

**BEST PRACTICES OF THE ENGINEER TO MINIMIZE  
CONSTRUCTION CLAIMS IN GOVERNMENT  
PROJECTS IN SRI LANKA**

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Degree of Master of Science in Construction Law and Dispute  
Resolution

Department of Building Economics

University of Moratuwa

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## DECLARATION

“I declare that this is my own work and this dissertation does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma 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.

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Name of the Supervisor: Mr. Vijitha Disaratna

Signature of the supervisor: .....

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## **Abstract**

Claim is fundamentally a term for demand for additional compensation in relation to alteration in the contract or affirmation of right to property or money, concerning time and cost. If claims are not clearly resolved the claims may lead to disputes and have to follow dispute resolution methods which are time consuming and costly. However, claims are inevitable in construction projects. Since, the Engineer is the person who is responsible for administration and supervision of Works fairly and independently his role in a construction project is significant. Further, main source of finance in government construction projects is public funds. Hence, unique characteristics such as limitations in budget allocations, public accountability, transparency, media influence, legislation and policy changes, time impact and media influence will create specific claims which will increase the importance of the best practices of the Engineer.

Therefore, this study explored the best practices that can be adopted to minimize claims in Sri Lankan government construction projects by the Engineer. Both, quantitative and qualitative research approaches were used to reach the aim in two stages. Firstly, thirty questionnaires were obtained to collect data on types of claims, causes of claims, effects of claims and best practices to be followed by the Engineer to minimize claims in government construction projects in Sri Lanka. Secondly, five experts were interviewed through a semi-structured interview to create links among top ten causes of claims and best practices to be followed by the Engineer to minimize claims in government construction projects in Sri Lanka. Moreover, usage of ICTAD/SBD/02 for minimizing claims by the Engineer and unique characteristics of Sri Lankan government projects which emphasise the importance of the best practices of Engineer in minimizing claims were discussed.

The findings of the research proved that, in order to minimize claims in Sri Lankan government construction projects, the Engineer has a vital role to treat the causes of claims comprehensively and that will enable the smooth functioning of construction project activities without baffling consequences. For this reason, it was evident that there are specific best practices like taking timely management actions and proper contract administration should be followed by the Engineer to minimize claims, in order to achieve successful completion of the project within the originally anticipated estimated time, cost and quality.

***Key Words: Construction Claims, Engineer, Government Construction Projects, Sri Lanka, Best Practices***

## DEDICATION

***I dedicate this piece of research to,  
All kind hearts and helping hands,  
Together with me,  
From the beginning to now,  
Of the journey of life...***

## **ACKNOWLEDGEMENTS**

This research is a result of ample dedication and remarkable assistance received from many personnel and organizations, who contributed in many ways to complete this study. As a matter of fact, there were number of people behind me, who supported and guided me to the correct path and genuinely wished my success. I should say that the following words would not be enough to express my appreciation for their immense help which was a tremendous strength to me. Nevertheless, I take this opportunity to express my gratitude to all of them.

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## LIST OF ABBREVIATIONS

AAA	- American Arbitration Association
ADR	- Alternative Dispute Resolution
CIDA	- Construction Industry Development Authority
FIDIC	- Fédération Internationale Des Ingénieurs-Conseils (International Federation of Consulting Engineers)
ICTAD/SBD/02	- Standard Bidding Document for Major Contracts [2 <sup>nd</sup> Edition (Revised) January 2007] - (Publication Ref. No. - ICTAD/SBD/02) published by Construction Industry Development Authority.
JCT	- Joint Contract Tribunal
RICS	- Royal Institution of Chartered Surveyors
RII	- Relative Importance Index
SBC	- Standard Form of Building Contract
SBD	- Standard Bidding Document

## **1.0 INTRODUCTION**

### **1.1 Background**

Invention of advanced technologies, novel standards and owner-desired additions and alterations are causing the construction projects to become more complex in nature day by day. In the meantime, corporation between the main stakeholders, Contractor, Consultant and Employer is prominent feature in successful completion of projects. Problems, disputes and claims always tend to arise due to various reasons such as conflicting opinions concerning the various aspects of design and construction (Abdul-Malak El-Saadi & Abou-Zeid, 2002).

Consultant is the person who ensures that the design team meet all their responsibilities and regulations and advise the Employer and the Contractor how they can comply. The appointment of this Consultant is done by the Employer. However, appointment and service of a Consultant is crucial for a construction project (Royal Institution of Chartered Surveyors [RICS], 2003). In many standard forms of contracts researcher found that the role of Consultant is named under other names as well. For instance, according to Ndekugri & Rycroft (2009) the Architect traditionally has been the leader of the design team. But Architect has been defined under the conditions of contract as the administrator of Contract in the form of contract published by Joint Contract Tribunal (JCT). Similarly, According to FIDIC (1999), Engineer is the person who is appointed by the Employer, responsible for carrying out the duties and authorised person under the Contract. Consequently, it is evident that the Engineer is being called in different names in different forms of contract. Undoubtedly there is a huge similarity among these Architect, Consultant and Engineer when considering the role of these parties to the contract. To sum up, even though many names are used, this is the same person.

Claim can be identified as a term for demand for additional compensation in terms of time and cost. Compensation can be related to change in the contract or assertion of right to property or money (Kumaraswamy, 1997; Jayalath, 2013). There are

avoidable and unavoidable claims in construction industry. The claims become unavoidable, because there will be unforeseen changes, ground conditions, delay caused by contractor, delay in payments by Client, subcontracting problems, accidents, client's priorities and changes in project conditions (Zaneldin, 2006). Chappel, Sims and Smith (2005) expressed that, claim is considered and often seen as a bad word in employer's perspective in the construction industry. It is obvious why the client doesn't agree with this term because it often results budget being exceeded. Kumaraswamy (1998); Zaneldin (2006) discovered that major causes of construction claims are overemphasised claims made by contractor, poor site investigations, inadequate design information, poor communication, midstream changes by client, estimating errors, inadequate contract administration and inadequate contract documentation. Except the unavoidable claims, the other claims should try to be avoided in initial stages. If not there will be budget exceeding, project duration changes and claims may lead to various disputes and disagreements.

Ren, Anumba and Ugwu (2003) expressed that conflicts which are handled inefficiently may lead to be disputes. When these conflicts are mishandled and not managed properly, these conflicts may lead to disputes. In the same way, when a conflict is not managed efficiently it will become a cause for claims and if these claims are not settled fairly the claims may create the basis for disputes (Acharya, Lee & Im, 2006; Fenn, Lowe & Speck, 1997; Kumaraswamy, 1998). The word dispute can be defined also as disagreement, argument or quarrel (Oxford dictionaries, 2019). However, dispute is something rather than a mere disagreement or argument. Conflict and dispute are two different notions (Acharya et al., 2006; Fenn et al., 1997; Kumaraswamy, 1998). If a claim has grown up to a dispute it is obvious that to resolve them, have to follow methods of dispute resolution such as negotiation, arbitration, adjudication, mediation and at the end litigation. These situations may costly, time consuming, bring bad reputation, disloyalty of members and damages to the good relations (Fenn et al., 1997; American Arbitration Association, 2009).

In many countries, the biggest Employer of the construction projects is government (Basheka & Tumutegereize, 2012). In fact, government projects are carried out fully or partially based on public funds (Institute of Civil Engineers, 2007). There is a clear difference or specialty between the government construction projects and other private sector construction projects. The government construction projects are accountable to the taxpayers or in other words to the citizens of a country. In addition, the awarding process shall be carried out fairly and without discrimination. In other words, whole process including awarding shall be transparent as well (Institute of Civil Engineers, 2007). Hence the Parties to the construction project have huge responsibility to complete the construction project on time and on budget (Long, 2018). On the contrary, there are two main problems encounter in construction projects. Specifically, these have become inevitable in government construction projects. These can be identified as delays and budget overruns (Chan, Wong & Scott, 1999). It is evident that, claims are inevitable in any construction project (Vidogah & Ndekugri, 1998).

In Sri Lankan context as stated in the Standard Bidding Document (ICTAD/SBD/02) Engineer is the person who is responsible for administering and supervising the execution of works. However, Engineer has no authority to amend the Contract and if it is necessary Engineer has to take approval from the Employer (Construction Industry Development Authority [CIDA], 2007). Similarly, according to the Conditions of Contract for Construction (FIDIC -Red Book) Engineer is the person appointed by the Employer to exercise the authority attributable to the Engineer as specified in or necessarily to be implied form the Contract (International Federation of Consulting Engineers [FIDIC], 1999).

According to Contract, which party is responsible for settling claim? It shall be clarified in the Contract, about the party responsible for settling the claim and giving the final decision. Generally, the Engineer designated by the Employer is responsible for deciding the outcome of the claim. Often, it is stated in the contract that if the outcome is not amicably settled, dispute resolution methods such as arbitration, mediation, dispute resolution boards, and litigation can be used (Abdul-Malak et al.,



2002). It is evident that, in Sub Clause 19.1 – Contractor’s Claims in Standard Bidding Document (ICTAD/SBD/02) Contractor shall submit notices and supportive particulars of claim to the Engineer (CIDA, 2007). Similarly, Engineer is responsible for settling contractor’s claims in FIDIC – Red Book (FIDIC, 1999). However, Abdul-Malak et al., (2002), further states that, Employer has to make sure that whether the Engineer is responsible for the occurrence or cause of the claim. Due to this very reason, Engineer has to strictly make sure that, actions he takes as the Engineer to the Contract are consistent with the terms of the contract. Albeit, claims are turning into way of life and indispensable part of current contract system (Vidogah & Ndekugri, 1998).

## **1.2 Research problem**

Many parties or stakeholders involved in a construction project are liable for construction claims in direct and indirect ways. It is evident through above background findings, many researches have conducted on types, causes of claims and situations where claims arise and the roles of the stakeholders related to claims management. For instance, Zaneldin (2006) discovered the types and causes of construction claims in United Arab Emirates. Kumaraswamy (1997) discussed the types and causes of claims in Hong Kong and relationship among conflicts, claims and disputes. Multi agent system for claims negotiation was explained by Ren, Anumba and Ugwu (2003). Research related to best practices of Engineer to minimize construction claims in government projects in Sri Lanka could not be found. Further it was identified as a proper research area to fulfil a research gap of construction industry in Sri Lanka. Hence, this research attempts to fill this research gap by studying on the Engineer’s best practices for minimizing claims in government Construction projects in Sri Lanka during post contract stage.

## **1.3 Aim and objectives**

The aim of the research is to explore the mechanisms to minimize claims in government projects in Sri Lanka by the Engineer.

The following objectives are set out to achieve the aim of this research.

- 1) Review the duties of the Engineer
- 2) Review the claims and causes of claims in construction industry
- 3) Investigate the claims and causes of claims which occur in government projects in Sri Lanka
- 4) Establish the best practices that an Engineer can adopt to minimize claims in government projects in Sri Lanka

#### **1.4 Methodology**

Comprehensive literature synthesis was conducted through books, journals, e-resources, web-sites, conference papers and research papers to gain a handsome knowledge about claims, Engineer's duties and claim mitigation methods. Following the literature review, survey approach with questionnaire and semi – structured interviews were adopted to investigate the research problem.

Data collected through questionnaire survey was analysed and ranked by using Relative Importance Index (RII) formula. The semi-structured interview guideline was created using the analysed data of the questionnaire survey. Then the data collected from five interviewees were analysed using content analysis method manually. Semi structured interviews were used to create link among the ranked data through the questionnaire survey.

#### **1.5 Scope and limitations**

The scope of the research is to find out the best practices of Engineer for minimizing claim situations. Engineer's role becomes part of contract after forming the contract between Employer and Contractor. Hence the study was conducted by considering post contract stage of a project. Types of claims, Engineer's duties, and relationship between Engineer and construction claims were found out through this research. The survey was conducted only on Government construction projects. To gain a better demonstration of the Sri Lankan construction context, this research is limited to the

Sri Lankan construction industry professionals who are familiar with the Standard Bidding Document for major contracts (ICTAD/SBD/02) published by Construction Industry Development Authority (CIDA).

## **1.6 Chapter breakdown**

**Chapter one – Introduction:** Consists of background of the study, research problem, aim and objectives, brief introduction to the research methodology, scope and limitations of the research.

**Chapter two – Literature Review:** Consists of the literature synthesis.

**Chapter three - Research Methodology:** Explains the research methodology.

**Chapter four - Data Collection and Analysis:** Consists of the presentation of collected data and analysis of data.

**Chapter five – Research Findings:** Consists of the discussion of research findings.

**Chapter six – Conclusions and Recommendations:** Concludes the research study with conclusions, recommendations and further research approaches.

## **2.0 LITERATURE REVIEW**

### **2.1 Introduction**

Chapter one provided a brief introduction about the research along with the aim, objectives and scope and limitations of the study. Chapter two provides a comprehensive review on literature in order to identify the prevailing knowledge about the government construction projects, Engineer, duties of the Engineer, types of claims, Causes and effects of claims and importance of the best practices of the Engineer to minimize the construction claims in government construction projects in Sri Lanka.

### **2.2 Construction industry**

There is no other industry which is more significantly impact on daily lives of human beings in the world (G. Sweis, Sweis, Hammad & Shboul, 2008). Up to the present day, construction is not only involved to build shelters but also to create gigantic monuments around the world (Halpin & Senior, 2006). The fact is universally accepted and for examples followings can be identified. As a source of life humans get water from wells and bore holes, humans live and work in the buildings and drive on the roads and bridges, the utility distribution systems such as, the airports, harbours, railways, where humans travel and trade from, power lines, dams which provide electricity, are the significant products of this construction industry (Basheka & Tumutegyereize, 2012)

Moreover, the construction industry accounts for an important portion in Gross Domestic Product of the world (Basheka & Tumutegyereize, 2012). Large scale projects such as infrastructure and industrial development projects have become important pillar for global economic growth (Benoit, 1996).

### **2.3 Government construction projects**

In many countries, the biggest Employer of the construction projects is government (Basheka & Tumutegereize, 2012). In fact, government projects are carried out fully or partially by using public funds (Institute of Civil Engineers, 2007). Especially, the government projects are mostly financed by official sources, such as government of the host country, the export promotion agencies of industrial countries and multilateral development institutions. However, recently the trends of the private sector participation in government projects have increased while availability of public sector financing for these projects have reduced (Benoit, 1996).

Is there any clear difference or specialty between the government construction projects and other private sector construction projects? Indeed, the government construction projects are accountable to the taxpayers or in other words to the citizens of a country. In addition, the awarding process shall be carried out fairly and without discrimination. In other words, whole process including awarding shall be transparent as well (Institute of Civil Engineers, 2007).

Moreover, there are two main problems encounter in construction projects. Specifically, these have become inevitable in government construction projects. These can be identified as delays and budget overruns (Chan, Wong & Scott, 1999). However according to Kumaraswamy (1998), there are no problem free projects can be found in construction industry.

### **2.4 Who is Engineer?**

There are extensive numbers of published forms of contract. Definition of the Engineer can be found in each of these forms of Contract around the world (Davison, 2003). For example, Standard Bidding Document published by the Construction industry Development Authority (CIDA), Sri Lanka, Conditions of Contract for Construction published by International Federation of Consulting Engineers (FIDIC) and Standard Building Contract Published by Joint Contract Tribunal (JCT), United Kingdom. However, some of these are not using the word Engineer as it is, but the

duties the contract administrators carry out are similar. For this reason, it is discussed under this sub heading.

According to the Standard Bidding Document for major contracts (ICTAD/SBD/02) published by the Construction industry Development Authority, Sri Lanka (CIDA), Engineer is the person who is responsible for administering and supervising the execution of works. However, Engineer has no authority to amend the Contract and if it is necessary Engineer has to take approval from the Employer (Construction Industry Development Authority [CIDA], 2007). Similarly, according to the Conditions of Contract for Construction (FIDIC -Red Book) Engineer is the person appointed by the Employer to exercise the authority attributable to the Engineer as specified in or necessarily to be implied form the Contract (International Federation of Consulting Engineers [FIDIC], 1999). Deferring from above two documents, in Standard Form of Building Contract (SBC) published by JCT such duties are carried out by the Architect/ Contract Administrator and he shall act as the agent of the Employer/Client. Table 2.1 below demonstrates a comparison among the general duties of Engineer according to ICTAD/SBD/02, Conditions of Contract for Construction (FIDIC -Red Book) and Standard Form of Building Contract (SBC) published by JCT.

**Table 2.1: Comparison among the general duties of Engineer/ Architect/ Contract Administrator**

No.	Types of duties assigned to the Engineer/ Architect/ Contract Administrator under Contract	Form of Contract		
		ICTAD/SBD/02	FIDIC Red Book (1999)	JCT SBC/Q (2016)
1	Issue clarifications for ambiguities or discrepancies found in the documents of Contract	Yes	Yes	Yes

No.	Types of duties assigned to the Engineer/ Architect/ Contract Administrator under Contract	Form of Contract		
		ICTAD/SBD/02	FIDIC Red Book (1999)	JCT SBC/Q (2016)
2	Issue written instructions to the Contractor	Yes	Yes	Yes
3	Giving notices to Contractor about commencement, programme, testing and etc.	Yes	Yes	Yes
4	Issue interim and final payment certificates, issue taking over and performance certificates	Yes	Yes	Issue interim certificates, certificate of making good, practical completion certificates and final certificate.
5	Evaluation of variations and claims	Yes	Yes	Yes

According to the table 2.1, it is evident that the general duties assigned to the Engineer/ Architect/ Contract Administrator are having more similarities according to the ICTAD/SBD/02, FIDIC Red Book 1999 and JCT SBC/Q. Hence, from now onwards the word Engineer will be used for the person mentioned in the forms of contracts who was appointed by Employer and carry out the project coordination, administration and supervision of executing works.

