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**Proposed Rotary Club Regional Headquarters**

**(Effective Lighting Strategies in the Design of Rotary Club Regional Headquarters)**

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Being a M.Sc. Thesis Submitted to the Department of Architecture, Faculty of  
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in Architecture.

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## Certification

This is to certify that Akande, Adewumi Samuel with matriculation number LCU/UG/001943 carried out this research work titled “Proposed Rotary Club Regional Headquarters (Effective Lighting Strategies in the Design of Rotary Club Regional Headquarters)” in the Department of Architecture, Faculty of Environmental Design, Lead City University, Ibadan, Oyo State for the Award of Master Degree (M.Sc.) in Architecture under the supervision of:

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## **Dedication**

This Research specially dedicated to Almighty God who has given me the strength to accomplish it and to my dear wife Mrs. Bolanle S. Akande who had been sources and assistance by the grace of almighty God during the period of study.

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## Abstract

Effective Day lighting strategy is substantial tools in achieving our needs in term of well-being without compromising in addition to natural resources. Lighting plays important roles in illumination, directing Viewer's gaze to important areas and portraying visual tension. Office Lighting determines Employee's perception about the work place and can enhance Employee performance as well as increase the aesthetics appealing of the Office. In the cause of this study, some techniques were adopted to achieve our sustainability, along with the benefits of embracing natural and effective lighting strategies: utilizing sunlight through the size and location of windows, Day-lighting System and functional and standard design. This Study aimed to investigate ways by which effectives Lighting Strategies could be used for the design of Office Complex and evaluate best practices through the analysis Case Studies for Lighting Office spaces in the design of proposed Rotary Regional Headquarters.

The Study employed a case study research approach; Six Case Studies were selected namely: i) Rotary International Headquarters Club House - Illinois United State ii) Rotary International World Headquarters – Chicago iii) Rotary Club House International- Chilliwack Canada iv) Rotary Club House - Inteswal v) Rotary Club House – Ibadanand vi) Nigerian Union of Journalist – Ibadan.

From the Case Study analysis, useful techniques as related to effective natural and quality lighting strategies in office building design were achieved , after which, these were transferred into the proposed design. However, it can be deduced from the Case Studies that the Rotary Regional Headquarters has adequate natural lighting features.

Therefore, I recommend that in order to achieve effective and quality lighting in the design of office Complex, Stakeholders should inculcate the identified strategies.

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## List of Acronyms

Abbreviation	Meaning	Page
LCU	Lead City University	Cover page
IEA	International Energy Agency	1
SAD	Seasonal Affective Disorder	3
DF	Daytime factors	13
SC	Skies Components	15
IRC	Internally Reveal Components	15
MFIS	Maintenance Factor for Internal Surfaces	15
GF	Glazing Factor	15
FF	Framing Factor	15
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## Chapter One

### 1.0 Introduction

#### 1.1 Background of the Study

Lighting design is a vital visual element for increasing mutual interaction (Ayoosu et al., 2022; Emovon, et al., 2018). In lighting quality theory, lighting design plays a significant role in illumination, directing viewer's gaze to important areas, and portraying visual tension (Llinares, Castilla, Higuera-Trujillo, and Mcnelis, 2022). However, lighting design is a complex process, for mutual interactive systems, such as spatial configuration and dramatic intensity. For example, office lighting is one of the many determinants to an employee's perception about the workplace and can enhance employee performance as well as increase the aesthetic appeal of the office, STN EN (2022), As such, best practices with regards to enhanced quality of lighting in office spaces would have to adhere to safety regulations and ensure a good balance with natural light as well.

According to (Veitch and Newsham 2018) explained Lighting quality as lighting that supports visual performance, task and behavior routine, social interactions, attitude, wellbeing and welfare, and appealing judgments. Fundamental to both definitions are strap line of the purpose of the space (the tasks or activities that take place in an individual setting) and the user of a space suggesting that lighting value depends on a contact between lighting, abode, and individual. Assessment of lighting typically involves detailed photometric processes of the environs; however, photometric procedures alone do not fully arrest the "person" element of lighting quality. International Energy Agency (IEA) recognize the importance of capturing subjective assessments in addition to objective photometric data.

To attain adequate natural lighting in buildings, the science of daylighting emphasizes the need to ensure balancing between heat gains and losses, glare control, and variations in daylight availability to avoid undesirable effects ((Rendón Gaviria, 2022). Some of the daylighting fixtures are windows, skylights (passive or active), Tubular daylight devices, Daylight redirection devices, and solar shading devices. However, inappropriate natural lighting in the designs of buildings is prone to more disadvantages in that it allows for the uncontrollable entrance of heat, noise, and solar radiation. A non-carefully thought out on regional headquarters building design results in temperature increase and visual discomfort for both members and public, thus ultimately making the building unsuitable for meeting. (Rendón Gaviria, 2022).

This review therefore aims to investigate ways by which effective lighting strategies could be used for designing the proposed Office Complex for Rotary Regional Headquarters.

## **1.2 Statement of the Problem**

Studies show that daylighting can provide substantial benefits to staff and employer's alike, but improper usage can lead to unpleasant conditions within the structure (Becek, Salim and Odihi 2020). In reality, inadequate Daytime often gets unnoticed in the office and been an important requirement for improving mental health and wellbeing, the focus for designers is to ensure that public spaces are designed to support conducive workstations. However, bad illumination is associated with a range of ill-health effects, both physical and psychological, such as sense strain, headaches, weakness along with stress and fretfulness in work environs.

(Plörer, Hammes,Hauer, van Karsbergen, and Pfluger,2021).stated that, as we Walking and working around during the day, we spend much of the time in artificial lighting which has a contrary effect on the body and the mind, and can result in situations such as seasonal affective disorder (SAD).

### **1.3 Aim and Objectives**

The purpose of this study is toward investigate ways by which effective lighting strategies could be used for the designing an Office Complex for Rotary Regional Headquarters. In order to achieve the goal set out for this study, the specific objectives are to:

1. To identify design strategies that can help in effective lighting of office space.
2. To evaluate best practices through the analysis case studies for lighting office spaces.
3. To design a proposal for a Regional Rotary Headquarters using identified lighting strategies.

### **1.4 Research Questions**

1. Which different lighting strategy and techniques of lighting are suitable as the basis for lighting project?
2. What is the best lighting design quality for an office building?
3. How can lighting be used to achieve mutual interaction in the design of an office spaces?

### **1.5 Significance of the Study**

The significance of natural light in workplace spaces are numerous. It is an essential element of indoor environmentally friendly quality, which embraces the well-being, shelter, and comfort issues connected to office block interiors. Well-designed indoor light increases occupier mood, satisfaction, and output (Pilechiha, Mahdavinejad, Rahimian, Carnemolla, and Seyedzadeh, 2020). By planning offices with adequately of daylight and views of the outside, you'll provide your workforces with calm, hospitable environment that will provide healthier and more dynamic place (Pilechiha, 2020).

In other words, day lighting can significantly enhance the environs to the quality of the room and support information flow and attentiveness.

This thesis will be of importance as it will add to body of knowledge on effective lighting strategies for office building Design. In addition the study will also be useful for Architects, Builders, and interior designer on best practices as it relates to sustainable lighting solutions in built interior spaces. Lastly, the Research will guide the policy sector in the area of policy formulation on criteria for lighting office Complexes.

### **1.6 Scope of Study: Target Group**

The study's scope would be delimited to the proposed Rotary Club Regional Headquarters, Ibadan, Oyo state. This proposal will serve a long way as a contact Secretariat for regional activities for Oyo, Ogun, Ondo, Lagos, Ekiti and Osun States. This foster unity among the members of these States. Through a comprehensive review of literature, it will identify effective natural lighting strategies and ways to enhance the quality of light in the proposed office building design. The case study will look at existing Rotary Club Offices in Nigeria, USA and Canada.

### **1.7 Operational Definition of Terms**

**Lighting strategy:** This refers to lighting methods, principles, steps in lighting design and basic principles of lighting (Plörer, 2021).

**Rotary Club:** Clubs work together to promote peace, fight disease and support education, is a humanitarian service organization which brings together business and professional leaders in order to provide community services, promote integrity and advance good will, peace and understanding in the world. (Balogun, 2022).

**Office Complex Design:** hypothetical model layout of office, the structure of the organizations Housed. This is a concentration of several offices in a single building or campus setting. May also to a grouping of architectural features that facilitate the production of clerical activities, data processing, or the delivery of business services (Esteghamati, and Flint, 2022).

**Natural Lighting:** Is a technique that efficiently brings natural light into our home or Office using exterior glazing windows, skylights e.t.c (Odiyur Vathanam, 2021).

**Rotary Regional Headquarters:** Largest body of Rotary club building which hold the bodies of the club together and be in unity as a body, where meetings, conferences, seminars and parties are been held regionally. (Mooty, P. R. 2010).

**Day lighting:** This is the measured charge of normal light, direct daylight, and diffused-skylight into a office to decrease electric lighting and saving energy. Providing a direct link to the active and always evolving designs of outside illumination, daylighting helps to improve a visually inspiring and dynamic atmosphere for office occupants and workplace (Skene and Münch, 2021).

**Lighting Levels:** According to the study, Lighting level refers to the quality of illumination in a workplace which is to be determined by the positioning of openings and quality of materials used for illumination such as energy bulbs, fluorescent lamp for health and safety, these should be tailored to the purpose of each space in a building, allowing for energy savings. Lighting design fixtures and glare that affect comfort. Especially in the workplace, avoid dark finishes that contrast greatly with luminous light fixtures. (Ngarambe, Kim, and Yun, 2021)

**Lighting Controls** these are yet another consideration. Lighting office buildings needs to fulfill a wide variety of needs: the spatial plan and design aspects, together with the financial framework conditions, form the basis for the lighting concept (Ngarambe, Kim, and Yun, 2021)

## Chapter Two

### 2.0 Literature Review

#### 2.1 Conceptual Review

Lighting involves several basic concepts, including reflectance, absorbance and transmittance. Day lighting should prevent excessive heat gains and glare. Prediction of daylight can be done mathematically or in the laboratory (Li & Lou, 2018). The daylight factor is made up of three components: the direct sky element, the visibly redirected element and inside revealed element. Systematic design of artificial lighting should consider the illumination badly-behaved, the technique of illumination, the brightness worth prerequisite, types of fixtures, and types of standard lamp, quantity and enlisting of fixtures as well as maintenance lighting standards relate to the design sky (Lou et al., 2020).

##### 2.1.1 Basic Concepts in Lighting

Light is electromagnetic radiation with wavelength between 380 and 780 nanometres. The colour of perceived light is determined by its wavelength. Light falling can be reflected, absorbed or transferred, on an object depending on the following properties of the objects: i) Reflectance (r) (ii) Absorbance (a) (iii) Transmittance (t). Since light falling on any object can only be reflected, absorbed or transmitted,  $r + a + t = 1$

(i.) **Reflectance:** This is similar rays of light reflection from a plane mirror. This is called specular reflection. In the case of a matt surface however, the light will be reflected in various directions giving rise to diffusion. The colour of the light after reflection is determined by the absorbance of the surface.

ii) **Absorbance:** Certain surfaces absorb selected wavelengths of light falling on them. This results in a difference in colour between the incident and reflected light (Gooch, 2011).

iii) **Transmission:** Transparent materials transmit a large part of the light incident upon them while opaque materials do not allow the passage of light. Translucent materials transmit a small part of the light falling on them, scattering the light and creating diffuse light. The transmission factor is the ratio of the light transmitted by a body to the incident light (González-Rodríguez et al., 2017).

### 2.1.2 Colour of Light

The colour of light is determined by its wavelength. The light from the sun is white. Coloured light can be produced by additive or subtractive processes. The properties of colour are: Hue - concept of colour, Value or pureness-light or dark Chroma or brightness - colorfulness or intensity (Doulos & Tsangrassoulis, 2022).

### 2.1.3 Measurement of Light

There are four quantities commonly used in the Measurement of light- the intensity (I), the flux (F), the illumination (E) and, the luminance (L) (Aydinli, 2000).

### 2.1.4 The Intensity

This is basically the brightness of a light, the luminous flux of visible light received per unit area. The greater the light intensity, the more energy is present. Light intensity is the rate at which the energy from the light is received at a unit of surface. (Aydinli, 2000; Ayoosu et al., 2022).

### 2.1.5 The Flux

This is defined as the movement of light and it is calculated in lumens (lm). Equivalent flow of light discharged by an 1 candela point source, within a unit solid angle.

### **2.1.6 The Illumination**

This is the amount of flux falling on a unit area and the unit of measurement is the lux ( $\text{lm}/\text{m}^2$ ) (Ayoosu et al., 2022).

### **2.1.7 The Luminance**

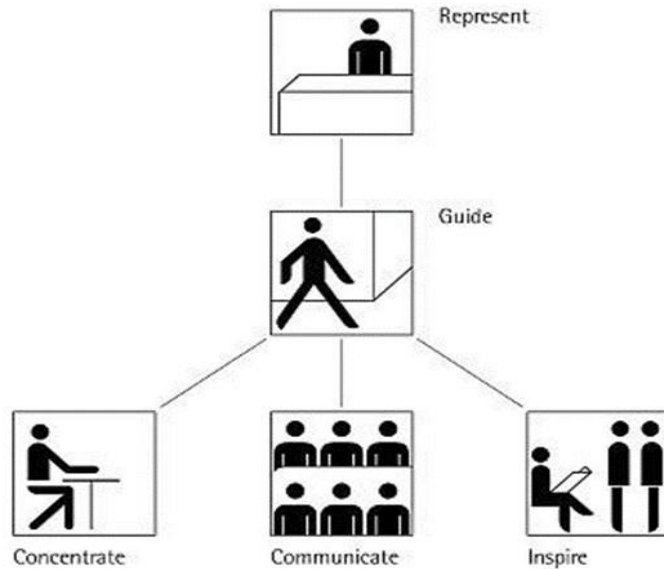
The brilliance of a surface and is defined as the luminous intensity of any surface in a given direction per unit of projected area of the surface viewed from that direction. It is measured in candelas per square metre ( $\text{cd}/\text{m}^2$ ) (Aydinli, 2000).

### **2.1.8 Effective Lighting Strategies Concepts**

When workers arrive at their offices, they want to enter bright spaces filled with abundant natural light; they don't want to walk into dimly lit, gloomy rooms. The benefits of natural light in office spaces are many. By designing offices with plenty of sunlight and views of the outdoors, employees are provided with calm, welcoming environment that will make them healthier and more productive (Wilkins 2018). The aims of effective lighting of interior spaces are to adequately illuminate visual tasks, to create an attractive visual environment, and to save electrical energy. Both the building design scheme and the application of systems play roles in meeting these goals (Aydinli, 2000).

The performance of a daylighting strategy for rooms depends on:

1. Daylight availability on the building envelope which determines the potential to daylight a space;
2. Physical and geometrical properties of window(s), and how windows are used to exploit and respond to available daylight; Physical and geometrical properties of the space.



**Figure 2.1:** *Effective lighting concept in the working place*  
(Source: Wilkins 2018).

## 2.2 Empirical Review of Lighting Quality Design

There is a need for empirical review design standards for lighting: Light is an important element of indoor environmentally friendly quality that can influence occupier satisfaction, comfort and production (Sharaf, 2014). Illumination value is a broad abstract perception and this has consequences for its valuation. Individual evaluations of lighting are important complement to objective photometric data; however, there is partial existing direction for the range of such procedures. We evaluation and highpoint the merit and restrictions related with methods of general lighting value and discomfort brightness (Wilkins 2018).

### 2.2.1 Daylighting

The provision of daylight is very important in architectural design. This is achieved through appropriate design of windows and openings (Moor, 2000; Aydinli, 2000). The origin of daylight within an architectural space may be one or more of the following: direct sunlight externally or internally reflected light diffused sunlight (Li & Lou, 2018).

In the Nigerian climate the design of windows should guarantee adequate lighting but excessive lighting should be avoided in order to prevent: heat gains Glare (Ayoosu et al., 2022).

### 2.2.2 Glares

In basic terms, glare can be defined as the visual exertion skilled when a bright and concentrated light source is in straight line of eyesight. Centered on its effects on human vision, glare can be categorized into two subtypes: Discomposure glare and unrestrained light glare is reproduced or unrestrained light that shines directly into one eyes.

Direct glare can be prevented by providing sun-shading devices designed with the aid of a direct solar radiation overlay and a sun path diagram (Diakite-Kortlever and Knoop, 2021). Glare can be; Debility glare or discomposure glare.

**Debility glare:** is a visual disorder in which one or more light bases in the arena of vision lead to a quantifiable reduction of visual presentation. (Aydinli, 2000).

**Discomposure glare:** - is to use matt indicators and large-space luminaires. It can also be condensed by elongate the brilliance on the room barriers and ceiling. This can be accomplished in diverse ways: Luminaires can be fortified with a certain amount of upright. Luminaires can be connected closer to the room's barriers. (Aydinli, 2000).

In the Nigerian climate, high luminance skies and reflection from the ground and nearby buildings cause glare. To prevent glare, externally reflected light should be avoided and light should be reflected from ceilings using high level windows (Ayoosu et al., 2022). Alternatively, vertical strip windows can be provided in room corners as these reflect light of internal walls. When sun shading devices are used, their surfaces should be non-reflective to prevent glare. A common solution to reflectance from the ground is the use of plants and flowers to cover the

reflective surface. Changing the colour of external reflective surfaces to a darker colour will also prevent glare. (Ogunsote 2018).

