



RESEARCH DEVELOPMENT OF THE U-TOLF BUILDING (OFFICE COMPLEX) AT W.T.C. ESTATE, NEW LAYOUT, ENUGU NORTH L.G.A., ENUGU STATE

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Accepted: May 17, 2023

Published: May 25, 2023

Citations - APA

Okechukwu, C. N., Egbo, J. C. & Oku, O. C. (2023). Research development of the U-tolf building (office complex) at W.T.C. Estate, new layout, Enugu North L.G.A., Enugu state. *International Journal of Engineering and Environmental Sciences*, 6(1), 22-31. DOI: <https://doi.org/10.5281/zenodo.7974737>

This paper described step by step research design and development of the U-Tolf Building (Office Complex) at W.T.C. Estate, New Layout, Enugu North L.G.A., Enugu State. The study used case study, literature review and field study method used to obtain various data from various primary and secondary sources on disaster management in Nigeria. Purposive (non-probability) sampling technique was used to obtain data for this research. The result showed that the conceptual integration of elements of unique comfort in the architectural design of the office complex has provided an eco-friendly design that enhances environmental sustainability, thereby contributing to climate change actions of the United Nations 2030 sustainable development goals.

ABSTRACT

Keywords: U-Tolf Building; W.T.C Estate; Climate Change Action; Disaster Management; Environmental Sustainability

Introduction

Disaster Management is the coordination and integration of all activities necessary to build, sustain and improve the capability to prepare for, protect against, respond to and recover from threatening or actual natural or human-induced disasters. It is a multijurisdictional, multi-sectoral, multi-disciplinary and multi-resource initiative. Therefore, it is vital that the Federal, State and Local Governments, Civil Society Organizations (CSOs) and the private sector discharge their respective roles and responsibilities and complement each other in achieving shared goals of disaster management. In view of this, The U-Tolf Foundation a Non-Governmental Organization that focuses on disaster management and response conceived the idea for the development of the NGO's cooperate office (The U-Tolf Building) at Enugu. This complex would serve as a center for training of volunteers in first aid, disaster preparedness and response, provision of water, sanitation and aid. Hence, this project report provides a concise package of information illustrating the planning, design process, construction documentation, tender process, contract management and the close out stages involved in the development of the U-Tolf Building in Enugu.

Project Goal and Objectives: The project goal is to develop a vernacular architecture with the incorporation of cost effective and contemporary eco-friendly features. This would be achieved with the main objective of using basic architectural principles and guide lines to create a functional and unique design suitable to the Client's requirements.

Site Location: The site is located at W.T.C. Estate, New Layout, Enugu North L.G.A., Enugu State Plot Size: 1252.52 square meters. The site is located at Latitude: 6°25'44.56°N and Longitude: 7°29'58.04°E