Besides Holland and Lamont (2007) mentioned, Contract Administrator has a unique position within the contract irrespective of the form of contract they follow. Despite Contract Administrator is appointed by the Employer, he shall exercise his duties fairly and independently.

## 2.5 Duties of the Engineer

Rathnayake (2017) listed the Engineer's duties under the general conditions of contract of Standard Bidding Document (ICTAD/SBD/02) published by the Construction Industry Development Authority, Sri Lanka (CIDA). In most of the sub clauses of the general conditions of contract consists different types of duties designated to the Engineer to the project. They are clearly listed in Table 2.2 as follows;

**Table 2.2: Engineer's Duties According to ICTAD/SBD/02**

Clause / Sub-Clause		Engineer's Duties
1.5	Priority of Documents	The Engineer shall issue clarification or instruction, if any ambiguity or discrepancy arises in the documents of the Contract.
3.1	Engineer's Duties and Authority	The Engineer shall have no authority to amend the Contract and if required, shall obtain the approval of the Employer before exercising a specified authority.
3.2	Delegation by the Engineer	The Engineer may from time to time assign duties and delegate authority to assistants.
3.3	Instructions of the Engineer	The Engineer may issue to the Contractor (at any time) instructions which may be necessary for the execution of the Works and the remedying of any defects.
3.4	Determinations	The Engineer shall make a fair determination in accordance with the Contract, taking due regard of all relevant circumstances.
7.2	Inspection	The Engineer shall at all reasonable times carry out inspections and testing without unreasonable delay, or promptly give notice to the Contractor if the Engineer does not require to do so.
7.3	Testing	The Engineer shall give the Contractor not less than 24 hours' notice of the Engineer's intention to attend the tests.  When the specified tests have been passed, the Engineer shall endorse the Contractor's test certificate.



<b>Clause / Sub-Clause</b>		<b>Engineer's Duties</b>
8.1	Commencement of Works	The Engineer shall give the Contractor not less than 7 Days' notice of the Commencement Date.
8.3	Programme	If the programme does not comply with the Contract, the Engineer shall give notice to the Contractor within 14 Days after receiving the programme.
10.1	Taking Over of the Works and Sections	The Engineer shall within 28 Days after receiving the Contractor's application either issue the Taking-Over Certificate or reject the application giving the reasons.
11.8	Performance Certificate	Engineer shall issue the Performance Certificate within 28 Days after latest of the expiry dates of Defects Notification Period.
12.1	Works to be Measured	When Permanent Works are to be measured from records, these shall be prepared by the Engineer.
12.3	Evaluation	The Engineer shall perform evaluation in accordance with the Conditions of the Contract. The Engineer shall determine a provisional rate or price until an appropriate rate or price is agreed, for the purposes of Interim Payment Certificates.
13.1	Right to Vary	Variations may be initiated by the Engineer at any time prior to issuing the Taking-Over Certificate for the Works.
13.3	Variation Procedure	The Engineer shall, as soon as practicable after receiving a proposal (under Sub-Clause 13.2 [Value Engineering] or otherwise), respond with comments.
13.4	Provisional sums	Each Provisional Sum shall only be used in accordance with the Engineer's instructions, and the Contract Price shall be adjusted accordingly.
13.5	Daywork	For work of a minor or incidental nature, the Employer may instruct that a Variation shall be executed on a daywork basis.

Clause / Sub-Clause		Engineer's Duties
14.5	Issue of Interim Payment Certificates	The Engineer shall, within 21 Days after receiving a Statement and supporting documents issue an Interim Payment Certificate to the Employer.
14.12	Issue of Final Payment Certificate	Within 28 Days after receiving the Final Statement and written discharge, the Engineer shall issue the Final Payment Certificate to the Employer.
14.8	Payment of Retention	When the Taking-Over Certificate has been issued for the Works, the first half of the Retention Money shall be certified by the Engineer for payment to the Contractor.
19.1	Contractor's Claims	The Engineer shall evaluate and certify full or part of the claim submitted by the Contractor.

Source: Rathnayake (2017)

Moreover, the general contractual duties of Engineer listed by the Construction Industry Development Authority (2005), are given in Table 2.3 as follows;

**Table 2.3: General Contractual Duties of Engineer**

Engineer's Duties	
i.	Issue the letter to commence work
ii.	Permission to sub-let parts of the works
iii.	Approval of the contractor's programme and his proposed methods of working
iv.	Approval of the Contractor's agent and (via the sanction of removal) of his employees
v.	Acceptance of workmanship and approval of the quality of materials
vi.	Approval of measures to deal with problems such as unforeseen physical conditions or slow progress
vii.	the issue of certificates accepting the works as substantially completed and accepting the satisfactory completion of the defects liability period

<b>Engineer's Duties</b>	
viii.	Obtaining of statement of Final Account from the contractor
ix.	The application of the test of satisfaction as the standard of compliance for all matters pertaining to the contract
x.	Explanation and adjustment of ambiguities, discrepancies, errors and omissions in the contract document
xi.	Assessment of whether physical conditions or artificial obstructions were unforeseen
xii.	Assessment of delays and evaluation of extra costs incurred by the contractor
xiii.	Allocation of liability for damage to the works or public highways
xiv.	Assessment of the rate of progress against completion date
xv.	Assessment of any extension grant to the period
xvi.	Measurement and valuation of the works certification for interim and final payment within the times specified in the contract.
xvii.	Evaluation of whether and how contract rates should be varied to take in to account changes in the works
xviii.	Adjudication in disputes between employer and contractor
xix.	The issue of further drawings and variation orders to supplement, delete or modify and any part of the works
xx.	The suspension of the works due to weather, default of the contractor, reasons of safety or the presence of unforeseen physical conditions or artificial obstruction and order to recommence works
xxi.	The direction of the contractor in dealing with unforeseen physical conditions
xxii.	Instructions for removal of improper work or materials
xxiii.	Instruction to the contractor regarding the use of provisional or prime cost items in the bill of quantities and the employment of nominated sub – contractors

<b>Engineer's Duties</b>	
xxiv.	Instruction to the contractor regarding the keeping and maintaining job particular contemporary records in connection with any claim

Source: CIDA (2005)

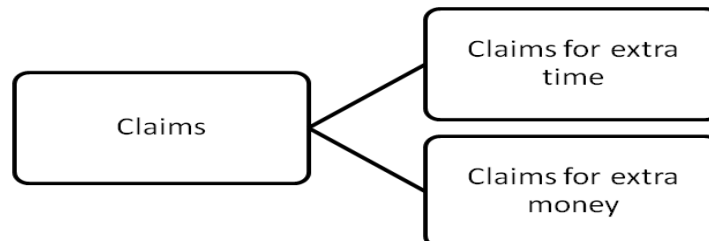
Even though there are many stakeholders to a project, Engineer's role has become very important to a project because of the diversification of the duties of Engineer. Engineer's greater breadth of knowledge and understanding of the complete process is another advantage a project can have (RICS, 2003). In addition Gibson (2008) stated that, Engineer's role is very important to a project not only to administer the project, but also to deal with the contractor's claims. For all these reasons, it is evident that the Engineer's role is prominent in a construction project.

## **2.6 What is a construction claim?**

Chappel et al. (2005) expressed that a claim can be defined as the insistence or demand for a right. Generally, this assertion of a right is insisted by the contractor, while expecting for an extension to the contract period and/or for extra payment which arises due to the changes of the Contract. Specifically, under the express or implied terms of construction contract. Likewise, Jayalath (2013) stated that a claim is fundamentally a term for demand for additional compensation in relation to alterations in the contract or otherwise in terms of time and/ or cost. Further Jayalath (2013) stated that, there is no exact definition for the word claim and there is no stereo-type formula for it. However, some elements must be available it to become a good claim. Good claim shall include the elements such as evidence for how the claim is originated, basis of claiming ability, the quantities, applicable rates and monetary value of the duration of its effects.

## 2.7 Types of claims

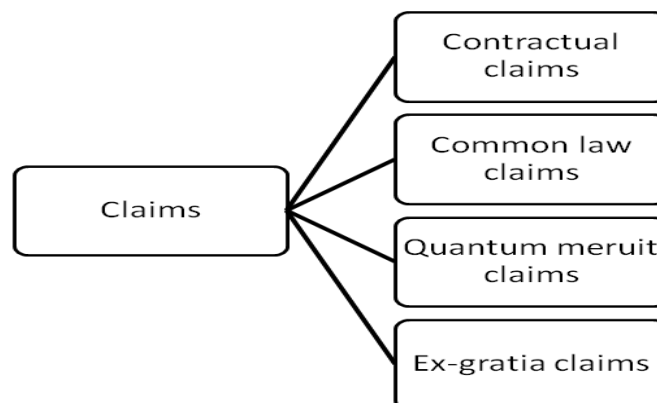
Kumaraswamy (1997) stressed that, there are two prominent types of claims. Demand for extra time and/ or extra money is the basis for most of the construction claims arises. The classification is illustrated as follows in Figure 2.1.



**Figure 2.1: Classification of claims -1**

**Source: Kumaraswamy (1997)**

Al-Sabah, Fereig and Hoare (2003) stated that, conventional construction projects are designed by design organization based on the Employer's Brief and constructed by the appointed Contractor according to the designed work. In many countries, construction projects are rarely completed to the budget or on time. This has been identified as a undesirable characteristic of the construction industry. This can be caused by many factors. Jayalath (2013) mentioned that word claim is not being heard in the initial stages of the construction project because the claims specialists are reported to locate loopholes in documentation and to cover such places. However, the contractors try to prepare claims and fill the gaps of cost or time overruns with the help of it. Chappel et al. (2005) stressed that there are four main categories of the claims and it illustrates from Figure 2.2.



**Figure 2.2: Classification of claims – 2**

**Source: Chappel et al. (2005)**

- Contractual claims are emerging from the express provisions of the particular contract. Almost all the standard forms of contracts facilitate the contractor's right to lay claim for his damages.
- Common law claims are arising out of the breach of contract under common law. At the same time, breach of some other aspects of law is also sometimes becoming legally enforceable claims.
- Quantum meruit claims are providing a remedy where no price has been agreed.
- Ex-gratia claims are based on pure sympathy or hardship. Employer has no legal obligation for compensating such events.

In the same way, Zaneldin (2006) identified six major types of claims such as, contract ambiguity claims, delay claims, acceleration claims, changes claims, extra work claims and different site conditions claims. By considering the name of the claim, types of such claims can be identified easily. However, claims arise due to many reasons and causes. So, it is essential to recognize the causes of claims as well as identification of the types of claims.

## **2.8 Causes of claims**

Kumaraswamy (1997) listed ten prominent causes of construction claims and those were ranked below in descending order according to their significance.

1. Inaccurate design information
2. Inadequate design information
3. Inadequate site investigations
4. Slow client response (decisions)
5. Poor communications
6. Unrealistic time targets
7. Inadequate contract administration
8. Uncontrollable external events
9. Incomplete tender information
10. Unclear risk allocation

Similarly, Zaneldin (2006) identified causes of claims. They can be listed as, change or variation orders, delay caused by owner, oral change orders by owner, delay in payments by owner, low price of contract due to high competition, changes in material and labour costs, owner personality, variations in quantities, subcontracting problems, delay caused by contractor, contractor is not well organized, contractor financial problems, bad quality of contractor's work, government regulations, estimating errors, scheduling errors, design errors or omissions, execution errors, bad communication between parties, subsurface problems, specifications and drawings inconsistencies, termination of work, poorly written contracts, suspension of work, accidents and planning errors.

Jayalath (2013) stated that one of the major reasons for the claims is documentation errors. These errors consist of the mistakes in entries, specifying wrong material, inaccurate dimensions and adoption of wrong formulas. So that, correct and clear record keeping is essential. Scott and Assadi (1999) discussed that the records are very useful in resolving the construction conflicts and disputes. Due to the changes and disagreements upon these changes may certainly affect the payment and time. Due to these reasons this will result the claims being initiated by the contractor in an attempt to obtain compensation. But as stated in the previous heading all the types of claims are not being paid and there should be fair and clear reasons and proof to get compensation and get the approval for the claims.

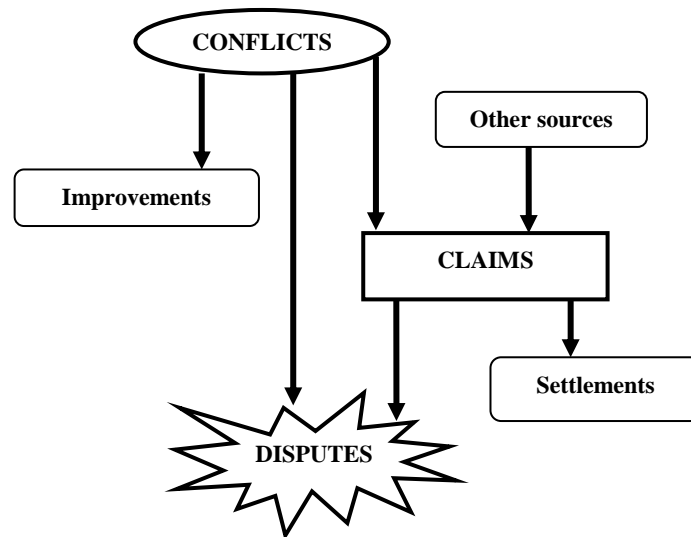
## **2.9 Effects of claims**

According to Arditi & Pattanakitchamroon (2006), one or combination of many reasons may cause the claims in construction industry. However, it may start with a straightforward reason. Another situation may be affected by the effects of claims. This may initiate a considerable number of interrelated complicated claims.

Bakhary, Adnan, Ibrahim & Ismail (2013) listed that differing site conditions, change orders, delays, impact and ripple effects of delays, inspection problems, owner furnished items, the difference in the interpretation of plans and specifications, unfulfilled duties, acceleration, inefficiency and disruption, unrealistic contract

duration and cost are the causes of the most typical claims. A claim can arise when a party to the project assumes that the other party has not fulfilled its part of the deal by act or omission. For instance, a claim happens when one party suffered by the act of the other party and the suffered party shall be compensated by the party who caused the suffering (Kartam, 1999).

However, Kumaraswamy (1997) mentioned, resolution of the claim in a good way is important. Resolved claims may result in payment of cost or extension of time in many situations. Otherwise, the effects of a claim will be soured if they are unresolved. In many cases unresolved claims lead to disputes. The relationship of the conflicts, claims and disputes are illustrated in Figure 2.3.



**Figure 2.3: Basic relationship among conflicts, claims and disputes and potential outcomes**

**Source: Kumaraswamy (1997)**

Kumaraswamy (1997) tried to provide a rough knowledge among the conflicts claims and disputes. Kumaraswamy (1998) stated that most of the reasons for the disputes are based on the unresolved conflicts and claims. There is a linkage among those three categories; conflicts, claims and disputes.

Fisher (2000) stated that, eventually an unmanaged claim will lead to disputes. Disputes will require costly dispute resolution which will waste time, money and



energy. Moreover, costly litigation may require resolving disputes (Adnan, Shamsuddin, Supardi and Ahmad (2012). In other words, Chau (2007) stated, since the legal advice is expensive, it is not chosen even though the construction claims are frequently occurred and the resolution is complex. In that case, alternative dispute resolution methods such as mediation, adjudication and arbitration can be used. However, Yiu and Cheung (2005) stressed that the unfortunate outcomes of such situations will bring loss of productivity and financial overruns in construction project.

## **2.10 Minimizing claims**

According to the details discussed earlier under the previous section 2.9 Effects of claims, taking precautions to minimize construction claims is a good practice to avoid the sour effects of claims. However Long (2018) stated that, minimizing of claims can be accomplished very effectively during the pre-contract stage in other words during design phase of a construction project. Careful preparation of well-considered contract documents can be identified as the next greatest opportunity of claim mitigation. Because, when the design is complete satisfactorily, it allows qualified contractors to submit successful bids for the proposed work. Despite this prevention or minimizing of claims become tougher once the contracts are executed and construction commenced. Still the effects of the claims can be minimized by practicing timely management actions and effective contract administration during post contract phase.

For these reasons, Zaneldin (2006) discovered a list of rules of thumb for reducing or prevention of construction claims;

1. Allow reasonable time for the design team to produce clear and complete contract documents with no or minimum errors and discrepancies.
2. Establish efficient quality control techniques and mechanisms that can be used during the design process to minimize errors, mismatches, and discrepancies in contract documents.

3. Have a clearly written contract with no ambiguity.
4. Read the contract several times before signing it to understand any unclear clauses.
5. Have a third party to read contract documents before the bidding stage.
6. Use special contracting provisions and practices that have been used successfully on past projects.
7. Develop cooperative and problem solving attitudes on projects through a risk-sharing philosophy and by establishing trust among partners (e.g., the owner and the contractor).
8. Implement constructability during the different stages of a project.
9. Establish a strategy on how to deal with tighter scheduling requirements.
10. Have signed change orders before starting doing these changes on site.
11. Maintain proper job records on a timely manner including time sheets, diary records, reports, photographs, records of labors and weather and its effect on progress, progress of the construction and site instructions.

