MITIGATION AND RESOLUTION OF CONTRACTUAL DISPUTES IN CONSTRUCTION INDUSTRY OF SRI LANKA

Jayantha Pradeep Kumara Dimbukkuwalage

(119306B)

Degree of Master of Science in Construction Law and Dispute Resolution

Department of Building Economics

University of Moratuwa

Sri Lanka

July 2016

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

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Mitigation and Resolution of Contractual Disputes in Construction Industry of Sri Lanka

Disputes have become an epidemic in the construction industry of Sri Lanka. Disputes consume lots of money and resources without meaningful return to the society. Hence, mitigation and resolution of potential contractual disputes in construction industry of Sri Lanka has become not only timely but also essential.

Identifying causes of disputes is a pre-requisite of that task. The construction process is complex and multi-parties involved in it. It needs to select initially a procurement method and a contract type. It has to undergo designing, drafting tender documents and tendering to be able to award a contract. Following award of a contract till completion, contracts needs to be administered based on an agreed framework to be able to successfully complete. During these stages, impetuses of causes of disputes would be emerged and embedded in construction process to be surfaced whenever time permits and situation prevails.

Therefore it is all essential to identify when disputes may emerge, to mitigate them before appearing and to resolve as last resort within the framework of contract, just not to waste money and resources by resorting to ADR and/or to litigation and not to sore relationships among stakeholders.

Findings of the study revealed that the inbuilt dispute mitigation and resolution provisions in FIDIC red Book and ICTAD SBD 02 were not adequate to address potential disputes that may occur due to the causes of disputes found in this study and it needs to be improved drastically. It is recommended that governing bodies of construction should take note and take action to alleviate waste of much needed money and resources that needs for betterment of lives in Sri Lanka.

Keywords: *Disputes, Causes of Disputes, Construction Process, Hints, Mitigation and Resolution.*

I dedicate this piece of work to my beloved parents, wife and kids who have being the superlative inspiration and courage of my life...

May this be a tribute for their greatest love, support and understanding...!

ACKNOWLEDGEMENT

This research study came into existence due to support of many people. Although, it is difficult to point out each and every individual as there are many, it is my duty to extend my gratitude to all of them.

First and foremost, I am deeply indebted to my dissertation supervisor, senior lecturer, Ch.QS. (Mrs.) Kanchana Perera, for her excellent supervision, timely guidance, enormous encouragement, constructive criticisms, familiarity with industry practise and most importantly sharp understanding on the research area that significantly contributed towards the successful completion of this research.

Secondly, I wish to extend my utmost gratitude to the Head of the Department and MSc Course Coordinator Dr (Mrs.) Yasangika Sandanayake and all other staff members of the Department of Building Economics, University of Moratuwa, Sri Lanka.

Thirdly, I express my indebtedness to the industry practitioners who participated in the questionnaire survey.

Last, but not least, I express my heartfelt gratitude towards my dearest parents for their unwavering belief in me and my wife and children for their loving support and patience at difficult times.

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ABBREVIATION	DESCRIPTION
FIDIC	Federation Internationale of Ingenieurs Conseils
ICTAD	Institute for Construction Training and Development
ADR	Alternative Dispute Resolution Methods

Appendix A - Questionnaire

1. INTRODUCTION

1.1 Background

Disputes have become an inherent feature of construction industry (Love, Davis, London & Jasper, 2008). In addition, according to Cheung and Yiu (2006), disputes are inevitable in a complex construction project. That is due to complexity and multi-party involvement in construction projects (Abeynayake & Wedikkara, 2013). As per Baccarini (1996), the construction process is considered as the most complex undertaking in any industry. The complex, relational and lengthy process of designing and building makes construction a process in which disputes are virtually ensured (McManamy, 1994).

Coulson (1983) disclosed that, the introduction of new procurement methods such as Fast-tracking, Design & Build and Construction Management brings more uncertainty into the construction process, since many specifics are not determined at the time the contracts are signed. Introduction of more uncertainties to the construction process to gain cost, time and quality advantages lead inevitably to more disagreements. El-adaway (2008) pointed that Construction disputes consume yearly around US $5 billion in United States, which negatively affects the health of the construction industry as well as the United States' economy. As per Diekmann and Girad (1995), a dispute is "any contract question or controversy that must be settled beyond the jobsite management". Reid and Ellis (2007) argued that there is no definitive meaning of a dispute and the existence of which is a subjective issue requiring a common-sense approach that relies on the facts, the law and policy considerations.

The researchers, Ndekugri and Russell (2006) and Reid and Ellis (2007), refer to the Halki Principle established in the case Halki Shipping Corporation v Sopex Oils Ltd, [1998], 1 WLR CA, where a dispute does not exist until a claim has been submitted and rejected; a claim being a request for compensation for damages incurred by any party to the contract. However, the House of Lords in the case Nova (Jersey) Knit Ltd v Kammgarn Spinnerei GmbH; HL 1977, stated that; "A "dispute" means a genuine or a real dispute, and that a claim which is indisputable because there is no arguable defence does not create a dispute at all". Further, Heath, Hills and Berry, (1994) identified seven main types of disputes which occur in construction projects. The main types of disputes

were Disputes related to Contract terms, Payments, Variations, Extensions of time, Nomination, Re-nomination and Availability of information.

Waldron (2006) recognised Variations to scope, Contract interpretation, EOT claims, Site conditions, Late, incomplete or substandard information, Obtaining approvals, Site access, Quality of design and Availability of resources as nine key causes that lead to disputes. Even on the best structured projects, disputes or differences will arise and need to be effectively managed to avoid (White Paper, 2010).

El-adaway (2008) developed an integrated and coherent methodology for mitigation of construction disputes for USA construction industry using both, multi-agent based simulation concepts and risk management modelling principles.

In his research, he had;

- developed an innovative method that utilized logical induction as support tool for construction claims and disputes;
- created a multi agent system for construction dispute resolution (MAS-COR) that simulates the legal discourse in construction disputes;
- developed a new method for addressing the issue of risks in the construction industry using principle of portfolio insurance; and
- created a leading way for mitigating negative effects of contractor's construction claims and disputes using a risk retention approach.

1.2 Problem Statement

Today, in Sri Lanka, construction contracts are prepared based on either ICTAD or FIDIC based standard conditions of contracts. These contracts have in-built dispute mitigation and resolution provisions. In addition, it was found that there was very few existing literature which address mitigation and resolution of Contractual Disputes in the Construction Industry of Sri Lanka. It was found that limited studies have been carried-out on dispute mitigation and resolution in the Sri Lankan context. Out of which, neither researches nor any study have attempted to analyse contractual disputes in construction projects, in order, to verify adequacy of existing dispute mitigation and resolution provisions in standard conditions of contracts. Further, adoption of mitigation and resolution methods of disputes are highly dependent on nature, culture, politics,

economics and legal systems of a country. Therefore, a systematic study on frequent dispute types and causes in Sri Lanka is long overdue and it needs to verify that whether these tested standard conditions are actually fulfilling the task that was intended in-terms of dispute mitigation and resolution.

1.2.1 Aim

The aim of this study is to investigate adequacy of dispute mitigation and dispute resolution measures available in FIDIC Red Book and ICTAD SBD 2 Standard Conditions of Contracts.

1.2.2 Objectives

- To identify causes for disputes which frequently occur in Sri Lanka.
- To categorise causes of disputes in to main stages of construction process.
- To relate identified causes of disputes to FIDIC Red Book and ICTAD SBD 2.
- To identify foreseeable hints for disputes that may occur.
- To verify adequacy of dispute mitigation measures in FIDIC Red Book and ICTAD SBD 2.
- To verify adequacy of dispute resolution provisions in FIDIC Red Book and ICTAD SBD 2.

1.3 Scope

The study was limited to building and infrastructure construction contracts which use FIDIC Red Book and ICTAD SBD 2 Standard Conditions of Contracts.

1.4 Methodology

1.4.1 Literature Survey

A literature survey was carried out initially to find causes disputes.

1.4.2 Desk Review

A desk study was done aiming at categorising the causes of disputes in to main stages of construction process.

1.4.3 Questionnaire Survey

A questionnaire survey was carried out, to validate if identified causes of disputes were true causes of disputes, to find foreseeable hints for disputes, to investigate if FIDIC red Book and ICTAD SBD 2 had got measures to mitigate the disputes that might occur and to also investigate if FIDIC red Book and ICTAD SBD2 had already got in-built contractual provisions to resolve such disputes.

1.5 Structure of the Dissertation

Chapter 1 – Introduction

Chapter 2 – Literature Survey

Chapter 3 – Research Methodology

Chapter 4 – Analysis and Research Findings

Chapter 5 – Conclusions and Recommendations

1.6 History of Research

Love, Davis, Ellis, & Cheung (2010) identified underlying pathogens contributing to disputes to enable their prevention.

Kumaraswamy (1997) identified root and proximate causes of significant claims and subsequent disputes which provided a basis on which to be investigated their avoidability. He recommended further research into linking specific groups of proximate and root causes to particularly significant claims categories to differentiate unavoidable and controllable claims to improve claims management with a view of minimizing disputes.

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter commences with a consideration to the background study. However, an abbreviated background to the research was provided in Chapter 1. Therewith, this segment of the research examines the critical points of current knowledge and findings related to causes for disputes as well as the construction industry. First off, the definition of dispute is discoursed. This is followed by establishing causes for disputes, hints to foresee disputes, avoiding and mitigating disputes and finally why the topic Mitigation and Resolution of Potential Contractual Disputes in Construction Industry of Sri Lanka is important by establishing the extent that the construction disputes related topics have been researched in Sri Lankan context.

2.2 What is a dispute?

A **Legal dispute** has been defined in numerous ways. As per, Mavrommatis, Palestine 33w Concessions (*Greece v Great Britain*), Judgment of 30 August 1924, the Permanent Court of International Justice (Ser. A) No. 2, at 11, 'A dispute is a disagreement on a point of law or fact, a conflict of legal views or of interests between two persons'.

In, Interpretation of the Peace Treaties with Bulgaria, Hungary and Romania, Advisory Opinion of 30 March 1950 (first phase), 1950 ICJ Rep. 65, at 74., the International Court of Justice referred **dispute** as to 'a situation in which the two sides held clearly opposite views concerning the question of the performance or non-performance of certain treaty obligations.'

The Tribunal in Texaco v. Libya referred **dispute** as to a 'present divergence of interests and opposition of legal views'. (*Texaco Overseas Petroleum Company and California Asiatic Oil Company v. Libyan Arab Republic*, Preliminary Award of 27 November 1975, 53 ILR 389, at 416 (1979)).

Numerous definitions as to what constitutes a dispute can be found in the literature (Brown and Marriott, 1993). As per Cheung and Yiu (2006), in construction, the words **dispute** and **conflict** have been used fairly loosely and almost as synonymous. They further say that **dispute** is the manifestation of the underlying conflict(s)". As per

Acharya and Lee (2006), in a perfect construction world there would be no conflicts, but there is no perfect construction world.

The terms **dispute**, **conflict** and **claim** are often used interchangeably, but their meanings are very different (Al-Tabtabai & Thomas, 2004). Examples of how each of these terms, as presented by Love, Davis, London, and Jasper, (2008), and others include:

- **Dispute** – "any contract question or controversy that must be settled beyond the jobsite management" (Diekmann & Girard, 1995).
- **Conflict** – "serious disagreement and argument about something important" (Collins, 1995). Similarly, Leung, Liu and Ng, (2005) defined conflict as a "functional or dysfunctional element in the management process". Willmot & Hocker (1998), on the other hand, provided a detailed definition of conflict as "an expressed struggle between at least two independent parties who perceive incompatible goals, scare resources, and interference from the other in achieving those goals".
- **Claim** – "for the assertion of a right to money, property or remedy" (Powell-Smith & Stephenson, 1993). Likewise, Semple, Hartman, and Jergeas, (1994) defined a claim as "a request for compensation for damages incurred by any party to a contract". However, the term "construction claim" is commonly used to describe any application by the contractor for payments made outside of contractual payment provisions, as and when the contractor demands additional costs and/or delays (Revay, 1990).