Literature

Disasters in Nigeria

Nigeria, like the rest of the world, is exposed to a wide range of natural or human induced disasters. While some of these disasters are rapid, others are slow-onset, resulting in catastrophic situations leading to loss of lives and property, degradation of environment. These disasters occur in form of drought, desertification, flooding, epidemics, coastal erosion, dam failure, building collapse, oil spillage, maritime collision or accident, bomb explosion, communal clash, fire, air crashes and boat mishap, amongst others (Refworld, 2013). Historically, salient disasters in Nigeria include, the yearly epidemics such as cholera, measles and cerebro-spinal meningitis. There was drought in the Sudan-Sahel zone of the country in 1972-74 and 1982-84. There were flood disasters in Ogunpa (Oyo State) in 1982, Lagos Bar Beach in 2001, Shiroro and Kaduna in 2003, Gombe in 2004, Jalingo in 2005, e.t.c. Others include, the 2008 landslide in Agwu LGA (Enugu state); and 2005, 2006 and 2009 landslide in Agwagune (Cross River State). Also, Nigeria experienced numerous ethnic, political and religious violent conflicts in Kaduna, Lagos, Kano, Plateau, Bauchi, Borno, Taraba, Benue, Delta, Anambra, Ondo, Osun, Ogun etc. In addition, there were technological disasters ranging from, the 2002 Ikeja bomb explosion (Lagos State); the 2002 West African Rubber Product Company fire in Ikorodu (Lagos State); the 1992 Hercules C-130 military air-crash at Itokin (Lagos State); the 2002 ADC air-crash at Ejirin (Lagos State); the EAS air-crash in Kano State; the 2005 Bellview air-crash in Lisa village (Ogun State); the 2005 Sosoliso air crash in Portharcourt (Rivers State); the ADC air crash in Abuja. Other technological disasters include the several pipeline explosions and vandalization in the Niger Delta, and series of road traffic crashes among others (Refworld, 2013). Beyond these events, threats posed by frequent oil spills and irreparable damage to environmental and coastal biospheres, increasing levels of industrial pollution, waste and unprecedented climatic changes, and its negative consequences make Nigerians to be increasingly at risk to a wide number of new and emerging hazards. The vulnerability of Nigerians to hazards is a function of several factors. These include, the level of poverty; population growth and distribution; and the condition of human settlements and their infrastructure. Other causative factors include, the level of environmental degradation, level of public awareness, the dynamics of public policy and environment on disaster management (Refworld, 2013).

History of Disaster Management in Nigeria

Organized Disaster Management in Nigeria can be dated back to 1906 when the Fire Brigade was established with functions that went beyond firefighting to the saving of lives and property and provision of humanitarian services during emergencies. In the 1960s and 70s, this noble and systematic approach was replaced with ad-hoc arrangements domiciled in the offices of the Head of State and the State Governors (Refworld, 2013). During this period disaster response was considered as mere security issues. In 1972/1973, Nigeria experienced a devastating drought which had negative socioeconomic consequences and cost the nation the loss of many lives and property. This event amongst others led to the establishment of the National Emergency Relief Agency (NERA) in 1976 with the mandate of collecting and distributing relief materials to disaster victims. An Inter-Ministerial body was set up by the Federal Government of Nigeria (FGN) in 1990 to address natural disaster reduction strategies in line with the UN International Decade for Natural Disaster Reduction (IDNDR) and to address the limited scope of NERA. In 1993, the FGN decided to expand the scope of managing disasters to include all areas of disasters. This bold approach was backed up by decree 119 of 1993 which raised the status of the Agency to an Independent body under the Presidency. In 1997, the management of NERA organized a National Workshop involving major stakeholders in disaster management in Nigeria to deliberate on critical factors for an effective disaster management system in Nigeria, and noted the need to:

- i. Expand the functions of NERA, amend the decree setting up NERA and change its name to National Emergency Management Agency (NEMA).
- ii. Structure the new Agency by putting into consideration appropriate Policies and Strategies; Search and Rescue resource mobilization capabilities; Information, Education and Prevention strategies; Administration, Finance and Logistics systems; Relief and Rehabilitation capabilities; Research and Planning.
- iii. provide appropriate budgetary allocation for the operations of the Agency.

The acceptance of these recommendations by the FGN led to the establishment of the National Emergency Management Agency (NEMA) in March 1999 by Act 12 of 1999 as amended by Act 50 of 1999 to manage disasters in all its ramifications. In fulfilling its mandate, NEMA developed several plans and guidelines, some of these are National Disaster Response Plan, the Search and Rescue/Epidemic Evacuation Plan, the National Nuclear and Radiological Plan, the Early Warning System on Epidemic etc. Over the years NEMA has encountered some challenges and learnt lessons in the implementation of the plans. This necessitated the development of the NDMF to correct implementation gaps and increase efficiency and effectiveness of disaster management in Nigeria (Refworld, 2013).