Additionally Long (2018) emphasized that, quality contract documents, management of outside design professionals, constructability and biddability review, site investigation and review & approval of detailed as- planned schedules are the claim minimizing methods which can be followed during pre-contract stage. Those methods are listed in Table 2.4 as follows;

**Table 2.4: Construction Claim Mitigation Methods**

<b>Claim Mitigation Methods</b>	
<b>Pre-Contract Stage</b>	
Quality contract documents	Vast majority of the claims are based on errors, omissions, conflicts and ambiguities in the contract documents and erroneous interpretation of the contract documents. Hence,

<b>Claim Mitigation Methods</b>	
	clarity, completeness, enforceability, correctness of information provided, errorless, fair and reasonableness are very important.
Management of outside design professionals	Most of the claims arise due to the defective contract documents. If the documentation is done by using outside professionals to the construction project, it is essential to define their liability, scope and duties clearly. Otherwise, errors and omissions will be inevitable.
Constructability and biddability review	Not every design is constructible and not every contract creates a basis for a bid. It is essential to discuss and communicate with construction team, Engineer and Employer about the project.
Site investigation	Soil conditions, subsurface conditions, utilities, permits, material availability, weather data, Pricing data, equipment and material information, labour information, transportation and access to the site shall be properly investigated prior to designing and make estimations for the project.
Contractor's Risk Analysis	It is essential to evaluate the probable risks of the project before the bid. By this proper management and mitigation measures can be taken from the earliest stage of the construction project.
Review & approval of detailed as- planned schedules	Creating a detailed as- planned schedule that identifies the scope of the work, the activity relationships, milestones and completion requirements is vital to the proper planning of a project.
<b>Post Contract Stage</b>	
Claims mitigation During Construction	<ul style="list-style-type: none"> <li>• Read and understand the contract documents.</li> <li>• Implement a document control system to capture code and file documents.</li> <li>• Hold pre-construction meetings and reach agreement</li> </ul>

<b>Claim Mitigation Methods</b>	
	<p>on key project objectives.</p> <ul style="list-style-type: none"> <li>• Prioritize the relative importance of each objective.</li> <li>• Define clearly the roles and responsibilities of each party.</li> <li>• Allocate risks to the party best able to control those risks and provide equitable rewards for assuming risks.</li> </ul>
	<ul style="list-style-type: none"> <li>• Develop performance criteria to communicate expectations and measure each party's achievements.</li> <li>• Coordinate activities involving several parties.</li> <li>• Implement cost, schedule and quality control procedures.</li> <li>• Hold periodic progress reviews and inspections.</li> <li>• Maintain open communications throughout the project.</li> </ul>
Project Reviews	It is prudent for the project team to conduct project reviews on periodical basis.

**Source: Long (2018)**

Moreover Long (2018) recommended methods to be followed by the Employer in order to mitigate the construction claims. They are as follows;

- Do not rush the design.

Provide Engineer sufficient time to complete, check and coordinate design, drawings and specifications.

- Prevent unnecessary expedite in preparation of the plans and specifications

A complete set of drawings and specifications consisting sufficient details which covers the total scope of the project diminish the occurrence of disputes and claims.

- Create a set of plans and specifications  
To avoid ambiguities, create a customized and detailed set of drawings and specifications to the specific project.
- Subsurface exploration and site investigation  
Perform subsurface exploration and site investigation to inform the bidders of the condition of the proposed work.
- Communicate  
Proper and clear communication is essential for a better outcome.
- Be timely  
Submitting the requested details and information such as design clarifications, approvals of submittals or shop drawings on time is very important. Otherwise, it will become a source of disputes and claims.
- Be event oriented  
Attend to solve problems when they appear. If the problem impacts the project, it is not only contractor's problem but also the Employer's.
- Assist the contractor  
Employer shall assist the contractor but not direct or manage the contractor.
- Document the job  
This is very important because contemporaneous record keeping give opportunity to evaluate the job. It provides opportunity to the people who are unfamiliar to the project to be familiar by reading the records.

These methods identified above can be listed as the best practices which can be followed for minimizing construction claims as well.

## **2.11 Claims management**

Construction projects in many countries which are completed on originally anticipated time or to budget are found rarely. It has been identified as a hapless characteristic in the construction industry in many countries (Al-Sabah, Fereig and Hoare, 2003). Further, it has been common condition, that the construction projects are delayed due to unforeseen conditions and weak practices in management (Bakhary, Adnan, Ibrahim & Ismail, 2013). Moreover, motivations to build in low cost and speedy method may sometimes be problematic to the professional on the construction location (Singh, Fook & Sidhu, 2006).

Over the history, due to advanced technologies, novel standards and Employer desired additions and changes, construction projects are being progressively complex in nature. Hence, successful completion of a construction project mainly depends on the cooperation and collaboration of the professionals involved especially between contractor, consultant and employer. Otherwise, it will be a difficult task to face the problems and disputes which will arise due to conflicting opinions on design and construction (Essam, 2006). In fact, the complications of the construction proceedings, documentation and the conditions of contract are being the reasons behind the disputes and conflicting interpretations and adversarial attitudes (Bakhary et al., 2013). For these reasons, claims have become inevitable burden for the construction projects (Chovichien & Tochaiwat, 2004).

Process of controlling, administering and handling the claims is known as Construction Claim Management. Due to the substantial increase of the number of construction claims, execution of effectual construction claim management is required (Tochaiwat, 2006). Consequently, the construction professionals shall pay serious attention on effective claims management process (Chovichien & Tochaiwat, 2004).

There is a need for reaching appropriate resolutions and for hindering claims from developing into disputes an overall gradual procedure for claims analysis and administration is essential. Even though the process is common to a certain extent,

depending on the specialty of each project and claim, each specific feature of the procedure can be developed further (Abdul-Malak et al., 2002). Management of claims can be identified as the management of risks. This initiates with the allocation of risk in the Employer's selection of a particular construction method. Then it continues with main contract, subcontracts and purchase orders and it peaks in the prevention. Moreover, risks can be allocated on variations and any claims that occurs during a project (Cox, 1997).

As a result of the construction projects being unpredictable in nature, a single principle or method of claims management is not sufficient to avoid or resolve claims. The development of construction claims management will be a lengthy and complicated process for the industry (Ren & Anumba, 2003; Bakhary et al., 2013). Moreover, claims management shall include the method of identifying, preparing and defending the claims. Therefore, all the parties to the construction project shall have a clear understanding about the claims management process. Specifically, the contractors shall know how to present claims to ensure receiving their right for money or time (Enshassi & Mohamed, 2009).

However Abdul-Malak et al. (2002) identified that, there is a prominent role for the Engineer to administration and management of claims in a construction project. When a construction claim is submitted by the Contractor, Engineer is the person who evaluates and analyses it. If the Contractor is satisfied about the Engineer's decision the claim can be settled accordingly. However, if the Contractor is dissatisfied about the Engineer's response, claim can lead to dispute resolution.

## **2.12 Summary**

This chapter provides a detailed description about the prevailing knowledge on the subject of government construction projects, who is Engineer, duties of Engineer, types of claims and their causes and effects and how the claims can be mitigated. It explains that in any country government is the major employer in the construction industry. Since the government uses public funds for these construction projects the

accountability and transparency of the projects are essential. Further, completion of these projects on time and budget is very important.

However, time and budget overruns can occur in these projects as any construction project. Hence, claims are inevitable in construction projects. Claims can occur caused by many reasons such as inaccurate and inadequate design information, delays of employer's response, poor communication, problems in contract administration, external causes such as weather, riot and political situations, incomplete contract information and unclear risk allocation. The claims caused due these reasons can affect badly to the progress, time targets and budget limits of the project.

Engineer is the person who is responsible for administering and supervising the execution of works. Hence Engineer can be identified as a party who is very important for the progress of the project from the inception to the handing over the project. Further, Engineer is the party who is responsible for evaluating and certifying the contractor's claims.

Each party to the contract has responsibility to mitigate claims not only during post contract stage but also take claim mitigation actions in pre contract stage. Among these two stages, pre-contract stage gets a prominent place for mitigation of claims since it is when the designing and documentation is being done. If the design is completed according to the employer's requirements and the document has covered each and every detail of the contract majority of the claims can be mitigated from the pre-contract stage. However, claims can be mitigated by following proper management during post contract stage.



## **3.0 RESEARCH METHODOLOGY**

### **3.1 Introduction**

The study of this research is based on the best practices of the Engineer to minimize the claims in government construction projects. An introduction to the research area has been made in the chapter one. Chapter two carried out a literature synthesis related to the topic of the research and the research problem has been clearly clarified. Chapter three, research methodology is used to depict the methodological framework used to conduct the research in order to fulfil the aim.

### **3.2 Research design**

Naoum (2007) defined that, the research design is an action plan starting from setting some initial questions which is expected to be answered systematically and finalizing with set of conclusions on the aforementioned questions. A perfect research design demonstrates a step by step procedure of achieving objectives and collecting appropriate information (Mauch & Park, 2003). Hence, it is evident that a research design can be considered as a guideline to conduct the research and achieve the research objectives systematically.

Punch (2005) stated that the research design is a plan which includes four basic questions to which the researcher should answer in order to collect data related to the research questions. These questions are based on,

- The strategy used to conduct the study in order to answer the research questions
- From which type of persons will the data be collected
- The tools and procedures used for data collection
- The tools and procedures used for data analysis

According to the answers found out for the above questions will enable the researcher to find the relevant data and analyse them in a systematic way in order to make conclusions about the arguments.

### **3.2.1 Research approach**

Naoum (2007) stated that, the research design can be defined as the approach in which the research objectives can be questioned. Quantitative approach which comprises an objective nature and qualitative approach which comprises a subjective nature are the two main types of research approaches. According to Yin (2003) there are five different types of research approaches namely; survey, case study, history, archival analysis and experiment. Both quantitative approach and qualitative approach based on survey research was adopted for this research and justifications for the selection are given below. However, choice of the design for the research should be made according to the nature of the research problem.

The role of the quantitative research approach in fact findings are based upon evidence or records. The literature synthesis responded for most of the objectives of this research to some extent. The relationship among concepts/ theories and research are tested or confirmed by a quantitative research approach (Naoum, 2007). This is different from qualitative research and the relationships are developed or emerged in it. This study was based on already developed facts and aimed to build up on those identified facts and the objectives and tried to relate facts to the Sri Lankan context.

Surveys are adopted to gather data within a limited time period from a quite large number of respondents (Naoum, 2007). Hence Saunders and Lewis (2003) mentioned that, rather than conducting an in-depth analysis, surveys would ease the process of collecting data and acquiring a broader general view about the prevailing situation in Sri Lanka. Quite large samples are feasible in surveys and thus it makes the results statistically significant even when analyzing multiple variables. This study had several variables that needed to be analyzed. Kraemer (2002) stated that a survey research is well suited for answering questions about what, how much and how many.

### 3.2.2 Research techniques

According to Thomas and Brubaker (2008) data collection and data analysis techniques are included in research techniques. There are five main types of procedures and instruments used to collecting data such as questionnaire, interviews, tests, observations and content analysis. The data collection technique used for this study was a questionnaire survey and it used to identify duties of the Engineer, the types of claims, causes for claims, effects of claims and best practices to be followed by the Engineer to minimize claims. However, to create a link among the causes of claims and best practices to be followed by the Engineer to minimize claims, semi-structured interview survey was carried out. These questionnaire survey and interviews were conducted among professionals who currently work in Sri Lankan government construction projects to support the outcome. Data was analysed using Relative Important Index (RII) formula and charts and tables were used to present data. The collected data through interviews was analysed using content analysis with the help of manual method of analysing.

### 3.3 Research process

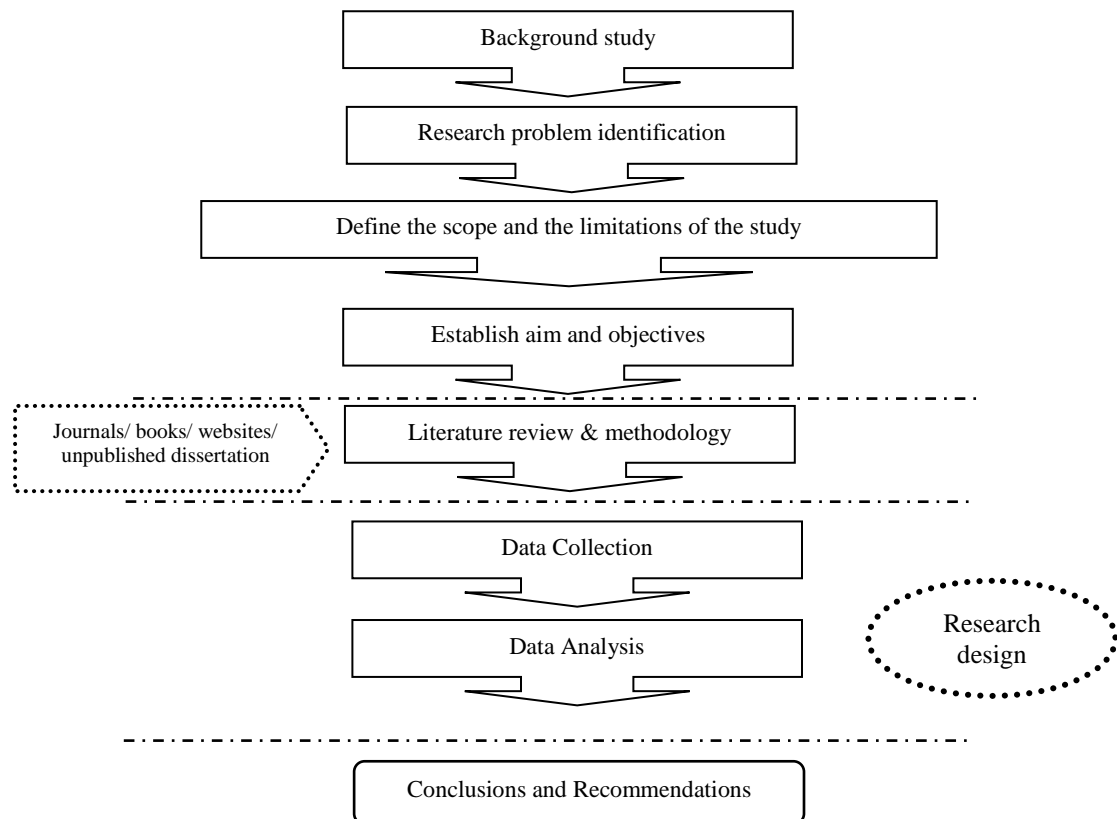


Figure 3.1: Research Process

### **3.3.1 Background study**

The background study for the related areas for the research topic has been carried out on duties of Engineer and claims by referring research papers, journal articles, books and unpublished dissertations. From the initial study through those documents it revealed that in Sri Lanka duties of the Engineer to minimize claims in government projects has not been given much priority and there is not much literature or researches done even though minimizing claims is a very important area in construction industry.

### **3.3.2 Literature survey**

Elaboration of research problem, aim and objectives during the introductory stage, comprehension on the background were achieved through the literature survey. Moreover, the literature survey was extended to support to accomplish the objectives of the research. Creation of the research methodology for this research was also aided by the literature survey. Specifically, the areas of research design related to quantitative research approach.

### **3.3.3 Identification of research problem**

The research problem has been established in a more comprehensive way as “What are the best practices to be followed by the Engineer to minimize claims in government construction projects in Sri Lanka?”

### **3.3.4 Survey design**

- Target population

The targeting population for this study was the construction professionals who have more than five years of experience and who are currently employed in Sri Lanka.

- Sample

A sample can be defined as a part or specimen of entire population (Naoum, 1998). Since the research targeted to find the context in Sri Lanka, it is not practical to conduct a survey on the entire population with the constraints on time and resource. For this reason, a sample consisting of consultant organisations in Sri Lanka was

chosen. Taylor (2010) stressed that the characteristics of the population would be reflected, if the survey sample size is higher than 30. Hence the survey sample will have to be taken as at least 30 number of construction professionals in order to obtain a meaningful response for the study. In order to achieve that target, questionnaires were distributed among 41 professionals and received 30 responses were chosen for data analysis.

### **3.3.5 Data collection techniques**

- Questionnaire survey

Walliman (2005) stated that a questionnaire allows a researcher to form the questions and receive answers without having talk to all plaintiffs for real. A five-degree scale questionnaire was prepared with close ended questions.

- Semi-Structured interviews

The main target of conducting these semi-structured interviews was to create link between the causes of claims and best practices to be followed by the Engineer to minimize claims in Sri Lankan government construction projects. The researcher adapted this method as the final stage of data collection technique to get direct and actual opinion from the professionals.

### **3.3.6 Data analysis techniques**

O'Leary (2004) expressed that, the major rule of any form of study is to move from raw data to significant comprehension. In such way, collected data is compiled and interpreted during the data analysis. However, according to the nature and form of the recorded data, data analysis depends on. The quantitative data was analysed using the RII (Relative important Index) formula under this research. Charts and tables were used to present the research findings.

- **Relative important index (RII)**

$$\text{RII} = \frac{\sum W}{A \cdot N} \times 100$$

Where,

W: Weight given to each attribute by respondent

A: The highest weight

N: Total number of respondents

In this research data collected through semi-structured interviews were analysed using content analysis method and it was carried out manually. Hsieh and Shannon (2005) stressed that, one of the widely used qualitative research techniques is content analysis and this method of analysing is done for the data collected from verbal or visual messages. Further Prasad (2008) mentioned that, content analysis is a method of analysis of data collected through communication.

### **3.4 Summary**

This chapter has presented an outline of the research methodology that was implemented for carrying out the research. Survey approach consisting of questionnaire survey and semi-structured interviews were selected to collect data. Questionnaire survey was prepared by following the comprehensive literature review conducted under the Chapter 2.0 in order to achieve the aim and objectives defined. RII formula was used to analyse data and charts and tables were used to present data. Data collection through semi structured interviews were carried out to create links among analysed data in questionnaire survey. The data collected by semi structured interviews was analysed using content analysis method.

