

**TRENDS OF CAUSES FOR VARIATION ORDERS IN ROAD  
CONSTRUCTION PROJECTS IN SRI LANKA**

By

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This Dissertation was submitted to the Department of Civil Engineering of the University of Moratuwa in partial fulfillment of the requirement for the Degree of Master of Business Administration in Project Management

Department of Civil Engineering

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## DECLARATION

I hereby certify that dissertation does not incorporate any material without acknowledgement and previously submitted for a degree or diploma in any university to the best of my knowledge, and further I believe it does not contain any material previously published, written or orally communicated by another person except where due reference is made in the text

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## **DEDICATION**



*Dedicated To*, Sri Lanka.  
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*My Parents and My Wife Nadeeka*  
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## ABSTRACT

One of the most important problems in the construction industry is variation orders. Variation occurs in every construction project and the magnitude of these variations varies considerably from project to project. Hence the variations orders right from inception to completion is assumed great importance in the construction industry. Further, in many instances, it is most cost effective to complete the project within minimum number of variation orders.

Most of road construction projects in Sri Lanka experienced large number of variation orders. The client has to spent more than what he planned in most of times. Sometimes, disputes, unnecessary delays occur due to variations.

This study attempt to reveal the Trends of Causes for Variation Orders in Road Construction Projects in Sri Lanka, and how variation orders are managed. The emphasis here was limited to study the Road Construction Professionals' point of view. The main concern of this study to find the causes and rank them using number of occurrence method and percentage vary method, for variation orders in road construction projects in selected case studies. The other focusing areas were find the causes for variation orders and rank them using a questionnaire survey and international study in order to compare the trends of causes from each method of ranking.

The preliminary data were collected through a literature review, case study analysis which focused 11 road construction projects which were completed by Asian Development Bank Division, RDA and questionnaire survey targeted the Road Construction Professionals in Sri Lanka. The study found that the trends of causes in local context is differ than international context.

According to the questionnaire survey, Poor Estimation was the most significant factor of trends of cause. The rank of Unforeseen Site Conditions, Political pressure during construction stage, Poor Investigation and Client-Initiated Variations have got the rank 3 to 5 respectively.


According to the number of occurrence of the case study survey Poor Estimation is the most significant factor. Poor Investigation, Unforeseen Site Conditions, Change in Design by Consultant /Design Changes and Additional Preliminaries Due To Time extension had the rank from 2 to 5 respectively.

According to the average percentage of percentages of the value of the contribution of each factor of case studies, Poor Investigation, Additional Preliminaries Due To Extension of Time, Poor , unforeseen site conditions , Change in design by consultant /design changes have got the rank from 1 to 5 respectively.

According to the literature review, Client-Initiated Variations is the most significant factor. Further Change of plans by owner, Substitution of material and procedure, errors and omission of design, Owner' Financial Problems, Change in design by consultant had got rank from 2-5 respectively.

**Keywords:** *Variation Orders, Trends of Causes, Road Construction Projects*

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## LIST OF SYMBOLS

$V_i$  -Percentage variation

$c_{final}$  -Project Cost at closure

$C_{initial\ without\ contingencies}$  -Planned Project Cost without Contingencies

W<sup>n</sup> is the weighting given to each factor by the respondents

A-Highest weight

N-Total number of respondents



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## **LIST OF ABBREVIATIONS**

RII-Relative Importance Index

FIDIC - International Federation of Consulting Engineers ( Federation Internationale des Ingenieurs Conseils (French))



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