EVALUATION OF ARCHITECTURE AS A TOOL TO ENHANCE CREATIVITY IN

THE DESIGN OF A CENTRE FOR ARTS AND CREATIVITY, ABUJA.

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MAY, 2015.

DECLARATION

I declare that this Thesis entitled AN EVALUATION OF ARCHITECTURE AS A TOOL TO ENHANCE CREATIVITY IN THE DESIGN OF A CENTRE FOR ARTS AND CREATIVITY, ABUJA has been performed by me in the Department of Architecture under the supervision of Dr. R. B. Tukur and Dr. M.L. Sagada

The information derived from the literature has duly been acknowledged in the text and a list of references provided. No part of this thesis was previously presented for another degree or diploma at any university

Ooche Inalegwu		May, 2015
Name of student	Signature	Date

CERTIFICATION

This thesis entitled AN EVALUATION OF ARCHITECTURE AS A TOOL TO ENHANCE CREATIVITY IN THE DESIGN OF A CENTRE FOR ARTS AND CREATIVITY, ABUJA by Inalegwu Ooche, meets the regulations governing the award of the degree of Master of Science of Ahmadu Bello University, Zaria, and is approved for its contribution to knowledge and literary presentation.

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Dr. M.D Ahmed _____ Date _____

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Dean, Postgraduate School (Signature)

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DEDICATION

I dedicate this thesis to God, all lovers of creativity and architecture, and to my late brother Peter Idoko Inalegwu.

ABSTRACT

This research sought to evaluate how architecture can be a tool to augment creativity in centres for art. Creativity is characterised by non- linear, organic and open minded ideas hence so when the environment where humans occupy is designed with such considerations in mind, the Architecture plays a very integral role in enhancing the efficiency of Artists. Artists have challenges of creative block which can be attributed to the environment and spaces they occupy also these environ can be underutilised when the building does not effectively communicate the function which it is to serve, otherwise called user-friendly design. The research highlighted the components of creativity (motivation, creative thinking, and knowledge) and how the basic architectural elements such as thermal comfort and temperature, access to nature, views and daylight, sensory change and variability, colour, noise control, less crowding, human factors and ergonomics, indoor air quality, flexibility and adaptable spaces can influence the users productivity. Also the presence of four basic spaces which are reflective space, collaborative space, and simulative space and play space cannot be left out in the design of a centre for art. The case study method of study was used using checklist, visual survey and interviews as instruments of data collection. Four art centres were purposely chosen which were: 1. Dept. of fine art, A.B.U Zaria, 2. Art and craft village Abuja, 3. Centre for art and culture Abuja and 5. Kaduna Museum. The four cases studied revealed that they succeed fairly with an average total of 64.37% in achieving centres that enhanced creativity. The best case amongst three studied with 72.96% (case 1) had high thermal comfort, access to daylight, good views and good level of flexibility in its design. The study also revealed that adopted buildings used as centre could have poor ability to

boost creativity as seen in case 4 (50.62%). Therefore a stimulating environment with collaborative spaces, with extensive landscape elements, high flexibility and adaptability applied, adequate day lighting and thermal would augment effective utilisation of centres for arts and creativity as this points gave higher boost to the creative performance of cases studied. In conclusion, for a building to enhance the user's creative outcome, features of flexibility and adaptability, Natural features and landscaping to improve the well being of the inhabitants, avoidance of adopted building for centres for art and equipped collaborative spaces are recommended.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF STUDY

A general idea about creative individuals is that there are certain factors that influence creativity. The creative processes is generally characterised by open ended features (Open mind) where anything is possible, organic and non linear. Creativity is not looked at as a planned process but that which nothing is pre-planned, predicted or perceived (Fakhra & Gregory, 2013). This features expected in creativity can also be a function of the building human beings occupy.

Architecture has a major role to play in not only providing functional spaces but also serve as a communication tool to the users and observers of a space, therefore according the architectural work copyright protection act (AWCPA) which stated that architecture should both be functional and possess creative elements this would promote creativity and communicative architecture that speaks to the individual carrying a particular activity there (Shah & Kesan 2003). Luca (2013) buttressed this point by saying that architecture should be stimulating and collaborate inspiring features which would put the users of such a building in the mode excepted in such a building. Gerlovina (2011) argued that creativity does not particular arise from certain geographical region, that artist can get inspirations which can arise from everywhere and everything. Therefore a supportive environment plays a very integral role in creativity, it also augments the freedom of expressing one's creativity, inspiring as well as enhancing learning (Fakhra & Gregory, 2013).

Lucas (2013) stated that good design which every building should possess has seven general principles guiding the architecture, one of which is “sensitive and responsive to context design”. Therefore when designing any centre for arts and creativity the environment must be able to respond to the function which is to be carried out. However, it should be a stimulating and inspiring environment which possess other sustainable architecture features such as durability, comfort functionality and much more (Lucas, 2013).

Designers and artists tend to work collaboratively with others fellow designers and are usually known for sharing ideas with experts or fellow colleagues so as to boost their knowledge of the field (Meyers & Gerstman, 2007). So the need to encourage team learning behaviour which enhances and facilitates individual learning and therefore bringing out learning-oriented individuals’ to learn better and have opportunities to explore their knowledge. However, research found that team learning behaviour will enhance learning particularly on an individual with a stronger learning orientation therefore the establishment of more learning institutes such as centres would automatically improve the creative output of designers and artists (Fakhra & Gregory, 2013).

Kyei (2012) stated that the design of a building can increase the users efficiency if it has some certain consideration in the design, some of which includes flexibility however Leigh (2013) added that building can enhance the productivity of the its users. The nature of a building can increase the user’s efficiency because less stress is placed on the users, therefore if the design of a building is flexible, less psychological stress will be placed on the users as well as the workers of that building as compared to other buildings which

may lack this quality. Also Sternberg & Wilson (2006) mentioned that studies have provided data on the effect of various features of the environment that tend to trigger comfort level and responses of the users of that space, therefore the designer taking this features as into account in the design tends to affect the creativity and productivity of those occupying or utilizing this space.

The performance of a space can potentially send a direct message to as the viewers as well as users. The message (which may be an action or an event) to be portrayed to them while occupying that space tends to have a better effect when the space is well lit, the way its occupied and arrangement gives a better perception to the users, this effect in extreme cases can also alter or manipulate their lifestyle (De Neufville, 2008). Therefore careful consideration is required in designing buildings such as centres which serves as a learning environment and also a place for entertainment because the building and environment can have either a positive or negative effect on the users.

1.2 STATEMENT OF PROBLEM.

Artists and designers are sometimes faced with some challenges such of lack of inspiration or what is called writers block, some other times an inefficient work environment which could support a higher level of creativity may be lacking. Research however has shown that the performance of humans can be attributed to the built and surrounding environment they find themselves in (Leigh, 2013: Amabile, 1998). Some design considerations are known to also alter the wellbeing of the people occupying it. Therefore designers have come to a point where they must begin to take these considerations seriously which can either make or mar the inhabitants of the building.

More so architecture overtime has began to lose its character due to the era of modern architecture where buildings no longer communicate the function which the carry out, the built environment no longer connects with the natural environment which is very vital to the wellbeing of man (Kellert, 2005) Architecture is been underutilised as a tool to enhance users performance due to its form of play. So measures are needed to curb this trend so as to have better people using the built environment in a better way.

1.3 RESEARCH QUESTIONS

i. What are the architectural features that enhance creative performance?
ii. To what extent have existing centres applied architectural elements make the environment conducive for creativity?
iii. What components of architecture can stimulate wellbeing?
iv. How can a centre of art and creativity be designed to employ relevant research information?

1.4 AIM AND OBJECTIVES.

The aim of this research was to evaluate on how architecture can be a viable tool to enhance creativity of artists and users of Art and Creativity centres. The aim will be achieved through the following objectives:

i. To examine the features of architecture that makes it a viable tool for enhancing creativity.

ii. To determine the extent to which existing centres have applied architectural strategies that makes the environment conducive for artists.

iii. To identify various components of architecture that stimulates a better wellbeing.

iv. To employ the relevant research information in the design of art and creativity centre, Abuja.

1.5 SCOPE OF STUDY

This research involved the background of the topic which had certain objectives and question it sought to answer. An elaborate study of various literature, exposed very enlighten points such as the concepts of creativity as it relates to architecture, how it is used in building designs, and the extent to which it could be applied in the design of centres.

The research also studied a number of cases covered study focusing on the relevant information gotten so as enrich the study. The focus was on how these spaces can be used to enhance the creative performance of the users of that space and showed how it can be applied in the proposed centre for art and creativity Abuja which had the following functional spaces: administrative facilities, exhibition and events facilities (theatres, exhibition halls, gallery, museum), learning and educational facilities and auxiliary facilities which will be designed so as to aid the performance of the users through the use of architecture features.

1.6 SIGNIFICANCE OF STUDY

In the tourism industry, arts, culture and creativity have a major role to play in boosting the nation's revenue. The nation's revenue has greatly improved because of the various aspects of arts and creativity such as the Nigerian nollywood industry, arts and craft industry, music, cultural carnivals etcetera. Nigeria has now become one of the world tourist centre and such achievements need to be nurtured, displayed and passed on to the younger generations. Therefore the need for a research to be done on a centre or art and creativity and how effective it can be to boost the creativity industry.

This study explored the various features of architectural elements that can enhance creativity and how it was applied in some existing centres studied. So this information could be well applied to a proposed centre for art and creativity which intends to be maximally utilised. It is located at the focal point of the nation the state Capital, Abuja where this features will be celebrated and nurtured.

CHAPTER 2

LITERATURE REVIEW

2.0 INTRODUCTION

This chapter sought to review various journals and publications that could enrich the research on architecture as a tool to enhance creativity. The chapter explained the components of creativity and where architecture features can be better put into use to reflect its creative components. Some movements in architecture which have design considerations that are vital for civic building that should enhance creativity was discussed in this chapter. The chapter also spelt out the variables that can be used to conduct a case study on building's creative performance.

2.1. CONCEPT OF ARCHITECTURE AND CREATIVITY

Creativity refers to the development of new and innovate ideas that create value-added to product, service, and process (Fakhra & Gregory, 2013). "The production of novel, appropriate ideas in any realm of human activity, from science, to the arts, to education, to business, to everyday life" (Amabile, 1998).

COMPONENTS OF CREATIVITY

The component of creativity according to Theresa Amabile(1998), a doctor in Psychology outlined three framework that explains the concept of creativity thus: Creativity (performance) = Knowledge + creative thinking + Motivation. However Leigh (2013) defined the components of creativity as; Performance = Ability x Motivation x

Opportunity. These two definitions can as well mean the same thing and are further explained thus:

2.1.1. Knowledge: Creativity is a product of what is known, without any form of knowledge of a subject matter there would not be any creativity. For knowledge to be passed across there must be a learning environment where the rightful information is properly communicated to the students (Amabile, 1998).

2.1.2 Creative thinking: This has to do with individual approach to problems however it is dependent on the person style, personality or thoughts (Amabile, 1998).

2.1.3 Motivation: this is the push of the creativity process and product. Some motivators can either be intrinsic passion or interest developed in the art (Adams, 2005). Some motivators however are forces of nature, The natural environment, a serene environment or a form of architecture that depicts nature all these explains biophilic architecture (Kellert, 2007).

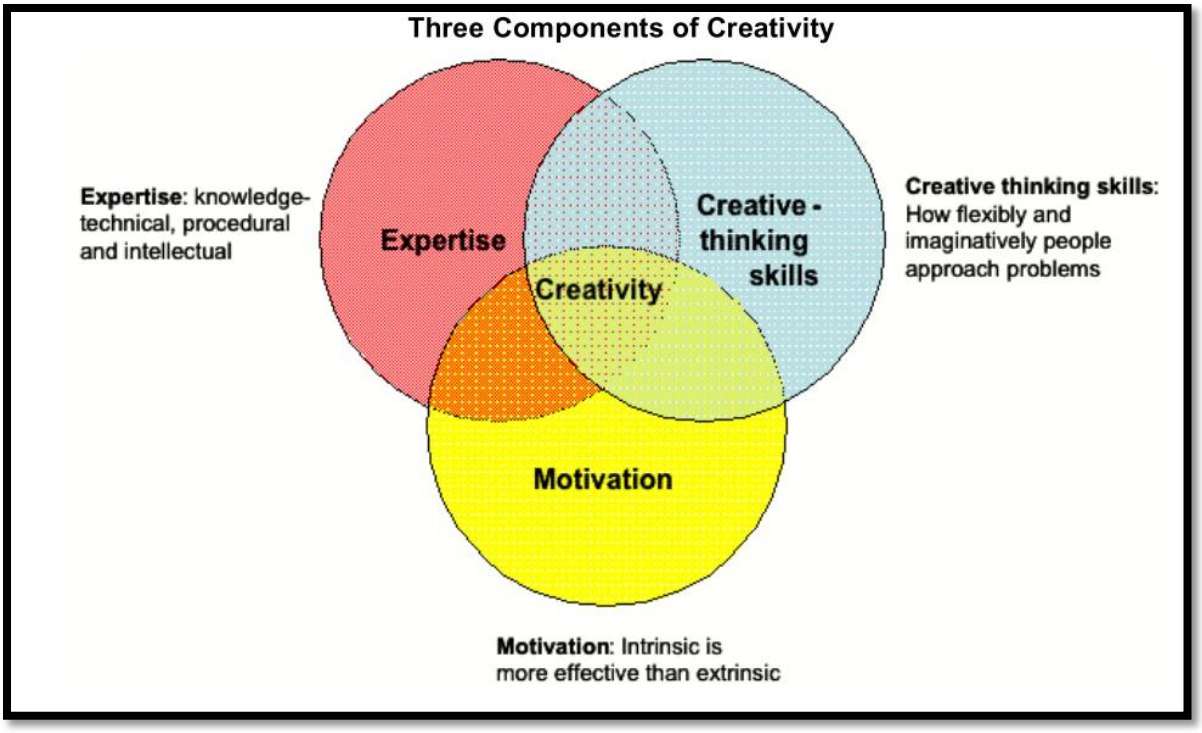


Figure 2.1. Components of creativity

(Source: Amabile, 1998)

Grove (2013) based on some years of research, highlighted some possible spaces that can serve as a motivation to creativity. These are explained below;

2.1.3.1 ***Nature*****:** has a profound impact on humans. The elements of nature perceived to have an impact on human includes: sunlight, fresh air and natural surroundings positively affect peoples' sense of wellbeing and happiness. Therefore such elements of nature (as seen in plate 2.1. below) are usually applied in hospital facility because of its therapeutic property hence the plate 2.1 below shows the application in an office environment Google which is a renowned research company, this feature serves as space to reduce stress and enhance productivity. More so nature can also reduce stress and fatigue because it promotes wellbeing.



Plate2.1: Outdoors-in environment at Google Tel Aviv

(Source: Groves, 2013)

2.1.3.2 ***Activity and movement:*** Physical health and fitness is a product of exercise. Exercise increases blood flow and oxygen to the brain, and also a specific protein that is known to promote the health of nerve cells and improve mental functioning.

2.1.3.3 ***Social setting:*** Ideas could come from social settings such as carnivals, relaxation spots, cafes because they tend to stimulate interaction and ideas. The juices of the brain can get easily stimulated with interaction with other people and could just be the boost required.

Groves (2013) also added that the bath or shower spaces are good reflective spaces. The sensation of water (nature) gives the brain a recharging moment and allows connections.

More so, four basic types of creative space which were highlighted by Groves (2013) include:

I. Stimulate environment: This is the space for inspiration.

II. Reflect space: The area where thinking could take place.

III. Collaborative space: The place to share ideas with others which could add quality to an individual.

IV. Play Environment: The space to connect and explore.

2.2. THE ROLES OF ARCHITECTURE IN CREATIVITY

Architecture can serve as a tool to enhance human behaviour in setting ways. It can regulate, serve as a communicative tool, symbolic tool and express the culture of individuals amongst other functions of architecture (Katyal, 2002: Shah & Kesan).

2.3 ARCHITECTURAL FEATURES THAT ENHANCE HUMAN PERFORMANCE

Leigh (2013) highlighted some design conditions that enhance efficiency of a space. They include:

2.3.1 Thermal Comfort and Temperature: This can be achieved through combining the right temperature and humidity. Some considerations includes: an ideal temperature for a comfortable indoor environment(like that of the one seen in Plate 2.2 below) is 21.6 degrees Celsius (70.88 degrees Fahrenheit), Operable windows to avoid sick building syndrome while maximizing air flow and sunlight an provision of zoned

temperature controls for HVAC systems (heating, ventilation and air conditioning) (Leigh, 2013).



Plate2.2. A combination of factors that enhance efficiency

(Source: Leigh, 2013).

2.3.2 Access to Nature, Views and Daylight: Nature in its self has therapeutic abilities, it causes sensory and psychological changes to various people there is a bond between nature and man that bond can be referred to as biophilic. Man's exposure to nature is beneficial to his health and such feeling should be replicated in the interior environment (Leigh, 2013) as seen in Plate 2.3 below where an office and learning environment (a research centre) provided some outdoor feeling by bringing nature into the environment through the use of atrium or courtyards.



Plate2.3. model and structure of an eco conscious research centre (Integration of natural views).

(Adapted by author, 2014).

Furthermore, exposure to nature have some benefits of ventilation and increasing the indoor air quality, Some of the ways this can be achieved is through the use of courtyards or as roof gardens as seen in plate 2.3 above. Introducing such natural features can also improve ventilation through stack effect (Howkes, 2002) as shown below in figure 2.2 below.

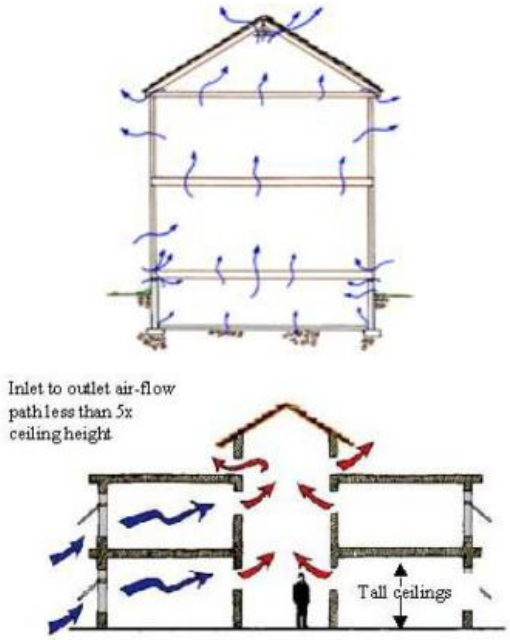


Figure 2.2. Schematic diagram of stack effect how cooler air replaces hotter air.

(Source: www.googleimages.com, 2009).

Stack effect is simply when air gets hotter, it expands and becomes dense than the surrounding air so it rises, while the cooler air is less dense and therefore where there are high level windows this hotter air goes out (Howkes, 2002).

2.3.3 Sensory Change and Variability: This is a feature of organic architecture which is architecture evolving from nature. It entails that they should be the following according to Kellert (2005) in his book:

i. Changes in environmental colour, temperature, air movement, textures, and light over time and spaces.

ii. Natural rhythms and processes (natural ventilation and lighting).

2.3.4 Colour: Colour can be perceived differently by different people however there is a common perception which Leigh (2013) highlighted below:

i. Brighter colours (reds, as well as blues and greens) are associated with higher focus and task accuracy.

ii. Blue is calming and cooling, promoting mental control and clear, creative thinking.

iii. Pink lessens feelings of irritation, aggression, loneliness, discouragement and burden.

iv. Red enhances feelings of strength and energy; it is associated with vitality and ambition.

v. Yellow makes people feel clear-headed and alert, allowing for clear thinking for decision making.

vi. Orange helps ease emotions and boost self-esteem. It creates enthusiasm for life.

2.3.5 Noise Control: This is common in places where performances are held where public address system are used. Use of sound absorption material is very important. An example of one is acoustic board is “Select Sound Black acoustic board” (Seen in plate 2.4 below) which provides excellent acoustical performance for theatres, sound studios and performing arts centres. Depending on specified thickness. The acoustic board absorbs up to 100% of the sound striking its surface.

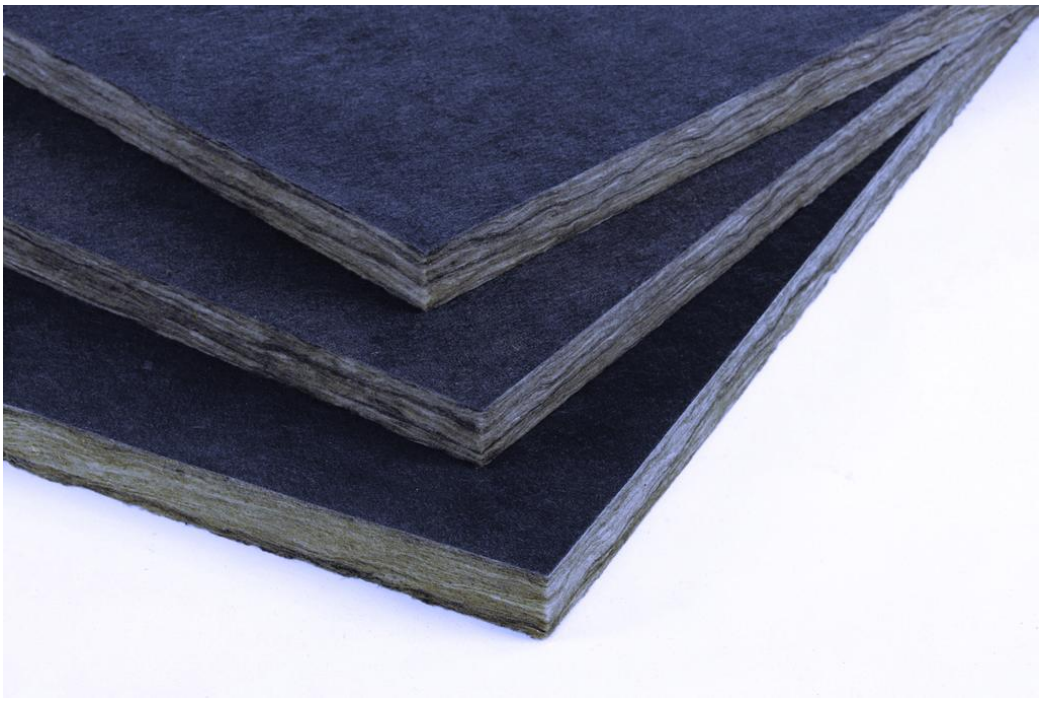


Plate 2.4. Acoustic board material

(Source: Archdaily, 2014)

2.3.6 Crowding: The feeling of being crowded can be based on perception though the feeling in itself can cause less efficiency on human (Leigh, 2013). Sally Augustin a psychologist explained that:

- **i.** Lighter colour spaces with high ceiling heights are perceived to be less crowded.
- **ii.** People who reside or work in high rise building are perceived to feel crowded because they have less views and access to daylight.
- **iii.** The perception of crowding can be reduced by using decorative elements, plants, furniture and pillars (Leigh, 2013).

2.3.7 Human Factors and Ergonomics: The two words "human factors" and "ergonomics" are often used synonymously. Human factor has to do with the activity

which man carries out at a particular space which will be required. Neufert (2007) in architectural data highlights some in figures 2.3 and 2.4 below:

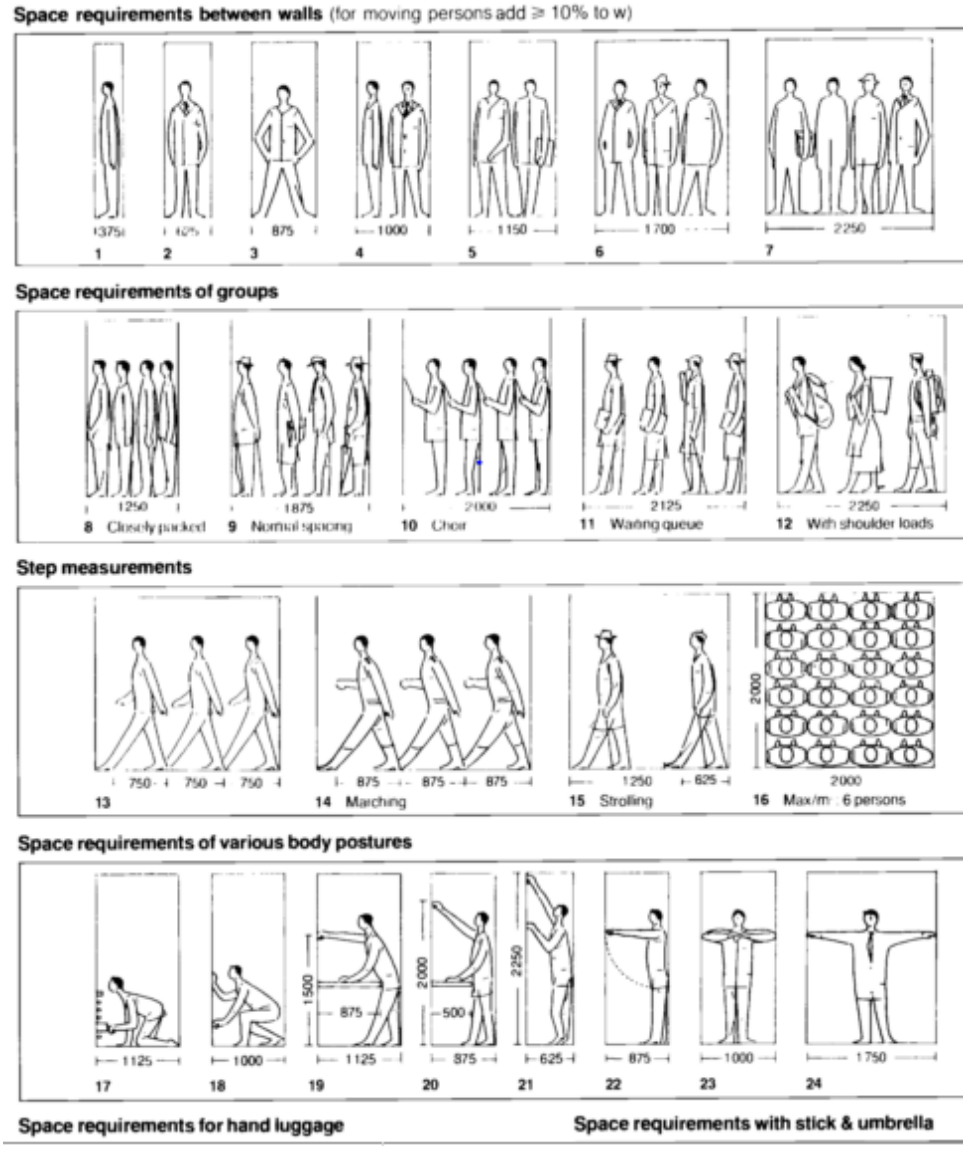
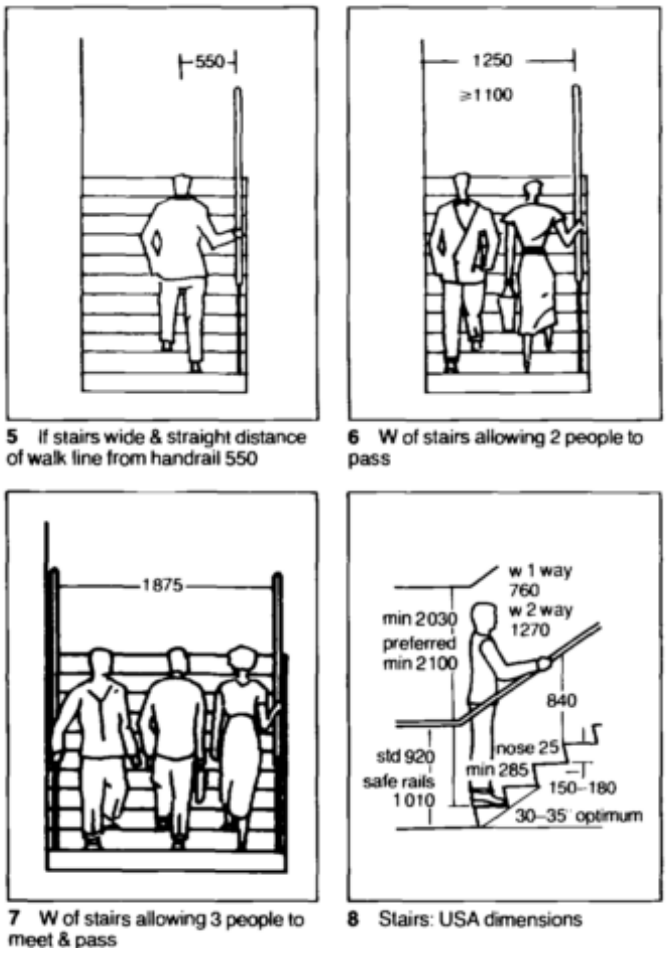


Figure 2.3. Some basic space requirements

(Source: Nuefert 2007).



5 If stairs wide & straight distance of walk line from handrail 550

6 W of stairs allowing 2 people to pass

7 W of stairs allowing 3 people to meet & pass

8 Stairs: USA dimensions

Figure 2.4. Space required for stairway.

(Source: Nuefert, 2007).

In a work establishment, a survey was carried out on some of the body pains which some of the occupants suffered and it was discovered that most of those pains were due to poor ergonomics. Some measures to curb poor ergonomics include:

i. Providing adjustable furniture.

ii. Do a design that encourages mobility.

2.3.8 Indoor Air Quality: Some researchers have shown that over 90% of the human life in developed countries is spent indoors however, if the quality of the indoor is poor which

was highlighted in a research also, then the human life is placed in danger(E.B.N) Indoor air quality otherwise referred to as "respect for users" is a principle concerned with the general atmosphere of within the built environment and the effect on the user's health, therefore any building which is hazardous to human health will not be likened as a eco friendly building (De Jesus, 2007).Some of the indoor pollutants includes: combustion, building materials and furnishings, household cleaning, maintenance, personal care or hobby products, central heating and cooling systems, and humidification (Leigh, 2013) Air pollution (indoor and outdoor) is responsible for over 1.6million deaths worldwide. A research carried out by a health organisation on asthma and indoor exposures stated that "Indoor settings often contain levels of pollutants that may be two to five times higher – and occasionally more than 100 times higher than outdoor levels" therefore building materials used for indoor environment should be as eco friendly as possible (Attmann, 2009; Leigh, 2013).

2.3.9 Flexibility and Adaptable Spaces: Eldonk & Fassbinder (1990) explains flexibility as an important attribute of open plan buildings, the use of open plans which is quite common in some public buildings is an expression of flexibility in play. Flexibility was defined as the ability to change to user's role. When a building lacks flexibility that is when users can not alter a space, is feels like there is a lack a sense of control of one's surroundings. This lack can result in anxiety, distress and discomfort. A Flexible building is structure that has been designed to allow easy rearrangement of its internal fit out and arrangement to suit the changing needs of occupants (Addis and Shouten, 2004). Some principles of flexibility and adaptability are however mentioned below:

i. **Durability:** Choosing materials that are not likely to require maintenance, repair or replacement (Russell & Moffatt, 2001).A building material which is known to be flexible yet durable is steel, it cover a span of 6-18m without intermediate supports and depending on the construction methods (Muller & Oppe, 2008).