## **4.0 DATA COLLECTION AND ANALYSIS**

### **4.1 Introduction**

The previous chapter, Chapter Three described the research process and the methodology. Chapter four discusses in detail the outcome of questionnaire survey and semi-structured interviews in conformity with the research methodology. This chapter discloses and maps out the best practices to be followed by the Engineer to minimize claims in Sri Lankan government construction projects. The types of claims, their causes, effects of claims and best practices to be followed to minimize claims by the Engineer are distinguished and analysed according to their significance.

Both quantitative and qualitative approaches were adapted for data collection of this research. A descriptive questionnaire survey was carried out to recognize the attitudes and preferences of key participants in the construction industry on the variables established from the literature review on the types of claims, causes of claims, effects of claims and best practices to minimize them. The findings of semi-structured interviews were consolidated with findings of questionnaire survey to set up a connection between the causes of claims and best practices to be followed to minimize claims by the Engineer in government construction projects in Sri Lanka. A five degrees RII formula method was used to analyse the data collected through the questionnaire survey. Microsoft Excel software was used to analyse the responses of the questionnaire survey, in order to draw relevant statistical inferences from the results. Discussion on the results are given in the latter part of this chapter. Content analysis method was applied to analyse the data collected through semi-structured interviews.

### **4.2 Questionnaire survey**

Questionnaire survey was conducted as the initial stage of data collection in this study. Determination of the ideas of construction professionals in Sri Lanka, on

gravity of the variables identified from literature survey was the aim of choosing this survey approach.

**Questionnaire design:** All the questions included in the questionnaire were close ended questions and extra space was provided at the end of each section to be filled by the respondents as per their will. All the respondents were requested to add more relevant information in this space, if they think their idea is not covered within the questionnaire.

The questionnaire was divided into two sections:

- i. General Information:** Respondents were asked to fill their name but this was optional, name of the organisation where they employed, their designation (Client/Employer, Architect, Quantity Surveyor, Civil Engineer) and number of years of experience in construction industry.
- ii. Claims:** In this section a set of short questions were asked. This was important to determine the respondents' involvement with claims.

Following are the main questions emerged by this section.

- **“Types of claims” in government construction projects in Sri Lanka:**  
This was the first question on which respondents were requested to assess the types of claims in government construction projects using a five-degree scale which were analyzed using RII formula. It was expected to be ticked with “X” on five degrees such as “very low”, “low”, “medium”, “high”, “very high” considering the “occurrence” of claims in construction projects. “1” if it is very low, “2” low, “3” medium, “4” high and “5” if it is rated as very high. Additional spaces were provided, if the respondent thinks there are more types of claims in government construction projects in Sri Lanka.
- **“Causes of claims” in government construction projects in Sri Lanka:**  
This was the second question where the respondents were requested to assess the causes of claims which can be identified in Sri Lankan government construction projects according to their magnitude.



- **“Effects of claims” in government construction projects in Sri Lanka:**  
This was the third question where the respondents were requested to assess the effects of claims in government construction projects such as disputes, expensive dispute resolution process, wastage of time and energy, increase the cost of construction project, loss of productivity and increase the project duration according to their magnitude.
- **“Best practices to be followed to minimize claims by the Engineer”:**  
Respondents were requested to assess the most preferred best practices to minimize claims according to their significance.

A sample questionnaire is attached as an appendix to this dissertation as Appendix A.

**Sampling frame of the study:** The professionals in Sri Lankan construction projects consist in the sample. The questionnaires were circulated among the key parties, who mainly engaged in building and civil engineering construction projects related to public sector construction organisations.

**Population and sampling size:** The professionals who possess five or more years of experience in construction industry including experience in government construction projects and having experience on claims were consisting in the target population. Since claims management is an especial subject area that needs to have plentiful knowledge and experience to share knowledge on the subject matters. Statistical concerns were considered for determination of the sample size.

Questionnaires were delivered personally and using electronic mail and the responses were received by using similar methods. Distribution of the questionnaires were done among the professionals who are currently working in public sector construction organizations or those who are having experience with public sector construction projects, professionally qualified, have considerable experience in the government construction projects in Sri Lanka and who are currently involving with the construction claims. 75% response rate was received by distributing total of forty one questionnaires and receiving thirty responses.

#### 4.2.1 Data processing and analysis

Precision of all collected information from the survey were checked and verified. Then the Microsoft Office Excel was used to analyse the verified data. A scale from 1 to 5 was used to rate the variables by the respondents. The five-degree scale was 1 = very low, 2= low, 3 = medium, 4 = high, 5 = very high. Following method of ranking has been created and used (The formula was described clearly in sub section 3.3.6). RII values of the collected data were calculated and the analysed data were ranked accordingly.

Base of the data analysis formed by the research objectives. Therefore, the research aimed to find the best practices to be followed to minimize claims by the Engineer in government construction projects in Sri Lanka. It was distinguished and ranked the different types of claims, causes of claims, effects of claims and best practices to be followed by the Engineer to minimize claims according to above ranking method.

#### 4.2.2 Types of claims in government construction projects in Sri Lanka

Respondents were asked to rank the identified types of claims established from literature synthesis considering the Sri Lankan government construction project context. The identified claim types are dividing in to two major categories namely claims for extra time and claims for extra money. Under these two main categories Contractual claims, common law claims, *quantum meruit* claims and ex-gratia claims can be classified. Hence, the main two categories of types of claims and the identified other four sub categories were ranked separately.

Table 4.1 and 4.2 represents Relative Importance Indexes (RII) and ranks calculated under the types of claims identified in the literature survey.

**Table 4.1: Types of claims (main categories)**

Types of claims	Occurrence (RII)	Rank based on RII value registered
Claims for extra time	90.67	1
Claims for extra money	85.33	2

**Table 4.2: Types of claims (sub categories)**

Types of claims	Occurrence (RII)	Rank based on RII value registered
Contractual claims	84.00	1
Common law claims	58.00	2
Quantum meruit claims	38.67	3
Ex gratia claims	32.67	4

Claims for extra time (90.67) ranked first according to RII calculated under the identified types of claims. Extra time claims are also known as claims for extension of time and these are demanded from the other party to extend the time for completion of the project. The second ranked claim type in accordance with the RII is claims for extra money (85.33).

The identified four sub categories of claims ranked separately for clearer understanding. Contractual claims (84.00) ranked first, common law claims (58.00) ranked second, *quantum meruit* claims (38.67) ranked third and ex-gratia claims (32.67) ranked fourth according to RII calculated.

#### **4.2.3 Causes of claims in government construction projects in Sri Lanka**

According to the literature synthesis the researcher identified thirty two (32) causes of claims. The respondents were asked to rate these causes of claims considering the government construction projects in Sri Lanka.

Table 4.3 represents Relative Importance Indexes (RII) and ranks calculated under the causes of claims identified in the literature survey.

**Table 4.3: Causes of claims**

Causes of claims	Magnitude (RII)	Rank based on RII value registered
Inadequate design information	85.33	1
Change or variation orders	83.33	2
Inadequate contract administration	78.00	3
Specifications and drawings inconsistencies	74.67	4

Causes of claims	Magnitude (RII)	Rank based on RII value registered
Design errors or omissions	72.00	5
Low price of contract due to high competition	70.67	6
Inadequate site investigations	70.00	7
Delays caused by Employer	69.33	8
Delay in payments by Employer	68.67	9
Documentation errors	68.67	9
Uncontrollable external events Eg: COVID19, Tsunami	68.00	11
Unrealistic time targets Eg: Expediting	67.33	12
Planning errors	66.67	13
Incomplete tender information	64.67	14
Government regulations	64.67	14
Inaccurate design information	64.00	16
Estimating errors, scheduling errors	63.33	17
Subsurface problems	63.33	17
Delay caused by contractor	63.33	17
Execution errors	62.00	20
Oral change orders by Employer	61.33	21
Unclear risk allocation Eg: physical and price contingencies	60.00	22
Poor communication	58.67	23
Contractor is not well organized	58.00	24
Suspension of work	57.33	25
Termination of work	57.33	25
Subcontracting problems	56.67	27
Contractor's financial problems	56.00	28
Changes in material and labour costs	52.00	29
Bad quality of contractor's work	48.67	30
Accidents	46.67	31
Employer's supremacy	32.67	32

First ten causes of claims, Inadequate design information (85.33), Change or variation orders (83.33), Inadequate contract administration (78.00), Specifications and drawings inconsistencies (74.67), Design errors or omissions (72.00), Low price of contract due to high competition (70.67), Inadequate site investigations (70.00),

Delays caused by Employer (69.33), Delay in payments by Employer (68.67) and Documentation errors (68.67) were identified as the highest claim causing factors by the researcher and these ten causes of claims in government construction projects in Sri Lanka were used to create the semi-structured interview guideline.

The main reason behind selecting only the top ten causes of claims for further investigation at the semi-structured interview is to reduce the difficulty of respondents' in marking answers during the interviews. Otherwise, the respondents would have to spend more time to mark their responses about the thirty two causes of claims and twenty eight best practices to be followed to minimize claims by the Engineer.

#### 4.2.4 Effects of claims in government construction projects in Sri Lanka

Respondents were requested to assess and rank seven effects of claims in government construction projects in Sri Lanka which have ascertained from literature synthesis. Table 4.4 below, represents the effects of claims in government construction projects in Sri Lanka with Relative Importance Index (RII) calculated and ranks.

**Table 4.4: Effects of claims**

Effects of claims	Magnitude (RII)	Rank based on RII value registered
Wastage of time and energy	88.00	1
Increase the cost of construction project	85.33	2
Increase the project duration	85.33	2
Disputes	84.00	4
Expensive dispute resolution process	76.00	5
Loss of productivity	75.33	6

Based on the RII value Wastage of time and energy (88.00) is the first ranked effect of claims in government construction projects in Sri Lanka. Construction industry is an industry which has vast differences from the other industries. Hence the time has become a prominent feature. Construction projects get limited time targets to achieve their targets, but especially in Sri Lankan projects it is hard to achieve time targets

for reasons like claims. It takes considerable time and energy not only to prepare claims but also to evaluate claims. Hence it is important for a project to eliminate such effects from the projects.

Second ranked effect of claims is Increase the cost of construction project (85.33). As discussed in the above paragraph, it takes considerable time and energy to prepare and evaluate claims and for this there are obvious costs other than the claim amounts. Sometimes the parties have to hire claim consultants and this may increase the cost vastly.

Increase the project duration (85.33) also ranked second, as this effect got the same RII value as above effect of claims. When a claim arises, the parties delay their work intentionally until the claim is being resolved. Further, if the claimant gets the recommendations for extension of time for completion there will be obvious increase of project duration.

Disputes (84.00) ranked as fourth effect of claims in government construction projects in Sri Lanka. If a claim is not being resolved properly it will lead to a dispute (Kumaraswamy, 1998). If a dispute arises, it will be difficult to resolve it without going for costly dispute resolution processes. For this reason, Expensive dispute resolution process (76.00) ranked fifth as effect of claims. In Fact, there are unavoidable costs incur for appointment of ADR professionals, administration, documentation and location charges and other legal expenses. As a consequence, these causes will evolve in to cost overruns and time overruns in the projects.

Loss of productivity (75.33) ranked sixth as effect of claims and this arises when the project is being decelerated or stopped until the claim is being resolved. This has a less impact as an effect because it is ranked last in the list.

#### **4.2.5 Best Practices to be followed by the Engineer to minimize claims in government construction projects in Sri Lanka**

Respondents were asked to rank according to the Sri Lankan government construction projects context, twenty eight (28) best practices to minimize claims

which have established from literature synthesis. Further, this list of best practices was identified under heading 2.10 Minimizing claims, as claim mitigation methods and these were used to create the seventh question of questionnaire survey. In the following table 4.5, RII was calculated on best practices to be followed by the Engineer to minimize claims in government construction projects in Sri Lanka and ranked.

**Table 4.5: Best Practices to be followed by the Engineer to minimize claims in government construction projects in Sri Lanka**

<b>Best Practices to be followed by the Engineer to minimize claims</b>	<b>Significance (RII)</b>	<b>Rank based on RII value registered</b>
Use special practices that have been used successfully on past projects Eg: Mentioning the payment due date of Employer on IPC to reduce the delay payment claims.	95.33	1
Timely management actions	94.67	2
Effective contract administration during post contract phase	94.67	2
Maintain proper job records on a timely manner including time sheets, diary records, reports, photographs, records of labors and weather and its effect on progress, progress of the construction and site instructions	93.33	4
Hold periodic progress reviews and inspections.	91.33	5
Coordinate activities involving several parties	89.33	6
Maintain open communications throughout the project.	88.67	7
Implement cost control procedures.	88.00	8
Constructability and biddability review	84.67	9
Implement a document control system to capture code and file documents	83.33	10
Establish a strategy on how to deal with tighter scheduling requirements	80.67	11

<b>Best Practices to be followed by the Engineer to minimize claims</b>	<b>Significance (RII)</b>	<b>Rank based on RII value registered</b>
Have signed change orders before starting doing these changes on site	79.33	12
Management of outside design professionals who are not the parties to the main contract	74.00	13
Review & approval of detailed as- planned schedules	72.67	14
Develop cooperative and problem solving attitudes on projects through a risk-sharing philosophy and by establishing trust among partners (e.g., the employer and the contractor)	70.00	15
Define clearly the roles and responsibilities of each party	69.33	16
Site investigation	66.00	17
Allow reasonable time for the design team to produce clear and complete contract documents with no or minimum errors and discrepancies	65.33	18
Have a clearly written contract with no ambiguity	64.00	19
Establish efficient quality control techniques and mechanisms that can be used during the design process to minimize errors, mismatches, and discrepancies in contact documents	62.67	20
Allocate risks to the party best able to control those risks and provide equitable rewards for assuming risks.	62.67	20
Read the contract several times before signing it to understand any unclear clauses	60.67	22
Develop performance criteria to communicate expectations and measure each party's achievements.	59.33	23
Hold pre-construction meetings and reach agreement on key project objectives	57.33	24
Contractor's risk analysis	55.33	25



<b>Best Practices to be followed by the Engineer to minimize claims</b>	<b>Significance (RII)</b>	<b>Rank based on RII value registered</b>
Use special contracting provisions that have been used successfully on past projects	54.67	26
Have a third party to read bid documents before the bidding stage	52.67	27
Prioritize the relative importance of each project	47.33	28

### 4.3 Expert semi structured interviews

Expert semi-structured interviews were carried out after collecting data through questionnaire survey and analysing those data. Reason of conducting these semi-structured interviews was to combine findings of the questionnaire survey. Precisely, to create a link between the causes of claims in government construction projects in Sri Lanka and the best practices to be followed by the Engineer to minimize claims in government projects in Sri Lanka. Further to above it was expected to collect and develop ideas about usage of Standard Bidding Documents (SBD) published by the Construction Industry Development Authority in Sri Lanka to minimize claims by the Engineer and unique characteristics of government construction projects which highlights the need of the Engineer.

Five number of experts were interviewed during this data collection process and interviewees' (Respondents') profile is shown in table 4.6. All of them are having experience more than ten years as quantity surveyors with government construction projects in Sri Lanka. Two of the interviewees are from a leading government consultancy organisation, two are from two private contracting organisations (but most of the projects handled are government construction projects) and a freelance quantity surveyor/ claim consultant who is involved with government construction projects and handled claims for more than ten years.

**Table 4.6: Interviewees' (Respondents') profile**

<b>Respondent No.</b>	<b>Designation</b>	<b>Experience</b>
R1	Chartered Senior Quantity Surveyor	11 years

<b>Respondent No.</b>	<b>Designation</b>	<b>Experience</b>
R2	Chartered Senior Quantity Surveyor	11 years
R3	Chartered Senior Quantity Surveyor	11 years
R4	Chartered Senior Quantity Surveyor	12 years
R5	Chartered Senior Quantity Surveyor/ Claim Consultant	22 years

#### **4.3.1 Results of the expert semi structured interviews**

The semi structured interviews were conducted in this study to create links among the findings of the questionnaire survey from some of the specialized and experienced professionals who are currently working or having plentiful experience in the field of government construction projects in Sri Lanka. Content analysis was used to analyse the collected data and it was done with the help of manual method of analysing due to the smaller number of interviewees.

#### **4.3.2 Involvement with claims**

Section one of the interview guideline consists with background information of the interviewee such as name, organisation, designation and date. Apart from the general information, it generally discussed about the interviewees experience and involvement with claims in government construction projects in Sri Lanka.

Conformably all the expert interviewees confirmed that they have involved with the claims in projects they have worked for in the Sri Lankan construction industry. They stated that construction claims are common in the construction industry of Sri Lanka. Still it is seldom that, each and every professional is being able to involve with the claims and preparation of claims because claim preparation and evaluation is a special area which needs specialised knowledge and experience in construction industry.

### 4.3.3 Causes of claims and best practices to be followed by the Engineer to minimize claims in government construction projects in Sri Lanka

Section two of the interview guideline consist with a table containing the causes of claims in construction industry and the best practices to be followed by the Engineer to minimize claims in government construction projects in Sri Lanka. The researcher tried to create a link among the causes of claims and the best practices to be followed by the Engineer to minimize claims in government construction projects in Sri Lanka. Consequently, the interviewees were requested to find what kind of best practices from the list can be used to minimize the claims which occurs due to listed causes of claims. Deliberately, the top ten causes of claims ranked from the questionnaire survey were selected for this survey. Then all the best practices identified were ranked according to the questionnaire survey analysis and listed in the table.