Acharya, Lee, and Man Im, (2006) explained occurrence of risk which develops in to disputes in their Risk, Conflict, Claim and Dispute Continuum Model. In that they clarified that **Risks** that were not clearly assigned in a project caused to have **Conflicts**, **Conflicts** that were not clearly managed resulted in **Claims** and **Claims** that were not clearly resolved ended up with **Disputes**.

Kumaraswamy (1997) explained that some construction claims were unavoidable and in fact necessary, to contractually accommodate unforeseen changes in project conditions or unavoidable changes in client's priorities. He further elaborated that while such claims could be settled amicably, the prior presence of unhealthy conflict could trigger degeneration into unnecessary disputes.

Reid and Ellis (2007) argued that there is no definitive meaning of a dispute and the existence of which is a subjective issue requiring a common-sense approach that relies on the facts, the law and policy considerations. Ndekugri and Russell (2006) and Reid and Ellis (2007) referred to the Halki Principle (*Halki Shipping Corporation v Sopex Oils Ltd*, (1998), 1 WLR CA) which described that a **dispute** would not exist until a **claim** had been submitted and rejected; a **claim** being a request for compensation for damages incurred by any party to the contract. However, the House of Lords in the case *Nova (Jersey) Knit Ltd v Kammgarn Spinnerei* GmbH; HL 1977, stated that; "A "dispute" means a genuine or a real dispute, and that a claim which is indisputable because there is no arguable defence does not create a dispute at all". Kumaraswamy (1997) described that disputes were taken to imply prolonged disagreements on unsettled claims and protracted unresolved/destructive conflict.

2.3 Causes for Dispute

A dispute would not arise without a cause. There is a difference between **causation** in law of tort and law of contract. As described by Bayliss (n.d.), the two aspects, factual component and legal condition of causation need to be considered in relation to claims in contract, but whereas in tort the difficulty tends to arise in determining causation in fact, in contract the focus more often tends to be on the question of what may, as a matter of law, be attributed to the breach.

When deciding whether to bring a contractual claim against another party, it is important to consider both causation and damages. Causation is the process of proving that the other party caused the loss. Damages are the losses suffered (Edwards, 2011).

There is plenty of literature theorising about what **causes** of disputes (Love, Davis, Ellis, & Cheung, 2010). Much of the research that has been undertaken simply seeks to identify a list of factors or triggers that show some association with disputes. Many of the factors identified are not dissimilar in nature. The identification of such factors, while useful, does not explain the underlying causal nature of disputes (Love et al., 2010).

Kumaraswamy (1997) attempted to examine causality of disputes. In that, he sought to determine the root causes, which means the underlying reason of the problem, which, if

eliminated, would prevent recurrence and proximate causes, which immediately precedes and produces the effect.

The root causes identified by Kumaraswamy (1997) include the following:

- unfair risk allocation;
- unclear risk allocation;
- unrealistic time/cost/quality targets by the client;
- uncontrollable external events;
- adversarial industry culture;
- unrealistic tender pricing;
- inappropriate contract type;
- lack of competence of project participants;
- lack of professionalism of project participants;
- client's lack of information or decisiveness; and
- contractor's unrealistic information expectations.

Proximate causes identified by Kumaraswamy (1997) include the following:

- inadequate brief;
- poor communications;
- personality clashes;
- vested interests;
- changes by client;
- slow client responses;
- exaggerated claims;
- estimating errors;
- other (eg. Works) errors;
- internal disputes (eg. In JVs);
- inadequate contract administration;
- inaccurate design information;
- incomplete tender information;
- inadequate design documentation;
- inappropriate contractor selection

- inappropriate payment modalities; and
- inappropriate contract form.

In an appraisal done by Kumaraswamy (1997) revealed that the root causes were controllable except a particular root cause which was 'uncontrollable external events'. Further, it also revealed that apart from above particular root cause which was leading to 'changes by client' that almost all the proximate causes were also controllable to a certain extent.

Semple, Hartman, and Jergeas (1994) described that the fundamental causes and real costs associated with conflicts and disputes in Canadian Construction Industry were not well understood. They identified the following causes as common causes of claims which might end up as disputes.

- acceleration;
- restricted access;
- weather / cold; and
- increase in scope.

Watts and Scrivener (1993) identified most frequent sources of disputes as listed below;

- violation of operational provisions in the agreement;
- variations;
- negligence in tort; and
- delay.

As per a survey conducted by Waldron (2006), it was revealed that Time and Cost overruns as the two biggest causes of disputes in construction and infrastructure projects. It was also mentioned that prevention was undoubtedly better than cure and it was vital that project participants agree in advance on clear dispute avoidance and resolution mechanisms.

It was also revealed that there was a firm link between those projects which were inadequately scoped and the scope related disputes. The most commonly cited causes of disputes in the survey were variations to the scope and interpretation of what was included in the scope of works.

As per Waldron (2006), the main issues that lead to disputes were as follows;

- variations to scope,
- contract interpretation,
- extension of time claims,
- site conditions,
- late, incomplete or substandard information,
- obtaining approvals,
- site access,
- quality of design and
- availability of resources.

Cheung and Yiu (2006) listed, as follows, general types of disputes in the order of perceived significance following a literature review, interviews and a questionnaire survey;

- variations due to site conditions,
- variations due to client changes,
- variations due to design errors,
- unforeseen ground conditions,
- ambiguities in contract documents,
- variations due to external events,
- interferences with utility lines,
- exceptional inclement weather,
- delayed design information and
- delayed site possession.

They, further, identified the basic factors that drive the development of disputes. Those include;

- project uncertainty,
- contractual problems and
- opportunistic behaviour.

Cheung and Yiu (2006) also proposed conceptualizing of construction disputes. In doing so, they mentioned that dispute include three basic ingredients namely:

1) Contract Provisions,
2) Triggering Events and
3) Conflict.

As per S. Mitkus and Mitkus (2013), the commonly identified causes of disputes are not true causes of disputes. The true or most frequent cause of dispute is "unsuccessful communication between the parties to a construction contract agreement". In their research they identified three groups of construction conflicts as follows;

1) Obviously wrong causes,
2) Potentially right but unclearly formulated causes and
3) True causes of conflicts.

The imprecise specification of works, change of construction conditions, changes in the scope of works, conditions on a construction site, change of equipment, improper choice of workers, etc. have been identified as obviously wrong causes as these circumstances occur in many construction projects and it is common in construction.

In most of the projects construction conditions (climate, soil, legal, etc.) often change, the client often modifies design solutions for constructions in progress, construction phases are delayed for different reasons, etc. Yet, these circumstances not always mature into conflicts.

S. Mitkus and Mitkus (2013) identified that the aforementioned circumstances were not true and original causes of conflicts.

As per S. Mitkus and Mitkus (2013) some of the circumstances that they identified in their literature review could be categorised as true causes of conflicts if they were clearly formulated. These might have included, for instance, poor management, influence of lawyers, and insufficiency of initial (and timely) information. The quoted literature sources in their study did not specify how, in particular, the indicated causes can mature into conflicts. However, as per them it was probable that in some cases they could lead, whether directly or indirectly, to a construction conflict.

According to S. Mitkus and Mitkus (2013), some causes found in their literature review they could qualify as the true causes of conflicts. They provided the arguments that problems in communication were the true and most frequent causes of conflicts in construction projects.

In addition to problems in communication, S. Mitkus and Mitkus (2013) identified that unfair behaviour and effects of psychological defences also as true causes of conflicts.

As per Acharya, Lee, and Im, (2006), there were six critical conflicting factors in construction projects in Korea; which would be helpful for project planners and implementers in assessing and taking proactive measures for reducing the adverse effects of conflict. The six critical conflicting factors were;

1) differing site condition,
2) public interruption,
3) differences in change order evaluation,
4) design errors,
5) excessive contract quantities variation and,
6) double meaning of specifications.

Further, the study of Acharya et al. (2006) revealed that owner and consultants were responsible for two thirds of the conflicts. The study concentrated only on owners, consultants and construction contractors.

Yates (1998) considered the application of transaction cost economics theory as a framework for rationalizing the nature, causes and management of conflict and disputes in the development and construction processes. The study had been carried out as drastic increase of conflicts and disputes in many countries and attendant high direct and indirect costs had become a huge problem to the industry. The direct costs were costs of lawyers, claims of consultants, management time, delays to project completions etc. and the indirect costs were costs due to degeneration of working relationships, consequences of mistrust between participants and lack of teamwork.

Internal conflict and interface conflict are two categories of conflicts that have been identified in large-scale construction projects by Awakul and Ogunlana (2002). Internal conflicts are experienced among the project participants such as Owner, Contractor,

Designer, Consultant etc., whereas interface conflicts are between the construction project and groups outside the project such as affected people, NGOs, etc.

Mahato and Ogunlana (2011) studied on Construction of dam projects which involves relatively large number of people of different objectives, interest, disciplines and ideological backgrounds performing interdisciplinary activities and having much effect on the environment and society. Time and physical resources limitations have added another dimension to the complexity of a project. When two social entities work together, it is not uncommon for them to have different interests, values, beliefs and preferences. They often struggle over value, claim for status, power, sharing of the scarce resources, and try to gain the desired value which normally fosters the development of conflict.

Cheung and Pang (2014) described that traditionally subject matter approach has been used to identify the construction disputes. The diagnostic approach aims to uncover the underlying causes that lead to disputes. They believe that this approach is more informative as far as understanding construction disputes is concerned. They tabulated as illustrated below factors concerning subject matter approach and diagnostic approach to construction dispute identification. They stressed that considering the subject matter and diagnostic approaches to identify construction disputes, the subject matter approach is the most commonly used and is useful in relating a dispute to the relevant contract provisions. However, it does not capture the contextual factors of the disputes. The diagnostic approach aims to fill that gap.

2.3.1 Summary of Causes for Dispute

Above disclosed literature shows that various researchers have identified different causes of disputes under different headings. Therefore following three tables provide the summarized version of causes for disputes.

