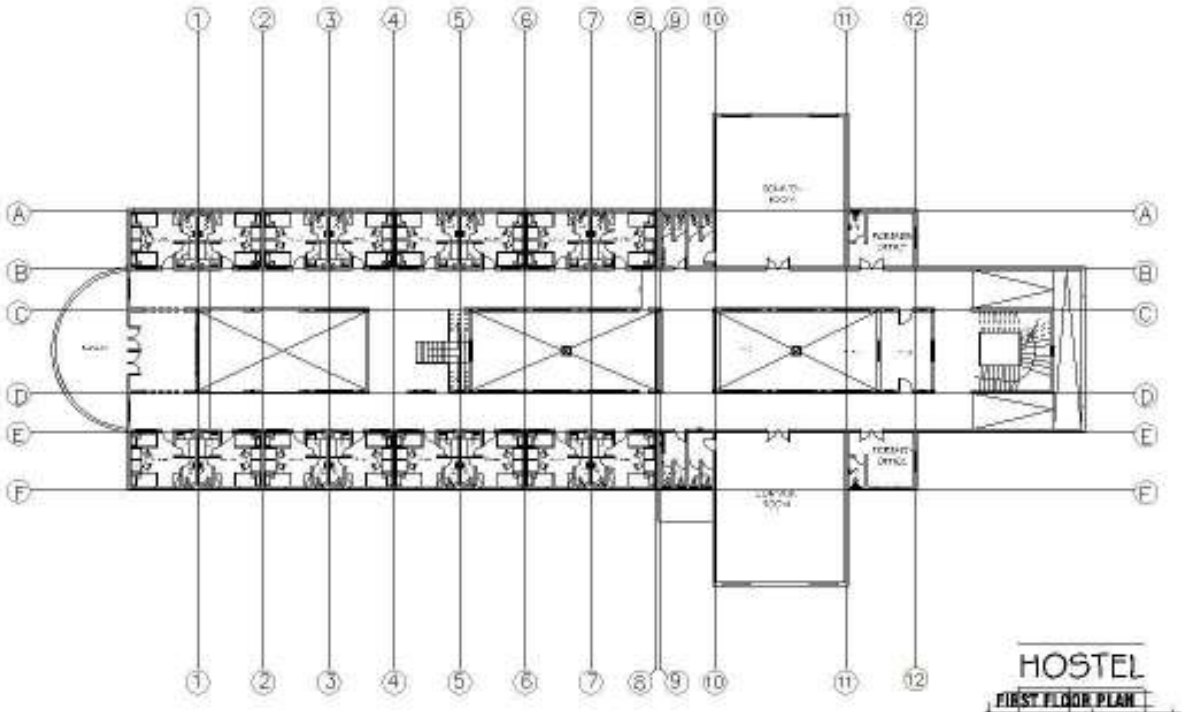
Name: ALADE, JOHN MEGAPINTO MAT. NO. ARC/05/3473 School: [illegible]	PROJECT TITLE **WORD OF FAITH BIBLE INSTITUTE, OOSHEN, ABUJA** *"THE USE OF NIGERIAN BUILDING MATERIALS FOR SUSTAINABLE ARCHITECTURE IN NIGERIA"*	SUPERVISOR Dr. A.A TAIWO DRAWING TITLE ELEVATIONS Scale: [illegible] Sheet NO. Date: JUNE, 2015

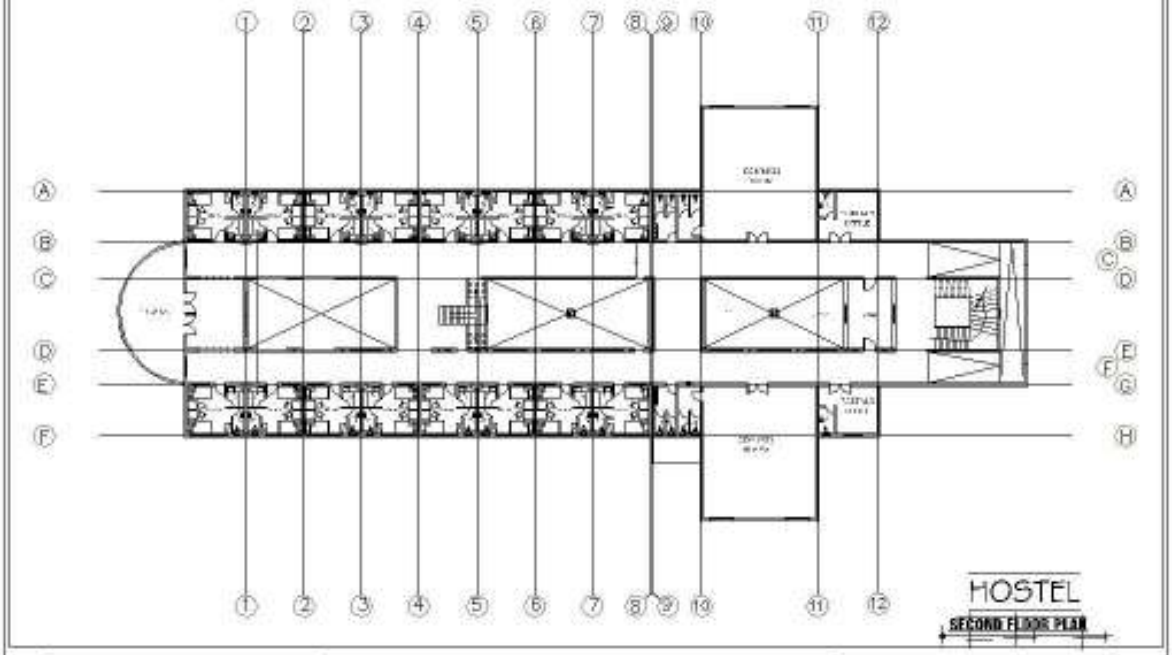


Name: ALADE, JOHN MEGAPINTO MAT. NO. ARC/05/3473 School: [illegible]	PROJECT TITLE **WORD OF FAITH BIBLE INSTITUTE, OOSHEN, ABUJA** *"THE USE OF NIGERIAN BUILDING MATERIALS FOR SUSTAINABLE ARCHITECTURE IN NIGERIA"*	SUPERVISOR Dr. A.A TAIWO DRAWING TITLE SECTIONS Scale: Date: JUNE, 2015 Sheet NO. 004

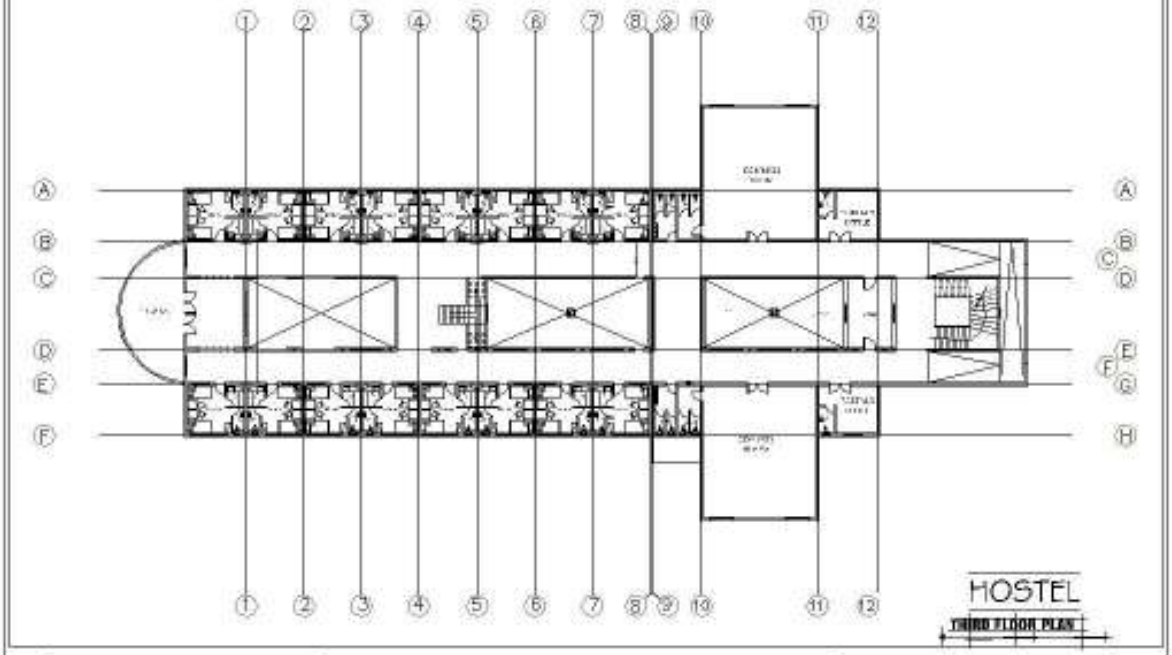


Name: ALADE, JOHN MEGAPHYC MAT. NO. ARC/06/3473 School:	WORD OF FAITH BIBLE INSTITUTE, OOSHEN, ABUJA "THE USE OF NIGERIAN BUILDING MATERIALS FOR SUSTAINABLE ARCHITECTURE IN NIGERIA"	SUPERVISOR: Arc. ENGR. A.A TAIWO DRAWING TITLE: HOSTEL GROUND FLOOR PLAN Scale: Date: JUNE, 2015 Sheet NO.