Plate 2.4. Multi storey Sheraton hotel in Bilbao

(Source: Muller et al, 2008).

The plate 2.5 above consists of a 1,100 tones steel structure which was constructed within 7 months due to the nature of construction (Muller et al, 2008). Table 2.1 below shows other load bearing durable materials, Building where such materials are used can last up to over 35 years (Asko, 2002).

Table 2.1. Durable load bearing materials

Material Description	Useful Structural Lifetime
Stone, brick or reinforced concrete	75 years
Structural steel	50- 100years
Timber	30-300 years

(Source: Asko, 2002)

Design for Disassembly/Movability: this is a design which has the ability to change location by using demountable elements. It reduces not only the cost but also the environmental impact by designing a building with shorter life in mind. More so the materials can be reused- this a sustainable strategy. Some examples of these cases are exhibition halls which could be temporary structures (Russell & Moffatt, 2001 & Manewa et al, 2013). Some strategies as identified by Manewa et al (2013) used to achieve this includes: Use of systemic buildings such as pneumatic structures, standard components, product families an prefabricated and parallel processes.

iii. Convertibility: Manewa et al (2013) refers to convertibility as the change of use of a building-'convertible' determines the ability of buildings to shift between different uses/functions. This requires internal and external alterations to buildings. Considerations are given to: Managing large spaces, renewable materials and ceilings and open spaces.

iv. Adjustability: This is the ability to change the task excepted to be performed in the building. Some ways could be through: The alteration of furniture placements**,** use of modular systems and coordinated connections (Manewa et al, 2013).

v. Scalability: The ability to change the size of the building that is expandability. The expansion can be vertical or horizontal. However elasticity is also applied here.

Some strategy used to achieve scalability is: Use of reusable components, renewable services, recycled materials, insulated buildings and kits of parts (Manewa et al, 2013).

vi. Refitability: This is the ability to change a building's components therefore the building must possess the following qualities: Operable**,** detachable**,** movable**,** degradable**,** mobile**,** movable and collapsible (Manewa et al, 2013).

vii. Versatility: The ability to change the internal space. The strategy involves: Changeable panels, demountable, stackable an portable units and oversized structures consisting of modular units and connections (Manewa et al, 2013).

Application Of Adaptability And Flexibility In Architecture

The King's School Chester**.**

Building type: School

Strategy: versatile, refitable

Location: Chestershire, UK (outside London)

Organizations: CGL Architects, King's School Chester

Completion date: 2011

Area: 350m2

Cost: £1 million

The King's School Chester which is located in the countryside of Cheshire as seen in plate 2.5 below is a leading independent school in the area. The school approached CGL to review a feasibility study for the refurbishment of the theatre hall (see plate 2.6).



Plate 2.5. Exterior view of King's School Chester.

(Source: adaptable features, 2014).

Some of the modifications which were made include:

Increased versatility for almost half the cost. Fixed support spaces for the hall so changing rooms, storage and other auxiliary facilities were placed on either sides of the theatre. Use of retractable seats (plate 2.6c below) which can be fully opened in ten minutes by a single person. Some additional loose chairs were also provided as seen in plate 2.6d below.



Plate 2.6. Retractable features in the theatre.

(Source: adaptable features, 2014).

Open space (26m x 13.5m and 6.7m high) to allow for the remainder of the space to be unfixed with the installation of a retractable seating system, a retractable curtain system, removable staging, adaptable lighting rigs, modular stage units and movable side wings as seen in Plate 2.6 a and plate 2.6b (Adaptable features, 2014).

2.4. ARCHITECTURAL FORMS

Form 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 (Crisman, 2007).

The evolution of architectural forms is as a reason the substantial recent changes to culture, climate, and energy economies these tend to greatly have contributed to the

forms and trends of construction and selection of materials, cultural and physical ecology within which architecture is produced and inhabited therefore material practices are at the beginning of a substantial reconfiguration, and our future practises due to this change (Weinstock, 2008).

The cultural parameter that is driving the evolution of a new architecture is clear. There is a growing cultural fascination with the new understanding of nature and of natural form both living and non living. The architectural and material manifestations of fluidity and dynamics, of networks and new topologies are at the centre of architectural discourses and innovations (as seen in plates 2.7).



Plate 2.7. Two buildings depicting the form of a fish but approached differently (side by side).
(Source: www.google.com, 2014).

The materiality of the boundaries between interior and exterior space, between public and private territories, is no longer so relentlessly solid and opaque. The increasing transparency of such boundaries is accompanied by less rigid territorial demarcations. Spaces flow into one another, programmes are not so strictly confined within the building envelope, where connections and co-existence are enhanced. When spaces flow one into

one another and between interior and exterior space, is increasingly recognized as an essential characteristic of contemporary life (Weinstock, 2008).

The form of a building has a lot to do with the temperature of the interior space as pointed by Roaf (2001) that greater the volume of the building the more surface area it has to lose, or gain, heat as seen in the figure below showing their volume to area ratio of how heat can be lost or gained in a building of the different shapes.

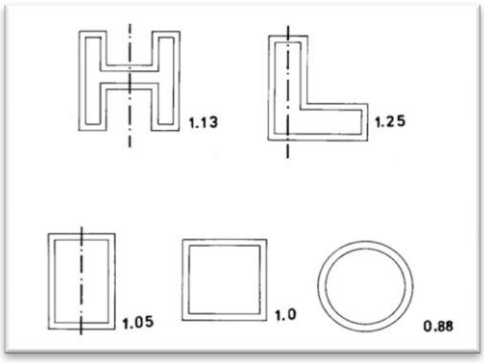


Figure 2.5. Showing the ratio of plan area to wall area

(Source; Krishan, 1995)

Hence most compacted shapes have tendency to loss or gain heat easily but shallower floor plans have better potentials of cross ventilation. Forms could be circular, Rectangular, irregular, rectilinear and many more (Roaf, 2001).

2.4.1 Architectural Movements And Principles That Relates With Forms

Buildings have the potential to stimulate and enliven communities. For example, cultural and arts facilities should serve as places of expression, imagination and education, which portray the identity of the people. Where artists and arts consultants are involved in the earliest planning of such projects, they can provide specialist advice on how other artists

will use space; contribute to the enhancement of the building fabric, use built form, materials, internal spatial quality, landscaping which would be harnessing the relationship to the site (Lucas, 2013).

2.4.1.1. *Expressionism*

Expressionist architecture is one movement which developed in the twentieth century about the first decade in parallel with visual and performing arts according to Sharp Dennis. It was primarily concerned with distortion, fragmentation or communication of violent and overstressed emotions. Sometimes it was informed by biomorphic forms, it can also sometimes seem overstressed or violent in the nature of the architecture (Deutscher Werkbund, 2011). Sheppard (2006) referred to expressionist architecture as being realist in favour of symbolically expressing an inner expression, abstraction and having an emotional feel. Some of the characteristics include:

I. Distortion of form for an emotional effect.
II. Subordination of realism to symbolic or stylistic expression of inner experience.
III. Originality and a lot of visionary thinking process are put in.
IV. Profusion of works on paper, and models, with discovery and representations of concepts more important than pragmatic finished products.
V. Often hybrid solutions, irreducible to a single concept.
VI. Themes of natural romantic phenomena, such as caves, mountains, lightning, crystal and rock formations. As such it is more mineral and elemental than florid and organic which characterized its close contemporary Art Nouveau.
VII. Usually uses the creative potential of artisan craftsmanship.

VIII. It tends towards Gothic, Rococo and Romanesque arts respectively.

IX. It has some forms of Islamic, Egyptian an Indian art.

X. The conception is more artistic than it is architecture. Is inspired more by natural phenomena rather such as rocks, crystals, organic elements and non geometric forms

(Sheppard, 2006; Deutscher Werkbund, 2011).

Some designers who can be considered as expressionist includes was Bruce Goff and Venturi who were modernist architects. Goff used a lot of recyclable materials such as coal, paper, rope and materials retrieved from rubbish heaps. He eventually did a building which was called the "green house" (1960) but with time he and Venturi got bored of the modernist style and decided to experiment with styles that represented richness joy and complexity. Goff's style had the feeling of guts feeling and subjectivity while Venturi's view was based on interpretation of history. Frank Lloyd Wright designed expressionist building but however he was too versatile to be considered an expressionist. Some of his buildings include the falling waters and the Guggenheim museum (Sheppard, 2006).

Some illustrations are given below (see plate 2.8- 2.10).



Plate 2.8.The Einstein tower in Potsdam-Berlin by Erich Mendelsohn 1919-22

(Source: Deutscher Werkbund, 2011)



Plate2.9.Flagship terminal, Kennedy Airport, New York City

(Source; adapted by author, 2014)



Plate 2.10.Guggenheim museum, New York.

(Source; Microsoft Encarta, 2009)

2.4.1.2 *Symbolism*

Symbolism as movement in the arts, literature, and architecture will be examined as a movement diametric to the symbolic development in architecture, since it ended up glorifying the analogical, and frequently the mimetic. The origins for how the symbolist movement became a denial of clarity will centre on Emanuel Swedenborg's concept of symbols however there was a misconception by symbolists. Since architecture is defined as an art, Enwerekowe (2012) is also of the opinion that it should be representational that is having a symbolic form.



Plate 2.11. The National Theatre Lagos, Nigeria

(Source: www.google.com , 2014)

Ernst Cassirer a philosopher established that the human mind is constituted in such a way as to provide meaning to given input, with human consciousness giving "form" to "whatever is given to it." This is done through the different symbolic forms inherent in our mind: through art, history, philosophy, religion, etc. as seen in plate 2.11 above where the politics of the people of Nigeria influences the theatre design. These symbolic forms have their counterparts as "symbols" outside of our mind, which are now translated into some form of master pieces (Rimmer, 1997).

2.4.1.3. *Biophilic design*

The two major aim of biophilic design is to;

I. Mitigate the adverse effect of building construction techniques on the natural environment and human health

II. Promoting positive interaction between people and the environment.

Some of the benefits of biophilic design is to enhance wellbeing, productivity, reduce stress, better emotional wellbeing and most importantly increased productivity and creativity.

Table 2.2. Elements of Biophilic design as outlined by Kellert (2007)

No	Elements Of Biophilic Design	Features
1	Prospect(ability to see through a distance)	A. Brightness B. Horizon and sky imagery C. Strategic viewing conditions D. View corridors, A design that directs the users to get certain view
2	Refuge(shelter)	A. Canopy effect through lowering ceiling heights, branch like forms and screening.
3	Water (indoor views)	A. Reflective surfaces tend to depict clean water. B. Moving water C. Symbolic forms of water
4	Biodiversity	A. Vegetation B. windows designed to incorporate nature views
5	Sensory Variability	A. Changes in the environmental conditions of the spaces over time B. Natural rhythms

6	Biomimicry	A. Mimicking forms of the natural environment. B. Use of natural forms and patterns.
7	Sense Of Playfulness	A. Incorporating delightful amusing features into the design.
8	Enticement	A. Design that explores, some form of complexity introduced to it B. Richness

(Source: Kellert, 2007).

An example of where such features where applied is Frank Lyord Wright's falling waters as seen below in plate 2.12)

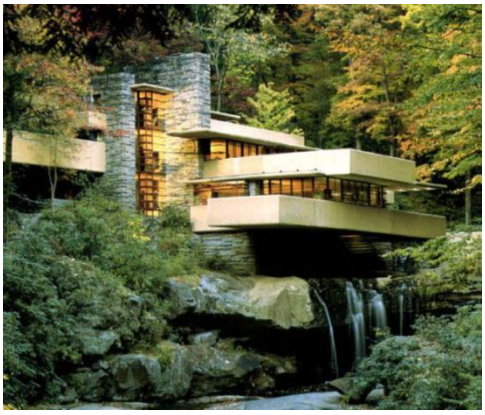


Plate2.12. Views Frank Lloyd Wright's Falling waters
(Source: http://commons.wikimedia.org, 2014; www.google.com, 2014)

The structure had the following attributes of Biophilic design:

i. Vegetation around the surrounding.

ii. Corridor views designed to have nature view of the water fall.

iii. Enticement was brought in to the architecture of the place through the incorporation of the water body.

iv. Exploration of natural forms such as the movement of the water body.

2.5. THE LEARNING ENVIRONMENT

Veltri, Banning, & Davies (2006) highlighted that there are certain aspects of a learning environment that the atmosphere has a serious effect on reactions and learning than others. Music, lighting, and comfortable seating are aspects of a learning environment that hold importance when creating a warm and welcoming environment that is intended to increase learning and effective reactions while reducing feelings of helplessness and unease. Also in a current study by Lang (1996) concluded that In the current study, music, lighting, and seat comfort are the three features used for creating a classroom that is warm and welcoming (Bonnick, 2014).

2.6. THE PLAY ENVIRONMENT

Physical environments are not just architectural structures. We attach meaning to our surrounding and that becomes part of our culture. Our empirical studies showed that change in performance and creativity of children can occur in different environments. According to the children interviewed in this study, they like to be in bright spaces. They do not like to be alone and they like to have more toys around. It seems their creativity performance is higher when furniture and colours are designed according to their needs. That is what we refer to as a more children friendly environment. Some elements of the physical environment that might play a role in enhancing children's creativity (as discovered by the study carried out) could be:

i. Brightness of the space,

ii. Less use of cool colours and more warms colours (as stated byMcCoy3, 2012) visual exposure to more children-friendly objects that are composed of basic shapes.

iii. The use of low height furniture or no furniture (sitting on the floor),

iv. An environment that increases the sense of security and protection.

A proper physical environment might help reduce the negative impacts of other factors around therefore an opportunity to explore more and think more, which could help to augment their creative thinking ability (Makhmalbaf & Do, 2007).

2.7. APPLICATION OF STIMULATING AND INSPIRING ARCHITECTURAL FEATURES IN A BUILDING ENVIRONMENT.

The Pixar's Emeryville Headquarters.

It is located at Emeryville, California. It was planned to carry a capacity of 1000 employees designed by Bohlin Cywinski Jackson. Completion date was 2000 and 2011 respectively due to some additional works done later. Every part of the building had some artistic feel to it right from the entrance (plate 2.13).



Plate 2.13. The celebrated entrance to Pixar studio

(Source: Office snapshots, 2014)



Plate 2.14. The site layout of Pixar studio

(Source: Office snapshots, 2014)

The structure is quite popular probably due to the creativity which can be perceived easily just by looking at it. The structure houses offices, modelling workshops, store board rooms, a massive render farm, orchestra and sound recording facilities and sporting facilities properly landscaped (as seen below). Pixar's campus design originally separated different employee disciplines into different buildings – one for computer scientists, another for animators, and a third building for everybody else, but because Steve Jobs (the C.E.O) was fanatic about these unplanned collaborations, a collaborative building was designed to pull everyone into a general atrium (as seen below in plate 2.15)

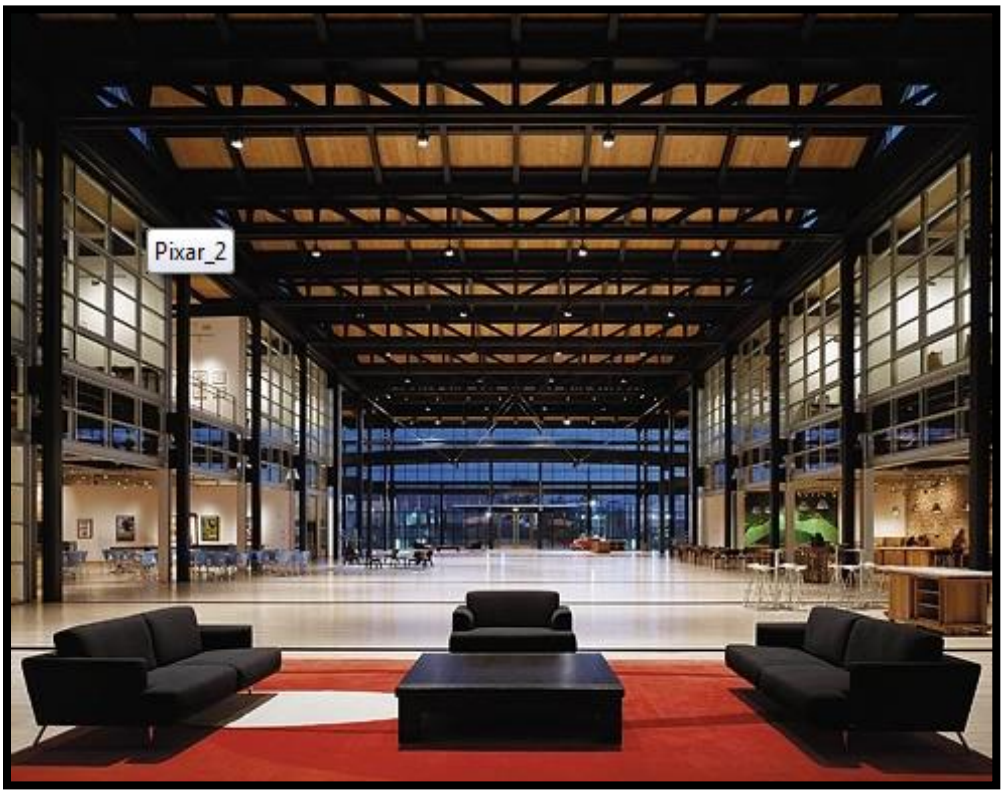


Plate2.15. The central Hub, the atrium.

(Source: Office snapshots, 2014)

The atrium houses a reception, employee mailboxes, cafe, foosball, fitness centre, two 40-seat viewing rooms, and a large theatre – and was planned by Jobs to house the campus' only restrooms. The idea was that people who naturally isolate themselves would be forced to have great conversations, even if that took place while washing their hands. Today, they do have more than one restroom, but it was the idea behind it that was important.

The building was generally planned to give a feeling of creativity even in the interiors. There are closed working environment with offices are arranged in U-shaped units of 5-6 individual offices – with a central gathering area in the middle that brings the idea of the creating unplanned collaboration down to a smaller, workspace-sized concept.



Plate 2.16. Landscaped recreational spaces and sporting facility.

(Source: Office snapshots, 2014)

The workspace has a perception of play in the workspaces by the use of have animation in the interior.

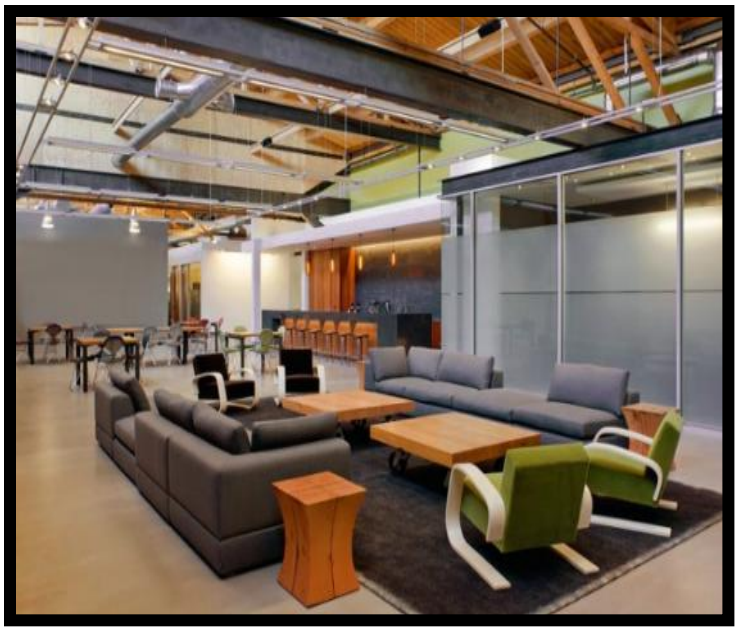


Plate 2.17.Collaborative Workspace and Individual Workspace

(Source: Office snapshots, 2014)



Plate 2.18.Bright lively interior spaces of lounge

(Source: Office snapshots, 2014).

In conclusion, the Pixar office studio has the various components of creativity which was highlighted by Amabile (1998). The studio also adequately incorporated the various components of creativity which are: knowledge, creative thinking facilities and motivation (largely through use of collaborative spaces).The design of the spaces as seen in plate 2.14

In conclusion, the three concept of creativity which is knowledge, motivation and creative thinking can be applied to a building through the use of various features such as: Lighting and ventilation, use of calming colours, flexibility and adaptability measures etcetera. Creativity must be purposely planned to a building that intends to enhance the users' performance and should have creative spaces such as a reflective space, play space and a learning space. However a building intending to serve a particular function should be able to communicate its function through the views and outward appearance so the building could be expressive, symbolic or even biophilic, it could combine the all features this way it can effectively serve as a building to enhance creativity through architectural features.

CHAPTER THREE

METHODOLOGY AND METHOD OF STUDY

3.0 INTRODUCTION

This chapter sought to theoretically explain the methodology used for this research, the method of study, methods of data collection, means of data collection, the data representation and descriptive analysis used in this research.

3.1 METHODOLOGY

Researchers have classified research in various ways; however one of the basic distinctions is between quantitative and qualitative methods. Qualitative research involves the use of qualitative data, such as interviews, documents and participant observation (Myer, 2007). Other classification of research includes: exploratory, descriptive, simulation and modelling, logical argumentation, as case studies (Asika, 2002; Groat &Wang, 2002). However the method of study adopted for this research is qualitative research method.

3.2 METHOD OF STUDY

This research was basically explorative and comparative in nature. It could be generally referred to as a qualitative method. The research involved a general exploration of architecture as a tool to enhance creativity and a detailed study of characteristics of architectural elements that tend to fall into the category of enhancing creativity. The detailed study involved the use of case studies as the research method. Some of the data obtained from the cases studied was compared in order to determine the extent to which

architecture serve as a tool to enhance creativity. The data obtained from the survey of the architectural principles was used to develop a scale based on which the Art and Creativity Centre was accessed. A logical argumentation was applied in charting the direction for design concepts and planning principles.

3.2.1 Case studies:

The case study approach is the most flexible of all research designs, allowing the researcher to retain the holistic characteristics of real-life events while investigating empirical events (Yin, 1984). Veal (2006) defined a case study as a research method as a unit of analysis, the paper further added that it the study of an example of a case of a phenomena being researched.

A basic principle of case study approach is to cross check an event through interview which ever form it is carried out (Obeka, 2011), therefore in order for this research to be an empirical study of the real life events was carried out.

Most case studies are qualitative, but quantitative methods, or a combination of both methods may be also be used. Quantitative methods in case study entail the study of multiple cases which are then used for statistical inferences (Osuala, 2005).

The adopted cases studied carried out on this research were based on the relevance of selected Art and Creativity Centres which are known to house art, crafts or creative activities. Therefore the data collected was to check how they applied architectural features that augmented creativity.

Case studies as a method of study can be viewed in two aspects

As a case study unit of analysis:

Art and Creativity Centres were studied and analyzed individually by the use of a checklist and some variables obtained from the literature review which had a table containing design elements broken down under the applicable features of architecture to Art centres known to enhance creativity. This study is to analyze each Art and Creativity Centre studied and how each centre has applied the principles of architecture that enhances creativity (see appendix 1).

As a case study research assessment method:

Based on the selected Art and Creativity Centres, an assessment table on applicable principles of architecture that enhances creativity was used to conduct a comparative analysis of all the Art and Creativity Centres studied in order to find out the extent to which these principles have been applied to Art Centres.

3.2.2 Case studies selection criteria (sampling)

Significant case studies of facilities that serve as Art and creativity centres relevance to the study being carried out have been selected. The analysis of these case studies would be based on architectural forms and character. The research method is basically qualitative. Each case study has been analyzed based on two aspects:

i. A general documentation of the centres.
ii. An assessment on the application architecture features that enhances creativity.

The variables discussed the research area – architecture as a tool to enhance creativity in design of a centre for arts and creativity.

The variables used to assess the case studies are:

i. Site and Landscaping
ii. Spatial Organisation and Design
iii. Structure and Dominant Building Material
iv. Aesthetics And Architectural Expression
v. Elements That Enhance Human Performance

3.3 DATA COLLECTION

The case studies for theoretical research in Architecture may require the use of general methods for data collection (Oluigbo, 2010). These methods include: observation and participant observations, visual survey and checklist, interviews, questionnaire, models and simulation and scientific measuring instruments among others. For the purpose of this research, visual survey and analysis of the extent to which the principles of architecture that enhances creativity are applied to the selected case studies that were adopted. The collection of data was done through a visual survey, use of a checklist and conducting an in depth interview of users and managers of the centres.

3.3.1 Visual survey of Existing Art and creativity centres

A visual survey was done by looking and identifying what has been achieved by the already existing Art and creativity centres with reference to the principles of architecture that enhances creativity, this was done by the use of photographs.

3.3.2 Checklist

The checklist contains variables of architecture that enhances creativity which will be used to carry the research on Art and creativity centres. The case studies will be accessed on a scale of weak to strong using the following check list on a likert scale (0-3);

Architectural features that enhance human performance

I Thermal comfort

II. Access to Nature, Views and Daylight

III. Sensory Change and Variability

IV. Colour

V. Noise Control

VI. Absence of Crowding

VII. Human Factors and Ergonomics

VIII. Indoor Air Quality

IX. Flexibility and Adaptable spaces

3.3.3 In-depth interview with existing Art and creativity centre operators

The selected Art and creativity centre designer/architects, operators / managers were interviewed to get more information on each of the existing Art and creativity centre design (see appendix 2)

3.4 DATA PRESENTATION AND ANALYSIS

Data collected on each case study will be analyzed and represented in different forms such as photographs, use of tables and charts.

3.4.1 Photographs of Existing Art and creativity centres

Pictures of the existing Art and creativity centres studied were taken, and documented showing the facilities and how the principles of architecture that enhances creativity were applied, (if applied or to what extent).

3.4.2 Tables: Data collected on this research were documented and presented on the architecture that enhances creativity case study assessment tables (see appendix 1).

3.4.3 Figures

Data collected on the case studies were also documented in form of drawings, such as the site plans and various views.

3.4.4 Logical Argumentation

Logical argumentation simply describes making sense of some aspect of the cosmos in a systematic rational manner. Literatures including works which give logical order to a set of desperate factors. Architectural works seems to frame logical conceptual systems; which connects previously unknown or unappreciated factors in relevant ways. These are examples of logical argumentation. The outcome of logical argumentation is an explanatory system, which if widely accepted will become a normative basis for action in design (Groat &Wang, 2002).

3.5 DESCRIPTIVE ANALYSIS

The selected Art and creativity centres showed the extent to which each centre applied the principles of architecture that enhances creativity after the case study analysis is done; this will be viewed under the case study summary and conclusion sheets.

CHAPTER FOUR

4.0 RESULTS AND FINDINGS

4.1. CASE STUDY ONE: DEPARTMENT OF FINE ART AND INDUSTRIAL DESIGN, FACULTY OF ENVIRONMENT DESIGN, AHMADU BELLO UNIVERSITY, ZARIA.

4.1.1. Brief Introduction

The department of fine art, Ahmadu Bello University, Zaria was an affiliation to the Slade School of Art and later the Goldsmith School of Art both of University of London many years ago. It was founded in 1953 as a part of Ibadan branch of the old Nigerian college of Arts, Science and Technology Nigeria which moved to Zaria in 1955.

4.1.2 Site Planning and Landscaping

The site is located on a relatively flat surface. The layout is simple and straight forward, with a single vehicular entrance into the facility from the main road. The site is beautifully landscaped with both soft and hard landscape of pavement and sculpture. The building took advantage of the North-South Orientation. There is little or no more space for future expansion because a lot of expansion has been carried out already.

4.1.3. Spatial Organisation and Design

The site consists of a number of buildings such as the main building, The Ceramics workshop (an extension), a foundry, an extension of the staff offices among others. The main building consists of a double banking grid design system of three storey. The design is that of a simple rectilinear shape and circular forms too with windows scattered everywhere on the building which further enhances day-lighting and natural ventilation.

It is also oriented towards the North. The grid is about 8000 x 3700mm in sizes and has windows on opposite sides. The building comprises of four floors, which will be explained below.

Ground Floor

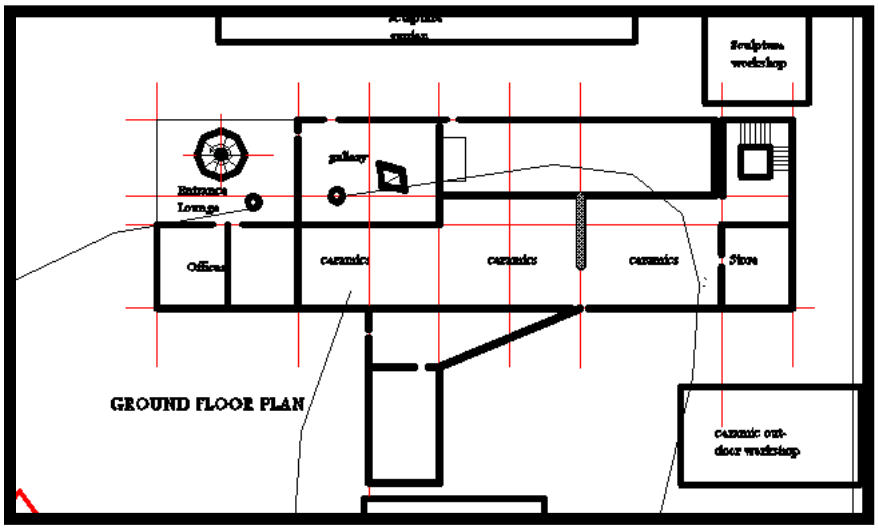


Figure 4.1: Ground Floor Plan

(Source: Author's sketch, 2014).

The building has a reception area also entrance to the main building is not celebrated as seen in the plate 4.1 below.



Plate 4.1: The Entrance Into The Main Building

(Source: Author's fieldwork, 2014)

There is a gallery which has sufficient natural light coming in through the windows at the north view and through the void as seen in the plate 4.2 below.



Plate 4.2: Gallery and Exhibition

(Source: Author's fieldwork, 2014)

First Floor

The lecture theatre, classrooms studio, library and offices are interconnected by a network of stairs and corridors (see Figure 4.2 below). The service core is at both extremes of the main building, Plate 4.4. below shows the escape staircase and the service lift which is no longer in use. The design is of the entire building is that of a contemporary style.

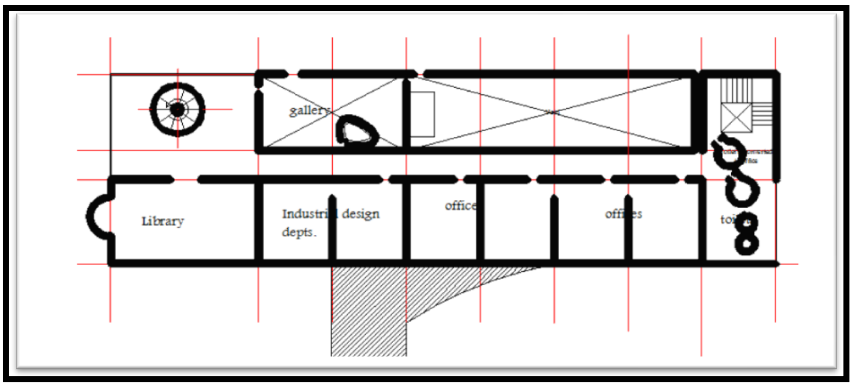


Figure 4.2: First floor Plan

(Source: Author's sketch, 2014).