Table 2.3.1 Identification of construction dispute with regard to subject matter

	Reference	Subject matters
1.	Hewit (1991)	(1) Change of scope, (2) change conditions, (3) delay, (4) disruption, (5) acceleration and (6) termination
2.	Watts and Scrivener (1993)	(1) Determination of the agreement; (2) payment related; (3) the site and execution of work; (4) time related; (5) final certificate and final payment and (6) tort related
3.	Heath et al. (1994)	(1) Contract terms; (2) payments; (3) variations; (4) extensions of time; (5) nomination; (6) re-nomination and (7) availability of information
4.	Conlin et al. (1996a, b)	(1) Payment, (2) performance, (3) delay, (4) negligence, (5) quality and administration
5.	Kumaraswamy (1997)	(1) Variation due to site conditions; (2) variations due to client changes; (3) variations due to design errors; (4) unforeseen ground conditions; (5) ambiguities in contract documents; (6) variations due to external events; (7) interferences with utility lines; (8) exceptional inclement weather; (9) delayed design information and (10) delayed site possession
6.	Yates (1998)	(1) Variations; (2) ambiguities in contract documents; (3) inclement weather; (4) late issue of design information/ drawings; (5) delayed possession of site; (6) delay by other contractors employed by the client (e.g. utility companies) and (7) postponement of part of the project
7.	Brooker (2002)	(1) Valuation of variations, (2) valuation of final account and (3) failure to comply with payment provisions
8.	Sheridan (2003)	(1) Payment, (2) delay, (3) defect/quality and (4) professional negligence
9.	Spittler and Jentzen (1992)	(1) Ambiguous contract documents, (2) competitive/ adversarial attitude and (3) dissimilar perceptions of fairness by the participants
10.	Mitropoulos and Howell (2001)	(1) Project uncertainty; (2) contractual problems, (3) opportunistic behaviour, (4) contractors' financial position and (5) cost of conflict and culture

Table 2.3.2 Identification of construction dispute in relation to Diagnosing underlying causes

	Reference	Underlying Causes
1.	Diekmann et al. (1994)	(1) People, (2) process and (3) product
2.	Rhys Jones (1994)	(1) Management; (2) culture; (3) communications; (4) design; (5) economics; (6) tendering pressure; (7) law; (8) unrealistic expectations; (9) contracts and (10) workmanship
3.	Totterdill (1991)	(1) Technical, (2) legal and (3) managerial dispute issues must have a contractual reference
4.	Sykes (1996)	(1) Construction contracts and (2) unpredictable events
5.	Mururu (1991)	Dispute is the formation of a position to maintain in conflict
6.	Brown and Marriott (1999)	Dispute can be viewed as a class or kind of conflict that require resolution
7.	Hellard (1987)	Construction dispute is the opposition of interests, values or objectives
8.	Spittler and Jentzen (1992)	Construction dispute is linked with difference in perspectives, interests and agenda of human beings
9.	Tillet (1991)	Construction dispute is the incompatibility of two (or more) people's (or groups') interests, needs or goals
10.	Fenn et al. (1997)	Dispute requires resolution is associated with distinct justifiable issues
11.	Bristow and Vasilopoulos (1995) and Sykes (1996)	Construction disputes are due to unrealistic expectation, lack of team spirit and misunderstandings

Table 2.3.3: El-Razek, Bassioni and El-Salam (n.d.), identified the following as causes of Disputes by researching the international literature.

	Reference	Cause of Dispute
1.	Al-Momani (2000)	Delays in payments to contractors and resulting cash problems during construction
2.	Jergeas et al. (1994); Diekmann and nelson (1985); Jergeas and Hartman (1994); Al-Momani (2000); McMullan (2003)	Inferior quality of design, drawings and/or specifications,
3.	Jergeas and Hartman (1994); Kumaraswamy and Yogeswaran (1998)	The contract documents have errors, defects, omissions, and poor management
4.	Kumaraswamy and Yogeswaran (1998)	Delays of approval of shop drawings, instructions and decision making
5.	Semple et al. (1994); Jergeas and Hartman (1994)	Restricted access
6.	Jergeas and Hartman (1994)	Faulty and/or late owner-supplied equipment and material
7.	Jergeas and Hartman (1994);	Unbalanced bidding , underestimation and incompetence of contractors
8.	Al-Momani (2000); McMullan (2003)	Stakeholders involved in the project
9.	Adrian (1993)	Relatively low profitability of the construction industry

	Reference	Cause of Dispute
10.	Semple et al. (1994); Jergeas and Hartman (1994); Diekmann and nelson (1985); Kumaraswamy and Yogeswaran (1998); Al-Momani (2000); McMullan (2003)	Variations initiated by the owner/consultant (additive/deductive)
11.	Semple et al. (1994); Jergeas and Hartman (1994)	Acceleration and stop-and-go operations
12.	Jergeas and Hartman (1994);	Insufficient time for bid preparation and Inadequate investigation before bidding
13.	Al-Momani (2000); McMullan (2003)	Changed conditions
14.	Adrian (1993) and Levin (1998)	Increased of complexity and scale of building process
15.	Semple et al. (1994); Kumaraswamy and Yogeswaran (1998); Al-Momani (2000)	Weather

El-Razek, Bassioni and El-Salam (n.d.), following consultation with the industry experts, short listed below mentioned causes of disputes as main causes of Disputes in Lebanon.

No. Causes of claims

1) Delays in payments to contractors and resulting cash problems during construction
2) Inferior quality of design, drawings and / or specifications
3) The contract documents have errors, defects and omissions
4) Delays of approval of shop drawings, instructions and decision making

5) Restricted access
6) Faulty and / or late Owner-supplied equipment and material
7) Unbalanced bidding, underestimation and incompetence of contractors
8) Stakeholders involved in the project
9) Relatively low profitability of the construction industry
10) Variations initiated by the owner/consultant (additive/deductive)
11) Acceleration and stop-and-go operations
12) Insufficient time for bid preparation and inadequate investigation before bidding
13) Changed conditions
14) Increase of complexity and scale of building process
15) Delay of Owner representative/ consultant in inspection work
16) Unexpected changes in exchange, interest, and inflation rate
17) Unexpected change in materials prices

Malak, Wood, and Yonis (2008) as continuing incidence of costly disputes in the construction industry had led to a common interest of researchers in different countries to identify the generic aspects of conflicts, claims, disputes and their resolution, undertook a comprehensive review of literature in the field of construction disputes and identified the relationship between procurement selection (with the inherent risk allocation) and the behavioural attitudes of key stakeholders as critical factors in the incidence of disputes.

In their study it was highlighted that Fenn, Lowe, and Speck, (1997), and Fenn (2008), had conducted exhaustive studies of previous research into causes of disputes. However, it was evident from the sample that direct comparison of the results was, as expressed by Kumaraswamy (1998), "neither possible nor useful, because of the diverse industry cultures and differing methodologies and terminologies used in data collection, analysis and outcome presentations." However, it was illustrated that all these factors as pointed out by Kumaraswamy (1997), fell in the broader sense in three categories of external factors, contract and project teams. The same had been confirmed by the Dispute Prevention and Resolution Task Force of the Construction Industry Institute (CII), based at the University of Texas at Austin, where the factors were described as project uncertainty, process problems including imperfect contracts and people issues (Vorster, 1993, and Mitropolous and Howell, 2001). They further pointed out that in spite of

abundant research in the area, the continuing emergence of costly disputes verified that further studies were needed to identify the causes of disputes.

2.3.1. Reasons for Misunderstandings that result as Causes for Disputes

Levy (2007), during their study on construction projects in the USA, reported that the principal reasons for misunderstandings leading to disputes were:

1) Plans and specifications containing errors, omissions and ambiguities which lack proper degree of co-ordination;
2) Incomplete or inaccurate responses or non-responses to questions or resolutions of problems presented by one party to another party in the contract;
3) The inadequate administration of responsibilities by the client, architect/engineer, contractor, subcontractors, or suppliers;
4) An unwillingness or inability to comply with the intent of the contract or to adhere to industry standards in the performance of work;
5) Site conditions which differ materially from those described in the contract documents;
6) Unforeseen subsurface conditions;
7) The uncovering of existing building conditions, which differ materially from those indicated in the contract drawings situations that occur primarily during rehabilitation or renovation work;
8) Extra work or change order work;
9) Breaches of contract by either party in the contract;
10) Disruptions, delays or acceleration to the work that creates any deviation from the initial baseline schedule
11) Inadequate financial strength on the part of the client, contractor or subcontractor.

2.3.2. Categorization of Disputes based on Causes

Farooqui, Azhar and Umar (1994) undertook a study in quantification of the causes of disputes on the basis of frequency of occurrence and severity of impact if a dispute occurs, as perceived by the contractors in the Pakistani construction sector so as to pave way for better and informed decision making. The causes of disputes were listed, as follows, on the basis of frequency of occurrence and severity of impact under the

categories of 1) Construction Related, 2) Financial/Economical Related, 3) Management Related and 4) Contract Related;

Construction related causes of disputes, are originating purely from activities linked with actual on site construction operations, such as;

1) Poor supervision
2) Unrealistic information expectations
3) Inappropriate selection of subcontractors
4) Reluctance to seek clarifications
5) Lack of appropriate level of man and machine
6) Lack of professionalism of project participants
7) Lack of competence of project participants
8) Unrealistic tender pricing
9) Unclear risk allocation
10) Unfair risk allocation

Financial / economical causes of disputes are emanating from aspects of recovery of costs, pricing, costing, payments and financing associated to execution of the contract, such as;

1) Material price fluctuations
2) Rising value of dollar
3) Project participant's default
4) Inadequate financial strength of the project participants
5) Delay in payments

Management related causes of disputes, are initiating from time management, risk management, site coordination, contract administration, procurement management, cash flow management and construction management, such as;

1) Unrealistic construction schedules
2) Lack of contingency provisions in schedules
3) Lack of risk management
4) Poor coordination and communication
5) Inadequate contract administration

6) Poor procurement management
7) Inappropriate payment schemes
8) Inappropriate contract type
9) Absence of construction management

Contract related causes of disputes, are instigating from Contract Administration, Professional Liability, Contract Interpretation, Contract Breach, Indiscipline in Claims and Pre-tender pricing, such as;

1) Contract clause interpretations
2) Exculpatory clauses such as Indemnity clause etc.
3) Ambiguous contract language
4) Breaches of contract by the project participants
5) Unjust and untimely presentation of claims
6) Exaggerated claims
7) Unrealistic tender pricing

Soekirno, Wirahadikusumah, and Abduh (2007) found percentage contribution, of below categories of causes, towards creating disputes among parties on construction projects in Indonesia. They established, External Conditions category, as liable for creating most disputes.

1) External conditions (26.79%);
2) Change of drawings document (21.43%);
3) Condition of the field (19.64%);
4) Change of technical specifications (16.07%);
5) Others (e.g., cost estimates, professional ethics and licensing) (16.07%)

2.3.3 An Overview of Causes of Disputes

There are several types of causes of disputes as described in the literature survey. Kumaraswamy (1997) defined the root causes and proximate causes for disputes. He also found that all causes of disputes were controllable except two. Semple, Hartman, and Jergeas (1994) identified common causes of claims which might end up as disputes. Watts and Scrivener (1993) identified most frequent sources of disputes. As per Waldron (2006), Time and Cost overruns are the two biggest causes of disputes in construction

and infrastructure projects. Cheung and Yiu (2006) listed general types of disputes in the order of perceived significance. They identified project uncertainty, contractual problems and opportunistic behaviour as the basic factors that drive the development of disputes. They, further, mentioned that Contract Provisions, Triggering Events and Conflict were the three basic ingredients for occurring disputes. S. Mitkus and Mitkus (2013) found that the commonly identified causes of disputes are not true causes of disputes. In their research they identified obviously wrong causes, potentially right but unclearly formulated causes and true causes of conflicts as three groups of causes prevailing in construction conflicts. Acharya et al. (2006) revealed that owner and consultants were responsible for two thirds of the conflicts in Korean Construction Industry. Yates (1998) considered the application of transaction cost economics theory as a framework for rationalizing the nature, causes and management of conflict and disputes. Awakul and Ogunlana (2002) identified internal conflict and interface conflict as two categories of conflicts prevailing in large-scale construction projects. Mahato and Ogunlana (2011) studied two social entities work together in a large project and found that they often struggle over value, claim for status, power, sharing of the scarce resources and try to gain the desired value which normally fosters the development of conflict. Cheung and Pang (2014) stressed that considering the subject matter and diagnostic approaches to identify construction disputes, the subject matter approach was the most commonly used and it also was useful in relating a dispute to the relevant contract provisions. However, it was unable to capture the contextual factors of the disputes. The diagnostic approach was aimed at filling that gap. El-Razek, Bassioni and El-Salam (n.d.), shortlisted causes of disputes by researching the international literature and identified causes of disputes in Lebanon. Malak, Wood, and Yonis (2008) identified the relationship between procurement selection (with the inherent risk allocation) and the behavioural attitudes of key stakeholders as critical factors in the incidence of disputes. Malak, Wood, and Yonis (2008) highlighted during their study that Fenn, Lowe, and Speck, (1997), and Fenn (2008), had conducted detailed studies on causes of disputes. They confirmed what Kumaraswamy (1998) expressed that “direct comparison of causes of disputes were neither possible nor useful, because of the diverse industry cultures and differing methodologies and terminologies used in data collection, analysis and outcome presentations.” However, Kumaraswamy (1997), illustrated that causes of disputes fell in the broader sense in three categories of external factors, contract and project teams where

the same was confirmed by the Dispute Prevention and Resolution Task Force of the Construction Industry Institute (CII), based at the University of Texas at Austin, where the factors were described as project uncertainty, process problems including imperfect contracts and people issues (Vorster, 1993, and Mitropolous and Howell, 2001). Malak, Wood, and Yonis (2008) pointed out that in spite of abundant research in the area of dispute causation, the continuing emergence of disputes justifies that further studies were needed to identify the causes of disputes.