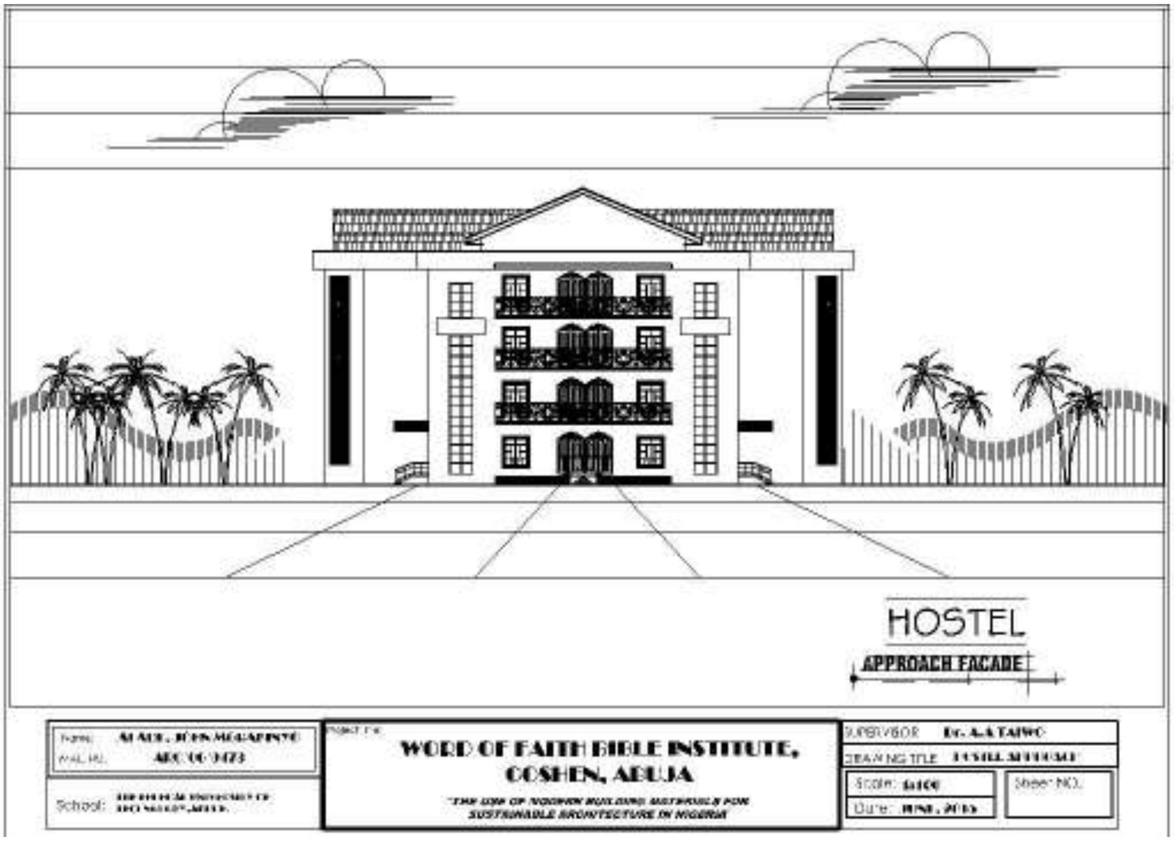


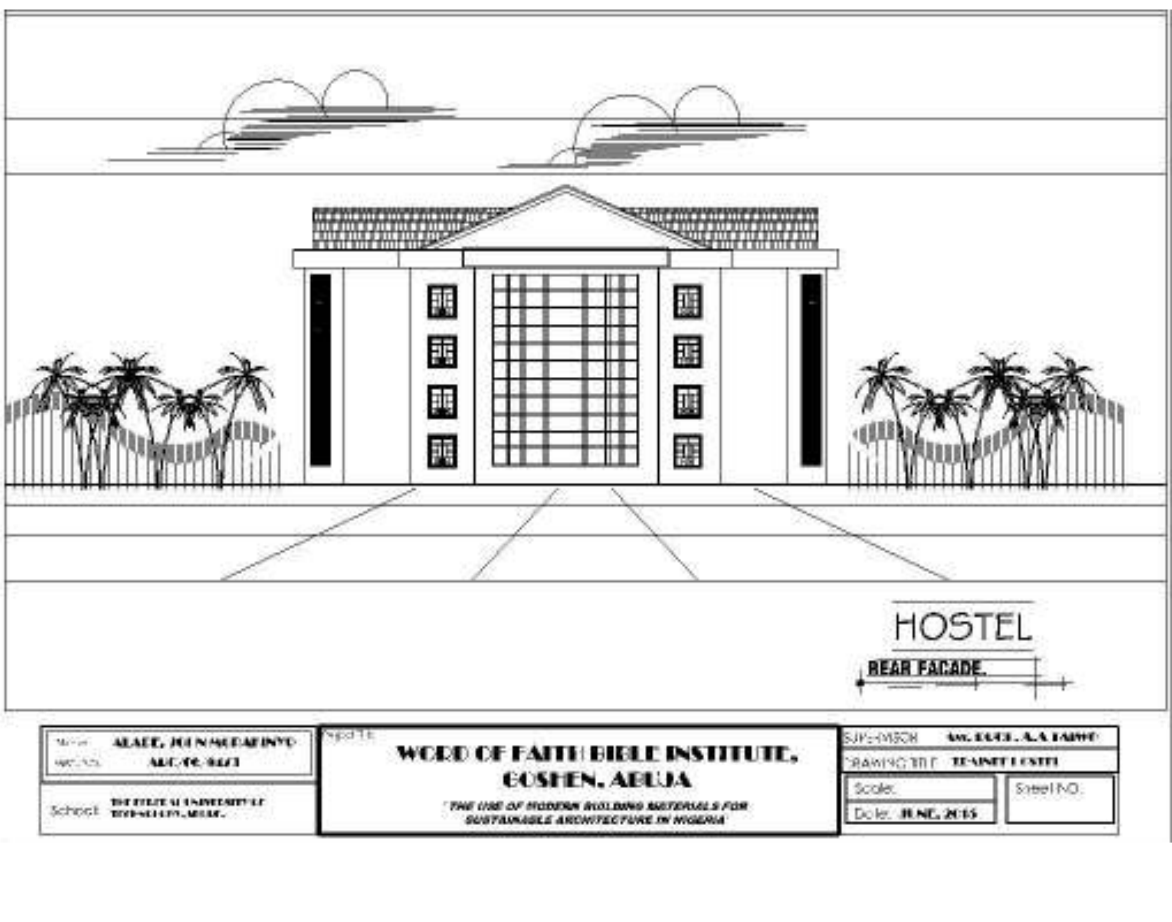


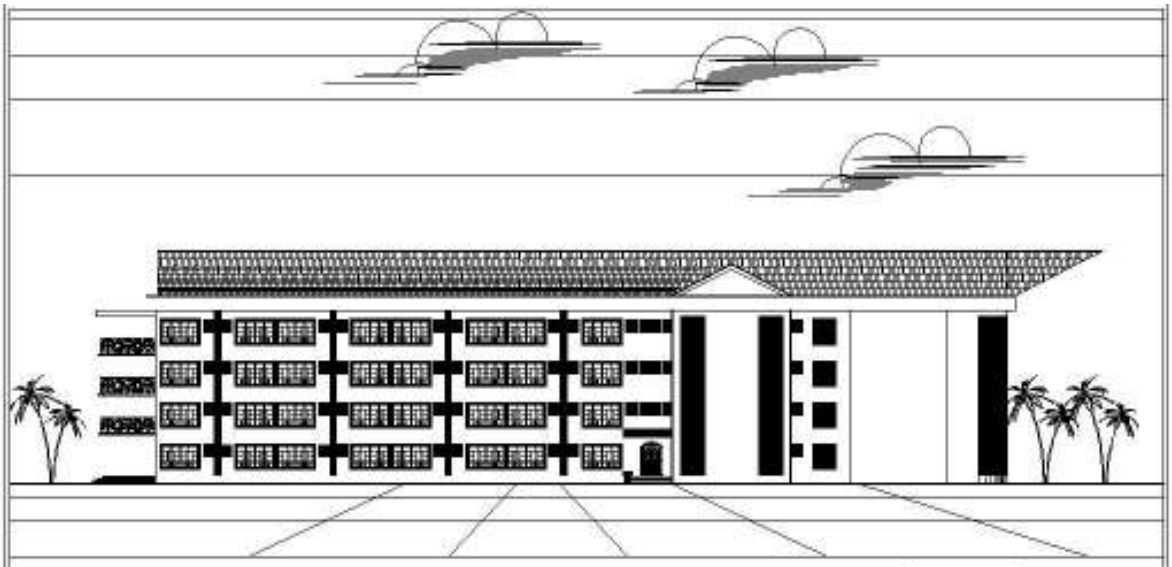
Name: ALADE, JOHN MEGAPHYTE MAT. NO. ARC/06/3473 School:	WORD OF FAITH BIBLE INSTITUTE, OOSHEN, ABUJA "THE USE OF NIGERIAN BUILDING MATERIALS FOR SUSTAINABLE ARCHITECTURE IN NIGERIA"	SUPERVISOR: Dr. A.A TAIWO DRAWING TITLE: FINAL Scale: 1:100 Date: JUNE, 2015	Sheet NO.