The method of prevention of glare should take into account the prevalence of either clear or overcast sky conditions. Clear sky conditions exist in hot dry climates where there is little cloud cover. The highest luminance is found near the horizon and glare results from reflections from the ground and sunlit walls opposite windows: In this case windows should be exposed to blue sky rather than the horizon (Alambeigi, 2013; Sharaf, 2014).

The opposite situation is found in warm humid climates where heavy cloud cover and overcast sky conditions exist. Here the darkest part of the sky is found near the horizon. The view should be directed towards the horizon and glare prevented by horizontal overhangs. In composite climates both of these conditions may be found. Screens are usually used as they prevent glare from both clear and overcast skies (Ogunsote 2018).

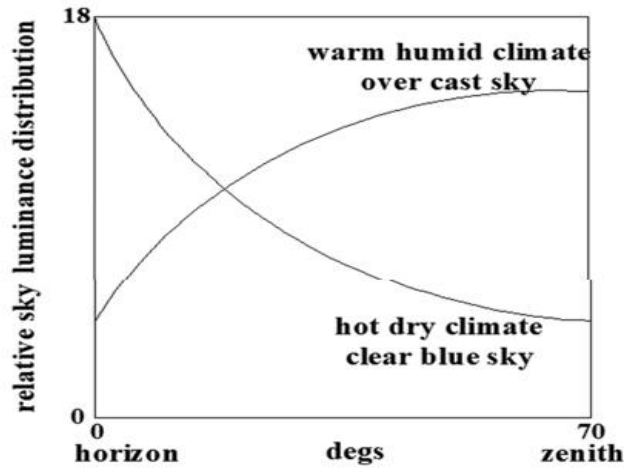
### **2.2.3 Prediction Techniques**

The prediction of daylight may be done through the use of mathematical formulae or in the laboratory. Laboratory studies are carried out in the artificial sky which simulates the illumination obtained from the sky. Daylight requirements may be calculated under clear sky or overcast conditions (Doulos & Tsangrassoulis, 2022). Daylight prediction techniques under clear sky conditions will not be discussed here due to their relative complexity. The daylight prediction technique discussed below was developed by the British Research Establishment and it uses the concept of the design sky to establish the daylight factor (Ogunsote 2018).

### 2.2.4 The Design Sky

The design sky illumination value is usually established for each location and it is the outdoor illumination level which is exceeded 85%. This is usually obtained from analysis of long-term illumination records (Ravn, et al., 2022). This concept is very useful in design as it makes it possible to determine the daylight factor or the required illumination level indoors from the following equation:  $DF = \frac{E_i}{E_o} \times 100\%$  Where; DF = daylight factor  $E_i$  = required illumination level  $E_o$  = design sky illumination. (Safranek, 2022)

**Table 2.1:** Relative light distribution from a blue sky and an overcast sky



Angular altitude from which light is received

(Source: Safranek, 2022)

The ninetieth or eighty-fifth percentile is usually employed to avoid uneconomical and excessive lighting most of the time. This is done at the expense of having too little light some of the time. The design sky illumination levels decrease with latitude and Nairobi for example has 18,000 lux while London has 5,000 lux (Doulos and Tsangrassoulis, 2022).

### 2.2.5 The Daylight Factor (DF)

The daylight factor method is used to calculate the intensity of daylight received on a surface inside a building from an overcast sky. It indicates the ratio of daylight falling on the surface as a

proportion of the total daylight that would fall on the same surface from an unobstructed sky (Ngarambe, Kim, and Yun, 2021). The daylight factor has three components which relate to the possible light paths to the surface: →the direct sky component (DSC).

The direct firmament constituent is the proportion of light that falls on the surface directly from the sky. It is affected by surface cleanliness as well as external obstructions (Dolníková, et al., 2021). The externally reflected component is the proportion of light from the sky which is reflected off external surfaces to fall directly on the surface. It is determined by the area and reflectance of external surfaces visible from the surface under consideration (Doulos and Tsangrassoulis, 2022). The internally reflected component is the proportion of light from the sky which is reflected off the internal surfaces of the room before falling on the surface. It depends on the size of the room, ratio of window area to total wall area and reflectance of indoor surfaces. The daylight factor is also dependant on the glazing factor, the framing factor and the maintenance factor of the glass. The glazing factor is a correction factor for glazing other than single clear glass glazing. The framing factor makes a correction for the use or mosquito Screens and security bars and is the ratio of the glass area to the total window area. The maintenance factor is a correction factor for the state of cleanliness of the glass.

The following equation is used to calculate the daylight factor:

$$DF = (SC + ERC + IRC + m) \times GF \times FF \times MF; \quad \text{where;}$$

DF = daylight factor

M = maintenance factor for internal surfaces

GF = glazing factor

FF = framing factor

MF = Maintenance factor of glass.

The direct sky component is determined with the aid of a pepper-pot diagram or a daylight factor protractor (Aydinli, 2000; Doulos, et al., 2019).

**Table 2.2:** Correction to the total daylight factors

<b>Factor</b>	<b>Condition</b>	<b>Correction Factor</b>
<b>Glazing factor</b>	Clear glass	1.0
	No glazing	1.1 -1.2
	Polished Wired Glass	0.9
	Diffusing Glass	0.9 – 1.0
	Louvres	0.95
	Heat Absorbing Glass	0.6 – 0.7
<b>Framing Factor</b>	Average Value	0.75
	Metal Wire Screen	0.6 – 0.7
	Plastic Screen	0.7 – 0.9
	Security Bars	0.9 – 1.0
<b>Maintenance Factor</b>	Clean	1.0
	Average	0.9
	Dirty	0.85

**Sources:** (Mohapatra, Kumar, Mandal, and Mohapatra, 2018).

### 2.3 Artificial Lighting

Artificial lighting is a necessity in buildings, not only in the night, but also in the daytime. Artificial lighting should however only be used to supplement daylight. Nevertheless, there are cases where only either daylight or artificial light (factories) may be provided. The level of daylight provided in buildings is usually enough for general lighting but inadequate for several tasks, especially those involving small details (Samiou, Doulos and Zerefos, 2022).

The amount of artificial light provided is often related to the wealth of the country with lower levels for poorer countries (Becek, Salim, and Odihi, 2020). This is dictated by the cost of lighting. In the Nigerian situation it is wise to rely on daylight and use artificial lighting & Supplement. Rooms for night-time use should however be provided adequate artificial lighting.

### **2.3.1 Lights Design Project**

A methodical approach to lights project is however desirable. According to (Knoop 2020), every design should determine the following;

- the lighting problem
- the method of lighting
- illumination value required
- types of fittings
- types of lamps
- number and placing of fittings
- Maintenance.

### **2.3.2 The Lighting Problem**

Lights difficult relates to the purpose and configuration of the area to be stricken. The designer should familiarize himself with the technique and spatial geometry of the space. The special lighting problem familiarized to the specific tasks to be performed and the degree of precision needed.

### **2.3.3 Methods of Artificial Lighting**

Methods of lighting such as Angle lighting is lighting which touches the working plane predominantly at a preferred angle, whether in a concentrated beam as from a spotlight, or over a wide angle as from a parabolic angle reflector (Wattan and Janjai 2015). Localized lighting provide reasonable general illumination between work places Local lighting is the illumination of a very small area by a lighting fitting usually placed very close to the area and giving practically no light outside the immediate confines of the area (Bellia, Fragliasso and Stefanizzi, 2016).

### 2.3.4 Illumination Value Required

The amount of illumination needed for a task depends on the following the magnitude of the aspect to be seen, the difference between the object of vision and its direct background, the reflection factor of the object, the signal of the object and the period of the charge. The level of illumination provided should not cause glare (Figueiro et al., 2019).

**Table 2.3:** Recommended values of illumination limiting glare index

Visual Mission	Lighting (lux)	Glare index
Casual sighted	150	27
Lumpy task with enormous detail	250	24-27
Conventional task, medium detail	450	24
Quantitatively simple task small detail (e.g. drawing office, sewing)	650	18-21
Simple prolonged task slight detail (e.g. Fine assembly, hand tailoring)	950	15 - 21
severe, prolonged task, very small detail (e.g. gem cutting, hosiery mending, gauging very small parts)	1350 - 2050	12- 15
Very severe task, With minute detail( watch and instrument making)	2050 - 3050	12

(Source: (Wienold, Iwata, Sarey Khanie, Erell, Kaftan, Rodriguez, and Andersen 2019).

### Types of Fittings

There are several factors that influence the choice of fittings: the light distribution of the lamp which determines whether the lighting will be direct, general or indirect. The brilliance of fittings should be such that defective glare is avoided. The light productivity ratio or luminous effectiveness is a measure of the total of light emitted by the lamp and engaged by the fitting (Ogunsote, 2018). The mechanical characteristics of the fitting should ensure easy installation, long life and easy maintenance.

## **Lamps**

The choice of standard lamp depends on the spectral configuration of light, source illumination, source area and profitable factors. The spectral configuration of light of day is taken as a standard and the light produced should be as natural as possible, except for special effects. The area and brightness of the source is determined so as to avoid glare. High brightness, small area sources are used for local lighting while low brightness, large area sources are used for general lighting. The economic factors relate to the procurement costs, running costs and maintenance costs (Wicks, (2021).

## **Number and Placing of Fittings**

The available mounting height and the brightness required is determined by the number and placing of fittings the mounting height determines the maximum spacing permissible for uniform lighting. The arrangement of fittings can be determined by the shape of the room (Wicks, 2021).

### **2.3.6 Maintenance**

The installation of fittings should enable flexibility of control and easy access for maintenance. The choice and installation of lamps and fittings should aim at keeping maintenance costs low. Fittings should be protected from dust (Orynycz, and Tucki, 2021). The design of artificial lighting should be seen in several aspects. The colour of the illuminant with respect to the surfaces should be natural and not cause colour fatigue.

A modelling balance should be maintained between directional and diffused lighting. Variety should be achieved by applying appropriate spacing/mounting height ratios and also by providing contrasts and changes in brightness to avoid visual boredom. The lighting should be designed flexibly to accommodate different functions. Costing should be done to enable adequate planning and justify alternative proposals (Orynycz, and Tucki, 2021).

These should be physical integration of lighting equipment and building fabric. Lamps with high noise levels should be avoided in quiet interiors. The heat production of lamps should be considered when choosing between fluorescent and tungsten lamps (Orynycz, and Tucki, 2021).

## **2.4 Lighting Standards**

The daylight factor required to provide adequate illumination depends on how much light is available from the sky. This in turn depends on the thickness of cloud cover and the position of the sun in the sky. The amount of light available reduces with increase in latitude, thus the level of illumination changes from place to place. A standard level of illumination known as the design sky is however usually assumed for different regions or countries. The design sky represents a level of illumination which is exceeded about 90% of the time. The design sky for Nigeria may be assumed to be about 15,000 lux (Stefani, and Cajochen, 2021).

The minimum levels of illumination required for different spaces, and rooms are shown in table 1.4. The daylight factors were calculated on the basis of BSCP-British Standard Code of Practice (Ref. 8, D 381) but using the appropriate sky luminance.

### **2.4.1 Natural Lighting Strategies and Benefits**

This is also known as day lighting, is a technique that efficiently brings natural light into your home using exterior glazing (windows, skylights, etc.), thereby reducing artificial lighting requirements and saving energy. Day light has been established to increase well-being and comfort levels for office occupants. Is an essential tool in attaining sustainability (Wang, Liang, Chen, and Wu, 2022). Therefore, decrease in the usage of artificial lighting is of greater advantageous.

For the purpose of this study, few strategies we can apply alongside with the advantages of embracing normal light are: (i) Openings positioning: Window positioning to exploit the benefits of day-lighting. Purposely to exploiting sunlight through the opening and positioning of windows. Day-light refers to catching diffused light without compromising well-being and purpose. This strategy should also improve the value of light, depending on the nature of the apartment involved (Wang, Liang, Chen, and Wu, 2022).

(ii) Use of clerestories: is a part of the roof where a windowed section is provided. Arango Díaz, et al., (2022).

(iii) kylights. A ceiling diffuser placed at the bottom of the skylight shaft can also help to improve even distribution of light.

(iv) Tubular skylights are a type of skylight that aid in providing natural lighting. Tubular skylights use a roof-mounted light collectors that can reflect light into a metal or plastic tube, which then guides the diffused sunlight into the interior space. (Arango Díaz, et al., 2022).

(v) Opt for retractable awnings. This strategy solves the concern with controlling the intensity of natural lighting.

(vi) Light cabinet and louvered window coverings. The attention is drawn here by bouncy out light from direct light sources, thereby reducing strength of the light, distributing the light to areas. (Ogunsote 2018).

### **2.4.3 Convincing Benefits:**

Minimized energy consumption. Artificial lighting can help reduce the use of electricity by as much as 15%.

Minimized of mildew or mold built-up. Natural lighting can naturally lessen the manufacture of harmful organisms and sunlight is taken to be one of the best natural disinfectants Chronic Diseases especially respiratory problems are often associated with bacterial and fungal. (Afolabi, Babalola, Olaniyan, and Aseyan, 2022).

(i) Healthy dose of vitamin D. Appropriate amount of sunlight can prevent vitamin D and B1 deficiency that may cause diseases.

(ii) Improved performance due to change in working environment. Studies showed that improved performance on employees where natural lighting have been applied in their work environment.

(iii) Improved visual appeal in interiors. Natural lighting is the best type of lighting system used in interior design can be a challenging, yet rewarding, integrate it into a building.

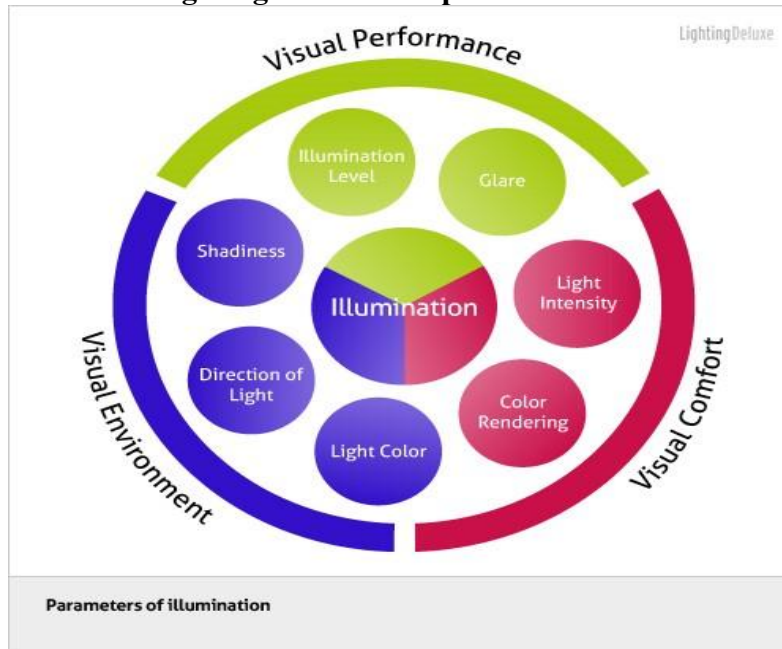
Natural lighting gives long-term assistances that influence the total health of our living biosphere (Afolabi, Babalola, Olaniyan, and Aseyan, 2022).

#### **2.4.4 Office best lighting design**

The facts remains that 85% illumination is required in a working place to have best and conducive working environment, therefore choice of daylighting has more significant impacts on the design and processing of information for office working place. In the workplace, the Illumination is mainly a quantity of ergonomic line of attack. Apart from the fact that illumination does influence the self-well-being and fitness, it has also a affirmative impact on the inspiration and good performances (McKee and Hedge, 2022).

Lighting at the workplace is based on ergonomic ideologies and has to meet well-being requirements within the working environs and of occupational health and safety in office complex.

## 2.4.5 Ergonomics and Lighting in the Workplace



**Figure 2.2:** Lighting performances in the Working Place  
(Source: Bildscharb 2018)

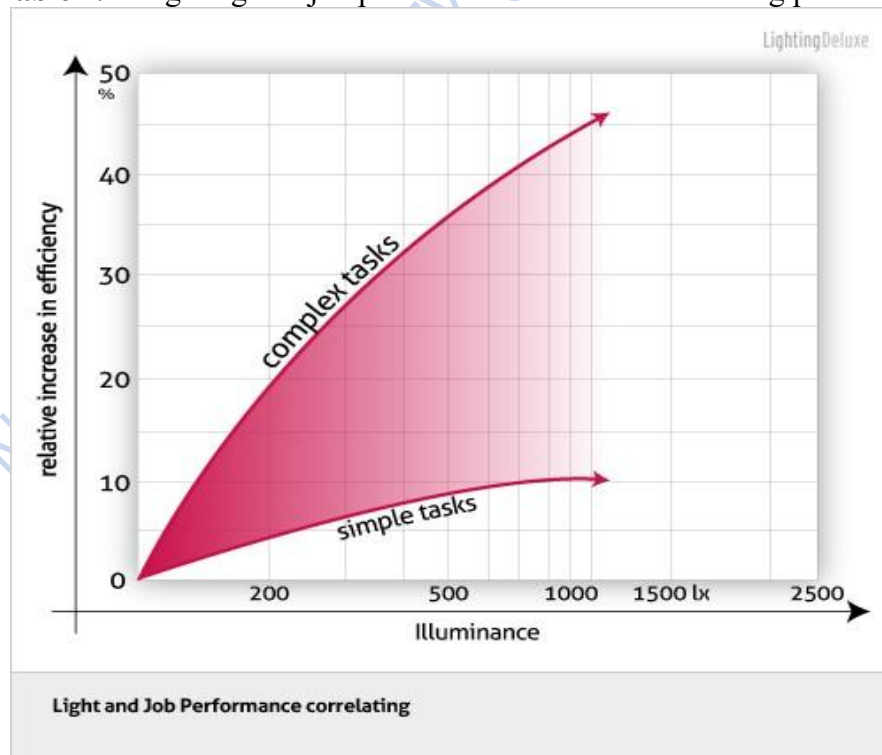
Day lighting has been design to have various roles that have to be taken into considerations for wide-ranging assessment of a lighting design in office complex. Day lighting not only support the visual insight, it also look the information surrounding the environs, but it is also identified by emotional and biological aspects of human working environment. (Bildscharb, 2018).