2.4 Hints for Disputes in order to Foresee Occurrence.

As commented by Love et al., (2010), an examination of root and proximate causes of disputes proposed by authors such as Kumaraswamy (1997) makes it difficult to determine what originally gave rise to the dispute in many instances. It had made even difficult to establish dispute causation which is a process of proving that one party caused the loss to the other party.

In many instances, parallels can be drawn with the "chicken or the egg causality dilemma" and the circular cause of consequence (Garner, 2003).

Love et al., (2010), described that there were many real-world examples of circular cause and effect, in which the chicken or egg dilemma helps identify the analytical problem. For example, fear of economic downturn causes people to spend less, spending less reduces demand which eventually creates an economic downturn. Similarly, reduced design fees forces consultants to hire inexperience professionals, inexperience professionals make mistakes in designs, bad designs leads to inferior contract documentation which eventually may cause disputes costing more than anticipated resulting in low budget for productive activities.

For the professionals who are involved in the process of preparation of tender documents, tendering, negotiation and award, because of the concept of bounded rationality, that is the idea that in decision making, rationality of individuals is limited to the information they have, the cognitive limitations of their minds, and the finite amount of time they have to make a decision, not all potential contingencies are identifiable and can be assessed until they are materialised which ultimately causes disputes (Williamson, 1979).

When a contract clause meant to deal with certain eventuality fails to account for an unforeseen event or it is not interpreted to suit the particular circumstances that have arisen, then there is a potential for one party to capitalize on that and take an advantage. In instances similar to above, there is prospect for one party to use the situation and exploit or delay another to maximise their own gain (Mitropoulos and Howell, 2001).

Busby and Hughes (2004) has stated that the fundamental causes for dispute which is called dispute pathogens can be identified by application of below quality checks:

- they are relatively stable phenomena;
- they are in existence for a substantial time before a dispute occurs;
- they would not have been seen, before a dispute occurs, as obvious stages in an identifiable sequence failure;
- they are strongly connected to the dispute; and
- they are identifiable as principal causes of a dispute once it occurs.

According to Busby and Hughes (2004), fundamental causes of dispute in other words, dispute pathogens can be categorised as;

- practice – resulting due to deliberate practices of professionals
- task – resulting due to the nature of the task being performed;
- circumstance – resulting due to the situation or environment the project was operating in;
- organisation – resulting due to organisational structure or operation;
- system – resulting due to an organisational system;
- industry – resulting due to the structural property of the industry; and
- tool – resulting due to the technical characteristics of way of doing things.

As per the authors experience, if an agreement is not reached within fair and reasonable time, almost all pre and post-contract causes of disputes discussed in this literature survey are actually have to be considered as hints for disputes. As always prevalence of a contentious cause has high probability of ending up in a dispute. However, this hypothesis is to be confirmed with an expert survey.

2.5 How to avoid and to mitigate the frequent disputes? And what are the ways to resolve?

Fenn and Gameson (2003), in their book where they edited and published the papers presented in the Proceedings of the First International Construction Management Conference conducted by the University of Manchester, Institute of Science and Technology (UMIST) that was held from 25th to 27th September 1992, stipulated following findings of various authors with regard to dispute avoidance. Hellard (1992) considered dispute avoidance was as part of integrated dispute management strategy, also suggested reasons for conflict in three principal phases of a construction project; 1) establishing the brief, 2) during design detailing and 3) construction, emphasised the importance of total quality management, advocated the appointment of a contract management adjudicator and promoted the idea of an interim reference point to foresee, identify and manage points of disagreement. Lewis, Cheetham and Carter (1992) discussed avoiding conflict by risk management with emphasis to the role of the client's project manager in the application of risk management, and outlined a methodology of risk management with its application being illustrated by two case studies. Fellows (1992) contended preventing conflicts was crucially important, rather than concentrating on dispute resolution, and suggested that improvements could be made by considering the notions of peopolism and Karma. Further, Fellows 1992 concluded that "hard, bad, unfair bargains" work against the interests of the construction industry and those who work in it. He ascribed this to the law of Karma, but the legal system would have produced exactly the same effect. Seeking to exact too heavy an imposition from the other side would have not operated as intended. For example, in Rosehaugh Stanhope v Redpath Dorman Long and Beaufort House Development v Zimmcor International the UK Court of Appeal declined to give effect to a purported provision in a construction management arrangement which would have given the clients' construction managers absolute discretion to determine what loss had been occasioned by delay and to claim immediately for it. The Court of Appeal felt that such a provision was so potentially onerous upon the contractor that it should not be enforced, by reason of the contra proferentem rule. Cree (1992) with his paper published in UMIST demonstrated that a dispute was analogous to a construction project and that the application of good project management would increase opportunities for success and minimise uncertainty for the

client. Zikmann (1992) described the ability to effectively identify and respond to conflict was a crucial requirement for successful project and dispute management.

Waldron (2006) mentioned that prevention was undoubtedly better than cure and it was vital that project participants agree in advance clear dispute avoidance and resolution mechanisms to mitigate effects of frequent disputes.

El-adaway (2008) developed an integrated and coherent methodology for mitigation of construction disputes in United States of America through both, multi agent based simulation concepts and risk management modelling principles. In that regard, the associated work carried out in his research had;

1) developed an innovative method for using logical induction decision support in construction claims and disputes;
2) created a multi agent system for construction dispute resolution (MAS-COR) that would simulate legal discourse in construction disputes;
3) developed a new method for addressing the issue of risks in the construction industry using portfolio insurance; and
4) created an innovative way for mitigating negative effects of contractor's construction claims and disputes using a risk retention approach.

2.6 Current Status of Construction Disputes Mitigation and Resolution in Sri Lanka.

As per Gunarathna and Fernando (n.d), magnitude of having conflicts in Sri Lankan construction industry was continuously increasing with time. They noted, even though conflicts create many harmful effects to projects including costly disputes, Sri Lankan construction industry has not yet given due consideration to find an efficient and an effective conflict management procedure. Further in their research they proposed a framework for effective conflict management using dual concern theory.

Dasanayake (2011) researched on common causes of disputes in construction industry of Sri Lanka and he categorised causes for disputes in to common and uncommon causes. He found that 70% to 75% of the disputes arise due to common causes and the remaining due to uncommon causes while common causes show similarity to causes for disputes in other countries; uncommon causes are only peculiar to Sri Lankan construction industry.

Construction industry of Sri Lanka is continuing to experience with more disputes. Recently Parliament of Sri Lanka enacted Construction Industry Development Act No. 33 of 2014. Through the Act, the task of settlement of disputes was vested on the Construction Industry Development Authority (CIDA). CIDA maintains a list of certified Adjudicators. The list keeps on growing as disputes are not receding to exist. Settlement of disputes has now become a lucrative business for practitioners who provide services of settling disputes as Adjudicators, Arbitrators etc. making it costlier for the parties to disputes.

In Sri Lanka, construction contracts are prepared based on either CIDA (Formerly ICTAD) or FIDIC based standard conditions of contracts. These contracts have in-built dispute mitigation and resolution provisions. If parties to a contract can settle conflicts, claims and disputes utilising provisions inbuilt in the conditions of contract, it could be a relief to struggling players in the construction industry of Sri Lanka.

This research attempts to validate adequacy of existing conflict, claim and dispute mitigation and resolution provisions in standard conditions of contracts with regard to the causes of disputes found in Sri Lanka and elsewhere.

3.0 RESEARCH METHODOLOGY

3.1 Introduction

As per, Fellows and Liu (2015) Research has two features. Those are;

- A careful search / investigation
- Contribution to knowledge

Further as per them research is a learning process where as teaching is passing on existing knowledge. Furthermore, as research is always executed in context, it is important to consider the contextual factors, the environmental variables, which may influence the results through their impacting on the data recorded. Such environmental variables merit consideration in tandem with the subject variables – dependent, independent and intervening of the topic of study. The choice of methodology or methodologies is important in assisting identification of all relevant variables, their mechanisms and amounts of impact.

According to Lewis, Thornhill and Saunders (2007), research has a number of characteristics namely:

- Data are collected systematically.
- Data are interpreted systematically.
- There is a clear purpose: to find things out.

They went on to define research as something that people undertake in order to find out things in a systematic way, thereby increasing their knowledge. To be systematic, they stressed that the research has to be based on logical relationships and not just beliefs. 'To find out things' as per them, may include describing, explaining, understanding, criticising and analysing.

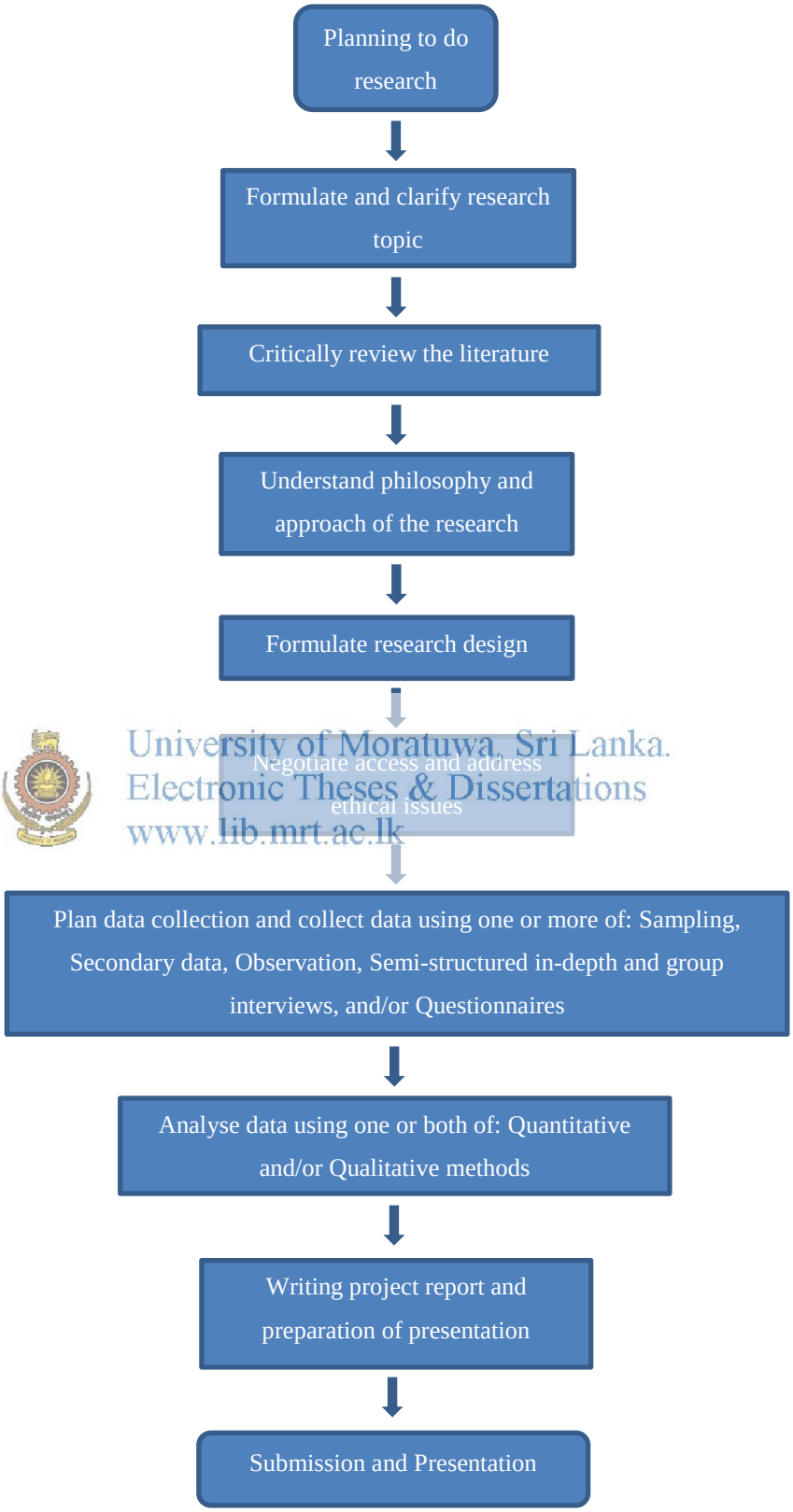
The aim of this chapter is to evaluate the established research methodologies and select the most appropriate to be adopted and then to describe the exact steps that will be undertaken to accomplish the research objectives (Refer section 1.2.2 for objectives).