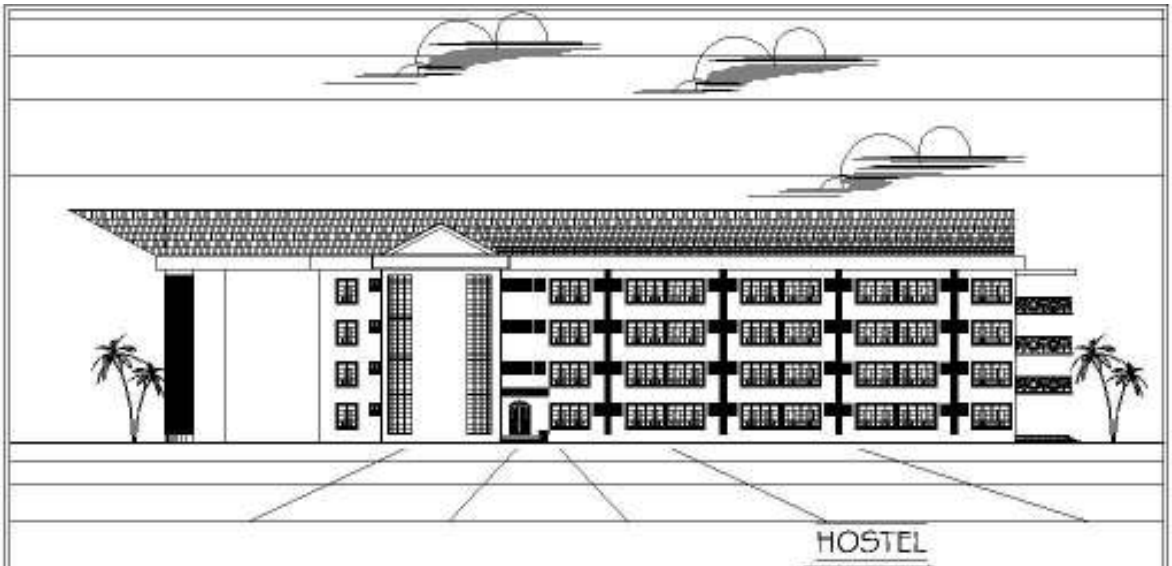
Name: ALADE, JOHN MEGAPHYTE MAT. NO. ARC/06/3473 School:	WORD OF FAITH BIBLE INSTITUTE, OOSHEN, ABUJA "THE USE OF NIGERIAN BUILDING MATERIALS FOR SUSTAINABLE ARCHITECTURE IN NIGERIA"	SUPERVISOR: Dr. A.A TAIWO DRAWING TITLE: FINAL Scale: 1:100 Date: JUNE, 2015	Sheet NO.


HOSTEL
APPROACH FACADE
WORD OF FAITH BIBLE INSTITUTE,
GOSHEN, ABUJA
"THE USE OF MODERN BUILDING MATERIALS FOR SUSTAINABLE ARCHITECTURE IN NIGERIA"
SUPERVISOR Dr. A.A TAIWO
Sheet NO.

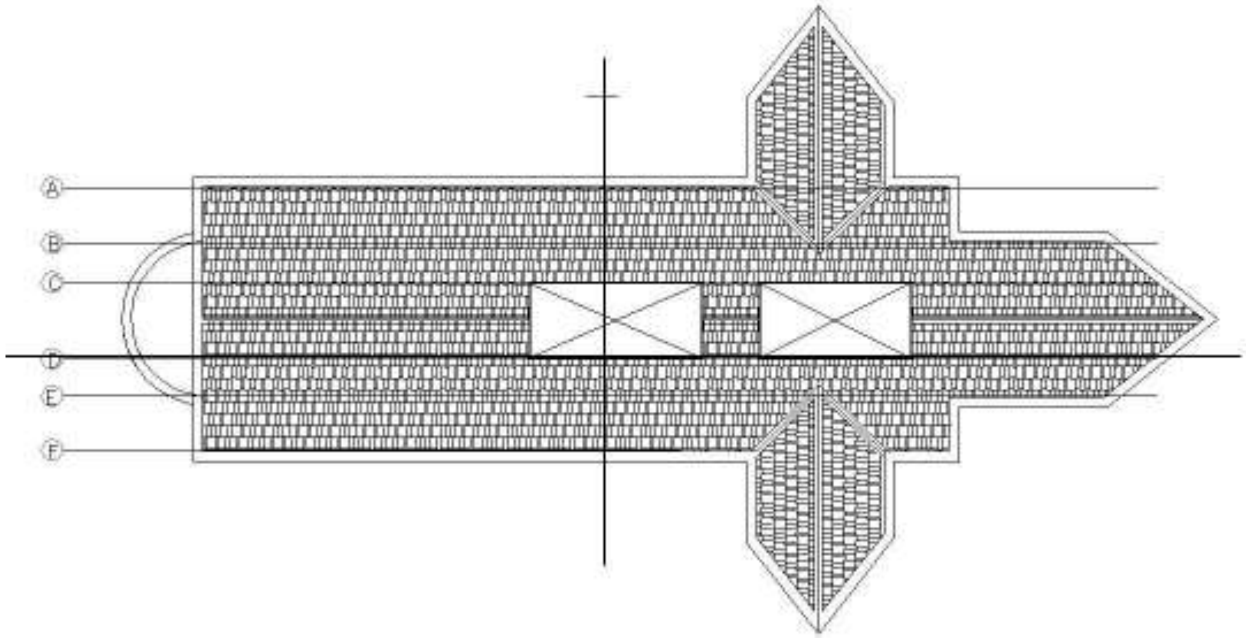

HOSTEL
REAR FACADE.
WORD OF FAITH BIBLE INSTITUTE,
GOSHEN, ABUJA
"THE USE OF MODERN BUILDING MATERIALS FOR SUSTAINABLE ARCHITECTURE IN NIGERIA"
Scale:
Sheet NO.