As a result of that, following list of best practices identified as the best practices to be followed by the Engineer to minimize claims in government construction projects in Sri Lanka against the top ten causes of claims are identified in Table 4.7.

**Table 4.7: Causes of claims Vs. Best practices to be followed by the Engineer to minimize claims in government construction projects in Sri Lanka**

No.	Causes of claims in government construction projects in Sri Lanka	Best practices to be followed by the Engineer to minimize claims in government construction projects in Sri Lanka
1	Inadequate design information	<ul style="list-style-type: none"> <li>• Use special practices that have been used successfully on past projects. Eg; Since the Engineer is having knowledge about programme of Works, Engineer can complete the insufficient design information in advance according to Contractor's Programme.</li> <li>• Timely management actions</li> <li>• Maintain open communications throughout the project</li> <li>• Implement a document control system to capture code and file documents</li> <li>• Management of outside design professionals who are not the parties to the main contract</li> <li>• Site investigation</li> </ul>

No.	Causes of claims in government construction projects in Sri Lanka	Best practices to be followed by the Engineer to minimize claims in government construction projects in Sri Lanka
2	Change or variation orders	<ul style="list-style-type: none"> <li>• Use special practices that have been used successfully on past projects. Eg: Engineer shall issue written instructions/ alterations in any event. In case Engineer is having difficulties of issuing formal instruction at site, Engineer can sketch the instruction and sign it for future use, ask for Variation Proposal from the Contractor before issuing Variation instructions where the situation permits.</li> <li>• Timely management actions</li> <li>• Effective contract administration during post contract phase</li> <li>• Maintain proper job records on a timely manner including time sheets, diary records, reports, photographs, records of labour and weather and its effect on progress, progress of the construction and site instructions</li> <li>• Hold periodic progress reviews and inspections</li> <li>• Coordinate activities involving several parties</li> <li>• Maintain open communications throughout the project</li> <li>• Implement a document control system to capture code and file documents</li> <li>• Have change orders signed before starting doing these changes on site</li> <li>• Management of outside design professionals who are not the parties to the main contract</li> <li>• Review &amp; approval of detailed as- planned schedules</li> <li>• Develop cooperative and problem solving attitudes on projects through a risk-sharing philosophy and by establishing trust among partners (e.g., the Employer and the Contractor)</li> <li>• Site investigation</li> </ul>
3	Inadequate contract administration	<ul style="list-style-type: none"> <li>• Use special practices that have been used successfully on past projects. Eg: Engineer shall know his duties and authority levels according to the Contract, have thorough knowledge on Particular Conditions as these may have altered the Engineer's authority and duties.</li> <li>• Timely management actions</li> </ul>

No.	Causes of claims in government construction projects in Sri Lanka	Best practices to be followed by the Engineer to minimize claims in government construction projects in Sri Lanka
		<ul style="list-style-type: none"> <li>• Effective contract administration during post contract phase</li> <li>• Maintain proper job records on a timely manner including time sheets, diary records, reports, photographs, records of labour and weather and its effect on progress, progress of the construction and site instructions</li> <li>• Hold periodic progress reviews and inspections</li> <li>• Coordinate activities involving several parties</li> <li>• Maintain open communications throughout the project</li> <li>• Implement a document control system to capture code and file documents</li> <li>• Establish a strategy on how to deal with tighter scheduling requirements</li> <li>• Review &amp; approval of detailed as- planned schedules</li> </ul>
4	Specifications and drawings inconsistencies	<ul style="list-style-type: none"> <li>• Use special practices that have been used successfully on past projects. Eg: Clarify the inconsistencies found promptly with necessary instructions and deal with them in a fair manner contractually.</li> <li>• Timely management actions</li> <li>• Coordinate activities involving several parties</li> <li>• Maintain open communications throughout the project</li> <li>• Management of outside design professionals who are not the parties to the main contract</li> </ul>
5	Design errors or omissions	<ul style="list-style-type: none"> <li>• Use special practices that have been used successfully on past projects. Eg: Address the design errors or omissions promptly with necessary instructions and deal with them in a fair manner contractually.</li> <li>• Timely management actions.</li> <li>• Coordinate activities involving several parties</li> <li>• Management of outside design professionals who are not the parties to the main contract</li> <li>• Develop cooperative and problem solving attitudes on projects through a risk-sharing philosophy and by establishing trust among partners (e.g., the Employer and the Contractor)</li> <li>• Site investigation</li> </ul>

No.	Causes of claims in government construction projects in Sri Lanka	Best practices to be followed by the Engineer to minimize claims in government construction projects in Sri Lanka
6	Low price of contract due to high competition	<ul style="list-style-type: none"> <li>• Maintain proper job records on a timely manner including time sheets, diary records, reports, photographs, records of labour and weather and its effect on progress, progress of the construction and site instructions</li> <li>• Hold periodic progress reviews and inspections</li> </ul>
7	Inadequate site investigations	<ul style="list-style-type: none"> <li>• Maintain proper job records on a timely manner including time sheets, diary records, reports, photographs, records of labour and weather and its effect on progress, progress of the construction and site instructions</li> <li>• Hold periodic progress reviews and inspections</li> <li>• Coordinate activities involving several parties</li> <li>• Maintain open communications throughout the project</li> <li>• Management of outside design professionals who are not the parties to the main contract</li> <li>• Develop cooperative and problem solving attitudes on projects through a risk-sharing philosophy and by establishing trust among partners (e.g., the Employer and the Contractor)</li> <li>• Site investigation</li> </ul>
8	Delays caused by Employer	<ul style="list-style-type: none"> <li>• Use special practices that have been used successfully on past projects. Eg. Advise the Employer about the claims which may occur due to delayed approvals of Employer like EOT claims, prolongation claims and decisions on any other matter for which Employer expects his approval.</li> <li>• Timely management actions</li> <li>• Effective contract administration during post contract phase</li> <li>• Coordinate activities involving several parties</li> <li>• Maintain open communications throughout the project</li> <li>• Establish a strategy on how to deal with tighter scheduling requirements</li> <li>• Develop cooperative and problem solving attitudes on projects through a risk-sharing philosophy and by establishing trust among partners (e.g., the Employer and the Contractor)</li> </ul>

No.	Causes of claims in government construction projects in Sri Lanka	Best practices to be followed by the Engineer to minimize claims in government construction projects in Sri Lanka
9	Delay in payments by Employer	<ul style="list-style-type: none"> <li>• Use special practices that have been used successfully on past projects. Eg. Mentioning the payment due date of Employer on Interim Payment Certificates to reduce the delay payment claims.</li> <li>• Establish a strategy on how to deal with tighter scheduling requirements</li> </ul>
9	Documentation errors	<ul style="list-style-type: none"> <li>• Use special practices that have been used successfully on past projects. Eg. Address documentation errors promptly upon their identification fairly and contractually.</li> <li>• Effective contract administration during post contract phase</li> <li>• Maintain proper job records on a timely manner including time sheets, diary records, reports, photographs, records of labour and weather and its effect on progress, progress of the construction and site instructions</li> <li>• Coordinate activities involving several parties</li> <li>• Maintain open communications throughout the project</li> <li>• Implement a document control system to capture code and file documents</li> <li>• Management of outside design professionals who are not the parties to the main contract</li> <li>• Develop cooperative and problem solving attitudes on projects through a risk-sharing philosophy and by establishing trust among partners (e.g., the Employer and the Contractor)</li> </ul>

According to above table, there are number of best practices that can be followed by the Engineer to minimize claims in government construction projects in Sri Lanka. However, the Engineer has to perform his duties within the post contract stage and in this stage, Contract is already formed. Further, in certain contracts Engineer's duties may be restricted through the particular conditions of the contract.

#### **4.3.4 Usage of Standard Bidding Document for Major Contracts published by Construction Industry Development Authority (CIDA) for minimizing claims by the Engineer**

Section three of the interview guideline contained four questions and the answers to them are analysed below.

The first question is as follows;

1. How can the Engineer use Standard Bidding Document 02 (SBD/02) published by the Construction Industry Development Authority (CIDA) to minimize claims in government construction projects in Sri Lanka?

R1 gave a brief introduction for the opening of the interview. *“What is considered as claim mitigation? That means mitigating the events that causes additional cost and additional time. Dispute mitigation is different from claim mitigation. In this case we must mitigate the claim and stop arising disputes due to these claims. And on the other hand, if the cost and/or time overruns the Contractor will definitely raise a claim. So that, as the Engineer we have to work to find methods to mitigate the causes of these events”.*

All interviewees agreed that, Standard Bidding Document for Major Contracts (ICTAD/SBD/02) published by the Construction Industry Development Authority (CIDA) is the common form of contract used for government construction projects in Sri Lanka. R3 and R4 stressed that, according to Public notice published on 26<sup>th</sup> of June in 2020 related to Sub Clause 46 of Construction Industry Development Act No. 33 of 2014, adhering to Standard Bidding Documents published by Construction Industry Development Authority (CIDA) is mandated (Parliament of Democratic Socialist Republic of Sri Lanka, 2014). Further to above, R2 stated that *“It is very important to adhere to the ICTAD/SBD/02 from the beginning of the project to minimize claims during construction. For instance, preparation of bidding document without ambiguities and discrepancies is counted as major consideration”.*

However, the aim of the research is to explore the methods to minimize claims in government construction projects in Sri Lanka by the Engineer. The Engineer’s role comes to the stage at the time of formation of Contract. Hence, the interviewees had given their opinions considering post contract stage.



According to the R1, it is difficult to eliminate direct claims during post contract stage. Because, the contract is already formed and the discrepancies and ambiguities found in the Contract cannot be revised or altered during this stage. Further R2 mentioned that, it is a Contractor's responsibility to prepare claims by assessing claim events. Therefore, claims are inevitable. Anyhow, all interviewees emphasised that, adhering to the conditions of the contract in ICTAD/SBD/02 and by following the special practices like timely management actions, proper communication practices, effective contract administration, maintain proper job records and other specific practices listed in table 4.7 will lead to treat the claim causing events. In other words, claim causing events can be minimized following above best practices by the Engineer. On the other hand R1 and R2 stressed that, if the Engineer follows the special provisions in the conditions of contract in ICTAD/SBD/02 it automatically facilitates to follow the specific practices identified.

#### **4.3.5 Provisions in Standard Bidding Document for Major Contracts published by Construction Industry Development Authority (CIDA) for minimizing claims by the Engineer**

All the five interviewees agreed that answering next two questions as one question would be much easier. Those two questions are as follows;

2. What are the provisions in SBD/02 that can be followed by the Engineer to minimize claims?
3. Can you specify the relevant clauses in SBD/02?

According to the interviewees there are limited number of provisions in ICTAD/SBD/02 which can be used to minimize claims by the Engineer. Reason for that is discussed earlier under sub heading "4.3.4 Usage of Standard Bidding Document for Major Contracts (ICTAD/SBD/02) published by Construction Industry Development Authority (CIDA) for minimizing claims by the Engineer". Therefore, the researcher wanted to know how the Engineer can minimize claims in such limitations and the interviewees' responses are listed hereafter as follows;

- **Sub clause 3.1 – Engineer's Duties and Authorities**

R5 stressed that, according to Sub Clause 3.1 Engineer's Duties and Authorities of Conditions of Contract in ICTAD/SBD/02, it states what are the limitations and level of the Engineer's duties and authorities. R5 stated that, *"There is no authority for Engineer to alter the Contract according to this Sub Clause 3.1. Further to above, Engineer shall perform his duties and authorities as implied as per the Contract."* Therefore, the Engineer has to adhere to the Contract as it formed and he has to act under his authority level provided under the Sub Clause 3.1 and Contract Data (CIDA, 2007).

- **Sub Clause 3.3 – Instructions of the Engineer**

All the interviewees agreed that, as stated under Sub Clause 3.3 Instructions of the Engineer of Conditions of Contract in ICTAD/SBD/02, the instructions of the Engineer shall be issued in writing and these instructions shall be necessary for execution of Works and remedy the defects. Moreover, the Contractor shall get these instructions only from Engineer or his assistant.

Most of the claims arise when the Engineer is not issuing his instructions in proper manner. For instance, if an instruction is issued verbally, this instruction cannot be proven by the Contractor in a later stage. Such situation can lead not only to claims but also to discrepancies in documents. Further, to above written instructions will help to smoothen the progress of the project. Hence, it is very important to issue Engineer's instructions adhering to Sub Clause 3.3 Instructions of the Engineer.

- **Sub Clause 1.9 – Delayed Drawings or Instructions**

All the interviewees stated that, Sub Clause 1.9 Delayed Drawings or Instructions of Conditions of Contract in ICTAD/SBD/02, is also known as double notice clause in practice. According to this Sub Clause, Engineer shall issue timely instructions and drawings. Firstly, Contractor shall give notice to Engineer about the details he required to carry out Work according to the programme submitted in accordance with Sub Clause 8.3 Programme in ICTAD/SBD/02. Secondly Contractor can give notice to the Engineer about delays likely to occur because of the delayed drawings and instructions. Then if the Engineer fails to issue his instructions and Contractor

suffers delays, Contractor can claim for costs and time for these delays. Details or/and drawings or/and instructions shall be issued on time to the Contractor by the Engineer. Because the construction programme is issued by the Contractor in accordance with Sub Clause 8.3 programme and the Engineer knows exactly when the details shall be ready according to the programme.

R2 described an event with example where Sub Clause 1.9 can act intense role. *“Let’s assume during an excavation huge rock is found and it shall be removed immediately to reach the time targets of the project. It is an unforeseeable physical condition and such events are claimable as stated in Sub Clause 4.11 Unforeseeable Physical Conditions in ICTAD/SBD/02. Yes, of course, the direct claimable event cannot be eliminated in such event. But, under Sub Clause 1.9 the Engineer can issue his instructions timely to minimize events that causes secondary claims or associated claims”.*

Hence, adhering to Sub Clause 1.9 is also very important to minimize claims during post contract stage by the Engineer.

- **Sub Clause 1.5 – Priority of Documents**

According to R3, each and every document has its own priority according to the Sub Clause 1.5 Priority of documents of Conditions of Contract in ICTAD/SBD/02. R3 mentioned that, *“Engineer shall define each document according to this priority order. For instance, Specifications are predominant to Drawings. If there is an ambiguity or discrepancy in the Specifications and Drawings. Things mentioned in the Specifications are considered first.”*

However, R4 & R5 gave their opinion on the other way around. They stressed that, all the documents forming the Contract has its own purpose. The purpose of the document can be clarified by the following example. Quality of the Works is described in Specifications and dimensions and what to build is shown in Drawings. If the decisions are taken wrong way, the final outcome of the Works will not be as planned. For this reason, the Engineer has to take decisions considering the purpose of the documents as well.

Accordingly, the Engineer shall issue clarification or instruction to the contractor and these clarifications or instructions shall be issued timely. Otherwise, claim events connected with Sub Clause 1.5 Priority of Documents and Sub Clause 1.9 Delayed Drawings or Instructions can arise. On the whole it is observed that, adhering to the conditions of Contract is important to minimize claims.

- **Sub Clause 13.1 – Right to Vary**

According to R3, Sub Clause 13.1 Right to Vary of Conditions of Contract in ICTAD/SBD/02, Contractor shall execute the Variation instructions issued by the Engineer. In such situation Engineer's duty is to issue instructions and/or Drawings without any delays. Otherwise the Contractor will be entitled for additional cost or time as per Sub Clause 1.9 Delayed Drawings or Instructions. At the same time the Engineer shall issue his instructions in accordance with Sub Clause 3.3 Instructions of the Engineer.

It is evident that, when considering all these events, all the claim causing events cannot be controlled or eliminated by the Engineer's actions. But by preventing delays of Engineer, taking timely administrative actions and by knowing his authority limits other secondary claim causes can be prevented or minimized.

- **Sub Clause 14.5 – Issue of Interim payment Certificate**

All the interviewees agreed that, according to the Sub Clause 14.5 Issue of Interim Payment Certificate of Conditions of Contract in ICTAD/SBD/02 the Engineer can withhold the payments (or part of payment) for two reasons only. It is when Contractor's work done is not accordance with Contract or Contractor's failure to perform works or obligations accordance with the Contract. Other than above reasons, the Engineer has no right to withhold the Interim Payment Certificate of the Contractor. If the Engineer has withheld the certification of payments for a reason like incomplete evaluation of variation, the Contractor get entitlement to claim for his money for already completed works at site. At the same time, according to the Sub Clause 13.3 Variation Procedure of Conditions of Contract in ICTAD/SBD/02 Engineer shall respond with approval, disapproval or comments for Contractor's

proposal for variation. Moreover, Contractor does not have to wait until the response is received and he has to proceed with the original scope of Work.

R3 stated that, *“Further, in situations like failure to comply with Sub Clause 14.5 or Sub Clause 14.6, according to the Contract the Contractor get entitlement to suspend works or reduce the rate of progress in accordance with Sub Clause 16.1 Contractor’s Entitlement to Suspend Work in ICTAD/SBD/02. Further to above, if he suffers delay and incur cost due to these delays Contractor get entitled for extra time and/or cost for suspended works.”*

Besides above R2 mentioned that, *“The Engineer can reduce the chances of delayed payments of Employer under Sub Clause 14.6 Payment in ICTAD/SBD/02. Engineer can mention the payment due date of the Employer on the Interim Payment Certificate itself. By such action, Employer’s delays causing due to unawareness of the time frames can be minimized.”*

Due to these reasons, Engineer’s timely responses and proper administrative actions at the right moment is essential. Clearly, there are many actions that can be taken by the Engineer in order to minimize claims during construction stage.