Plate 4.3: Service Lifts and Escape Stair Case

(Source: Author's fieldwork, 2014)

Second Floor and Third floor Plan

The second floor which follows the grid structural pattern house the studio classrooms of industrial design such as the photography studio (as seen in figure 4.3 by the right), the supporting facility of the dark room which is integral to the analogue way of doing photography is also present. The third floor (figure 4.4) is also for industrial design. Some of the functions there include: Textile studio where the tie and dye works are done, weaving studio which could be looming or knitting, library and staff offices. The spatial arrangement is seen in figure 4.4 below.

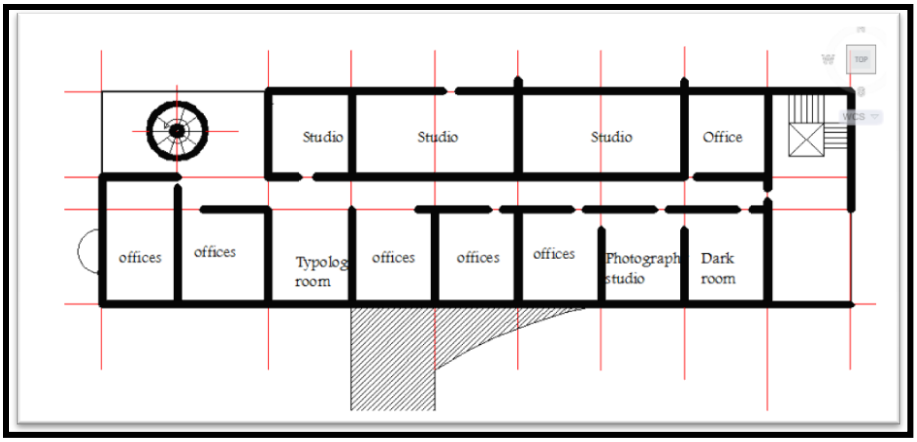


Figure 4.3: Second floor Plan

(Source: Author's sketch, 2014).

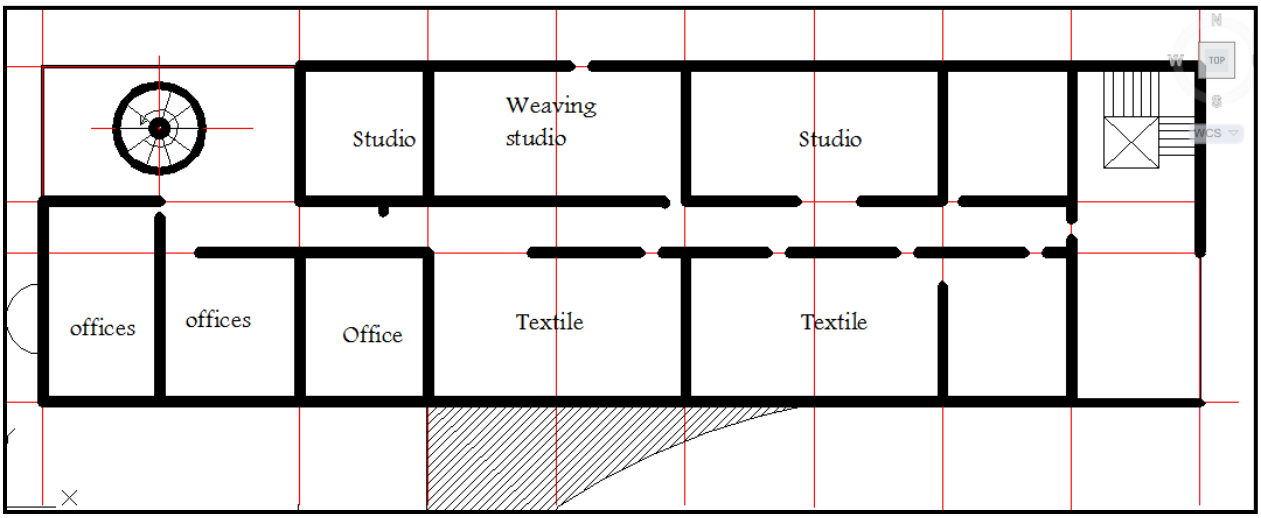


Figure 4.4: Third floor Plan

(Source: Author's sketch, 2014).

4.1.4. Structure and Dominant Building Material

The prevalent building material used includes sandcrete block, reinforced concrete floor slabs, ribbed one way slab supported with concrete beams and an L section steel beam. In the sculpture and ceramics studio, recycled particle board ceiling material is used. The

roofing system is steel truss method with aluminium roof sheet. Extensive use of glass for windows to bring in natural light and ventilation.

4.1.5. Aesthetics And Architectural Expression

The Aesthetics and expression, reflects that of the colonial period modern architecture of clean line, pure forms but has some bit of expressionism. A play with forms and distortion of forms as seen in the plate 4.4 below.



Plate 4.4: View Exposing the Interplay of Forms

(Source: Author's fieldwork, 2014)

4.1.6 Elements That Enhance Human Performance

Table 4.1 Variables used for analysis of case study.

Principle	Requirement	Level of Reflectance				Remark
		Ab-sent	Low	Med-ium	High	
Thermal comfort	Presence of HVAC system		✓			Few HVAC systems, mostly in offices.
	Natural cooling facilities			✓		Two sides covered with over 50% window openings, presence of trees.
Access to Nature, Views and Daylight	Presence of atrium/courtyard	✓				
	Access to natural views through windows				✓	Visual corridor of trees, vegetation an sculpture garden.
	Operable windows				✓	Louvre system of windows Fixed windows in some places and side hinged windows on external walls.
	Scenic views			✓		Upper floors give a good view of the university.
	Natural recreation gardens				✓	Sculpture garden
Sensory Change and Variability	Presence of natural ventilation			✓		Presence of trees and shrubs
	Use of natural lighting				✓	Through presence of windows.
	A stimulating work environment			✓		Presence of open lit bright spaces in studio
	Variability		✓			A stereotypical environment
Colour	Use of bright colours				✓	Such as white, Sky blue, red and more
	calming colours				✓	A fair use of calming colours
Noise control	Absence of sources of noise				✓	Due to buffer zone of trees and shrubs.
	Noise absorption materials				✓	In the lecture theatre.
Absence of Crowding			✓			Short width of corridors on lower floors and poor ease of circulation
Human Factors and Ergonomics	Adjustable furniture			✓		In the theatre and offices
	mobility design				✓	Lots of space with activities scattered around encourages movement.
Indoor air quality	Absence of air pollution sources			✓		Due to types of paint used by artist and presence of a kiln and foundry
	Natural ventilation properties				✓	Windows and trees.
Technology of Flexibility and adaptability	Durability				✓	Use of terrazzo floors, steel and concrete elements
	Design for disassembly/Movability		✓			Due to excessive use of concrete. Seamless connections between spaces

	Convertibility				✓	Use of grid system and centralised service core
	Adjustability		✓			Only in one space, which is the master's students studio.
	Scalability			✓		Expansion has already taken place hence there's little or no more space left.
	Refitability		✓			The spaces can serve new functions temporarily when there is need. Operable windows and movable furniture.
	Versatility				✓	The spaces can accommodate the new functions as if they were designed purposely for that. The spaces can accommodate the new functions as if they were designed purposely for that.

Source: field work (2014)

4.1.7 Interview Answers

I. The building was designed purposely for the current use.

II. It is usually used 24/7 that is through the week and the year.

III. During the second semester of the academic year since students do their academic project that period.

IV. In fine art: Sculpture, Art history and art education while in Industrial design: ceramics, graphics and textile design.

In Fine art department, the aspect of painting has a higher patronage due to the cultural values of the Northerners while in industrial design, Textile design and ceramics have a higher patronage.

V. **Motivation**: The presence of the sculpture garden which not only serves as a relaxation space but also a motivation spot, a place to get ideas for the various art practised and taught.

Creative Thinking: The presence of alumina students work groomed at the sculpture garden an places around the institution has played an integral role in

boosting th the creative thinking of the student whom want to come out with something better than what is already there.

Knowledge: In order to impact knowledge the facility was properly designed to carry out teaching and practical works. Lectures are been taught in the teaching facilities and practically carried out in the various studio and workshop spots

VI. Challenges faced includes:

a. Lack of office spaces for staff therefore some conveniences were converted to office space.

b. Inadequate learning facilities due to the increase in the student population.

4.2 CASE STUDY TWO: ARTS AND CRAFT VILLAGE, CADASTRAL ZONE, CENTRAL BUSINESS DISTRICT AREA.

4.2.1 Brief Introduction.

The place is currently managed African Arts and Culture Heritage Association (AACHA) but it was originally built to exhibit the African culture and craft for the common wealth on the 5^{th} -8^{th} October, 2003 by Queen Elizabeth. It was also built to host and showcase the Nigerian Art but after the exhibition, the artist stayed back so the government adopted it as a place for them. The arts and craft village is divided into three sections namely: general art and craft section, textile section, painting section and performance facility-an amphitheatre which is barely used. The facility is planned in a radial manner as seen in plate 4.5 below with parking spaces, shopping facility and administrative facility.



Plate 4.5: Layout of the Art and Craft Village

(Source: Google earth, 2014)

Some of the craft carried out here or sold includes; painting, leather works, wood work, fabric section, weaving, jewellery, sculpture, bead making, ceramics, cane work (some of which are seen in the plate 4.6 below) and much more.



Plate 4.6: Shops exposing arts and crafts exhibited

(Source: Author fieldwork, 2014).

4.2.2 Site Planning and Landscaping

The site is located on a relatively flat surface but with a few undulating spots. The layout is scattered like that of a village settlement, with a single vehicular entrance into the facility from the main road. The site is landscaped with both soft and hard landscape of pavement and sculpture. There is room for future expansion within the site (As seen in the layout in plate 4.5 above). The site is also proxy to public transit. The site is zoned based on the arts carried out.

4.2.3. Spatial Organisation and Design

The functional spaces include;

Shops: There are several units of shops, some partitioned by the sellers to sell their wares, most of which are redecorated and renovated in the interior space (as seen plate 4.6 above). The shops have an oval shaped plan form (plate 4.5) with decoration around the window sill which depicts the Hausa architecture. The extension of the shops which was as result of some agreement with an organisation has a more modern design. It comprise of a block of shops made of brick as well (as seen in plate 4.8 below).



Plate 4.7: Older shops

(Source: Author fieldwork, 2014).



Plate 4.8: Recently Built Buildings and Shops

(Source: Author fieldwork, 2014).

Amphitheatre: The semicircular open theatre can seat about 400 people it has a stage which is also made from concrete though it is barely used hence it is gradually dilapidating (as seen in plate 4.9 below).



Plate 4.9: Dilapidating Amphitheatre

(Source: Author fieldwork, 2014).

Administrative Facility: The administrative facility (plate 4.10) is the red roofed building on the site layout above (plate 4.5). It houses offices which are designed with grids, single banking with

modern architectural materials, opposite the admin far into the site is the restaurant facilities which are also rented out to users, and some are temporary structures.



Plate 4.10: Administrative Block

(Source: Author fieldwork, 2014).

Parking: In the core of the site is the parking, it branches off the tarred road. The parking is soft caped and the road is lined with stone boulders to serve as a demarcation (see plate 4.11).



Plate 4.11: Parking and access road landscaped with boulders.

(Source: Author fieldwork, 2014).

4.2.4 Structure and Dominant Building Material

The structures are predominantly oval shaped in plans with circular thatched roof lined with zinc roofing sheets to avoid leakage, however the newer shop structures (see plate 4.8) which have rectangular plans (rows) tend to have had modern interior finishes such as tiles and ceiling. Partitioning materials are basically clay composite brick, floor is mostly concrete screed floors. Some shop owners went ahead to use ceramics tiles and P.O.P ceiling (see plate 4.13). The admin block is made of sandcrete blocks, terrazzo floor, long span aluminium roofing sheets. Windows are aluminium glass sliding windows. The shops in the arts and craft village (oval buildings) are basically wooden windows but some of the more recent structures have aluminium glass windows.



Plate 4.13: Modified Interior of Hut Shop

(Source: Author fieldwork, 2014).

4.2.5. Aesthetics and Architectural Expression

The Aesthetics and expression, reflects that of modern architecture, use of mostly circular forms giving it some form of liveliness and communal living like a village setting which reflects the cultural identity of Nigeria with a core of entertainment facility that is the amphitheatre(village square) to pull the people together as seen in the layout above.

Furthermore the materials which were used which is basically indigenous building materials were aesthetically put together in a modern way as seen in the plate below. The use of both natural and artificial elements gives the art and craft village a form of creativity through architecture.



Plate 4.14: Views of the Village with Various Uses of Modern and Indigenous Materials.

(Source: Author fieldwork, 2014).



Plate 4.15: Views of Sculptures Embedded Into the Building Elements.

(Source: Author fieldwork, 2014).

4.2.6. Elements That Enhance Human Performance

Table 4.2 variables used for analysis of case study. Source: Field work, (2014)

Principle	Requirement	Level of Reflectance				Remark
		Absent	Low	Medium	High	
Thermal comfort	Presence of HVAC system		✓			Only in admin offices.
	Natural cooling facilities				✓	Window openings and presence of trees. The use of bricks helped to keep a cooler interior environment.
Access to Nature, Views and Daylight	Presence of atrium/courtyard	✓				
	Access to natural views through windows				✓	Visual corridor of trees, vegetation and sculpture.
	Operable windows				✓	Wooden side hung windows and glass sliding windows external walls.
	Scenic views			✓		The topography gives the site a pleasing view and artificial features such as sculptures.
	Natural recreation gardens		✓			Artificial. The amphitheatre serves as a relaxation spot.
Sensory Change and Variability	Presence of features of natural ventilation				✓	Presence of trees and shrubs
	Use of natural lighting		✓			Presence of insufficient size of windows.
	A stimulating work environment				✓	The architecture of the place which is collaborative and the design of the various units.
	Variability			✓		A stereotypical environment but due to the open outdoor space features it feels mild.
Colour	Use of bright colours		✓			Moderate use of bright colours
	calming colours			✓		A fair use of calming colours
Noise control	Absence of sources of noise				✓	Due to buffer zone of trees and shrubs.
	Noise absorption materials	✓				
Absence of Crowding					✓	Ease of circulation
Human Factors and Ergonomics	Adjustable furniture		✓			In restaurant and admin spaces basically
	mobility design				✓	Lots of space with activities scattered around encourages movement.
Indoor air quality	Absence of air pollution sources				✓	Natural material used has less pollution hazards.
	Natural ventilation properties			✓		Windows and trees.
Technology of	Durability		✓			Use of well made bricks but

Flexibility and adaptability						thatch giving away due to poor maintenance
	Design for disassembly/Movability	✓				Rigid structures
	Convertibility	✓				
	Adjustability		✓			only admin structure
	Scalability				✓	Space for future expansion are available but with temporary structures
	Refitability		✓			The spaces cannot serve new functions although there are Operable windows and movable furniture.
	Versatility	✓				The spaces cannot accommodate the new functions because they comprise of small units.

(Source: Author's field work, 2014).

4.2.7. Interview Answers

I. The facility was designed purposely for the facility which is used for.

II. It is usually used 24/7 that is through the week and the year. During the second semester of the academic year since students do their academic project that period.

III. There is usually more patronage during festive periods and weekends mostly before the security challenges.

IV. All aspects of art such as fashion design and textile, sculpture, painting, bead making, leather works, cane weaving but the painting section and wood sculpture arts has more appreciation.

V. **Motivation**: The presence of the hut like structure tends to pull customers and tourist to the facility so it is a form of motivation to the people who patronise it.

Creative Thinking: The presence of the various art works enhances their thoughts to do better and also the presence of the amphitheatre helps in relaxation.

Knowledge: In order to impact knowledge the facility was properly designed to carry out informal learning sometimes to students or apprentices and practical works are also carried out on the site. Exhibition are organised which serves as an opportunity to pass knowledge across to people.

VI. Challenges faced includes:

a. There is little or no funding to manage and maintain the facility.

b. No sufficient awareness so appreciation of the arts and crafts is low.

4.3. CASE STUDY THREE: CENTRE FOR ARTS AND CULTURE, CYPRIAN EKWENSI CENTRE, AREA 10, ABUJA.

4.3.1 Brief Introduction.

Located at Moshood Abiola Road, Area 10, Garki, FCT, Abuja, Nigeria. It was commissioned in 1991 by Gen. Ibrahim Badamassi Babangida. It was named after Cyprian Ekwensi a renowned African author. The centre houses both visual and applied art facilities, it also has let able office spaces and exhibition facility, auxiliary facility includes tourist office and let able shops used as business centres.

4.3.2 Site Planning and Landscaping

The site which the facility is located on, gently slopes towards the entrance of the site. The layout is simple, with a single vehicular entrance into the facility from the main road. The site is landscaped with both soft and hard landscape of pavement. There is no room for future expansion within the site. The site is also proxy to public transit.

4.3.3. Spatial Organisation and Design

The site made use of its passive solar devices by orienting the longest sides on the north and south with access to public transit. The site does not have room for future expansion and extensive use of day lighting features and well landscaped with soft and hard landscape.

Parking

High capacity parking space which seems inadequate, well landscaped with natural shedding device of trees to avoid glare and which also serve as a buffer zone.

The entrance hall

The entrance (see plate 4.16) is well celebrated with a large hall and a reception. It leads to the courtyard as seen in plate 4.16 right.



Plate 4.16: The main entrance into the building and courtyard

(Source: Author fieldwork, 2014).

The functional spaces include:

Administrative Facility: The management facility is on the first floor and second, some of the offices have been leased out to other organisation.

Performance facility and banquet

The banquet hall covering a capacity of 350-400 (as seen in plate 4.16-4.17) and theatre are on opposite side, separated by a large courtyard finished with terrazzo. Both facilities are currently leased to event management firms to manage so usually events such as workshops, reception, public lectures, conferences and wedding reception takes place. The halls have Stages, gallery and backstage facility. The theatre is raked as seen in the figure 4.5-4.7 below:

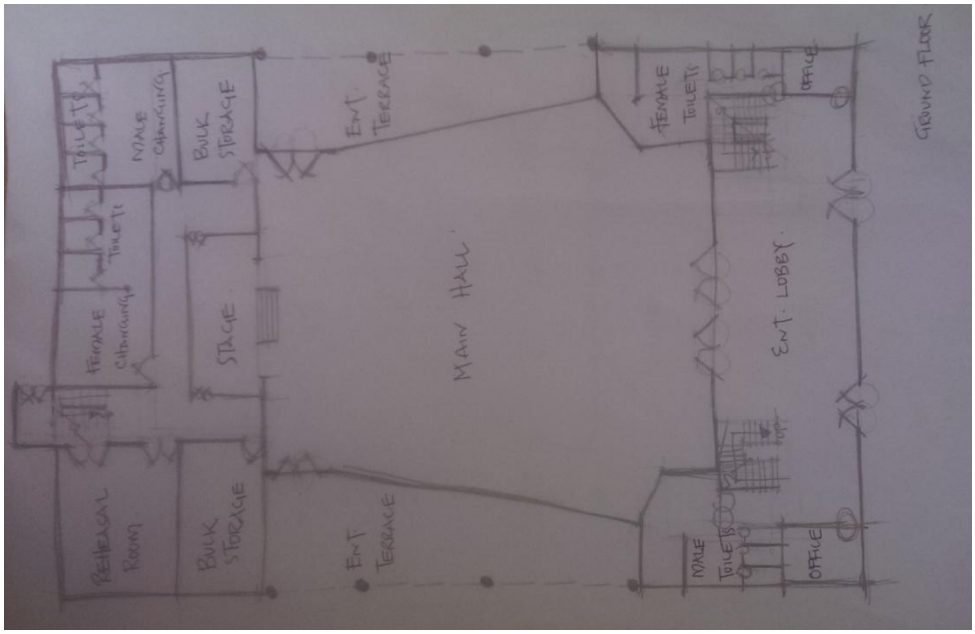


Figure 4.5: Ground Floor Plan Of Theatre

(Source: Author fieldwork, 2014).

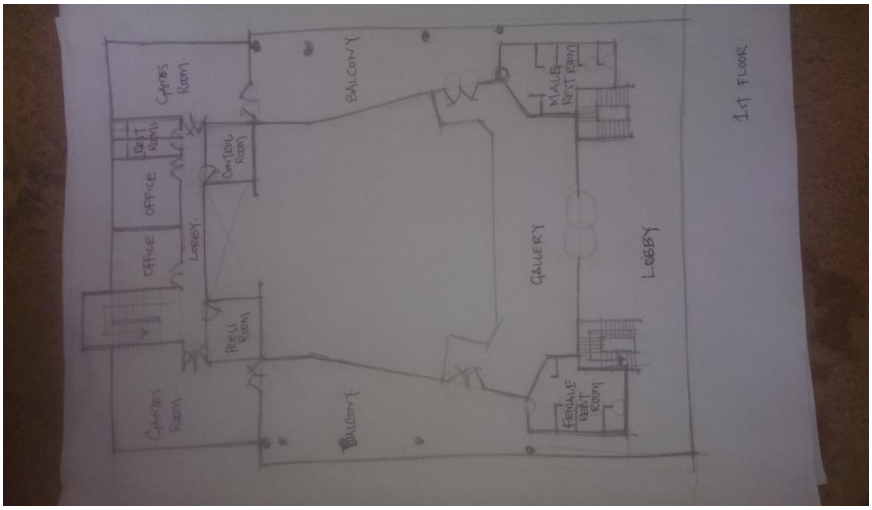


Figure 4.6: First Floor Plan Of Theatre

(Source: Author fieldwork, 2014).

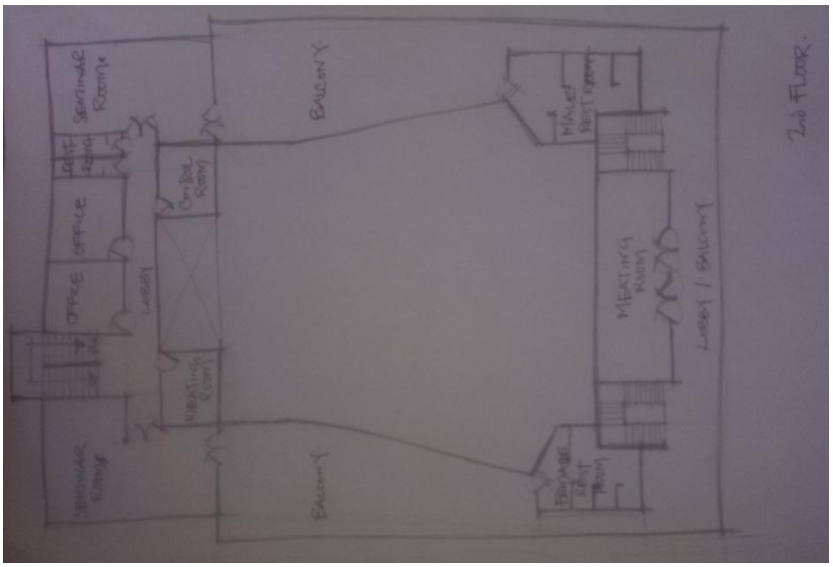


Figure 4.7: Second Floor Plan of Theatre

(Source: Author fieldwork, 2014).



Plate 4.16: Access of the banquet hall from the exterior

(Source: author field work, 2014)

Studio comprise of ceramics, painting, textile, graphics and sculptural studio



Plate 4.17: Interior of Banquet Hall

(Source: Author fieldwork, 2014).

Museum and exhibition facility: Just opposite the entrance hall is the exhibition facility, the temporary exhibition hall (24m x 12m) is side by side with the gallery space and just above that is the museum. The museum houses artefacts and pieces of ethno Abuja history.

Applied art facility: Comprising of the studio and workshop spaces. The ceramics studio and coordinator's office is the only one within the main building, every other studio were single units outside in the private space.

Auxiliary facility: Two number restaurants which are no longer in use are within the main building. Other facilities includes, tourism office, blocks of business centres which let out and single hut structures as well, serving as let able shops.

4.3.3 Structure and Dominant Building Material.

Open plan and grid building construction method was adopted in order to make the plan flexible. The main building plan form is rectilinear while the studio is circular in plan. Some of the shops however the other set of let able. The let able shops are rectangular.

The theatre is clad with acoustical boards and sound absorption materials in order to enhance the sound quality of the halls. The let able shops and single unit studio are made from thatch and burnt bricks, designed interior to users' taste. In the gallery, natural light is used either brought in through glass windows or use of smaller courtyards.

Flooring materials includes terrazzo, ceramic tiles and screeding. Ceiling materials includes, P.O.P, concrete floor slab, ceiling board and matted thatch ceiling. Roofing material includes concrete and long span aluminium roofing sheets.

4.3.4 Aesthetics And Architectural Expression

The Aesthetics and expression, reflects that of modern architecture, use of rectilinear forms with an interplay of a variety of textures and paintings on the facade to celebrate the function of the building as well as the art industry forms giving it some form of liveliness and which reflects the cultural identity of Nigeria Furthermore the materials which were uses which are basically indigenous building material was aesthetically put together in a modern way as seen in the plate 4.16 above. The overall design of the building is aesthetically pleasing have a bit of expressionism and modern architecture.

4.3.5 Elements That Enhance Human Performance

Table 4.3 variables used for analysis of case study.

Principle	**Requirement**	**Level of Reflectance**				**Remark**
		Absent	**Low**	**Medium**	**High**	
Thermal comfort	Presence of HVAC system				✓	Excessive use of HVAC system to cool the building.
	Natural cooling facilities			✓		Window openings and presence of trees.
Access to Nature, Views and Daylight	Presence of atrium/courtyard				✓	A very big hard courtyard to enhance collaborative environment.
	Access to natural views through windows				✓	Visual corridor of trees and vegetation
	Operable windows				✓	Excessive use of aluminium glass sliding windows external walls.
	Scenic views			✓		The topography gives the site a pleasing view and the landscape of trees and shrubs
	Natural recreation gardens	✓				No relaxation spot
Sensory Change and Variability	Presence of features of natural ventilation				✓	Presence of trees and shrubs
	Use of natural lighting		✓			Presence of windows. Artificial lights used in theatres and banquet hall.
	A stimulating work environment				✓	The architecture of the place has artistic features excessive used. The presence the courtyard encourages the collaborative environment.
	Variability				✓	Interplay of textures and motifs of paintings on the wall.
Colour	Use of bright colours				✓	Excessive use of bright colours

	calming colours				✓	A fair use of calming colours
Noise control	Absence of sources of noise				✓	Due to buffer zone of trees and shrubs.
	Noise absorption materials				✓	In theatre and spaces that sound is used.
Absence of Crowding					✓	Ease of circulation
Human Factors and Ergonomics	Adjustable furniture		✓			seen only in offices
	mobility design				✓	Lots of space with activities scattered around encourages movement.
Indoor air quality	Absence of air pollution sources			✓		Due to the presence of a kiln
	Natural ventilation properties			✓		Windows and trees.
Technology of Flexibility and adaptability	Durability		✓			Use of well made bricks but thatch giving away due to poor maintenance
	Design for disassembly/Movability	✓				Rigid structures
	Convertibility				✓	Open plan system with grid structural system.
	Adjustability			✓		Especially in exhibition halls, gallery and museum.
	Scalability	✓				No space for future expansion.
	Refitability				✓	The spaces can serve new functions an there are Operable windows and movable furniture.
	Versatility				✓	The spaces can accommodate the new functions because they comprise of large units and open plan.

Source: Field work, (2014).

4.3.6 Interview Answers

I. The facility was designed purposely for the facility which is used for currently.

II. It is used every day especially during festive periods.

III. There is usually more patronage during festive periods and weekends mostly before the security challenges.

IV. All aspects of art basically the visual and performing arts, all of the arts have patronage.

V. **Motivation**: Art lovers and tourist are usually attracted to the centre to get to see arts works at the gallery and as well buy the one that interest them.

Creative Thinking: No recreation or relaxation facility to enhance creative thoughts

Knowledge: In order to impact knowledge the facility was properly designed to carry out formal learning sometimes to students or other interested persons. Resource persons are on ground to pass knowledge across to people.

VI. Challenges faced includes:

a. There is little or no funding to manage and maintain the facility.
b. Under utilization of facility. The two restaurants are currently not in use.
c. Epileptic power outage.

4.4. CASE STUDY FOUR: KADUNA NATIONAL MUSEUM.

4.4.1 Brief Introduction

The museum was opened in 1975. The building was formally serving the Northern People's Congress as a head office in Sir Ahmadu Bello's administration. So it was not purposely built for the Museum but was converted. The building houses a collection of archaeological, ethnolographic and crafts and art exhibit. It also has live arts and craft centre.



Plate 4.18. Layout of Kaduna Museum

(Source: Google earth, 2012).

4.4.2 Site and Landscaping: The site made use of North-South orientation for most of the buildings present. The use of a garden makes the environment cool, it covers a wide sparse of land see figure 4.8. Some of the building materials used such as mud, thatch and many more which are suitable for buildings in hot climate. The facility has proximity to vehicular access and it's on the major road that leads to various motor parks and the further away is the airport (as seen in plate 4.18). There is no room for future expansion due to the presence of offices and a market at adjacent sides and behind.

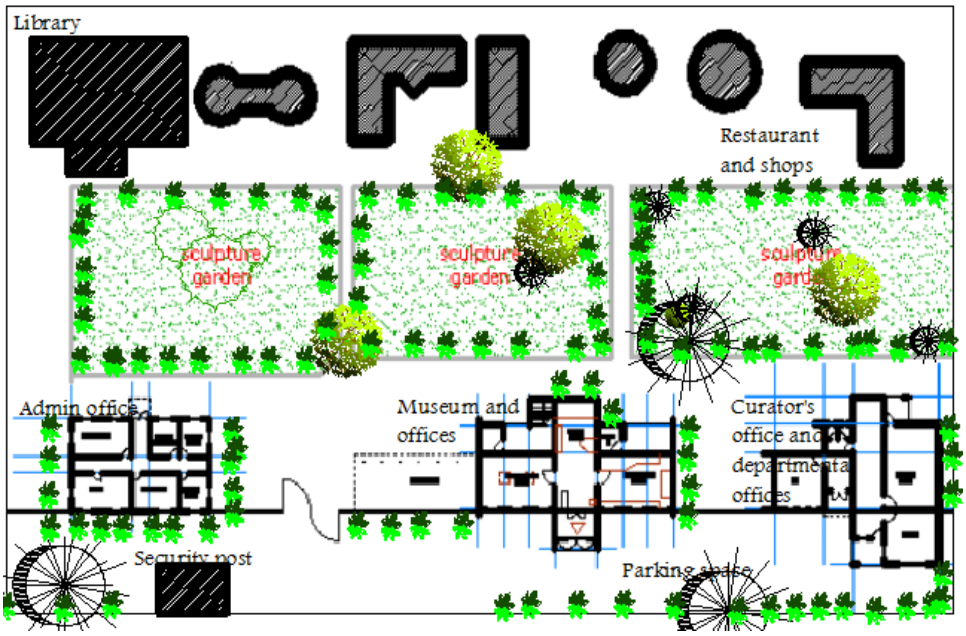


Figure 4.8: Sketch of Site Layout

(Source: Adopted by Author, 2014)

4.4.3 Spatial Organisation and Design

The facility is divided into four sections,

Admin

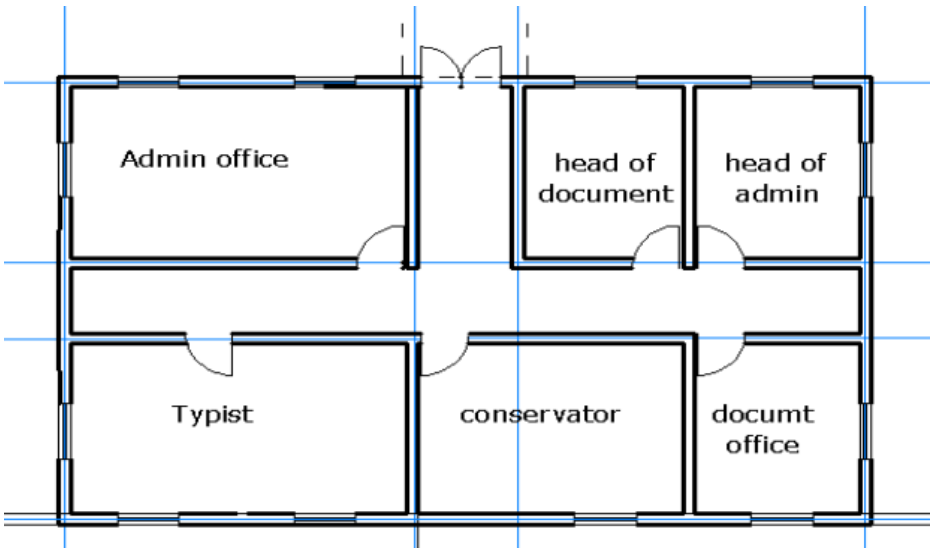


Figure 4.9. Sketch Plan of Admin Office

(Source: Adopted by Author, 2014)



Plate 4.19: Admin building

(Source: Author fieldwork, 2014).