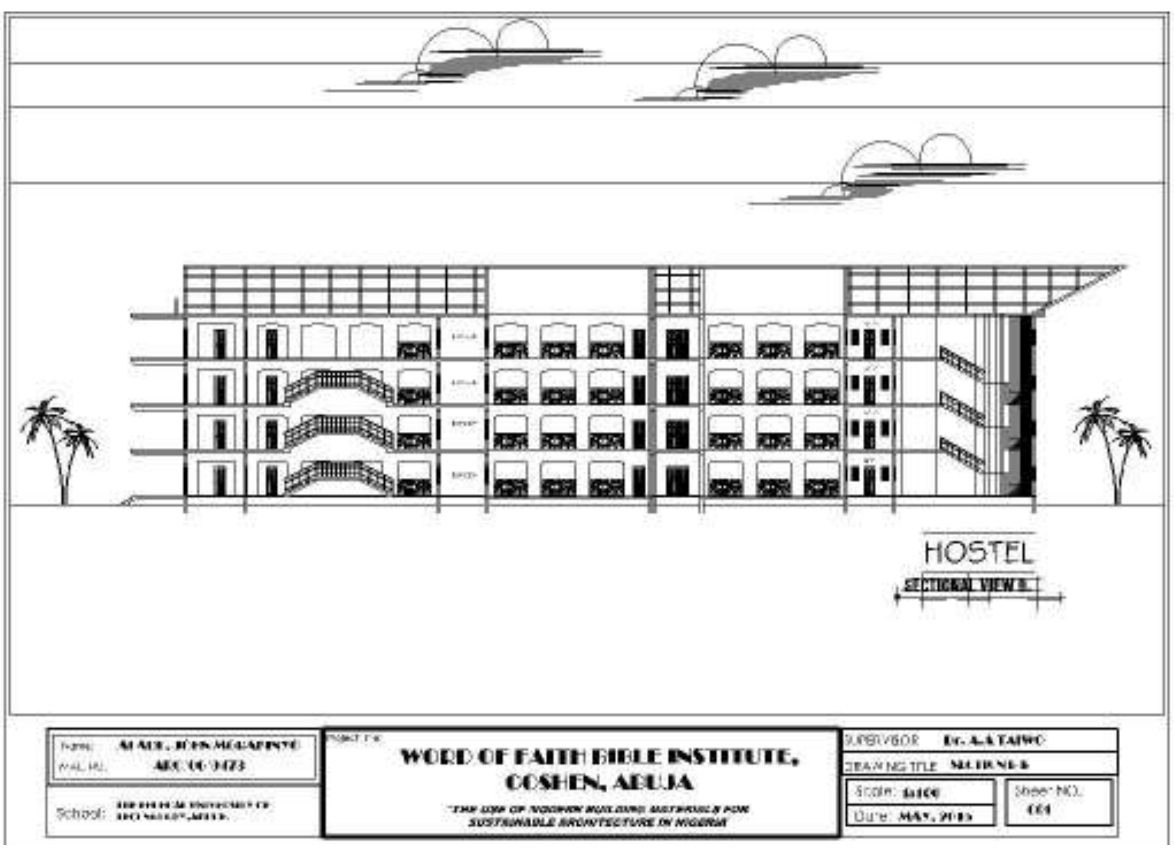


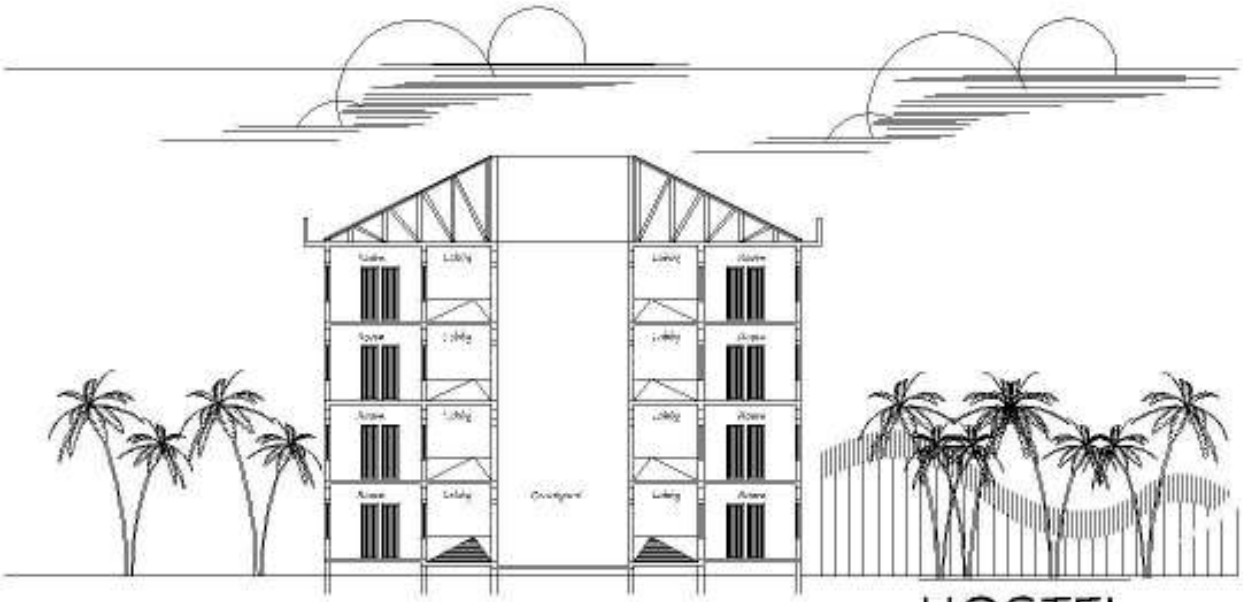
Name: ALADE, JOHN MEGAPHYTE MAT. NO.: ARC/06/3473 School:	WORD OF FAITH BIBLE INSTITUTE, OOSHEN, ABUJA "THE USE OF NIGERIAN BUILDING MATERIALS FOR SUSTAINABLE ARCHITECTURE IN NIGERIA"	SUPERVISOR: Ars. ENGR. A.A TAIWO DRAWING TITLE: HOSTEL (SIDE) Scale: Date: Sheet NO.:



Name: ALADE, JOHN MEGAPHYTE MAT. NO.: ARC/06/3473 School:	WORD OF FAITH BIBLE INSTITUTE, OOSHEN, ABUJA "THE USE OF NIGERIAN BUILDING MATERIALS FOR SUSTAINABLE ARCHITECTURE IN NIGERIA"	SUPERVISOR: Eg. A.A TAIWO DRAWING TITLE: HOSTEL (LEFT VIEW) Scale: Date: Sheet NO.:


A
B
C
D
E
F

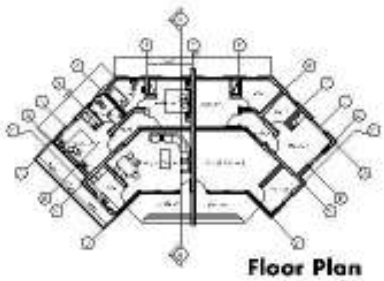

HOSTEL
SECTIONAL VIEW
WORD OF FAITH BIBLE INSTITUTE,
GOSHEN, ABUJA
Supervisor: Dr. A.A TAIWO
Scale:
Sheet NO.



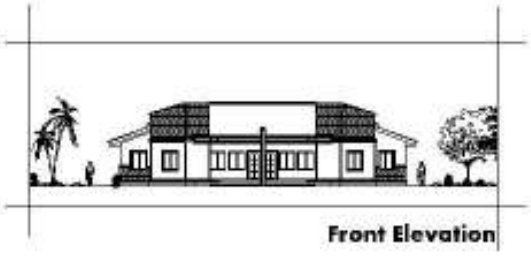
HOSTEL

SECTIONAL VIEW A.

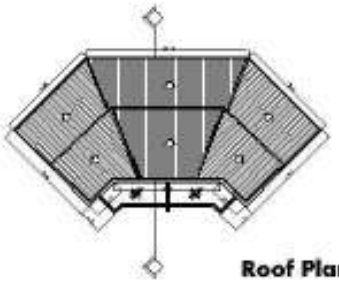
MINISTERS CHARLET



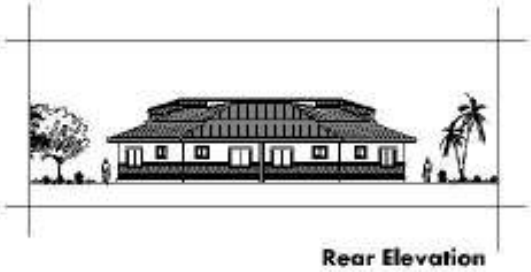
Floor Plan



Front Elevation



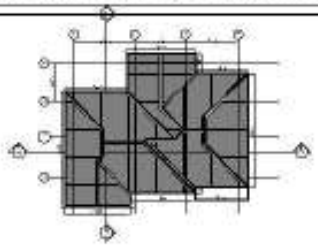
Roof Plan

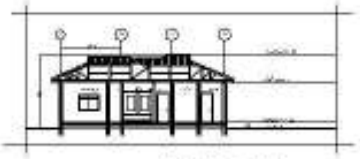


Rear Elevation

Name: ALADE, JOHN MOGAJINNU MAT. NO. ARC/05/3473	PROJECT TITLE WORD OF FAITH BIBLE INSTITUTE, OSHEN, ABUJA "THE USE OF MODERN BUILDING MATERIALS FOR SUSTAINABLE ARCHITECTURE IN NIGERIA"	SUPERVISOR: Dr. A.A TAIWO DRAWING TITLE: CHARLET	
School: [illegible]		Scale: 1:100 Date: JUNE, 2010	Sheet NO.

PASTORS CHARLET

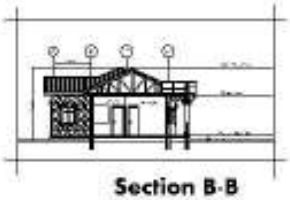




Section A-A

Front Elevation

Left Side Elevation



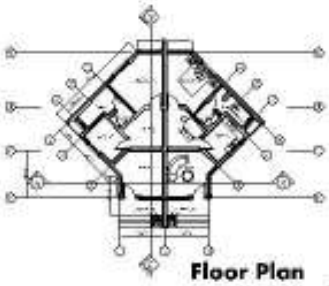
Section B-B

Rear Elevation

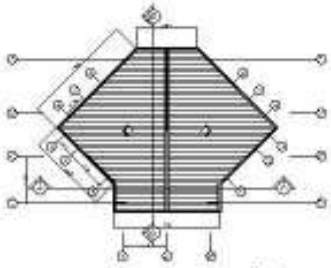
Right Side Elevation

Name: ALADE, JOHN MEGAPHYTE	WORD OF FAITH BIBLE INSTITUTE, OOSHEN, ABUJA
MAT. NO.: ARC/06/3473	"THE USE OF NIGERIAN BUILDING MATERIALS FOR SUSTAINABLE ARCHITECTURE IN NIGERIA"
School: [illegible]	SUPERVISOR: Dr. A.A TAIWO
	DRAWING TITLE: CHARLET
	Scale: 1:100 / Date: JUNE, 2015 / Sheet NO.

