

**DAYLIGHTING STRATEGIES IN THE DESIGN OF STATE HIGH COURT
COMPLEX IN UYO, AKWA IBOM STATE**

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GOU/U22/ARC/186**

**DEPARTMENT OF ARCHITECTURE
FACULTY OF NATURAL SCIENCES AND ENVIRONMENTAL STUDIES
GODFREY OKOYE UNIVERSITY, ENUGU
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JULY, 2026

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**A PROJECT RESEARCH SUBMITTED TO THE DEPARTMENT OF
ARCHITECTURE IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE
AWARD OF BACHELOR OF SCIENCE
[B.SC] DEGREE IN ARCHITECTURE**

SUPERVISOR: ARC. DR. JERRY OBIEFUNA

JULY, 2026

APPROVAL PAGE

This project entitled "**Daylighting Strategies in the Design of State High Court Complex in Uyo, Akwa Ibom State**" was carried out by **Ekong UnwanaAbasi Justin (GOU/U22/ARC/186)** and has been examined and approved as meeting the requirements of the Department of Architecture, Faculty of Natural and Environmental Sciences, Godfrey Okoye University, Enugu, for the award of the degree of **Bachelor of Science (B.Sc.) in Architecture**.

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CERTIFICATION

I certify that this project entitled "**Daylighting Strategies in the Design of State High Court Complex in Uyo, Akwa Ibom State**" was carried out by **Ekong UnwanaAbasi Justin (GOU/U22/ARC/186)** under my supervision in the Department of Architecture, Faculty of Natural and Environmental Sciences, Godfrey Okoye University, Enugu.

The work presented in this report is original and has not been submitted, either wholly or partly, for the award of any degree or diploma in this or any other institution.

Project Supervisor

Signature: _____

Date: _____

DEDICATION

This project is dedicated first to **Almighty God**, whose grace, wisdom, strength, and unfailing guidance have sustained me throughout my academic journey.

It is also dedicated to my beloved parents and family for their unwavering love, encouragement, sacrifices, and continuous support, which have been the foundation of my educational pursuit.

Finally, this work is dedicated to every student of architecture and future designer whose passion is to create functional, sustainable, and innovative spaces that positively impact society.

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ABSTRACT

Judicial buildings are critical public institutions where lighting quality directly affects visual performance, occupant comfort, and operational efficiency. In Nigeria, many court facilities suffer from inadequate daylighting, poor spatial organization, and heavy dependence on artificial lighting which is a significant challenge given inconsistent electricity supply. These deficiencies reduce visual comfort, increase energy costs, and compromise the dignity of judicial environments. This study therefore examines the elements of daylighting in judicial buildings and applies the findings to a design proposal for a State High Court Complex in Uyo, Akwa Ibom State. The research employed descriptive and qualitative methods, including literature review, case study analysis, site analysis, and design synthesis. Six case studies were examined: three Nigerian courts (Federal High Court Abuja, Rivers State High Court Port Harcourt, and Enugu State High Court) and three international examples (Amsterdam Courthouse, Long Beach Courthouse USA, and Leuven Courthouse Belgium). These revealed common problems such as deep-plan layouts limiting daylight penetration, over-reliance on artificial systems, and insufficient consideration of building orientation. They also demonstrated the effectiveness of internal courtyards, clerestory windows, atriums, narrow floor plates, and strategic orientation in improving daylight distribution and visual comfort. The study area along Udo-Udoma Avenue, Uyo, occupies 1.16 hectares within a tropical monsoon climate characterized by high humidity, abundant rainfall, and year-round warm temperatures. The site offers good accessibility, stable ground conditions, and suitable orientation potential for passive environmental design. The study concludes that daylighting should be integrated as a primary design criterion in judicial buildings, not an afterthought. By combining passive daylighting strategies with functional planning and security requirements, the proposed complex offers a sustainable model for judicial architecture in Nigeria and similar tropical contexts.

Keywords: Daylighting, judicial buildings, courthouse design, sustainable architecture, tropical climate, passive design, Nigeria.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Judicial buildings are essential public institutions designed to support the administration of justice through organized legal processes. These spaces accommodate various groups of users such as judges, legal practitioners, court staff, defendants, and the general public. As a result, the design of judicial buildings must address functional efficiency, security, user comfort, and optimal environmental performance.

Lighting is a critical component of architectural design that significantly influences how spaces are perceived and used. In the judicial setting, lighting plays a vital role in ensuring clear visibility, supporting task performance, and reinforcing the formal and authoritative atmosphere required for court proceedings. Research has shown that lighting affects visual comfort, productivity, and user perception within buildings, making it an essential factor in spaces where accuracy and clarity are required (Durmuş & Doulos, 2024).

Lighting in buildings generally involves the integration of natural lighting (daylighting) and artificial lighting systems. Daylighting has been widely recognized as a sustainable design strategy that reduces energy consumption, improves indoor environmental quality, and enhances occupant well-being (Atamewan, 2022). In tropical regions such as Nigeria, proper daylighting design is particularly important due to high solar intensity and energy supply challenges. Studies have shown that effective daylighting can significantly reduce reliance on artificial lighting while improving comfort and productivity in buildings (Fadeyi, Iniobong, Nnezi & Adebamowo, 2024).

However, achieving effective lighting design requires careful consideration of building orientation, window placement, shading devices, and internal spatial arrangement. Poorly designed lighting systems often result in glare, uneven illumination, and discomfort. For instance, recent research in architectural environments revealed that many spaces fail to meet recommended lighting levels of around 500 lux, thereby leading to reduced visual comfort and inefficiency (Frontiers, 2025).

In Nigeria, many public buildings including court facilities, suffer from inadequate integration of lighting design at the design stage. This often leads to overdependence on artificial lighting systems, which is problematic due to inconsistent power supply. Additionally, poor spatial organization further limits the effectiveness of both natural and artificial lighting.

This study along with its accompanying design therefore presents an opportunity to explore how proper integration of lighting strategies, spatial planning, and environmental design principles can enhance the performance of judicial buildings. This study focuses on developing a design approach that combines functional planning with effective lighting systems to create a comfortable, efficient, and secure judicial environment.

1.2 Statement of the Problem

Court facilities in many developing regions are often faced with challenges such as overcrowding, poor spatial organization, and inadequate infrastructure. These issues can lead to inefficiencies in court operations, delays in proceedings, and poor user experience. A key issue within these challenges is the lack of effective lighting design. In many cases, judicial buildings are designed without sufficient consideration for daylighting and visual comfort. As a result, spaces may experience poor illumination levels, glare, and uneven light distribution. Research indicates that insufficient or poorly distributed lighting can negatively affect visual

performance and user comfort, particularly in task-intensive environments (Durmuş & Doulos, 2024).

Furthermore, excessive reliance on artificial lighting increases energy consumption and operational costs, especially in regions with unstable electricity supply like Nigeria. Studies in Nigerian buildings have shown that inadequate daylighting leads to higher energy use and reduced building efficiency (Atamewan, 2022).

In addition to lighting challenges, the absence of proper zoning and circulation systems in many court complexes results in the mixing of different user groups, including judges, defendants, and the public. This creates security risks and reduces operational efficiency. When combined with poor lighting conditions, these issues significantly affect the functionality and effectiveness of judicial buildings.

Therefore, there is a need for a design approach that integrates effective lighting strategies with proper spatial organization and security considerations to improve the overall performance of court facilities.

1.3 Aim and Objectives of the Study

The aim of this study is to determine the elements of daylighting in judicial buildings, and their application in the Akwa Ibom State.

The objectives are:

1. To examine elements of daylighting in public and judicial buildings.
2. To identify the requirements and problems daylighting in judicial building.
3. To evaluate how architects have balanced daylighting/artificial lighting needs in judicial buildings along with security requirements.

4. To deploy the findings in a design proposal for a state high court in Uyo, Akwa Ibom State.

1.4 Research Questions

The study seeks to answer the following questions:

1. What are the key elements of daylighting in public and judicial buildings?
2. What are the daylighting requirements in judicial buildings, and what challenges affect their implementation?
3. How have architects balanced the use of daylight and artificial lighting in judicial buildings while meeting security requirements?
4. How can the findings from the study be applied in the design proposal for a State High Court in Uyo, Akwa Ibom State?

1.5 Significance of the Study

This research is relevant in various ways. Firstly, it contributes to architectural knowledge by emphasizing the importance of lighting design in specialized institutional buildings such as judicial facilities. While spatial planning and aesthetics are often prioritized, lighting remains a fundamental element that directly impacts building performance and user experience.

Secondly, the study provides practical design solutions that can be applied to the development of court buildings in Nigeria. By addressing issues such as inadequate lighting, inefficient circulation, and poor zoning, the research offers strategies that can improve the quality and functionality of judicial spaces.

Thirdly, the study promotes the use of sustainable design approaches, particularly daylighting, which has been shown to improve energy efficiency and occupant well-being . This is especially relevant in Nigeria, where energy supply challenges necessitate the adoption of passive design strategies.

Finally, the study enhances user comfort and operational efficiency within judicial environments, thereby supporting the effective delivery of justice.

1.6 Scope and Delimitation of the Study

This study focuses on understanding the elements of daylighting in the design of a State High Court in Uyo, Akwa Ibom State, with particular emphasis on the use of daylighting in judicial buildings. It examines the key elements of daylighting used in public and judicial buildings, identifies the daylighting requirements and challenges associated with judicial facilities, and explores how architects balance natural daylight with artificial lighting while meeting security requirements. The findings from the study will be applied in the development of a design proposal for a State High Court in Uyo, Akwa Ibom State, with the aim of creating a secure, functional, and well-lit judicial environment.

However, the study has certain limitations. The study does not include detailed structural design calculations, as the primary focus is on architectural planning and lighting design. Additionally, mechanical and electrical systems are only discussed in relation to lighting and are not examined in detail beyond this scope. The research is also limited to architectural design principles and does not explore the legal or procedural aspects of court operations.

1.7 Organization of the Report/Thesis

This research work is organized into five chapters as follows:

1. Chapter One introduces the study, including background, problem statement, aim and objectives, research questions, significance, scope, and definitions.
2. Chapter Two presents a review of relevant literature on lighting design and judicial buildings.

3. Chapter Three describes the study area, its geographical location and setting, criteria used for site selection, the physiology, climate and vegetation of the study area.
4. Chapter Four describes the research methodology.
5. Chapter Five provides the design synthesis and development which contains the design brief, special considerations, concept and proposal, as well as the conclusion and recommendations.

1.8 Definition of Special Terms

1. **Judicial Buildings:** These are buildings designed for legal proceedings such as courts and tribunals.
2. **Courtroom:** A space where legal cases are heard and decided.
3. **Lighting Design:** The process of planning and implementing light to achieve functional and aesthetic goals.
4. **Daylighting:** The use of natural sunlight to illuminate indoor spaces.
5. **Illuminance:** The amount of light incident on a surface, measured in lux.
6. **Zoning:** The organization of spaces based on function and user groups.
7. **Circulation:** Movement paths within a building.
8. **Glare:** Excessive brightness that causes visual discomfort.
9. **Visual Comfort:** A condition in which lighting allows occupants to perform tasks comfortably without causing eye strain, glare, or discomfort.
10. **Security:** Measures incorporated into a buildings design to protect occupants, information, and property while ensuring safe access and movement.
11. **Sustainability:** The practice of designing and operating buildings in a way that minimizes environmental impact while making efficient use of resources.