Museum: Kaduna museum housed over 5000 artefacts stored which is 25times the number of exhibits exhibited within the museum**.** The museum is divided into three sections which could not be viewed because of the renovation currently going on at the museum currently. The three sections are shown in the figure 4.10-4.11 below. They include:

Archaeological gallery: showcasing Artefacts found and preserved.

Modern Craft section: Exhibition of things used in the current age such as leather works, calabash, and "wena" pot and much more.

Ethnography gallery: Things used in the older days in various cultures such as the "Kakaaki", and currency.

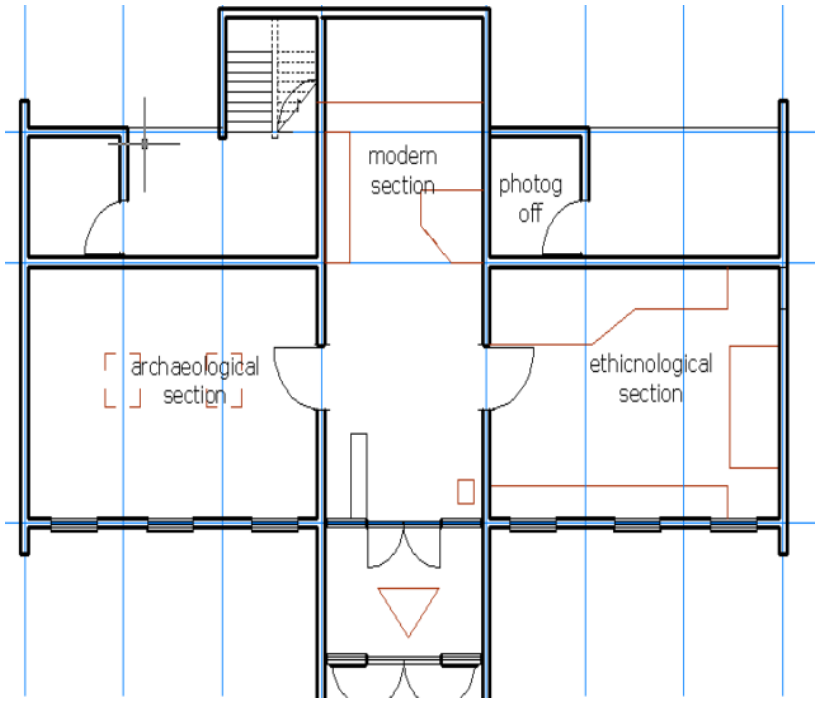


Figure 4.10. Sketch Plan of Museum Ground Floor.

(Source: Adopted by Author, 2014)

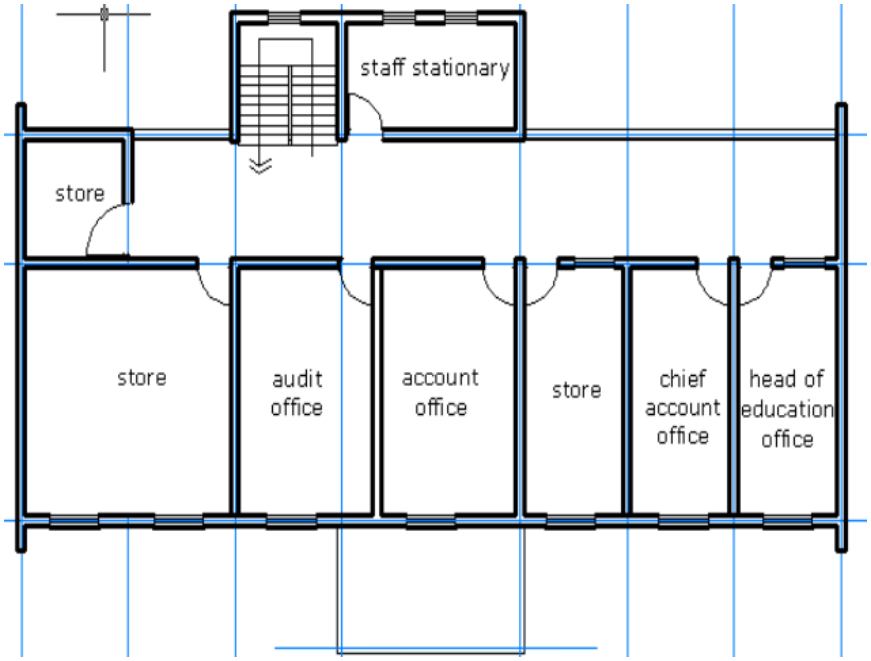


Figure 4.11: Sketch Plan of Museum First Floor.

(Source: Adopted by Author, 2014).

The museum building has two floors as seen in figure 4.10-4.11 the first floor (see figure 4.10 houses the four gallery exhibition spaces and a waiting hall while the first floor contains the offices as seen in figure 4.11. The exterior view (see plate 4.20) has no form that make the building eye catching.



Plate 4.20: Museum

(Source: Author fieldwork, 2014).

Curators' office and departments

The curator's office has a small gallery (see figure 4.12) attached to it for temporary exhibitions for school, artists or visitors. The disadvantage however is that the curator may not be easily accessible to museum visitors as his office is a bit far from the main exhibition hall. For exterior view of the office see plate 4.21.

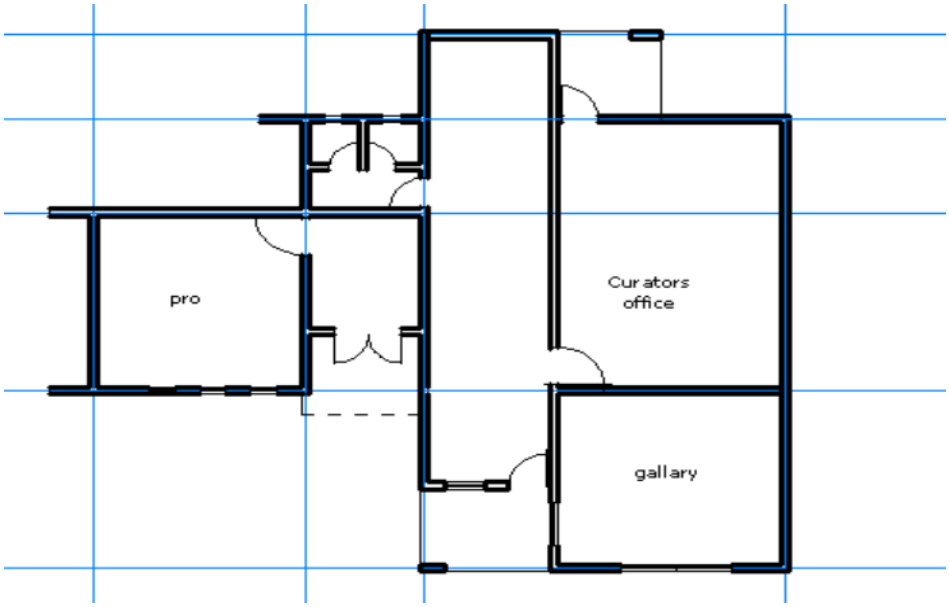


Figure 4.12: Sketch Plan of Curator' Office.

(Source: Adopted by Author, 2014)



Plate 4.21: Curator's Office

(Source: Author fieldwork, 2014).

Art and craft village

The art and craft village is divided into various sections such as the hair styling section (as seen in the plate 4.22 left and right below)



Plate 4.22: Exterior and Interior Of and Traditional Hair Styling Section

(Source: Author fieldwork, 2014).

The painting section, tie and dye section and goldsmith section or blacksmith section are also rectilinear hut structures (see plate 4.23 below) with motifs on the mud walls.



Plate 4.23: Exterior and Interior Of and Painting and Goldsmith Section

(Source: Author fieldwork, 2014).

Museum Restaurants and Shops: due to the renovation process currently going on, the structure of the restaurant was pulled down to be reconstructed therefore they are currently occupying a temporary structure (as seen in the plate 4.24 below).



Plate 4.24: Foundations Of Demolished Buildings, Temporary Structures And Burnt Bricks Expected To Use To Rebuild.

(Source: Author fieldwork, 2014).

4.4.4 Structure and Dominant Building Material

Structural grid system grid building construction method was adopted in the design of offices as seen in the figure above, the buildings plan form is rectilinear while the art and

craft workshops are oblong and round reflecting the Hausa architecture. The library which is under construction (see plate 4.25), it has a rectilinear plan form with the "arewa" spire on its facade. In the gallery, natural light is used through glass windows. The exterior walls are finished with mortar and thick masonry granite stone walls (as seen in the plate 4.20-4.21 above).



Plate 4.25: Ongoing Construction of Library

(Source: Author fieldwork, 2014).

Flooring materials includes terrazzo in administration office and other offices and screeding in arts and craft village. Ceiling materials includes: concrete roof slab, chip board and matted bamboo ceiling in art and craft village. Roofing material includes long span aluminium roofing sheets for sand creed building and zinc and thatch at craft village which is undergoing renovation.

4.4.5 Aesthetics and Architectural Expression

The building was put up about the time of a fresh Nigerian government therefore its looks very colonial in its expression with the building form of thick mass of masonry to give an impression of strength and opulence.

4.4.6. Elements That Enhance Human Performance

Table 4.4 Variable used for analysis of case study

Principle	**Requirement**	**Level of Reflectance**				**Remark**
		Absent	**Low**	**Medium**	**High**	
Thermal comfort	Presence of HVAC system			✓		Moderate use of HVAC system to cool the building due to natural landscaping aimed at reducing heat effect.
	Natural cooling facilities				✓	Window openings and presence of trees.
Access to Nature, Views and Daylight	Presence of atrium/courtyard	✓				No use of courtyards or atrium.
	Access to natural views through windows				✓	Visual corridor of trees, sculpture and vegetation
	Operable windows				✓	Excessive use of aluminium glass sliding windows external walls.
	Scenic views			✓		The site gives a pleasing view of landscape elements, trees and shrubs
	Natural recreation gardens			✓		Presence of a sculpture garden
Sensory Change and Variability	Presence of features of natural ventilation				✓	Presence of trees and shrubs
	Use of natural lighting				✓	Presence of windows. and adequate spacing between one building and another.
	A stimulating work environment		✓			Due to the former use of the building, the building shows has intimidating effects because of the brutalise form of architecture.
	Variability		✓			No variability
Colour	Use of bright colours			✓		Moderate use of bright colours, Colour used is pink and light green.
	calming colours			✓		A fair use of calming colours
Noise control	Absence of sources of noise		✓			Due to proximity of facility to major road.

	Noise absorption materials	✓				No noise absorption materials
Absence of Crowding					✓	Ease of circulation
Human Factors and Ergonomics	Adjustable furniture		✓			seen only in offices
	mobility design			✓		Activities around encourages movement.
Indoor air quality	Absence of air pollution sources		✓			Due to activities such as goldsmith practised there
	Natural ventilation properties			✓		Windows and trees.
Technology of Flexibility and adaptability	Durability			✓		Excessive concrete used in admin facilities.
	Design for disassembly/Movability	✓				Rigid structures
	Convertibility			✓		Due to structural grid system.
	Adjustability			✓		Especially in exhibition halls, gallery and museum.
	Scalability		✓			No space for future expansion.
	Refitability				✓	The spaces can serve new functions an there are Operable windows and movable furniture.
	Versatility			✓		The spaces can fairly accommodate the new functions because it is currently an adapted space

(Source: Author's field work, 2014)

4.4.7 Interview Answers

I. The facility was not designed purposely for the facility which is used for currently but it was remodelled to suite this function.

II. It is used every day especially during festive periods, it is patronised by students on excursion, tourists, social organisation, artisans and actors. All aspects of art basically the visual and performing arts, all of the arts have patronage.

III. Local hair dressing, Painting, Pottery, Tie and dye, goldsmith and blacksmith. All of them have high patronage.

IV. **Motivation**: The traditional features of Hausa architecture exhibited in the museum tend to pull the attraction of people especially those who want to know about the root of their forefather.

Creative Thinking: No recreation or relaxation facility per say but the landscaped sculpture garden can equally carry out that function.

Knowledge: The facility is one that has the role of boosting the knowledge of those visiting it because there are facilities where one can read observe and even learn how to carry out such skills

V. Challenges faced includes:

a. There is little or no funding to manage and maintain the facility.

4.5.0 FINDINGS OF CASE STUDIES

Table 4.5-4.8 below is a cumulative representation of the assessments carried out in the individual selected case studies. A likert scale used to analyse the data on the check list ranging from value 0-3, Value 0 = absent, 1= low, 2= medium and 3= These data is represented in percentages thus revealing the extent of application of architecture principles that enhance creativity.

4.5.1. A Representation Of The Findings for Case Study One:

Table 4.5.Percentage assessment of factors that enhance creativity applied in case one

Principle	Total units	Units	percentage	Remarks
Thermal comfort	6	3	50%	Use of excessive windows and HVAC
Access to Nature, Views and Daylight	15	11	73.33%	Good visual corridor
Sensory Change and Variability	12	8	66.67	Fair variability
Colour	6	6	100%	Good use of bright colours
Noise Control	6	6	100%	In noise prone spaces, Acoustic material an buffer zone
Absence of Crowding	3	1	33.33%	Small corridor, Poor ease of circulation
Human Factors and Ergonomics	6	5	83.33%	A mobility design
Indoor Air Quality	6	5	83.33%	Features to enhance indoor air present
Flexibility and Adaptable spaces	21	14	66.67%	The building is fairly flexible
Total units	**81**	**56**	**Ave.Percent.72.96%**	

(Source: Author, 2014)

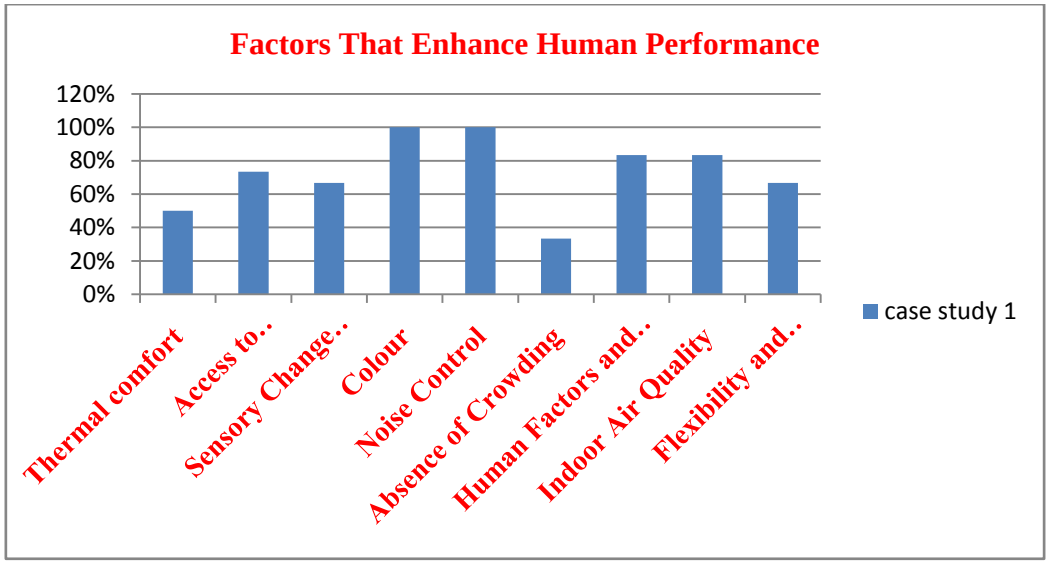


Figure 4.13: Representation of factors that enhance creativity in case one.

(Source: Author, 2014)

4.5.2. A representation of Findings for Case Study Two:

Table 4.6.Percentage assessment of factors that enhance creativity applied in case two

Principle	**Total units**	**Units**	**percentage**	**Remarks**
Thermal comfort	6	4	66.67%	Use of excessive windows and HVAC
Access to Nature, Views and Daylight	15	9	60%	Good visual corridor
Sensory Change and Variability	12	9	75%	Fair variability
Colour	6	3	50%	Good use of bright colours
Noise Control	6	3	50%	In noise prone spaces, Acoustic material an buffer zone
Absence of Crowding	3	3	100%	ease of circulation
Human Factors and Ergonomics	6	4	66.67%	A fair mobility design
Indoor Air Quality	6	5	83.33%	Features to enhance indoor air present
Flexibility and Adaptable spaces	21	6	28.57%	The building is not flexible due to size of shop units
Total units	**81**	**46**	**Ave.Percent.64.47%**	

(Source: Author, 2014)

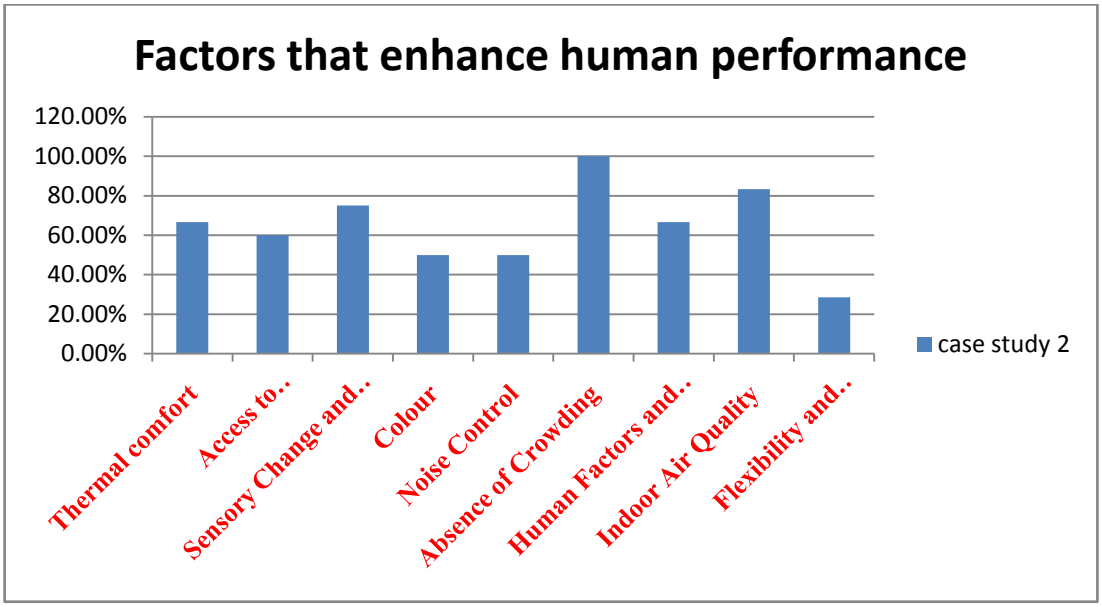


Figure 4.14: Representation of factors that enhance creativity in case two.
(Source: Author, 2014)

4.5.3. A Representation of Findings for Case Study Three:

Table 4.7.Percentage assessment of factors that enhance creativity applied in case three.

Principle	Total units	Units	percentage	Remarks
Thermal comfort	6	5	83.33%	Use of excessive windows and HVAC
Access to Nature, Views and Daylight	15	11	73.33%	Good visual corridor
Sensory Change and Variability	12	10	83.33%	Good variability due to excessive use of motifs on walls
Colour	6	6	100%	Good use of bright colours which enhance the perception of being active.
Noise Control	6	6	100%	In noise prone spaces, Acoustic material an buffer zone
Absence of Crowding	3	3	100%	ease of circulation
Human Factors and Ergonomics	6	4	66.67%	A fair mobility design
Indoor Air Quality	6	4	66.67%	Features to enhance indoor air present
Flexibility and Adaptable spaces	21	12	57.14%	The building is flexible due to the structural grid system adopted
Total units	**81**	**61**	**Ave.Percent.69.50%**	

(Source: Author, 2014)

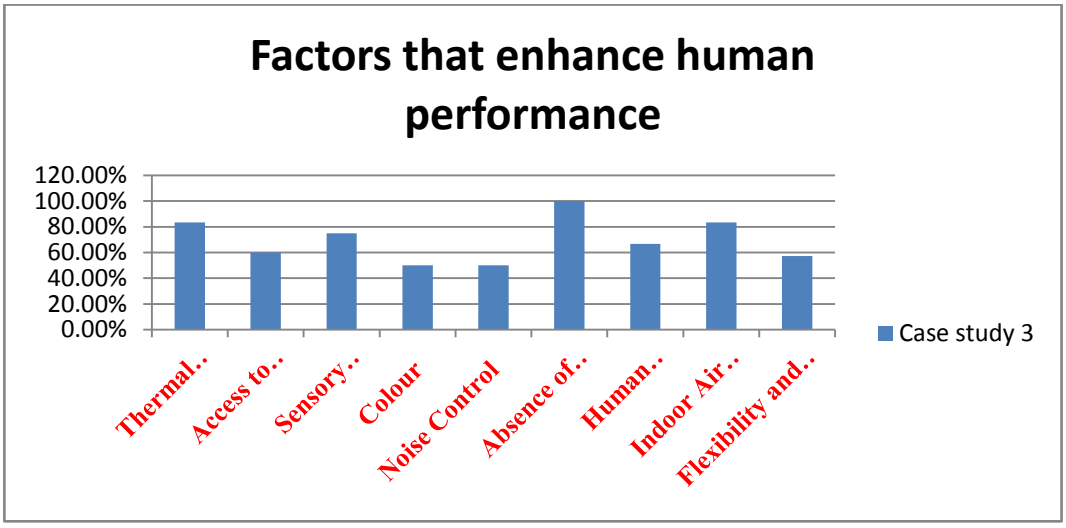


Figure 4.15: Representation of factors that enhance creativity in case three.
(Source: Author, 2014)

4.5.4. A Representation of Findings for Case Study Four:

Table 4.8.Percentage assessment of factors that enhance creativity applied in case four.

Principle	Total units	Units	percentage	Remarks
Thermal comfort	6	5	83.33%	Use of excessive windows and HVAC
Access to Nature, Views and Daylight	15	11	73.33%	Good visual corridor
Sensory Change and Variability	12	8	66.67%	Good variability due to excessive use of motifs on walls
Colour	6	4	66.67%	Fair use of bright colours.
Noise Control	6	1	16.67%	No buffer zone in noise prone areas
Absence of Crowding	3	3	100%	ease of circulation
Human Factors and Ergonomics	6	3	66.67%	A fair mobility design
Indoor Air Quality	6	4	66.67%	Features to enhance indoor air present
Flexibility and Adaptable spaces	21	12	57.14%	The building is fairly flexible due to the structural grid system adopted and it was versatile enough for the function to be changed to the current use.
Total units	**81**	**41**	**Ave.Percent.50.62%**	

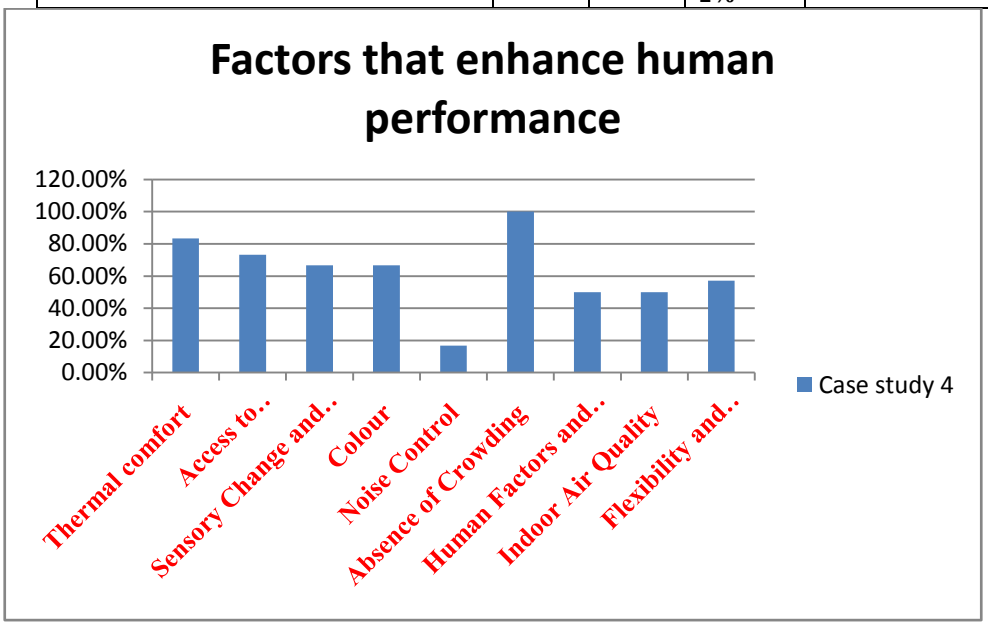


Figure 4.16: Representation of factors that enhance creativity in case four.
(Source: Author, 2014)

4.6. CONCLUSIONS FROM CASE STUDIES.

Thermal comfort was enhanced by the use of excessive windows as well as HVAC system or even in the building material (thatch an mud) which are great reflectors of heat in such a tropical climate as seen in case 4 (83.33%) and case 3 of same percentage figure. However the use of trees and vegetation as well as courtyards especially when well landscaped with natural features goes a long way in enhancing the thermal comfort of the place thereby increasing the productivity of the users of that space.

Access to nature was seen in very few of the cases studied as not all of them incorporated scenic views of nature, and natural day lighting in the buildings, yet case 4 used the natural features of vegetation to their advantage which as well improved the micro climate of the site while case 3 has a very large collaborative space of a courtyard but was not well landscaped so is not totally serving the function but the entrance hall partially serves that function. Case 1 provided a very good visual corridor in integral parts of the building such as studio and rooftop (73.33%).

Having a prototypical type of building forms an material, takes the place of rhythm in views, temperature, materials, air quality which all put together according to Leigh (2013) enhances creativity such as case 3 with 83.33%.

More so, colour tends to detect moods and bright colours such as orange, red, yellow , blue, white and many more used in case 3 through medium of finishes and motifs gives a 100% enhancement of productivity through cool colours. Also the noise control was greatly enhanced through the use of acoustic material such as lona 3D wall panels as in a

case 3 (100%) or through zoning in case 2, also providing a buffer zone in case 1, this features excessively reduced noise spread.

Furthermore the absence of crowding which was minimal in case 1 due to low ceiling heights but use of several floors or lots of circulation space as in case 2 tends to curb that effect of crowding. Human factors and ergonomics were greatly achieved through a design that aides movement through use of movable adjustable furniture with functions spread across the site. Therefore the case 4, 3, and 2 lacked this feature as they are the lowest with 66.67% respectively.

Indoor air quality was enhanced through use of windows and less air pollution facilities such as furnaces and vehicles so it was higher in case 1 and 2 because of zoning. The feature of flexibility and adaptability was poor in the case 2 (28.57%) due to the small units of circular forms used but is highest in case 1 (66.67%) due to the grid structural pattern used and the ability to convertible but all buildings lacked the feature of versatility and movability.

In conclusion, Case 1 with 72.96% features that enhance creativity applied which has all year patronage which is an academic institution. showed the highest in close descending order is Case 3 percentage (69.50%) of architectural features that enhances creativity and from the interview reply, it has a seasonal good patronage but Case 4 has the lowest percentage (50.62%) which is way below the average 64.39% (fairly good) of the four cases put together especially because it was not purpose built, therefore a centre for arts which intends to use its architecture as a principle that enhances creativity must begin

right from the very preliminary stage. This information should be adopted in the design of the centre for arts and creativity in Abuja.

CHAPTER FIVE

DESIGN REPORT.

5.0. INTRODUCTION

This chapter sought to explain the various aspect of the design such as the site location, site selection criteria, suitability of the chosen site, the site analysis, design proposal, design parameters and considerations, other considerations, site concept design overview, building materials technology, services facilities and schedule of accommodation.

5.1. SITE LOCATION

The site plays a very important role in enhancing the building either positively or negatively. The site location serves as the focal point of the nation, to showcase its art and creativity to the world at large.

The site for the centre of arts and creativity is located in Abuja, The federal Capital Territory, Nigeria. Nigeria is in the savannah region of between latitudes 8°25" and 9°20' north of the equator and longitudes 6°45" and 7°30" east of the Greenwich meridian with an area of 932,768 Sq.km and a population of 160 Million. Abuja the state capital of Nigeria with a total area of is 8000 square kilometres and a population of 776,298 as at 2006 Census. It is bounded by Kaduna state to the north, Nassarawa state to the East and south east, Kogi state to the south west and Niger state to the west. Abuja has a land use control map (figure 5.1)



Figure 5.1. Land use map of Abuja

(Source: Umar, 2010).

5.2. SITE SELECTION CRITERIA

For purpose of this research, three sites were studied at Abuja where it is to be located. The sites studied are: site 1, site 2 and site 3. The site selection criteria listed below are used to analyse the suitability of the site for the design of a centre for arts and creativity in Abuja. The criteria rated on a scale 1-5 in ascending order.

i. Location and accessibility to public transit: Access to public roads
ii. Site with passive solar qualities: To achieve energy efficiency which is a trend in sustainability, the site could take advantages of features which can enhance day lighting, cooling, ventilation and lots more.
iii. Allowance for future expansion

iv. Access to public facilities: Public facilities here includes: electricity, water and other services which would be beneficial to put up a centre at the location.

v. Presence of scenic views: This is a vital feature to enhance the creative learning environment.

vi. Land use compliance: The centre to be put up would have to be in compliance with the land use policies of the area an meet the requirement for zoning and building code (see figure 5.1.- 5.3)

Table 5.1 Site selection criteria assessment

Criteria	**Site 1** Kukwaba area	**Site 2** Central business district	**Site 3** Wuse, Zone 5	**Remarks**
Location and accessibility to public transit	5	3	4	Site 1&3 are having direct access to major roads unlike site2 which is linked to a minor road.
Site with passive solar qualities	4	3	5	Site 3 has its longest sides oriented towards the north and south.
Allowance for future expansion	0	2	5	Site 1 and 2 has its neighbouring borders developed already.
Access to public facilities	2	5	4	Site 2 has an advantage of public facilities such as shopping facilities. Site 3 however has moderate access to facilities such as residential and commercial facilities
Presence of scenic views	0	2	5	Site 3 has undulating topography of rocky ground and a waterfall in the water body that goes across.
Land use compliance	5	5	5	They all compliant to the master planning of recreational facilities Site 3 falls into community and commercial centres.
	16	20	28	Site 3 is more favourable for the centre.