This chapter commences by depicting the research process, research philosophy and research technique. Research technique conceives both data collection and data analysis techniques.

3.2 Research Process

A research is a multi-stage process. Stages of the process usually include formulating and clarifying a topic, reviewing the literature, designing the research, collecting data, analysing data and writing up (Lewis at el. 2007) as illustrated below in figure 1. Further, Lewis at el. (2007) describe that while research is often depicted as moving through each of the stages outlined in the figure 1, one after the other, this is unlikely to be the case. In reality researcher will probably revisit each stage more than once. Each time a stage is revisited researcher will need to reflect on the associated issues and refine ideas accordingly in order to fine tune the research.

Figure 3.2: Research Process



3.3 Research Philosophy

As per Lewis at el. (2007) the research philosophy which is adopted contains important assumptions about the way in which the researcher view the world. These assumptions will underpin the research strategy and the methods are chosen as part of that strategy. In part, the philosophy, researcher adopt will be influenced by practical considerations. The main influence is likely to be researcher's particular view of the relationship between knowledge and the process by which it is developed. The biggest dilemma is selecting the most suitable research philosophy.

In research, as per Lewis at el. (2007) a researcher can rarely use only one single philosophy but he ends up using combination as depicted in figure 2 – Research Onion.

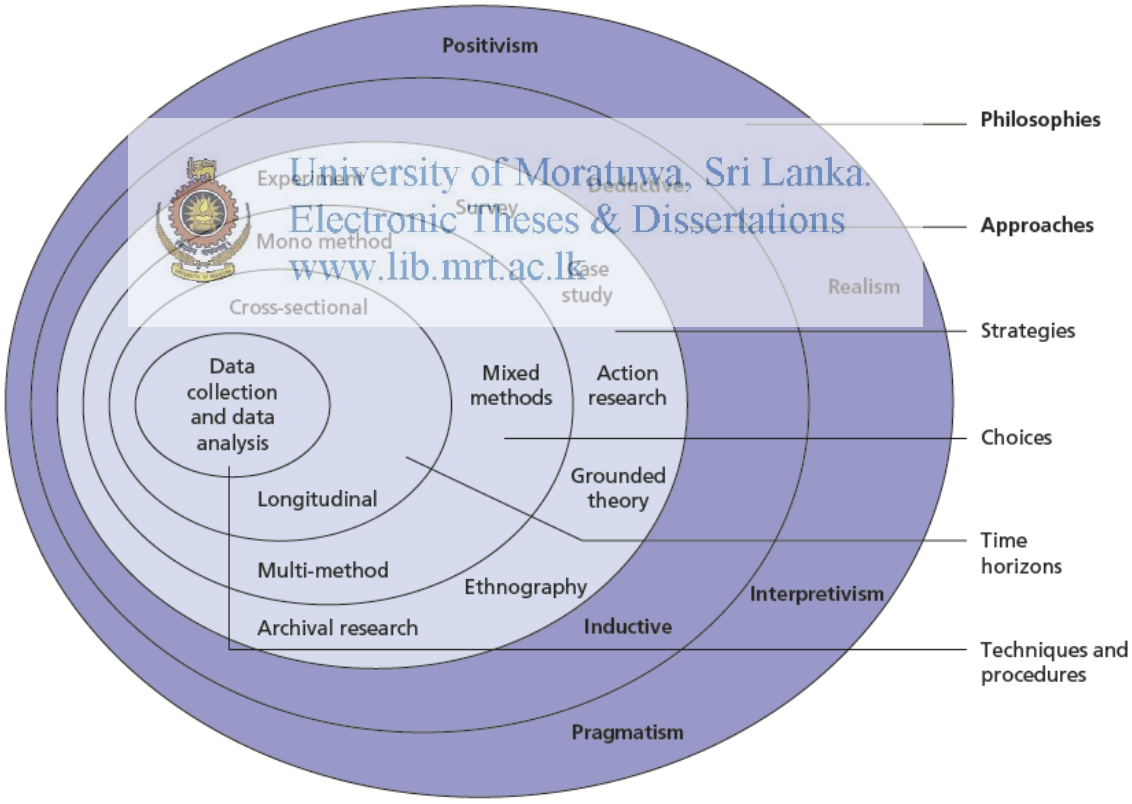


Figure 3.3: Research Onion

3.3.1 Ways of thinking about Research

The major ways of thinking about research philosophy are;

- Ontology
- Epistemology
- Axiology

3.3.3.1 Ontology

As per Lewis at el. (2007) Ontology is concerned with nature of reality. This raises questions of the assumptions researchers have about the way the world operates and the commitment held to particular views.

The first aspect of ontology Lewis at el. (2007), discuss is **objectivism**. This explains that social entities exist in reality external to social actors concerned with their existence. The second aspect, **subjectivism**, is that social phenomena are created from the perceptions and consequent actions of those social actors concerned with their existence.

3.3.3.2 Epistemology

As per Lewis at el. (2007) Epistemology concerns what constitutes acceptable knowledge in a field of study. They deal with both **positivist** philosophy and **interpretivist** philosophy relating to epistemology, as well as the stance of the researcher embracing the **realist** and interpretivist philosophies.

3.3.3.3 Axiology

As per Lewis at el. (2007), axiology is a branch of philosophy that studies judgements about value. Although this may include values we possess in the fields of aesthetics and ethics, it is the process of social enquiry with which we are concerned. The role that your own values play in all stages of the research process is of great importance if you wish your research results to be credible.

3.3.2 Positivism

It is frequently advocated that the positivist researcher will be likely to use a highly structured methodology in order to facilitate replication (Gill and Johnson 2002).

As per Lewis at el. (2007) the emphasis will be on quantifiable observations that lend themselves to statistical analysis.

3.3.3 Realism

As per Lewis at el. (2007) the essence of realism is that what the senses show us as reality is the truth: that objects have an existence independent of the human mind. The philosophy of realism is that there is a reality quite independent of the mind. In this sense, realism is opposed to idealism, the theory that only the mind and its contents exist.

The first type of realism is direct realism (Lewis at el., 2007). Direct realism says that what you see is what you get: what we experience through our senses portrays the world accurately. The second kind of realism is called critical realism (Lewis at el. 2007). Critical realists argue that what we experience are sensations, the images of the things in the real world, not the things directly. Critical realists point out how often our senses deceive us.

3.3.4 Interpretivism

As per Lewis at el. (2007), interpretivism advocates that it is necessary for the researcher to understand differences between humans in their role as social actors. This emphasizes the difference between conducting research among people rather than objects such as trucks and computers. People interpret their everyday social roles in accordance with the meaning they give to these roles. In addition, they interpret the social roles of others in accordance with their own set of meanings.

3.3.5 Pragmatism

As per Lewis at el. (2007) Pragmatism argues that the most important determinant of the epistemology, ontology and axiology a researcher adopt is the research question – one may be more appropriate than the other for answering particular questions. Moreover, if the research question does not suggest unambiguously that either a positivist or interpretivist philosophy is adopted, this confirms the pragmatist's view that it is perfectly possible to work with variations in researcher's epistemology, ontology and axiology.

A comparison of research approaches published by Lewis at el. (2007);

	Positivism	Realism	Interpretivism	Pragmatism
Ontology: *the researcher's view of the nature of reality or being*	External, objective and independent of social actors	Is objective. Exists independently of human thoughts and beliefs or knowledge of their existence (realist), but is interpreted through social conditioning (critical realist)	Socially constructed, subjective, may change, multiple	External, multiple, view chosen to best enable answering of research question
Epistemology: *the researcher's view regarding what constitutes acceptable knowledge*	Only observable phenomena can provide credible data, facts. Focus on causality and law like generalisations, reducing phenomena to simplest elements	Observable phenomena provide credible data, facts. Insufficient data means inaccuracies in sensations (direct realism). Alternatively, phenomena create sensations which are open to misinterpretation (critical realism). Focus on explaining within a context or contexts	Subjective meanings and social phenomena. Focus upon the details of situation, a reality behind these details, subjective meanings motivating actions	Either or both observable phenomena and subjective meanings can provide acceptable knowledge dependent upon the research question. Focus on practical applied research, integrating different perspectives to help interpret the data
Axiology: *the researcher's view of the role of values in research*	Research is undertaken in a value-free way, the researcher is independent of the data and maintains an objective stance	Research is value laden; the researcher is biased by world views, cultural experiences and upbringing. These will impact on the research	Research is value bound, the researcher is part of what is being researched, cannot be separated and so will be subjective	Values play a large role in interpreting results, the researcher adopting both objective and subjective points of view
Data collection techniques most often used	Highly structured, large samples, measurement, quantitative, but can use qualitative	Methods chosen must fit the subject matter, quantitative or qualitative	Small samples, in-depth investigations, qualitative	Mixed or multiple method designs, quantitative and qualitative

3.4 Research Technique

3.4.1 Literature Survey

A comprehensive literature survey was carried out to find disputes and causes of disputes on research papers published locally and internationally. Internationally, extensive research was carried out on construction disputes and causes of disputes. Locally only three research were found on disputes that were done by Abeynayake and Wedikkara (2013), Gunarathna and Fernando (n.d), and Dasanayake (2011).

3.4.2 Critical review of literature

To achieve the aim of this research (Refer chapter 1.2.1), fulfilling objective one (1) was a prerequisites. Therewith, a critical review of literature was carried out to short list the causes of disputes that were found during the literature survey. All the causes of disputes were listed under the author who published them. Around one hundred and eighty (180) causes of disputes (Refer chapter 4.3) could be listed. In some instances, similar or same causes of dispute were listed under different authors. Duplication of causes of disputes was the main reason for the huge number of causes to be listed in the critical review of the literature.

3.4.3 Desk review

Objective two (2) was set to categorise causes of disputes in to main stages of construction process. It was achieved by a desk review conducted using the comprehensive list prepared during the critical review of literature. The duplication of causes of disputes was not addressed as no cause needed to be left out. The main stages were Selection of Procurement Method and Contract Type, Designing and Drafting of Tender Documents, Tendering and Contract Administration (Refer chapter 4.4).