12. **Energy Efficiency:** The use of design strategies and technologies that reduce energy consumption while maintaining adequate building performance.
13. **Building Orientation:** The positioning of a building on its site in relation to the sun, wind, and surrounding environment to improve lighting, ventilation, and energy performance.
14. **User Experience:** The overall experience of building occupants, including their comfort, safety, ease of movement, and satisfaction with the buildings environment.

CHAPTER TWO

LITERATURE REVIEW AND CASE STUDIES

2.1 Review of Related Literature

The role of lighting in architectural design has been extensively studied due to its significant influence on building performance, energy efficiency, and user well-being. Over the years, research has evolved from focusing mainly on illumination levels to a more comprehensive understanding of how lighting affects human experience, sustainability, and spatial functionality (Boyce, 2014; Durmuş, Hu, & Doulos, 2024). In institutional environments such as judicial buildings, where activities require concentration, communication, and precision, the importance of design for proper illumination becomes even more critical.

One major area of literature focuses on energy efficiency and lighting performance in buildings (Mangkuto et al., 2016; Fadeyi et al., 2024). Lighting accounts for a substantial portion of total energy consumption, particularly in public and institutional buildings that operate for extended periods. With advances in lighting technology, especially LED systems, research has increasingly emphasized balancing energy efficiency with occupant visual needs. Durmuş, Hu and Doulos (2024) observed that contemporary lighting design extends beyond energy savings to include biological, psychological, and environmental considerations.

Daylighting has been widely recognized as one of the most effective strategies for reducing dependence on artificial lighting while improving indoor environmental quality. Nguyen et al. (2023) investigated daylight-responsive architectural strategies, including optimized window design, building orientation, and light-directing devices. Their findings showed that these approaches significantly reduced energy consumption and improved visual comfort by promoting a more uniform distribution of daylight within indoor spaces. Similarly, Hu, Zhang,

Wang, and Ke (2023) emphasized that effective daylighting performance in large buildings depends on accounting for changes in outdoor lighting conditions throughout the day.

The reviewed literature suggests that several architectural design techniques can enhance daylight penetration and distribution within buildings. One of the most frequently recommended strategies is proper building orientation. The study done by Fadeyi et al. (2024) has shown that buildings oriented along the east-west axis, with major facades facing north and south, generally achieve better daylight performance while minimizing excessive solar heat gain in tropical climates. Such an orientation allows spaces to receive more consistent daylight and reduces problems associated with low-angle morning and evening sun.

Another important consideration is the window-to-wall ratio (WWR), which refers to the proportion of wall area occupied by windows. Research indicates that window size has a significant influence on both daylighting and thermal performance. Undersized windows often restrict daylight penetration into interior spaces, while excessively large glazed areas may increase glare, solar heat gain, and cooling loads (Karlsen et al., 2021). For institutional buildings in warm and tropical climates, a window-to-wall ratio ranging from approximately 30% to 40% is often considered effective for balancing daylight availability, visual comfort, and thermal performance. Studies have shown that increasing window-to-wall ratio beyond 40% produces only marginal improvements in useful daylight illuminance while significantly increasing the risk of glare and solar heat gain (Cammarano et al., as cited in Scientific Reports, 2025). Furthermore, energy-performance studies indicate that window-to-wall ratio values between 20% and 30% may optimize energy efficiency, while values around 30–40% provide a practical compromise between daylighting and occupant comfort.

Spatial planning also plays an important role in indoor illumination. The configuration of spaces significantly affects how natural light is distributed throughout a building. Proper spatial design strategies such as internal courtyards, atriums, light wells, clerestory windows, skylights, and shallow floor plans have been identified as effective daylighting techniques (Mustafa, 2024). Courtyards and atriums allow daylight to penetrate deeper into building interiors, making them particularly useful in large institutional buildings where many spaces are located far from external walls. Clerestory windows and skylights introduce daylight from above, thereby improving illumination in circulation areas and interior zones that may otherwise depend heavily on artificial lighting. Open-plan layouts and reduced floor depths have also been recommended in the literature as means of enhancing daylight distribution. According to Mustafa (2024), minimizing deep-plan spaces and reducing internal obstructions allow daylight to spread more uniformly across occupied areas. This is especially relevant in judicial buildings, where adequate lighting is required not only in courtrooms but also in offices, waiting areas, libraries, and circulation corridors.

Beyond daylighting, recent studies have highlighted the growing importance of smart and adaptive lighting systems. These systems employ sensors and automated controls to adjust lighting levels according to occupancy patterns and available daylight. Durmuş and Doulos (2024) argue that intelligent lighting technologies improve both energy efficiency and occupant comfort by ensuring that spaces receive only the amount of artificial lighting required at any given time. In judicial buildings, such systems can be particularly beneficial because different functional spaces have varying lighting requirements. Courtrooms, judges chambers, administrative offices, libraries, and circulation spaces each require different illumination levels to support their activities effectively.

Despite these advancements, several studies highlight ongoing challenges in achieving effective passive indoor illumination, particularly in developing countries. Common issues include poor building orientation, inadequate window sizing, inappropriate window placement, and insufficient integration of daylighting considerations into the design process (Adewale & Ewuoso, 2024; Olatunji & Adebayo, 2018). These shortcomings often result in increased dependence on artificial lighting, higher energy consumption, and reduced occupant comfort. In many Nigerian public buildings, insufficient daylight penetration and poor maintenance of lighting systems have been identified as major factors affecting building performance (Ayoade, 2015; Ogunsote & Prucnal-Ogunsote, 2014). These findings reinforce the need for judicial buildings that integrate orientation, window design, spatial planning, and adaptive lighting systems from the earliest stages of architectural design.

2.2 CASE STUDIES

LOCAL CASE STUDIES

2.2.1 CASE STUDY 1: FEDERAL HIGH COURT, ABUJA

Location: Shehu Shagari Way, Central District, Abuja, FCT

Type: Judicial Building

Overview

The Federal High Court of Nigeria, originally established in 1973 in Lagos as the Federal Revenue Court and renamed in 1979, relocated its headquarters to Abuja in 2009 following the consolidation of federal judicial and administrative institutions within the Federal Capital Territory (Federal High Court of Nigeria, 2024, Plate 2.1). The Federal High Court, Abuja handles legal matters under federal jurisdiction, including cases involving government agencies, taxation, and regulatory issues. It serves as a formal courthouse within the Federal Capital

Territory and accommodates courtrooms, judges chambers, administrative offices such as case management offices, chambers support offices (clerical/legal assistants) and security-controlled circulation zones.



Plate 2.1: Image showing the Facade of the Federal High Court Complex, Abuja (Source: Wikipedia, 2026)

ARCHITECTURAL AND SPATIAL ANALYSIS

The Federal High Court, Abuja was developed under the institutional framework of the Federal Government of Nigeria, with planning and execution influenced by the Federal Capital Development Authority (FCDA) as part of the broader Abuja Master Plan implementation. Like many federal institutional buildings within Abujas Central Area, the court complex was delivered through government-led architectural and engineering consultancy teams responsible

for federal capital infrastructure development. The architectural development of the court is therefore best understood as a state-led institutional design project, shaped by federal standards for judicial buildings rather than individual architectural authorship.

The design concept of the Federal High Court, Abuja is rooted in the principles of:

1. Judicial authority and monumentality
2. Security and controlled access
3. Functional separation of user groups
4. Efficient administration of justice within a federal capital

The building is designed to project authority while ensuring strict control of movement between judges, legal practitioners, defendants, staff, and the public. This concept prioritizes order, surveillance, and procedural clarity over open spatial transparency.

The court is located within the Central Business District of Abuja, a zone defined by the Abuja Master Plan as the administrative and institutional core of the Federal Capital Territory. The master plan, developed by International Planning Associates (IPA) and coordinated through the FCDA, emphasized:

- i. Zoning of government institutions into structured districts
- ii. Wide setbacks and controlled building plots
- iii. Monumental civic buildings aligned with major boulevards
- iv. Security buffers between public and institutional zones

This planning structure strongly influenced the Federal High Courts placement and spatial organization. The building is positioned within a high-security government corridor, adjacent to other federal institutions, reinforcing controlled access and institutional separation.

The Federal High Court, Abuja exhibits a monumental architectural style, typical of institutional buildings designed for authority and permanence. The form is generally characterized by:

- i. Centralized circulation corridors
- ii. Enclosed interior spaces with limited external permeability

This compact and controlled massing supports security requirements but reduces opportunities for deep natural light penetration into interior zones. The buildings orientation is primarily influenced by:

- i. Site geometry within the Central District grid
- ii. Security zoning requirements

Rather than being primarily daylight-optimized, the orientation follows institutional planning logic, aligning the building with access roads and surrounding government structures. As a result, façade exposure to sun paths is not fully optimized for passive daylighting, especially for interior courtrooms located away from external walls.

The spatial structure of the court is organized into:

- i. Public reception and waiting areas
- ii. Security screening zones
- iii. Circulation corridors (linear and controlled)
- iv. Courtrooms (enclosed, acoustically sealed spaces)
- v. Judges chambers and administrative offices

Due to this configuration:

- i. Courtrooms rely heavily on artificial lighting
- ii. Corridors receive limited borrowed light

- iii. Offices near façades receive better daylight access
- iv. Interior zones experience reduced daylight penetration

SPATIAL ANALYSIS (Lighting Focus)

Courtrooms

- i. High need for clear vision
- ii. Minimal daylight penetration due to enclosure
- iii. Artificial lighting provides uniform illumination

Corridors and Waiting Areas

- i. Often long and enclosed
- ii. Dependence on artificial lighting systems

Administrative Offices

- i. Better daylight access if located along perimeter
- ii. Still partially dependent on artificial lighting due to depth

Observed Design Merits

- i. Strong security zoning and controlled circulation
- ii. Clear separation of user categories
- iii. Monumental architectural expression reinforcing institutional authority

Observed Design Limitations

- i. Limited integration of passive daylighting strategies
- ii. Over-reliance on artificial lighting in interior zones
- iii. Minimal use of atriums, skylights, or light wells
- iv. Reduced visual openness compared to modern sustainable courthouses

2.2.2 CASE STUDY 2: RIVERS STATE HIGH COURT, PORTHARCOURT

Location: Port Harcourt, Rivers State

Operational Since: 1970

Type: Judicial Building

OVERVIEW

The Rivers State High Court, Port Harcourt is a major state-level judicial institution in Nigeria that handles civil and criminal cases within the jurisdiction of Rivers State (Plate 2.2). It was established in 1967 following the creation of Rivers State. It exercises original jurisdiction over major civil and criminal matters and hears appeals from decisions of the Magistrate Courts and Customary Courts, before further appeals may proceed to the Court of Appeal.



Plate 2.2: Image showing the Facade of the Rivers State High Court, Port Harcourt (Source: Megastarng.com, n.d.)