TRAINEE CHARLET



Floor Plan



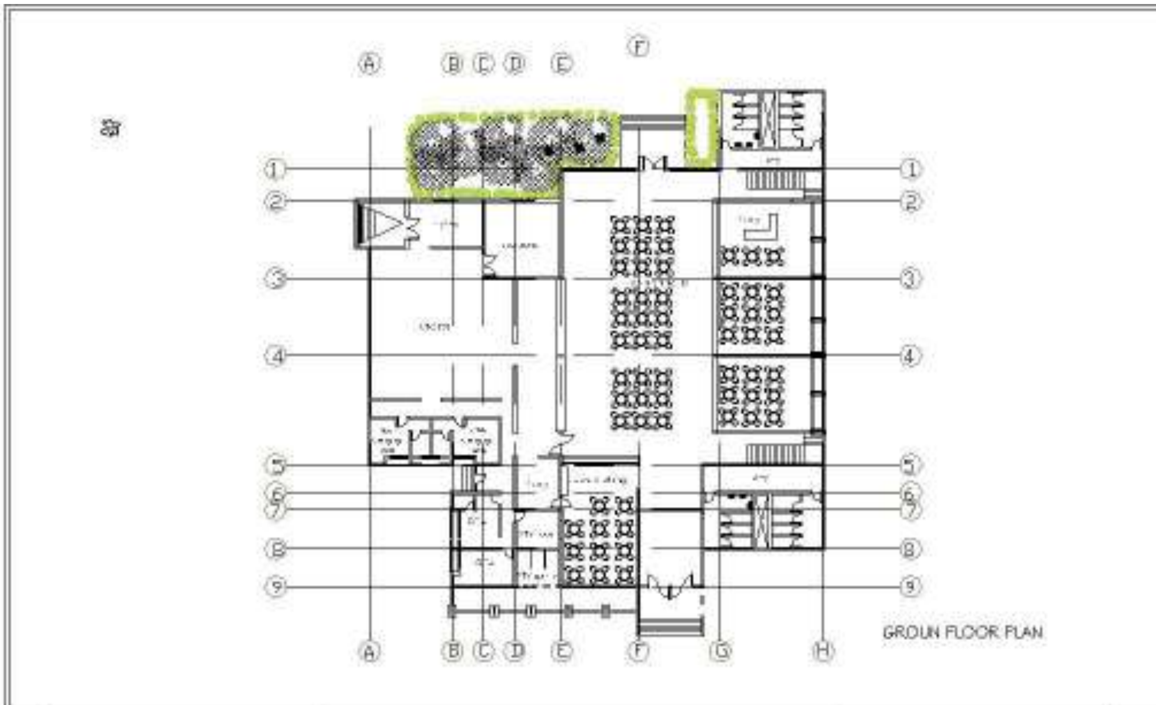
Roof Plan

Typical Side Elevation

Front Elevation

Rear Elevation

Name: ALADE, JOHN MEGAPHYTE	WORD OF FAITH BIBLE INSTITUTE, OOSHEN, ABUJA
MAT. NO.: ARC/06/3473	"THE USE OF NIGERIAN BUILDING MATERIALS FOR SUSTAINABLE ARCHITECTURE IN NIGERIA"
School: [illegible]	SUPERVISOR: Dr. A.A TAIWO
	DRAWING TITLE: CHARLET
	Scale: 1:100 / Date: JUNE, 2015 / Sheet NO.



WORD OF FAITH BIBLE INSTITUTE, GOSHEN, ABUJA

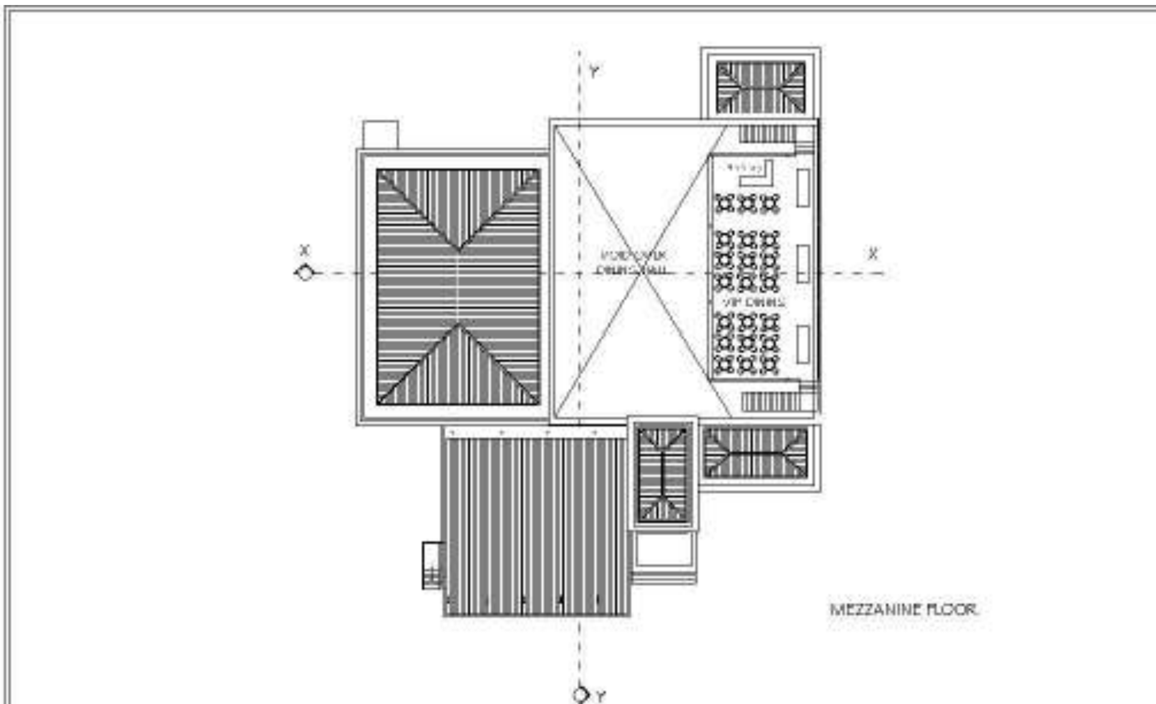
"THE USE OF MODERN BUILDING MATERIALS FOR SUSTAINABLE ARCHITECTURE IN NIGERIA"

SUPERVISOR

DRAWING TITLE RESTAURANT

Scale 1:200

Sheet NO.



WORD OF FAITH BIBLE INSTITUTE, GOSHEN, ABUJA

"THE USE OF MODERN BUILDING MATERIALS FOR SUSTAINABLE ARCHITECTURE IN NIGERIA"