Institutional Capacity for Disaster Management

This thematic area mandates the establishment of Disaster Management structures at all levels of governance (federal, states and local) in Nigeria. It centers on the principles of shared responsibility and the need to ensure proper integration and collaboration among stakeholders. There shall be National Emergency Management Agency (NEMA) at the Federal level, State Emergency Management Agency (SEMA) at the state level, and Local Emergency Management Authority (LEMA) at the local government level. This to a large extent shall strengthen the capabilities of Federal, State and Local Governments to reduce the likelihood and severity of disasters. Every tier of government shall build the capacity of their emergency management institution to prepare for, prevent against, respond to and recover from disaster events. Federal State and Local Government, relevant Ministries, Departments and Agencies (MDAs), the military, police, para-military and Civil Society Organizations (CSOs) shall develop their capacities in disaster management. Community institutions shall acquire disaster management capabilities as first responders, and Emergency Management Volunteers (EMV) shall be established to compliment the organized structures. Disaster Response Units (DRUs) shall be established in different military formations across the country to provide assistance to civil authority during emergencies (Refworld, 2013).

According to Refworld (2013), this thematic area shall have the following objectives:

- I. Establish functional disaster management institutions at all levels of governance to prepare for, prevent, mitigate, respond to and recover from disaster events in Nigeria.
- II. Develop capacity of relevant institutions and stakeholders for effective and efficient disaster management in Nigeria.

Volunteers in Disaster Management

Volunteers in Disaster Management shall be individuals or groups with specialized or basic training in different areas of disaster management. Volunteerism refers to rendering of time, skills, experience or resources for the advancement of disaster management. They shall be established by NEMA, SEMA and LEMA to tap into the huge knowledge and experiences of specialized skills of personnel living or working in the country (Refworld., 2013).

Roles of Volunteers in Disaster Management

Volunteers in disaster management shall perform the following functions, amongst others:

- I. Assist in search and rescue operations in case of disaster.
- II. Function as emergency personnel that can render specialized assistance to
- III. disaster survivors.
- IV. Give useful information of places prone to both human-induced and natural
- V. disasters.
- VI. Partake in simulation exercises.
- VII. Help in direct distribution of relief materials in emergency situations.
- VIII. Take part in activities that will lead to disaster risk reduction measures in the community.

Volunteers shall perform their duties in an organized manner and under the supervision of and guidance of NEMA, SEMA and LEMA in preparing for, preventing and responding to disasters. They shall be at least trained in Basic Life Support, disaster preparedness and response, relief, prevention, mitigation, contingency planning, recovery, capacity assessment, water and sanitation (Refworld., 2013).

Concept Design (unique comfort)

The concept design of 'unique comfort' was formulated. The concept was aimed at developing a unique contemporary office design that will enhance a more sustainable and healthier life style by increasing the dependence on natural ventilation to enhance thermal comfort and reducing overdependence on mechanical ventilation devices thereby making the complex to have an eco-friendly design that enhances environmental sustainability, thereby contributing to climate change actions of the United Nations 2030 sustainable development goals. This was achieved with the use of large windows, long fin walls and deep roof overhangs to provide shades and enhance indoor thermal comfort.

Materials and Methods

Case study, review of literature and field interview were used to appraise and conduct the research based on the Client's statement of need. Due to the peculiar characteristics of this study concept, the non-probability sampling technique was used in selecting the sample size of this study. Under this, Purposive sampling method was employed because to assisted in selection of sample size of the study with special characteristics under study which will help in achieving the goal of this study. Both primary and secondary data were collected through review of related literatures and during field studies.

The Brief

To develop a cooperate office complex for a Non-Governmental Organization (the U-Tolf Building) that focuses on disaster management and response at Enugu. This complex would serve as a center for training of volunteers in first aid, disaster preparedness and response, provision of water, sanitation and aid.