ARCHITECTURAL AND SPATIAL ANALYSIS

The Rivers State High Court was commissioned by the Rivers State Government and constructed by Megastar Technical & Construction Company as part of the states judicial infrastructure development programme. The court forms part of a broader judicial network within Rivers State, which includes multiple judicial divisions across Port Harcourt and surrounding local government areas. The conceptual basis of the Rivers State High Court is rooted in:

- i. Institutional authority and judicial dignity.
- ii. Functional efficiency in justice delivery.
- iii. Accessibility for public legal processes.
- iv. Security and controlled movement of users.

The design reflects a functional institutional concept, where spatial organization is driven primarily by courtroom operations, administrative efficiency, and security zoning rather than expressive architectural form. The building is intended to support the high volume of litigation typical of Port Harcourt, one of Nigerias busiest legal jurisdictions.

The Rivers State High Court is located within Old Port Harcourt Township / Government Reservation Area (GRA, a historically planned urban district characterized by:

- i. Colonial and post-colonial administrative planning structure.
- ii. Proximity to other government and civic institutions.
- iii. Grid-based road networks with institutional zoning.
- iv. Moderate building density with mixed civic use.

This location reinforces the role of the court as a central judicial hub within the state capital. The site planning emphasizes accessibility for litigants while maintaining separation from

high-density commercial zones. The judiciary in Rivers State operates through multiple divisions, with Port Harcourt serving as the principal judicial center handling a significant proportion of the states civil and criminal cases.

The architectural form of the Rivers State High Court is primarily institutional and utilitarian. The building adopts a deep-plan configuration, where internal spaces extend far from external façades. Courtrooms and administrative offices are arranged along circulation corridors, resulting in a structured but often enclosed spatial experience. The orientation of the court complex is influenced by:

- i. Existing urban grid of Port Harcourt township
- ii. Road access and institutional adjacency

Rather than being primarily designed for solar optimization, the orientation follows functional constraints. As a result, some internal courtrooms and corridors are not optimally positioned for passive daylighting, especially those located away from external façades.

OBSERVED DESIGN MERITS

- i. Large glazed façade may enhance daylighting.
- ii. Vertical façade members help reduce glare.
- iii. Deep roof projections provide passive shading over some windows.
- iv. Combination of glazing and solid walls.
- v. Long linear building form.
- vi. Presence of recessed windows along the external walls in some parts.
- vii. Clear security and circulation control systems

OBSERVED DESIGN DEMERITS

- i. Large glazed surfaces may increase heat gain.

- ii. No obvious external vertical shading fins
- iii. Potential glare near perimeter spaces
- iv. Heavy reliance on artificial lighting in interior spaces
- v. Lack of modern passive design features (atria, skylights, light wells)

2.2.3 CASE STUDY 3: ENUGU STATE HIGH COURT

Location: Independence Layout, Enugu, Enugu State, Nigeria.

Year of Commissioning: Aug 27, 1991

Type: Judicial Building

OVERVIEW

The Enugu State High Court serves as the principal trial court in Enugu State, exercising original jurisdiction over major civil and criminal matters while also hearing appeals from Magistrate Courts and Customary Courts within the state. The complex accommodates several courtrooms, judges chambers, administrative offices, registries, waiting areas, circulation spaces, and support facilities required for judicial administration (Plate 2.3). As one of the states major public institutions, the building is designed to facilitate efficient court proceedings while providing secure circulation for judges, court staff, litigants, lawyers, and members of the public.



Plate 2.3: Image showing the interior of one of the courtrooms in Enugu State High Court (Source: Authors Field Survey, 2026)

ARCHITECTURAL AND SPATIAL ANALYSIS

The Enugu State High Court is a purpose-built judicial complex comprising multiple court halls, judges chambers, administrative offices, registries, research facilities, process units, appeal units, and supporting judicial services. The layout is organized around a central circulation spine that links the various functional units while maintaining clear movement patterns for judicial officers, court staff, legal practitioners, and members of the public (Plate 2.4). The planning reflects the functional requirements of a modern judicial facility, where accessibility, security, and environmental comfort are essential considerations.

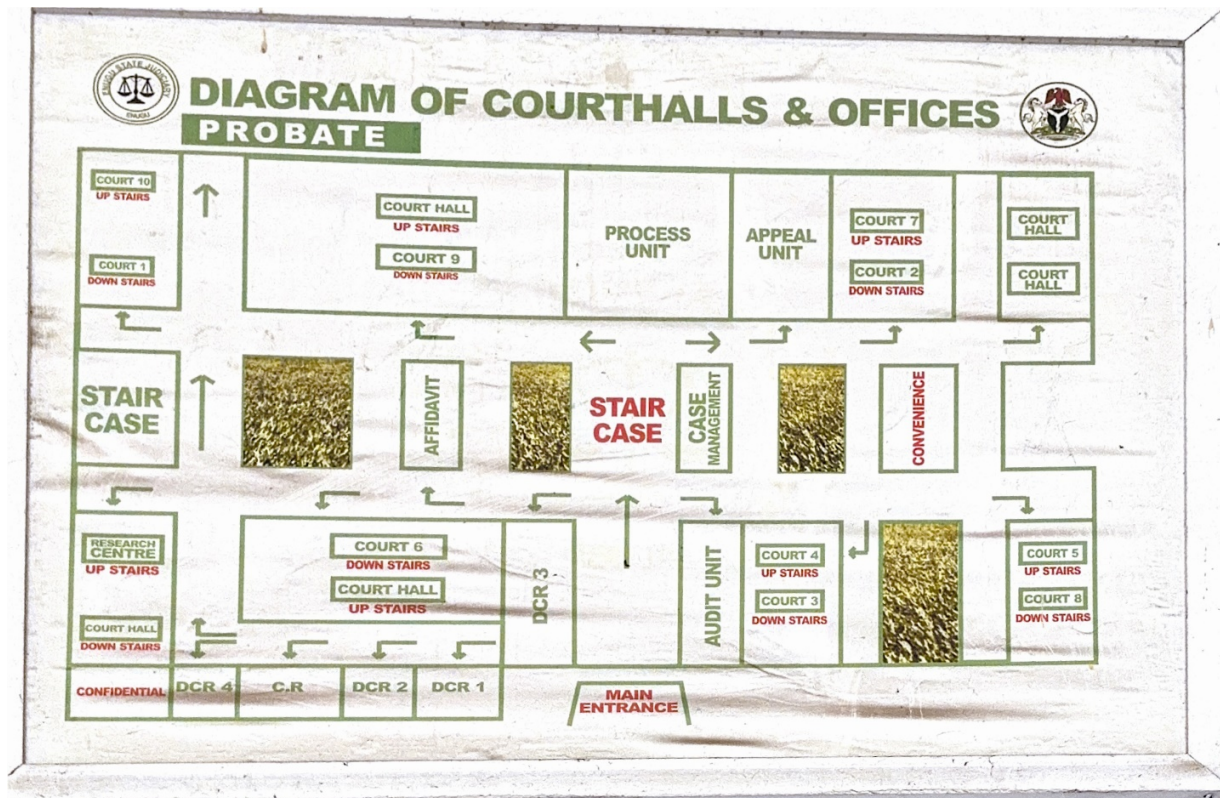


Plate 2.4: Image showing the plan of Enugu State High Court (Source: Enugu State High Court (Researchers Field Survey, 2026))

The architectural concept of the Enugu High Court emphasizes functional efficiency through courtyard planning. The court complex is divided into several interconnected blocks separated by internal courtyards. This planning strategy improves environmental quality by allowing daylight and natural ventilation to penetrate interior spaces that would otherwise depend heavily on artificial lighting. The concept also promotes visual connectivity, easier circulation, and a more comfortable indoor environment for court users.



Plate 2.5: Image showing the interior of one of the courtrooms in Enugu State High Court (Source: Authors Field Survey, 2026)

The High Court adopts a predominantly rectilinear building form organized around interconnected wings. Instead of relying on a single compact mass, the building is broken into functional blocks separated by landscaped open courts. This arrangement minimizes deep-plan spaces and ensures that most occupied rooms maintain proximity to an external wall or courtyard, thereby improving access to natural daylight. The circulation pattern of the court follows a central corridor that connects court halls, registries, administrative offices, and support facilities. This configuration enables efficient movement while allowing the internal courtyards to illuminate adjoining corridors and occupied spaces.

The building blocks are arranged around three internal courtyards, creating multiple opportunities for daylight penetration into the interior. Unlike conventional court buildings where only perimeter spaces receive natural light, the courtyard arrangement introduces daylight into the centre of the complex, significantly reducing dependence on artificial lighting in

circulation areas and adjacent offices. The relatively open arrangement of the blocks also encourages cross-ventilation and reduces the visual enclosure commonly associated with deep institutional buildings. One of the most significant architectural strengths of the Enugu State High Court is its use of internal courtyards as a passive daylighting strategy. The courtyards function as light wells that channel natural daylight into the interior portions of the building, ensuring that offices, corridors, and adjacent court halls receive adequate illumination despite their distance from the external façade. The incorporation of high-level (clerestory) windows in the office spaces further enhances daylight penetration by introducing diffuse light into occupied spaces while reducing glare. Because these windows are positioned above eye level, they admit daylight without compromising security or privacy within sensitive judicial spaces. The combined use of courtyards and clerestory windows creates a more evenly distributed indoor lighting environment, reduces reliance on artificial lighting during daytime hours, and improves visual comfort for building users.

OBSERVED DESIGN MERITS

The incorporation of three internal courtyards significantly improves daylight penetration into the interior of the building, allowing natural light to reach spaces that would otherwise rely heavily on artificial lighting.

The use of high-level (clerestory) windows enhances indoor illumination by admitting diffuse natural light while maintaining privacy and reducing glare within courtrooms and circulation spaces.

The modular arrangement of interconnected building blocks minimizes deep-plan spaces, ensuring that most functional areas have access to either the external façade or an internal courtyard for daylight and natural ventilation.

The central circulation system surrounding the courtyards promotes efficient movement and allows corridors to benefit from natural lighting throughout the day.

The balanced combination of solid walls and strategically positioned window openings provides adequate daylight.

The courtyard-based planning contributes to improved indoor environmental quality by enhancing both daylighting and natural ventilation, thereby creating a more comfortable environment for judges, court staff, lawyers, and visitors.

OBSERVED DESIGN DEMERITS

Some offices and support spaces located farther from the courtyards or external façades may still require artificial lighting during periods of low daylight availability.

The building does not appear to incorporate advanced daylight-enhancing technologies such as light shelves, fins, or automated daylight-responsive lighting systems, which could further improve lighting performance and energy efficiency.

Although the courtyards improve environmental performance, they occupy a considerable portion of the site that could otherwise accommodate additional functional spaces where land availability is limited.

The façade relies primarily on conventional window openings and roof overhangs, with limited use of external solar-control devices that could provide better glare reduction and thermal performance.

The effectiveness of the daylighting strategy depends on regular maintenance of the courtyards and surrounding windows; poor maintenance could reduce light penetration and diminish the environmental benefits of the design.

INTERNATIONAL CASE STUDIES

2.3.4 CASE STUDY 4: AMSTERDAM COURTHOUSE, NETHERLANDS

Location: Amsterdam, The Netherlands (Zuidas district)

Design Period: 2014–2020

Completion / Commissioning Year: 2020–2021 (operational from May 2021)

OVERVIEW

Designed by KAAN Architecten, the Amsterdam Courthouse is conceived as a highly transparent civic institution where justice is expressed as part of public life. The design emphasizes openness, accessibility, and daylight as a symbolic and functional element of judicial architecture (Plate 2.6).