The visual insight in an apartment is initially attained by lighting. Consequently, ceiling fittings have to be chosen individually according to the building apartment state. Moreover, all other fixtures in an apartment such as table lights, floor lamps and others are intensify the illumination effect. Most of them are also able to rise in on facts processing and perceptual stimulation occasionally. (Bildscharb, 2018) Adequate functions of daylight and artificial light have a greater impacts on the emotional influences of illumination. Some other features that are impacts by sunlight are well-being and performance (McKee and Hedge, 2022).

An ergonomically planned day lighting can be very backup and as schoolwork have proofed, a good lighting at the working place has also an impact on inspiration. The German Ordinance for Work with Visual Display Units (Bildscharb, 2018) implements the minimum standards in Germany regarding safety and health at computer workstations. More so, the offices control more important subjects as lighting matter is concerned at the office (McKee and Hedge,2022).Summarily, assessment of value of daylighting, various considerations is examined. The main criteria are lighting level and luminance, harmonize brightness device, light color, bearing of light and restriction of glare and shadiness. Those factors, influencing visual surroundings, well-being and enactment, are often noted in scientific and applied methods (McKee and Hedge, 2022).

#### 2.4.4 Commendations for Lighting in the office

**Table 2.4:** Lighting and job performance level in the working place



(Sources: Berson 2018).

When you at good mood lighting level in the working placemat will avoid you dizziness and lack of attentiveness and concentration. This can be controlled by the luminance which is regulated in Lux (lx). A minimum of 545 Lux is specified for the illumination at processor work places. By and large, the more prolong in lighting increases the visual performance and definitely influences the comprehensive and fast visual information processing. A luminance between 550 and 1000 Lux can also be expressed as fatigue -free and stressfulness (McKee and Hedge, 2022).

Good Day lighting is often attained by current illumination parameter light colour. For the purpose of a rendering index (CRI) as applied to directional and location. Indices from 85 Ra should be applied as ordinary values and joining with LED fairy lighting and luminous lamps. Additionally, classification of illuminants and lighting bases, the lighting colour of luminous lamps is likened to the lights colour and illuminance of luminous bulbs. (McKee and Hedge, 2022). In order to attain an equilibrium between normal and artificial lighting and to escape darkness and glower, the recommendable to place lighting similar to the window and the office place. This field work was carried out by the Ergonomic Institute (1997).

#### **2.4.7 Office Lighting and worker productivity**

Lighting environments of which office is located has great influence and impacts, on individual worker especially as influenced by lighting in many ways The influential factors in the workplace environs is day lighting. From concentration to well-being levels, field works have gathered that an individual's health, well-being and achievements at work can be influenced (McKee and Hedge, 2022).

In office efficiency lighting is very important yet it is often unnoticed. Bulbs and investing in proper lighting throughout the office to optimize the workplace environment is necessary and will ultimately produce higher productivity levels among Users. (McKee and Hedge, 2022)..

#### **2.4.8 Lighting Regulations in office**

Office lighting principles typified that an office requires 450 lumens of light per square meter. As specified, lightning dynamics for illumination standards in the office falls under four categories Lighting measurement – office lighting is to be measured in units. (McKee and Hedge, 2022).

#### **2.4.9 Well-being in office lighting**

Education findings on well-being in office lighting shows that the good use of daylighting decreases the occurrence of headaches, and eyestrain (Franta and Anstead, 2019). These illnesses are reduced when the lighting level is better by using proper spectral light. However, the number one health problem in offices is eyestrain (Ott Biolight, 2019).

Problem of Eyestrain is similar to the spectrum of light find in a place of work. The proper addition and organization of day lighting in an office building gives the best spectrum of day light for the eye (Franta and Anstead 2020).

Stress decrease and attention direction can also be multiplied by the presence of natural vegetation in the place of work or through opening. (Heerwagen, et al. 2018)

In addition simple effects from lighting could have positive effects for workers. More so, satisfaction work, involvement, motivation, organizational and lowered absence could result from an increase work satisfaction (Heerwagen, et al., 2018).

Clark and Watson 2020 suggested that negative moods are related with uneasiness and distraction, whereas positive moods are connected with the physical location at work and daily activities such as communal connections among workers.

In 2019 studies by the National Sleep Foundation in its Sleep Health Journal established that workforces who are unprotected to high levels of natural light in workplaces reported better quality sleep compared to workers who weren't exposed to any natural light (Owen, E. C. (2021).

Study published by Rand Health Quarterly in 2019 established that good sleep also leads to greater employee productivity and satisfaction. and that workers who get plenty of rest accomplished more than their sobordinates who get less than six hours of sleep per night. Furthermore, a study piloted by Dr. Alan Hedge of Cornell University's Department of Design and Environmental Analysis established some other benefits of natural light in the place of work which are: problem of eye strain, headaches, better mood, drowsiness and error making. (Owen, E. C. (2021

According to the studies, worker productivity can increase with the quality of light. And this Studies of the effects of light on productivity date back to the 1920s when studies were conducted on silk weavers. It has been established in the workplace from then until now; a relationship between work output and the amount of lighting still exists.

(Tennesen and Cimprick Heerwagen, et al., 2020) established that people with views of natural ventilation scored higher. The view from windows is not the only important part of daylighting techniques. Natural light increases attention and alertness during the post-lunch dip and has shown to be helpful in curing boring or monotonous office working condition (Jiang, S.Liu, and Dong, Y. (2020).

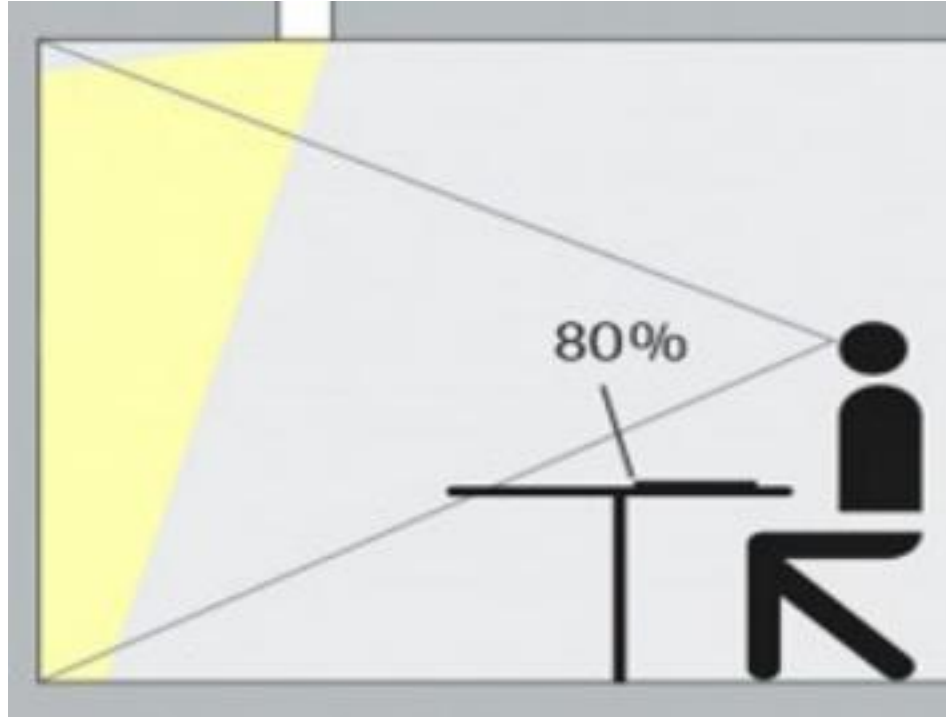
(Drews, 2020).also established that one can also increase the benefits of natural light in workplace by adding biophilic elements. Including indoor plants and fountains make environs feel calmer, improving employee satisfaction environment. Lighting generally, improving working environment with attraction of natural paint colours, such as green, blue, and yellow, will brighten spaces and help light reflect through beatification of surrounding features.

#### **2.4.10 Day lighting achievements**

Day lighting studies gathered according to (Nicklas and Bailey, 2019) on the North Carolina Johnston County schools precisely examined the educational benefits of daylighting. Also Johnston County School studied equated the performances of students from newly constructed daylight schools to schools that were affectedly light. Students in the daylightt schools had higher reading and math achievement improvements.

#### **2.5 Daylighting Design Considerations**

Day lighting needs to fulfill some design considerations which helps to practice of bringing natural sunlight into our spaces both to conserve energy by using less artificial lighting and to maximize comfort within the interior. Day lighting system consists of systems, technologies, and architecture. While not all of these components are required for every daylighting system or design, The fulfilling considerations factors could be established through the one or more of the following: High-results finishing Daylight-optimized building footmark, Climate-responsive window-to-wall area ratio, Tubular daytime method Day lighting-optimized fenestration project, Skylights (passive or active), Daylight redistribution devices, Solar shading devices, Daylight-responsive electric lighting controls, and daylight-optimized space planning. (McKee and Hedge, 2022).



**Figure 2.3:** Lighting design illuminance showing energy efficiency in Office  
(Source; Eklund and Boyce 2019).

The exemplary of the lighting functions enables designers to diversify situations and system of work methods within an progressively active world of working environment, as well as modularly group lighting tasks and dimensioning room areas functionally. The basic idea is to achieve qualitative, perception-orientated lighting designing any working environment (McKee and Hedge, 2022).

### **2.5.1 Lights Survey Conditions**

The whole lighting survey may be required to pinpoint and solve more difficult or complicated situations. A comprehensive lighting survey involves complex equipment and practical knowledge. Industrialized as part of the Daylight in Buildings chore for the IEA Solar Heating and Cooling Programme (IEA 2018), the Lighting Situations Survey consists several items that

opened prolong-exercise lighting pleasure, value, and other characteristics of the workplace in a field environs. It includes comprehensive demands relating to total well-being, and individual parts of lighting. “The lights flicker throughout the day”), comfort (e.g., “Overall, the lighting is contented”), and the enactment (e.g., “Reflections from the light fixtures hinder my work”).

### **2.5.2 Lighting Limits survey**

In lighting survey, there are some certain limitations and this evaluate and has greater effects on evaluation. However, an additional daylighting question is described by Veitch (2019). The item has effects on evaluating the light fixtures and does not explicitly address discomfort and comparative quality judgment. Some scale properties such as internal dependability are not reported and aspects of reliability and validity are inspected.

### **2.5.3 Assumptions of day lighting evaluation**

Subjective evaluations of lighting subjectively, are great important accompaniment to photometric processes when defining lighting quality. Studied therefore summarized the protocols roles of subjective measures of lighting, and concluded that though numbers of measures exist, within the part of building for further development and valid tools of lighting value and its apparatuses. Consequently, expansion of future development should be based on clear definitions of lighting quality and its module parts, follow established evaluation. (Veitch 2019).

## Chapter Three

### 3.0 Methodology

#### 3.1 Introduction

Research is simply the process of arriving at dependable solutions to problems through the planned and systematic collection, analysis and interpretation of knowledge, for promoting progress and for enabling man to relate more effectively to his environment, to accomplish his purpose, and to resolve his conflicts. (Ogunsote, 2018).

Research methodology could also be simply referred to as the various processes, procedures, methods and instrumentalities by which data are secured, specified, collated, processed and analyzed (Wikipedia, 2019).

#### 3.2 Case Studies Analysis

This Research is a qualitative study using a Case study research approach. Case study is appropriate for this study because similar such as: Popoola, 2018, Akande, 2019, as used case study approach. The case studies carried out are to serve as existing example or as a guide towards achieving a realistic design and also to learn through their analysis, the merits and demerits of their design so that the proposed design can inculcate some of these merits and then improve on the demerits especially in attaining a unique designed form that will provide easy accessibility.

For the purpose of this research, six case studies are carried out, which captures selected Rotary club regional headquarters and some others with the intent to garner useful techniques and information both local and foreign that can further inform the design of the proposed Regional Headquarters for Rotary Club. These case studies sites were careful selected based on the following criteria: aligns with the topic of study, it has universal applicability, functional and relevant factors to the study, with the intent of adopting effective natural lighting strategies in

view. (Yin, 2017). The Six case studies sites that will be appraised in this study are: i) Rotary International Headquarters Club House - Illinois United State ii) Rotary International World Headquarters – Chicago iii) Rotary Club House International- Chilliwack Canada iv) Rotary Club House - Inteswal v) Rotary Club House – Ibadan and vi) Nigerian Union of Journalist - Ibadan

### **3.3 Case Study One: Rotary International Headquarters Club House - Illinois United State**

#### **3.3.1 Description of the Building:**

Rotary International headquartered in Evanston, Illinois, USA, founded by Paul P. Harris, with some key people like Jennifer E. Jones, John Hewko and some others. Having its headquarters in Evanston, Illinois, States. It was designed by Architects named Schipporeit, 1977.

Rotary Club, the world's first service organization, was founded FEB. 23, 1905 in Chicago by attorney Paul Harris, when he met with three friends to discuss an idea - which businessmen should get together periodically to enjoy each other's company and enlarge their circle of business and professional acquaintances. They rotated their meetings to each member's place of business to become acquainted with one another's vocation, thus the name Rotary.



**Figure 3.1** Rotary International Headquarters in Illinois United State  
(Source: Website :[www.rotary.org](http://www.rotary.org) )



Virtual tour of One Rotary Center ....  
[blog.rotary.org](http://blog.rotary.org)

**Figure 3.2:** Interior view Rotary International Headquarters Club House Illinois, US  
Source: Website: [www.rotary.org](http://www.rotary.org)

# Rotary International Headquarters

Located In Evanston, IL



Figure 3.3: Front view Rotary International Headquarters.  
(Source: [www.rotary.org](http://www.rotary.org))



Paul Harris | Rotary District 5650  
rotarydistrict5650.org

**Figure 3.4** (*External view showing higher level lighting*)  
(*Source: [www.rotary.org](http://www.rotary.org)*)

**3.3.2 The design description:** From the outside, the building has a cubic expression with its larch facades and rectangular windows placed in a vibrant, rhythmic sequence on all sides. The interior space of the building is designed as a dynamic sequence of open floor levels display vertical Columns where abstract, rectangular shapes windows and transparent glass façade

without interrupting lighting. Ground floor of skyscraper is designed to accommodate car parking with large compound with well landscape environment.

One of the key objectives that informed the design of the building is the creation of a bright lighting with open passages which ease the passage and movement of people.

### **3.3.3 Appraisal of the Building**

- There is flexibility in the design
- All spaces are well lighted
- The spaces are large enough to accommodate the required number of occupants for such spaces.

## **3.4 Case Study Two: Rotary International World Headquarters - Chicago**

### **3.4.1 Description of the Building:**

The Sky-scrapers (multi-storey) office building located in Chicago. Rotary World Headquarters Building was designed by joint works of Architects from Down-Town, Lake Point Tower in 1905. The building was originally housed of American Hospital and was used for Global meetings and services.

In 1987, Global Services Organization purchased the Building for office headquarters. The Building was designed with equipped Boardroom, Offices offer sweeping views of the lake and with Recreation of the office where Rotary meetings used to take place in 1905. The 17<sup>th</sup> and 18<sup>th</sup> floors of the building are linked by a light-filled Atrium to honour Rotary Leaders and Donors.



Rotary International Tour & Chicago ...  
[sunprairierotary.org](http://sunprairierotary.org)

**Figure 3.5** (External vertical view showing higher level window to aid natural lighting)  
basement parking (Source: [www.rotary.org](http://www.rotary.org))



**Figure 3.6:** Basement Area (Interior showing natural lighting effect)  
(Source: [www.rotary.org](http://www.rotary.org))

DO NOT COPY LL



**Figure 3.7:** Horizontal veins aid natural lighting effect (Source: www.rotary.org)



virtual tour of Room 711 | Rotary Voices  
blog.rotary.org

**Figure 3.8:** (Interior Office room showing natural lighting effect)  
(Source: [www.rotary.org](http://www.rotary.org))

### 3.4.2 Description:

Information provided by (Author 2022) stated that in the early design process, energy calculations and daylight simulations helped to establish that the facade should consist of wood with window holes instead of only glass in order to achieve an energy reduction of 50 %.