(Source: author's field work, 2014)



Figure 5.2. Google earth map showing location of three sites

(Source: Google earth, 2014).

5.3. SUITABILITY OF THE CHOSEN SITE

The site chosen for the centre which is at Wuse zone 5 is in the Wuse II district which is in phase two of the Abuja master plan (see figure 5.2-5.3). Wuse district has most of the federal govt Parastatal such as national food and drug agency (NAFDAC), Foreign Affairs Ministry, Nigerian Tourism Development Cooperation in Zone 7, Sheraton hotel in Zone 4, Federal Civil Service and Federal Road Safety Commission (FRSC) in Zone 3 and many more.

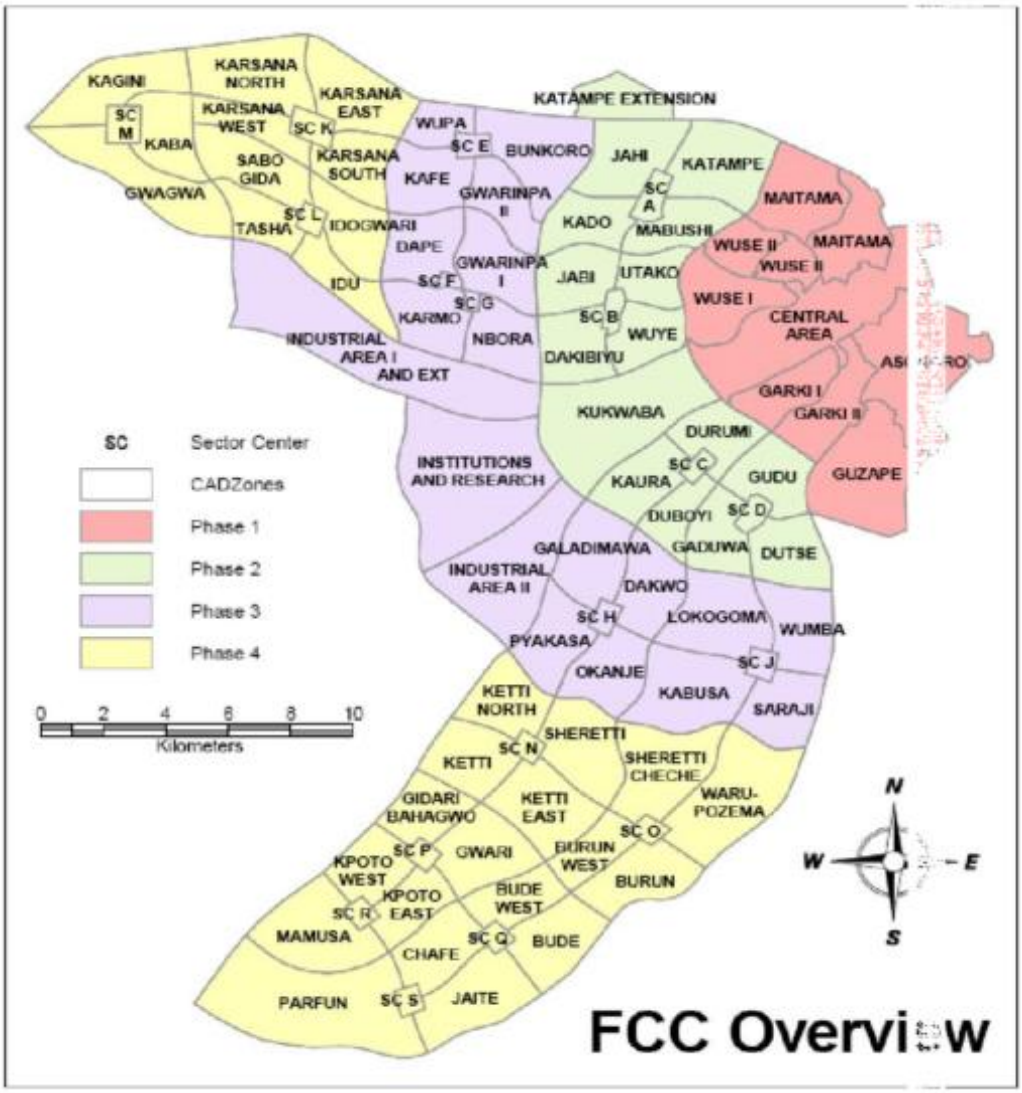


Figure 5.3. Land use map of Abuja showing various phases

(Source: Umar, 2010).

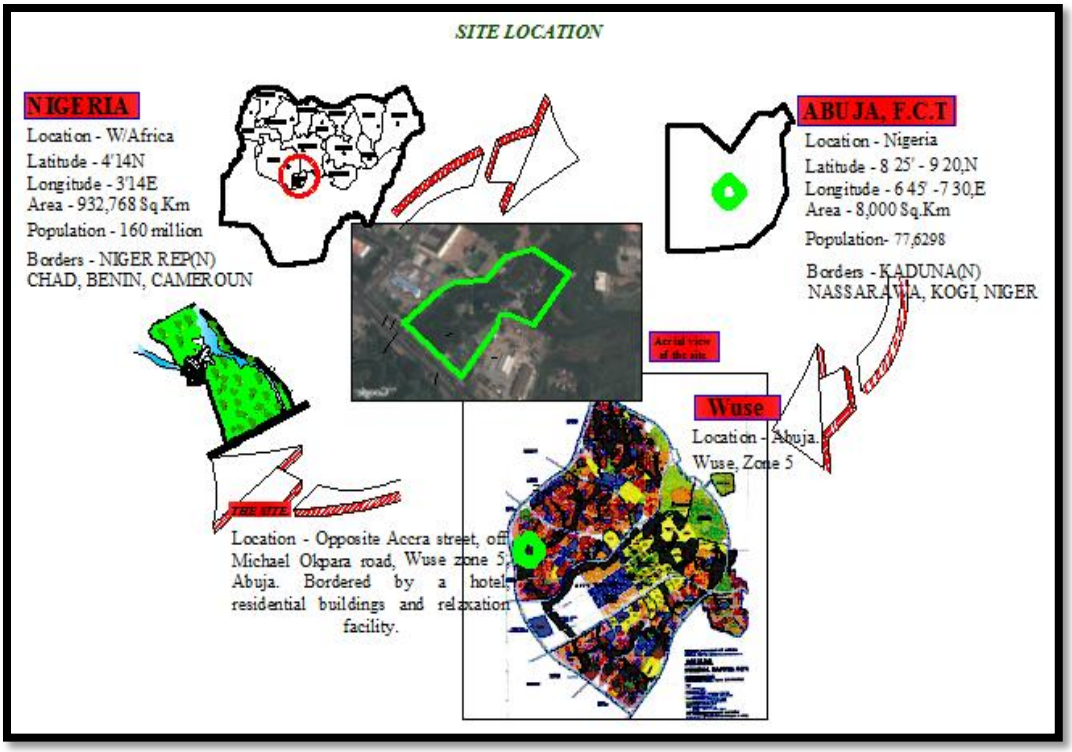


Figure 5.4: Site Location

(Source: Author's Sketch, 2014)

The proposed site 1 (See fig. 5.3) was chosen and considered more suitable for the centre for arts and creativity because the site chosen (see figure 5.4 above) is a land with prospects of future expansion it is also accessible to public transit. The site is accessible by road through a major road Michael Okpara road which route that branches off the Nnamdi Azikiwe express road. The site is about 41 km (40 minute drive) from the Nnamdi Azikiwe International airport.The proximity of the site to public transport facilities will enable accessibility by all people including those from the neighbouring states and countries as well.

The site has a total area of 386110.32m^2 with a perimeter of 2,872.14m which will be sufficient to design the centre and also allow enough room for future expansion. The

presence of scenic views also makes the site suitable as artist is able to have a connection to nature.

5.4. SITE ANALYSIS

The site was analysed based on climate, geology, vegetation climate, surface water, views and zonings which are all outlined below.

5.4.1 Physiography

The site slopes form the east to the west with a contour interval of 4.8m from one end to the other (see figure 5.5). The site is very rocky with fall which can make for good scenery and improve the microclimate of the site (see figure 5.5- 5.11 below).

5.4.2 Vegetation

The soil type is loamy with some swampy areas makes the site very viable for plant growth therefore sufficient landscaping will be incorporated into the design. Due to the presence of the water body, the vegetation can survive all year round. The vegetation is like that of a forest with very little or no sunlight reaching the ground. The vegetation will be utilised as much as possible.

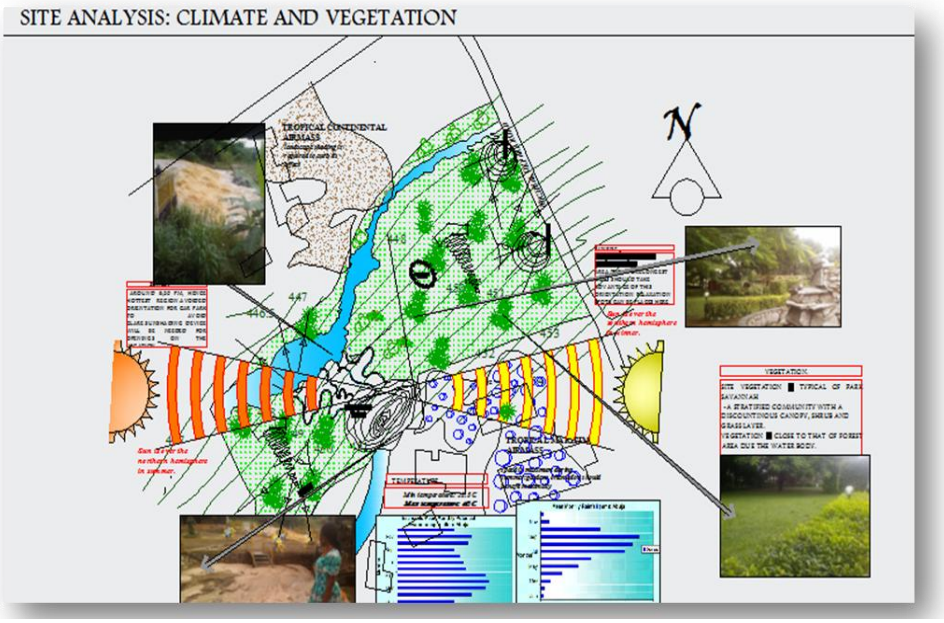


Figure 5.5. Site Analysis: Climate

(Source: author's sketch, 2014).

5.4.3 Geology

Site within the city are characterized with the following geological feature of igneous rock all around which are not expected to present any serious problem during construction. The rock can as well aid the sculptures who can directly harvest their raw material from the site.

5.4.4 Soil

The soil (loamy) is favourable for plant life as seen from the current vegetation in figure 5.5, therefore the site will be properly landscaped with suitable trees and hedges.

5.4.5 Surface water

A network of stream valleys and depressions are seen to cover the site when observed vertically. The site slopes and drains crescent of the proposed development area. Thus the

site can be divided into small continuous watersheds, all converging at one point but flowing out (see figure 5.5).

5.4.6 Climate

The climate of the FCT is typical of the guinea savannah. Abuja climate is characterized by two major seasons. Climatic parameters and planning implications are discussed below.

Temperature: the highest temperatures are recorded during the dry season. Diurnal temperature change of as much as 18° has been recorded. Lower temperatures abound during the rainy season, especially the month of august due to dense cloud cover.

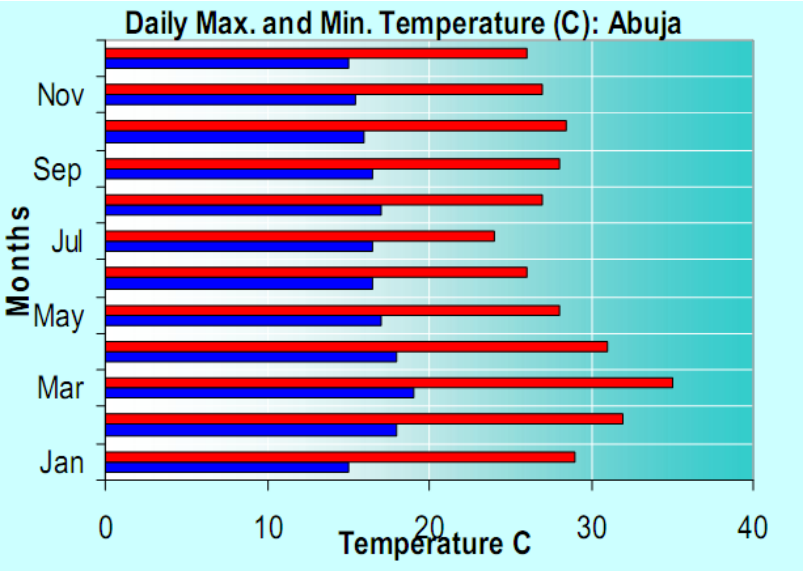


Fig. 5.6. Daily maximum and minimum temperature

(Source: http//: www.abujaclimate.com)

Humidity: High humidity levels are attained during the rainy season. Humidity values generally drops during the dry season, from November – march

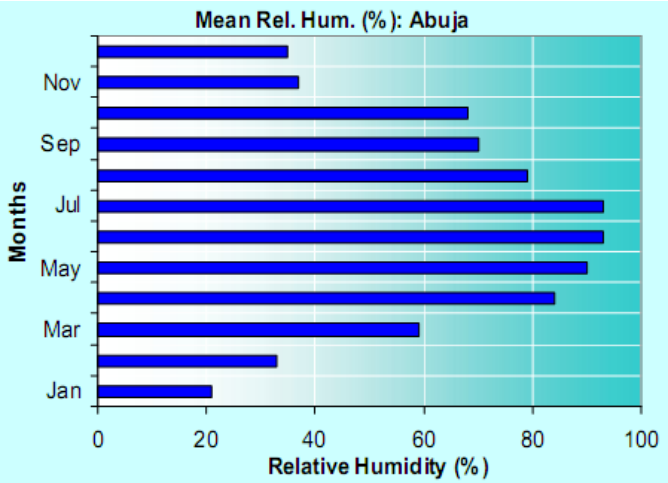


Fig. 5.7 Mean relative humidity

(Source: http//: www.abujaclimate.com)

Rainfall: Rainfall begins in April and rapidly tapers off after October. The mean monthly distribution shows a tendency for concentration in three to four months. These concentrations of rainfall show the need for drainage system that can handle large volumes of water quickly.

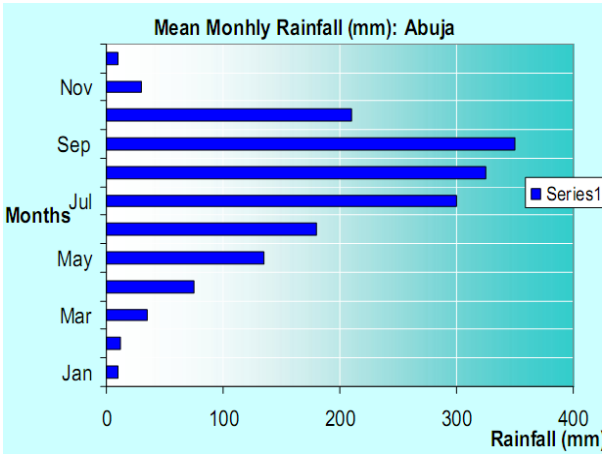


Fig. 5.8 Mean monthly rainfall

(Source: http//: www.abujaclimate.com)

Wind: The tropical maritime air mass and the tropical continental air masses dominate the climate of the F.C.T. The tropical maritime air mass is warm and moist, forming over the Atlantic Ocean moving inland, in a Southwest to Northeast direction. The tropical continental air mass is developed over the Sahara desert, therefore warm and dry and blows in the opposite direction northeast to southwest. Further information is seen in figure 5.10- 5.11.

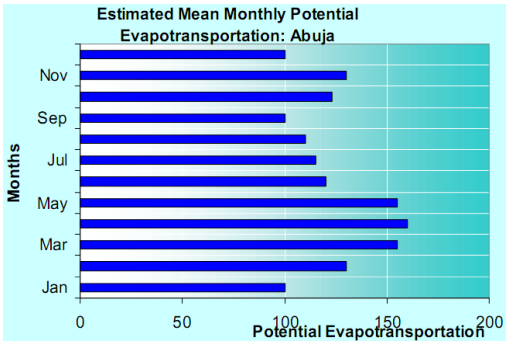


Fig. 5.9 Estimated mean monthly potential evapotransportation

(Source: http//: www.abujaclimate.com)

5.4.7 Views and Zoning

The site was zoned based on the existing features on it such as noise, traffic, accessibility and views so as to aid a suitable planning of the facilities to be present on the site. The best view of the site is the view of the water fall which is the north-east view (see figure 5.10) hence relaxation facilities, painting studio and spaces meant to aid inspiration faced this area also building had access to view this area through windows. The site has noise interference from the public road (as seen in figure 5.11 below) also consideration of the current road accessibility was used in the zoning the site into public area (the red portion), semi public area (the yellow portion) and private area (the brown shaded portion).

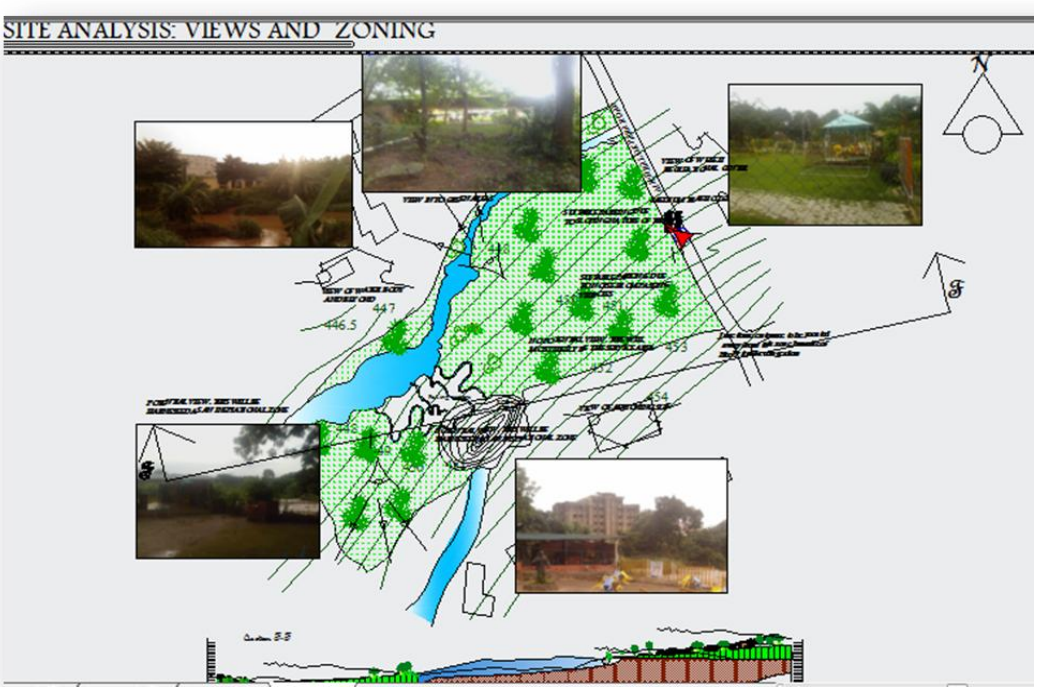


Figure 5.10. Site Analysis: Views and zoning

(Source: author's sketch, 2014).

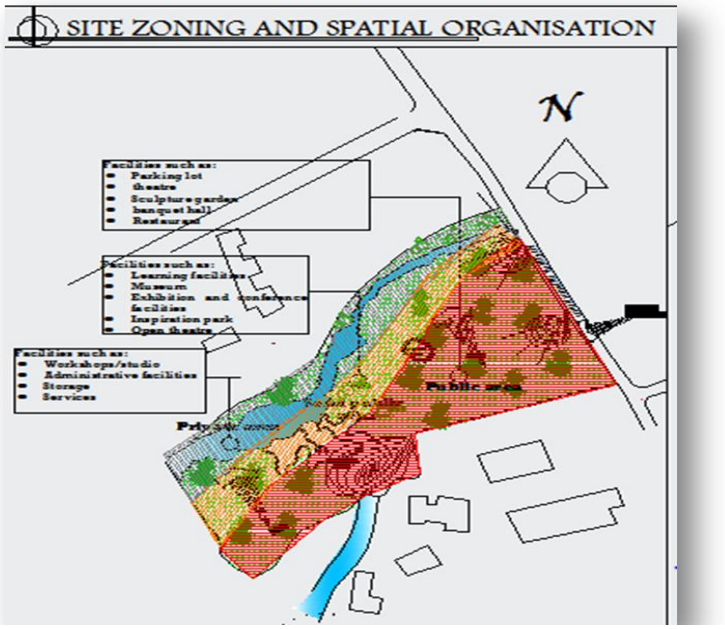


Figure 5.11. Site Analysis: Spatial Organisation

(Source: author's sketch, 2014).

5.5. DESIGN PROPOSAL

The centre for art and creativity is a day learning centre which house academic environment, a commercial facilities and exhibition facilities of various arts and crafts which will be done in it. It is an avenue for people of all ages to come and explore creativity of all sorts. The learning environment has a little bit of play to it which is a feature that enhances creativity as highlighted by Amabile (1998). The design takes advantage of the natural features present in it and utilises its benefit to a maximum level.

The learning facility which forms the most important part of the site was adequately designed so as to enhance the creativity and performance of its users. Exhibition facilities are incorporated into to serve as a show to visitors both local and international of the art and crafts of Nigeria. More so commercial facilities for both local and modern crafts were provided to develop revenue for the country through the sale of this art works.

5.6. DESIGN PARAMETERS AND CONSIDERATIONS

A centre for art and creativity can be considered generally as a civic centre with functions such as theatre, art centres, multipurpose building and much more (see figure 5.12) Auditoriums have moved away from decorative structures (as was in the Victorian period) to ones that accommodate a whole range of functions, therefore the trend has moved to multipurpose, flexible and functional structures which can adapt. Also flexible seating is an integral part, storage facilities with variable stages, mobile ceilings for adaptation of audience capacity which is the aim of the application of flexible and

adaptable measures in the design. However, acoustic dynamics is a consideration too in theatres (Quentin, 2003).

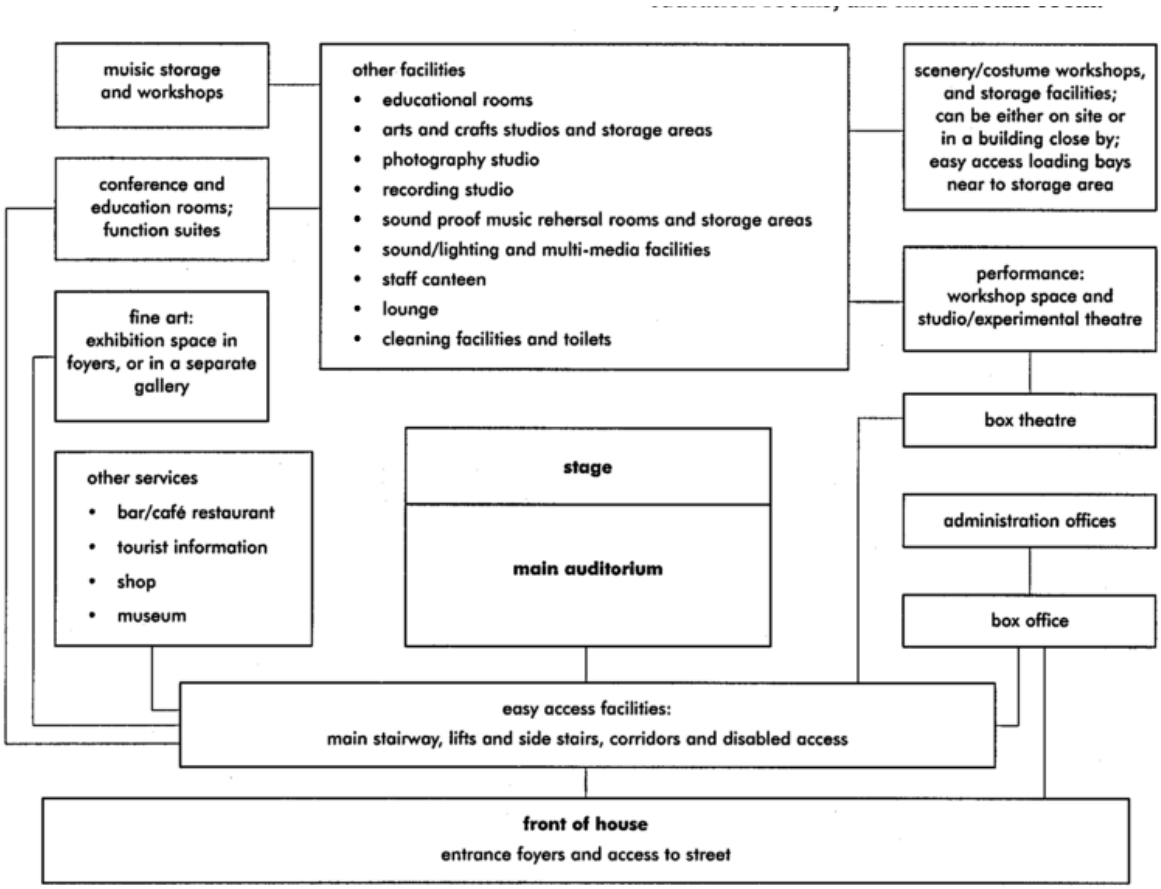


Figure 5.12. Functional spaces required in a centre for Art

(Source: Quentin, 2003).

5.6.1. Administrative facilities: Reception**,** Entrance hall, foyers, box office, cloak room, toilets, shops, exhibition space, restaurant, information centre, administrative offices and many more are required to be within accessible areas.

5.6.2. Exhibition spaces, Theatres and Auditorium: These are majorly large spaces or hall serving various functions and so the interior space are specially designed to accommodate its functions.

5.6.2.1. ***Theatres;*** Theatres could be Convex, irregular surfaces aid sound diffusion. Domes, vaults and other large concave shape could cause acoustic problems. Slight angle from balconies should not be more than 30 degrees. Seating row layers can be; straight, straight with curved ends, curved, angled and straight rows in blocks at different angles

Types of stage

The stage/ backstage comprises of main stage, wings, back stage, dressing rooms, scenery shop, wardrobe/ costume shop, education rooms an kitchen/ staff room.

Proscenium Stage: Traditional used because it is both versatile and flexible, there is usually a separation of the audience from the performance area as seen in the figure below. For drama the size is between 8 to 10m, 12 to 20m for multipurpose venues.

Thrust stages: This is an extension from the proscenium stage but it brings in the performance into the audience. There is a variety of shapes and sizes:

i. oval or quarter circle
ii. square or rectangle
iii. long and thin with seats on both sides

Open stage or arena: Is a Roman style. An open performance area usually at floor level or raised, surrounded by the audience. Stage shapes and sizes include:

i. part, half or fully open

ii. round or oval

iii. square, rectangular or polygonal

There is a more intimate relationship here. A show exhibited here is fashion parades and catwalks.

Stage is usually raised about 1100mm above the level of the auditorium. Stage is better finished with non reflective, non slippery material and one which is durable, such as hardboard or removable panels. Stage could possess modular structures (Quentin, 2003).

5.6.2.2 ***Auditorium*:** comprises of main seating area, Box/studio theatre (optional) (Quentin, 2003).

5.6.2.3 ***Museum:*** The purpose of a museum is collect, document, preserve, study, display and interpret to both residents and visitors of the cultural heritage and to boost visual, performing and literary arts of today with exhibitions of works (Lord et al, 2012). A museum will be designed to provide multiple experiences, such as aesthetic and emotional delight, celebration and learning, recreation and sociability by using the appropriate vocabulary such that the building itself becomes a piece of art. Museums Association (UK) in 1984 defined a museum is an institution which collects, documents, preserves, exhibits and interprets material evidence and associated information for the public benefit (Littlefield, 2008). The major spaces required in a museum is shown in the figure 5.13 below.

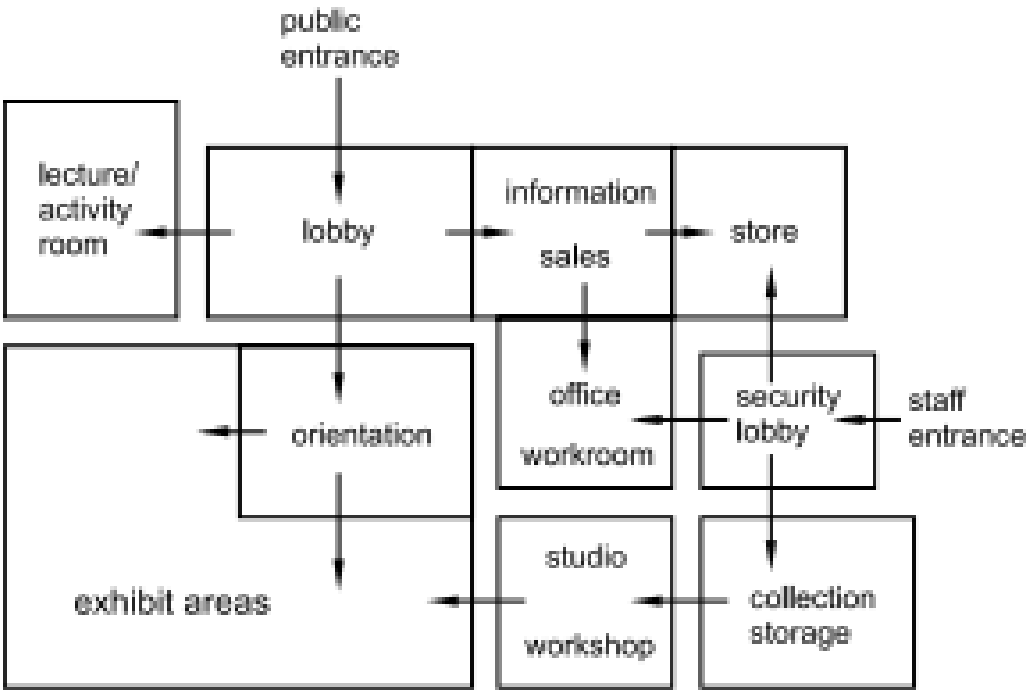


Figure 5.13. Functional Flow for a Museum

(Source: Littlefield, 2008).

5.6.3. Learning and educational facilities

Some studies carried out have found that the learning environment tends to have a great effect on the users performance as well as on their reactions to the experience, teacher, material presented, and institution as a whole (Bonnick, 2014). Some spaces in this category includes: Lectures room, Dance rooms, Data room/ ICT room, Arts and crafts room and Workshops.