Plate 2.6: Image showing the facade of the Amsterdam Courthouse, Netherlands (Source: kaanarchitecten.com, 2014-2020)

ARCHITECTURAL AND SPATIAL ANALYSIS

The building is organized as a vertically stratified structure with horizontal zoning, consisting of:

- i. Public zones at lower levels
- ii. Courtrooms in mid-level stacked volumes
- iii. Administrative/judicial offices in upper levels

This stratification ensures functional separation while maintaining visual openness.

The building is oriented to maximize urban engagement and daylight penetration, with large façades facing public squares and key solar directions. Orientation supports both symbolic transparency and environmental performance (Figs 2.1 & 2.2; Figs 2.3 & 2.4).

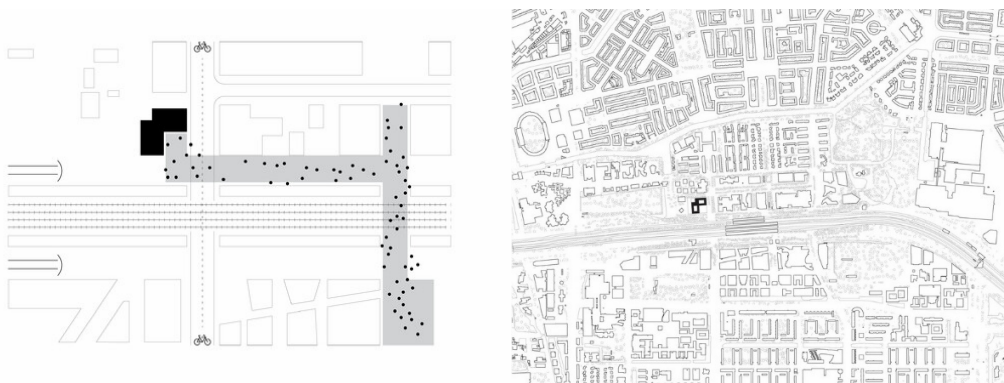


Figure 2.1: Images showing the maps of the Amsterdam Courthouse, Netherlands (Source: kaanarchitecten.com, 2014-2020)

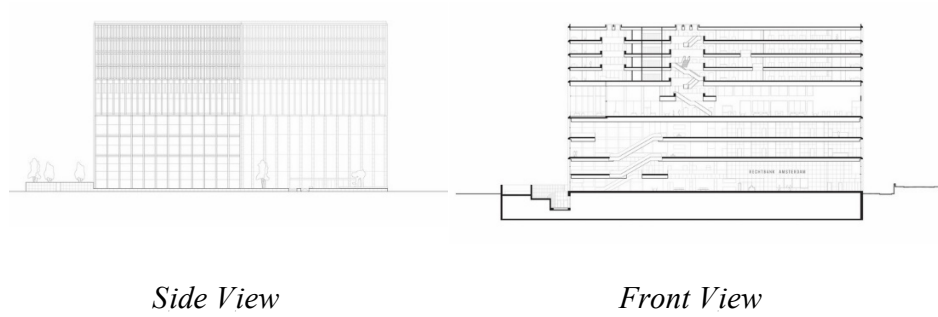


Figure 2.2: Images showing the front and side view of the Amsterdam Courthouse, Netherlands (Source: kaanarchitecten.com, 2014-2020)

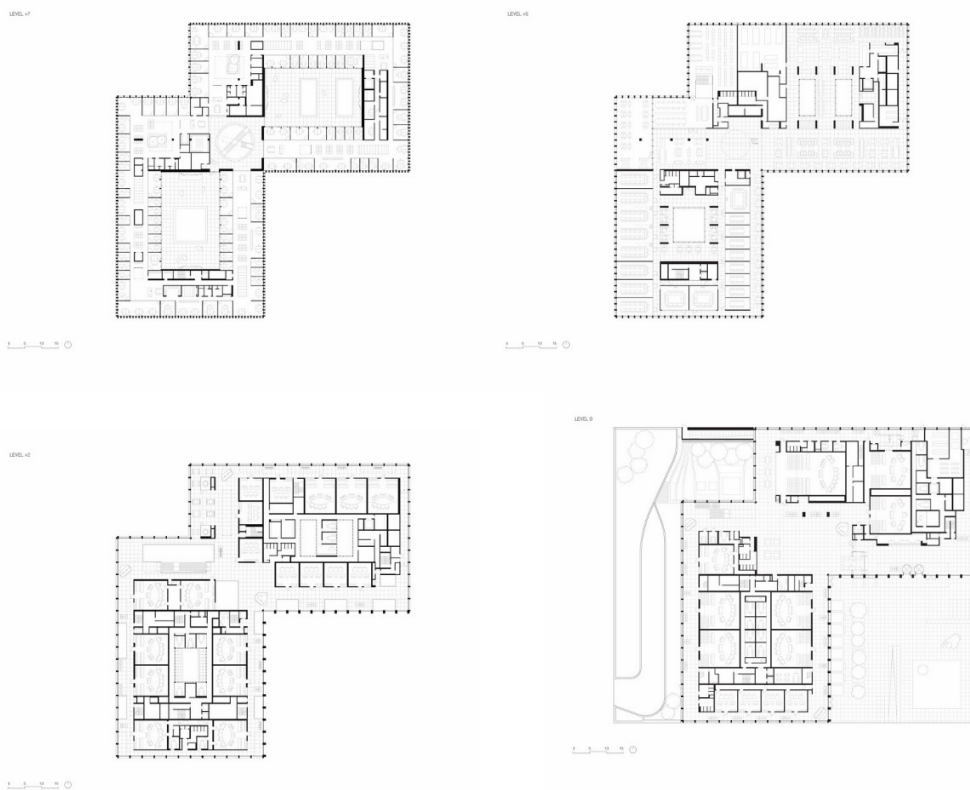


Figure 2.3: Images showing the floor plans of levels 1, 2, 5 & 7 of the Amsterdam Courthouse, Netherlands (Source: kaanarchitecten.com, 2014-2020)

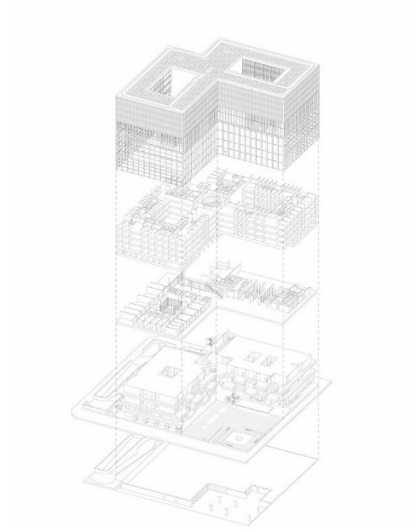


Figure 2.4: Image showing exploded view of the Amsterdam Courthouse, Netherlands (Source: kaanarchitecten.com, 2014-2020)

DAYLIGHTING STRATEGIES

- i. Large perimeter glazing across multiple façades
- ii. Central atrium with vertical daylight distribution
- iii. Internal courtyards and gardens
- iv. Sunken and elevated light wells
- v. Double-volume public spaces for deep daylight penetration

A key feature of the Amsterdam Courthouse is the central hall flooded with daylight, achieved through a combination of glazing and void spaces that connect multiple levels visually and environmentally (Fig 2.4).

LIGHTING IMPACT ON CRITICAL SPACES

The lighting performance of the Amsterdam Courthouse demonstrates a deliberate integration of daylighting strategies across different functional spaces within the building. Courtrooms are designed to receive controlled natural light through a combination of façade glazing and

adjacency to atrium spaces, ensuring adequate illumination for judicial proceedings while minimizing glare and visual discomfort.

Public areas within the building benefit significantly from the extensive use of daylight, which enhances spatial legibility, orientation, and user comfort. The introduction of large glazed surfaces and internal voids allows daylight to penetrate deep into these spaces, creating a welcoming and transparent civic environment. Similarly, office spaces are strategically organized around courtyards, allowing for more even and consistent distribution of natural light, which improves working conditions and reduces reliance on artificial lighting during daytime hours.

Circulation areas within the building are also effectively illuminated through indirect daylighting strategies. These include light penetration from atrium edges, glazed internal partitions, and visual connections between different building levels. As a result, corridors and transitional spaces are no longer dark or purely functional passages but are integrated into the overall daylight system of the building.

RELEVANCE TO STUDY

Firstly, horizontal zoning of functions plays a critical role in improving daylight distribution, particularly when spaces are arranged to maximize exposure to external façades and internal light courts. Secondly, the incorporation of atriums and courtyards is essential in large judicial complexes, as these elements allow natural light to reach deep interior zones that would otherwise remain poorly illuminated. Finally, while transparency and openness enhance daylight access, they must be carefully balanced with the security requirements inherent in judicial buildings.

2.3.5 CASE STUDY 5: LONG BEACH COURTHOUSE, CALIFORNIA, USA

Location: Long Beach, California, United States

Year of Completion: 1960

OVERVIEW

The Long Beach Courthouse is designed as a modern civic justice facility that emphasizes transparency, sustainability, and user comfort. The architectural intention is to move away from closed, opaque judicial buildings toward a more open and daylight-responsive courthouse typology. The design prioritizes environmental performance, particularly the use of natural light to improve interior working conditions while maintaining security requirements (Plate 2.7).



Plate 2.7: Image showing façade of the Long Beach Courthouse, USA (Source: Adobe Stock, n.d.)

ARCHITECTURAL AND SPATIAL ANALYSIS

The building adopts a compact yet articulated massing strategy, with courtrooms and administrative spaces organized around a central circulation system. The form is generally stacked vertically and arranged to reduce floor depth, allowing daylight to penetrate deeper into the building envelope. A key spatial strategy is the use of narrower floor plates, which reduces the distance between exterior walls and interior spaces. This ensures that most occupied zones are within reach of natural light.

The building is oriented to maximize controlled solar access, with façade positioning designed to balance daylight penetration and glare control. Courtrooms are generally positioned along perimeter zones to ensure access to daylight while minimizing overheating.

