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QUANTIFICATION OF UNCERTAINTY AND CONTINGENCY MANAGEMENT FOR CONSTRUCTION PROJECTS

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QUANTIFICATION OF UNCERTAINTY AND CONTINGENCY MANAGEMENT FOR CONSTRUCTION PROJECTS

BY

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SUPERVISED BY DR. MALIK RANASINGHE

We accept this thesis as confirming to the required standard

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Abstract

The main objective of this thesis is to develop an analytical method for quantification of uncertainty in building projects and thereby deciding the contingency allocation based on probability of success.

The factors that give rise to uncertainty in Bill of Quantities (BOQ) type of building contracts are discussed. The uncertainty of input items to a Bill of Quantities, namely, quantities of bill items, usages of resources in building schedule of rates (BSR) and their basic prices are quantified as two moments using subjective probabilities. From these, expected value and standard deviation of project cost are evaluated. The contingency allocation is decided based on the desired probability of success and the total allocation for the whole project is distributed among individual BOQ items. Finally it is discussed how the project manager can monitor the depletion of allocated contingency and exercise a management control over the total project cost and over individual BOQ items.

A computer program is designed to automate the whole process of contingency allocation.

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