Design Requirements

Spatial requirements: The spaces provided for are:

On the ground floor:

- a) Entrance porch
- b) Reception hall
- c) Waiting area
- d) Private offices (4)
- e) Consulting and room Screening rooms

On the first floor:

- f) Reception / stair hall with bar
- g) Kitchen
- h) Machine room
- i) Laundry
- j) 6 suites ensuite
- k) Male and female Conveniences

Technical Requirements: The following technical requirements were considered during the briefing:

- a) Design for optimal thermal comfort ensuring that the rooms are cross ventilated and adopting bioclimatic design principles.
- b) Design for adequate natural lighting by using large fenestrations.
- c) Use of sustainable building materials.
- d) Structural strategy to be adopted (which should be reinforced concrete) and the finishes required.

Site Information:

Site location – WTC Estate, New Layout, Enugu North L.G.A., Enugu state.

Plot Size – 1252.52m² as indicated on the project's survey plan.

Site Survey - The predominant soil type is gravely-silt. It is mostly reddish in color and has a high-density bearing capacity for intense building construction.

Public Utilities – Available public utilities include a graded and asphalt coated access road and electricity.

Noise & Neighborhood - The project site is bounded by the University of Nigeria Enugu, St. Anthony Catholic Church, Urban Girls Secondary, Metropolitan Secondary and WTC Primary School. The neighborhood is generally serene and quiet, possible source of noise is from the major access road leading to the site, and from the schools and the church within the environs. The elevated nature of the site enabled it to have a good view of the neighborhood and proper drainage.

Other Site Inspections – The site was properly inspected and there was no record of government utility or natural water drainage cutting across the site. Also, there was no sighting of any pit or sign of poor soil conditions.

Deed and planning permit: The Certificate of Occupancy conveying the plot to the Client guaranteed free hold with no restrictions of easement attached.

Table 1: Distribution of space requirements

S/N	Activity of Space Schedule	Space Requirements (m ²)	Percentage Distribution (%)
1.	Total Site Area	1252.52	
2.	Ground Floor Plan		
	Entrance porch	19.63	
	Reception hall with WC and staircase	56.36	
	Waiting area with 2 WCs	41.71	
	Consulting and room Screening rooms with WC	39.04	
	Private offices (2) with WC each	22.83	
	Private offices (2)	22.83	
	Additional staircase	16.69	
	Circulation Lobby	39.04	
3.	First Floor Plan		
	Reception/stair hall with bar	41.44	
	Kitchen with store	27.58	
	Machine room	15.08	
	Laundry	17.97	
	Suites ensuite (6)	22.80	
	Male and female Conveniences (4)	25.33	
	Circulation Lobby	26.92	
	Additional staircase	16.69	
4.	Area of Plot Developed	361.57	28.85
5.	Landscaped Area	34,904.48	71.15
	Total	1252.52	100

Source: Author's field work (2014).

Results and Discussions

Design Development

Stage 1a: Preliminary Design

Site development and Analysis: a comprehensive analysis of the site was presented in a schematic diagram, showing the prevailing site conditions necessary for proper building orientation.