Objective three (3) was to relate identified causes of disputes to FIDIC Red Book and / or ICTAD SBD 2. Achieving objective three (3) also was done by a desk review of causes of disputes listed under Contract Administration Stage (Refer chapter 4.5).

3.4.4 Questionnaire Survey

In order to achieve Objective four (4) which is to identify foreseeable hints for disputes that may occur due to causes of disputes, objective five (5) which is to verify availability of dispute mitigation measures in ICTAD SBD 2 and FIDIC red Book and objective six (6) which is to verify availability of dispute resolution provisions in ICTAD SBD 2 and FIDIC Red Book, it was necessary to obtain views and opinions of the industry practitioners. Hence, a comprehensive questionnaire (Refer Appendix A) was prepared to carry out a questionnaire survey to fulfil the need.

Questionnaire survey was carried out with wide cross section of industry practitioners (respondents), who were well experienced with regard to disputes and dispute resolution.

3.4.5 Data Analysis

The data that was collected vide desk review and questionnaire survey was analysed to arrive at conclusions with regard to Objective four (4) which is to identify foreseeable hints for disputes that may occur due to causes of disputes, objective five (5) which is to verify availability of dispute mitigation measures in ICTAD SBD 2 and FIDIC red Book, objective six (6) which is to verify availability of dispute resolution provisions in ICTAD SBD 2 and FIDIC Red Book and to ascertain that the causes of disputes listed during desk review were true causes of disputes.

3.5 Summary

This chapter illustrated the research methodology for this research. Initially a comprehensive literature survey was carried out to find disputes and causes of disputes on research papers published locally and internationally. Thereafter, a critical review of literature was carried out to short list the causes of disputes that were found during the literature survey in to main stages of construction process and to relate identified causes of disputes to FIDIC Red Book and / or ICTAD SBD 2. A comprehensive questionnaire (Refer Appendix A) was prepared to carry out a questionnaire survey to obtain views and opinions of industry practitioners. Finally the data that was collected vide desk review and questionnaire survey was analysed to arrive at conclusions.

4.0 ANALYSIS AND RESEARCH FINDINGS

4.1 Introduction

In the Research Methodology Chapter, which is the third chapter of this report, the methodology of the research has been elaborated. A Desk review was a major source of data. The collected data was validated with the questionnaire survey. In chapter 4, the data and survey results of questionnaires were evaluated with an aim of achieving the research objectives. Further, this chapter critically analyses outcome of evaluation results in order to understand how identified causes of disputes be useful as hints for disputes. This chapter also revalidates already identified causes of disputes as true causes of disputes. It also identifies four main stages in which disputes occur due to inherent causes for the stages. It also validates with questionnaire survey results if FIDIC Red book and ICTAD SBD 2 conditions provide mitigation measures for the resultant disputes due to identified causes. Similarly, it also validates with questionnaire survey results if FIDIC Red book and ICTAD SBD 2 conditions provide resolution provisions for the resultant disputes due to identified causes.

4.2 Respondents for the Questionnaire

The questionnaire survey was paramount for the success of this research. The questionnaires were emailed to one hundred and twenty (120) professionals and forty one (41) of them responded. Hence the response rate for this questionnaire survey was 34.16%.Table 4.2 below depicts the details of the respondents in terms of service offered by respondents organization, number of years of work experience, whether they have experienced disputes during their career, frequency of encountering disputes, type of organization, nature of work involved with and type of services offered by their employer.

4.2.1 Type of Service Offered by Respondents Organization

The questionnaires were sent to potential respondents of 9 categories of organizations. Organizations such as, Developers, Project Managers, Main Contractors, Design Consultants, Cost Consultants, Supervision Consultants, Sub-Contractors, Suppliers, and

Others were specified. The following is the cross section of respondent organizations of work.

Table 4.2.1: Service offered by the organizations of the questionnaire respondents

Seq.	Organization Type	Number
1	Developer	16
2	Project Manager	11
3	Cost Consultant	9
4	Supervision Consultant	5
	Total	**41**

Answers for questionnaires were not received from recipients of questionnaire who work in Main Contractor, Sub-Contractor, Design Consultant, Supplier and Other categories of organizations. Above tabulated organizations of Developers, Project Managers, Cost Consultants and Supervision Consultants are types of organizations which involves heavily in dispute in various capacities such as party to disputes, evaluation of disputes or consultants of party to disputes. Another major party to dispute is Main Contractors. No questionnaire answers were received from recipients of questionnaires who work in Main Contractor organizations.

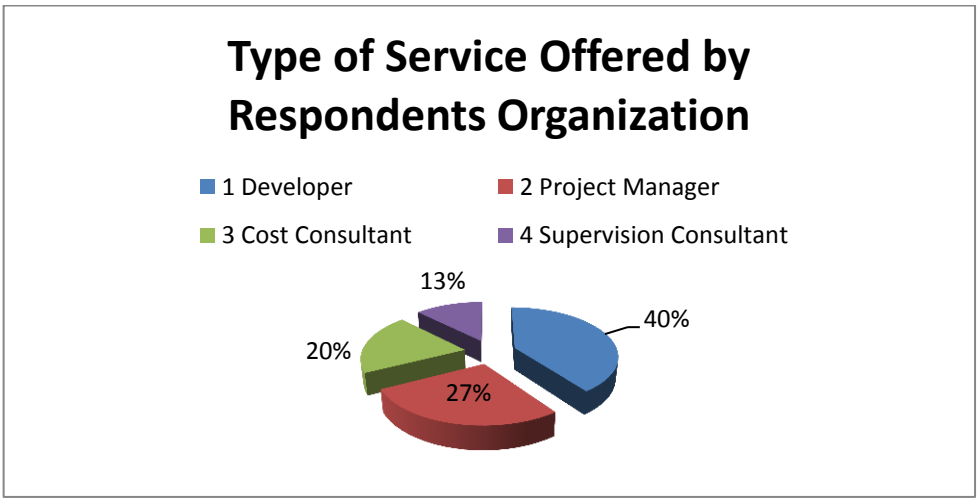


Figure 4.2.1: Distribution of respondents according to type of organization

4.2.2 Working Experience of Questionnaire Respondents

The questionnaires were aimed at six categories of experience such as 0 – 5 years, 6 – 10 years, 11 – 15 years, 16 – 20 years, 21 – 25 years and more than 26 years. It was evident while going through answered questionnaire that respondents have got experience in different types of organizations which is good for overall understanding of disputes.

Table 4.2.2: Number of years of experience of questionnaire respondents

Seq.	Years of Experience	Number
1	0 – 5 Years	1
2	6 – 10 Years	1
3	11 – 15 Years	1
4	16 – 20 Years	29
5	21 – 25 Years	9
6	More than 26 Years	0

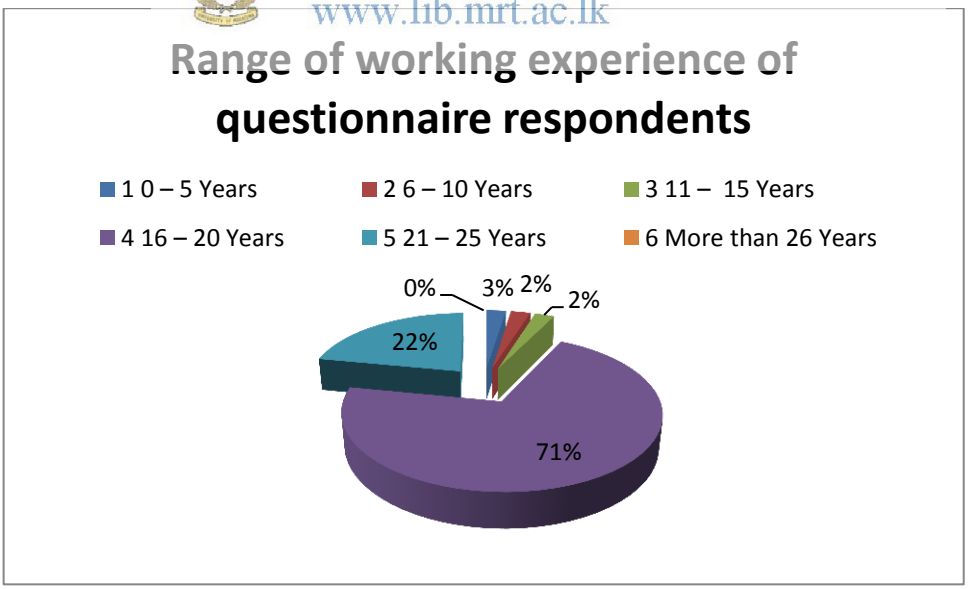


Figure 4.2.2: Range of working experience of questionnaire respondents

4.2.3 Dispute awareness of questionnaire respondents

The respondents were asked to answer in the questionnaires, whether they have encountered disputes during their professional career. That question was followed by

another question to understand how often the respondents encounter disputes. There were five options of selection for frequency of involvement of disputes by the respondents. The frequencies were very high, high, average, low and very low.

All the respondents (100%) have encountered disputes during their professional career. The frequency of encountering disputes is tabulated below.

Table 4.2.3: The frequency of encountering disputes by the respondents

Seq.	Frequency	Number
1	Very High	0
2	High	24
3	Average	4
4	Low	0
5	Very Low	13

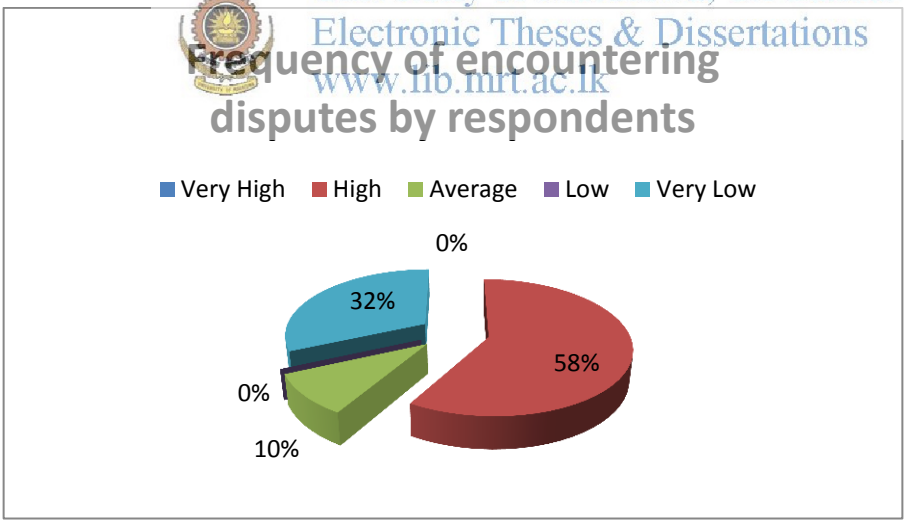


Figure 4.2.3: Frequency of encountering disputes by respondents

4.2.4 Types of organizations of questionnaire respondents

Type of organization was a question requested to answer in the questionnaires. Three types of organizations were listed in the questionnaire for the respondents to select. The three organization types are public, private and freelance.

