INFLUENCE OF DELAY IN UTILITY SHIFTING FOR EXTENSION OF TIME CLAIMS IN ROAD CONSTRUCTION PROJECTS IN SRI LANKA

D. C. Karunarathna

189546A

Degree of Master of Science in Construction Law and Dispute
Resolution

Department of Building Economics

University of Moratuwa Sri Lanka

July 2022

INFLUENCE OF DELAY IN UTILITY SHIFTING FOR EXTENSION OF TIME CLAIMS IN ROAD CONSTRUCTION PROJECTS IN SRI LANKA

D. C. Karunarathna

189546A

Thesis submitted in partial fulfilment of the requirements for the degree Master of Science in Construction Law and Dispute Resolution

Department of Building Economics

University of Moratuwa Sri Lanka **DECLARATION**

I declare that this is my own work and this dissertation does not incorporate without

acknowledgement any material previously submitted for a Masters or Degree in any

other University or institute of higher learning and to the best of my knowledge and

belief it does not contain any material previously published or written by another

person except where the acknowledgement is made in the text.

Further, I acknowledge the intellectual contribution of my research supervisor Ch.QS

P.A.P.V.D.S. Disaratna for the successful completion of this research dissertation. I

affirm that I will not make any publication from this research without the name of my

research supervisor as contributing author unless otherwise I have obtained written

consent from my supervisor.

Also, I hereby grant to University of Moratuwa the non-exclusive right to reproduce

and distribute my dissertation, in whole or in part in print, electronic or other medium.

I retain the right to use this content in whole or part in future works such as articles or

books.

| | / / 2022 |
|---|-------------------------------|
| D. C. Karunarathna | Date |
| | |
| The above candidate has carried out research f supervision. | for the Dissertation under my |
| | / / 2022 |
| Dissertation Supervisor | Date |
| | |

Ch.QS Mr. P.A.P.V.D.S. Disaratna

i

ABSTRACT

With the growing of the road construction sector, extension of time claims has been grown significantly due to the various reasons. Utility shifting is critical in road construction since it necessitates the relocation of existing service lines in the site premises without causing public disruption. However, there have been a number of delays in recent years, which will result in the emergence of extension of time claims as a result of these delays in the utility shifting procedure. As a result, utility transfer delays have become a major issue in road construction projects, resulting in time claims being extended. Therefore, the aim of the research is to improve the efficiency of the utility shifting process, which will help to reduce the impact of utility shifting delays on time claims in Sri Lankan Road Construction projects. Content analysis and Relative Important Index (RII) methods were used to analyse the empirical data acquired from preliminary and expert interviews with a questionnaire survey.

The research's findings indicated 10 most severe causes of delay in utility shifting process. These causes have been derived based on the possibility of arising extension of time claims and significance of impact of causes of delay in utility shifting process. Lack of coordination by the Client/the Engineer and utility Authorities except the Contractor, insufficient budget allocation for the Client and procurement issues by the utility Authorities are the top three most severe causes of this study which rapidly leads extension of time claims for delays in utility shifting process in Sri Lankan Road construction projects. In this research, forty-one (41), handling strategies were provided to minimise the effect of the ten most severe causes in utility shifting to reduce the extension of time claims in road construction projects is Sri Lanka.

Finally, it is recommended not to include unfair contractual terms as to utility shifting work, such as transferring complete responsibility to the contractor even if the delay is caused by other parties in utility shifting.

Keywords: Utility Shifting, Extension of Time Claims, Road Construction

I'd like to dedicate my work to my encouraging parents, wife, daughters and the excellent supervisor, who encouraged me and provided invaluable assistance.

ACKNOWLEDGEMENT

It is my foremost duty to pay my gratitude to my supervisor Ch.QS Mr. P.A.P.V.D.S.

Disaratna for the great commitment, guidance and encouragement given throughout

the research.

Further, my sincere gratitude shall also be extended to Prof (Mrs) Yasangika

Sandanayake, Former Head of the Department of Building Economics, Ch.QS Mr.

Suranga Jayasena, Head of the Department of Building Economics and rest of the

academic and non-academic staff at the department and specially the Assistant

Programme Coordinator Mr. A. A. D. W. V Udaya Shantha for the guidance and

support given throughout the research and two years of my academic career in

postgraduate studies.

Special thanks to all the expert interviewees and industry practitioners who gave me

an immense support to complete a successful data collection by sharing their valuable

knowledge and experiences with me.