- **Insurance and Securities/ Guarantees**

R2 stressed that, *“more specific actions can be taken by the Engineer regarding Insurance and Securities/ Guarantees.”* Those can be identified as follows.

It is found in some instances that some insurance policies are not covering all the damages that can be occurred in the site. Hence, in most of the situations those damages have to be borne by the Employer or Contractor. It may be more disadvantageous to the Employer or Contractor according to the extent of the damage. It may incur vast financial losses than predicted at inception.

In such situations, with the Engineer’s past experience with the projects, he can predict what type of damages or losses can arise in a project. Further, Engineer can discuss with Employer and Contractor to make them bear these losses or discuss with insurance companies to cover these risks with their insurance policies with extra

costs/ increased insurance premium. So, it is essential to read and understand the insurance policy before it is being accepted by the Employer. By following the knowledge gained from past experience some types of insurance claims can be mitigated successfully. For example, real event occurred was explained by R2 *“Damages due to vibration in road constructions are not covered through some insurance policies. These damages are inevitable in road construction and these third parties shall be paid for their losses. Moreover, insurance companies do not cover the damages occurred during defects notification period. Hence it is important to cover such risks as well. Hence, it is important to identify these loopholes in policies or bonds by the Engineer before approving them. Then the Engineer can mitigate the claims causing such errors/ conditional clauses/ exemptions in documents by using his past experience with projects and proper contract administration methods.”*

Additionally R2 disclosed that, *“it is frequently found that conditional bank guarantees or securities were submitted in projects. Undoubtedly it is a duty of the Engineer to read them carefully before approving them. Such actions are very important to mitigate the claims arise during later stages of the project.”*

#### **4.3.6 Unique characteristics of Sri Lankan government projects which highlights the importance of the role of Engineer in minimizing claims**

All the interviewees agreed that, the government construction projects are having their own unique characteristics. As described by R1 *“We can see that, in Sri Lanka infrastructure development projects like roads, hospitals, schools, railways, airports and some of the government funded building construction projects such as government offices, apartment complexes can be taken as examples for government construction projects.”* According to R4, *“It is evident that, development of these kind of infrastructure will not generate direct monetary profits but will always facilitate the long term development of the country.”*

R1 confirmed that, *“Government construction projects are having unique features compared to private construction projects in Sri Lanka. There are obvious*

*differences and claims can arise due to these unique characteristics. So that, the Engineer has a main role in these projects to minimize construction claims in such projects.*” For this reason, Engineer shall be a competent enough to minimize claims which arise due to these unique characteristics by using his skills and strategies.

All the interviewees listed a set of unique characteristics such as, budget allocations, public accountability, transparency, media influence, legislation and policy changes by the government, time impact, media influence and political influence. It is noticeable that, most of these characteristics are not found in private sector construction projects.

Consequently R1 outlined that, *“Budget allocation is one of the most prominent characteristic. That means, at the time of contract is made the budget limit is identified and allocations were done by the government. If the budget limit exceeds due to a claim, it will affect the whole progress of the project. For example, the government allocates funds for a project with approvals from ministry level through MPC (Ministry Procurement Committee) or sometimes parliament level through CAPC (Cabinet Appointed Procurement Committee). So, it is very difficult to allocate budgets if the budget limits exceed during the construction process.”*

Further R1 explained that, *“There is a need of consumption of budgets allocated within the allocated time period. For example, at the end of the year according to the zero-budgeting concept the unconsumed funds were returned to the treasury. So, if these funds are not managed throughout the project with its planned time periods it is difficult to bring those sums from the treasury again, and this is a lengthy process with a lot of administrative actions.”*

Both R1 and R4 agreed that, public accountability and transparency of the project are another prominent characteristics of government construction project as these projects are carried out with tax payers’ money. R1 stated that, *“The government has to show what they have done to their public funds. If the budget limits exceed the public will protest against the projects. Hence public pressure is also a unique feature. Further, if this is the case media will highlight these situations and increase*

*the public pressure on government. On the other hand, some projects are based on foreign loans. So, the public is concerned about how these debts are repaid, with public funds or profits from the projects.”*

*R5 stressed that, “time impact is a key characteristic of the government projects. If the project is not completed within its period, the government will not get the expected outcome of it at the right moment. For example, a government office is located in a rented building and the office is expected to shift within a year period. If the new office building is not completed within the contract period the government has to incur more costs on payment of extra rental for extended period until they move to their new place.”*

*Further to above R1 listed that, “Government legislation changes and policy changes will be another unique characteristic which will affect the progress of a government project. Recently, government has gazetted to use locally manufactured material for construction projects in Sri Lanka. These kinds of policies were made for the betterment of the local manufacturers. But if these materials are scarce for the requirement, the Contractors will face problems of purchasing materials and this will delay the project.”*

Therefore, the unique characteristics of the government construction projects will increase the importance of the role of the Engineer in government construction projects. By identifying these characteristics and taking proper administrative actions according to these unique features, it will help the Engineer to minimize construction claims successfully. Moreover, the Engineer has a huge responsibility to be aware of these unique characteristics to smoothen the progress of the project.

#### **4.4 Summary**

The outcome of data collection and analysis presented in this chapter four discloses and produces an outline of how the Engineer can minimize claims in government construction projects in Sri Lanka. Data was collected in two stages by using



questionnaire survey and semi structured interviews conducted with the experts who are having more than ten years of experience.

Firstly, collected data through questionnaire survey was ranked by using Relative Important index (RII) method. Types of claims, causes of claims, effects of claims and best practices to be followed by Engineer to minimize claims in government construction projects in Sri Lanka were listed by using the findings through literature survey and ranked accordingly through the collected data from questionnaire survey.

Secondly, the semi structured interviews were conducted to create a link between the top ten causes of claims and identified best practices which can be used by the Engineer to minimize claims in government construction projects in Sri Lanka. Moreover, Experts were requested to explain about the provisions in ICTAD/SBD/02, which can be used to minimize claims by the Engineer and about the unique characteristics of government construction projects which highlights the importance of the role of the Engineer.

It was revealed that, Engineer has a major role to perform independently as who is responsible for administration and supervision of the execution of the Works. There are considerable actions that can be followed and adopt best practices by the Engineer to minimize claims in government construction projects in Sri Lanka. Timely management actions, proper administration of the project, using of past experience of the projects are examples for some of the best practices identified.

Further, unique characteristics of the public sector projects increase the importance of the Engineer's role in government construction projects in Sri Lanka. Because of this uniqueness of the public sector projects it is evident that construction claims related to these unique characteristics are not rare. Hence, the Engineer has to have extensive knowledge about them also adopt best practices in making proper administrative decisions to minimise construction claims.

## **5.0 RESEARCH FINDINGS**

### **5.1 Introduction**

Chapter four discussed how the data collection and analysis was conducted in accordance with research methodology of this research study. The main aim of this chapter five is to clarify the validity of results attained from the research findings comparison to literature synthesis. Discussion is particularly based on the topics including duties of the Engineer, types of claims, causes for claims, effects of claims and best practices to be followed by the Engineer to minimize claims in government construction projects in Sri Lanka. Further the provisions to be followed by the Engineer to minimize claims in Standard Bidding Document for Major Contracts published by Construction Industry Development Authority is also discussed.

### **5.2 Duties of the Engineer**

The first objective of the research is ‘Reviewing the duties of Engineer’. This objective was achieved through the Chapter two Literature Review. The literature findings elucidate the duties of the Engineer. Deliberately, it was expected to provide a clear picture about the Engineer and significance of his duties towards success of a construction project.

In brief, the Engineer and his duties can be identified as follows. According to the Standard Bidding Document for Major Contracts published by Construction Industry Development Authority, the Engineer is the person who is responsible for administering and supervising the execution of the works (CIDA, 2007). Similar definitions for the Engineer are found in other common forms of contracts used. CIDA (2007) disclosed that, the role of the Engineer sets in at the time of the Contract is made between the Employer and the Contractor. Because, the Engineer is appointed and his duties and authorities are explained in the Contract itself.

Engineer has a vast role under a contract. For instance, in each sub clause of the general conditions of contract of SBD for Major Contracts published by CIDA

consists different types of duties designated to the Engineer of the Project. Issue clarifications for ambiguities or discrepancies found in the documents of Contract, issue written instructions to the Contractor, giving notices to Contractor about commencement, programme, testing and etc., issue interim and final payment certificates, issue taking over and performance certificates, evaluation of variations and claims are some of the duties assigned to the Engineer (CIDA, 2007). In any event, it is Engineer's responsibility to take timely management actions and effective contract administration. Those are two main factors to be followed for a successful project as Engineer.

### **5.3 Construction claims**

The literature survey turns to achieve second objective by giving an introduction to a claim. Chappel et al. (2005) expressed that a claim can be defined as the insistence or demand for a right. Generally, this assertion of a right is insisted by the contractor, while expecting for an extension to the contract period and/or for extra payment which arises due to the changes of the Contract. Specifically, under the express or implied terms of construction contract. Likewise, Jayalath (2013) stated that a claim is fundamentally a term for demand for additional compensation in relation to alterations in the contract or otherwise in terms of time and/ or cost.

Second objective of the research is 'reviewing types of claims and causes of claims'. Third objective is 'investigating the types and causes of claims which occur in government construction projects in Sri Lanka'. Types of claims and causes of claims are identified through the literature findings under the Chapter Two. Afterwards, types of claims and causes of claims which occur in Sri Lankan government construction projects was identified through the data collection and analysis stage under Chapter Four.

From the research findings it can be shown that the types of claims identified in the Sri Lankan government construction projects such as claims for extra time and claims for extra cost. This result is in line with the literature findings as described by Kumaraswamy (1997). In addition, those major two types are divided in to

contractual claims, common law claims, quantum meruit claims and ex-gratia claims. However, all these types of claims can be led by a cause of claim.

Even though, these types of claims are not specifically identified under government construction projects through the literature review, it is evident that these types of claims are common in Sri Lankan government projects as well according to the data analysis of the questionnaire survey. So, it is clear that the literature findings are in compliance with the outcome of the research and as exposed by Chappel et al. (2005) in the literature review.

According to the research findings, the top ten major causes for claims in government construction projects in Sri Lanka are inadequate design information, change or variation orders, inadequate contract administration, specifications and drawings inconsistencies, design errors or omissions, low price of contract due to high competition, inadequate site investigations, delays caused by Employer, delays in payment by Employer and documentation errors. Hence it is evident that, this result is balanced with the literature findings described by Kumaraswamy (1997) and Zaneldin (2006).

Arditi & Pattanakitchamroon (2006) mention that, one or more reasons may cause the claims in construction industry. Due to these reasons, one or many events of a project can be affected by the effects of claims. As revealed in the literature synthesis wastage of time and energy, increase the cost of construction project, increase the project duration, disputes, expensive dispute resolution process and loss of productivity are the effects of claims in government construction projects in Sri Lanka and in line with the research findings of the questionnaire survey.

#### **5.4 Best practices to be followed by the Engineer to minimize claims in government construction projects in Sri Lanka**

A comprehensive method was adapted to achieve forth objective. Significantly, it is a step by step procedure. Under section 5.4, 5.5 and 5.6, method of achieving the fourth objective is discussed descriptively.

In the first stage of the data collection responses of the questionnaire survey were analyzed and ranked accordingly. The list of causes of claims and list of best practices were identified through the literature review to create the questionnaire survey. Then in the second stage of the data collection interviewees were asked to create a link among the top ten causes of claims and best practices to be followed to minimize claims by the Engineer in government construction projects in Sri Lanka as illustrated in table 4.7: Causes of claims Vs. Best practices to be followed by the Engineer to minimize claims in Sri Lankan government construction projects in Chapter Four. By using this method, it was expected to know the ways of treating the top ten causes of claims identified in Sri Lankan government construction projects.

According to the findings of the study, it is evident that these best practices can be used to treat these specific causes of claims identified in government construction projects. Through that, it was expected to minimize the claims in government construction projects in Sri Lanka strategically.

### **5.5 Minimizing claims by using Standard Bidding Document for Major Contracts published by CIDA**

Standard Bidding Document for Major Contracts published by the Construction Industry Development Authority (CIDA) - (ICTAD/SBD/02) is the common form of contract used for government construction projects in Sri Lanka. The general conditions of contract play a vital role in a construction contract formed by using ICTAD/SBD/02.

Obviously, it is difficult to eliminate direct claims during post contract stage, because the contract is already formed and the discrepancies and ambiguities found in the Contract cannot be revised or altered during the stage. Moreover, Contractor is the person who is responsible for preparation of claims. Due to this reason the Contractor is always being vigilant about the claim causing events and try to minimize his losses. Therefore, claims are inevitable in a contract which is not prepared prudently.

It is evident that, when considering all these events, all the claim causing events cannot be controlled or eliminated by the Engineer's actions. Anyhow, by following the special practices like timely management actions, proper communication practices, effective contract administration and maintain proper job records, claim causing events can be minimized by the Engineer.

In the same way, there are some provisions in Conditions of Contract in ICTAD/SBD/02 that can be followed by the Engineer to minimize claims. These were identified through the interviews conducted with the experts and illustrated in table 5.1 below. Adhering to these Sub Clauses of the Conditions of Contract will support the Engineer to minimize claims and, in some events, to eliminate them.

**Table 5.1: Provisions under ICTAD/SBD/02 to be followed by the Engineer to minimize claims**

<b>Provision in ICTAD/SBD/02</b>	<b>Content</b>	<b>Claimable Event</b>	<b>Best Practices of minimizing the claims by Engineer</b>
Sub Clause 1.5 Priority of Documents	If an ambiguity or discrepancy is found in the document, the Engineer shall issue necessary clarifications or instructions.	Claims related to Sub Clause 1.9 - Delayed Drawings and Instructions	Issue the requested clarifications or instructions on time and in writing.
Sub Clause 1.9 Delayed Drawings or Instructions	If the Contractor suffers delays and/or incur cost as a result of a failure of the Engineer to issue notified Drawings or Instructions within a reasonable time.	Claims related to Sub Clause 1.9 - Delayed Drawings and Instructions	Issue the requested drawings or instructions on time and in writing.
Sub Clause 3.1 Engineer's Duties and Authority	The Engineer may exercise the authority attributable to the Engineer as specified in or necessarily implied from the Contract.	-	Shall perform Engineer's duties in accordance with the Contract.

<b>Provision in ICTAD/SBD/02</b>	<b>Content</b>	<b>Claimable Event</b>	<b>Best Practices of minimizing the claims by Engineer</b>
Sub Clause 3.3 Instructions of the Engineer	The Engineer may issue to the Contractor (at any time) instructions, which may be necessary for the execution of the Works and the remedying of any defects, all in accordance with the Contract. These instructions shall be given in writing.	Claims related to Sub Clause 1.9 - Delayed Drawings and Instructions	Issue the requested clarifications or instructions on time and in writing.
Sub Clause 13.1 Right to Vary	Variations may be initiated by the Engineer at any time prior to issuing the Taking - Over Certificate for the Works.	Claims related to Sub Clause 1.9 - Delayed Drawings and Instructions and Sub Clause 3.3 Instructions of the Engineer	Issue the requested clarifications or instructions on time and in writing.
Sub Clause 14.5 Issue of Interim Payment Certificates (IPC)	IPC shall be issued within 21 Days after receiving Statement and supporting documents. IPC shall not be withheld without a valid reason.	Claims related to Sub Clause 14.7 - Delayed Payment, Sub clause 16.1 – Contractor’s Entitlement to Suspend Work.	Issue IPC within the time limitation and for the Contractor’s actual work done at site.

<b>Provision in ICTAD/SBD/02</b>	<b>Content</b>	<b>Claimable Event</b>	<b>Best Practices of minimizing the claims by Engineer</b>
Clause 18.0 Insurance	Contractor shall insure all the events causing damages and losses in the contract.	Employer or Contractor has to bear the losses by themselves if insurance policy does not cover all the events.	Engineer shall read, understand and make sure the insurance policies cover all the losses predictable at site.
Guarantees/ Securities/ Bonds (In accordance with Sub Clause 4.2 Performance Security, Sub Clause 14.2 Advance Payment Guarantee, Sub Clause 14.3 (c) Retention Money)	Contractor shall issue relevant guarantees/ securities / bonds as requested according to the contract.	Employer has to suffer from losses if the Contractor submit conditional guarantees/ securities/ bonds. Employer will not be able to encash them at non-performance of Contractor.	Engineer shall read, understand and make sure the guarantees/ securities/ bonds are unconditional and on demand.

## **5.6 Unique characteristics of the Government Construction projects in Sri Lanka**

The main target of this question in the semi-structured interview guideline was to identify the unique characteristics of Sri Lankan government projects which highlights the importance of the role of Engineer in minimizing claims. According to the literature findings in section 2.3 Government construction projects, characteristics of the government construction projects were discussed commonly.



But, following list of unique characteristics were identified through the data analysis of the semi-structured interviews conducted.

- Budget limitations
- Difficulties in allocation of budget
- Time impact
- Transparency and public accountability
- Media influence
- Government policies and legislation changes
- Lengthy processes in administration and approvals
- Political influence

These unique features have direct impact in construction claims in government construction projects in Sri Lanka. In other words, these unique characteristics will create unique construction claims which is specific to the government construction projects. Hence, the Engineer shall have a good knowledge about these characteristics to minimize the construction claims correlated to these characteristics.

## **6.0 CONCLUSIONS AND RECOMMENDATIONS**

### **6.1 Introduction**

The chapter five made a comprehensive discussion on the findings of the research with comparison of the literature findings and how the objectives were achieved descriptively. With the aim of establishing conclusions and recommendations, the key findings were outlined under this chapter six.

