

**APPLICATION OF PASSIVE COOLING PRINCIPLES IN THE DESIGN  
OF A FIVE-STAR HOTEL, UYO**

**JAMES, MBUOTIDEM ETOP  
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**SEPTEMBER, 2021**

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OF A FIVE-STAR HOTEL, UYO**

**BY**

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**A DISSERTATION SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES IN  
PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER  
OF SCIENCE (M.Sc) DEGREE IN ARCHITECTURE IN THE DEPARTMENT OF  
ARCHITECTURE, COLLEGE OF SCIENCE AND TECHNOLOGY, COVENANT  
UNIVERSITY.**

**SEPTEMBER, 2021**

## ACCEPTANCE

This is to attest that this dissertation is accepted in partial fulfilment of the requirements for the award of the degree of Master of Science in the Department of Architecture, College of Science and Technology, Covenant University, Ota, Nigeria

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**DECLARATION**

I, **JAMES, MBUOTIDEM ETOP (15CA03345)** declare that this research was carried out by me, under the supervision of Dr. Omoyeni A. Fulani of the Department of Architecture, College of Science and Technology, Covenant University, Ota, Nigeria. I attest that the dissertation has not been presented either wholly or partially for the award of any degree elsewhere. All sources of data and scholarly information used in this dissertation are duly acknowledged.

**JAMES, MBUOTIDEM ETOP**


.....

Signature and Date

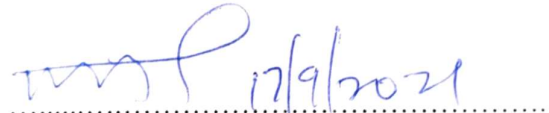
## CERTIFICATION

We certify that this dissertation titled “**APPLICATION OF PASSIVE COOLING PRINCIPLES IN THE DESIGN OF A FIVE-STAR HOTEL, UYO**” is an original research work carried out by **JAMES, MBUOTIDEM ETOP (15CA03345)** in the Department of Architecture, College of Science and Technology, Covenant University, Ota, Ogun State, Nigeria under the supervision of Dr. Omoyeni A. Fulani. We have examined and found this work acceptable as part of the requirements for the award of Master of Science in Architecture.


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## **DEDICATION**

This Design Thesis is dedicated to God Almighty; my parents, the service of humanity, community of Architecture, and the people of Akwa-Ibom.

## **ACKNOWLEDGEMENT**

This thesis would not have been possible without the undeniable help of God and the assistance of my supportive parents, AIG. Rtd. and Mrs. Etop John James. I want to specially thank my parents for their financial support and continuous exaltation throughout the two years of Master's Program.

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## ABSTRACT

The required cost for cooling hotel occupants has been on a steady increase, which has been a major issue for those that venture into the hotel industry. In relation to this, the world faces the problem of energy crisis. Nigeria, not being an exception faces the same problem as its generating capacity is below 5000 megawatts. The passive ventilation systems could reduce the power consumption in a building by using a non-energy solution to reduce the peak cooling loads. The objective of this paper is to investigate the extent to which Passive Cooling Principles were applied in hotel buildings in Nigeria, and the impact of these principles on the selected hotels; in order to promote Energy Efficiency and Conservation. The study is limited to selected five-star hotels in Nigeria; and they were studied in-depth to determine their compliance levels to passive cooling principles. Non-participant observation was carried out to obtain objective data. As Lagos State houses a larger number of the five-star hotels in the study population, two of the selected case studies were from this location; and the last was from Abuja, which represented the North and Central Region of the country. The sampling technique used for this research is purposive sampling. The Five-Star hotels were selected based on their star rating according to set standards that have been identified in Literature; and they include prominent hotels in both Lagos and Abuja. Insulating Materials, Sustainable materials, building orientation and Building form are identified as the predominant passive cooling principles applied by Architects in Nigeria. This information provides a benchmark for future researches and designers that intend to implement or study Passive Cooling Principles; and will play a vital role in the incorporation of these principles in the five-star hotel design carried out along-side this research. The extent to which Passive Cooling Principles are applied in hotel buildings in Nigeria is attained at an application rate of 64%, which also creates a basis for determining the minimum application rate targeted for the five-star hotel design carried out along-side this research; which is 75%.

**Keywords:** Hotel, Passive Cooling, Energy Conservation, Tourism.