Table 4.2.4: Types of organizations that the respondents represent

Seq.	Type of organization	Number
1	Public	18
2	Private	23
3	Freelance	0

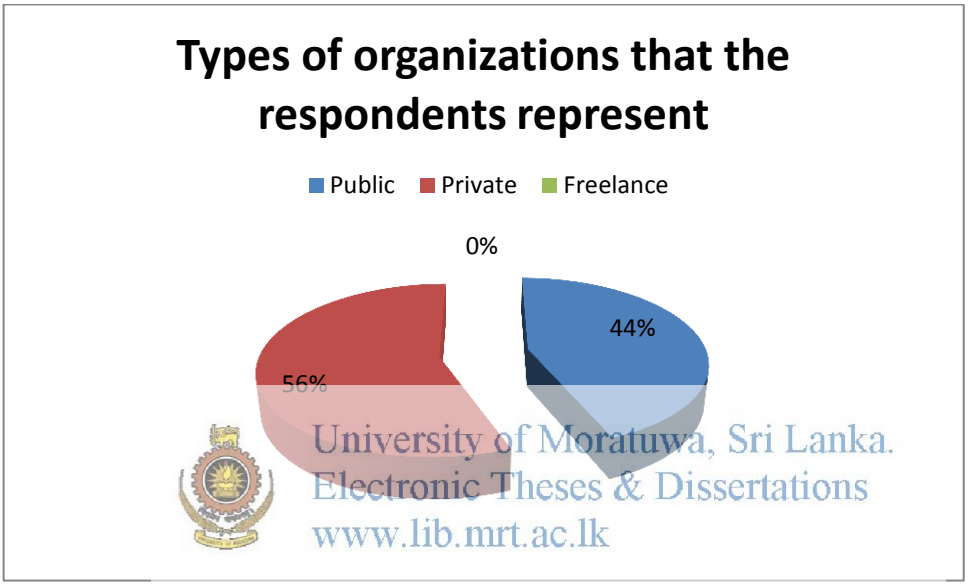


Figure 4.2.4: Types of organizations that the respondents represent

4.2.5 Nature of Work involved by questionnaire respondent organizations

The questionnaire respondents' organizations are normally involved with two main categories of work. The first category mentioned in questionnaire is building and the second is infrastructure. The respondents were given an option of filling by themselves if they were working in different category of organization which was involved other than building and infrastructure works such as oil and gas etc. During the questionnaire evaluation it was found that some respondents work in both building and infrastructure simultaneously.

Table 4.2.5: Nature of work respondents' organizations carryout

Seq.	Nature of Work	Number
1	Building	12
2	Infrastructure	15
3	Building & Infrastructure	14
3	Other	0

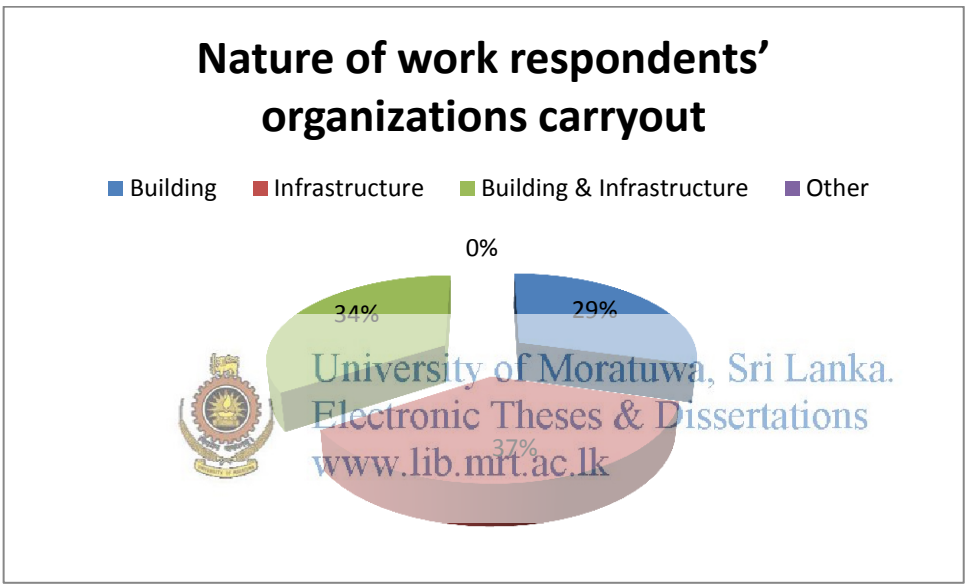


Figure 4.2.5: Nature of Work involved by questionnaire respondent organizations

4.3 Critical Review of Literature – List of Causes of Disputes

A critical review on the findings of the literature survey was carried out to short list the causes of disputes. Almost all literature published on causes of disputes were subjected to the literature review. As a result of the critical review of literature findings, a comprehensive list of Causes of Disputes has been enlisted. This has been given in **Appendix A**.

4.4 Categorization of Causes of Disputes in to Main Stages of Construction Process.

During the course of critical review to short list causes of disputes, it came in to light that the causes of disputes listed in **Appendix A** could be categorised into four main stages of construction process. A desk review has been then carried out to categorize the list of causes in to the below mentioned four main stages of construction process.

The four main stages of construction process were as described below;

1. Stage 1 – Selection of Procurement Method and Contract Type

   This is the earliest stage of construction process. Following investment decision is taken by the developer, in this the stage, the project team decides on the method of procurement that is suitable for the construction of the particular project and selection of type of contract which fulfils the requirements of the client.

2. Stage 2 – Designing and Drafting of Tender Documents

   This is the stage where concept, schematic and details designs are completed and tender documents are prepared.

3. Stage 3 – Tendering

   During this stage the bidders are short listed, tender invitations are sent out, tender documents are issued, tender quarries are answered, tender submissions are received, tender evaluations and negotiations are carried out, and contract awarding process is completed.

4. Stage 4 – Contract Administration

   This stage starts from the award of the contract and finishes when completion certificate is issued at the end of the defects liability period.

The causes of disputes were then staked under each and every stage of construction process as illustrated in **Appendix B**.

4.5 Sorting of Stage 4 – Contract Administration related Causes of Disputes in line with FIDIC Red Book and ICTAD Publication/SBD/02 Conditions of Contract.

As contract administration related causes of disputes occur during construction is in progress, it was found that the Stage 4 – Contract Administration related causes of disputes could be aligned with the FIDIC (Federation Internationale of Ingenieurs Conseils) Red Book and ICTAD (Institute for Construction Training and Development) Publication/SBD/02 Conditions of Contract. Hence, Stage 4 – Contract Administration related causes of disputes were sorted, as listed **Appendix C**, removing duplications under headings of FIDIC Red Book and ICTAD Publication/SBD/02 Conditions of Contract.

All the Contract Administration related causes of disputes could be listed under FIDIC Red Book and ICTAD Publication/SBD/02 Conditions of Contract. Hence, it was apparent that Contract Administration related causes of disputes have a direct relationship and relevance with FIDIC Red Book and ICTAD Publication/SBD/02 Conditions of Contract.

4.6 The foreseeable hints for Construction Contract Disputes.

During the evaluation of questionnaire answers, it was revealed that the situation arise related to the causes of disputes, prior to actual dispute occurrence, could be identified as foreseeable hints of disputes of construction contracts. The respondents to the questionnaires, during the questionnaire survey were asked to reveal in relation to the main stages identified in Chapter 4.4 - Categorization of Causes of Disputes in to Main Stages of Construction Process whether the surfacing of precursor situation of disputes of different causes are actually could be identified as hints for disputes.

The answers were given in form of Yes or No. For the evaluation purpose, Yes was given score one and No was given a score of zero. The outcome was evaluated as per the main stages of construction process as depicted below.

4.6.1 If precursor situations related to Selection of Procurement Method and Contract Type Stage related causes of disputes could be considered as true hints of disputes.

Overall 95% of the respondents agreed that precursor situation of disputes that is occurred due to Selection of Procurement Method and Contract Type related causes of disputes serves as hints for disputes (Refer Appendix D Table 4.6.1).

4.6.2 If precursor situations related to Designing and Drafting of Tender Documents Stage related causes of disputes could be considered as true hints of disputes.

Overall 85% of the respondents agreed that precursor situation of disputes that is occurred due to Designing and Drafting of Tender Documents related causes of disputes serves as hints for disputes (Refer Appendix D Table 4.6.2).

4.6.3 If precursor situations related to Tendering Stage related causes of disputes could be considered as true hints of disputes.

Overall 84% of the respondents agreed that precursor situation of disputes that is occurred due to Tendering related causes of disputes serves as hints for disputes (Refer Appendix D Table 4.6.3).

4.6.4 If precursor situations related to Contract Administration Stage related causes of disputes could be considered as true hints of disputes.

Under the chapter 4.5 above, the Contract Administration related causes of disputes were categorized into the FIDIC Red Book / ICTAD SBD2 Conditions of Contract respectively. In this chapter, the answers given by the respondents for listed causes of disputes under Conditions of Contract were analysed to understand if questionnaire respondents conceived if precursor situations of causes of disputes serve as hints for disputes.

4.6.4.1 Contract Administration Stage – General Provisions (FIDIC Red Book / ICTAD SBD2)

Overall 94% of the respondents agreed that precursor situation of disputes that is occurred due to Contract Administration – General Provisions related causes of disputes serves as hints for disputes (Refer Appendix D Table 4.6.4.1).

4.6.4.2 Contract Administration Stage – The Employer (FIDIC Red Book / ICTAD SBD2)

Overall 76% of the respondents agreed that precursor situation of disputes that is occurred due to Contract Administration – The Employer related causes of disputes serves as hints for disputes (Refer Appendix D Table 4.6.4.2).

4.6.4.3 Contract Administration Stage – The Engineer (FIDIC Red Book / ICTAD SBD2)

Overall 85% of the respondents agreed that precursor situation of disputes that is occurred due to Contract Administration – The Engineer related causes of disputes serves as hints for disputes (Refer Appendix D Table 4.6.4.3).

4.6.4.4 Contract Administration Stage – The Contractor (FIDIC Red Book / ICTAD SBD2)

Overall 89% of the respondents agreed that precursor situation of disputes that is occurred due to Contract Administration – The Contractor related causes of disputes serves as hints for disputes (Refer Appendix D Table 4.6.4.4).

4.6.4.5 Contract Administration Stage – The Nominated Sub-contractor (FIDIC Red Book / ICTAD SBD2)

Overall 95% of the respondents agreed that precursor situation of disputes that is occurred due to Contract Administration – The Nominated Sub-contractor related causes of disputes serves as hints for disputes (Refer Appendix D Table 4.6.4.5).

4.6.4.6 Contract Administration Stage – The Staff and Labour (FIDIC Red Book / ICTAD SBD2)

Overall 70% of the respondents agreed that precursor situation of disputes that is occurred due to Contract Administration – Staff and Labour related causes of disputes serves as hints for disputes (Refer Appendix D Table 4.6.4.6).

4.6.4.7 Contract Administration Stage – Plant, Material and Workmanship (FIDIC Red Book / ICTAD SBD2)

Overall 88% of the respondents agreed that precursor situation of disputes that is occurred due to Contract Administration – Plant, Material and Workmanship related causes of disputes serves as hints for disputes (Refer Appendix D Table 4.6.4.7).

4.6.4.8 Contract Administration Stage – Commencement, Delays and Suspension (FIDIC Red Book / ICTAD SBD2)

Overall 90% of the respondents agreed that precursor situation of disputes that is occurred due to Contract Administration – Commencement, Delays and Suspension related causes of disputes serves as hints for disputes (Refer Appendix D Table 4.6.4.8).

4.6.4.9 Contract Administration Stage – Tests on Completion (FIDIC Red Book / ICTAD SBD2)

There were no causes of disputes found during the desk review related to Contract Administration Stage – Tests on Completion (FIDIC Red Book / ICTAD SBD2).

4.6.4.10 Contract Administration Stage – Employer's Taking Over (FIDIC Red Book / ICTAD SBD2)

There were no causes of disputes found during the desk review related to Contract Administration Stage – Employer's Taking Over (FIDIC Red Book / ICTAD SBD2).

4.6.4.11 Contract Administration Stage – Defects Liability (FIDIC Red Book / ICTAD SBD2)

There were no causes of disputes found during the desk review related to Contract Administration Stage – Defects Liability (FIDIC Red Book / ICTAD SBD2).