DAYLIGHTING STRATEGIES

The Long Beach Courthouse integrates several passive lighting strategies (Figure 2.5):

- i. Reduced floor depth to enhance daylight reach
- ii. Large, high-performance glazed façades
- iii. Daylight-responsive façade design
- iv. Controlled solar shading systems
- v. Strategic courtroom placement along external walls
- vi. Clerestory windows on external walls

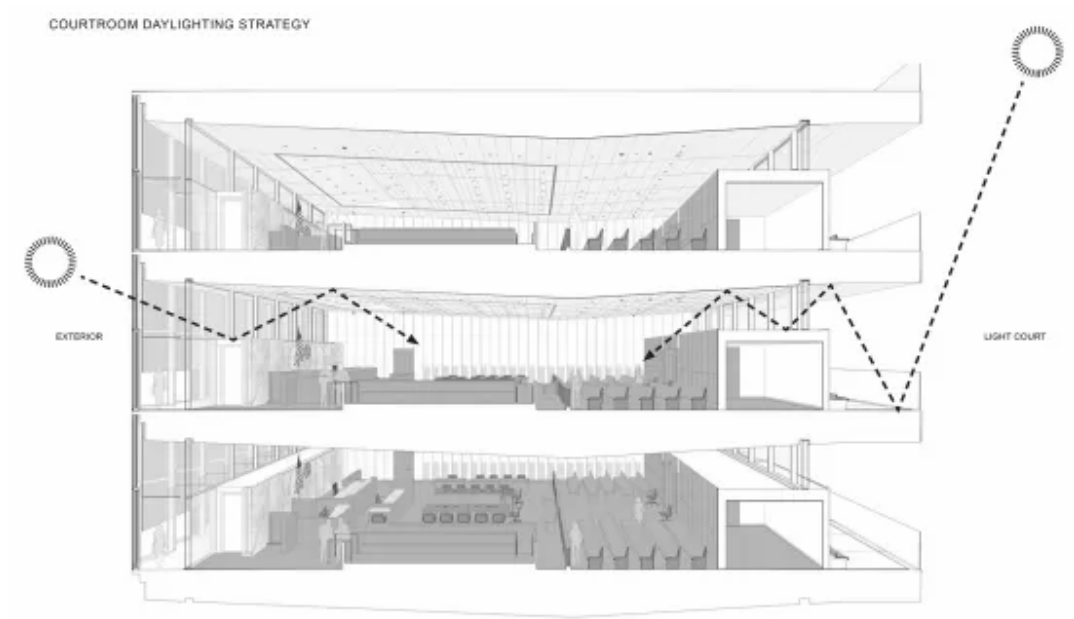


Figure 2.5: Image showing daylighting strategy of the Long Beach Courthouse, USA (Source: architectmagazine.com, n.d.)

These strategies ensure that daylight is distributed evenly across occupied spaces, reducing dependence on artificial lighting during daytime hours.

LIGHTING IMPACT ON CRITICAL SPACES

- i. **Courtrooms:** Receive controlled natural light, improving visual clarity and reducing fatigue
- ii. **Offices:** Benefit from consistent daylight levels along perimeter zones
- iii. **Circulation areas:** Borrow light from adjacent spaces, improving spatial legibility

RELEVANCE TO STUDY

- i. Narrow floor plates are essential for effective daylight penetration
- ii. Courtrooms should be positioned along external façades
- iii. Controlled glazing improves comfort and reduces glare
- iv. Orientation must support solar control and lighting quality

2.3.6 CASE STUDY 6: LEUVEN COURTHOUSE, BELGIUM

Location: Leuven, Belgium

Year of Completion: 2003

OVERVIEW

The Leuven Courthouse is designed as a civic institution that promotes openness in the justice system. The concept emphasizes visual accessibility, daylight penetration, and spatial clarity, reflecting European judicial architecture principles (Plate 2.8).



Plate 2.8: Image showing a view of the Leuven Courthouse, Belgium (Source: Wikimapia, 2013)

ARCHITECTURAL AND SPATIAL ANALYSIS

The building seems to have a permeable spatial structure, allowing daylight to penetrate deep into the building. The form is less compact than traditional courthouses, intentionally designed to enhance environmental performance. The building is oriented to allow maximum daylight

exposure into the atrium and courtyard zones, ensuring that natural light is distributed vertically and horizontally across multiple levels.

DAYLIGHTING STRATEGIES

- i. Large perimeter glazing
- ii. Open circulation corridors around light wells
- iii. Transparent internal partitions for light sharing

RELEVANCE TO STUDY

- i. Atriums are effective for deep-plan courthouse lighting
- ii. Courtyards improve daylight distribution in large complexes
- iii. Light-sharing circulation systems enhance visual comfort
- iv. Internal voids are critical in judicial buildings

2.3 Summary of Literature Review

The reviewed literature demonstrates that the focus of lighting in architecture has evolved from merely providing adequate illumination to achieving energy efficiency, occupant comfort, and improved spatial quality, particularly in institutional buildings such as courthouses. Daylighting has emerged as one of the most effective passive design strategies for reducing energy consumption while enhancing indoor environmental quality through appropriate building orientation, window design, and spatial planning. Studies consistently recommend orienting buildings along the north–south axis, adopting a balanced window-to-wall ratio of approximately 30–40%, and incorporating spatial features such as courtyards, atriums, skylights, and clerestory openings to improve daylight penetration, minimize glare, and reduce solar heat gain. In addition, the integration of smart lighting systems has been shown to complement passive daylighting strategies by regulating artificial lighting based on occupancy

and available daylight. However, the literature also reveals that many public buildings in developing countries continue to experience inadequate daylighting due to poor orientation, inappropriate window design, and insufficient integration of daylighting principles into the architectural design process, resulting in increased dependence on artificial lighting and reduced occupant comfort.

These findings provide the basis for the design approach adopted in this study. Considering the tropical climatic conditions of Uyo, the proposed court complex will adopt a predominantly east-west building orientation and a window-to-wall ratio of approximately 30–40% on the principal north and south façades to achieve a balance between daylight availability and thermal performance. The design will also incorporate external shading devices, clerestory openings, courtyards, atriums, and strategically positioned openings to enhance daylight penetration, improve visual connectivity, reduce glare and heat gain, and ultimately create a comfortable and energy-efficient judicial environment.

2.4 Summary of Case Study Findings

The case studies reveal important insights into the design of judicial buildings. Local examples highlight common challenges such as poor daylighting, inadequate spatial organization, and over-reliance on artificial lighting. These issues often result in reduced user comfort, increased energy consumption, operational inefficiencies and they illustrate institutional character.

In contrast, international case studies demonstrate that effective lighting in judicial architecture is strongly influenced by building form, orientation, and spatial organization. Across the cases, a common finding is the importance of reducing building depth and controlling spatial layout to enhance daylight penetration.

Generally, the three case studies demonstrate that successful daylighting in judicial buildings depends not only on extensive glazing but also on the careful integration of external shading devices, recessed façades, clerestory windows, atrium roof glazing, courtyards, and strategically positioned openings. Additionally, circulation spaces in these buildings are no longer purely functional corridors but are designed as daylight-supported transitional spaces that enhance spatial legibility.

Overall, the case studies reveal that successful courthouse lighting design depends on an integrated approach that combines form, orientation, façade design, and internal spatial devices such as atriums and courtyards. These principles provide key design lessons for the proposed court complex in Uyo, particularly in achieving adequate daylight distribution, improved visual comfort, and reduced dependence on artificial lighting.

CHAPTER THREE

THE STUDY AREA

3.1 Geographical Location and Setting

Uyo is the capital city of Akwa Ibom State, located in the southern part of Nigeria, within the oil-rich Niger Delta region. It lies approximately between Latitude 4°30'N and 5°30'N and Longitude 7°30'E and 8°00'E, placing it within a tropical rainforest zone characterized by high humidity, heavy rainfall, and warm temperatures throughout the year. The city serves as the administrative, political, and judicial headquarters of Akwa Ibom State, making it a strategic location for government infrastructure, including courts, ministries, and institutional buildings. Over the past two decades, Uyo has experienced rapid urban expansion driven by state capital development, infrastructural investment, and population growth. The city center shown in Figure 3.1 below, is strategically occupied by the Ibom plaza with major streets emanating from it and connecting to various parts of the city.



Figure 3.1: Satellite imagery of Ibom Plaza Roundabout showing the major road network within Uyo metropolis. (Source: Adapted from Google Earth Pro (2026))

From an urban structure perspective, Uyo exhibits a semi-planned but rapidly expanding layout, with government reserved areas and administrative districts surrounded by residential and emerging commercial zones. Key institutional zones, including the Judiciary Complex, High Court, and Magistrate Courts, are typically located within planned government districts to ensure accessibility, security, and administrative coordination.



Figure 3.2: Image showing the drone picture of Ibom Plaza Roundabout (Source: Wikipedia, 2024)

3.2 Site Selection Criteria

The selection of a suitable site for a judicial complex is very important because it directly influences accessibility, security, functionality, and environmental performance, particularly

lighting and spatial organization. For the proposed court complex in Uyo, several criteria were considered to ensure that the facility responds effectively to both user needs and environmental conditions.

One of the primary criteria is accessibility. A court complex serves a wide range of users, including judges, lawyers, court staff, defendants, and members of the public. Therefore, the site must be easily accessible through a well-connected road network. For Uyo, sites located within or near government reservation areas (GRAs) or institutional zones are preferred due to their proximity to major roads and administrative facilities. Good accessibility reduces congestion and ensures smooth movement of people and services, which is essential for judicial efficiency. Another important factor considered is security and zoning compatibility. Judicial buildings require a high level of security due to the sensitive nature of legal proceedings. As such, the selected site should be located in an area with controlled land use, preferably within an institutional or government zone where incompatible activities such as heavy commercial or industrial operations are minimal. This also supports the segregation of user movement paths, which is a key objective of the proposed design.

Environmental suitability, particularly in relation to lighting and ventilation, is also a key consideration. This includes adequate site openness, minimal obstruction from surrounding high-rise structures, and the potential for optimal building orientation. A site that allows a north-south building orientation is preferred, as it supports better daylight control and will help reduce glare in tropical climates like Uyo.

In addition, land availability and expansion potential are essential criteria. Court complexes are typically long-term civic infrastructures that may require future expansion due to increasing caseloads. Therefore, the selected site should have sufficient land area to accommodate

additional courtrooms, administrative blocks, parking spaces, and support facilities without compromising spatial quality or daylight access.

Another key consideration is topography and drainage conditions. Uyo experiences high rainfall levels, making proper drainage essential in site selection. A site with gentle slope and good soil drainage characteristics is preferred to prevent flooding, waterlogging, and structural damage. Poor drainage can also indirectly affect lighting conditions by limiting usable outdoor space and reducing the effectiveness of courtyard or open-space daylighting strategies.

Finally, integration with surrounding land use is important. The site should complement existing civic and institutional developments such as courts, police stations, legal institutions, and administrative offices. This ensures functional synergy and strengthens the identity of the judiciary within the urban fabric of Uyo. The factors above collectively ensured that the site supports both the functional requirements of a judicial building and the environmental objectives of effective daylighting and spatial design.

3.3 Brief History of the Study Area

Uyo evolved from a traditional Ibibio settlement into the administrative capital of Akwa Ibom State. Prior to becoming a state capital, Uyo functioned primarily as a local administrative and commercial town within the former Cross River State. Its growth was relatively gradual, characterized by low-density settlement patterns, traditional housing forms, and limited institutional infrastructure.

A significant turning point in the history of Uyo occurred in 1987, when Akwa Ibom State was created from the former Cross River State. Following this political restructuring, Uyo was designated as the state capital, which marked the beginning of rapid urban transformation. This change led to the establishment of major government institutions, including administrative

offices, legislative buildings, and judicial facilities. The designation of Uyo as a capital city significantly increased its political and economic importance, attracting public investment and infrastructural development.

Uyo transitioned into a planned capital city with the introduction of Government Reserved Areas (GRAs), institutional zones, and road expansion projects. Key infrastructure such as the airport road, ring roads, and major arterial routes were developed to support increased mobility and administrative activity. However, despite these improvements, urban expansion has remained partially uncoordinated in some areas, leading to mixed development patterns where planned zones coexist with informal residential growth (see Plate attached below).