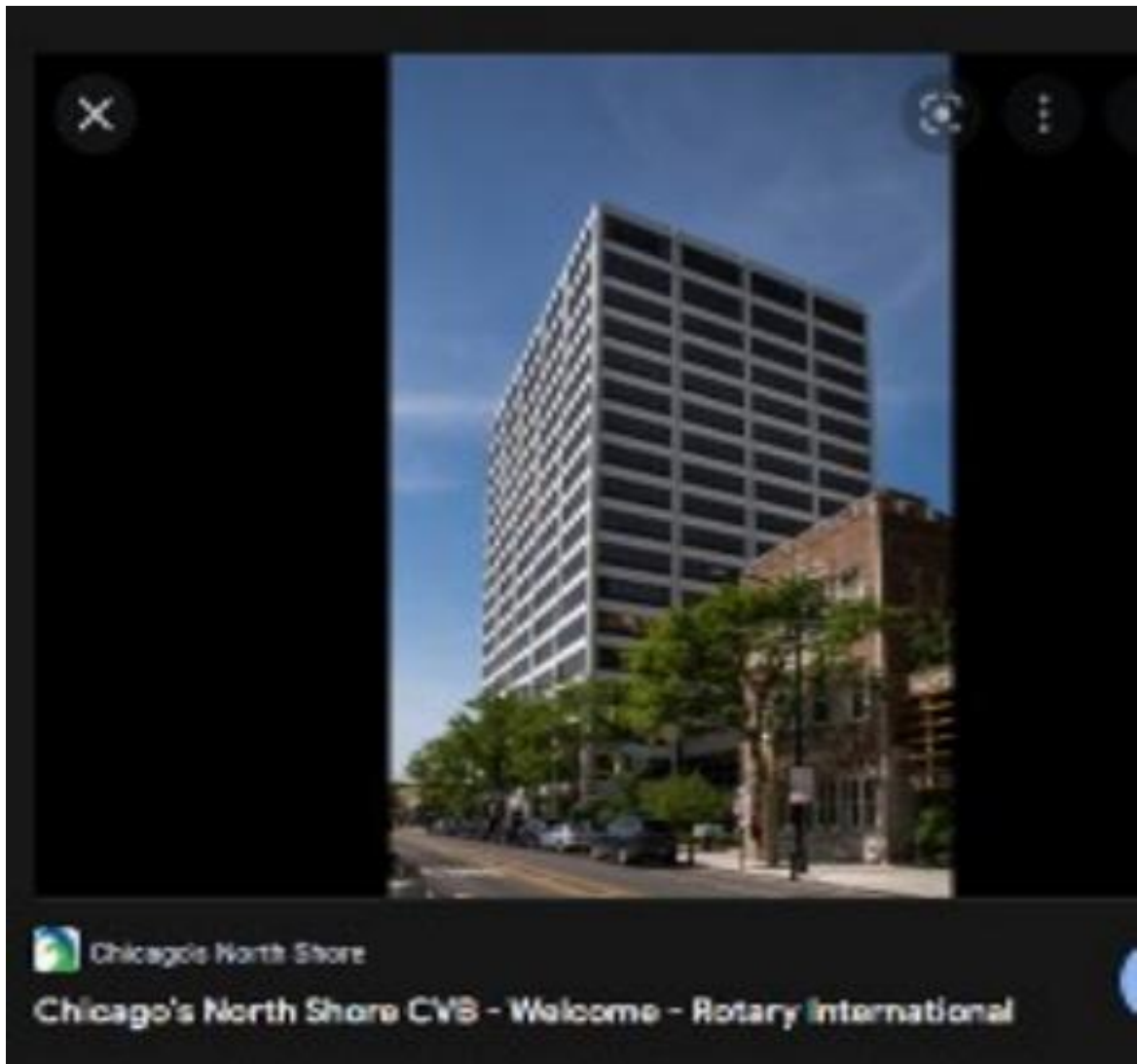
Ventilation, lighting and heating functions are ingeniously integrated in the bearing structure.

The air comes in under the floor and is transported to the roof of the building via the columns and beams where it is circulated round the building via vertical and rectangular windows,



**Figure 3.9:** Approach Elevations: Rotary International at Chicago. Showing vertical view)

(Source: [www.rotary.org](http://www.rotary.org))



**Figure 3.10:** Rotary International at Chicago. Showing side views

(Source: [www.rotary.org](http://www.rotary.org) )

### 3.4.3 Appraisal of the Building

1. Elevations were positioned at strategic locations where necessary for easy vertical movements
2. All spaces are well lighted and effective lighting strategies were adopted.





**Figure 3.12:** Approach view of Rotary international Club House, - Chicago

**Source:** [www.rotary.org](http://www.rotary.org)

- ❖ The building was purposely built as Club house and as well as a monument
- ❖ It is aesthetically edifice speaks the cultural zone values of central area of Evanston

The Whole construction method is load bearing wall design incorporated with a great work taken in elevated appearance in using red clay to compliment the emulsion paint the facial appearance of the concurrence hall with multiple floors and open terrace.

### **3.5 Case Study Three: Rotary Club House International- Chilliwack Canada**

Located within the cultural zone of central area of Chilliwack Canada

The new building is somewhat larger, and include a book drop-off area, display space, office space, storage, and meeting room space.

#### **3.5.1 Description of the Building:**

This Rotary Club House was located in Chilliwack Castilla province, Northern Peru. The Building is bungalow, with lighted environment and was purposely built by Rotary Club International to improve Project constructional activities, such as Educational services, implementation of Library projects and training of future Leaders.



Figure: 3.13: Rotary Club House International- Chilliwack Canada, showing lighted environment  
(Source: [www.rotary.org](http://www.rotary.org))



Figure: 3.14. Interior view The Rotary Club of Chilliwack, Rotary Club of Castilla, interior lighting effects  
(Source: [www.rotary.org](http://www.rotary.org))



**Figure 3.15.** Floor Plan: Rotary Club House International- Chilliwack.  
(Source: [www.rotary.org](http://www.rotary.org))



**Figure 3.16.** Approach Elevation: Chilliwack Rotary Club House, (Source: [Www.Rotary.Org](http://www.Rotary.Org))

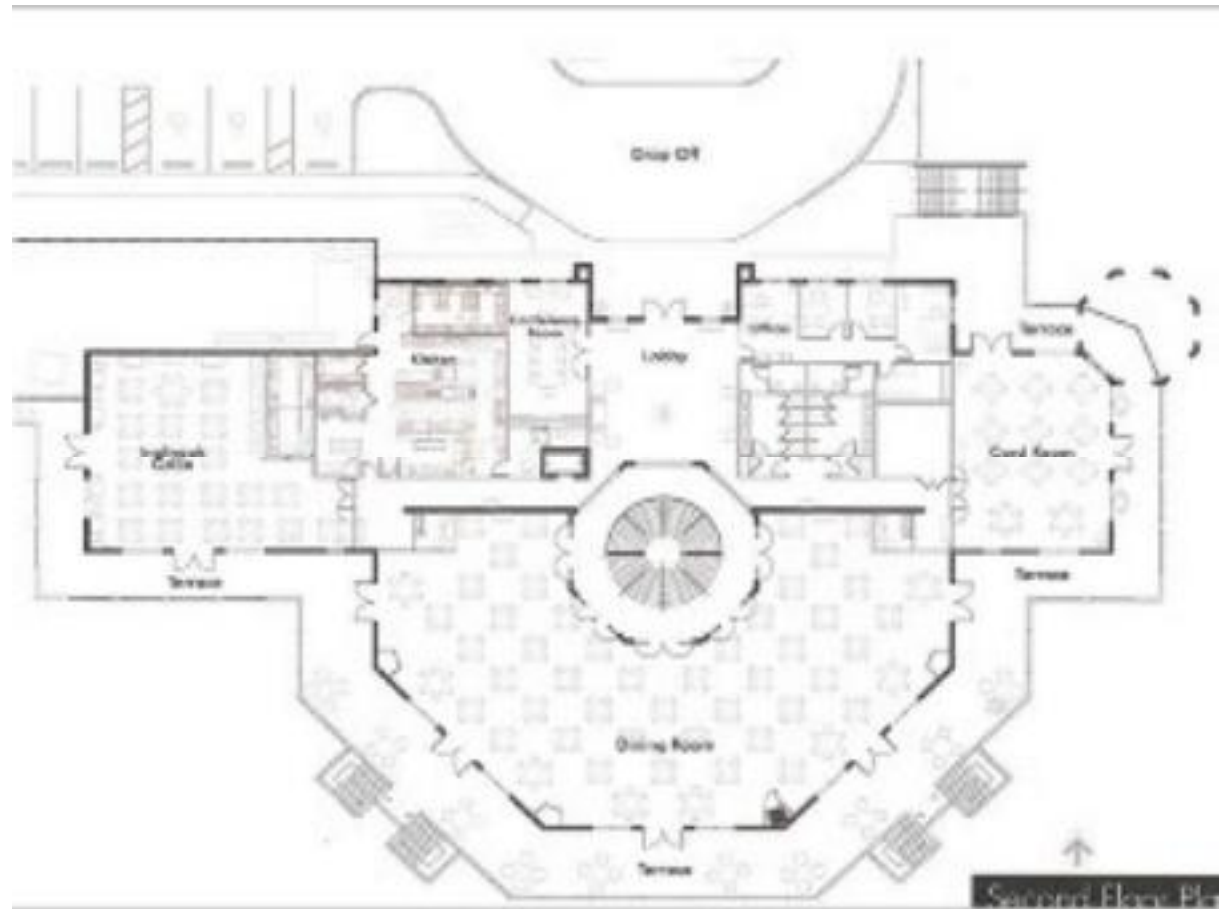
### **3.5.2 Appraisal of the Building**

- ❖ The building was purposely built as CLUB house and as well as a monument
- ❖ It is aesthetically edifice speaks the cultural zone values of central area **Chilliwack**
- ❖ The building is properly landscape. With defined parking space for the users
- ❖ Sport arena, Land scape areas, Swimming pool and Circulation area well defined.

A visual pleasant environment was created round the club house; a great deal of care has been taken in the design of lighting system and the selection of fittings. The generous landscaping provided around the building to enhance it and beautify it.

### **3.6 Case Study Four: Rotary Club House - Inteswal**

Located within the cultural zone of central area of Interwal, The building was purposely built as Club house and as well as a monument, It is aesthetically edifice speaks the cultural zone values of central area of Inteswal



**Figure 3.17.** Floor Plan: Rotary Club House –Inteswal .  
 (Source: Website: [www.rotary.org](http://www.rotary.org)).

### 3.6.1 Appraisal of the Building:

The building is properly landscape. There's defined parking space for the users, Meeting hall, Circulation area, Outdoor games and Drop off Terrace.

**Merits** A great deal of care has been taken in the design of the lighting system and the selection of the fittings to provide a visually pleasant environment. And the generous landscaping provided around the building to enhance it and Garden concept which counterpoise to the eclectic scramble around it.

### 3.7 Case Study Five: Rotary Club House - Ibadan

#### 3.7.1 Description of the Building

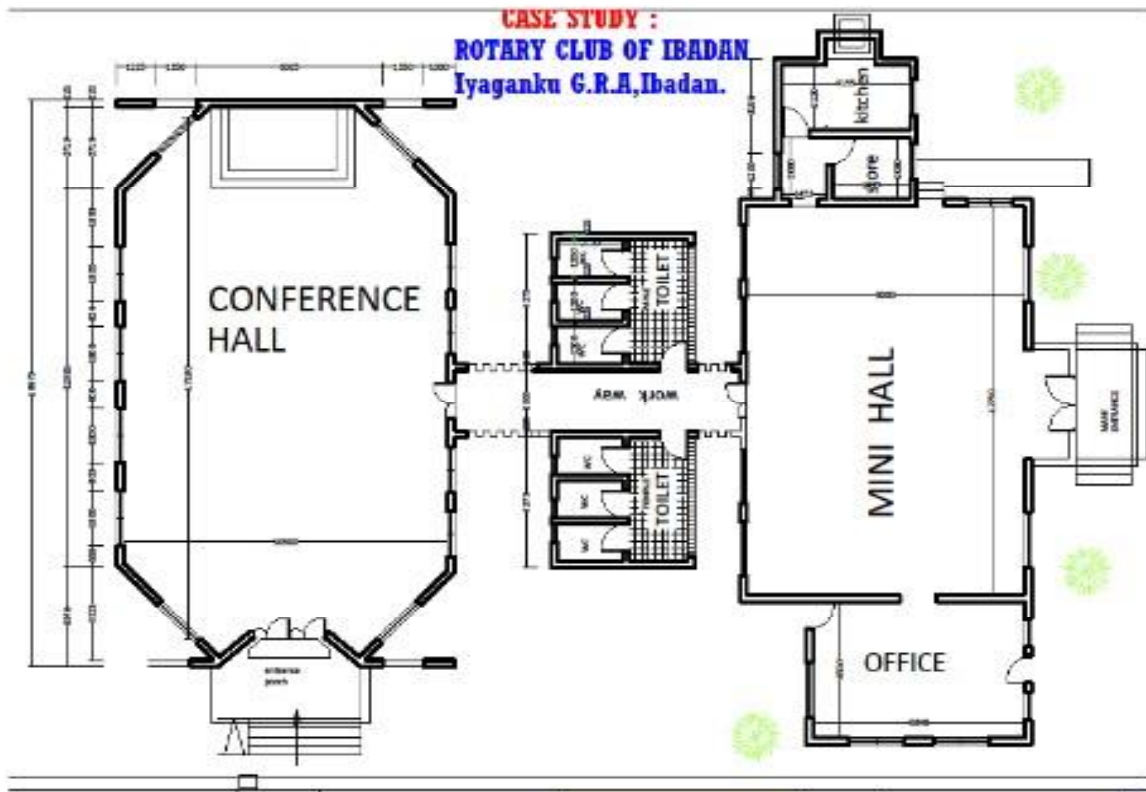
Rotary Club House, Iyaganku, Gra Ibadan, Ibadan, Nigeria. 34 likes · 922 were here. Local business with Latitude: 7.3964. Longitude: 3.9167



**Figure.3.18.** Main Conference Hall: Rotary Club House – Ibadan  
(Source: Author’s Field Work)



**Figure.3.19.** Main Conference Hall: Rotary Club House – Ibadan Side Elevations  
(Source: Author’s Field Work)



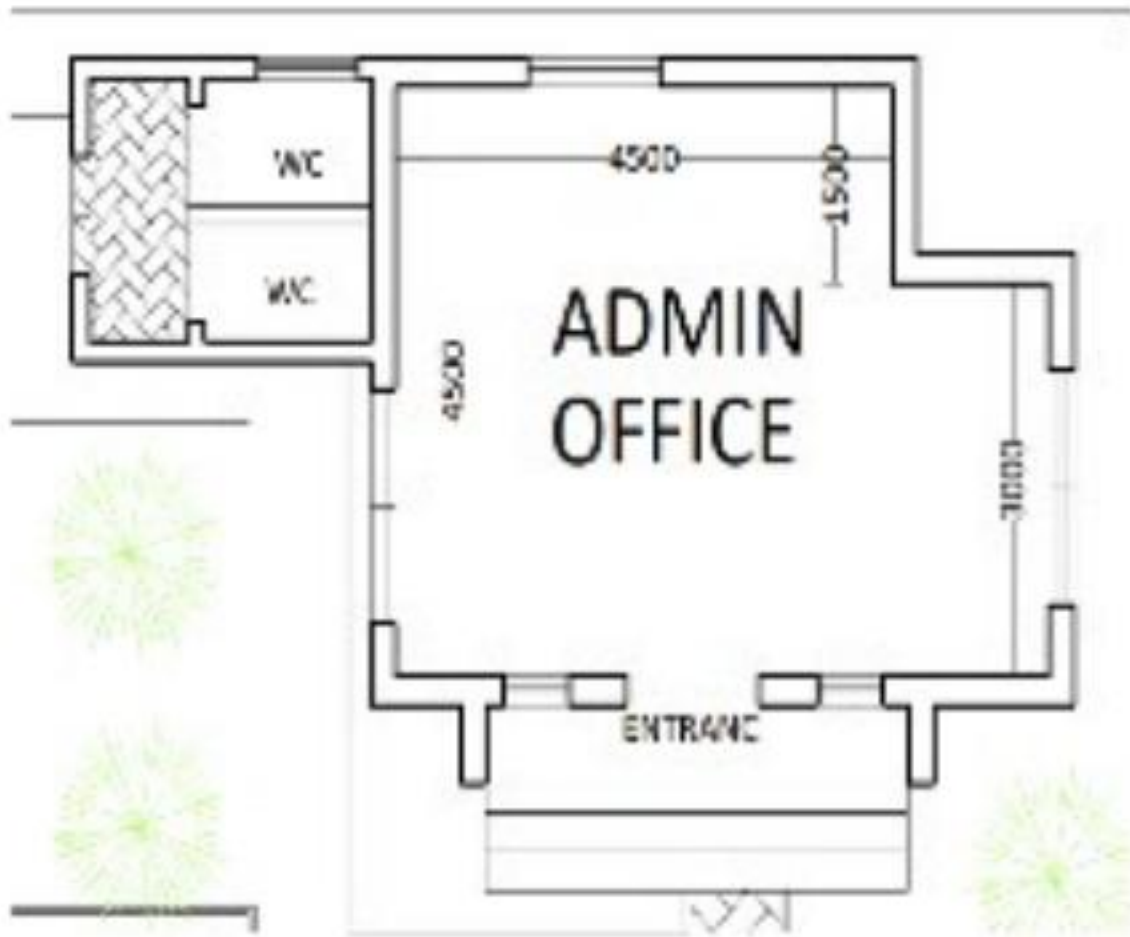
**Figure.3.20:** Main Conference and Mini Hall: Rotary Club House – Ibadan.  
**Source:** Author’s Field Work

