Cyprus University of Technology

Faculty [Engineering and Technology]

Master's Thesis

Thermal performance: Thermal Performance between the design data and the as-built data

Nicolaos Hadjicharalambous

Limassol, 17 of December 2018

CYPRUS UNIVERSITY OF TECHNOLOGY

FACULTY [Engineering and Technology]

DEPARTMENT [Civil Engineering and Geoinformatics]

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Approval Form

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Presented by

Nicolaos Hadjicharalambous

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Member of the committee: Name Surname and position

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I dedicate this project (thesis) to my parents as a part of my respect to them for their continuous help, their patience and understanding throughout my entire life and are still keep doing…

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Abstract

Studies have shown that walls account for 35% of heat loss of a dwelling. In most cases, the external walls of a dwelling are found to be underperforming in relation to their design performance, creating a need for higher energy consumption. This project aims to research the reasons why this gap exists between design and as-built performance, in an endeavor to eliminate it. This is writing down instructions for a possible practical experiment on model walls and through the use of BuildDesk U software. It is found that the key reasons contributing to the performance gap are poor workmanship and the use of generic data during the design stage. Further, by inputting the findings from the practical experiment and the findings from BuildDesk U into the RdSAP software, it is found that the performance gap can have an impact on energy assessment methodologies. Lastly, through the examination of secondary sources, it is determined that the insulation option chosen for a dwelling can indirectly contribute to the performance gap. Finally, in an attempt to eliminate the performance gap, improvements to wall construction methods are proposed, and recommendations for improvements to the research approach taken will be put forward.