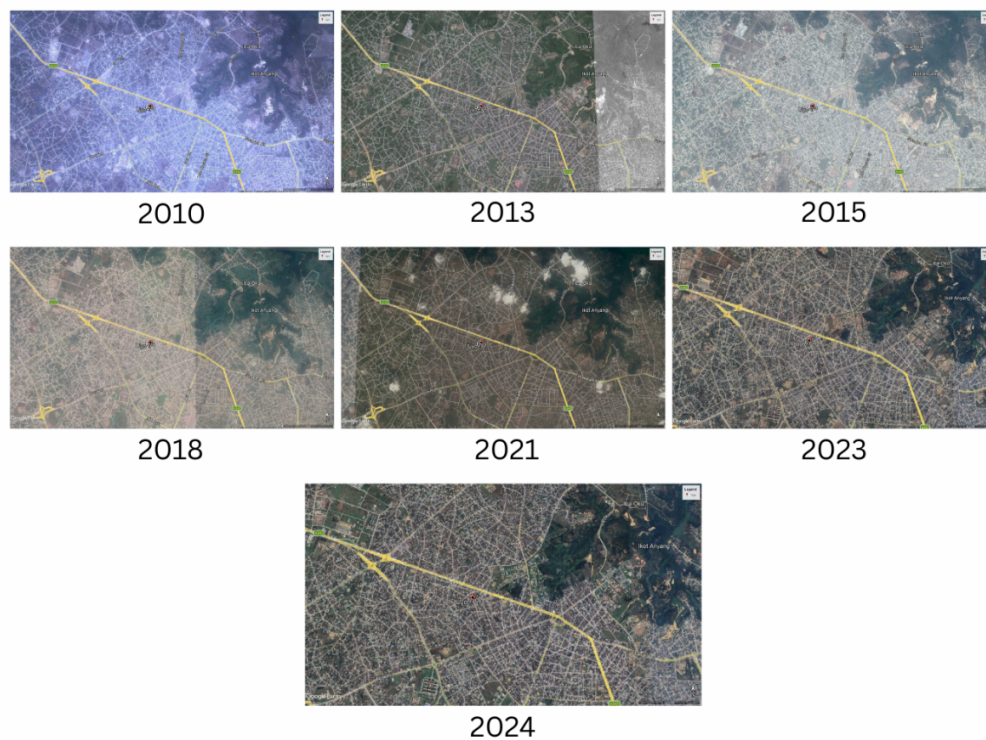


Plate 3.1 imagery showing urban expansion around Uyo between 2010 and 2024. (Source: Adapted from Google Earth Pro (2026))

The establishment of the High Court of Justice, Magistrate Courts, and other legal institutions in Uyo formed part of the broader effort to strengthen governance and rule of law within the new state capital. The judiciary became a critical arm of government, requiring dedicated infrastructure to support legal proceedings, administrative functions, and public access to justice. Over time, however, many of these facilities have experienced challenges such as spatial congestion, inadequate environmental quality, and architectural designs that do not fully respond to contemporary functional or environmental requirements. The existing judicial buildings in Uyo were largely developed during earlier phases of state capital development, when architectural emphasis was placed more on basic functionality than on appropriateness and environmental performance. As a result, many of these facilities exhibit limitations in terms of spatial organization, daylighting integration, and user comfort. Courtrooms and administrative offices are often designed without optimized orientation where possible or consideration for natural light penetration, leading to heavy reliance on artificial lighting systems.

In recent years, however, there has been a growing recognition of the need to modernize judicial infrastructure in Uyo to reflect contemporary architectural standards. This includes the integration of improved spatial planning, better environmental design strategies, and enhanced user comfort systems. The proposed court complex in this study responds directly to this need by addressing deficiencies in existing judicial facilities, particularly in relation to lighting, spatial organization, and circulation efficiency.

3.4 Physiography, Climate, and Vegetation

Uyo is located within a low-lying terrain, which provides a generally stable landform suitable for large-scale institutional developments such as court complexes. The soil is

predominantly clayey and lateritic, which offers adequate structural support but requires proper drainage design due to its tendency to retain water, especially during heavy rainfall periods. This makes stormwater management and site drainage important considerations in architectural planning within the city.

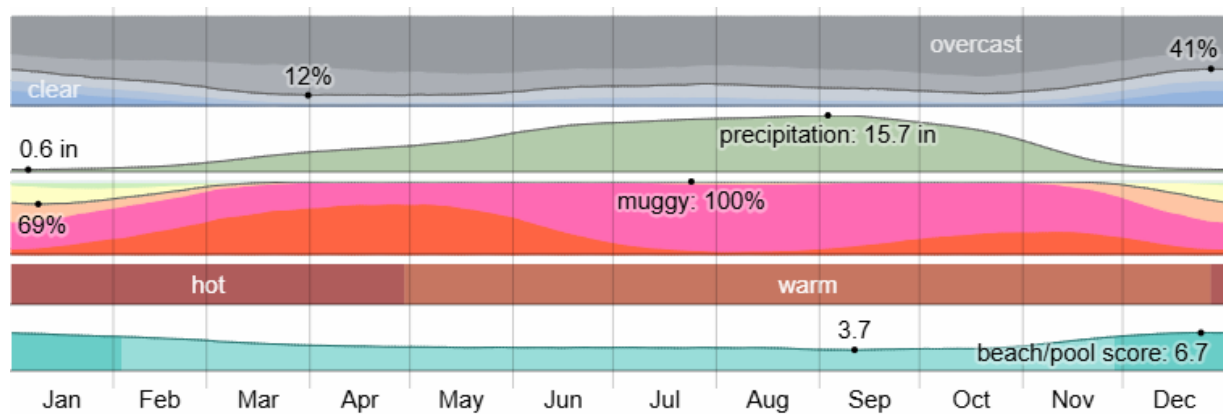


Figure 3.3: Weather in Uyo year round (Source: [Weather Spark](#), 2016)

The city falls within the tropical monsoon climate zone and is characterized by high humidity, abundant rainfall, and relatively stable warm temperatures throughout the year. Annual rainfall is high, often exceeding 2,000 mm, with long rainy seasons and short dry periods. Although daylight is available throughout the year, it is frequently diffused due to cloud cover, resulting in soft lighting conditions that require careful architectural control to ensure adequate indoor illumination. The high humidity and intense rainfall require protection from excessive moisture and heat, while the diffused daylight conditions necessitate optimized building orientation, well-designed openings, and controlled façade systems. (Figure 3.3)

Uyo is also located within the tropical rainforest vegetation zone, although urban expansion has significantly reduced its natural forest cover. The remaining vegetation within the urban environment plays an important role in moderating microclimatic conditions by providing shade, reducing heat gain, and improving air quality. Vegetation can also function as a natural

filter for daylight, reducing glare and enhancing outdoor comfort, making it an important component in the environmental design of institutional buildings such as judicial complexes.

3.5 Population, Culture, and Economic Development

Uyo has experienced significant population growth over the past few decades, largely due to its designation as the capital of Akwa Ibom State in 1987. According to the National Population Commission (NPC), the population of Uyo Local Government Area increased from 244,762 in the 1991 Population Census to 309,573 in the 2006 Population and Housing Census, representing a substantial increase within a period of fifteen years. This growth has been driven by the concentration of government institutions, educational establishments, commercial activities, and improved infrastructure, all of which have attracted migrants from different parts of Akwa Ibom State and Nigeria. This growth has increased pressure on urban infrastructure, including transportation networks, housing, and public buildings such as courts and administrative facilities. The rising population also contributes to higher demand for judicial services, making the adequacy and efficiency of court infrastructure an important urban necessity.

Uyo is predominantly inhabited by the Ibibio people, whose traditions and social structures influence aspects of community life, settlement patterns, and social interaction. The city reflects a blend of traditional cultural identity and modern urban development, as seen in the coexistence of indigenous neighborhoods and contemporary institutional layouts. Social behavior in the city places importance on communal interaction and civic participation, which is reflected in the use of public institutions such as courts, markets, and government offices. This cultural context reinforces the need for accessible, user-friendly, and well-organized court facilities that accommodate diverse categories of users with dignity and clarity.

Uyo serves as one of the fastest-growing urban centers in the Niger Delta region, with its economy largely driven by public administration, construction, education, and service industries. The presence of state government institutions plays a major role in employment generation and economic activity within the city. In addition, ongoing infrastructural development projects have contributed to increased investment in real estate and commercial services. However, despite this growth, there remains a need for improved institutional infrastructure that supports efficient governance and public service delivery.

Increasing caseloads, higher public engagement with the legal system, and expanding administrative functions require court buildings that are not only functional but also spatially efficient and environmentally responsive. This reinforces the need for a modern court complex that can accommodate present and future demands while ensuring comfort, accessibility, and operational efficiency for all users.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 Research Design

This study adopted a qualitative research approach to examine the role of lighting in the design and functionality of judicial buildings and to inform the design of a proposed court complex in Uyo, Akwa Ibom State. A qualitative approach was considered appropriate because it enables an in-depth exploration of architectural design principles, users experiences, and environmental factors that influence lighting performance in judicial facilities. The study sought to understand how architectural elements such as building orientation, spatial organization, façade design, and daylighting strategies affect the functionality, comfort, and efficiency of court buildings.

The study employed a literature review and case study research strategy, which involved a review of selected literature on daylighting design and analysis of selected local and international judicial buildings. The case studies provided insight into how different architectural solutions have been used to enhance natural lighting, improve user comfort, and support judicial functions. To complement the case study analysis, field investigations were conducted through site visits and direct observation of existing court buildings. These visits enabled the researcher to assess lighting conditions, spatial arrangements, circulation patterns, and environmental characteristics within real judicial settings. In addition, semi-structured interviews were conducted with selected court users and personnel to obtain firsthand accounts of their experiences with the existing facilities, particularly regarding visual comfort, functionality, and the adequacy of natural and artificial lighting.

4.2 Data Needs and Sources

The design of a judicial complex requires comprehensive information on both the functional and environmental requirements of court buildings. As a result, this study relied on data relating to lighting conditions, spatial organization, circulation patterns, user requirements, building orientation, environmental conditions, and architectural best practices in judicial facilities. These data were necessary to understand the existing challenges associated with lighting in court buildings and to develop appropriate design solutions for the proposed court complex in Uyo.

Data for the study were obtained from both primary and secondary sources. Primary sources included:

- i. Physical observation of existing court buildings.
- ii. Interviews conducted with selected judicial personnel and court users.
- iii. Photographic documentation of existing lighting conditions, circulation systems, and spatial organization.
- iv. Physical site visit and Documentation

Secondary sources comprised:

- i. Books on architectural lighting and courthouse design.
- ii. Peer-reviewed journals.
- iii. Architectural magazines and conference proceedings.
- iv. Nigerian building regulations and standards.
- v. Online architectural databases such as ArchDaily and design firm publications.
- vi. Documented local and international case studies relevant to judicial architecture.

The combination of these data sources provided a comprehensive understanding of lighting considerations in judicial architecture.

4.3 User Experience Data

Understanding the experiences of building users was an important aspect of this research because the effectiveness of lighting in judicial buildings extends beyond technical performance to include user comfort, functionality, and productivity. Information relating to users experiences was collected from lawyers, court staff, and other court users through informal interviews conducted during site visits. The interviews focused on issues such as the adequacy of natural and artificial lighting, visual comfort, glare, ease of movement within the building, functionality of different spaces, and the overall impact of lighting on daily court activities. The responses provided valuable insight into practical challenges encountered in existing court facilities and informed the development of design recommendations aimed at improving user satisfaction and operational efficiency.