### 3.7.2 Appraisal of the Building

The building was purposely built for Club House

The building is naturally ventilated

Allocated acres of Land gives room for future expansion and development



**Figure 3.21.** Administrative block Floor Plan Rotary Club House – Ibadan (Source: Author's field work)



**Figure 3.22.** Administrative block Approach Elevation,  
Rotary Club House –Ibadan (Source: Author’s field work)

**Demerits:**

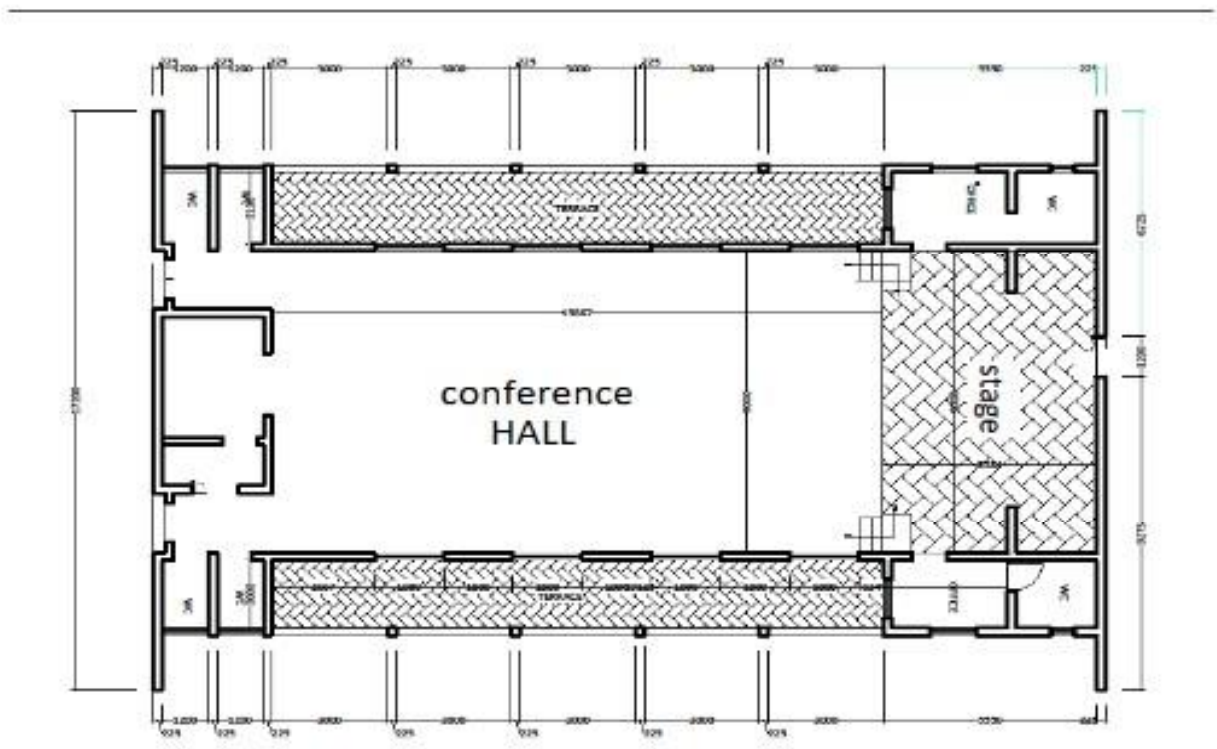
In the assessment of design (building), the expert says “No perfect design”. In the case of NIA (national) secretariat, it was found out that the spaces was inadequate and the place looks a residential building thereby debar its architectural aesthetic externally and poor inter-service arrangement There’s no enough parking space for the users and Lack of a befitting administrative section and Poor landscape maintenance.

### 3.8 Case Study Six: Nigerian Union of Journalist - Ibadan

**3.8.1 Descriptions of the Building** Location: Located at Iyaganku G.R.A .Ibadan.The Oyo State Chapter, Nigerian Union of Journalists is located in No.2 Simeon Adebo Avenue, Iyaganku, Ibadan. It was established in 1995, by the group of able journalist. The National chapter of NUJ was located at No,2, Eric Moore close, Surulere, Lagos. The NUJ Oyo State chapter were designed and constructed by different Architects and contractors respectively.

**3.8.2 Conference hall:** Conference hall was designed and constructed by Ministry of Works and housing awarded by Oyo State Government and was commissioned by Chief kolapo Olawuyi

Isola Ex-Executive Government of Oyo State on 23<sup>rd</sup> November,



**Figure 3.23. Floor plan: ground floor plan Nigerian Union of Journalist – Ibadan (Source: Author’s field work).**



**Fig 3.24. NUJ Conference Hall Side view (Source; Author's field work)**



**Fig 3.25. NUJ Conference Hall Sides elevation (Source; Author's field work)**

### **3.8.3 Administrative**

Converted building, because it formally designed as NUJ clinic, now converted to Administrative block. Designed and constructed by Ministry of Works and Housing awarded by Oyo State Government and commissioned by Col. Sasaeniyen Adedeji Oresanya, Ex-Military Governor, Oyo State on 7<sup>th</sup> day of February, 1990. The building was donated by Oyo State Directorate of Rural development.

### **3.8.4 Guest House**

The guest was designed by Abode Architects, opposite Oyo radio Station, Ibadan, awarded by NUJ. The building was commissioned by Col. Abdul Kareem Adisa, Governor of Oyo State on 5<sup>th</sup> November, 1990 under the Chairman (Executive) Dapo Aderogba.

### **3.8.5 Sport Hall**

Designed and constructed by state government awarded by Abiodun Ajagbe. Hence the hall was named after him called **Abiodun Ajagbe sport hall**.

The hall was commissioned by Oyo state Military administrator Navy Captain Adetoye Sode on Thursday May 5<sup>th</sup> 1994.

### **3.8.6 Main Bar**

Design and constructed by State government, Ministry of Work and Housing

### **Merits and Demerits**

Most of the building are converted to suit the purpose. Administrative building was purposely designed for NUJ Health Clinic which is now use for Administrative block. The design is faulty and inadequate for the purpose.

### **3.8.7 Appraisal of the Building**

Aesthetically, a great deal was taken in elevated appearance in using red clay to compliment the emulsion paint the facial appearance of the conference hall with open terrace. But

administratively is not as attractive aesthetically. The whole structure is load bearing wall separated in blocks apartment in the compound.

Most of the building are converted to suit the purpose. Administrative building was purposely designed for NUJ Health Clinic which is now use for Administrative block. The design is faulty and inadequate for the purpose.

**Demerits:**

In the assessment of the building design failure the following vults is carried out:-

1. Lack of well-defined landscape and packing space.
2. Inadequacy of required functionality space compared to requirement of the people to be served.
3. Inadequacy of facility in term of office well equipped. And the architectural of the building look obsolete poor inter services arrangement.

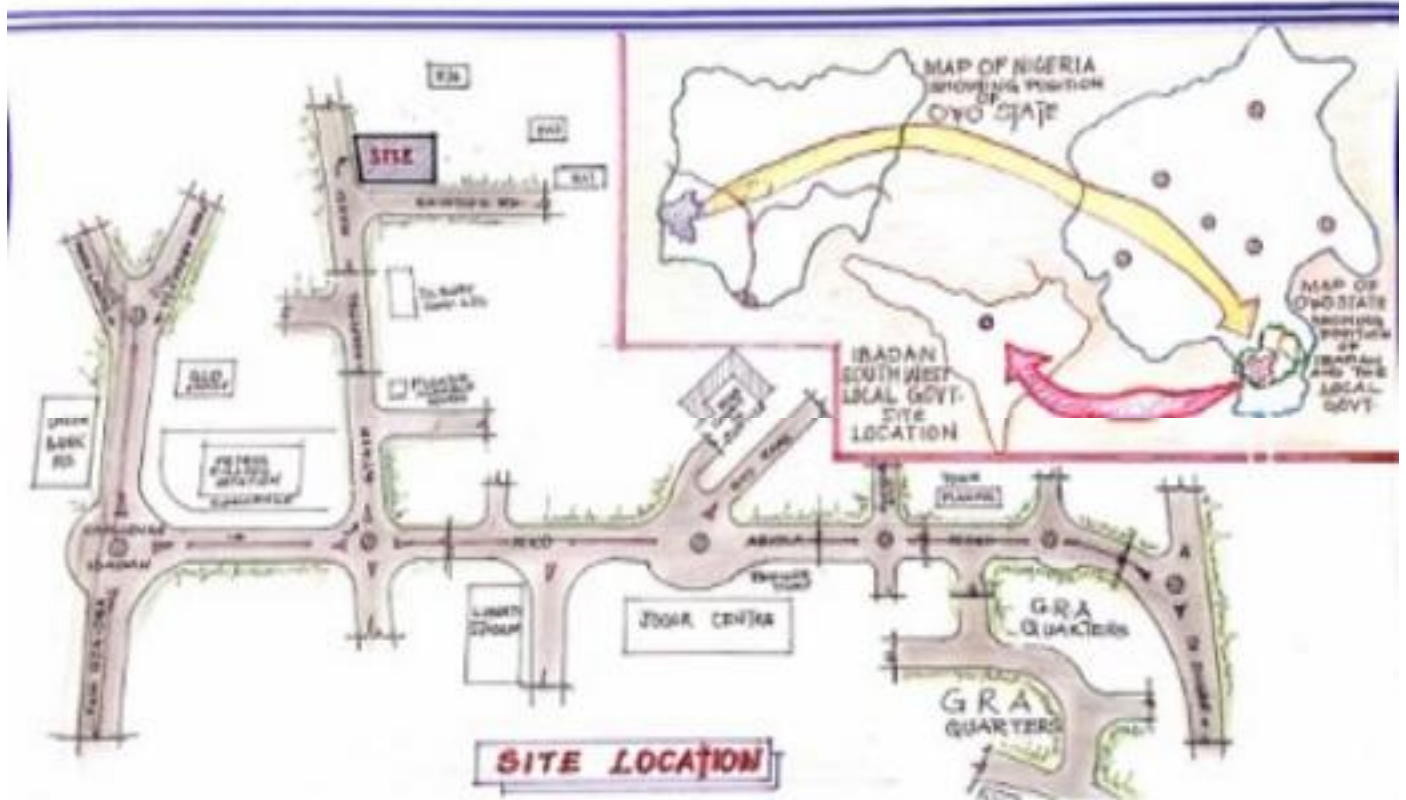
## Chapter Four

### 4.1 Site Analysis Selection and Design Synthesis

#### 4.1.1 Site Location

The proposed Rotary Club Regional Headquarters is allocated a site at Ring Road, Ibadan by Oyo State Government. This site is within south west local government area, Ring road, Ibadan, Oyo

State, along Adeoyo State Hospital road surrounding by simila social and public buildings like Nigerian Union of Journalist (N.U.J.).



**Figure. 4.1.** Proposed Site Location  
(Source; Author's field work)



**Figure. 4.2.** Proposed Google Site Location  
(Source; Author's field work)

#### 4.1.2 Site Selection Criteria

The site is sited in a conspicuous place and suitable and is directly connected to all other branches in term of accessibility and to serve both students and members of the Rotary Club.

The chosen site is capable of providing for all present and future needs of the institute which the project will serve, its location is therefore dependent on (1) its accessibility to member and students A pleasant environment is an ideal setting of Rotary Club Regional Headquarters.

The site selection criteria for the proposed regional headquarters for Rotary club based on the principal principle: site is allocated by Oyo State government on Government acquired land on social Centre. To provide cordial and mutual interaction within the social bodies capable of providing present and future needs for the government. And nearness to Public Utilities: that is

the site has adequate access to basic infrastructures e.g. Good Roads, Electricity, Water, Telecommunications, Security etc.

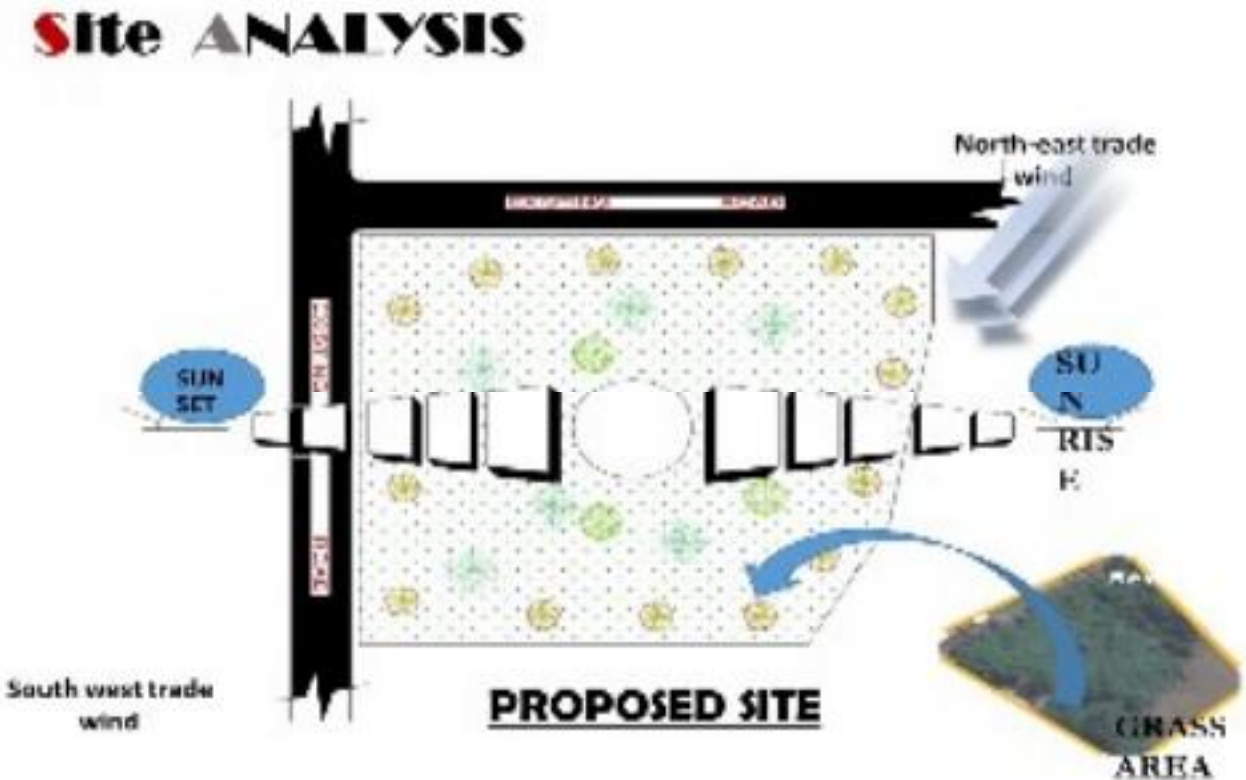
The principle of the site is also based on providing for the needs of the club members which depends on accessibility to all members and public, pleasant environment and ideal of information and mutual interaction.

#### **4.1.3 Site Analysis/Inventory**

The site is a very important aspect of a design proposal being the point at which the tangible percentage of a development emerges or starts making an impact. The site chosen for any project hence goes a long way in determining the final resultant composition of the solution-in-all aspects. The site and its environment determine the solution in terms of contextual appropriateness measured the geographers, geologists, and geometrics. The specific aspect of the site, its micro-climate are thus a complex interaction of any factor, orientation, scope, topography, temperature patterns, humidity, precipitation, vegetation, presence or absence of water, seasonal availability of sunlight especially in urban areas, the influence of other buildings. The success of any design in this case 'Rotary Regional Headquarters' to a large extent depends on a wise site selection. The layout of the building on site will greatly be determined by the topography and Physical features (such as water bodies, access, trees, local climate, utility lines) seen on site. The existing in close proximity to the site will greatly influence the character of the building to be built in terms of forms, beauty and economy of the design. A thorough analysis of the project site that enhances an in-depth understanding of its suitability to the intended purpose is necessary.

The reason is to achieve the aim of the design. Site analysis helps in the functional development

of the relationship that exists between the site and the structure. Every design solution should aspire to be a function of the site and also a direct reflection and adaptation of its environment.



**Figure 4.3.** Site Analysis for the proposed Design  
(Source: Author's field work).

#### 4.1.4 Site Analysis/Development Proposal

The proposal is located in such a way that breeze will be well distributed to the proposed project from the site. The North east monsoon breeze the site- right from the left side of the site and the introduction of fins right of the side prevent sun and wind from entering directly into the building. The secretariat building must be constructed in a way that the main entrance is directly facing the North direction and the conference hall at pointed south direction. Noise pollution entering from main road from traffic pollution and also Noise pollution from parking couple with the noise from neighbor can still be considered in the proposal.

## **4.2 Project Analysis and Design Synthesis**

In the design Rotary Regional Headquarters, certain parameter must be taken into cognizance in ensuring through organization and use of space, the comfort of the users population and the functionality of the total environment in meeting their educational physiological, protective and social needs. The limiting control guidelines impose restrictions on the design of site. A properly located building achieved harmony, increased functional efficiency and minimized drainage problem. The orientation, the plan arrangement, the design of the building and the materials used can contribute to the quality of comfort achieved and minimized cost.

### **4.2.1 Brief Analysis**

The Rotary Club is a Global union of business people having branches all over the Continent. Currently Rotary has more than 1.5 Million memberships, those whom are Business tycoons, Community Leaders and Professionals in their various field of life. As the Club spreads all-over, over 220 Countries, the Club is non-religious and opens to all Cultures and aces.

Rotary Cub was first formed on 23<sup>rd</sup> Februarym1905 by Paul P.Harris. Summarily, the name Rotary was derived from the early practice of rotating meeting among the member's house

### **4.2.2 Brief Development**

The proposed Rotary Regional Headquarters will be an inquisition to business. It will provide the minimum required standards for a functional conference seminars Exhibition business interactions e.t.c.

Hence in conforming to a set standards, spaces to be provided includes;

a) Entrance porch b) Security post provide facilities for conference hall, reference library, Exhibition room and Administrative functions.