Stage 1b: Sketch Design

Full scale drawing in presentation form



Figure 1: 3D presentation 1



Figure 2: 3D presentation 2



Figure 3: 3D presentation 3

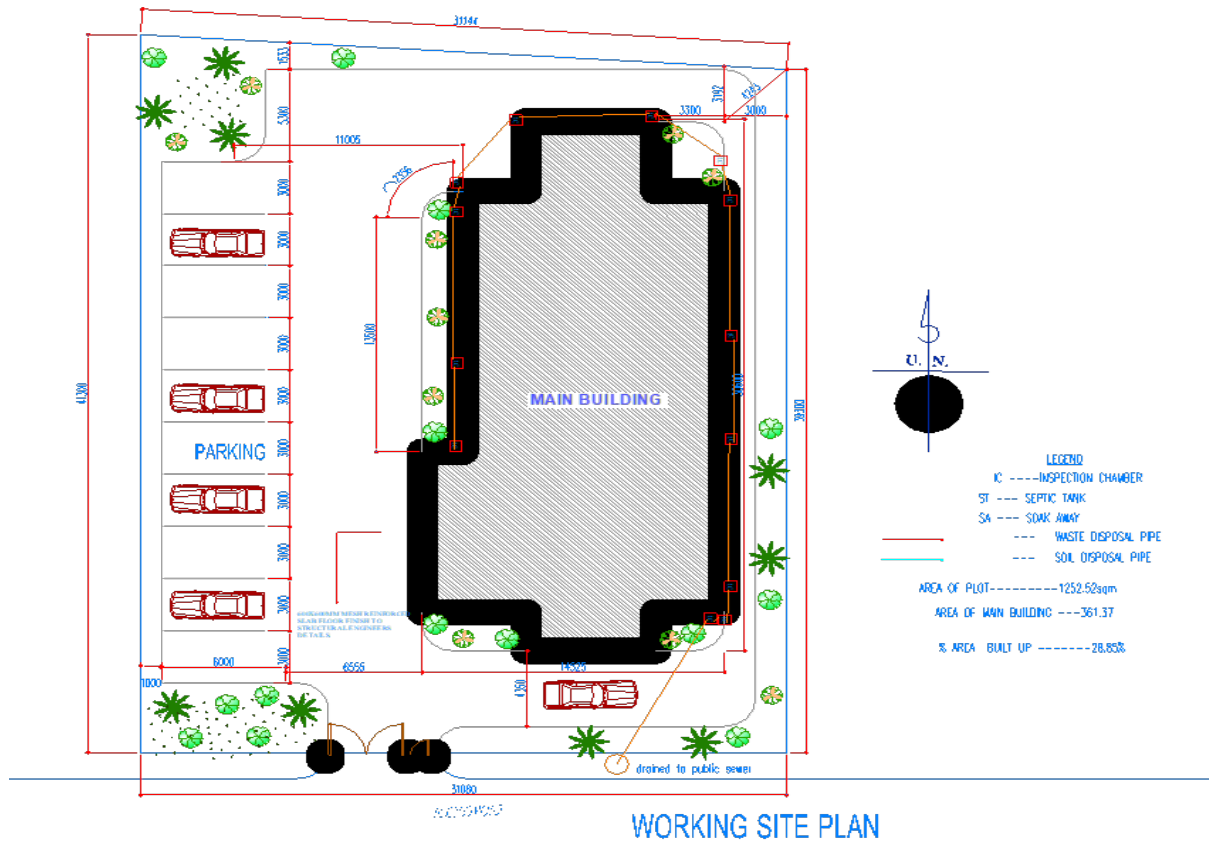


Figure 4: Working Site Plan

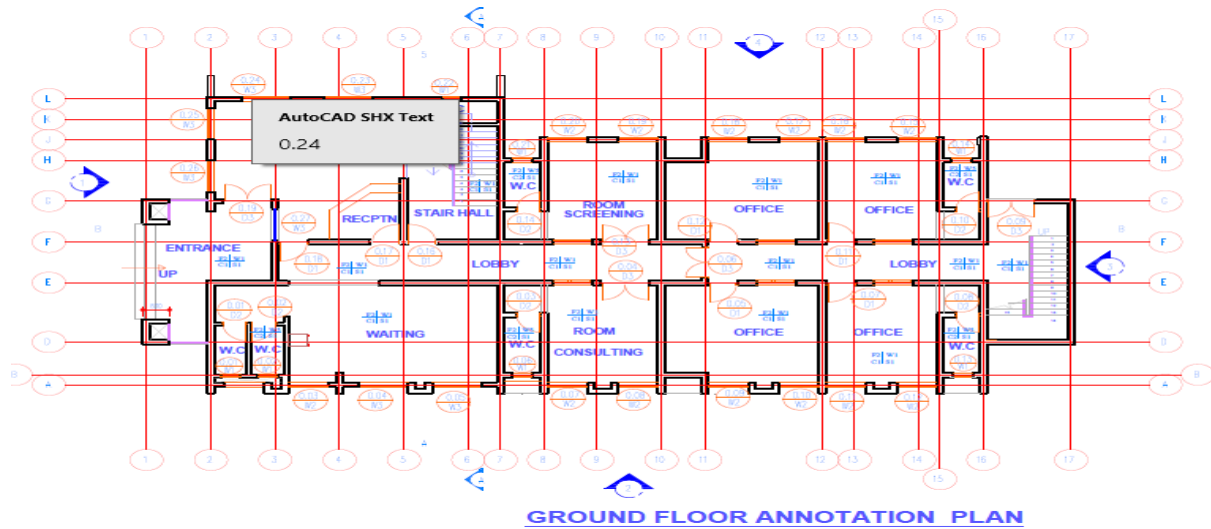


Figure 5: Ground Floor Annotation Plan

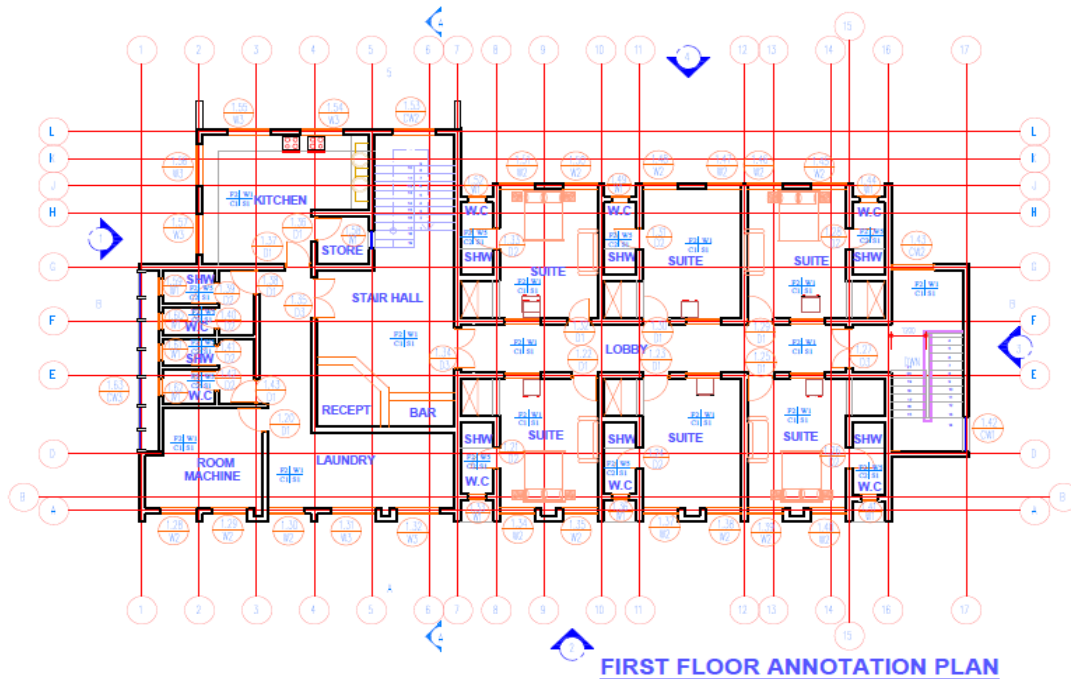


Figure 6: First Floor Annotation Plan

Stage 2: Production drawings and detail designs

Production of working drawings and graphical presentation of the drawings with appropriate dimensions, annotations and specifications. Following the Coordinated Project Information (CPI) minimum information requirement for Architectural Working Drawings; which comprises of: Site plan, Floor plans, Ceiling plans, Roof plans, Sections, Elevations, Schedules and Details.

Conclusion

This study's concept of the U-TOLF Building of application of architectural elements to achieve unique concept assisted in the development of a sustainable design that is environmentally friendly.

References

Refworld (2013). *National Disaster framework, understanding the framework*; www.refworld.org. Available at <https://www.refworld.org/pdfif/5b3f84874.pdf>. (Accessed: 11/5/2023)

Appendices



Appendix 1



Appendix 2



Appendix 3



Appendix 4