4.4 Methods and Instruments for Data Collection

The primary instrument for data collection was the interview guide, which was used to obtain information from lawyers, and court staff regarding lighting performance, spatial functionality, and user experience within existing judicial buildings. An observation checklist was also developed to guide site inspections. During field visits, observations were made on building orientation, window placement, daylight availability, circulation patterns, spatial organization, shading devices, and the use of artificial lighting. Photographs were taken during site visits to document important architectural features and lighting conditions. These photographs served as visual evidence during the analysis of existing court facilities.

Secondary information was collected through documentary review of books, journal articles, planning standards, architectural drawings, and published case studies.

4.5 Data Collection Method

Data collection was carried out in two phases. The first phase involved the collection of secondary data through an extensive review of literature relating to architectural lighting, daylighting strategies, judicial building design, sustainable architecture, and environmental design principles. Relevant journals, books, conference papers, planning documents, and online architectural resources were reviewed.

The second phase involved field investigations through site visits and visit to some case studies. Physical observations were conducted to assess spatial organization, building orientation, lighting conditions, and circulation systems. Interviews were also conducted with selected users to obtain firsthand information regarding their experiences with the existing facilities. Photographs and field notes were taken to support subsequent analysis.

4.6 Method Used for Site Analysis

The data collected for this study were analyzed using qualitative descriptive analysis. Information obtained from interviews was organized into thematic categories based on recurring issues relating to daylight availability, artificial lighting, user comfort, spatial organization, and building functionality. Observational findings from site visits were compared with established architectural principles and best practices identified in the literature.

Case studies were comparatively analyzed by examining architectural form, building orientation, spatial configuration, daylighting strategies, and lighting performance. The findings from the literature review, interviews, field observations, and case studies were combined to develop design recommendations for the proposed court complex in Uyo.

CHAPTER FIVE

DESIGN SYNTHESIS AND DEVELOPMENT

5.1 Design Brief

The proposed Court Complex is being proposed as a modern judicial facility located along Udo-Udoma Avenue, Uyo, Akwa Ibom State, and is intended to serve the growing administrative and judicial demands of the state judiciary.

The design is conceived to provide judges, court officials, litigants, legal practitioners, and members of the public with a facility that supports the dispensation of justice in an environment that is dignified, secure, and well-lit. Emphasis is placed on daylighting as the central design strategy, guiding the form, orientation, and spatial organization of the complex.

The proposed design is a two-storey structure, with each floor replicating an identical courtroom cluster arrangement, allowing for consistent circulation, structural regularity, and ease of vertical expansion of judicial functions. The design places strong emphasis on the clear separation of the three principal circulation groups within a courthouse: the public, the judiciary, and detainees, ensuring that each group moves through the building along independent, non-intersecting routes.

This design seeks to establish a unique architectural identity for the state judiciary through functional planning, passive environmental design, and a clear expression of order, transparency, and justice.

5.2 Design Requirements for Activities and Planning Data

The requirements for the planning and design of the proposed Court Complex are derived from the range of activities expected to occur within the facility. These include court proceedings,

jury and public seating, deliberation by judges, holding of detainees, court registry operations, administrative work, and legal consultation, among others.

To accommodate these activities, the court complex requires adequately sized and properly zoned spaces including courtrooms, judges chambers and offices, deliberation rooms, holding cells, court registries, conference rooms, libraries, and staff facilities. These spaces are planned in accordance with acceptable architectural principles, ergonomics, and anthropometric standards specific to judicial buildings.

The circulation system within the complex is organized to allow free and independent movement of the public, judiciary, and detainees, without conflict or unauthorized interaction between the three groups. Restricted corridors are provided exclusively for judges movement between chambers and courtrooms, while a separate secure route connects holding cells directly to the courtrooms for detainee movement.

Lighting, ventilation, security, and acoustic separation between courtroom clusters are equally critical considerations, given the sensitive nature of judicial proceedings.

5.3 Schedule of Accommodation

The following spaces are provided on each of the two floors of the Court Complex. As the floors are designed with an identical layout, the schedule below applies uniformly to the ground, first, and second floors.

Public and Entrance Areas

- i. Library (one per wing)
- ii. Conference Room (one per wing)

Judiciary Areas

- i. Judges Office (four per floor)

- ii. Deliberation Room (four per floor, adjoining each Judges Office)
- iii. Chambers (four clusters per floor, near entrance/library wings)
- iv. Restricted Corridor for Judges (two per floor)

Courtroom Cluster

- i. Courtroom (four per floor), each comprising:
 - ii. – Jury Box
 - iii. – Public / Gallery Seating
 - iv. – Judges Bench Area
- v. Court Registry (four per floor, one per courtroom)

Detainee Areas

- i. Holding Cell (four per floor, one per courtroom)

Circulation and Support Facilities

- i. Staircase Hall (two per floor)
- ii. Male and Female Conveniences (distributed across the floor)
- iii. Staff Toilets (distributed near chambers, judges offices, conference rooms, and courtrooms)

External and Landscape Facilities

- 1. Internal courtyards with landscaping (three per floor, positioned between courtroom blocks to enhance daylighting and natural ventilation)

Each courtroom is planned as a self-contained module comprising a judges office, deliberation room, holding cell, courtroom, and registry, arranged symmetrically on either side of a central circulation spine, with the library and chambers wings.

Table 5.1: Schedule of Accommodation - Ground Floor

S/N	Room Name	Area (m2)
1	Judges Deliberation Hall	60 m ²
2	Library	39 m ²
3	WC	6 m ²
4	WC	4 m ²
5	Chambers	39 m ²
6	Chambers	39 m ²
7	Chambers	39 m ²
8	WC	4 m ²
9	WC	4 m ²
10	Conference Room	41 m ²
11	WC	6 m ²
12	WC	4 m ²
13	WC	4 m ²
14	WC	5 m ²
15	Court Registry/Secretary	19 m ²
16	Court Room	170 m ²
19	Holding Cell	13 m ²

Table 5.2: Schedule of Accommodation - First Floor

S/N	Room Name	Area (m2)
1	Judges Deliberation Hall	60 m ²
2	Library	39 m ²
3	WC	6 m ²
4	WC	4 m ²
5	Chambers	39 m ²
6	Chambers	39 m ²
7	Chambers	39 m ²
8	WC	4 m ²
9	WC	4 m ²
10	Conference Room	41 m ²
11	WC	6 m ²
12	WC	4 m ²
13	WC	4 m ²
14	WC	5 m ²
15	Court Registry/Secretary	19 m ²
16	Court Room	170 m ²

Table 5.3: Schedule of Accommodation - Second Floor

S/N	Room Name	Area (m2)
1	Judges Deliberation Hall	60 m ²
2	Library	39 m ²
3	WC	6 m ²
4	WC	4 m ²
5	Chambers	39 m ²
6	Chambers	39 m ²
7	Chambers	39 m ²
8	WC	4 m ²
9	WC	4 m ²
10	Conference Room	41 m ²
11	WC	6 m ²
12	WC	4 m ²
13	WC	4 m ²
14	WC	5 m ²
15	Court Registry/Secretary	19 m ²
16	Court Room	170 m ²

5.4 Special Considerations

Security, daylighting, acoustic privacy, accessibility, and clear separation of circulation are the key considerations that required particular attention in the design of the proposed Court Complex. Court buildings, unlike typical public institutions, must reconcile openness to the public with strict control over the movement of detainees and the privacy of judicial deliberation.

Natural lighting and ventilation, introduced through internal courtyards, and careful building orientation, are central to the design, reducing dependence on artificial lighting while creating a calm and dignified atmosphere within the courtrooms and adjoining spaces.

Accessibility for physically challenged users is another major consideration, and the design incorporates ramps, accessible toilets, and barrier-free routes throughout the public areas of the complex.

Security is of paramount importance in a judicial facility. The design provides controlled access points, a restricted judges corridor, a dedicated and secure detainee route linking holding cells directly to courtrooms, and surveillance provisions throughout, ensuring that public, judiciary, and detainee circulation never intersect.

Sustainability considerations, including the use of durable materials and passive climate-responsive strategies, were also incorporated to reduce the long-term operational and environmental cost of the facility.

5.5 Site Inventory and Analysis

The selected site for the Court Complex is located along Udo-Udoma Avenue, Uyo, Akwa Ibom State, within a setting that provides good accessibility and visibility befitting a civic and judicial institution.

The site offers sufficient land area of 11663.354spm (1.16 Hectare) to accommodate a three-storey court building, parking areas, landscaped courtyards, pedestrian walkways, and service access, while also allowing room for controlled, secure vehicular routes for detainee transport separate from public and staff access to enhance security, prevent unauthorized contact between detainees and the public, and ensure the safe and efficient movement of all court users.

The relatively stable ground conditions on the site are favourable for institutional development, allowing proper building orientation and effective drainage, thereby minimizing the risk of erosion and surface water pooling during the rainy season.

The sites location along a major avenue ensures convenient access for the public, legal practitioners, and court officials, while also allowing for the development of separate service and security access points required for a judicial facility.

On weather, the site experiences the tropical conditions typical of Akwa Ibom State, with high temperatures and a pronounced rainy season. These conditions informed the adoption of sun-shading devices, generous roof overhangs, and passive ventilation strategies in the design.

Overall, the chosen site is well suited to the Court Complex project due to its accessibility, adequate land area, stable ground conditions, and suitability for the layered security requirements of a judicial building.

5.6 Data Analysis and Presentation

Data gathered through literature review, case studies, and site analysis were examined to determine the key design determinants for the proposed Court Complex on Udo-Udoma Avenue, Uyo. The analysis revealed that contemporary court buildings are no longer designed purely as spaces for judicial proceedings, but as institutions that must express order, transparency, and public trust while maintaining strict internal security.

The literature review established that the clear separation of circulation is one of the most critical determinants of court building design. Public, judiciary, and detainee movement must be planned along independent routes that never intersect, and this principle directly informed the decision to provide a restricted judges corridor and a dedicated secure detainee route within each courtroom cluster.

Daylighting was also identified as a critical requirement for judicial spaces, both for energy efficiency and for creating a calm, dignified atmosphere appropriate to the dispensation of justice. This informed the courtyard-based planning strategy adopted in the design, in which internal landscaped courtyards are interspersed between courtroom blocks to introduce natural light and ventilation deep into the plan.

Findings from case studies of comparable judicial and institutional facilities reinforced the need for modular, repeatable courtroom clusters, secure and separate detainee holding facilities directly linked to courtrooms, and centralized circulation spines that allow for efficient way-finding by the public.

From the site analysis, it is evident that the Udo-Udoma Avenue site offers sufficient space and a favourable setting for the proposed development, supporting efficient site planning, secure vehicular access, landscaping, and parking. Climatic analysis further recommended a design approach that embraces passive environmental strategies including orientation, natural ventilation, and daylighting.

