

MINIMIZING DESIGN WASTE IN HIGHRISE RESIDENTIAL PROJECTS IN SRI LANKA

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Degree of Master of Science in Project Management
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Sri Lanka

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Dissertation submitted in partial fulfillment of the requirements for the degree Master
of Science in Project Management

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DECLARATION

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Senevirathne A.M.S.R

The above candidate has carried out research for the Master's Dissertation under my supervision.

Signature of the Supervisor:

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CH. QS (Mrs.) Dr. Sachie Gunathilake

Minimizing design waste in high-rise residential projects in Sri Lanka

ABSTRACT

The construction industry can be mentioned as a major generator of waste material and contributes a huge portion of waste to landfills. Construction waste should be addressed from the beginning of the project. Even though, the results of waste arise during the construction stage, the sources of waste originate from the design stage. Therefore, the design stage is the most crucial stage of every construction project and designers should be focused on reducing waste during the design process.

To address design waste properly, the methods of waste generation, strategies for waste minimization, and possible barriers to mitigate waste should be understood.

Design documents play a vital role in a construction project and problems related to the quality, precision, and clarity of design documentation become the drivers of waste generation during the construction.

This paper investigates the significance of the design stage for waste management along with the methods of design waste generation, strategies to minimize design waste, and barriers for minimizing design waste with special reference to High-rise residential building projects in Sri Lanka. In addition, this provides a framework for understanding the relationship between methods of waste generation with waste minimization strategies and barriers to waste minimization in High-rise residential building projects in Sri Lanka.

This research employs the mixed research approach as findings and analyzed in both qualitative and quantitative research methods.

For qualitative data, semi-structured interviews were done to obtain expert opinions and to validate literature findings and as quantitative research, a questionnaire was distributed among 50 professionals who are involved in the design process of high-rise residential building projects. Through the questionnaire, the points identified for methods of design waste generation, strategies to minimize design waste, and barriers for minimizing design waste were rated using the Likert scale and results were ranked based on the significance by using the Mean Weighted Rating (WMR).

Design, detailing, and material specification errors were identified as the major reason for design waste while strategies such as error-free and, adequately detailed drawings that are clearly understood by all the parties, the proper coordination and, correct specifications were identified as mitigation measures. Professional negligence, insufficient professional experience, and knowledge were some of the major barriers identified.

Key Words –*Barriers for waste mitigation, Construction industry, Design waste, High-rise residential, Waste minimization strategies,*

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DEDICATION

To all the
Known and Unknown,
Sri Lankan “Taxpayers”
who paid for my school and
the University education
for Eighteen years.

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ABBREVIATIONS

CDW- Construction and Demolition waste

MWR- Mean Weighted Rating

RIBA- Royal Institute of British Architects

SD- Standard Deviation

LIST OF APPENDICES

Appendix A- Semi-structured interviews and the primary questionnaire survey
(Sample filled by Interviewee No-13)

Appendix B - Comprehensive Questionnaire survey