5.6.4. Auxiliary facilities

5.6.4.1 ***Restaurant*****:** Restaurants and other facilities providing food and drink for consumption on the premises is labour intensive services which usually operate in a

highly competitive environment (Littlefield, 2008). The functions (see figure 5.14) in a restaurant can be divided into the following below;

I. Delivery and checking of food supplies, beverages and other items.

II. Storage: separate for vegetables/fruit, dry goods, chilled and frozen foods.

III. Preparation: using fresh ingredients, partially or fully prepared foods.

IV. Cooking: with large-scale centrally grouped or back-bare equipment.

V. Assembly of meals to order, ready for service or refrigeration freezing.

VI. Dishwashing

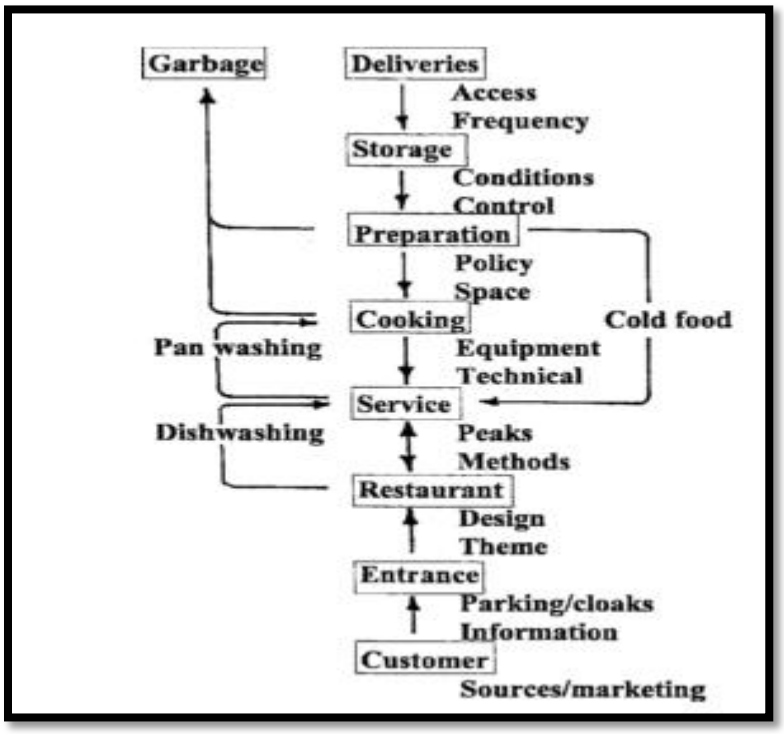


Figure 5.14. A Functional Flow of the Activities in a Restaurant

(Source: Littlefield, 2008).

The restaurant type considered in the thesis is that of a cafeteria to comfortable take 100-200 seats, where 1.4–1.5 m^2 per seat. The arrangement in figure 5.15 below is known to maximise space.

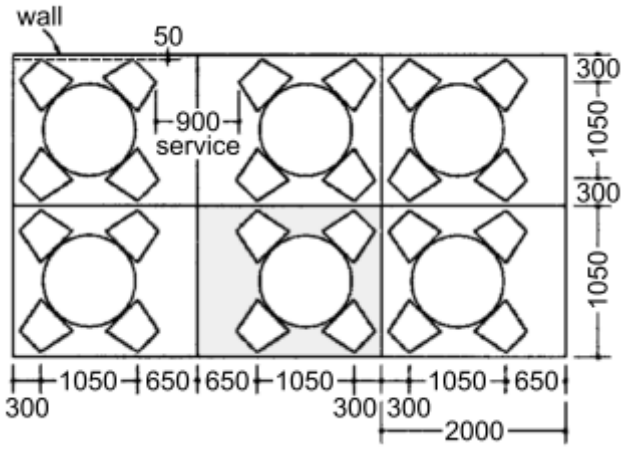


Figure 5.15. Restaurant seating arrangement to minimise space

(Source: Littlefield, 2008).

5.6.4.2 ***Shopping facility*****:** A shopping centre of the arts and crafts works that will be made or brought in for lovers of art to come and purchase.

5.6.4.3 ***Recreational spaces*****:** This will serve as a play environment for relaxation and revitalization of all age grade, Such as playground for children, sporting facilities and game facilities for others, scenery sites can as well be the recreational facility. The recreational facility can serve as (creative) reflective thinking space which according to Amabile (1998) and Groves (2013) considers as important creative spaces.

5.6.4.4 ***Health facility*****:** Such as sick bays and dispensaries.

5.7. OTHER CONSIDERATIONS

5.7.1 Acoustics and zoning: The transport of sound through the structure especially within the screening room, multi-purpose hall, sound stage and studio should be

controlled. Functional zones should be provided with surface or sub-surface materials that dampen impact sound. The use of isolating cavities to interrupt the structural transmission of sound should also be incorporated. Noise levels should be controlled within zones by appropriate choices of material finishes on floors, walls and ceilings, and the shaping of interior spaces to prevent flutter and unwanted amplifying effects (see figure). Acoustic ceiling panel and walls are to be cavity panels to absorb sound and not reflect them. Wooden panels on walls, interior shapes of the particular spaces should also strive to achieve a balanced acoustic property (see figure 5.16) (Littlefield, 2008).

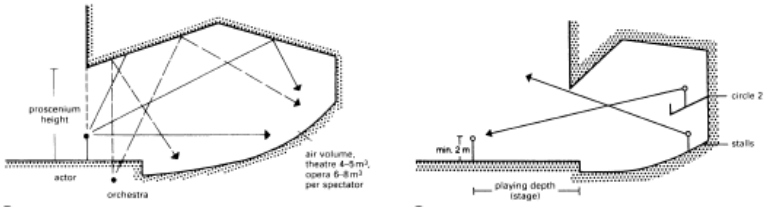


Figure 5.16. Ceiling Shape and Sound Reflection

(Source: Littlefield, 2008).

Consideration should be given as to whether the floors of these spaces should be flexible to account for acoustic variability. Also acoustics upholsteries are to be used to satisfy the acoustic requirements. Usually the level of absorbency when the space is unoccupied is low so upholstery materials curb this trend.

5.7.2 Design Criteria for learning Facilities in Abuja

Planning for entertainment usually involves principles such as;

i. Restricted access to certain activities and facilities.

ii. Facilities should be adaptable to future requirements

iii. Facilities should make the most efficient use of land, be designed to provide for the convenience, health, safety, and pleasure of the intended users, and represent positive examples of design, energy conservation, and a concern for people.

iv. Some functional space requirements according to the manual are listed below in table 5.2.

Table 5.2. Space requirements in educational facilities for adults

S/N	SPACE	BASIC AREA	WINDOW	MIN DIM	DOOR	HEAD ROOM
1	Lecture Hall	85 m^2/person	40%	-	1.5	3.5
2	Laboratory	36 m^2	30%	-	1.2	3.0
3	Library	1.2m^2/person	40%	-	1.2	3.0
4	Cafeteria	85 m^2/person	30%	-	1.2	3.0
5	Admin. Block	-	10%	-	-	-
6	Multi-purpose Hall	65 m^2/person	30%	-	1.2	3.5
7	Hostels	3.1m^2/per bs	40%	-	.9	3.0
8	Sick Bay	3.1m^2/per bs	30%	-	.9	3.0
9	Toilet	1:15/1.35 m^2	10%	-	.75	3.0

(Source : Abuja Development Control Manual , 2007).

The Abuja Development Control Manual (2007) has some stated design criteria for research facilities, recreational facilities and parks as shown below:

i. One parking space per 75m^2 floor area

ii. Formal parking should accommodate not less than 50 cars (if the capacity of the facility warrants) and not more than 1,200 cars in one area.

iii. Parking should be provided for persons with disability. This should be 3.6m wide x 4.8m long.

iv. Considerable proportion (at least 60%) of the existing or planted ground cover grass and trees should be preserved as much as practicable.

v. Energy conservation shall be given due consideration in the design, construction, operation and maintenance of the park facilities.

vi. Buffer shall be provided so that noise levels do not exceed 68dB.

vii. Need to enhance scenic beauty and take advantage of eco tourism features such as rock outcrops and water body on site.

viii. Aquatic bodies should have boat launch ramps and adequate parking area.

5.8. SITE CONCEPT

The planning concept has been derived by considering the various activities that will take place in such a place. The efficiency of the design is not only the measure of functionality of individual spaces, but how individual functions relate properly with each other and flows into one another. A centre is collaboration of several units working together. The concept tries to incorporate the culture and a traditional art and craft village (see figure 5.17-5.18).

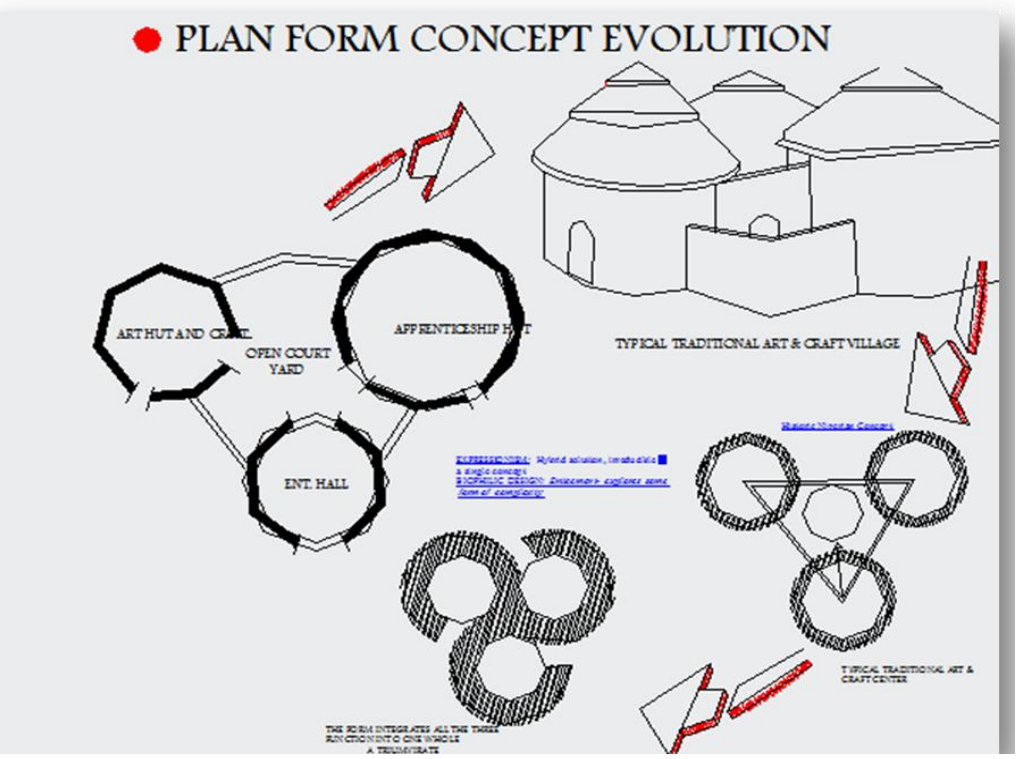


Figure 5.17. Plan Form Concept
(Source: Author's sketch, 2014).

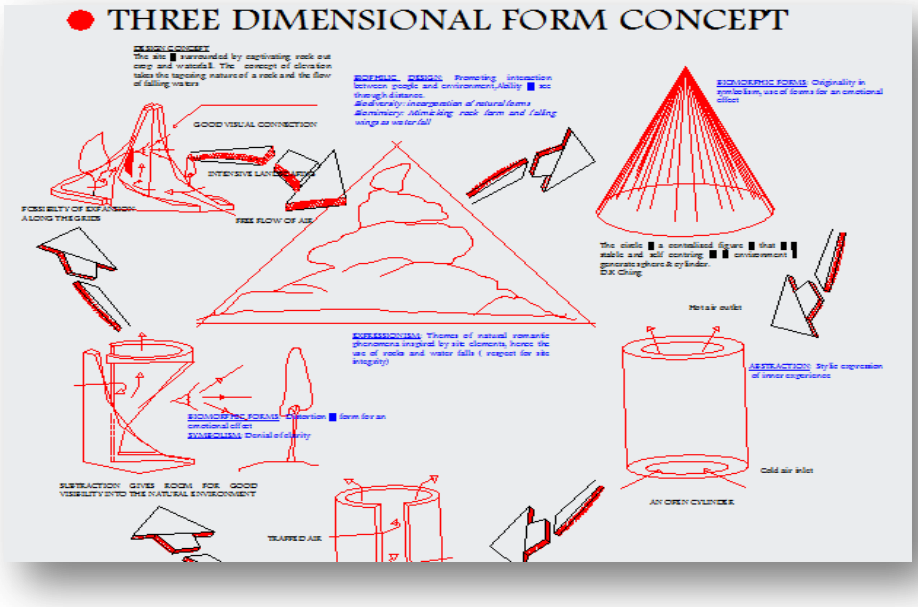


Figure 5.18. Elevation Form Concept
(Source: Author's sketch, 2014).

5.9. DESIGN OVERVIEW

The centre for art and creativity was designed for the purpose of learning application and exhibiting of visual and performing arts.

5.9.1 Site Plan

The sis located at Wuse zone 5 and was found to be suitable for the design of a centre for art and creativity. It is endowed with a good soil which can make vegetation viable, also the presence of a water body and rock outcrop gives the site a natural bioclimatic environment. The spaces were designed so as to aid mobility and health based on the zoning as seen in the figure 5.19 below. The site comprises of public facilities, semi public and private facilities (as seen in the figure 5.19) hence the public facilities gives the majority access to the learning, commercial and relaxation facilities but shields the practical facilities from the public.

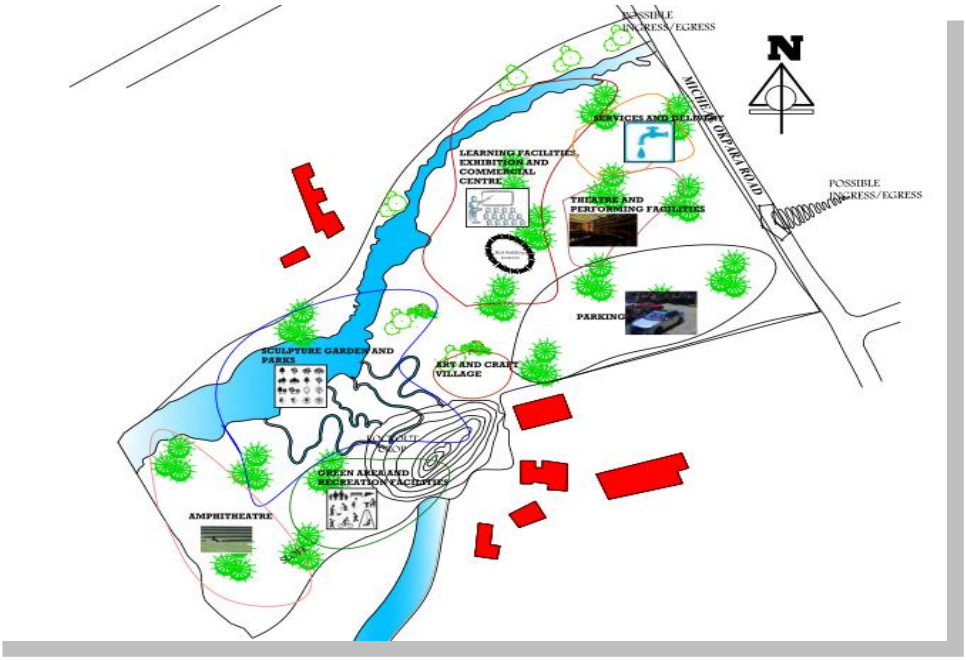


Figure 5.19. Site Zoning Of Functional Spaces

(Source: Author's sketch, 2014).

The site possessed the following functional spaces namely: The main building, a twin theatre, an amphitheatre, a floating restaurant, an art and craft village and other recreation facilities such as a sculpture garden, an inspiration park and a play ground (see figure 5.20).



Figure 5.20. Site Plan Of The Proposed Centre For Art And Creativity, Abuja.

(Source: Author's sketch, 2014).

5.9.2 Art and Creativity Centre

Plan: The building consists of eleven floors which strink at intervals- giving it a flexible pattern for future expansion. The centre as seen in the figure 5.21 below was designed with the features that enhance creativity of the users. The presence of various well

landscaped open spaces and atriums serves as collaborative space as well as to improve creative and critical thinking. The use of a structural grid was to aid flexibility and adaptability. Natural landscape serves as a means of improving indoor air quality as well as ventilation, however the use of excessive windows is to make the building energy efficient during the day as well as improve natural lighting. The windows are shaded with photo voltaic panels in order to improve the thermal comfort of the building.

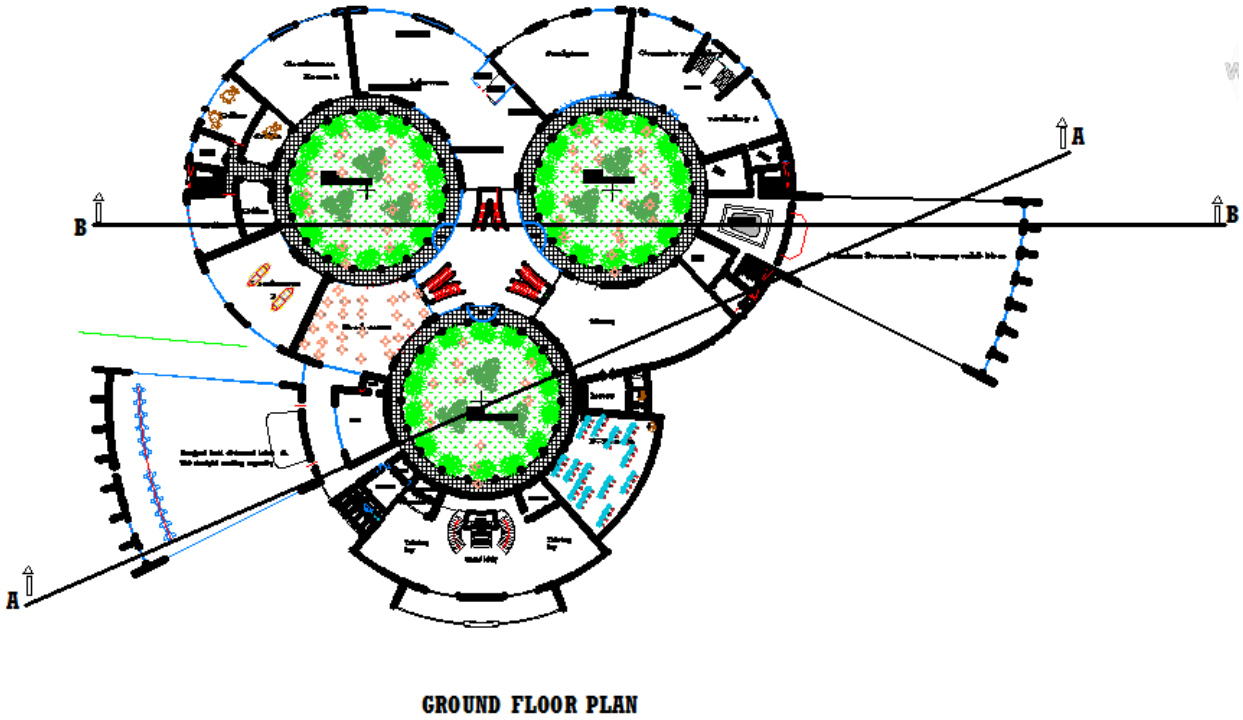


Figure 5.21. Ground Floor Plan Of The Proposed Centre For Art.

(Source: Author's sketch, 2014).

The elevation: The concept of the elevation came as a result of the natural feature of rock outcrops present on site. Biophilic architecture which is an architecture that enhances wellbeing connotes mimicry of the natural features with enticement of the natural feature as seen in the elevation below. The building elevation form (as seen in figure 5.22-5.24)

concept gave an advantage of uninterrupted views of the scenic features on site and easy access to passive ventilation and passive lighting.

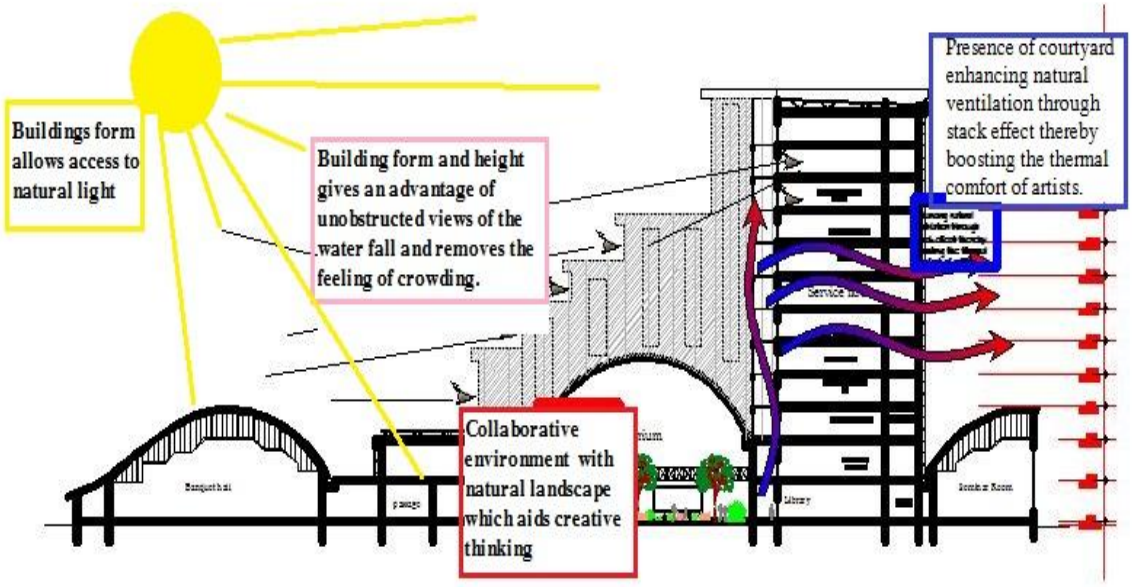


Figure 5.22. Section of proposed centre for art.

(Source: Author's sketch, 2014).

Use of bright calming colours was not left out since research has shown that bright calming tends to improve an active positive mind. Colours such as white, yellow, green and much more are used on bright finishes(see figure 5.24). The use of several floors is to take away the feeling of crowding as well as improve the visual corridor of the building that is exposing the scenic views of the site (see figure 5.23).



Figure 5.23. Elevation Proposed Centre for Art.

(Source: Author's sketch, 2014).



Figure 5.24. Three Dimensional View of Centre for Art.

(Source: Author's sketch, 2014).

5.9.3 Performance theatre.

The performance theatre (see 5.25) comprises of two major theatres one of which is multipurpose and the other which is specifically for performance which requires sound. The theatre complex has various facilities for performance arts such as the rehearsal rooms for music and dance and changing facilities for programs of a larger audience. The grid structural system used is so as to enable the principle of flexibility to easily be implemented. The extensive use of glass enables the users to have access to scenic view of the environment.

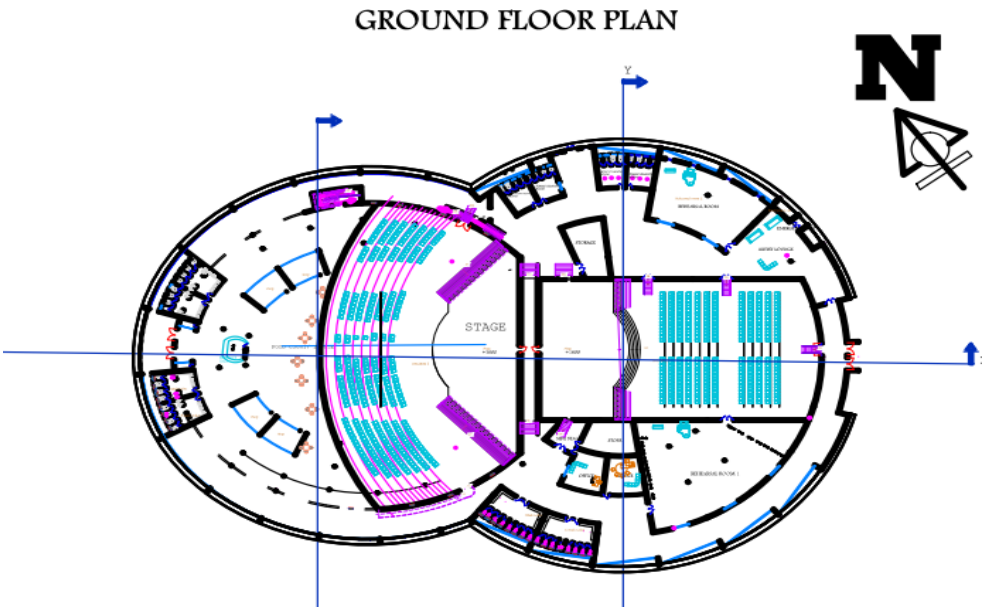


Figure 5.25. Ground Floor Plan of the Proposed Performance Theatre.

(Source: Author's sketch, 2014).

The roofing style however allows for natural daylight into the interior spaces so as to increase the energy efficiency of the building. The building envelope and shedding device serves as a means of improving the thermal comfort of the interior space as seen in figure 5.26-5.27 below.

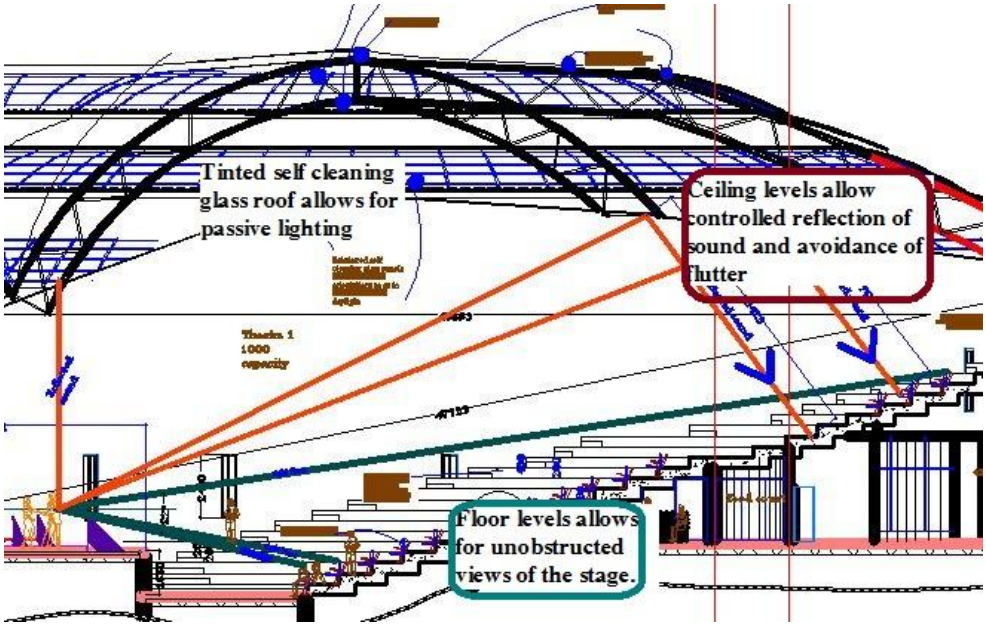
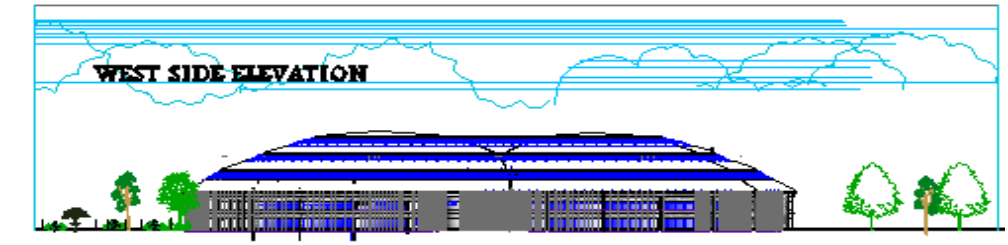


Figure 5.26. Section of the Proposed Performance Theatre.

(Source: Author's sketch, 2014)



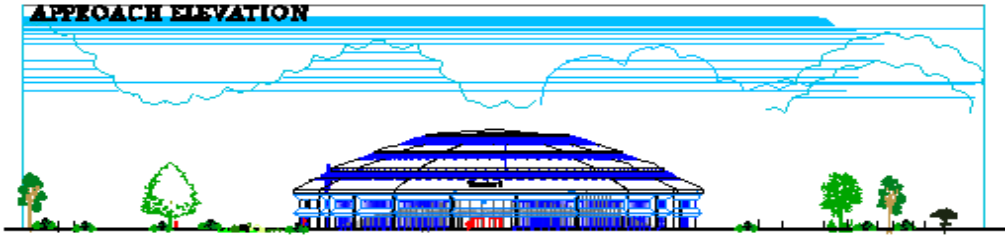


Figure 5.27. Elevation of the proposed performance theatre.

(Source: Author's sketch, 2014)

The theatre has two floors, ground and first and with a high ceiling height to allow for a uniform reverberation. Acoustic considerations such as ceiling high and acoustic materials was considered.

5.9.4 Amphitheatre

From cases observed, Nigerians delight in informal gatherings where folk tales and told and some engage in dance and some cultural sports therefore the need for an open theatre (see figure 5.27) is integral. It is built with sustainable materials so as to aid better wellbeing. The use of natural terrain in the open theatre gives the feeling of relaxed environment and enhances the outdoor climate of the theatre.

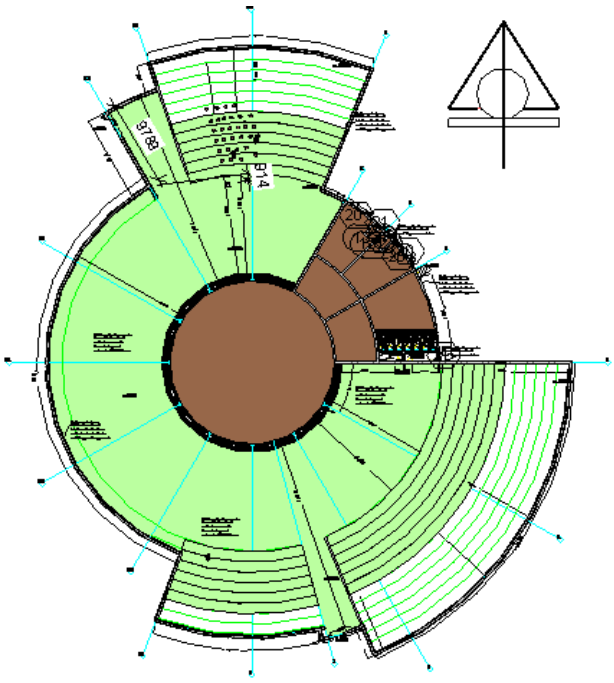


Figure 5.28. Floor Plan of Amphitheatre

(Source: Author's sketch, 2014)

Other facilities include a floating restaurant, Art and crafts village (see appendix) which are designed with purely contemporary sustainable materials with the Nigerian architecture design considerations put in place.

5.10. BUILDING MATERIALS AND TECHNOLOGY

Concrete: The use of concrete in some parts of the site is due to the low maintenance which it requires overtime, its durability cannot be over emphasised. The fluid nature of the concrete also makes it a good construction material.

Steel: Excessive use of steel (see detail in figure 5.27) is due to the advantage of it being demountable depending on the nature of joint, which is mostly screwed. Composite steel structural members are also used so as to cover long spans.

