

بسم الله الرحمن الرحيم





شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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لم ترد بالأصل





Ain Shams University - Faculty of Engineering
Department of Architecture

EVALUATING INDOOR ENVIRONMENTAL QUALITY AND ITS EFFECT ON USERS' PERFORMANCE

WITH SPECIAL REFERENCE TO LEED CERTIFIED OFFICE BUILDINGS IN EGYPT

A thesis Presented in Partial Fulfillment of the Requirements for Master of
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Submitted by
Nada Atef El Tohamy

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Under supervision of
Prof. Dr. Hanan Mostafa Kamal Sabry
Professor of Architecture, Faculty of Engineering, Ain Shams university

Prof. Dr. Ahmed Atef El Dessoqy Faggal
Professor of Architecture, Faculty of Engineering, Ain Shams university

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Abstract

It is vital for the building design to address its users' needs as they spend 90% of time indoors. Indoor environmental quality (IEQ) refers to the conditions inside the building having impact over human performance, health, and wellbeing. Satisfied and comfortable occupants are generally performing in higher levels and more productive. Comparing occupants' salaries over building's life cycle with the initial cost reveals that installing efficient indoor environmental quality IEQ strategies from the beginning would be more economic. By investigating how each factor of Indoor environmental quality (IEQ) could affect human performance positively when properly designed or negatively at poor conditions, both building designers and owners would be keen on installing IEQ strategies promoting building users' satisfaction. As certifying buildings with Leadership in energy and environmental design (LEED) rating system is constantly increasing in Egypt, and IEQ category is frequently obtained in majority of certified buildings, the effect of this certification on the actual situation of IEQ needs to be examined.

This research aims at evaluating the state of indoor environmental quality (IEQ) specially in Leadership in energy and environmental design (LEED) certified office buildings by performing a post occupancy evaluation (POE). The research is carried out in two parts: theoretical and analytical. The theoretical study addressed main aspects of IEQ including thermal comfort, indoor air quality (IAQ), visual comfort, and acoustics. It also investigated the positive and negative impacts of these factors over office occupants' performance and health in addition to IEQ evaluation methods and criteria. The analytical study is represented in a post occupancy evaluation using self-assessment questionnaire method. Two LEED certified office buildings were chosen to perform study. Both buildings have significant sustainability features and high certification levels varying between gold and platinum. Both buildings are located in greater Cairo and adopting the concept of open-plan layout. Data collected from each building was independently analyzed and compared with standard recommendations with no comparison with the other building as it is not the intent of the research.

The findings of this research are concerned with the analysis and discussion of the performed survey's results. IEQ satisfaction scores, dissatisfaction causes, occupant's perceived performance, and personal control means are the main issues addressed in the analysis of collected data. Research findings aims at providing a feedback of the actual situation of building performance from the perception of its users. These findings also reveal areas of deficiency to give building operators and owners the chance for enhancement and give building designers the chance for improvement in future designs.

keywords

Indoor environmental quality (IEQ) – Office occupants' work performance – Self-assessment questionnaire – Questionnaire design process – LEED certified office buildings

Acronyms

BRI: Building related illness

IEQ: Indoor environmental quality

LEED: Leadership in energy and environmental design

MCS: Multiple chemical sensitivity

POE: Post occupancy evaluation

SBS: Sick building syndrome

VOC: Volatile organic compounds

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