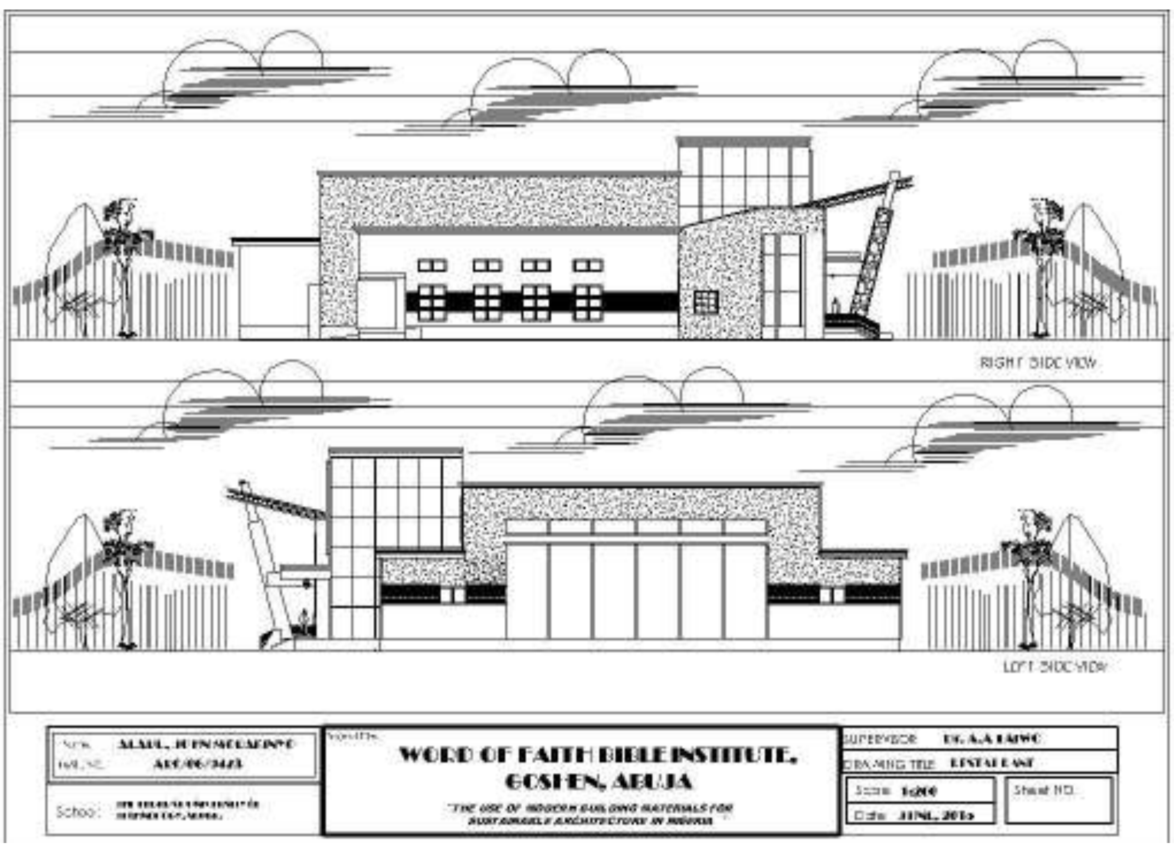
SUPERVISOR

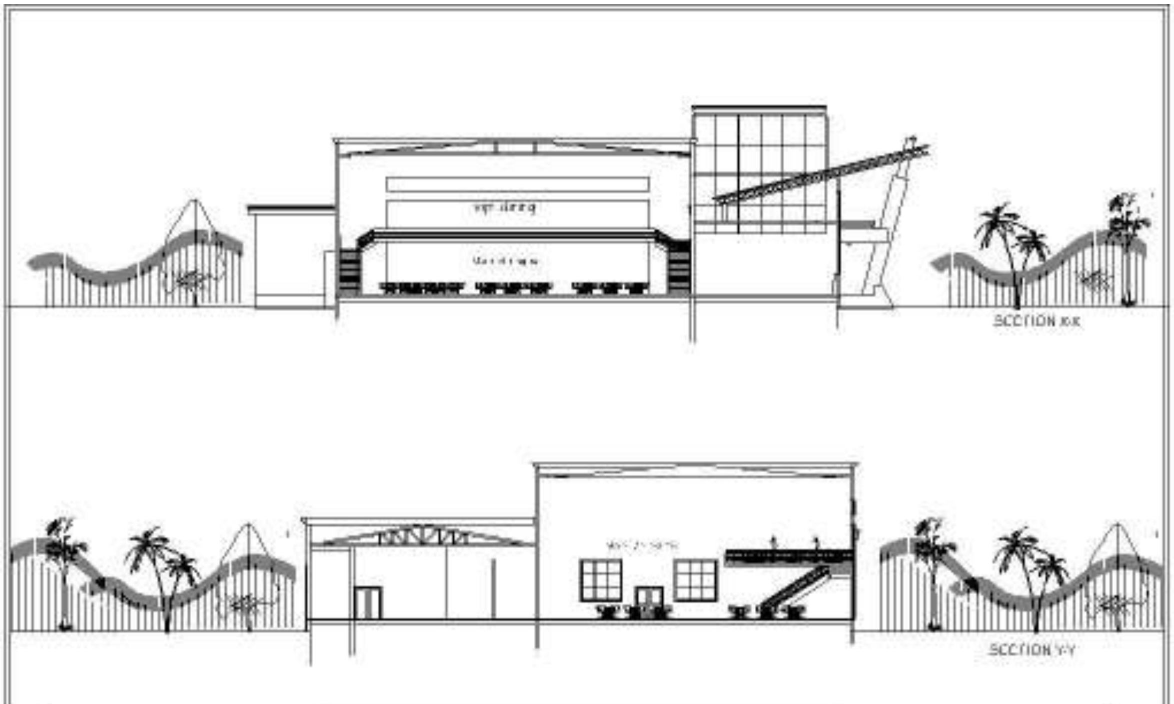
DRAWING TITLE RESTAURANT

Scale 1:200

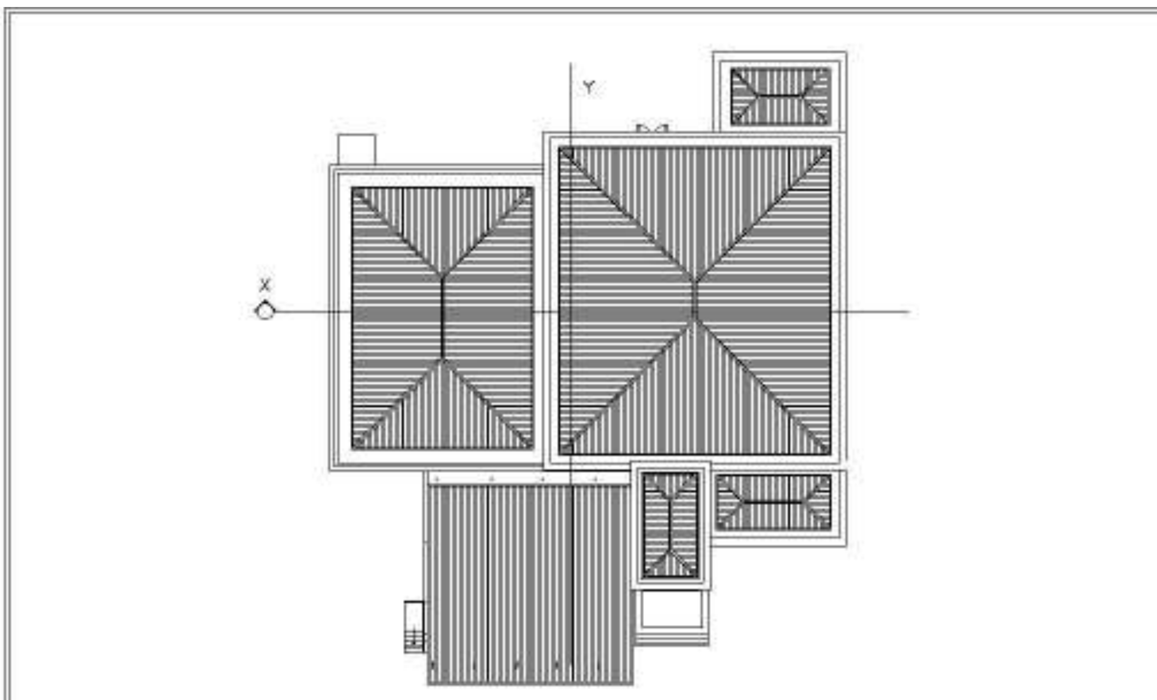
Sheet NO.


APPROACH VIEW
REAR VIEW

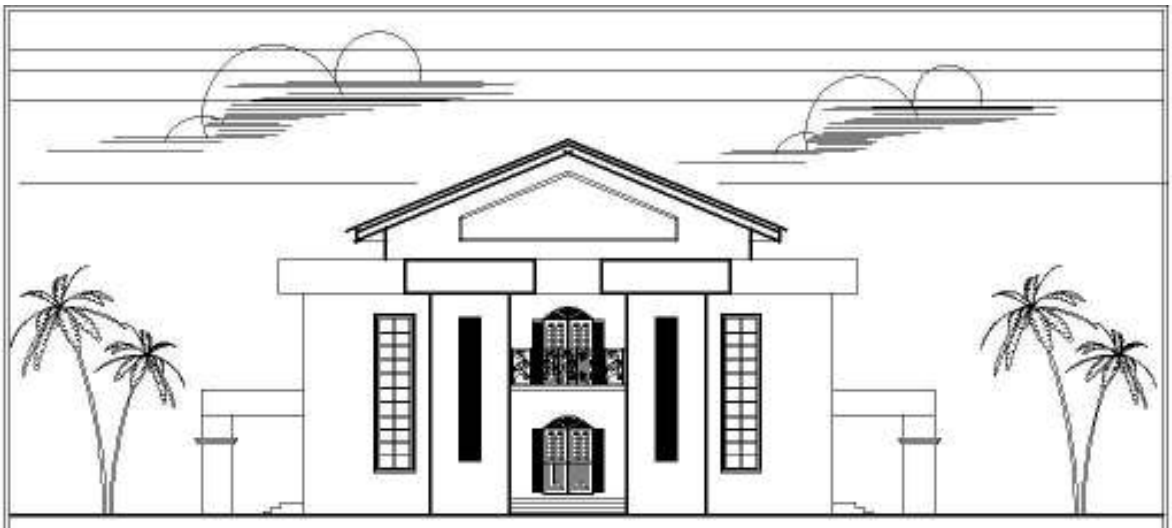

RIGHT SIDE VIEW
LEFT SIDE VIEW
School:
WORD OF FAITH BIBLE INSTITUTE,
GOSHEN, ABUJA
SUPERVISOR
DRAWING TITLE
Scale
Date
Sheet NO.



