DEVELOPMENT OF AN ENERGY EFFICIENCY RATING SYSTEM FOR BUILDING LIGHTING SYSTEMS

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Degree of Master of Science

Department of Electrical Engineering

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Sri Lanka

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Thesis/Dissertation submitted in partial fulfillment of the requirements for the degree Master of Science in Electrical Installation

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DECLARATION

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Prof. Asanka S. Rodrigo

ABSTRACT

Lighting systems consumes more than 10-20% of total energy consumption of the buildings. Lighting systems significantly affect for the energy efficiency of the building. The energy efficiency rating systems were developed by various countries including Sri Lanka to enhance the energy efficiency in buildings. This research is aimed at developing a new rating system by identifying the existing rating systems and investigating the criteria stated to rate the efficiency of lighting systems and shortcomings and issues.

To implement a new performance rating system, the studies were carried out modeling the lighting systems using DIALux evo software. A perfect model was developed optimizing the luminaire and building envelope parameters using the software simulations for an office area. The ratings of the optimum model normalized to develop the energy score between 0-100. The lighting system efficiency rate proposed in this thesis can be used to rate the lighting systems of buildings with various functional requirements.

***Keywords**: Lighting system, Efficiency rating system, Optimum model, DIALux evo*

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H.D.S.Randimali

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List of Abbreviations

Abbreviation	Description
LED	*Light Emitting Diode*
WWR	*Window to Wall Ratio*
CFL	*Compact Fluorescent Lamp*
SEA	*Sustainable Energy Authority*
LSE	*Lighting System Efficiency*