Initially, the conclusions made on the research problem is presented with summarising the key findings. Afterwards, based on the research findings recommendations are made. Finally, the research limitations and further research directions for this study are discussed.

### **6.2 Conclusions**

In simpler meaning, claim can be identified as demand for something due. Claims in the construction industry are common and unavoidable. Because of the firm bond between the causes of claims and the nature of the construction industry which is impossible to break, the tendency of eliminating claims is very hard, yet must be done as much as possible at least to minimize claims.

The aim of this research is to explore the mechanisms to minimize claims in government projects in Sri Lanka by the Engineer. The research consisted with four objectives to achieve the aim. First two objectives were achieved through the literature survey. Duties of the Engineer, types of claims and causes of claims in construction industry were reviewed and discussed comprehensively in chapter two.

Third and fourth objectives were achieved by data collection and analysis discussed in chapter four. Data collection techniques used for this study consisted with two stages, a detailed questionnaire survey and semi-structured interviews. Through questionnaire survey it was distinguished and ranked the types of claims, causes for claims, effects of claims and best practices to be followed to minimize claims by the

Engineer considering government construction projects in Sri Lanka. Semi – structured interviews were conducted to create a link between causes of claims and best practices to be followed to minimize claims by the Engineer considering Sri Lankan government construction projects.

The first objective of the research is reviewing the duties of Engineer. The literature findings discussed the duties of the Engineer in a construction project expressively. Significantly, it was expected to provide a clear picture about the Engineer and significance of his duties towards success of a construction project. According to CIDA (2007), Engineer's roles comes on to the stage at the time of creating the contract amongst the Employer and the Contractor. Evidently, the Engineer has a extensive role under a contract. In any event, it is Engineer's responsibility to take timely management actions and effective contract administration. Those are two main factors to be followed for a successful project as Engineer.

Second objective of the research is to review the claims and causes of claims in construction industry as a whole. This objective is also achieved through the literature synthesis in chapter two. According to the literature findings there are two major types of claims namely claims for extra time and claims for extra money. Each and every following claim type can be categorized under above mentioned main two types of claims. Those are namely, the contractual claims, common law claims, *quantum meruit* claims and *ex-gratia* claims. Moreover, thirty two causes of claims were identified through the literature survey. In addition, it was expected to rank and identify the top ten causes of claims in government construction projects in Sri Lanka through questionnaire survey while achieving the third objective of the research.

Investigation about the claims and causes of claims which occur in Sri Lankan government projects is the third objective of the research. The research findings about the types of claims identified in the government construction projects in Sri Lanka comply with the literature findings of the research. These finding were ranked according to the Sri Lankan government sector context. Furthermore, it was expected to ascertain the top ten causes of claims in government construction projects in Sri Lanka. According to the data analysis inadequate design information, change or

variation orders, inadequate contract administration, specifications and drawings inconsistencies, design errors or omissions, low price of contract due to high competition, inadequate site investigations, delays caused by Employer, delays in payment by Employer and documentation errors are the top ten causes for claims identified.

Besides, the research findings of the questionnaire surveys distinguished that the government construction projects in Sri Lanka disturbed from the negative effects of claims such as wastage of time and energy, increase the cost of construction project, increase the project duration, disputes, expensive dispute resolution process and loss of productivity.

Achieving of fourth objective of the research was done in a comprehensive manner. Fourth objective of this research is establishing the best practices that an Engineer can adopt to minimize claims in government projects in Sri Lanka. Two data collection methods were used to achieve this objective. Those were questionnaire survey and semi-structured interviews. Even though the best practices to be followed by the Engineer to minimize claims in government construction projects in Sri Lanka were ranked according to the questionnaire survey, there was a need of creating a link between top ten causes of claims in government construction projects and best practices to be followed by the Engineer. So that, a veritable list of best practices to be followed by Engineer to minimize claims in government construction projects was identified against the causes of claims through the analysis of semi structured interviews conducted with experts.

Notwithstanding that, provisions that can be used by the Engineer to minimize claims according to Standard Bidding document for Major Contracts published by CIDA were discussed through the semi structured interviews. The reason to choose ICTAD/SBD/02 for the discussion is that, it is the commonly used standard form of contract in government construction projects in Sri Lanka. According to the research findings Sub Clause 1.5 - Priority of Documents, Sub Clause 1.9 – Delayed Drawings or Instructions, Sub Clause 3.1 – Engineer’s Duties and Authority, Sub Clause 3.3 – Instructions of the Engineer and Sub Clause 14.5 – Issue of Interim

Payment Certificates are the prominent provisions which can be used by the Engineer to minimize claims in government construction projects in Sri Lanka.

Finally, the interviewees were requested to list the unique characteristics of Sri Lankan government projects which highlights the importance of the role of Engineer and adopting best practices in minimizing claims. Budget limitations, difficulties in allocation of budget, time impact, transparency and public accountability, media influence, government policies and legislation changes, lengthy processes in administration and approvals and political influence are the unique characteristics identified in public sector construction projects in Sri Lanka. These unique characteristics tend to create unique construction claims which is specific to the government construction projects. Consequently, awareness of such characteristics will also be advantageous for performance of the Engineer to minimize construction claims.

In order to minimize claims in government construction projects, the Engineer has a vital role to treat the causes for claims comprehensively and that will facilitate the smooth functioning of construction project activities without baffling consequences. Consequently, it was clear that there are specific practices should be followed by the Engineer to minimize claims in government projects, in order to achieve successful completion of the project within the estimated financial allocations, time and preferred quality.

### **6.3 Recommendations**

It was evident that, the Engineer's role in a construction project is immense. Engineer is the person who does the administration and supervision of the project as an impartial character during the post contract stage. Hence, Engineer has to adhere to best practices which will make the project successful.

It is natural that claims will however arise due to the fix bond between their causes and the nature of the construction industry. In short, the claims cannot be completely eliminated from a project. However, a main stakeholder to the project like Engineer

can follow specific best practices to minimize claims in projects as he is the person who is responsible for administering the project.

Contemplating about the findings of this study, following can be recommended as implications to the government construction projects in Sri Lanka. The implications to the construction industry contained with the proposed best practices for minimizing claims in the Sri Lankan government construction projects in order to achieve successful completion of the project within the originally anticipated financial allocations, time and quality.

### **6.3.1 Implications to the construction industry**

Following can be recommended as implications for the construction industry in Sri Lanka. Most of these implications are applicable with the Engineer to the government construction projects.

- Through this research it is strongly recommended to follow the best practices identified, by the Engineer to the project.
- There are number of best practices that can be followed by the Engineer to minimize claims in government construction projects in Sri Lanka. However, the Engineer has to perform his duties within the post contract stage and in this stage Contract is already formed. Further, in certain contracts Engineer's duties may be restricted through the particular conditions of the contract. Since, it is difficult to eliminate claims during post contract stage, the Employer can hire consultants to prepare the Contract documents without discrepancies and ambiguities in the pre contract stage. For the reason that, most of the claims occur due to the discrepancies and ambiguities found in documentation.
- Timely management actions and proper contract administration of the Engineer are the other key factors of a successful project.
- Being aware about the unique characteristics of government construction projects is also advantageous for minimizing claims.

- It can recommend through using these best practices, Engineer can minimise the claims which may develop through the prominent claim causing events found in government construction projects in Sri Lanka.

#### **6.4 Limitations of the Research**

As emphasised and construed in previous chapters, collection of data for the study is limited to the survey approach within a sample population and cannot be collected from a wider population or universe. Moreover, this study had aimed and limited to research on the professionals who had experience with Sri Lankan government construction projects and construction claims. In order to achieve a better depiction of Sri Lankan construction context this study was limited to Sri Lankan professional who are having experience in the particular research issues. As the data has been collected from Sri Lanka it was expected that the best practices can be followed for the Sri Lankan context. However, after identification of the best practices it was noted that these best practices can be used not only for Sri Lankan government construction projects but also for the construction industry as a whole. But the Engineer shall be able to choose the best practices according to the nature of the claim causing events and form of contract used.

#### **6.5 Further Research Directions**

Amidst conducting this study, it was observed that there are number of scenarios relating to the topic have not been discussed so far. Therefore, the following further research directions are recommended with suitable changes.

##### **1) Conducting the research for private sector of construction**

The research was done limiting the study in to government sector. Hence, a similar research can be recommended to be conducted considering the private sector construction projects. For instance, there may be contrasting features related to procurement methods, rules, regulations, nature of the project and Employer's attributes. Hence, this will be a beneficial research area.

## **2) Conducting the research to minimize claims by project consultant during pre contract stage**

The research was done to find the best practices to be followed by Engineer to minimize claims during post contract stage. On the other hand, it is possible to research on best practices to be followed to minimize claims by the project consultant during the pre-contract stage.



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## APPENDIX A: QUESTIONNAIRE GUIDELINE

.....  
.....

Dear Sir/Madam,

### Conducting a Questionnaire Survey for Dissertation

I'm a post graduate student of the M.Sc. in Construction Law and Dispute Resolution programme at the Department of Building Economics of University of Moratuwa. I'm currently conducting a research under the module "Dissertation" (BE6404) on the topic "**Best Practices of the Engineer to Minimize Construction Claims in Government Projects in Sri Lanka**". In order to collect data for aforementioned topic, I wish to conduct a questionnaire survey with the experts of the construction industry who are currently involving in construction projects. Therefore, I kindly request your assistance by filling my questionnaire regarding the aforementioned topic. The questionnaire survey is attached herewith.

The sole purpose of this questionnaire survey is to collect data to complete my research. I strictly confirm the confidentiality of your identity and the details you provide.

I'll be very grateful if you can complete the attached within your busy and tight work schedule.

Thank You.

Yours Sincerely,

H.D. Sendanayake

Student of Post Graduate Studies,  
Department of Building Economics  
University of Moratuwa  
Tel.: 071-6421266  
E-mail: [hasarads@gmail.com](mailto:hasarads@gmail.com)

Supervisor

Mr. Vijitha Disaratna

Senior Lecturer  
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University of Moratuwa  
Tel.: 077-6177202  
E-mail: [vijitha.disaratna@gmail.com](mailto:vijitha.disaratna@gmail.com)

**SECTION 01: General Information**

**1. Name of the respondent (Optional):** .....

**2. Name of the organisation:** .....

**3. Designation of the respondent:** .....

**4. Experience:**

Number of years of experience in construction industry of Sri Lanka. (Please tick with a “X”)

0 - 5 years	
5 - 10 years	
10 - 15 years	
More than 15 years	

**SECTION 02: Claims**

**1. Have you ever involved with the government construction projects in Sri Lanka?** (Please tick with a “X”)

Yes	
No	

**2. Have you ever involved with “construction claims” in government construction projects in Sri Lanka?** (Please tick with a “X”)

Yes	
No	

**3. Do you think construction claims can be affected by the Engineer’s role in a government construction project in Sri Lanka?** (Please tick with a “X”)

Yes	
No	



4. How do you rate the following types of claims which may arise in government construction projects in Sri Lanka? Please indicate the rating according to occurrence of each area. (Please tick with a “X”)

Types of Claims		Frequency				
		Very Low	Low	Medium	High	Very High
1	Claims for extra time					
2	Claims for extra money					
1	Contractual claims					
2	Common law claims					
3	<i>Quantum meruit</i> claims					
4	Ex-gratia claims					
5	Other (Please specify below)					

5. How do you rate the following “causes of claims” in government construction projects in Sri Lanka? Please indicate the rating according to the magnitude of each area. (Please tick with a “X”)

Causes of Claims		Magnitude of the cause				
		Very Low	Low	Medium	High	Very High
1	Inaccurate design information					
2	Inadequate design information					
3	Inadequate site investigations					
4	Delays caused by Employer					

Causes of Claims		Magnitude of the cause				
		Very Low	Low	Medium	High	Very High
5	Poor communication					
6	Unrealistic time targets Eg: Expediting					
7	Inadequate contract administration					
8	Uncontrollable external events Eg: COVID19, Tsunami					
9	Incomplete tender information					
10	Unclear risk allocation Eg: Physical and Price contingencies					
11	Change or variation orders					
12	Oral change orders by Employer					
13	Delay in payments by Employer					
14	Low price of contract due to high competition					
15	Changes in material and labour costs					
16	Employer's Supremacy					
17	Subcontracting problems					
18	Delay caused by contractor					
19	Contractor is not well organized					
20	Contractor's financial problems					
21	Bad quality of contractor's work					
22	Government regulations					
23	Estimating errors, scheduling errors					
24	Design errors or omissions					
25	Execution errors					
26	Subsurface problems					

Causes of Claims		Magnitude of the cause				
		Very Low	Low	Medium	High	Very High
27	Specifications and drawings inconsistencies					
28	Termination of work					
29	Suspension of work					
30	Accidents					
31	Planning errors					
32	Documentation errors					
	Other (please specify below)					

6. What are the effects of the claims in the government construction projects in Sri Lanka? Please indicate the rating according to the magnitude of each area. (Please tick with a “X”)

Effects of Claims		Magnitude of the effect				
		Very Low	Low	Medium	high	Very High
1	Disputes					
2	Expensive dispute resolution processes					
3	Wastage of time & energy					
4	Increase the cost of construction project					
5	Loss productivity					
6	Increase the project duration					
7	Other (Please specify below)					

Effects of Claims		Magnitude of the effect				
		Very Low	Low	Medium	high	Very High

7. How do you rate the following as the “Best practices to be followed to minimize the claims by the Engineer” in the government construction projects in Sri Lanka? Please indicate the rating according to the significance of the best practice of each area. (Please tick with a “X”)

Best practices to be followed to minimize the claims by the Engineer		Significance				
		Very Low	Low	Medium	high	Very High
1	Timely management actions					
2	Effective contract administration during post contract phase					
3	Allow reasonable time for the design team to produce clear and complete contract documents with no or minimum errors and discrepancies					
4	Establish efficient quality control techniques and mechanisms that can be used during the design process to minimize errors, mismatches, and discrepancies in contact documents					
5	Have a clearly written contract with no ambiguity					
6	Read the contract several times before signing it to understand any unclear clauses					

<b>Best practices to be followed to minimize the claims by the Engineer</b>		<b>Significance</b>				
		<b>Very Low</b>	<b>Low</b>	<b>Medium</b>	<b>high</b>	<b>Very High</b>
7	Have a third party to read bid documents before the bidding stage					
8	Use special contracting provisions that have been used successfully on past projects					
9	Use special practices that have been used successfully on past projects					
10	Develop cooperative and problem solving attitudes on projects through a risk-sharing philosophy and by establishing trust among partners (e.g., the Employer and the Contractor)					
11	Establish a strategy on how to deal with tighter scheduling requirements					
12	Have signed change orders before starting doing these changes on site					
13	Maintain proper job records on a timely manner including time sheets, diary records, reports, photographs, records of labors and weather and its effect on progress, progress of the construction and site instructions					
14	Management of outside design professionals who are not the parties to the main contract					
15	Constructability and biddability review					
16	Site investigation					
17	Contractor's risk analysis					
18	Review & approval of detailed as-planned schedules					

Best practices to be followed to minimize the claims by the Engineer		Significance				
		Very Low	Low	Medium	high	Very High
19	Implement a document control system to capture code and file documents					
20	Hold pre-construction meetings and reach agreement on key project objectives					
21	Prioritize the relative importance of each project					
22	Define clearly the roles and responsibilities of each party					
23	Allocate risks to the party best able to control those risks and provide equitable rewards for assuming risks.					
24	Develop performance criteria to communicate expectations and measure each party's achievements.					
25	Coordinate activities involving several parties					
26	Implement cost control procedures.					
27	Hold periodic progress reviews and inspections.					
28	Maintain open communications throughout the project.					
	Other (Please specify below)					

## **APPENDIX B: SAMPLE QUESTIONNAIRE TRANSCRIPT**

### **SECTION 01: General Information**

**1. Name of the respondent (Optional):** Respondent 03

**2. Name of the organisation:** XX

**3. Designation of the respondent:** Senior Chartered Quantity Surveyor

**4. Experience:**

Number of years of experience in construction industry of Sri Lanka. (Please tick with a “X”)

0 - 5 years	
5 - 10 years	
10 - 15 years	X
More than 15 years	

### **SECTION 02: Claims**

**1. Have you ever involved with the government construction projects in Sri Lanka?** (Please tick with a “X”)

Yes	X
No	

**2. Have you ever involved with “construction claims” in government construction projects in Sri Lanka?** (Please tick with a “X”)

Yes	X
No	

3. Do you think construction claims can be affected by the Engineer's role in a government construction project in Sri Lanka? (Please tick with a "X")

Yes	X
No	

4. How do you rate the following types of claims which may arise in government construction projects in Sri Lanka? Please indicate the rating according to occurrence of each area. (Please tick with a "X")

Types of Claims		Frequency				
		Very Low	Low	Medium	High	Very High
1	Claims for extra time				X	
2	Claims for extra money				X	
1	Contractual claims				X	
2	Common law claims				X	
3	<i>Quantum meruit</i> claims		X			
4	Ex-gratia claims		X			

5. How do you rate the following "causes of claims" in government construction projects in Sri Lanka? Please indicate the rating according to the magnitude of each area. (Please tick with a "X")

Causes of Claims		Magnitude of the cause				
		Very Low	Low	Medium	High	Very High
1	Inaccurate design information		X			