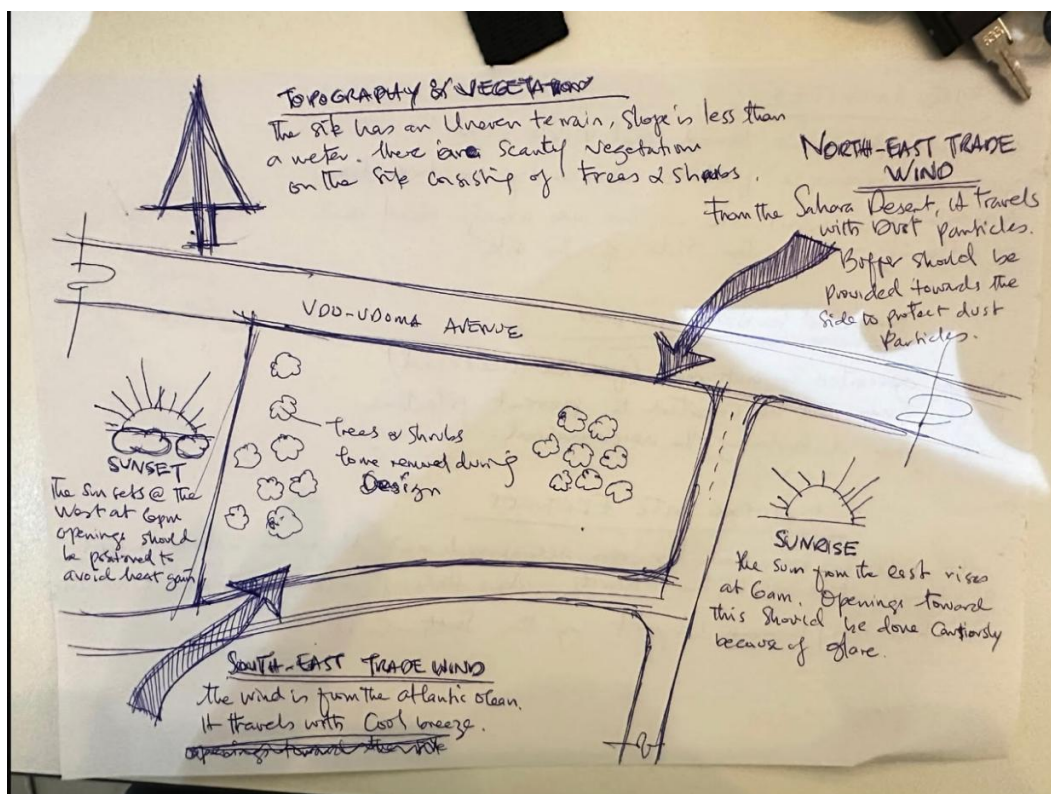


Plate 5.1 Showing Site analysis sketch of the proposed site (Source: Authors Sketch Book)

With these findings in mind, the proposed design adopts a repeated, modular courtroom-cluster plan across three floors, organized around a central circulation spine from which all functional

spaces emerge, with independent routes maintained for the public, judiciary, and detainees throughout.

In all, the analysis demonstrates that the Court Complex design integrates lessons from the literature and case studies with the physical characteristics of the site to produce an architectural response that is secure, daylit, functionally efficient, and appropriate to the judicial needs of Udo-Udoma Avenue, Uyo, Akwa Ibom State.

5.7 Design Concept and Design Proposal

Design Concept: Light of Justice Concept

The design concept of the proposed Court Complex is founded on the idea of daylight as a symbol of justice: transparent, impartial, and revealing. Just as natural light illuminates a space without distortion, the design seeks to create courtrooms and judicial spaces that are open, honest, and free of the oppressive, enclosed character often associated with institutional buildings.

The concept translates this idea into a modular arrangement of courtroom clusters interspersed with internal courtyards that admit daylight and natural ventilation deep into the plan. Each courtroom cluster is treated as a self-contained unit, comprising a judges office, deliberation room, holding cell, courtroom, and registry, mirrored across a central circulation spine to achieve both symmetry and efficient way-finding.

The central circulation spine acts as the organizing element of the design, much like a courts central hall, from which all functional areas are accessed. Courtyards positioned between courtroom blocks break up the mass of the building, allow daylight to penetrate internal spaces, and provide moments of visual and psychological relief for occupants and visitors.

This arrangement is equally responsive to the strict circulation requirements of a judicial facility. The positioning of restricted judges corridors and secure detainee routes around the modular courtroom clusters ensures that daylighting and openness are achieved without compromising the security and separation required between the public, judiciary, and detainees. Overall, the design produces a dignified, secure, and naturally lit judicial facility that expresses the values of transparency and fairness central to the administration of justice, while offering the flexibility to replicate the same efficient courtroom cluster across all three floors of the Court Complex.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Summary of Findings and Main Issues

This study examined the role of daylighting in the design of judicial buildings, emphasizing particularly on the proposed court complex in Uyo, Akwa Ibom State. The study was carried out in recognition of the important role natural daylight plays in creating functional, comfortable, and energy-efficient judicial environments. Since court buildings accommodate activities that require high levels of visual accuracy, concentration, and confidentiality, the provision of adequate natural lighting is essential for improving the quality of indoor spaces and supporting the effective administration of justice.

The review of literature revealed that daylighting has become an important consideration in contemporary architectural design because of its contribution to energy conservation, occupant comfort, and environmental sustainability. Previous studies established that effective daylighting depends largely on architectural decisions made during the early design stages. The literature also showed that proper integration of these design elements can improve indoor illumination, reduce glare, minimize heat gain, and decrease dependence on artificial lighting.

The findings from the literature further indicated that building orientation remains one of the most important determinants of daylight performance. Buildings oriented along the east-west axis generally provide more uniform daylight distribution while reducing excessive solar heat gain. Similarly, an appropriate window-to-wall ratio, combined with external shading devices, helps achieve a balance between adequate daylight penetration and thermal comfort. The literature also emphasized that successful daylighting requires the integration of passive design

strategies with appropriate spatial planning, rather than relying solely on artificial lighting systems.

The field investigation conducted in selected judicial buildings revealed that many court buildings in Nigeria incorporate only basic daylighting principles. While features such as roof overhangs, recessed windows, and moderate window openings are commonly observed, comprehensive daylighting strategies are often lacking. In several cases, poor building orientation, deep-plan layouts, limited internal openings, and inadequate consideration of natural lighting during the design stage result in uneven daylight distribution and increased dependence on artificial lighting. These conditions affect visual comfort, increase energy consumption, and reduce the overall environmental quality of judicial spaces. The local case studies demonstrated different approaches to daylighting in Nigerian judicial buildings. The Federal High Court, Abuja, illustrated the importance of proper site planning, balanced façade composition, and adequate setbacks in improving daylight access. The Rivers State High Court showed how roof overhangs, recessed glazing, and carefully arranged façade openings contribute to daylight admission while reducing direct solar penetration. The Enugu State High Court provided one of the strongest examples of passive daylighting through the incorporation of internal courtyards and high-level clerestory windows, which allow natural light to penetrate deep into the building interior.

The international case studies further reinforced the importance of integrating daylighting into the architectural design process. Major findings from these include atriums, internal voids, and extensive glazing, clerestory windows and narrow floor depths.

A major finding of this study is that successful daylighting depends on the integration of multiple architectural strategies rather than on a single design element. Buildings that combine

appropriate orientation, efficient spatial organization, well-designed façades, suitable window proportions, internal courtyards, and high-level daylight openings consistently achieve better daylight performance than buildings designed without these considerations. The study also found that daylighting enhances not only energy efficiency but also the quality of the indoor environment by improving visual comfort, reducing eye strain, and creating more pleasant spaces for judges, lawyers, court staff, and members of the public.

The major issue identified throughout the study is that many existing judicial buildings in Nigeria still do not fully integrate daylighting principles into their architectural design. This often results in excessive dependence on artificial lighting, increased operational costs, and indoor environments that do not fully support occupant comfort and productivity. These findings therefore highlight the need for future judicial buildings to adopt a more integrated and climate-responsive approach to daylighting.

6.2 Conclusion

It can be concluded from this study that daylighting is an essential component in the design of judicial buildings and should be considered a primary architectural design criterion rather than an afterthought. Effective daylighting contributes significantly to visual comfort, energy efficiency, environmental sustainability, and the overall quality of indoor spaces. Because judicial buildings accommodate activities requiring concentration, accuracy, and prolonged occupancy, providing adequate natural lighting is necessary for improving both building performance and user experience. The findings of the study show that architectural design decisions have a direct influence on daylight performance. Building orientation, spatial organization, building form, façade treatment, window design, and the incorporation of architectural elements such as courtyards, atriums, clerestory windows, and external shading

devices collectively determine the effectiveness of natural lighting within judicial buildings. When these elements are properly integrated, they improve daylight penetration, reduce glare and heat gain, minimize dependence on artificial lighting, and create healthier indoor environments.

The assessment of existing court buildings further indicates that although some Nigerian judicial facilities incorporate passive daylighting features, many still face challenges arising from poor orientation, deep-plan layouts, inadequate façade design, and limited consideration of daylight during the design process. Addressing these shortcomings presents an opportunity to improve the design of future judicial buildings.

Consequently, for the design of the proposed court complex in Uyo, architectural strategies identified through the literature review and case studies, including appropriate building orientation, balanced window design, internal courtyards, clerestory openings, and the use of external shading devices were adopted. These strategies are expected to improve indoor daylight distribution, enhance visual comfort, reduce energy consumption, and provide a more functional and sustainable judicial environment.

6.3 Recommendations

Based on the findings of this study, the following recommendations are made:

1. Daylighting should be considered as a primary design objective during the planning and design of judicial buildings rather than being introduced after the building layout has been established.
2. Architects should adopt building orientations that maximize access to natural daylight while minimizing excessive solar heat gain, particularly in tropical climates.

3. Large judicial buildings should incorporate architectural features such as courtyards, atriums, clerestory windows, skylights, and light wells to improve daylight penetration into interior spaces.
4. Building forms should minimize excessive floor depth and promote efficient spatial layouts that allow more occupied spaces to benefit from natural lighting.
5. Artificial lighting systems in judicial buildings should complement natural daylight through the use of daylight-responsive controls and energy-efficient lighting technologies.
6. Existing court buildings should be periodically evaluated to identify opportunities for improving daylight performance through renovations and architectural retrofitting.
7. Further studies should employ daylight simulation software and post-occupancy evaluations to assess the effectiveness of daylighting strategies in completed judicial buildings.

6.4 Contribution to Knowledge

This study contributes to existing knowledge by examining daylighting specifically within the context of judicial buildings, an area that has received comparatively less attention in architectural research than educational, residential, or commercial buildings. By focusing on court complexes, the study demonstrates that the functional requirements of judicial buildings demand carefully integrated daylighting strategies that support visual comfort, privacy, security, and efficient building performance.

The study also contributes by identifying and synthesizing architectural design strategies that influence daylight performance in judicial buildings. Through the analysis of literature and selected local and international case studies, it highlights the importance of building

orientation, spatial organization, façade treatment, window design, courtyards, atriums, clerestory windows, and shading devices in improving indoor daylight conditions.

Finally, the study provides a useful groundwork for architects, planners, researchers, and government agencies involved in the planning and design of judicial buildings. The findings contribute to the growing body of knowledge on sustainable architectural design and provide practical guidance for improving daylight performance in future court buildings across Nigeria and similar tropical regions.

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