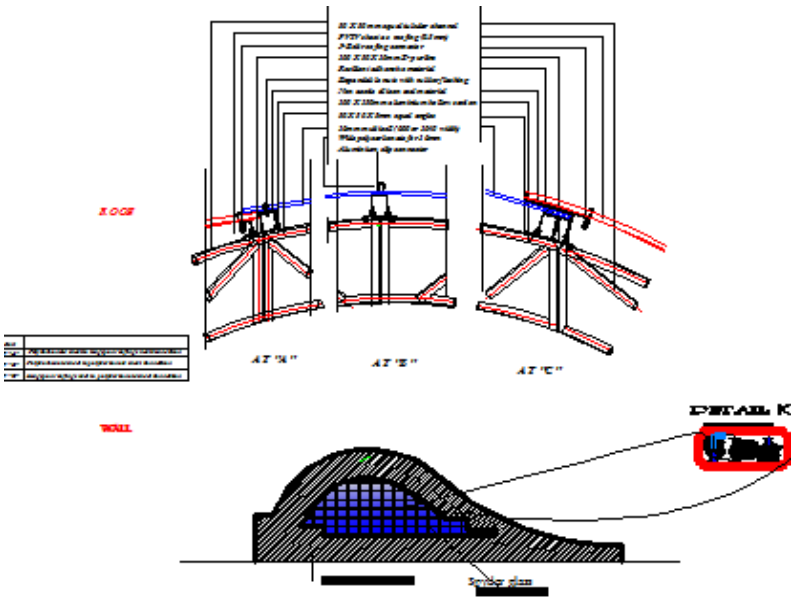


Figure 5.29. Detail of Steel Element and Polycarbonate Sheet Used In Centre.

(Source: Author's sketch, 2014).

Glass: Self cleaning glass to enhance natural day lighting and passive ventilation. Curtain wall is also used in the centre to aid visibility of shop owner's wares. Polytetrafluoroethylene (PTFE) also called coated fibreglass, with high strength and long service life is used as roof covering and some other major places.

Hylite: is a laminate of aluminium and polyprop. It is light and easy to process, used as a cladding material for the centre of art. Aluminium in thin layers however is quite vulnerable

Photo voltaic Panels: used as a shedding device of the so as to increase the energy efficiency of the buildings. The transparent one which was used in the centre for art, has a "three-in-one" functionality: it is able to act a solar panel, glazed window and video display screen.

As an external glazing, PV-TV allows up to **10%** visible light to be transmitted through the panel. This level of light transmission is optimal It can provide thermal insulation and replace eaves, windows, and/or curtain walls.

As a solar photovoltaic (PV) panel, PV-TV can generate 3.8 watts of electricity per square foot, an above-average level of efficiency.

Indigenous building material: The use of local building material in order to show case the African cultural identity was through use of treated thatch roof, bamboo floors and brick blocks in the art and craft village which comprise of modular units bricks walls in open theatre.

5.11. SERVICES

Drainage: The site slopes into the river body, therefore, embarkment will be built around the water body so as to be able to successfully receive the volume of water that will be flowing. The extensive use of soft landscape element grass will serve as a purifying agent.

Source of power: The use of photo voltaic panels in some building will serve as an alternative power source to Power Holding Company Nigeria (PHCN). Also energy efficiency was considered by improving the microclimate of the spaces through use of courtyards, Atriums, water fountains, and enveloping materials.

Fire service consideration: The water body can serve as an easy means of supplying the hydrants with water. Escape doors were put in strategic parts of the theatre an centre to be able to direct the public to a converging point in the case of emergency

5.12. FACILITIES SCHEDULE OF ACCOMADATION.

Table 5.3. Schedule of Accommodation

FUNCTION SPACES	REQUIRED NUMBER OF UNITS	ADAPTED GROSS AREA($M^{2)}$	TOTAL AREA ($M^{2)}$
Exhibition halls	6	288	1728
Museum	1	720	720
Theatre	2	240	480
Banquet Hall	1	1000	1000

Conference rooms	4		
Atm gallery	1	21	21
Restaurant	1	2500	2500
Workshop	7	576	4032
Shop units	30	9	270
Library/I.C.T Facility	1	1000	1000
Lecture rooms	6	36	216
Concourse	4	36	144

Source : authors's work, 2014).

CHAPTER SEVEN

CONCLUSION

6.0 INTRODUCTION

This chapter sought to conclude the entire body of this research by containing a summary of the entire write up, contribution to knowledge and lastly recommendations to necessary persons and authorities.

6.1 SUMMARY

This research sought to study architecture features that enhance creativity in a centre for arts. Creativity characterised by open minded, organic and non linear and can largely influence the usage of such a space efficiently. When a space encourages collaboration, this could stimulate the user's creative thinking. Artists are faced with challenges such as "block" and poor working environment, this could be largely attributed to the environment they are in because the building does not effectively communicate the function for which it was designed therefore the building will be underutilised. The research aimed at evaluating how architecture features can be a viable tool to enhance creativity in a centre for art and creativity.

Literature revealed that creativity has three major components which are: knowledge, creative thinking and motivation. Motivating factors includes nature (green landscape and water), social setting (festivals and group discussions) and lastly is activity and movement(like exercise which causes an active brain). Creative spaces (where one could reflect, play, stimulate and Collaborate) according to Groves (2013) are very vital to

establishments that intends to get the best output from the workers or artists. Amabile (1998) highlighted that the following features of architecture could enhance creativity: Thermal comfort, noise insulation, Indoor air quality, flexibility and adaptability, less crowding, use of calm colours, sensory variability, adequate lighting and natural features. However these features are better put into play when the entire building process puts this principle in perspective right from the preliminary stage to the design stage. It wasn't enough however to just study literature and proceed to design the centre for art and creativity as was established, thus live case studies were also under taken to determine what existed in order to be further informed on what needed to be done or provided for the purpose of designing a Centre for art and creativity. The results of these case studies played very vital roles in the over-all end product (centre for art and creativity). The results was insightful to the what was excepted of the proposed design of a centre of art, it revealed that one cases amongst the four scored (see table 4.5-4.8) a higher percentage of the assessment of features that enhance creativity because the facility had higher thermal comfort level due to use of natural landscape and windows, also use of beautiful composition of calming colours as well as wall motifs high sensory change and variation (see figure 4.13) high indoor air quality and most importantly flexibility and adaptability. Furthermore the lowest case assessment very low noise control methods application due to the absence of buffer zone, the building was not flexible due to the fact it was an adopted military era building. Therefore these considerations guided in the design of a centre for art and creativity whose organisational concept emanated from the activity usually carried out in centre for art and the form concept from the biophilic nature of the

site chosen. The suitable site chosen was in conformed to be right with Abuja land use map as spaces for recreational, civic and community centre.

The centre for art is highly equipped with state of the art facilities which adequately applied the architecture features that will grossly aid creativity in Nigeria.

6.2 CONTRIBUTION TO KNOWLEDGE

i. Features of architecture which enhance creativity when applied to centres for art, civic buildings can greatly improve the performance level of artist through the flowing means: Thermal comfort (use of windows, use of passive and active means of cooling and heating, use of well landscaped courtyards or green gardened atriums in the indoor space), noise insulation (use of buffer zones and acoustic wall and ceiling treatment), Indoor air quality, flexibility and adaptability (movability (collapsible connections of elements) , versatility, Convertibility (use of an open plan in centres), Adjustability (use of mobile furniture system), Refitability (demountable panels)) less crowding was achieved through wide lobbies and big entrance halls with high ceiling heights, use of calm colours (such as red, orange e.t.c which have significant meanings to creativity), sensory variability, adequate lighting natural features and ergonomics. All this features put together had the ability to increase the creativeness of the users of the proposed centre for art and creativity this would therefore entailed a good design.

ii. Existing centre of art and performance studied were seen to mostly lack in the aspect of flexibility of work space hence this affected the usage of the facility which in such cases were seen to be grossly inadequate and causing discomfort to

most users especially those of the applied forms of art and creativity. Therefore the extent to which feature that enhance creativity was applied is fair because the average of the four cases put together is 64.37%.

iii. From literature biophilic architecture was discovered to stimulate better wellbeing. Biophilic features attributed to stimulated wellbeing as seen in the existing centres studied where natural environment was incorporated into the design and it scored higher percent of factors which enhances creativity. Therefore the centre for art took advantage of this by using a site which encourages plant life and it was well landscaped both naturally and through artificial means. Also the design tried to celebrate the biophilic nature of the site by making the buildings blend into the rocky nature of the site.

6.3 RECOMMENDATIONS

A building has the capacity to enhance the user's productivity (Amabile, 2003) if some of the following features are included:

i. Architects and Interior Designers are required to always incorporate Features of flexibility and adaptability grants the users of those space especially public spaces the ability redesign spaces to suit their needs and thereby increasing the life span and longevity of the building.

ii. Architects, Landscape architects as well as planners are advised to always have facilities to design features such as vegetation, landscaping, weather soft or hard improve the well being of the inhabitants of such an environment, therefore should be part of any centre which intends to enhance the creativity of the users.

iii. The bodies which regulate building standards and planning should always ensure that centres for art are adopted building as much as possible but one where the initial conception was meant for such function. It is, however, mandatory to recognize the basic overall concept from the onset in order to accommodate user needs adequately.

iv. Employers, Heads of academic and creativity required industries must always consider collaborative environments as a vital issue to have better output from their subjects as it which tends to augment the creativity and productivity of its users. Some of such includes lounges, atriums, outdoor spaces, recreation facilities and many more.

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APPENDICES

APPENDIX 1

Variables used for analysis of case studies.

Principle	Requirement	Level of Reflectance				Remark
		Absent	Low	Medium	High	
Thermal comfort	Presence of HVAC system					
	Natural cooling facilities					
Access to Nature, Views and Daylight	Presence of atrium/courtyard					
	Operable windows					
	Scenic views					
	Natural recreation gardens					
Sensory Change and Variability	Presence of natural ventilation					
	Use of natural lighting					
	A stimulating work environment					
	Variability					
Colour	Use of bright colours					
	calming colours					
Noise control	Absence of sources of noise					
	Noise absorption materials					
Absence of Crowding						
Human Factors and Ergonomics	Adjustable furniture					
	mobility design					
Indoor air quality	Absence of air pollution					
	Natural ventilation properties					
Technology of Flexibility and adaptability	Durability					
	Design for disassembly/Movability					
	Convertibility					

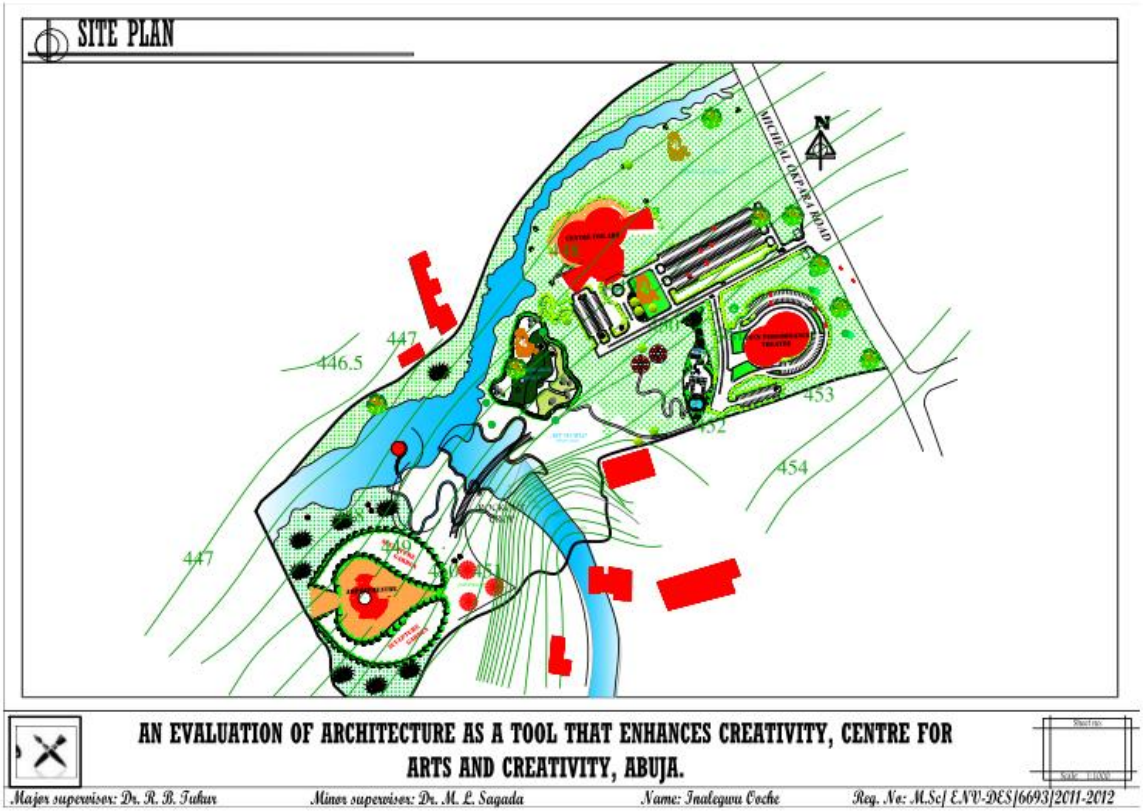
	Adjustability					
	Scalability					
	Refitability					
	Versatility					

(Source: Field work, 2014)

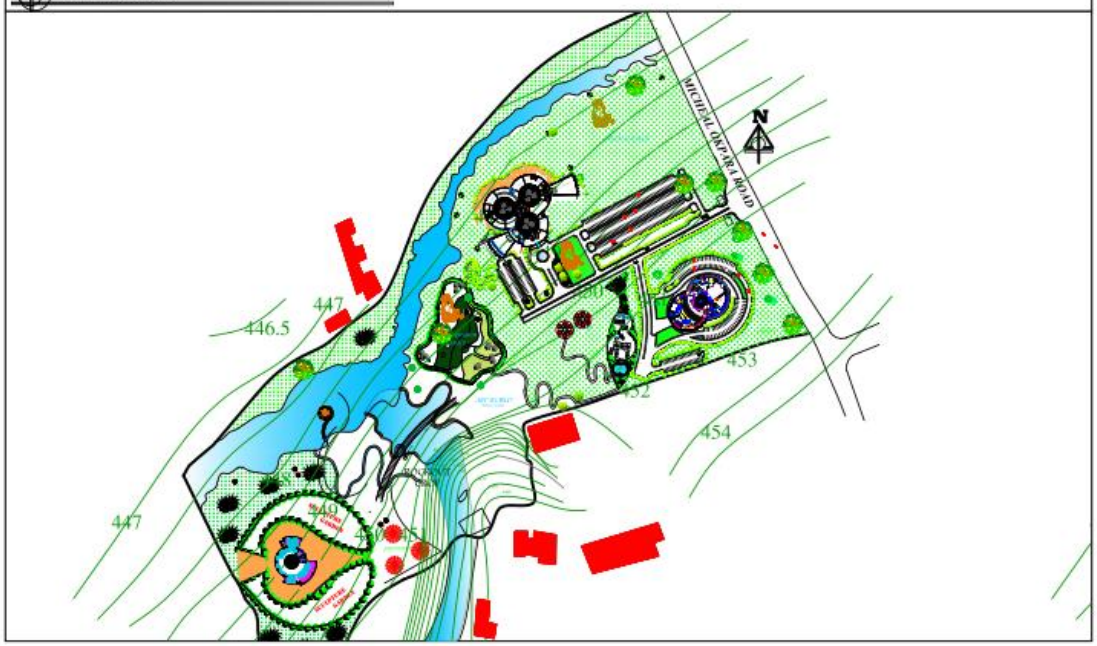
APPENDIX 2

INTERVIEW QUESTIONS

1. Was the building built purposely to serve this function?
2. How often do people use this facility?
3. When are the booming periods when you record more usage of the facility?
4. What are the various types of art taught or practised here? Which aspect of Art do you have more patronage?
5. Do you consider this structure as one which has helped to boost the intellect of the people who use it and why in terms of the following;
    I. Motivation
    II. Creative thinking
    III. Knowledge
6. What are some of the challenges you face in running this facility?


SITE PLAN
MICHEAL OKPARA ROAD
N
447
446.5
453
452
454
447
440
AN EVALUATION OF ARCHITECTURE AS A TOOL THAT ENHANCES CREATIVITY, CENTRE FOR ARTS AND CREATIVITY, ABUJA.
Major supervisor: Dr. R. B. Tukur
Minor supervisor: Dr. M. L. Sagada
Name: Inalegwu Coche
Reg. No: M.Sc/ ENV-DES/6693/2011-2012

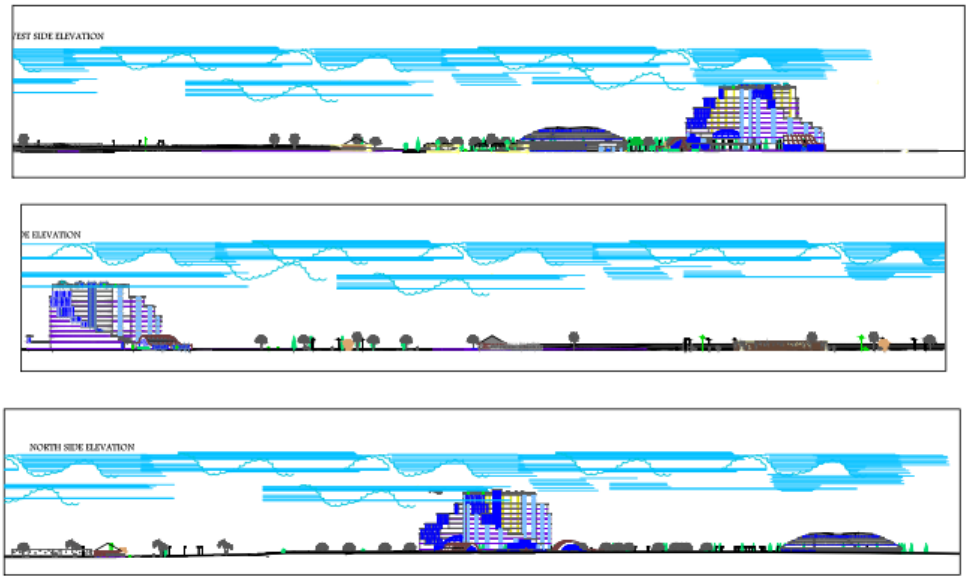
SITE LAYOUT



AN EVALUATION OF ARCHITECTURE AS A TOOL THAT ENHANCES CREATIVITY, CENTRE FOR ARTS AND CREATIVITY, ABUJA.

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SITE ELEVATION

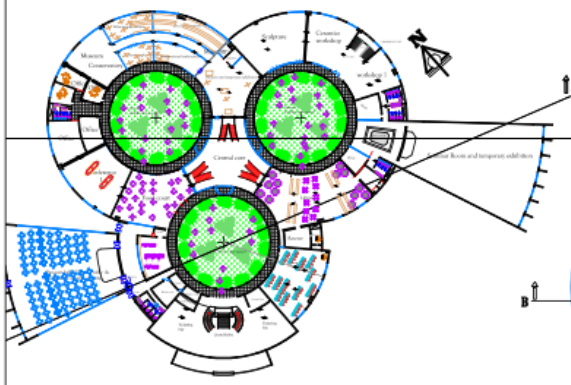


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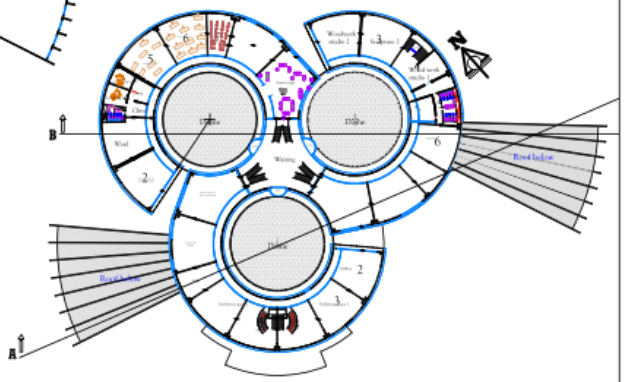
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CENTRE FOR ART

GROUND FLOOR



FIRST FLOOR

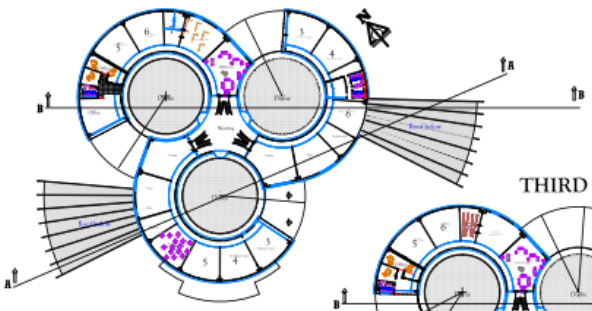


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CENTRE FOR ARTS AND CREATIVITY, ABUJA.

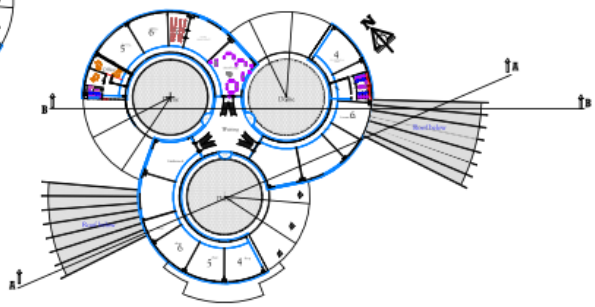
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CENTRE FOR ART

SECOND FLOOR



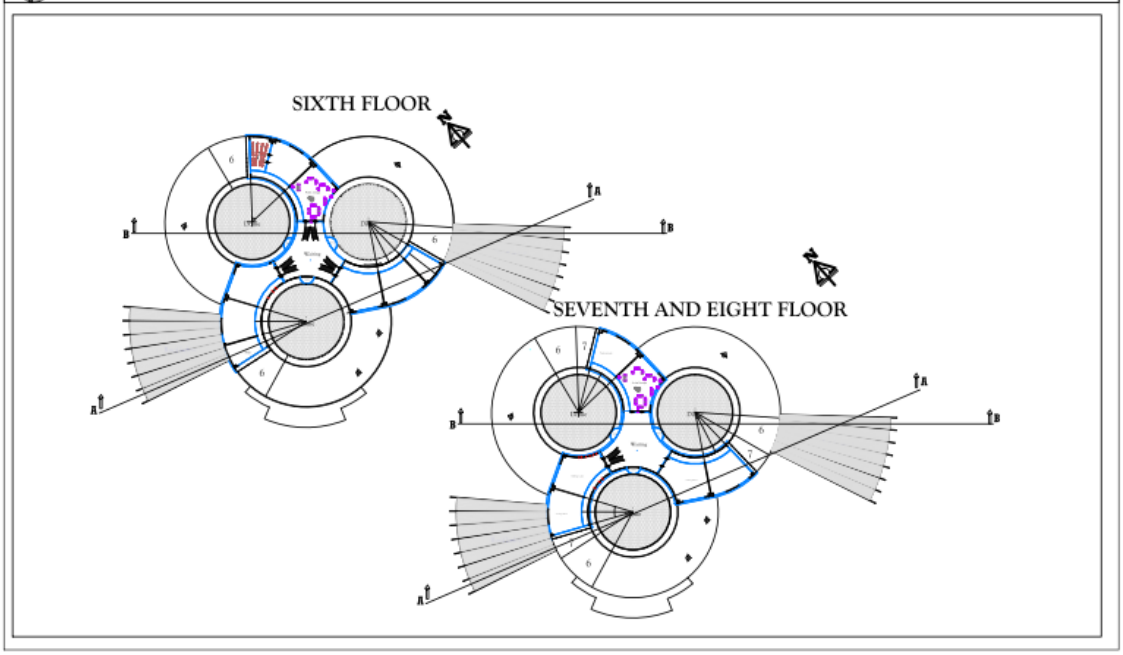
THIRD FLOOR



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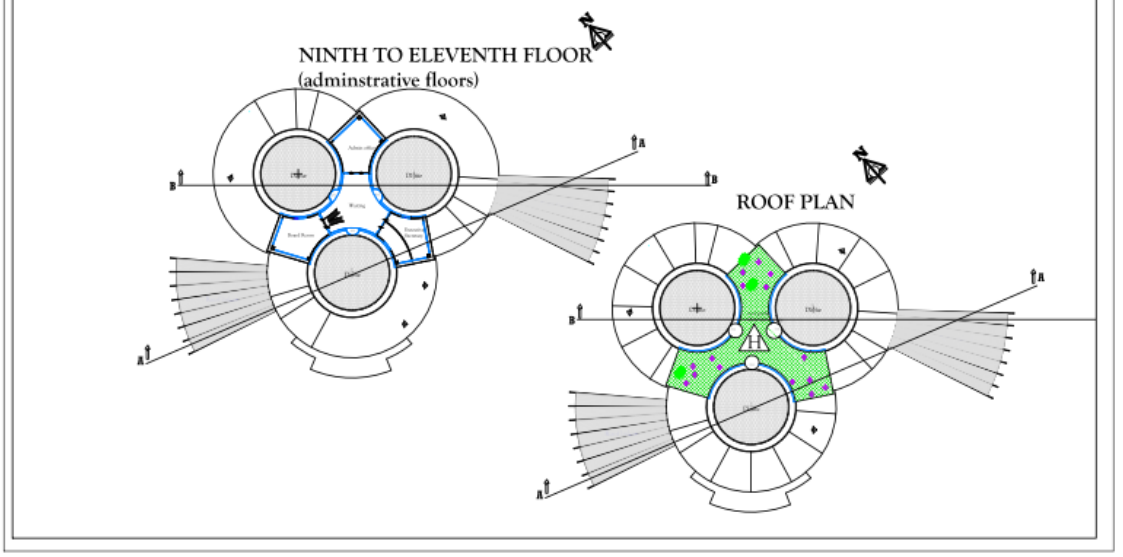
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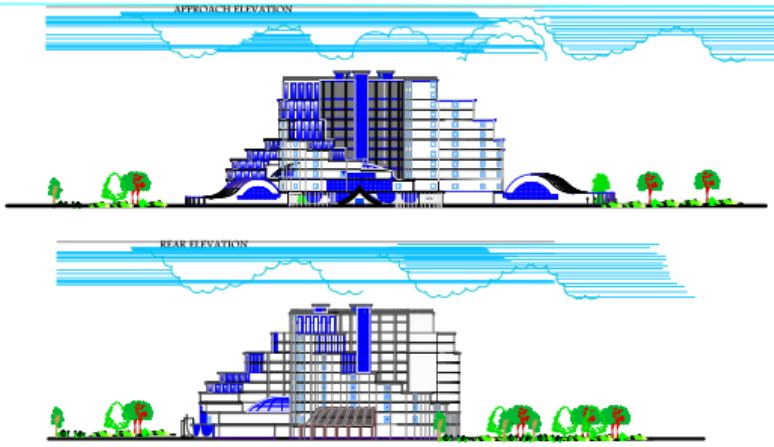
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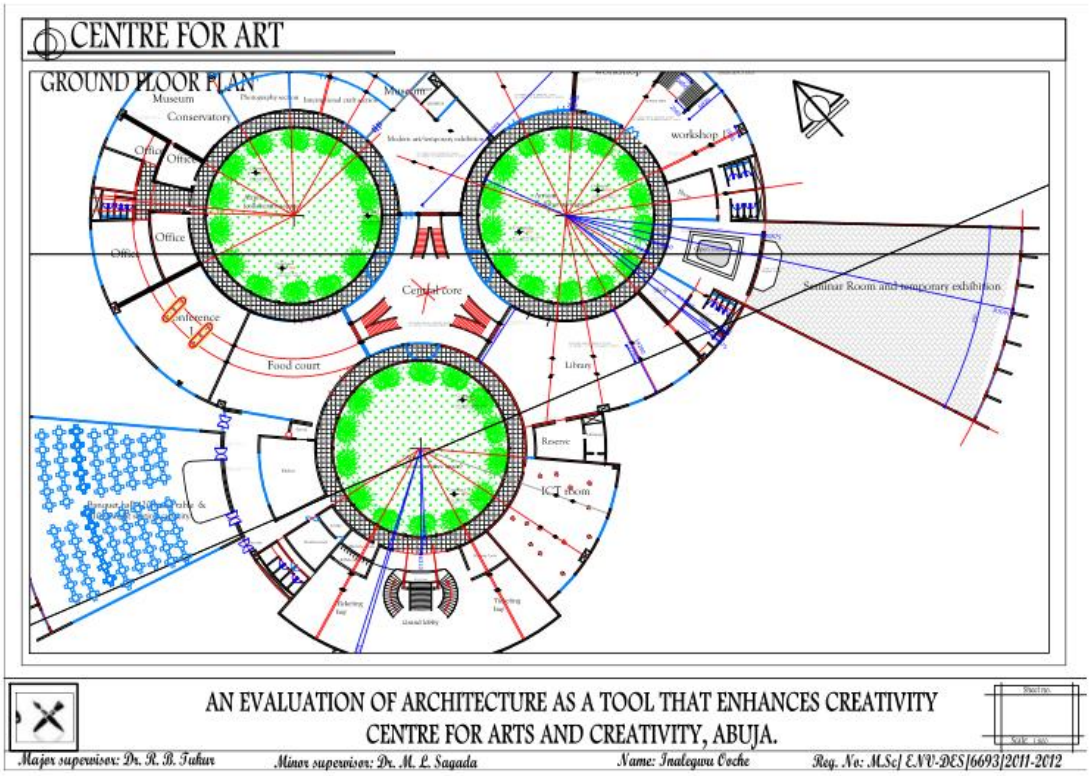
CENTRE FOR ART

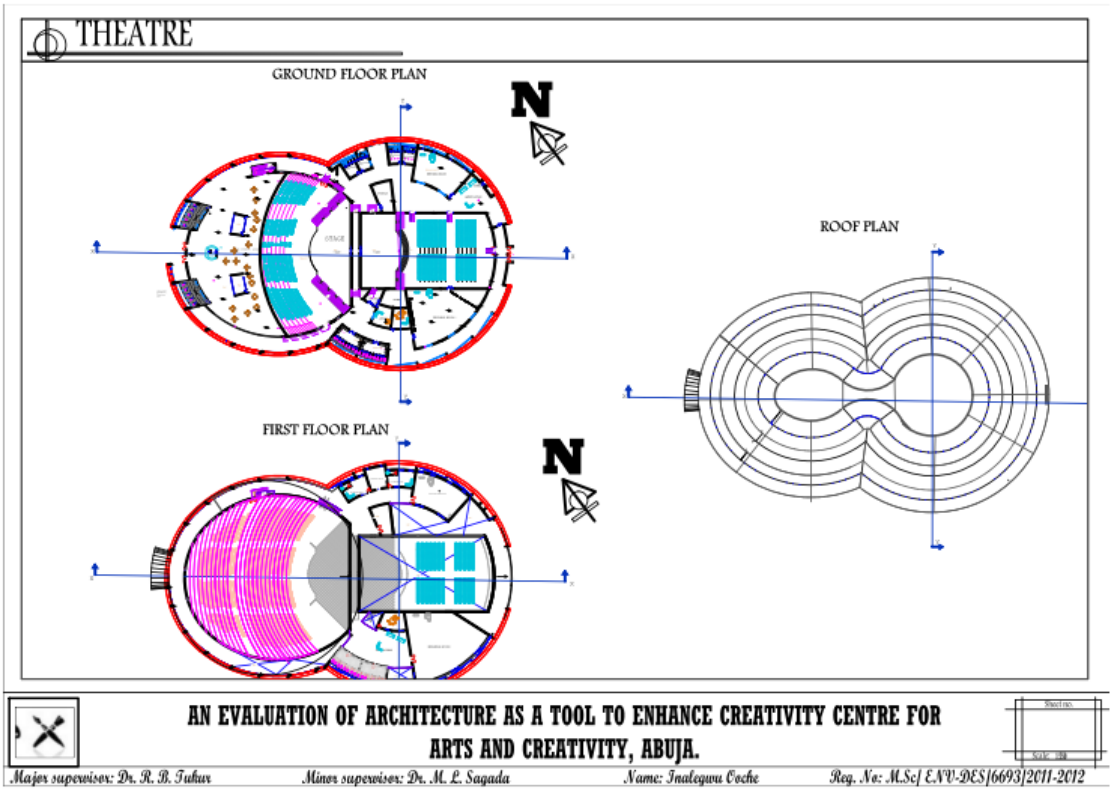
CUT OUT PORTIONS



AN EVALUATION OF ARCHITECTURE AS A TOOL THAT ENHANCES CREATIVITY
CENTRE FOR ARTS AND CREATIVITY, ABUJA.