WORD OF FAITH BIBLE INSTITUTE, GOSHEN, ABUJA



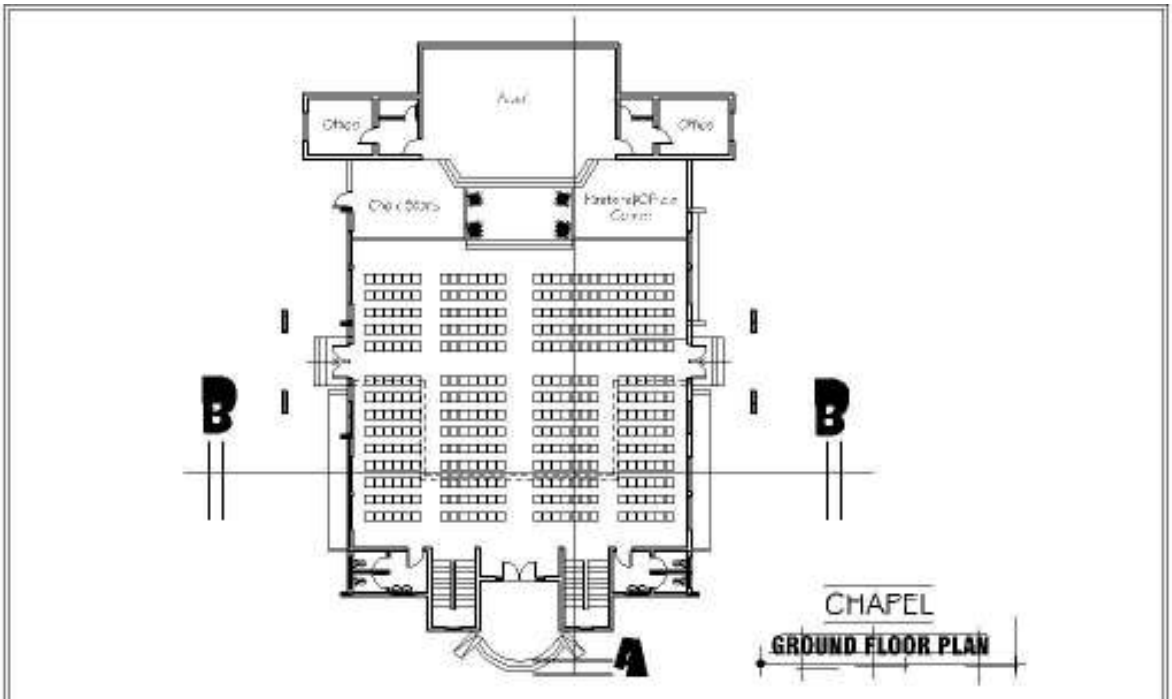
WORD OF FAITH BIBLE INSTITUTE, GOSHEN, ABUJA



CHAPEL

APPROACH FACADE

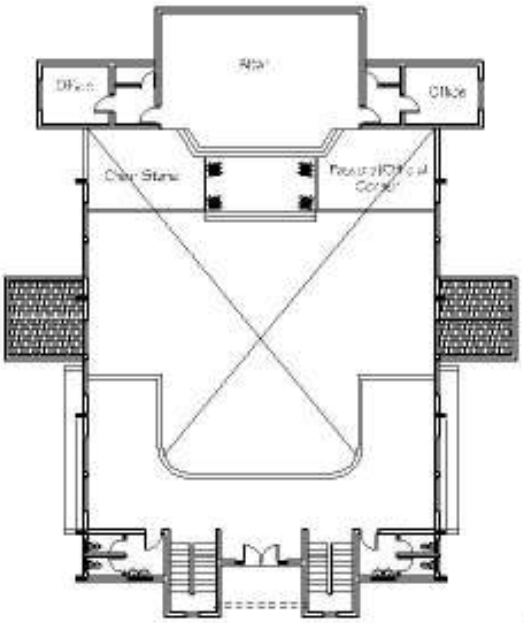
Name: [illegible]	PROJECT TITLE: WORD OF FAITH BIBLE INSTITUTE, OOSHEN, ABUJA	SUPERVISOR: Dr. A.A TAIWO	
MAT. NO.: [illegible]	"THE USE OF NIGERIAN BUILDING MATERIALS FOR SUSTAINABLE ARCHITECTURE IN NIGERIA"	DRAWING TITLE: [illegible]	
School: [illegible]		Scale: [illegible]	Sheet NO.: 004
		Date: MAY, 2015	



CHAPEL

GROUND FLOOR PLAN

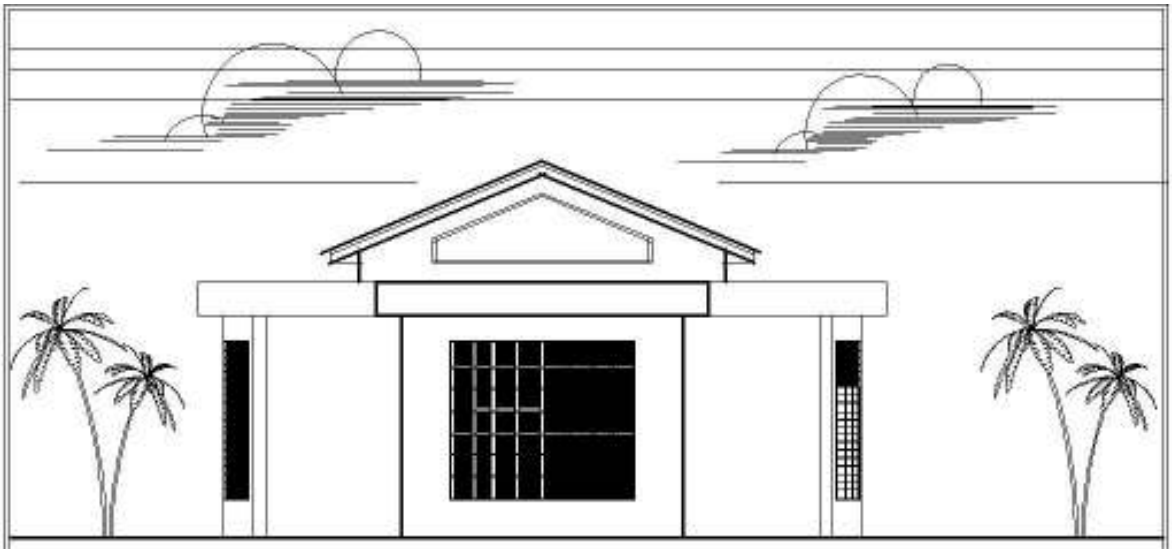
Name: [illegible]	PROJECT TITLE: WORD OF FAITH BIBLE INSTITUTE, OOSHEN, ABUJA	SUPERVISOR: Dr. A.A TAIWO	
MAT. NO.: [illegible]	"THE USE OF NIGERIAN BUILDING MATERIALS FOR SUSTAINABLE ARCHITECTURE IN NIGERIA"	DRAWING TITLE: [illegible]	
School: [illegible]		Scale: [illegible]	Sheet NO.: 004
		Date: MAY, 2015	



CHAPEL

MEZZANINE FLOOR PLAN

Name: ALADE, JOHN MEGAPINTO MAT. NO.: ARC/06/3473 School: [illegible]	WORD OF FAITH BIBLE INSTITUTE, OOSHEN, ABUJA "THE USE OF NIGERIAN BUILDING MATERIALS FOR SUSTAINABLE ARCHITECTURE IN NIGERIA"	SUPERVISOR: Dr. A.A TAIWO DRAWING TITLE: [illegible] Scale: 1:100 Date: MAY, 2015 Sheet NO.: 02



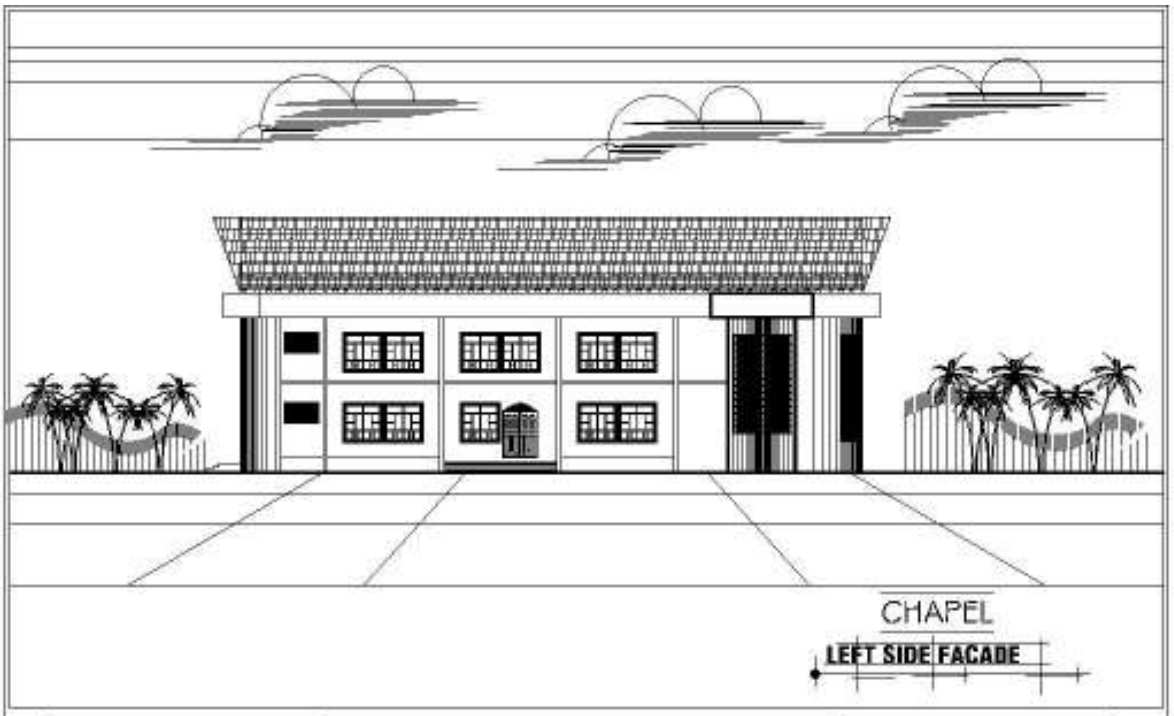
CHAPEL

REAR FACADE

Name: ALADE, JOHN MEGAPINTO MAT. NO.: ARC/06/3473 School: [illegible]	WORD OF FAITH BIBLE INSTITUTE, OOSHEN, ABUJA "THE USE OF NIGERIAN BUILDING MATERIALS FOR SUSTAINABLE ARCHITECTURE IN NIGERIA"	SUPERVISOR: Dr. A.A TAIWO DRAWING TITLE: [illegible] Scale: 1:100 Date: MAY, 2015 Sheet NO.: 03