Last but not least, I sincerely thank all my wife, daughters and other family members

for their dedications, all my companions, for sharing their experience and knowledge

throughout the learning process.

D C Karunarathna

July 2022

iv

CONTENTS

| 1. INTRODUCTION | CHAPTER 1 | 1 |
|---------------------------|------------------------------------|----|
| 1.1 Research Backgroun | nd | 1 |
| 1.2 Problem Statement. | | 3 |
| 1.3 Aim | | 3 |
| 1.4 Objectives | | 4 |
| 1.5 Scope and Limitation | ons | 4 |
| 1.6 Research Methodolo | ogy | 4 |
| 1.6.1 Literature revie | ew | 4 |
| 1.6.2 Preliminary Into | erviews with Experts Validating | 4 |
| 1.6.3 Questionnaire S | Survey | 5 |
| 1.6.4 Expert Interview | ws | 5 |
| 1.7 Chapter Breakdown | 1 | 5 |
| 1.7.1 Chapter 01: Inti | roduction | 5 |
| 1.7.2 Chapter 02: Lite | erature Review | 5 |
| 1.7.3 Chapter 03: Res | search Methodology | 5 |
| 1.7.4 Chapter 04: Dat | ta Analysis and Research Findings. | 5 |
| 1.7.5 Chapter 05: Co | nclusions and Recommendations | 5 |
| 2. LITERATURE REVIE | W CHAPTER 02 | 6 |
| 2.1 Chapter introduction | n | 6 |
| 2.2 Construction industr | ry | 6 |
| 2.2.1 Building constr | ruction projects | 7 |
| 2.2.2 Civil engineerin | ng construction projects | 8 |
| 2.3 Road construction p | projects | 9 |
| 2.3.1 Uniqueness of r | road projects | 10 |
| 2.4 Need for utility shif | ting in road construction projects | 13 |

| 2.4.1 Types of Laying Utilities in Road Construction | 14 |
|--|-----------------|
| 2.4.2 Utility shifting in Sri Lankan Road projects | 17 |
| 2.5 Causes of delay in utility shifting for road projects | 18 |
| 2.6 Delay claims in road construction projects | 19 |
| 2.6.1 Extension of time claims | 21 |
| 2.6.2 Cost Overruns and Other Cost Related Claims | 22 |
| 2.7 Extension of time (EOT) claims due to utility shifting for road pro | ojects 23 |
| 2.7.1 Requirements for Concise Contractual Provisions for EOT du Utility Shifting | _ |
| 2.7.2 Application of Standard Forms of Contracts in EOT Claims in Utility Shifting | _ |
| 2.8 Impact of EOT due to delay in utility shifting for Sri Lankan Road | d projects 27 |
| 2.8.1 Cost Impacts of EOT due to Delay in Utility Shifting | 27 |
| 2.8.2 Other Impacts of EOT Claims due to Delay in Utility Shifting | g 28 |
| 2.9 Methods of mitigating the arise of EOT claims due to delay in roa | nd projects. 29 |
| 2.9.1 Technical Strategies used in Reducing Delays in Utility Shift | ing 29 |
| 2.9.2 Coordinating Strategies used in Reducing Delays in Utility St | hifting 30 |
| 2.10 Chapter summary | 31 |
| 3. METHODOLOGY CHAPTER 03 | 32 |
| 3.1 Introduction | 32 |
| 3.2 Research Design | 32 |
| 3.3 Research Approach | 33 |
| 3.3.1 Quantitative Approach | 33 |
| 3.3.2 Qualitative Approach | 33 |
| 3.3.3 Mixed Approach | 34 |
| 3.3.4 Selected Approach for this Study | 34 |