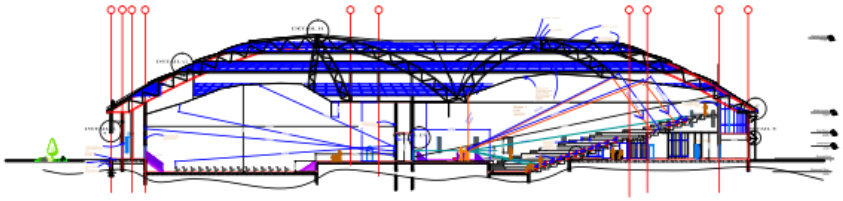
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CENTRE FOR ART
GROUND FLOOR PLAN
Museum
Conservatory
Office
Office
Office
Office
Office
Central Core
Conference
Food court
workshop
Seminar Room and temporary exhibition
Libran
Reserve
ICT room
AN EVALUATION OF ARCHITECTURE AS A TOOL THAT ENHANCES CREATIVITY
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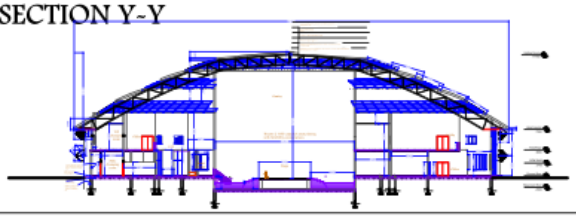

THEATRE
GROUND FLOOR PLAN
N
ROOF PLAN
FIRST FLOOR PLAN
N
AN EVALUATION OF ARCHITECTURE AS A TOOL TO ENHANCE CREATIVITY CENTRE FOR
ARTS AND CREATIVITY, ABUJA.
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THEATRE

SECTION X-X



SECTION Y-Y

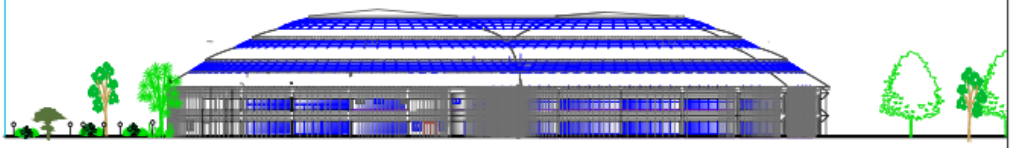


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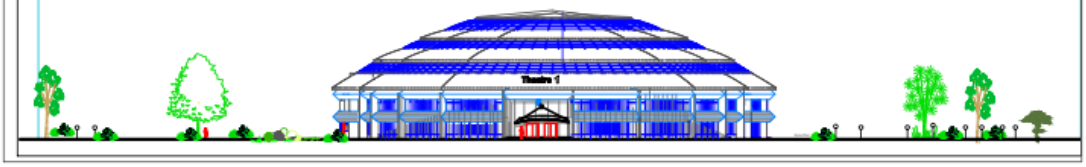
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THEATRE

RIGHT SIDE ELEVATION

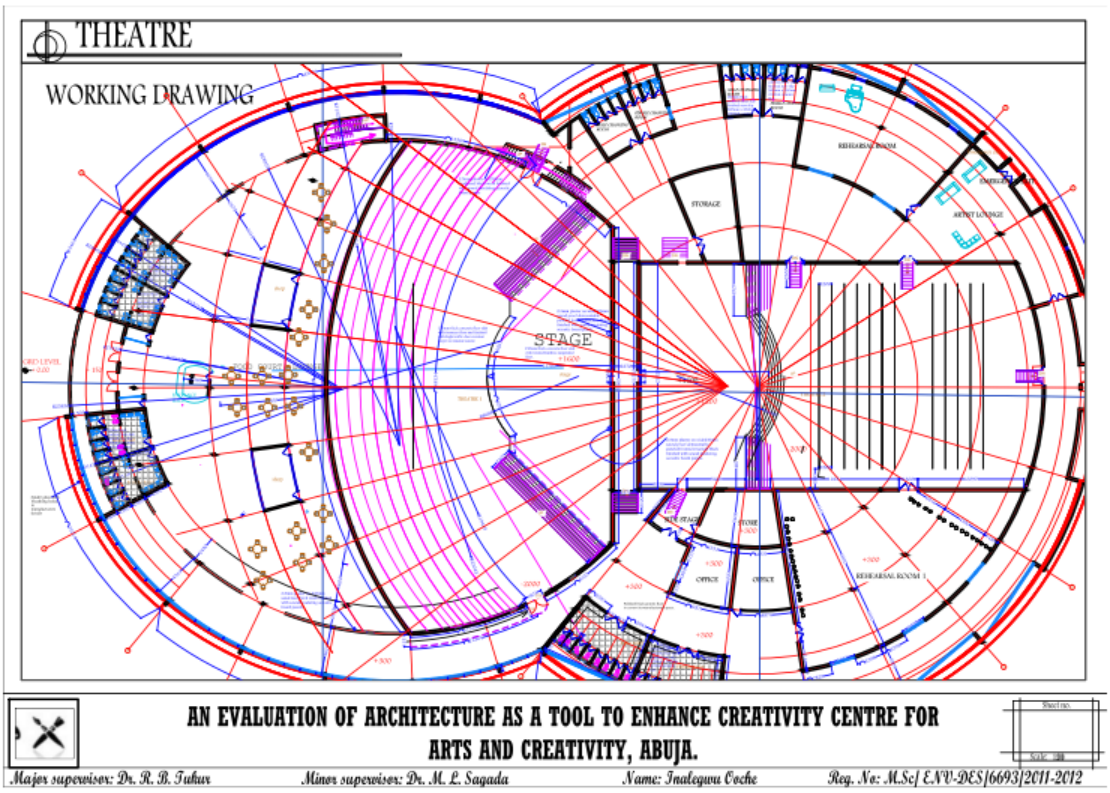


APPROACH ELEVATION



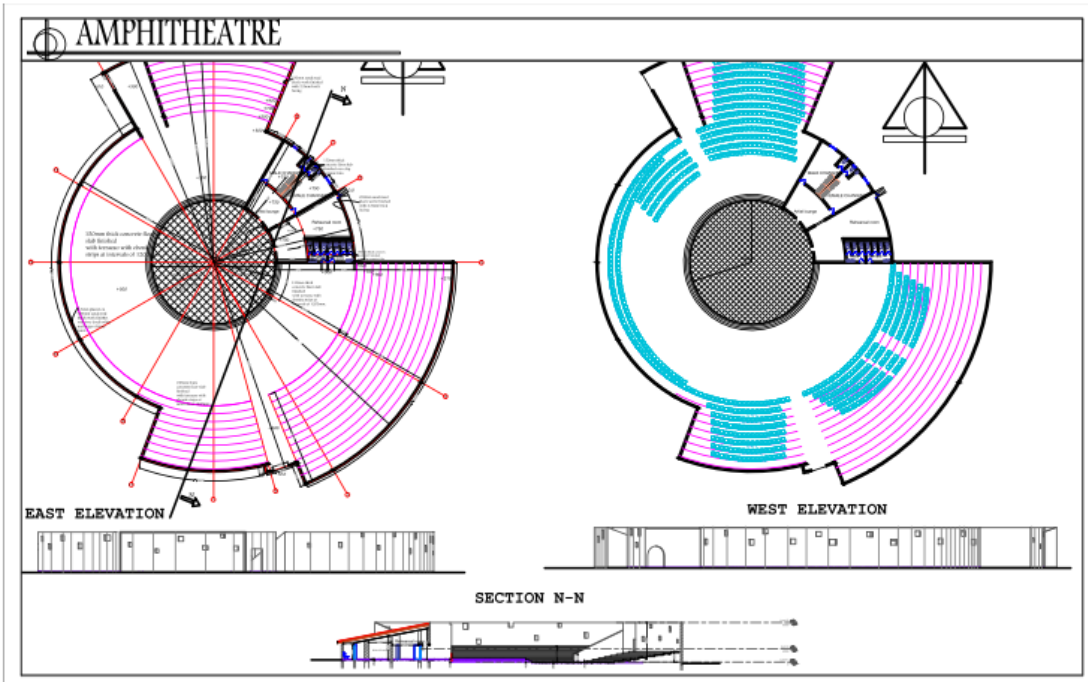
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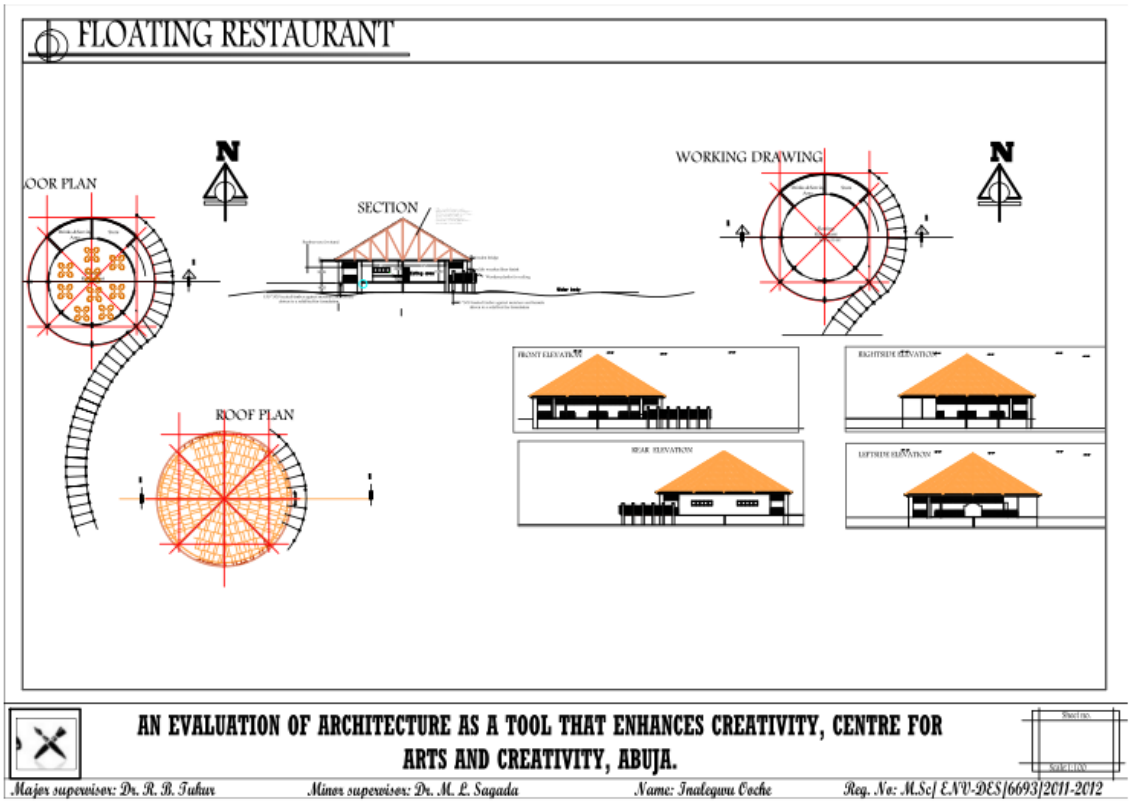
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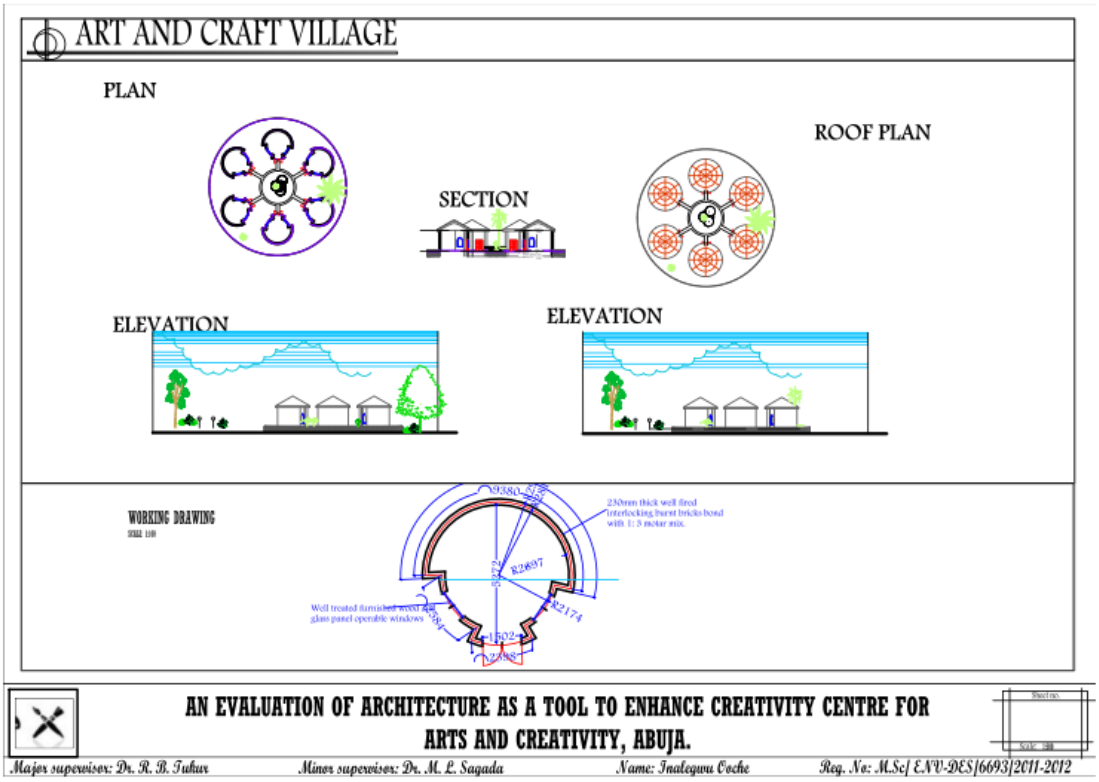
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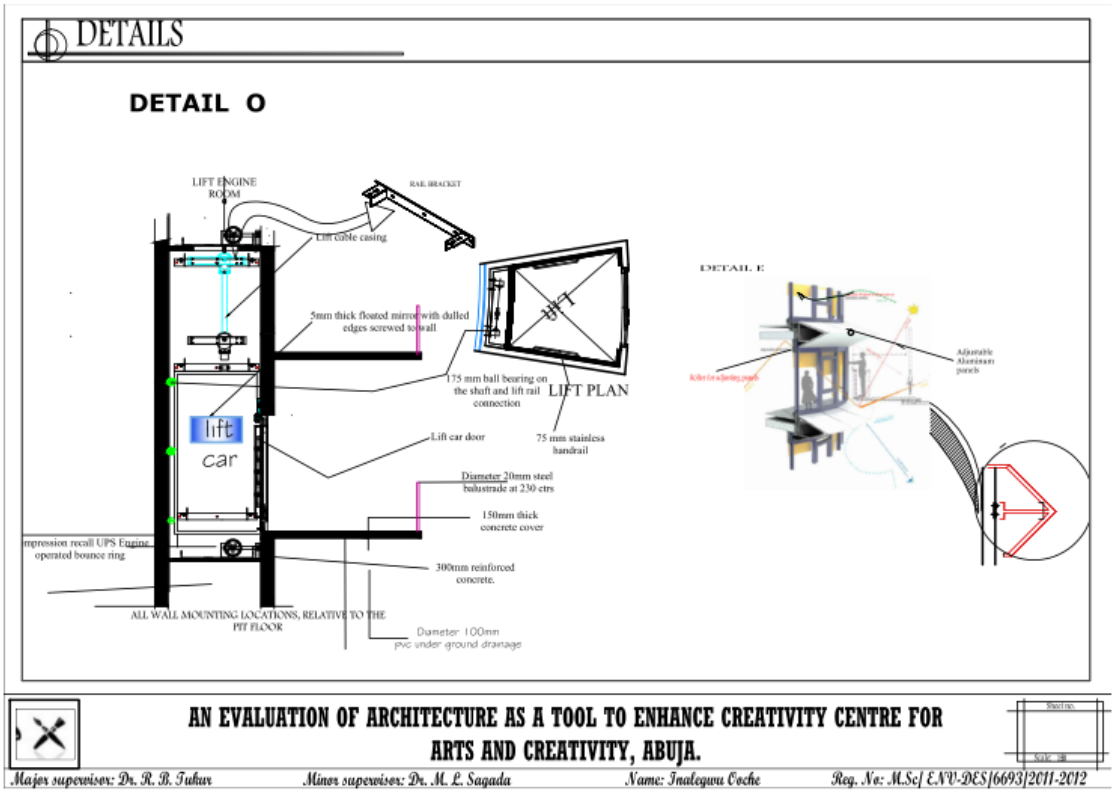


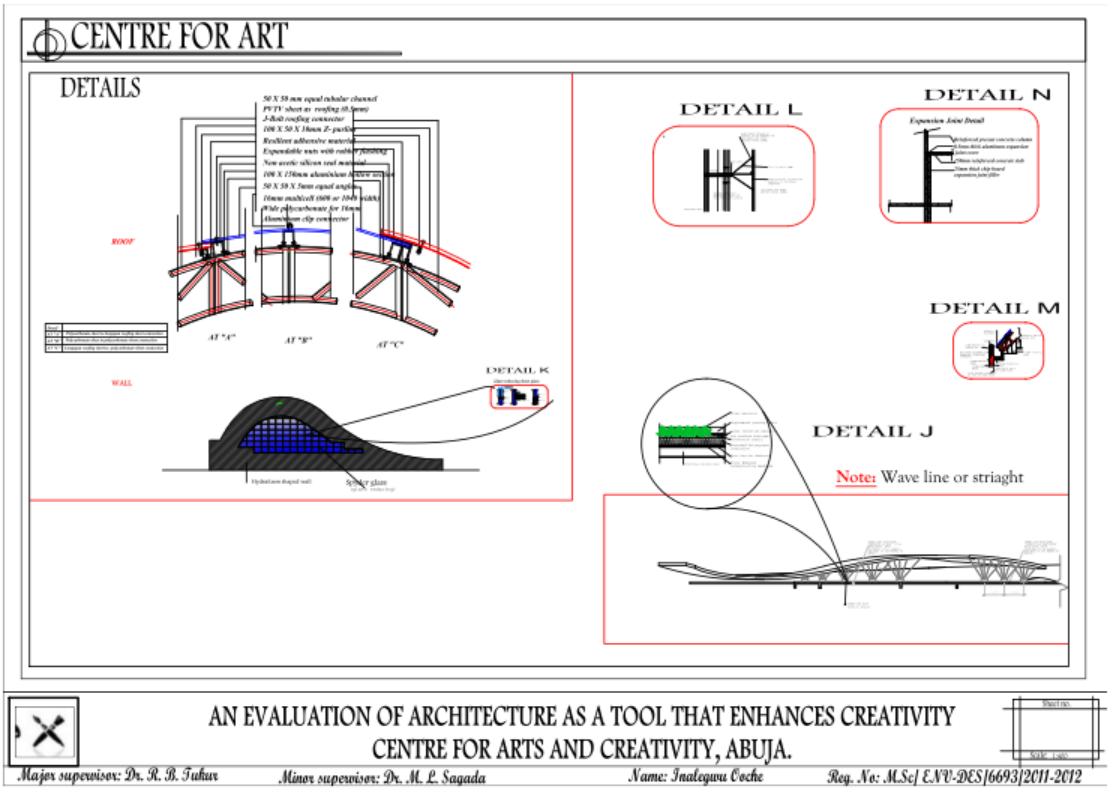
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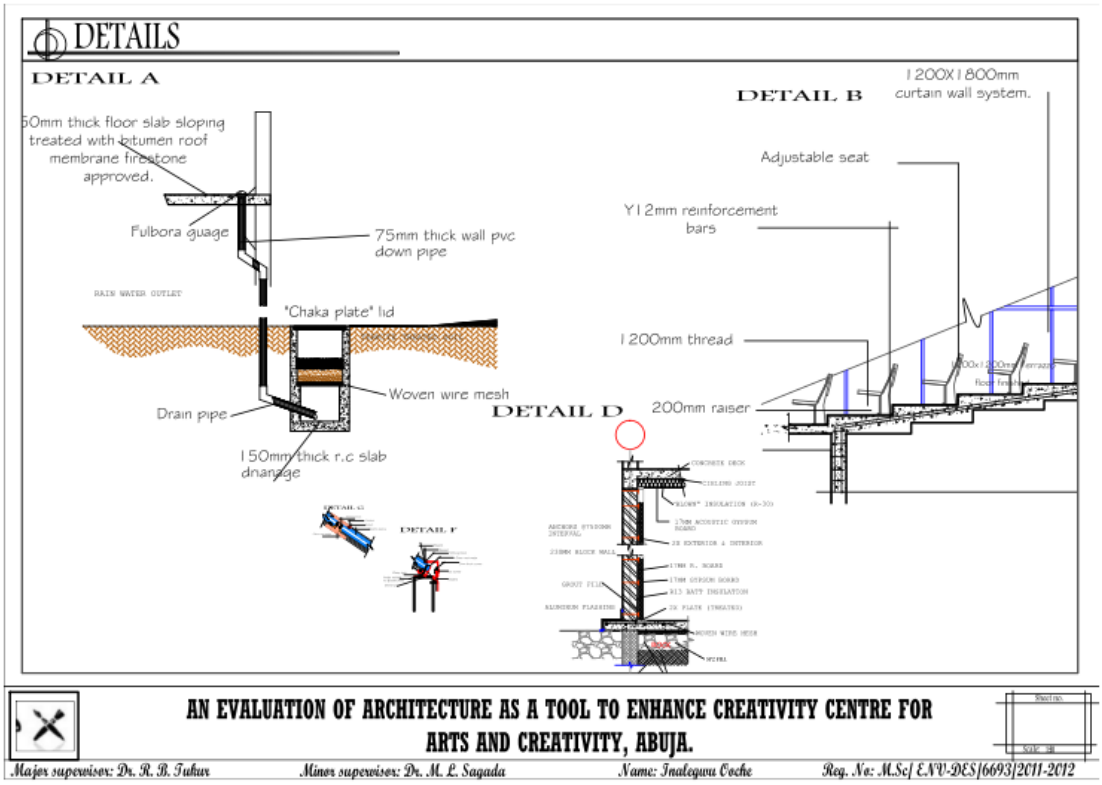
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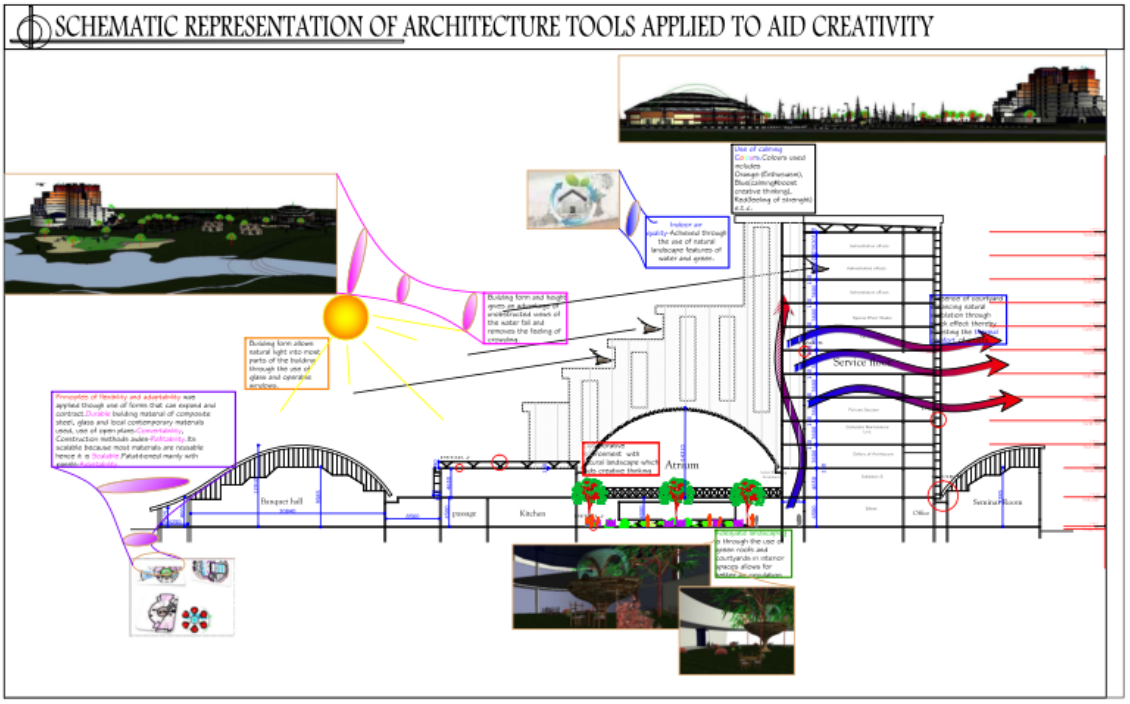

FLOATING RESTAURANT
OOR PLAN
N
SECTION
WORKING DRAWING
N
ROOF PLAN
AN EVALUATION OF ARCHITECTURE AS A TOOL THAT ENHANCES CREATIVITY, CENTRE FOR ARTS AND CREATIVITY, ABUJA.
Major supervisor: Dr. R. B. Tukur
Minor supervisor: Dr. M. L. Sagada
Name: Inalegwu Coche
Reg. No: M.Sc/ ENV-DES/6693/2011-2012


ART AND CRAFT VILLAGE
PLAN
ROOF PLAN
SECTION
ELEVATION
ELEVATION
WORKING DRAWING
AN EVALUATION OF ARCHITECTURE AS A TOOL TO ENHANCE CREATIVITY CENTRE FOR ARTS AND CREATIVITY, ABUJA.
Major supervisor: Dr. R. B. Tukur
Minor supervisor: Dr. M. L. Sagada
Name: Inalegwu Coche
Reg. No: M.Sc/ ENV-DES/6693/2011-2012


DETAILS
DETAIL O
LIFT ENGINE ROOM
RAIL BRACKET
Lift cable casing
5mm thick floated mirror with dulled edges screwed to wall
175 mm ball bearing on the shaft and lift rail connection
LIFT PLAN
lift car
Lift car door
75 mm stainless handrail
Diameter 20mm steel balustrade at 230 ctrs
150mm thick concrete cover
300mm reinforced concrete.
ALL WALL MOUNTING LOCATIONS, RELATIVE TO THE PIT FLOOR
Diameter 100mm pvc under ground drainage
DETAIL E
Adjustable Aluminium panels
AN EVALUATION OF ARCHITECTURE AS A TOOL TO ENHANCE CREATIVITY CENTRE FOR ARTS AND CREATIVITY, ABUJA.
Major supervisor: Dr. R. B. Tukur
Minor supervisor: Dr. M. L. Sagada
Name: Inalegwu Cocke
Reg. No: M.Sc/ ENV-DES/6693/2011-2012


CENTRE FOR ART
DETAILS
ROOF
WALL
AT "A"
AT "B"
AT "C"
DETAIL K
DETAIL L
DETAIL N
DETAIL M
DETAIL J
Note: Wave line or striaght
AN EVALUATION OF ARCHITECTURE AS A TOOL THAT ENHANCES CREATIVITY CENTRE FOR ARTS AND CREATIVITY, ABUJA.
Major supervisor: Dr. R. B. Tukur
Minor supervisor: Dr. M. L. Sagada
Name: Inalegwu Cocke
Reg. No: M.Sc/ ENV-DES/6693/2011-2012


DETAILS
DETAIL A
150mm thick floor slab sloping treated with bitumen roof membrane fireatone approved.
Fulbora guage
75mm thick wall pvc down pipe
RAIN WATER OUTLET
"Chaka plate" lid
Woven wire mesh
Drain pipe
150mm thick r.c slab dranage
DETAIL B
1200X1800mm curtain wall system.
Adjustable seat
Y12mm reinforcement bars
1200mm thread
200mm raiser
DETAIL D
AN EVALUATION OF ARCHITECTURE AS A TOOL TO ENHANCE CREATIVITY CENTRE FOR ARTS AND CREATIVITY, ABUJA.
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SCHEMATIC REPRESENTATION OF ARCHITECTURE TOOLS APPLIED TO AID CREATIVITY
Atrium
Kitchen
Banquet hall
AN EVALUATION OF ARCHITECTURE AS A TOOL THAT ENHANCES CREATIVITY CENTRE FOR ARTS AND CREATIVITY, ABUJA.
Major supervisor: Dr. R. B. Tukur
Minor supervisor: Dr. M. L. Sagada
Name: Inalegwu Coche
Reg. No: M.Sc/ ENV-DES/6693/2011-2012

THREE DIMENSIONAL VIEWS

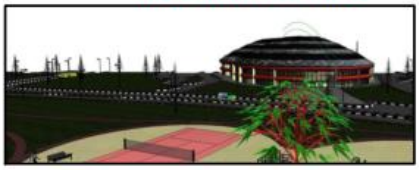
AERIAL VIEW



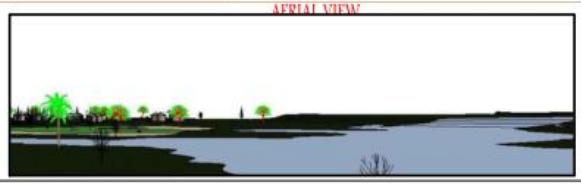
INTERIOR OF BANQUET HALL



VIEW OF RELAXATION FACILITIES



AERIAL VIEW



AN EVALUATION OF ARCHITECTURE AS A TOOL THAT ENHANCES CREATIVITY
CENTRE FOR ARTS AND CREATIVITY, ABUJA.

Sheet no:

Scale:

THREE DIMENSIONAL VIEWS

CENTRE FOR AR



AERIAL VIEWS



INTERIOR OF ATRIUM



ART AND CRAFT VILLAGE





AN EVALUATION OF ARCHITECTURE AS A TOOL THAT ENHANCES CREATIVITY
CENTRE FOR ARTS AND CREATIVITY, ABUJA.

Sheet no:

Scale:

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