Name: ALADE, JOHN MEGAPINTO MAT. NO. ARC/06/3473 School: [illegible]	PROJECT TITLE: WORD OF FAITH BIBLE INSTITUTE, OOSHEN, ABUJA "THE USE OF NIGERIAN BUILDING MATERIALS FOR SUSTAINABLE ARCHITECTURE IN NIGERIA"	SUPERVISOR: DR. A.A TAIWO DRAWING TITLE: [illegible] Scale: Date: Sheet NO.

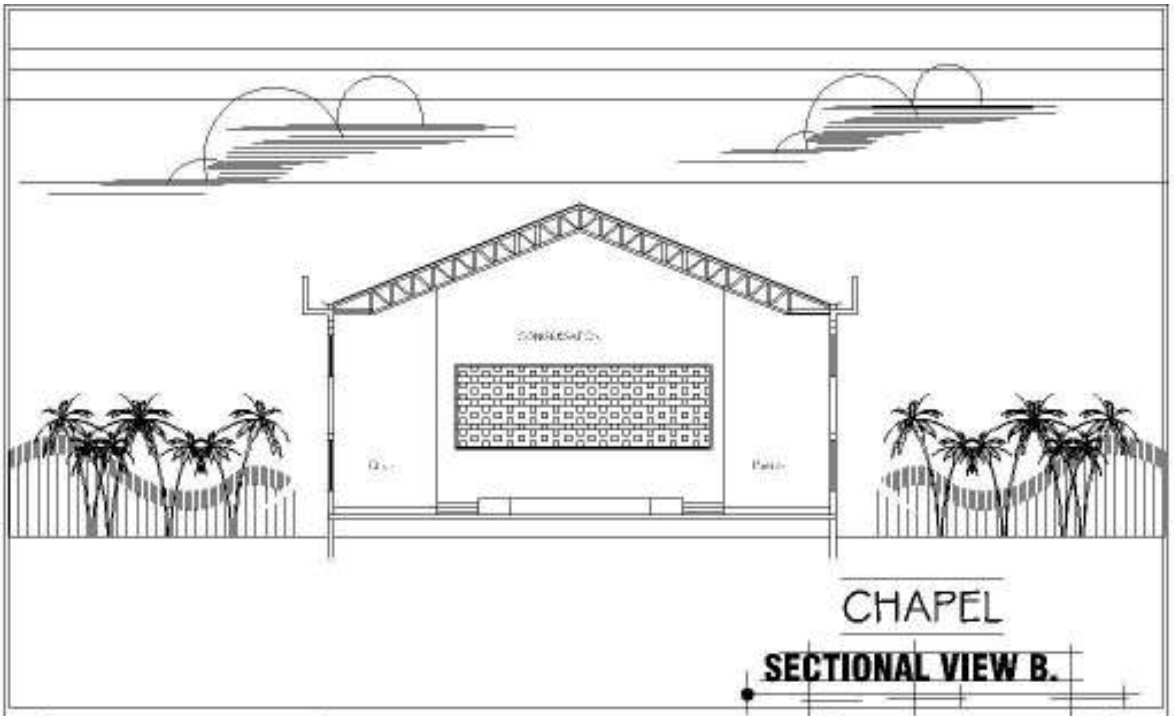
Name: ALADE, JOHN MEGAPINTO MAT. NO. ARC/06/3473 School: [illegible]	PROJECT TITLE: WORD OF FAITH BIBLE INSTITUTE, OOSHEN, ABUJA "THE USE OF NIGERIAN BUILDING MATERIALS FOR SUSTAINABLE ARCHITECTURE IN NIGERIA"	SUPERVISOR: DR. A.A TAIWO DRAWING TITLE: [illegible] Scale: Date: Sheet NO.



CHAPEL

LEFT SIDE FACADE

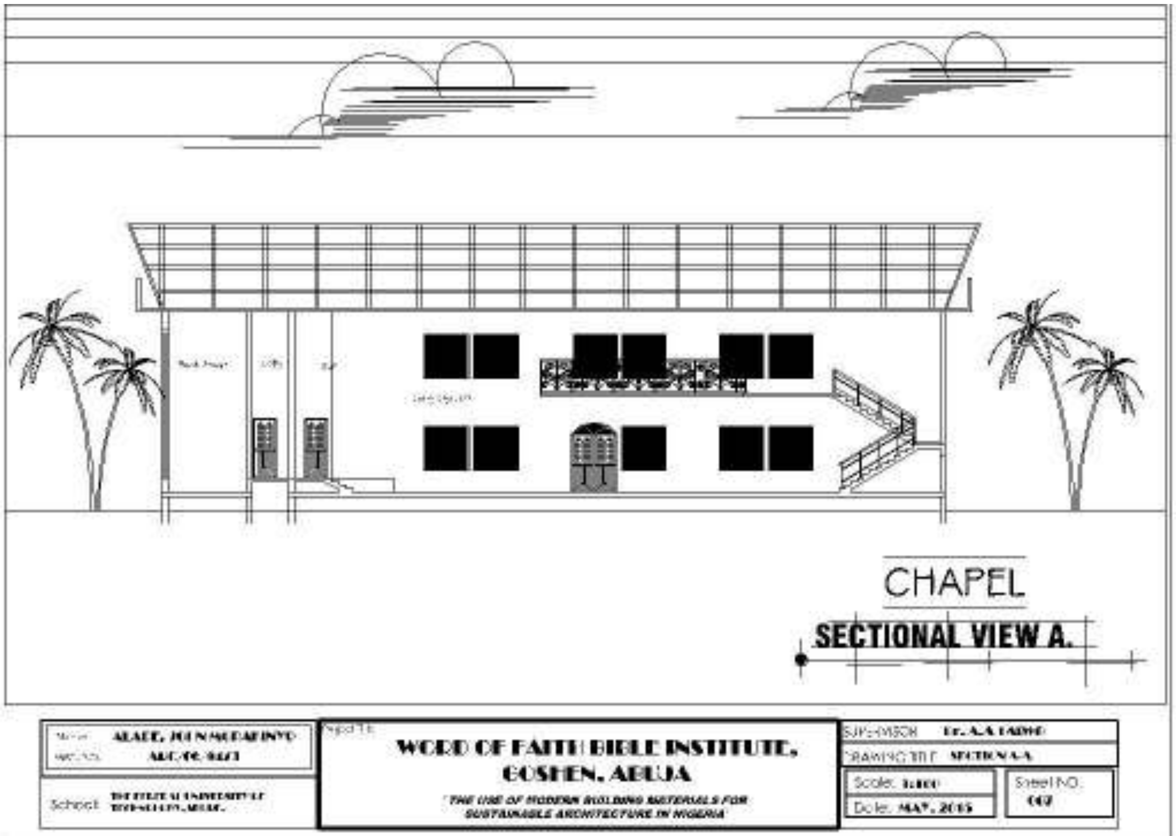
Name: ALADE, JOHN MEGAPINTO MAT. NO.: ARC/06/3473	PROJECT TITLE: WORD OF FAITH BIBLE INSTITUTE, OOSHEN, ABUJA "THE USE OF NIGERIAN BUILDING MATERIALS FOR SUSTAINABLE ARCHITECTURE IN NIGERIA"	SUPERVISOR: DR. A.A TAIWO DRAWING TITLE: Left View Scale: Date: Sheet NO.:
School: [illegible]		



CHAPEL

SECTIONAL VIEW B.

Name: ALADE, JOHN MEGAPINTO MAT. NO.: ARC/06/3473	PROJECT TITLE: WORD OF FAITH BIBLE INSTITUTE, OOSHEN, ABUJA "THE USE OF NIGERIAN BUILDING MATERIALS FOR SUSTAINABLE ARCHITECTURE IN NIGERIA"	SUPERVISOR: DR. A.A TAIWO DRAWING TITLE: SECTION Scale: 1:100 Date: JUNE, 2010 Sheet NO.:
School: [illegible]		


CHAPEL
SECTIONAL VIEW A.
WORD OF FAITH BIBLE INSTITUTE,
GOSHEN, ABUJA
Scale:
Date:
Sheet NO.