#### **4.2.3 Design Criteria/Concept Client/User's Requirements:**

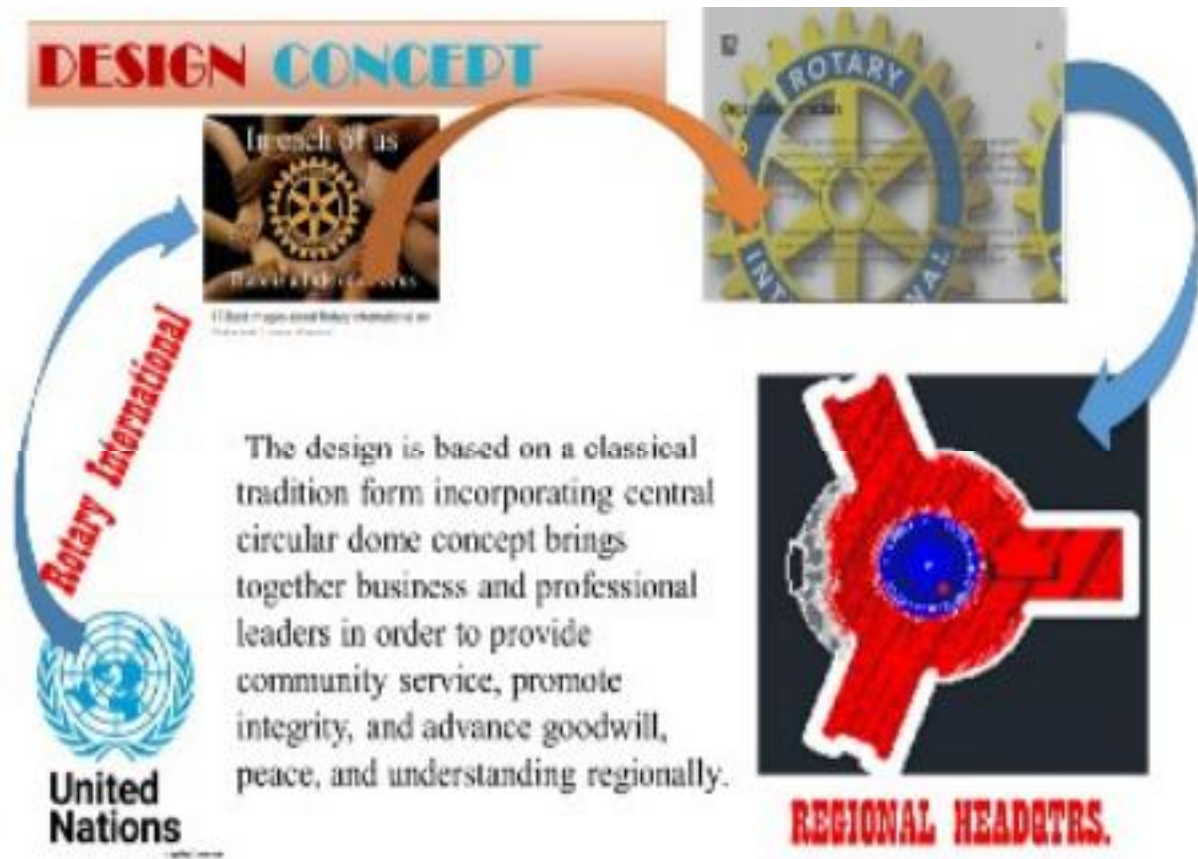
Designing a functional and comprehensive Rotary Regional Headquarters, requires several design considerations with respect to their impact on the overall building. They include: a) Site selection b) Space requirements c) Structure- Economical structural spans and spacing modules d) Ventilation (natural means) e) Air temperature (passive cooling) f) Lighting - daylight, bright lit walls with energy efficient technology (solar panel g) Acoustic- Sound absorptive materials h) High performance features (green Architecture).

#### **4.2.4 Conceptual Development**

A pragmatic approach was taken towards the generation of the building form and arrangement of spaces. Technical requirements such as area of space per person, circulation space requirements for different activities, among others, were considered for the spaces so as to achieve the desired user capacity. Flexibility in the layout of spaces was also an important consideration.

#### **4.2.5 Design Concept**

The proposed design based on the concept that form the functional requirements with atmosphere of quiet dignity flair charm.



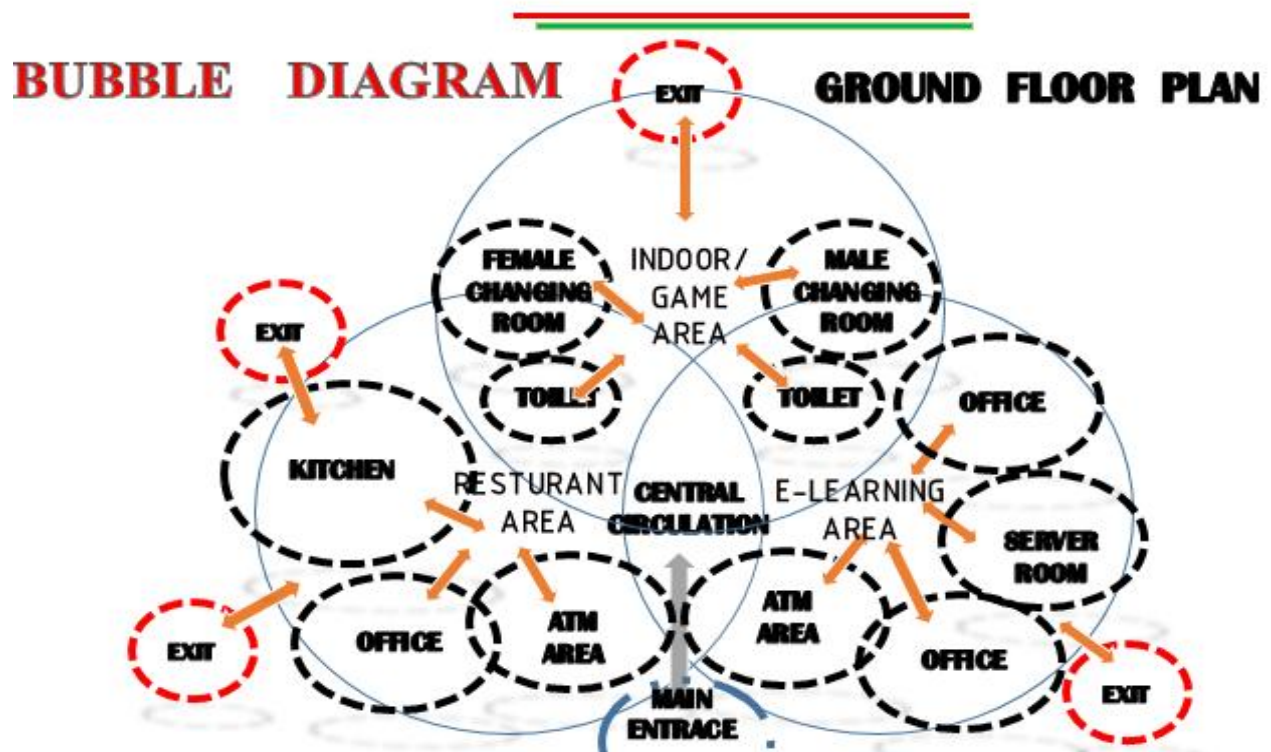
**Figure. 4.4.** Proposed **design concept** for Rotary regional Headquarters  
 (Source: Author’s field work)

The design is based on a classical tradition form incorporating central circular dome concept brings together business and professional leaders in order to provide community service, promote integrity, and advance goodwill, peace, and understanding regionally.

#### 4.2.6 Functional Relationship

The functional relationship chart shows the degree of relationships among the various spaces in the facility. It helps the designer to see at a glance which spaces are or not related to one another. This helps the designer to locate related spaces within easy proximity of each other and isolate those which are not related. It also aids zoning of spaces and functionality of the design. General functional relationship principles taken into consideration include;

1. Separation of the various traffics from one another i.e. vehicular, pedestrian, Staff, students etc.
2. Orientation of buildings to create maximum thermal comfort and convenience
3. Orderliness, functionality, aesthetics, unity.
4. Green areas with soft and hard landscaping.
5. Ample parking spaces.



**Figure 4.5** Bubble Diagram of showing Functional relationship Ground floor plan  
**Source:** Author's Field survey.

## BUBBLE DIAGRAM

## FIRST FLOOR PLAN



Figure 4.6 Bubble Diagram of showing Functional relationship (1st floor plan)  
Source: Author's Field survey.

## BUBBLE DIAGRAM

## SECOND FLOOR PLAN



Figure 4.7 Bubble Diagram of showing Functional relationship (second floor)  
Source: Author's Field survey.

#### 4.2.7 Project Scope

The institute is intended to provide facilities for conference hall, reference library, Exhibition room and Administrative functions. The facilities will create a platform for interaction between the regional headquarters for Rotary club public, other related and the social clubs.

The Regional headquarters has facilities for the Conference hall, Board room Administrative offices staff office and as well as reception lounges for visiting members.

The design is intended to have data stores, to store information and files of the members. Also the design is desired to have surrounding atmosphere well planned and dignity.

#### 4.2.8 Space Allocation /Schedule of Accommodation

**Table 4.1** Spatial allocation of the proposed Rotary Regional Headquarters

Exhibition hall	12	1	36		Mainly for seminars
General office	3	1	49		This space comprises of clerks and the typist.
Library	4	1	30		This space comprises for both the architects and students at a time
Administrative officer	1	1	16		The space is meant for honorary administrative officer
Assistant Administrative Officer	1	1		16	The space is meant for honorary administrative officer

General Secretary	1	1		16	This meant for the secretary alone.
Computer Room	1	1		12	This meant for computer analysis
Data Bank	2	1		12	This space is meant for one researcher
kitchenette	1	1		9	Meant for a person alone at a time

(Source: Author's field work).

#### 4.2.9 Special Requirement/Design Criteria

The special requirement for the project based on provision for professional meeting hall which take the ample space in the project. The Administrative section to the left side of the design provides facilities for lounge Administrative manager and assistant, clerks and general secretary.

While conference hall takes right side position.

Exhibition room and Library take the approach by the right side of the design.

Reception/waiting room takes the approach with atmosphere of quiet dignity, flair and charm.

**Table 4.2.** Spatial requirement for the proposed Rotary Regional Headquarters

SPECIAL REQUIREMENT	NO. OF PERSON REQD.	DIMENSION		REMARKS
		mm	m <sup>2</sup>	
Conference Hall	95	104000	104	This comprises of numbers of Arcs. Mainly for meeting and deliberating.
Administrative Section	9	49000	49	This is mainly for administrative work and affair of NIA.
Exhibition Room	12	36000	36	Mainly for Display of architectural works in the history and seminars.
Library	4	30000	30	For reading and searching.
Reception	5	18000	18	Administration of visitor and waiting room.

(Source: Author's field work).

### 4.3 Climatic Constructions

Wet season starts in April and ends in October while dry season starts in November and ends in March, December and January witness a cold dust laden wind of harmattan. The monthly rainfall, relative humidity and temperature range from one season to the other.

The site then like most other places in the southern part of the country is influenced by these two prominent climate factors, which are worm, moist and dry hot respectively. In essence the proposed regional headquarters for Rotary club shall take due consideration of this factor in the design procedure as regards the orientation.

### 4.3.1 Design Consideration

In the design Rotary regional Headquarters, the following factors are put into considerations:

1. **Lighting:** Lighting is an essential aspect of any building. Adequate lightning is very necessary to achieve a befitting environment. Within the Club building, light can be introduced either naturally or artificially.

2. **Natural Lightning:** This is any form of lightning gotten naturally, i.e. through natural means such as sunlight and moonlight. The window area within a designed space must be at least 10% of the total floor area for adequate natural lightning. It is important to note the amount of light needed in a design in order to determine efficiently the size of the window opening required.

#### Advantages of natural lightning

- (i) It gives a better 3 dimensional view of objects.
- (ii) It gives the color rendering of objects to which we are accustomed.
- (iii) It creates the awareness of the spacing of time and period of day and it is a cheap form of light/solar energy.

#### Artificial Lightning:

This is light gotten through artificial means. It is in most cases used to supplement for day lightning. Artificial illumination could be direct, indirect or diffused in reality, a beam of light is always scattered which describes why light is always diffused.

**Natural ventilation:**

This include the Orientation of the building, Sizes and locations of fenestrations, Vegetation, Artificial Ventilation: Realize the height, size and types of building, position of occupants and the sources of the conditioned air, the location of the ventilating plant. It is better located away from the traffic (vehicular/pedestrian) as a result of dust and where it will not generate noise in the building.

**Landscaping:**

The form of landscaping of the university is aimed at satisfying user requirements, having aesthetic value and improving environmental comfort. Hence landscaping will be considered in the design.

**Wind:**

Wind is a liability in cold climates because it strips heat away quicker than normal; wind can also be a liability to comfort in hot dry climates when it causes the human body to dehydrate and then overheat, Wind can be an asset in hot, humid climates to provide natural ventilation, Use natural ventilation wherever feasible; to wind through plan orientation and configuration, number and position of wall and roof openings, and relationship to grade and vegetation and Use wind scoops, thermal chimneys, or wind turbines to induce ventilation on sites with limited wind.

**Sun:**

Sun can be a significant liability in hot climates, but is rarely a liability in cold climates. Sun can be an asset in cold climates to provide passive heating, Design must reflect seasonal variations in solar intensity, incidence angle, and cloud cover, and storm influences.

**Temperature:**

Temperature is a liability in climates where it is consistently too hot or too cold, Areas that are very dry or at high elevation typically have the asset of large temperature swings from daytime heating to nighttime cooling, which can be flattened through heavy/massive construction to yield relatively constant indoor temperatures. Provide shaded outdoor living areas such as porches and decks and Capitalize on cool nighttime temperatures, breeze, or ground temperatures.

**Moisture:**

Moisture can be a liability if it comes in the form of humidity, causing such stickiness that one cannot evaporative cool (cooling by perspiring) in summer, Strategies to reduce the discomfort of high humidity include maximizing ventilation, inducing air flow around facilities, and venting or moving moisture-producing functions such as kitchens and shower rooms to outside areas,

**4.4 Constructional Method and Materials**

To achieve maximum functionality of the project a careful selection of materials and methods of construction deserves an in-depth study. In order to get a very good functional requirement the construction method for this project should be handled, properly, hence the following factors to be consider for the selection of material. Climatic, economy, aesthetics, cost, durability and the ease to maintenance are all considered factors. And also in chosen right type of materials.

**4.4.1 Foundation**

The soil has good load bearing capacity, hence strip foundation will be adopted and in some area reinforcement has to be introduced where necessary.

The depth of the foundation will be determined on the site. Earth filling should be well compacted, so also is to hand care fill which should be well consolidated.

#### **4.4.2 Floor and Floor Finish**

The floor will be specified according in the toilet Ceramic tiles will be used throughout on the concrete finish in the conference hall terrazzo will be employed for Library screed floor finish with P.V.C tiles.

#### **4.4.3 Wall**

External wall- sandcrete block wall and day construction will be used with cement mortar binder, blocks of 225, 150 mm will be used and in some doubled depending on the function of the area of such walling system. It prevents against external disruption and weather elements.

#### **4.4.4 Roof**

There are many types of roofing system that can be used in building, the choice any particular type would be dependent on the span and shape of the building the supporting structure, the lighting needs and the esthetics desired. The simplest roof structure for this project is gable roof for solar and rain protection.

#### **4.4.5 The Superstructure**

The height of the superstructure would determine the type of support that would be used in any structure. Since the project is a mere bungalow building, the column system is only used in some conspicuous points of the building like entrance canopy. This is in form of rectangular grid columns system to allow for easy in expansion in any direction. Also Arches are the top of this column for aesthetics purposes.

#### 4.4.6 Doors and Windows

The material used for the doors are purely Aluminum door except in some certain internal spaces where flush is been applied: This are made of plywood with good laminated timber and very strong. Windows used in the cause of this project are mainly aluminum except in some internal spaces where louvres window are used. The frame are of wood and is gives good cross ventilation.

#### 4.4.7 Schedule of Finishes

**Table 4.3** Schedule of Finishes for the proposed Rotary Regional Headquarters

SPACES	FLOOR	WALL	CEILING	ROOF	WINDOW	DOOR
Entrance Porch				Longspan Aluminum Roofing Sheet	Aluminum Window	Aluminum Doors
Reception				“	“	“
Conference	Non-slippery Ceramic Tiles	225mm Block wall finished with POP screeding, apply 2coats of paint	P.O.P	“	“	Security imported door
General Office	Fully Rugged	“	“	“	Aluminum Window	“
Administrative secretariat	“	“	“	“	“	“
Assistance Secretary	“	“	“	“	“	“

Library	Ceramic Tiles	“	“	“	“	“
Exhibition	Terrazzo Floor Finish	“	“	“	“	Aluminum Door
Data Bank	P.V.C Tiles	Wall Treated with colour PT	“	“	Louvre Blade Window	“
Computer Room	P.V.C Tiles	“	“	“	“	“
Coffee covered Terrace	Terrazzo Floor Finish	Wall with coloured Sandtex	Polished Slites Timber	“	“	“
Kitchenette	Red Coloured Cement Finish	Wall treated in Emotion PT	White Celotex Board	“	Louvre Blade Window	Flush Laminated Door
Terrace	Terazzo Finish	With Coloured Sandtex	Polished Slites Timber	“	“	“
Toilet	Ceramic Tiles	Ceramic Tiles to Certain High	“	“	Aluminum Window	“

(Source: Author's field work).

## 4.5 Building Services

### 4.5.1 Ventilation

Adequate ventilation should be provided which could either be mechanical or Natural with priority to Natural ventilation. Since natural ventilation is the best way to allow for optimum comfort within the conference hall and in administrative offices, a great effort should be made

for its provision also the incessant power failure in Nigeria would not allow for optimum efficiency of artificial ventilation that could be provided.

