

**IMPLEMENTATION OF DAYLIGHTING STRATEGIES FOR
IMPROVING USERS' COMFORT IN THE DESIGN OF A CONVENTION
CENTRE IN MARYLAND, LAGOS**

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JULY, 2023

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BY

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**A DISSERTATION SUBMITTED TO THE SCHOOL OF POSTGRADUATE
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THE AWARD OF DEGREE OF MASTER OF SCIENCE (M.Sc) IN
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COLLEGE OF SCIENCE AND TECHNOLOGY, COVENANT
UNIVERSITY, OTA, OGUN STATE, NIGERIA**

JULY, 2023

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 (M.Sc) in the Department of Architecture, College of Science and Technology, Covenant University, Ota, Nigeria and has been accepted by the School of Postgraduate Studies, Covenant University, Ota, Ogun state.

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DECLARATION

I, EWUOSO, ESTHER AYOMIDE (17CA022931), declare that this dissertation is a representation of my work, and is written and implemented by me under the supervision of Dr. Bukola A. Adewale of the Department of Architecture, Covenant University, Ota, Nigeria. I attest that this dissertation has in no way been submitted either wholly or partially to any other university or institution of higher learning for the award of a master's degree. All information cited from published and unpublished literature has been duly referenced.

EWUOSO, ESTHER AYOMIDE

Signature and Date

CERTIFICATION

This is to certify that this dissertation titled “IMPLEMENTATION OF DAYLIGHTING STRATEGIES FOR IMPROVING USERS’ COMFORT IN THE DESIGN OF A CONVENTION CENTRE IN MARYLAND, LAGOS” is an original research work carried out by **EWUOSO, ESTHER AYOMIDE (17CA022931)** in the Department of Architecture, College of Science and Technology, Covenant University, Ota, Ogun State, Nigeria under the supervision of Dr. Bukola A. Adewale. This dissertation has met the required standard for the award of Master of Science (M.Sc) in Architecture.

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DEDICATION

This research work is dedicated first and foremost to God Almighty, the custodian of all wisdom, knowledge, and understanding, for His grace and favour throughout the duration of carrying out this research. Then to my family for their endless support and love.

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LIST OF ABBREVIATIONS

U.S.	United States
IEQ	Indoor Environmental Quality
WWR	Window-to-wall Ratio
SDGs	Sustainable Development Goals
PLC	Private Limited Company
HVAC	Heating, Ventilation, Air-Conditioning
A.D.	After Death (of Christ)
QSNCC	Queen Sirikit National Convention Centre
IMF	International Monetary Fund
IESNA	Illuminating Engineering Society of North America
IAQ	Indoor Air Quality
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
CO₂	Carbon Dioxide
ISO	International Organization for Standardization
PMV	Predicted Mean Vote
PPD	Predicted Percentage Dissatisfied
EPMV	Extended Predicted Mean Vote
EPPMV	Empirical PMV
LCCI	Lagos Chamber of Commerce and Industry
SICEC	Shijiazhuang International Convention & Exhibition Centre
GRA	Government Reserved Area
MCSS	Maryland Comprehensive Secondary School

ABSTRACT

Daylighting is a significant factor in the design consideration of a building because of its many benefits and advantages. It increases productivity in office workplaces and enhances the wellness of the users of the space. It can also improve users' thermal and visual comfort. Convention centres are large commercial buildings that utilize large amounts of energy to provide a lot of lighting which can affect indoor comfort. Implementing daylighting in this building typology can help reduce energy cost, load, and demand, and improve the thermal and visual comfort of users. This study examined the daylighting strategies that can be utilized in the design of a convention centre to improve users' thermal and visual comfort. The study created new opportunities for improving the design of convention centres and other built environment and is useful to architects and other relevant professionals. Questionnaires were used to gather data from the users of the selected buildings, and case studies were carried out to gather information on the entirety of convention centres in Lagos State, Nigeria, and other countries. The data gotten was analyzed descriptively using IBM Statistical Package for the Social Sciences. It was discovered that in many convention centres, daylighting was not appropriately considered, and many respondents lack knowledge of daylighting elements due to their lack of common use. The available elements were found to have mostly negative effects on thermal and visual comfort. Implementing daylighting more frequently can help increase adequate use and knowledge on daylighting, as well as improve users' comfort.

Keywords: Daylighting, Strategy, Daylighting Strategy, Comfort, Thermal Comfort, Visual Comfort, Convention Centre.