FEASIBILITY STUDY ON TUBULAR SKYLIGHTS TO BE USED IN SRI LANKAN OFFICE BUILDINGS

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Degree of Master of Science in Building Services Engineering

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University of Moratuwa
Sri Lanka

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Thesis submitted in partial fulfillment of the requirements for the degree Master of Science in Building Services Engineering

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DECLARATION

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The above candidate has carried out research for the Masters dissertation under my supervision.

……..

Signature of the supervisor Date:

(Dr. Asanka Rodrigo)

ABSTRACT

Tubular Daylight Guidance technology can deliver natural light in to a space in a building where daylight is limited with an internally mirrored pipe system using the phenomena called total internal reflection. This research has been conducted to identify the potential and feasibility of applying Tubular skylights in a Sri Lankan office building. The research has focused on the existing technologies and evaluated three models of Tubular skylights designed to be used in office applications. Computer simulations have been carried out to evaluate the light out puts of different lighting arrangements made with Tubular skylights. Energy evaluations have been carried out for the cases require artificial lighting to keep constant illuminance levels. Economic evaluations have been carried out with life cycle cost calculations to evaluate the economic feasibility.

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LIST OF ABBREVIATIONS

UK	United Kingdom
SLL	Society of Light and Lighting
TDGS	Tubular Daylight Guidance Systems
HLS	Hybrid Daylight/Electric Systems
DGS	Daylight Guidance Systems
ELS	Electric Lighting Systems
HRE	Heat Replacement Effect
EDCS	Effective Daylight Capturing Surface
UV	Ultra Violet
TS1	Tubular Skylight with 250mm diameter
TS2	Tubular Skylight with 350mm diameter
TS3	Tubular Skylight with 525mm diameter
USA	United States of America
CIBSE	Chartered Institution of Building Services Engineers
DNI	Direct Normal Irradiance