Effective natural ventilation could be achieved by having fenestration as large as possible and orientating of library, conference hall and administrative offices such that the longer side are facing the direction of wind. Also adequate provision of air space and setbacks be made between the Rotary building and the adjacent buildings. Proper artificial ventilation like air conditioners would only be provided in administrative offices and also with electric fan could be provided in other spaces to aid the natural ventilation by using mechanical method, which is another form of artificial ventilation with low maintenance cost.

#### **4.5.2 Lighting**

Choosing the best lighting is a complex problem because the lighting has to perform entirely different functions viz: To allow the users' comfort, to contribute to the internal appearance of the building and to make external impact upon the passerby psychologically.

Lighting affects the emotions of users, awakens and brightens the aesthetics response of individuals. Light, when appropriately used is a mood one bright light promotes hardwork subdued light makes one feel relaxed and when too subdued makes one sleep.

In the cause of this project, Artificial and natural lighting should be adopted.

Natural day lighting should be allowed priority over artificial lighting and could be achieved through the use of clear transparent glass windows. The general form of artificial lighting to be used in the cause of this project is fluorescent lights and incandescent lighting where the fitting cost is low but power consumption is high.

### **4.5.3 Acoustics**

Acoustical materials that will help reduce the reflection of sound should be provided i.e. by laying carpet or hanging curtains where applicable. This needed because an effective sound control must be provided in order to create a pleasant environment.

Air born noise developed within the building can be reduced by treating ceiling and wall surface with acoustic material. The acoustic problems can be a solved by way of: creating buffer zone against environmental noise pollution at the preliminary design stage such as rows of trees. Proper selection and use of sound absorbing materials, such as suspended acoustic tiles for ceiling, soft floor covering like carpet, use of resilient separation materials.

### **4.5.4 Plumbing**

The plumbing network is distributing sanitary services the secretariat is the use of underground and conduit piping. These are neatly down by experienced technicians. All plumbing works will be passed through duets and all the plumbing works that caring the waste products are properly directed into the central sewage system for further treatment.

### **4.5.5 Refuse and Sewage System**

Dust bin will be provided at interval within the premises which shall be collected by sanitary Disposal trucks. Sewage system laid down by town planning shall be met, hut since public sewage are not in existence in this part of the town, and private sewer will be employed through soak away pits.

### **4.5.6 Water Supply**

There should be adequate and constant water supply from nearest section through the top and this helps a great deal in improving the sanitation level on the premises as the toilet and gutter are easily maintained and good portable water available every times.

#### **4.5.7 Fire Protection**

Fire hydrant extinguishers are placed at strategic places or point both in and outside of the building or connected directly to the site fire mains. There should also be emergency exits within the building.

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## Chapter Five

### Conclusion

#### 5.1 Summary of Findings

Summarily, the Case study sites were careful selected based on the following criteria: aligns with the topic of study, it has universal applicability, functional and relevant factors to the study, with the intent of adopting effective natural lighting strategies in view.

Findings captured selected Rotary club regional headquarters and some others which helps to garner useful techniques and information both local and internationally that further informed the design of the proposed Regional Headquarters for Rotary Club.

Finally, poor and uncondusive environment now turn to a very interesting, educative and quiet dignity environment and permanent one where all philanthropist within the club can usefully render their services to the public.

#### 5.2 Conclusion

In Conclusion, it is cleared from the inception to the completion of this project that the aims and objectives have now come into reality.

The provision of the Regional Headquarters for Rotary Club would actually settled the heart of members, and confidentially have the sense of belonging to an Club having a regional headquarters of its own, and however serve as a centre of attraction holding the districts together regimentally<sup>9</sup> for them to hold meeting, lunching, seminars and forum and discuss problem of the club and meet the needs of people in the society.

The project however would actually out left not in providing very attractive, conducive incorporating atmosphere of quiet dignity, and make it centre of attraction for the members. Finally, poor and uncondusive environment now reform or turn to a very pleasing, interesting educative and quiet environment, a very permanent one. **See Appendixes.**

### **5.3 Recommendations**

It is recommended that the proposed Rotary Regional Headquarter will serve a long ways

- i) As a contact Secretariat for regional activities for Oyo, Ogun, Ondo, Lagos, Ekiti and Osun States. This foster unity among the members of these States. The building at the same time will serve outsiders that need the services or help of Rotary Club centralized in Oyo State.
- ii) It is recommended that the proposal could host seminars, symposiums, workshops and conferences, at the same time a means of generating income for both Government and the club by renting it out to wishers.
- iii) Finally, the building is recommended for training and vocational Centre for the Less-privileges in the society.

### **5.4 Contributions to the Knowledge**

In the light of this proposal, the seminars, symposium and conferences which currently being held at the hired premises and which used to face a lot of handicaps will now be catered for in this new proposal.

Another thing is that other Rotary regions and Districts can confidently come to this regional headquarters that is the property of their Rotary Club and without much ado ask for specific assistance which he could never dare to ask previously because he knew that lack of office space prevent the storing of such data or information because the hired premised are quiet inadequate for such occasion. Finally, poor and unconducive environment now turn to a very interesting, educative and quiet dignity environment and permanent one where all philanthropist within the club can easily be useful to the public.

## **5.5 Suggested areas of further Research**

- (I) NIA Nigerian Institute Architects
- (ii) ARCHON Architects Registration Council
- (iii) NUJ Nigerian Union of Journalist
- (iv) Omo-Ajorosun Social Club

Some other suggested areas of studies of Rotary Club Regional Headquarters could be traced back to Ways in which Rotarians have continually adapted and improved the way they respond to those needs, taking on a broad range of service projects, The most successful and sustainable Rotary service tends to Peace and Conflict Prevention / Resolution, Disease Prevention and Treatment, Water and Sanitation and Maternal and Child Health.

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## **Appendix**

### **Appendix 1**

#### **Presentation Drawings**

- (i) Site Location (ii) Site Plan
- (iii) Ground/First Floor Plan
- (iv) Roof Plan (v) Sections (vi) Elevation

### **Appendix II**

#### **Working Drawings**

- (i) Ground Floor Plan
- (ii) First Floor Plan
- (iii) Sections

### **Appendix III**

#### **Details Drawings**

- (iii) Foundation
- (iv) Floor Finishes
- (v) Roof Details

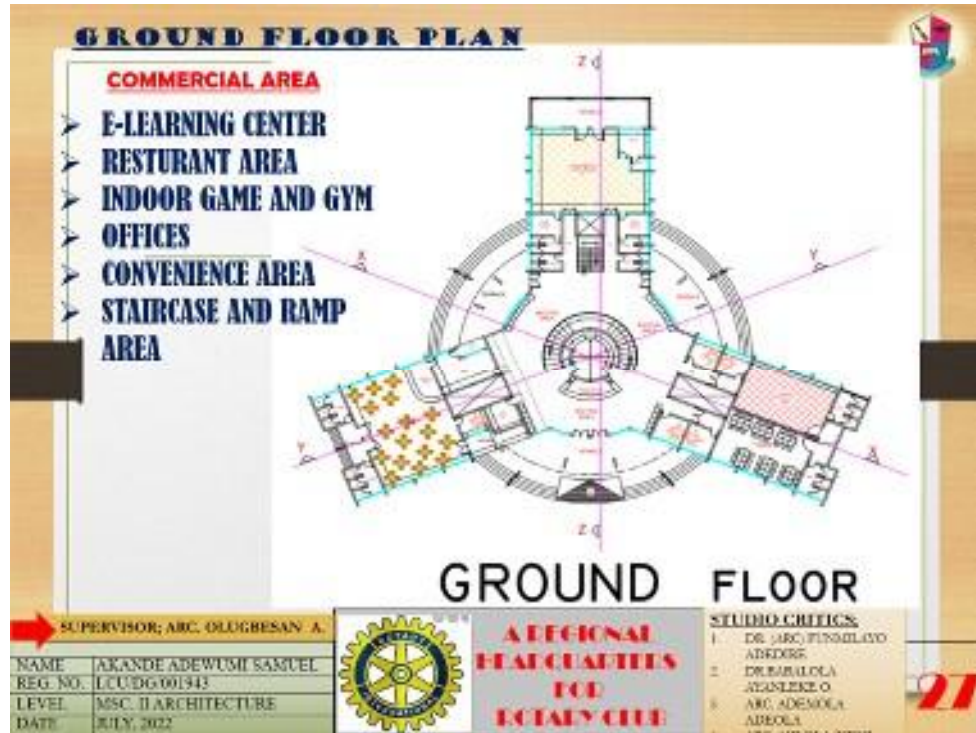
**Appendix I Site Location:**



**Site Plan**



## Ground Floor Plan



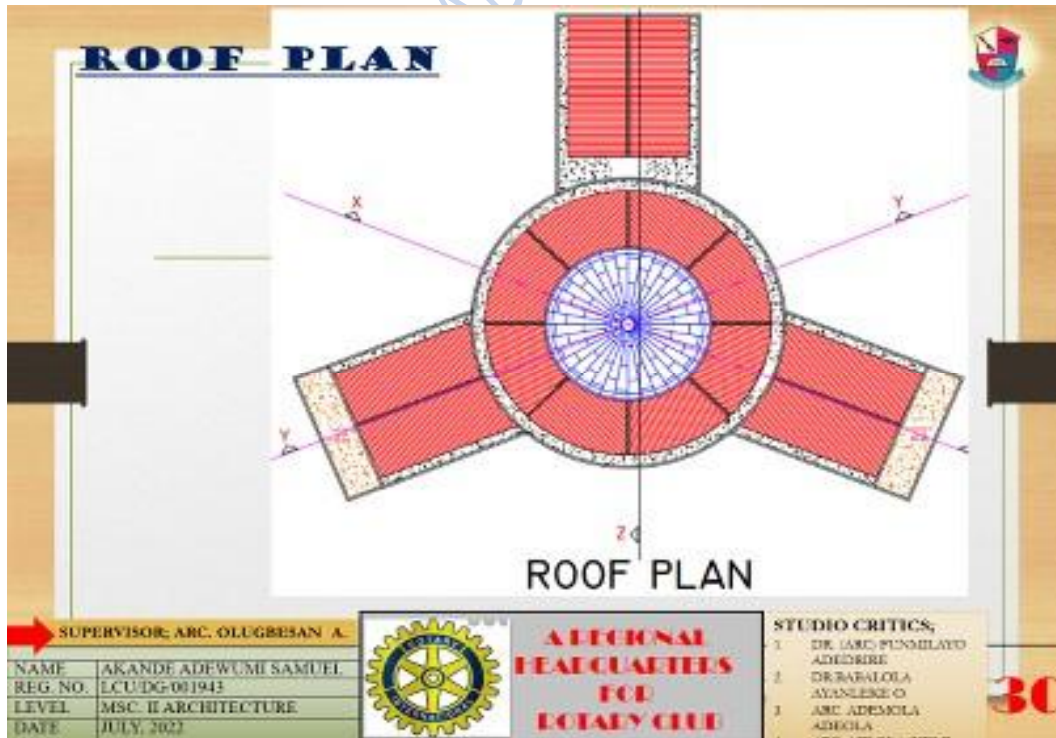
## First Floor Plan



## 2<sup>nd</sup> Floor Plan



## Roof Plan



Section x-x

## SECTION X-X

**SECTION X-X**

<b>SUPERVISOR:</b> ARC. OLUGBESAN A.		<b>REGIONAL HEADQUARTERS FOR LOCALITY CLUB</b>	<b>STUDIO CRITICS:</b> 1. DR. ARC. FUNGLAYO ADEDE 2. DR. BABALOLA AYANLEKE O. 3. ARC. ADEMOLA ADEOLA	<b>31</b>
<b>NAME:</b> AKANDE ADEWUMI SAMUEL				
<b>REG. NO:</b> LCU/DG/001943				
<b>LEVEL:</b> MSc. II ARCHITECTURE				
<b>DATE:</b> JULY, 2022				

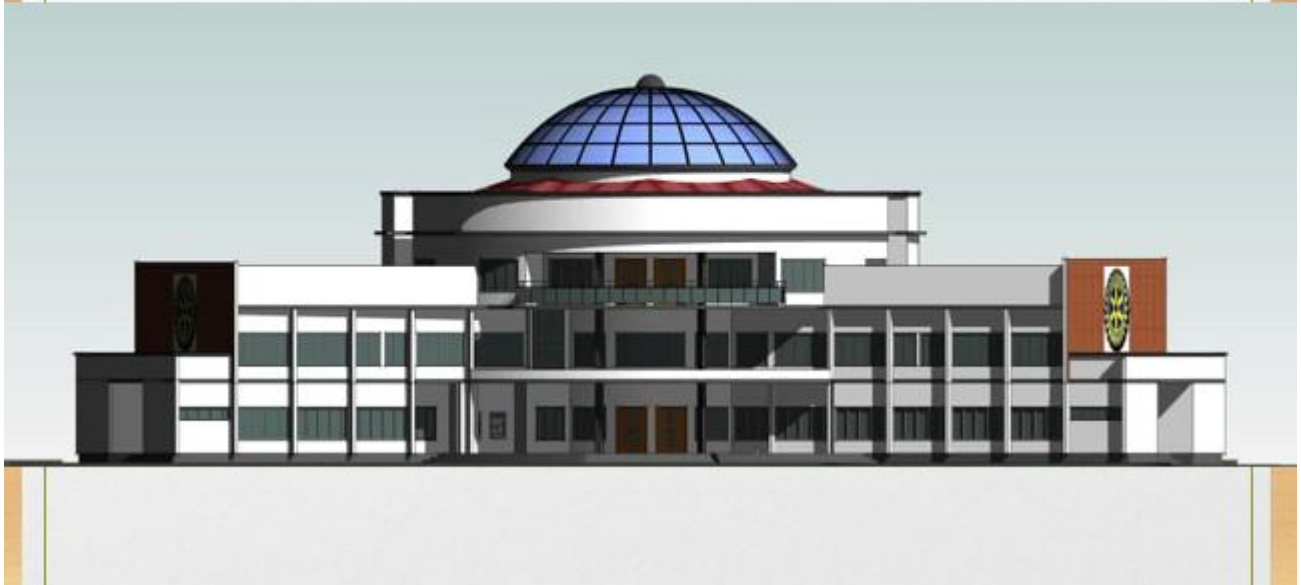
Section Y-Y

## SECTION Y-Y

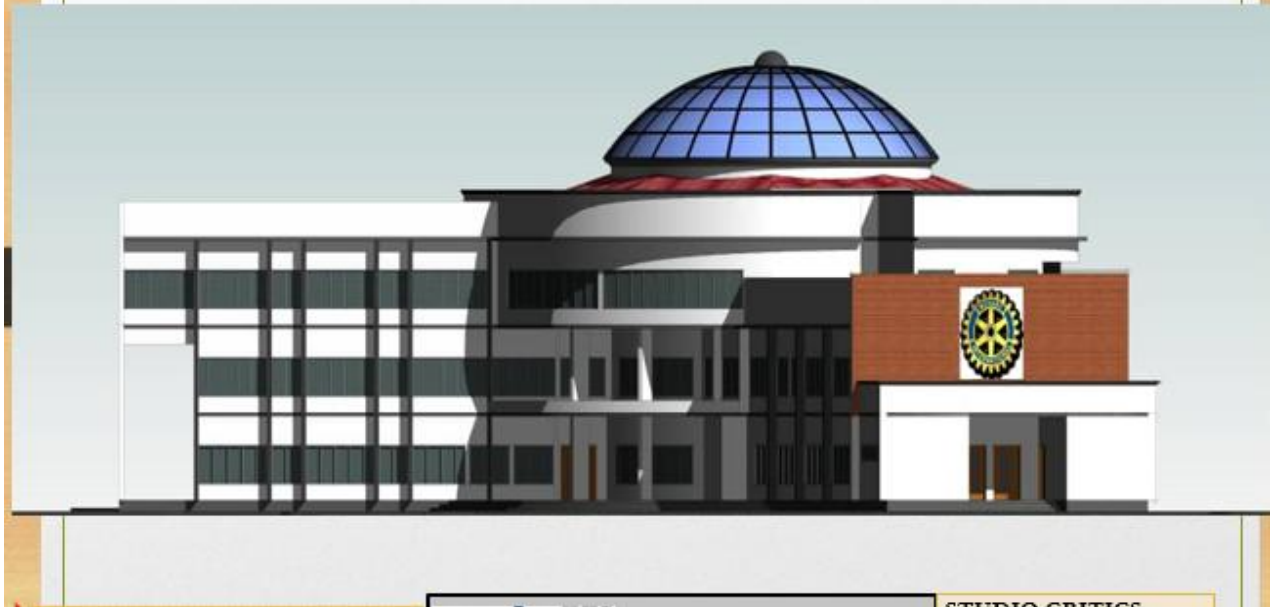
**SECTION Y-Y**

<b>SUPERVISOR:</b> ARC. OLUGBESAN A.		<b>REGIONAL HEADQUARTERS FOR LOCALITY CLUB</b>	<b>STUDIO CRITICS:</b> 1. DR. ARC. FUNGLAYO ADEDE 2. DR. BABALOLA AYANLEKE O. 3. ARC. ADEMOLA ADEOLA	<b>32</b>
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<b>LEVEL:</b> MSc. II ARCHITECTURE				
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**APPROACH VIEW**