Causes of Claims		Magnitude of the cause				
		Very Low	Low	Medium	High	Very High
2	Inadequate design information				X	
3	Inadequate site investigations			X		
4	Delays caused by Employer			X		
5	Poor communication			X		
6	Unrealistic time targets Eg: Expediting				X	
7	Inadequate contract administration				X	
8	Uncontrollable external events Eg: COVID19, Tsunami				X	
9	Incomplete tender information				X	
10	Unclear risk allocation Eg: Physical and Price contingencies				X	
11	Change or variation orders				X	
12	Oral change orders by Employer				X	
13	Delay in payments by Employer				X	
14	Low price of contract due to high competition				X	
15	Changes in material and labour costs		X			
16	Employer's Supremacy	X				
17	Subcontracting problems			X		
18	Delay caused by contractor				X	
19	Contractor is not well organized			X		
20	Contractor's financial problems			X		
21	Bad quality of contractor's work			X		
22	Government regulations			X		
23	Estimating errors, scheduling errors			X		

Causes of Claims		Magnitude of the cause				
		Very Low	Low	Medium	High	Very High
24	Design errors or omissions				X	
25	Execution errors			X		
26	Subsurface problems			X		
27	Specifications and drawings inconsistencies			X		
28	Termination of work			X		
29	Suspension of work			X		
30	Accidents			X		
31	Planning errors			X		
32	Documentation errors			X		

6. What are the effects of the claims in the government construction projects in Sri Lanka? Please indicate the rating according to the magnitude of each area. (Please tick with a “X”)

Effects of Claims		Magnitude of the effect				
		Very Low	Low	Medium	high	Very High
1	Disputes				X	
2	Expensive dispute resolution processes				X	
3	Wastage of time & energy				X	
4	Increase the cost of construction project				X	
5	Loss productivity				X	
6	Increase the project duration				X	

7. How do you rate the following as the “Best practices to be followed to minimize the claims by the Engineer” in the government construction projects in Sri Lanka? Please indicate the rating according to the significance of the best practice of each area. (Please tick with a “X”)

Best practices to be followed to minimize the claims by the Engineer		Significance				
		Very Low	Low	Medium	high	Very High
1	Timely management actions					X
2	Effective contract administration during post contract phase					X
3	Allow reasonable time for the design team to produce clear and complete contract documents with no or minimum errors and discrepancies	X				
4	Establish efficient quality control techniques and mechanisms that can be used during the design process to minimize errors, mismatches, and discrepancies in contact documents	X				
5	Have a clearly written contract with no ambiguity	X				
6	Read the contract several times before signing it to understand any unclear clauses	X				
7	Have a third party to read bid documents before the bidding stage	X				
8	Use special contracting provisions that have been used successfully on past projects	X				
9	Use special practices that have been used successfully on past projects					X

Best practices to be followed to minimize the claims by the Engineer		Significance				
		Very Low	Low	Medium	high	Very High
10	Develop cooperative and problem solving attitudes on projects through a risk-sharing philosophy and by establishing trust among partners (e.g., the employer and the contractor)					X
11	Establish a strategy on how to deal with tighter scheduling requirements					X
12	Have signed change orders before starting doing these changes on site					X
13	Maintain proper job records on a timely manner including time sheets, diary records, reports, photographs, records of labors and weather and its effect on progress, progress of the construction and site instructions					X
14	Management of outside design professionals who are not the parties to the main contract					X
15	Constructability and biddability review					X
16	Site investigation	X				
17	Contractor's risk analysis	X				
18	Review & approval of detailed as-planned schedules			X		
19	Implement a document control system to capture code and file documents					X
20	Hold pre-construction meetings and reach agreement on key project objectives	X				
21	Prioritize the relative importance of each project	X				

<b>Best practices to be followed to minimize the claims by the Engineer</b>		<b>Significance</b>				
		<b>Very Low</b>	<b>Low</b>	<b>Medium</b>	<b>high</b>	<b>Very High</b>
22	Define clearly the roles and responsibilities of each party	X				
23	Allocate risks to the party best able to control those risks and provide equitable rewards for assuming risks.	X				
24	Develop performance criteria to communicate expectations and measure each party's achievements.	X				
25	Coordinate activities involving several parties					X
26	Implement cost control procedures.					X
27	Hold periodic progress reviews and inspections.					X
28	Maintain open communications throughout the project.					X

## APPENDIX C: INTERVIEW GUIDELINE

.....  
.....

Dear Sir/Madam,

### Conducting an Interview for Dissertation

I'm a post graduate student of the M.Sc. in Construction Law and Dispute Resolution programme at the Department of Building Economics of University of Moratuwa. I'm currently conducting a research under the module "Dissertation" (BE6404) on the topic "**Best Practices of the Engineer to Minimize Construction Claims in Government Projects in Sri Lanka**". In order to collect data for aforementioned topic, I wish to conduct an interview with the experts of the construction industry who are currently involving in construction projects. Therefore, I kindly request your assistance by allowing me to interview you regarding the aforementioned topic. The interview guideline is attached herewith.

The sole purpose of this interview is to collect data to complete my research. I strictly confirm the confidentiality of your identity and the details you provide.

I'll be very grateful if you can send me a date and time for the interview within your busy and tight work schedule.

Thank You.

Yours Sincerely,

H.D. Sendanayake

Student of Post Graduate Studies,  
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**Conducting Semi-Structured Interview for Dissertation**

**Section 01: General Information**

- 1 Name of the interviewee:
- 2 Name of the organisation:
- 3 Designation of the respondent:
- 4 Experience (in years):
- 5 Date:
- 6 Involvement with Claims:

**Section 02: Best practices to be followed to minimize claims by the Engineer in government construction projects in Sri Lanka**

		Rank	1	2	3	4	5	6	7	8	9	9
Rank	Best Practices to be followed to minimize claims by Engineer in government projects in SL	Causes of claims										
		Inadequate design information	Change or variation orders	Inadequate contract administration	Specifications and drawings inconsistencies	Design errors or omissions	Low price of contract due to high competition	Inadequate site investigations	Delays caused by Employer	Delay in payments by Employer	Documentation errors	
1	Use special practices that have been used successfully on past projects											
2	Timely management actions											
3	Effective contract administration during post contract phase											
4	Maintain proper job records on a timely manner including time sheets, diary records, reports, photographs, records of labors and weather and its effect on progress, progress of the construction and site instructions											
5	Hold periodic progress reviews and inspections											
6	Coordinate activities involving several parties											
7	Maintain open communications throughout the project											
8	Implement cost control procedures											
9	Constructability and biddability review											
10	Implement a document control system to capture code and file documents											
11	Establish a strategy on how to deal with tighter scheduling requirements											
12	Have signed change orders before starting doing these changes on site											
13	Management of outside design professionals who are not the parties to the main contract											
14	Review & approval of detailed as- planned schedules											
15	Develop cooperative and problem solving attitudes on projects through a risk-sharing philosophy and by establishing trust among partners (e.g., the employer and the contractor)											
16	Define clearly the roles and responsibilities of each party											
17	Site investigation											
18	Allow reasonable time for the design team to produce clear and complete contract documents with no or minimum errors and discrepancies											
19	Have a clearly written contract with no ambiguity											
20	Establish efficient quality control techniques and mechanisms that can be used during the design process to minimize errors, mismatches, and discrepancies in contact documents											
21	Allocate risks to the party best able to control those risks and provide equitable rewards for assuming risks											
22	Read the contract several times before signing it to understand any unclear clauses											
23	Develop performance criteria to communicate expectations and measure each party's achievements											
24	Hold pre-construction meetings and reach agreement on key project objectives											
25	Contractor's risk analysis											
26	Use special contracting provisions that have been used successfully on past projects											
27	Have a third party to read bid documents before the bidding stage											
28	Prioritize the relative importance of each project											
	Please Specify Other best practices if any :											

**Section 02:**

1. According to the above table in Section 2, what are the “Best practices to be followed to minimize the claims by the Engineer” in the government construction projects in Sri Lanka. Please tick with a “X” in the relevant Box.

**Section 03:**

1. How can the Engineer use Standard Bidding Document 02 (SBD/02) published by the Construction Industry Development Authority (CIDA) to minimize claims in government construction projects in Sri Lanka?
2. What are the provisions in SBD/02 that can be followed by the Engineer to minimize claims?
3. Can you specify the relevant clauses in SBD-02?
4. What are the unique characteristics of Sri Lankan government projects which highlights the importance of the role of Engineer in minimizing claims?



## **APPENDIX D: SAMPLE INTERVIEW TRANSCRIPT**

### **SECTION 01: General Information**

1. Name of the interviewee: Interviewee 01
2. Name of the organisation: xx
3. Designation of the respondent: Senior Chartered Quantity Surveyor
4. Experience (in years): 11 years
5. Date: 26<sup>th</sup> October 2020
6. Involvement with Claims: Yes

### **Section 02:**

1. According to the table in Section 2, what are the “Best practices to be followed to minimize the claims by the Engineer” in the government construction projects in Sri Lanka. Please tick with a “X” in the relevant Box.

**Conducting Semi-Structured Interview for Dissertation**

**Section 02: Best practices to be followed to minimize claims by the Engineer in government construction projects in Sri Lanka**

Rank	Causes of claims	Rank									
		1	2	3	4	5	6	7	8	9	9
	Best practices to be followed to minimize claims by Engineer in government projects in SL	Inadequate design information	Change or variation orders	Inadequate contract administration	Specifications and drawings inconsistencies	Design errors or omissions	Low price of contract due to high competition	Inadequate site investigations	Delays caused by Employer	Delay in payments by Employer	Documentation errors
1	Use special practices that have been used successfully on past projects	X	X	X	X	X			X	X	X
2	Timely management actions								X		
3	Effective contract administration during post contract phase		X	X					X		X
4	Maintain proper job records on a timely manner including time sheets, diary records, reports, photographs, records of labors and weather and its effect on progress, progress of the construction and site instructions		X	X			X	X			X
5	Hold periodic progress reviews and inspections		X	X			X	X			
6	Coordinate activities involving several parties		X	X	X	X		X	X		X
7	Maintain open communications throughout the project	X	X	X	X			X	X		X
8	Implement cost control procedures		X				X			X	
9	Constructability and biddability review	X	X		X	X		X			X
10	Implement a document control system to capture code and file documents	X	X	X							X
11	Establish a strategy on how to deal with tighter scheduling requirements			X					X	X	
12	Have signed change orders before starting doing these changes on site		X							X	
13	Management of outside design professionals who are not the parties to the main contract	X	X		X	X		X			X
14	Review & approval of detailed as- planned schedules		X	X							
15	Develop cooperative and problem solving attitudes on projects through a risk-sharing philosophy and by establishing trust among partners (e.g., the employer and the contractor)		X			X		X	X		X
16	Define clearly the roles and responsibilities of each party	X	X								
17	Site investigation	X	X			X		X			
18	Allow reasonable time for the design team to produce clear and complete contract documents with no or minimum errors and discrepancies	X	X		X	X		X			X
19	Have a clearly written contract with no ambiguity		X		X						X
20	Establish efficient quality control techniques and mechanisms that can be used during the design process to minimize errors, mismatches, and discrepancies in contract documents	X	X		X	X					X
21	Allocate risks to the party best able to control those risks and provide equitable rewards for assuming risks					X		X			
22	Read the contract several times before signing it to understand any unclear clauses										
23	Develop performance criteria to communicate expectations and measure each party's achievements						X				
24	Hold pre-construction meetings and reach agreement on key project objectives	X		X							
25	Contractor's risk analysis		X				X	X			
26	Use special contracting provisions that have been used successfully on past projects		X								X
27	Have a third party to read bid documents before the bidding stage	X			X	X					X
28	Prioritize the relative importance of each project								X	X	

### **Section 03:**

1. How can the Engineer use Standard Bidding Document 02 (SBD/02) published by the Construction Industry Development Authority (CIDA) to minimize claims in government construction projects in Sri Lanka?
2. What are the provisions in SBD/02 that can be followed by the Engineer to minimize claims?
3. Can you specify the relevant clauses in SBD-02?

It will be convenient for me to discuss the first three questions all together. However, I will give you a brief introduction about the claims first. What is claim mitigation? That means mitigating the events that causes additional cost and additional time. Dispute mitigation is different from claim mitigation. In this case we must mitigate the claim and stop arising disputes due to these claims. And on the other hand, if the cost and/or time overruns the Contractor will definitely create the claim. So that we as the Engineer we have to work to find methods to manage these events.

First event which comes to my mind is holding payments of the Contractor without valid justification. According to the Sub Clause 14.5 Issue of Interim Payment Certificate, Engineer cannot withhold the payments without valid reasons. The Engineer can withhold the payments only if anything supplied or work done by the Contractor is not accordance with the Contract and/or if the Contractor was or is failing to perform any work or obligation in accordance with the contract and had been so notified by the Engineer. Then if the IPC is issued by the Engineer, Employer do the payments to the Contractor. However, if the Contractor was not paid within the time period, he can claim interest for delayed payments. Similarly, in some events Engineer withhold payments/ parts of payment without valid reasons and actually the Contractor is entitled for this withheld amount. This situation can be mitigated by the Engineer. For example, the price proposal submitted by the Contractor for variation is not approved yet by the Employer. So sometimes Engineer withhold this amount of variation. According to the Conditions of Contract, the Engineer cannot withhold this payment. He must get a provisional rate for the calculations and do a provisional payment to the Contractor. Because he has conducted the work at site and he must be paid for what he did. It is alright it to be a provisional amount or percentage from variation rather than withholding total amount. This claim event can be mitigated by the Engineer.

Second event is relating to Sub Clause 1.9 Delayed Drawings and Instructions. According to this Sub Clause, Engineer shall issue timely instructions and drawings.

Third event occurs related to the Sub Clause 3.3. Instructions of the Engineer. According to this sub clause, instructions of the Engineer shall be given in writing. But at site some instructions are given verbally. These events cause claims. For example, there is a process of carrying out work. In road construction projects, typical drawings were issued at tender stage and then the Contractor is asked to produce the construction drawings after a proper land survey for 10km intervals. Then at site the engineer gives verbal instructions to do some changes to the design due to some valid reasons. However, these verbal instructions cannot be confirmed properly. Since there are no proper written instructions. To prevent such situations, the site engineers can be instructed by the Engineer to issue at least signed hand sketch. By using these signed instructions, the process can become smoother.

Fourth event is related to Sub Clause 8.3 Programme and 8.6 Rate of Progress. Progress monitoring is conducted to check the progress of the project. When taking photos for progress monitoring, the photos shall be taken from same place by the Contractor for the progress report. We must check whether the progress go for as planned programme. However, if the Construction goes smoothly, if the contract is managed properly, if the contract goes according to the programme, claim situations are very rare. This will cause to lower the loss of Contractor automatically. So that the claims will be mitigated.

Winner's curse – Contractor always compare his price to second lowest bidder's price. He thinks he lost that much of profit due to high competition and because he priced low to win the bid.

Effectively evaluating or deciding on variations, proper correspondence, good administration, will lead to reduce claims of Contractor. Claim causing events will be reduced. But the claim events cannot be completely removed. In other words, it will not reduce direct claims. Further, Quality assurance system shall be properly defined.

If the documentation process is fixed many claim causing facts will be reduced. For example, quality assurance system shall be properly defined, proper documentation, etc. Effective contract management – drawings and instruction issuing process shall be monitored and regulated.

4. What are the unique characteristics of Sri Lankan government projects which highlights the importance of the role of Engineer in minimizing claims?

Construction industry has many unique characteristics when comparing with other industries. When considering the construction industry as a whole it can be divided into two main sectors, the public sector and private sector construction projects in Sri Lanka. We can see that, in Sri Lanka infrastructure development projects like roads, hospitals, schools, railways, airports and some of the government funded building construction projects such as government offices, apartment complexes can be taken as examples for government construction projects.

As we discussed earlier, government construction projects are having unique features compared to private construction projects in Sri Lanka. There are obvious differences and claims can arise due to these unique characteristics. So that, the Engineer has a main role in these projects to minimize construction claims in such projects.

Budget allocation is the most prominent characteristic. That means, at the time of contract is made the budget limit is identified and allocations were done by the government. If the budget limit exceeds due to a claim, it will affect the whole progress of the project. For example, the government allocates funds for a project with approvals from ministry level or sometimes parliament level MPC (Ministry Procurement Committee), CAPC (Cabinet Appointed Procurement Committee). So, it is very difficult to allocate budgets if the budget limits exceed during the construction process.

Further, there is a need of consumption of budgets allocated within the allocated time period. For example, at the end of the year according to the zero-budgeting concept the unconsumed funds were returned to the treasury. So, if these funds are not managed through out the project with its planned time periods it is difficult to bring those sums from the treasury again, and this is a lengthy process with lot of administrative actions.

Moreover, these government constructions projects are based on the taxpayers' money/ public money. So, the public accountability is a prominent feature. The government has to show what they have done to their public funds. If the budget limits exceed the public will protest against the projects. Hence public pressure is also a unique feature. Further, if this is the case media will highlight these situations and increase the public pressure on government.

On the other hand, some projects are based on foreign loans. So, the public is concerned about how these debts are repaid, with public funds or profits from the projects. If the project gets delayed the pressure of paying back the debts will set on the general public. For example, according to my knowledge, the tolls collected from the expressways constructed in Sri Lanka are used for paying back the debts.

However, in some situations even though the funds allocated from the beginning, the funds get delayed by approvals. So, this will lead to delays in payment and badly affect the progress of the project.

Government legislation changes, policy changes will be another unique characteristic which will affect the progress of a government project. Recently, government has gazetted to use locally manufactured material for construction projects in Sri Lanka. These kinds of policies were made for the betterment of the local manufacturers. But if these materials are scarce for the requirement the Contractors will face problems of purchasing materials and this will delay the project.

For these reasons there is a huge responsibility to the Engineer to be aware of these characteristics and act accordingly to minimize the claims arise due to these unique features other than the common claim causing events.