| 3.4 Data | Collection Techniques | 34 |
|-----------|--|------|
| 3.4.1 | Literature Review | 35 |
| 3.4.2] | Preliminary Interviews with expert validation | 35 |
| 3.4.3 | Questionnaire Survey | 35 |
| 3.4.4] | Expert Interviews | 35 |
| 3.5 Data | Analysis Techniques | 36 |
| 3.5.1 | Quantitative Analysis – Relative Importance Index (RII) | 36 |
| 3.5.2 | Qualitative Analysis – Content Analysis | 36 |
| 3.5.3 | Quantitative Analysis – Severity Index | 37 |
| 3.6 Data | Validation | 37 |
| 3.6.1 | Internal Consistency of Sample - Cronbach Alpha Calculation | 37 |
| 3.7 Rese | earch Process | 39 |
| 3.8 Sum | mary | 40 |
| 4. DATA A | ANALYSIS CHAPTER 04 | 41 |
| 4.1 Intro | duction | 41 |
| 4.2 Phas | e I - Preliminary Interviews with Expert Validation | 41 |
| 4.2.1 1 | Phase I - Main Objectives of Preliminary Interviews | 41 |
| 4.2.2 1 | Phase I – Respondents of Preliminary Interview | 42 |
| 4.2.3 1 | Phase I - Findings of Preliminary Interview | 42 |
| 4.3 Phas | e II – Questionnaire Round | 47 |
| 4.3.1 1 | Phase II - Main Objectives of Questionnaire Round | 47 |
| 4.3.21 | Phase II – Respondents of Questionnaire Round | 47 |
| 4.3.3 1 | Phase II - Findings of Questionnaire Round | 49 |
| 4.3.4 | Phase II – Data Validation - Internal Consistency of Sample - Cron | bach |
| Alpha | Calculation | 64 |
| 4.4 Phas | e III – Expert Interviews | 65 |

| 4.4.1 Phase III - Main Objectives of Expert Interviews |
|--|
| 4.4.2 Phase III – Respondents of Expert Interviews |
| 4.4.3 Phase III - Findings of Expert Interviews |
| 4.5 Summary |
| 5. CONCLUSIONS AND RECOMMENDATIONS CHAPTER 05 |
| 5.1 Introduction |
| 5.2 Conclusion |
| 5.2.1 Objective 1 - Review on the need for utility shifting in road construction projects |
| 5.2.2 Objective 2 - Identify the causes of delay in utility shifting for road construction projects in Sri Lanka |
| 5.2.3 Objective 3 - Examine the possibility of arising Extension of Time claims and the significance of impact of the causes of delay in utility shifting in road construction projects in Sri Lanka |
| 5.2.4 Objective 4 - Identify the most severe causes of delay in utility shifting for Extension of Time claims in Sri Lanka |
| 5.2.5 Objective 5 - Propose solutions to mitigate Extension of Time claims arising due to delay in utility shifting in road construction projects in Sri Lanka 79 |
| 5.3 Recommendations |
| 5.4 Further Research Areas 80 |
| 5.5 Summary |
| References81 |
| ANNEX I –PRELIMINARY INTERVIEW GUIDELINE |
| ANNEX II – QUESTIONNAIRE ROUND |
| ANNEX III – EXPERT INTERVIEW |

ABBREVIATIONS

BOO - Built Own Operate

BOT - Built Operate Transfer

CEB - Ceylon Electricity Board

GAO - General Accounting Office

NWSDB - National Water Supply and Drainage Board

RDA - Road Development Authority

RII – Relative Important Index

ROW - Right of Way

UDA – Urban Development Authority

LIST OF FIGURES

| Figure 2-1- Road Types in Sri Lanka Source: Road Development Authori | ty in Sri |
|--|-----------|
| Lanka: Road Classification | 9 |
| Figure 2-2 - Life Cycle of a Road | 11 |
| Figure 2-3 - Risks in Road Projects | 12 |
| Figure 3.1 - Thumb Rue of Cronbach Alpha | 38 |
| Figure 3-2 - Research Process | 39 |
| Figure 4.1: Responses Percentages | 48 |
| Figure 4-2- Chart of Most Severe Causes of Delay | 63 |

LIST OF TABLES

| Table 2.1: Summary of Approvals required for the Project |
|---|
| Table 2.2: Summary of Causes of Delay in Utility Shifting |
| Table 4.1: Respondents of Preliminary Interview |
| Table 4.2: Amalgamated Causes |
| Table 4.3: Non amalgamated Causes |
| Table 4.4: Respondents of Questionnaire Round |
| Table 4.5: Investigate Possibility of Arising Extension of Time claims due to the |
| causes of delay in utility shifting |
| Table 4.6: Significance of causes of delay in utility shifting |
| Table 4.7: Most severe causes of delay in utility shifting |
| Table 4.8; Comparison table of causes with high possibility and high significance but |
| not derived as severe causes of study |
| Table 4.9: Respondents of Expert Interview |
| Table 4.10: Suitable Strategies to minimise most severe causes of delay in utility |
| shifting67 |