**RIGHT VIEW**



**North Elevation 1**



**East West Elevation 2**



**Bird View**

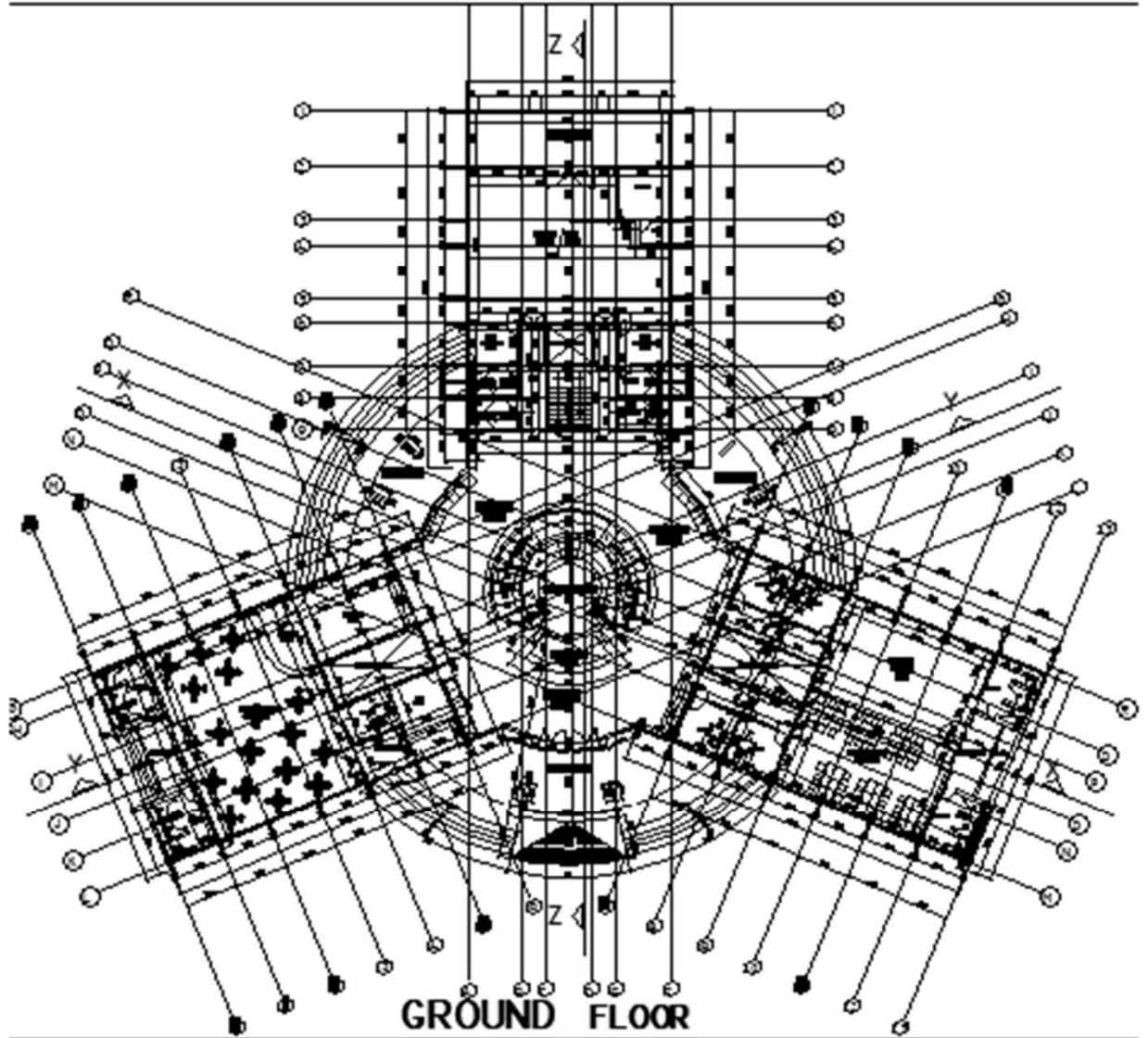


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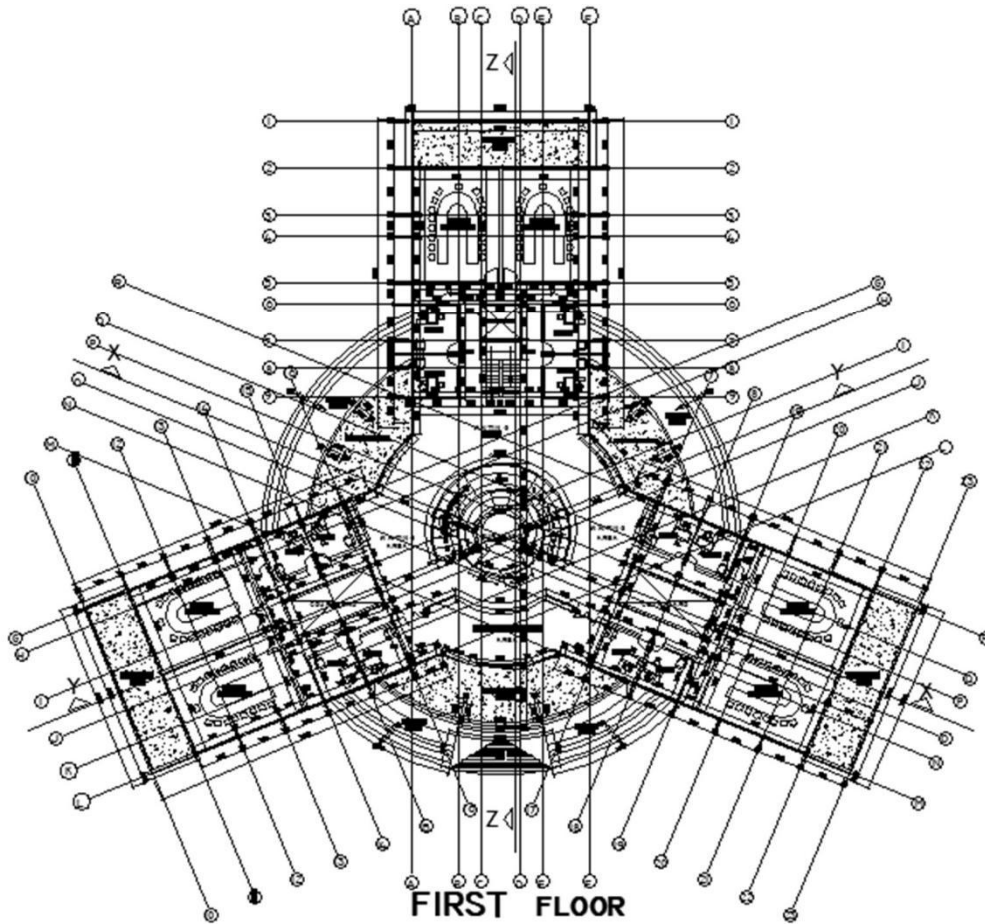
## Appendix ii

### Working Drawings

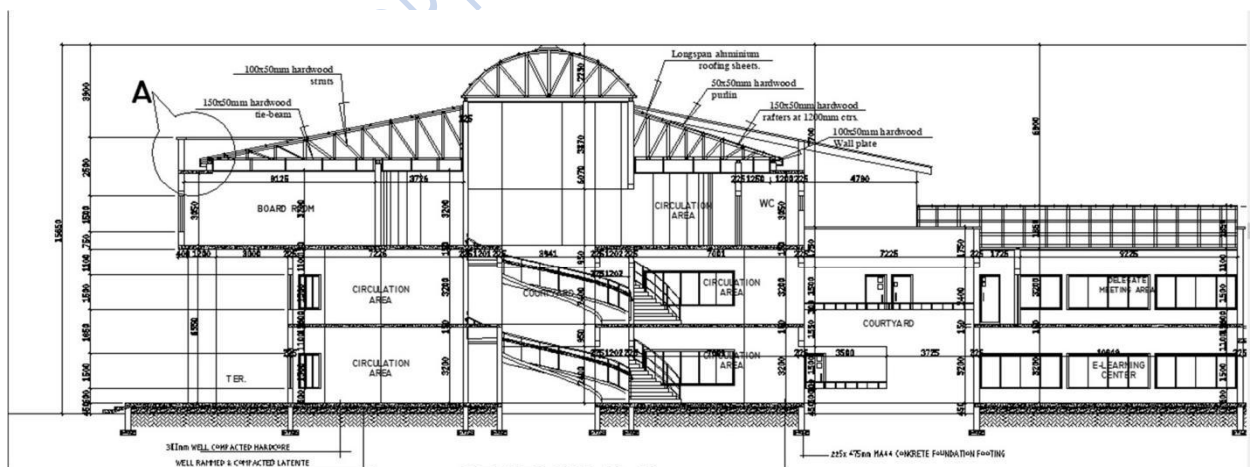
#### Ground Floor Plan



# First Floor Plan

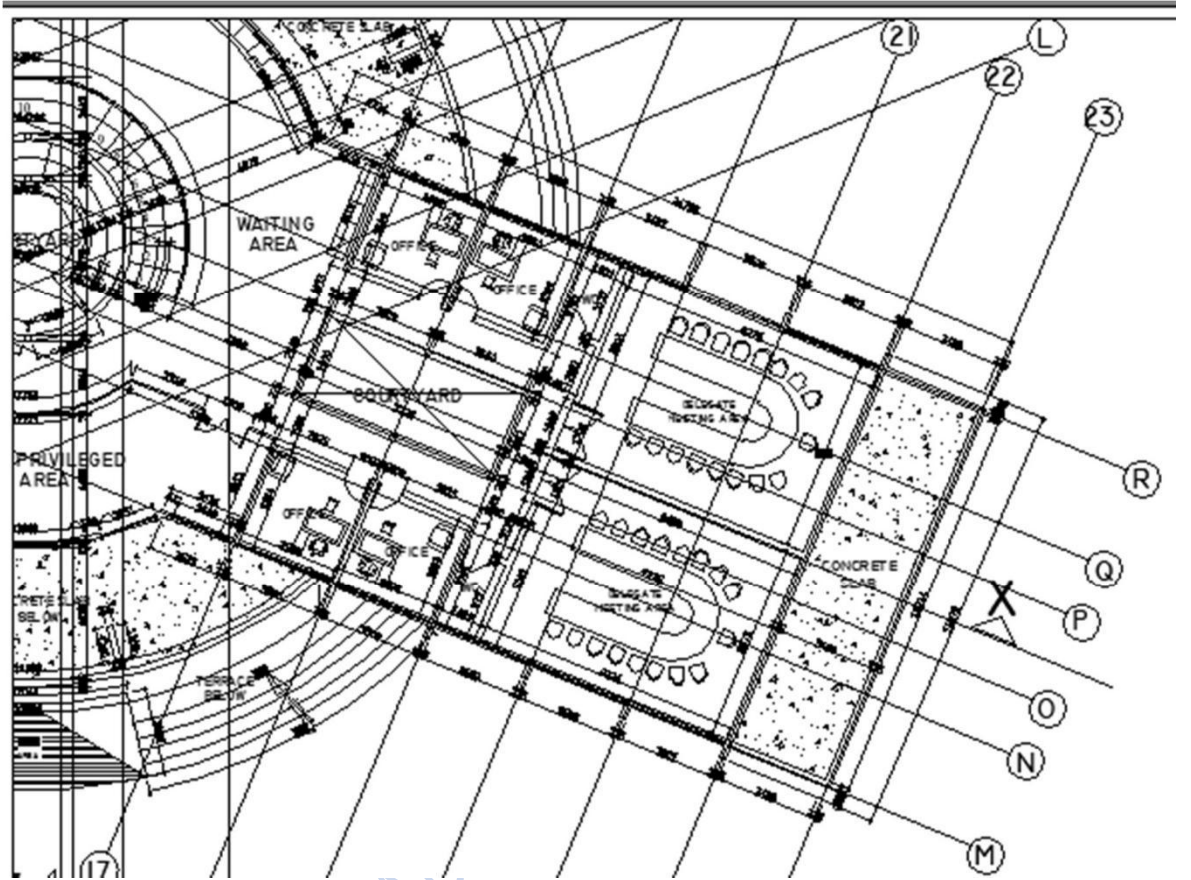


## (ii) Section



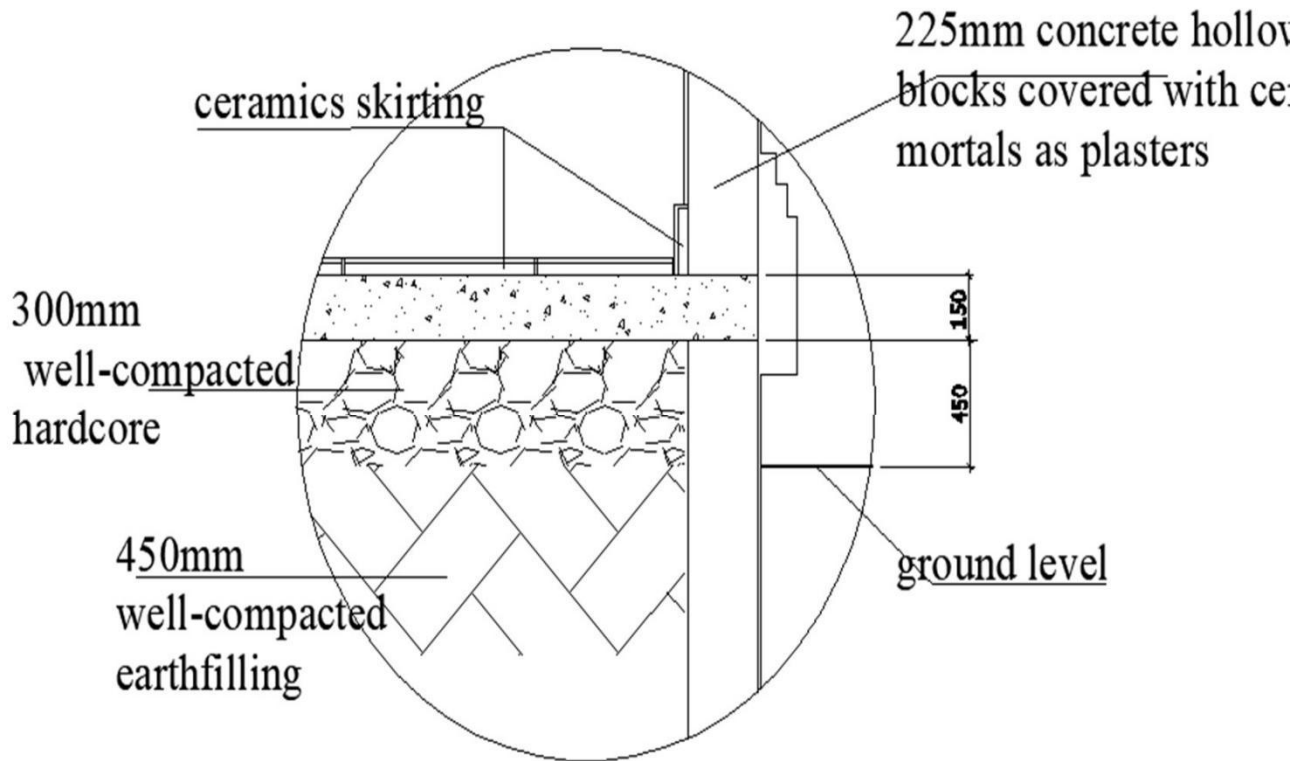
## (3) DETAILS DRAWINGS

# Floor Plan Details



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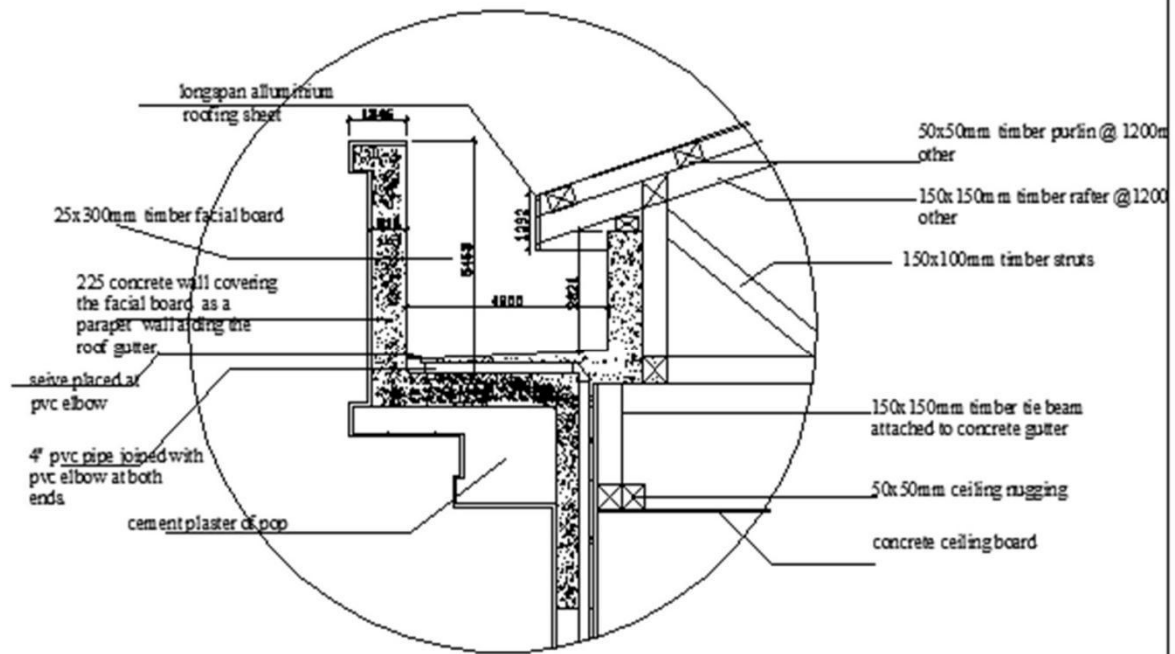
Foundation Details



# foundation DETAIL AT P

DO NOT

(i) Roof Details



Roof DETAIL AT A

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