4.6.4.12 Contract Administration Stage – Measurement and Evaluation (FIDIC Red Book / ICTAD SBD2)

Overall 80% of the respondents agreed that precursor situation of disputes that is occurred due to Contract Administration – Measurement and Evaluation related causes of disputes serves as hints for disputes (Refer Appendix D Table 4.6.4.12).

4.6.4.13 Contract Administration Stage – Variations and Adjustments (FIDIC Red Book / ICTAD SBD2)

Overall 88% of the respondents agreed that precursor situation of disputes that is occurred due to Contract Administration – Variations and Adjustments related causes of disputes serves as hints for disputes (Refer Appendix D Table 4.6.4.13).

4.6.4.14 Contract Administration Stage – Contract Price and Payment (FIDIC Red Book / ICTAD SBD2)

Overall 89% of the respondents agreed that precursor situation of disputes that is occurred due to Contract Administration – Contract Price and Payment related causes of disputes serves as hints for disputes (Refer Appendix D Table 4.6.4.14).

4.6.4.15 Contract Administration Stage – Termination by Employer (FIDIC Red Book / ICTAD SBD2)

Overall 88% of the respondents agreed that precursor situation of disputes that is occurred due to Contract Administration – Termination by Employer related causes of disputes serves as hints for disputes (Refer Appendix D Table 4.6.4.15).

4.6.4.16 Contract Administration Stage – Suspension and Termination by Contractor (FIDIC Red Book / ICTAD SBD2)

Overall 88% of the respondents agreed that precursor situation of disputes that is occurred due to Contract Administration – Suspension and Termination by Contractor related causes of disputes serves as hints for disputes (Refer Appendix D Table 4.6.4.16).

4.6.4.17 Contract Administration Stage – Risk and Responsibility by Contractor (FIDIC Red Book / ICTAD SBD2)

Overall 88% of the respondents agreed that precursor situation of disputes that is occurred due to Contract Administration – Risk and Responsibility by Contractor related causes of disputes serves as hints for disputes (Refer Appendix D Table 4.6.4.17).

4.6.4.18 Contract Administration Stage – Insurance (FIDIC Red Book / ICTAD SBD2)

There were no causes of disputes found during the desk review related to Contract Administration Stage – Insurance (FIDIC Red Book / ICTAD SBD2).

4.6.4.19 Contract Administration Stage – Claims, Disputes and Arbitration (FIDIC Red Book / ICTAD SBD2)

Overall 80% of the respondents agreed that precursor situation of disputes that is occurred due to Contract Administration – Claims, Disputes and Arbitration related causes of disputes serves as hints for disputes (Refer Appendix D Table 4.6.4.19).

4.6.4.20 Contract Administration Stage – Force Majeure (FIDIC Red Book / ICTAD SBD2)

Overall 88% of the respondents agreed that precursor situation of disputes that is occurred due to Contract Administration – Force Majeure related causes of disputes serves as hints for disputes (Refer Appendix D Table 4.6.4.20).

4.6.4.21 Overall Contract Administration Stage causes of disputes

Overall 83% of the respondents agreed that precursor situations of disputes that are occurred due to overall Contract Administration Stage related causes of disputes serves as hints for disputes.

4.7 Mitigation measures in FIDIC Red Book / ICTAD SBD2 to mitigate disputes that may occur due to causes of disputes

The respondents to the questionnaires, during the questionnaire survey, were requested to provide their opinion on if FIDIC Red Book / ICTAD SBD 02 have inbuilt mitigation measures to mitigate the disputes that may occur due to the causes of disputes identified in chapter 4.3 Desk Review - Causes of Disputes in relation to the main stages discussed in Chapter 4.4 - Categorization of Causes of Disputes in to Main Stages of Construction Process.

The answers were given in form of Yes or No. For the evaluation purpose, Yes was given score one and No was given a score of zero. The outcome was evaluated as per the main stages of construction process as depicted below.

4.7.1 If FIDIC Red Book / ICTAD SBD2 have inbuilt mitigation measures to mitigate disputes that may occur due to causes of disputes related to Selection of Procurement Method and Contract Type Stage

Only 50% of the respondents agreed that FIDIC Red Book / ICTAD SBD2 have got mitigation measures to mitigate disputes that may occur due to Stage 1 Selection of Procurement Method and Contract Type related causes of disputes (Refer Appendix D Table 4.7.1).

4.7.2 If FIDIC Red Book / ICTAD SBD2 have inbuilt mitigation measures to mitigate disputes that may occur due to causes of disputes related to Designing and Drafting of Tender Documents Stage

Only 49% of the respondents agreed that FIDIC Red Book / ICTAD SBD2 have got mitigation measures to mitigate disputes that may occur due to Stage 2 Designing and Drafting of Tender Documents related causes of disputes (Refer Appendix D Table 4.7.2).

4.7.3 If FIDIC Red Book / ICTAD SBD2 have inbuilt mitigation measures to mitigate disputes that may occur due to causes of disputes related to Tendering Stage

Only 18% of the respondents agreed that FIDIC Red Book / ICTAD SBD2 have got mitigation measures to mitigate disputes that may occur due to Stage 3 Tendering related causes of disputes (Refer Appendix D Table 4.7.3).

4.7.4 If FIDIC Red Book / ICTAD SBD2 have inbuilt mitigation measures to mitigate disputes that may occur due to causes of disputes related to Contract Administration Stage

Under the chapter 4.5 above, the Contract Administration Stage related causes of disputes were categorized into the FIDIC Red Book / ICTAD SBD2 Conditions of Contract respectively. In this chapter, the listed causes of disputes under Conditions of Contract were analysed to understand if questionnaire respondents believed that FIDIC Red Book / ICTAD SBD2 Conditions of Contract respectively have got mitigation measures to mitigate disputes that may occur due to causes of disputes.

4.7.4.1 Contract Administration Stage – General Provisions (FIDIC Red Book / ICTAD SBD2)

75% of the respondents agreed that FIDIC Red Book / ICTAD SBD2 have got mitigation measures to mitigate disputes that may occur due to Stage 4 Contract Administration – General Provisions related causes of disputes (Refer Appendix D Table 4.7.4.1).

4.7.4.2 Contract Administration Stage – The Employer (FIDIC Red Book / ICTAD SBD2)

38% of the respondents agreed that FIDIC Red Book / ICTAD SBD2 have got mitigation measures to mitigate disputes that may occur due to Stage 4 Contract Administration – The Employer related causes of disputes (Refer Appendix D Table 4.7.4.2).

4.7.4.3 Contract Administration Stage – The Engineer (FIDIC Red Book / ICTAD SBD2)

44% of the respondents agreed that FIDIC Red Book / ICTAD SBD2 have got mitigation measures to mitigate disputes that may occur due to Stage 4 Contract Administration – The Engineer related causes of disputes (Refer Appendix D Table 4.7.4.3).

4.7.4.4 Contract Administration Stage – The Contractor (FIDIC Red Book / ICTAD SBD2)

69% of the respondents agreed that FIDIC Red Book / ICTAD SBD2 have got mitigation measures to mitigate disputes that may occur due to Stage 4 Contract Administration – The Contractor related causes of disputes (Refer Appendix D Table 4.7.4.4).

4.7.4.5 Contract Administration Stage – The Nominated Sub-contractor (FIDIC Red Book / ICTAD SBD2)

83% of the respondents agreed that FIDIC Red Book / ICTAD SBD2 have got mitigation measures to mitigate disputes that may occur due to Stage 4 Contract Administration – The Nominated Sub-contractor related causes of disputes (Refer Appendix D Table 4.7.4.5).

4.7.4.6 Contract Administration Stage – The Staff and Labour (FIDIC Red Book / ICTAD SBD2)

48% of the respondents agreed that FIDIC Red Book / ICTAD SBD2 have got mitigation measures to mitigate disputes that may occur due to Stage 4 Contract Administration – The Staff and Labour related causes of disputes (Refer Appendix D Table 4.7.4.6).

4.7.4.7 Contract Administration Stage – Plant, Material and Workmanship (FIDIC Red Book / ICTAD SBD2)

69% of the respondents agreed that FIDIC Red Book / ICTAD SBD2 have got mitigation measures to mitigate disputes that may occur due to Stage 4 Contract Administration – Plant, Material and Workmanship related causes of disputes (Refer Appendix D Table 4.7.4.7).

4.7.4.8 Contract Administration Stage – Commencement, Delays and Suspension (FIDIC Red Book / ICTAD SBD2)

86% of the respondents agreed that FIDIC Red Book / ICTAD SBD2 have got mitigation measures to mitigate disputes that may occur due to Contract Administration – Commencement, Delays and Suspension related causes of disputes (Refer Appendix D Table 4.7.4.8).

4.7.4.9 Contract Administration Stage – Tests on Completion (FIDIC Red Book / ICTAD SBD2)

There were no causes of disputes found during the desk review related to Contract Administration Stage – Tests on Completion (FIDIC Red Book / ICTAD SBD2).

4.7.4.10 Contract Administration Stage – Employer's Taking Over (FIDIC Red Book / ICTAD SBD2)

There were no causes of disputes found during the desk review related to Contract Administration Stage – Employer's Taking Over (FIDIC Red Book / ICTAD SBD2).

4.7.4.11 Contract Administration Stage – Defects Liability (FIDIC Red Book / ICTAD SBD2)

There were no causes of disputes found during the desk review related to Contract Administration Stage – Defects Liability (FIDIC Red Book / ICTAD SBD2).

4.7.4.12 Contract Administration Stage – Measurement and Evaluation (FIDIC Red Book / ICTAD SBD2)

80% of the respondents agreed that FIDIC Red Book / ICTAD SBD2 have got mitigation measures to mitigate disputes that may occur due to Contract Administration – Measurement and Evaluation related causes of disputes (Refer Appendix D Table 4.7.4.12).

4.7.4.13 Contract Administration Stage – Variations and Adjustments (FIDIC Red Book / ICTAD SBD2)

80% of the respondents agreed that FIDIC Red Book / ICTAD SBD2 have got mitigation measures to mitigate disputes that may occur due to Stage 4 Contract Administration – Variations and Adjustments related causes of disputes (Refer Appendix D Table 4.7.4.13).

4.7.4.14 Contract Administration Stage – Contract Price and Payment (FIDIC Red Book / ICTAD SBD2)

80% of the respondents agreed that FIDIC Red Book / ICTAD SBD2 have got mitigation measures to mitigate disputes that may occur due to Contract Administration – Contract Price and Payment related causes of disputes (Refer Appendix D Table 4.7.4.14).

4.7.4.15 Contract Administration Stage – Termination by Employer (FIDIC Red Book / ICTAD SBD2)

90% of the respondents agreed that FIDIC Red Book / ICTAD SBD2 have got mitigation measures to mitigate disputes that may occur due to Stage 4 Contract Administration – Termination by Employer related causes of disputes (Refer Appendix D Table 4.7.4.15).

4.7.4.16 Contract Administration Stage – Suspension and Termination by Contractor (FIDIC Red Book / ICTAD SBD2)

90% of the respondents agreed that FIDIC Red Book / ICTAD SBD2 have got mitigation measures to mitigate disputes that may occur due to Contract Administration Stage – Suspension and Termination by Contractor related causes of disputes (Refer Appendix D Table 4.7.4.16).

4.7.4.17 Contract Administration Stage – Risk and Responsibility by Contractor (FIDIC Red Book / ICTAD SBD2)

44% of the respondents agreed that FIDIC Red Book / ICTAD SBD2 have got mitigation measures to mitigate disputes that may occur due to Contract Administration Stage – Risk and Responsibility by Contractor related causes of disputes (Refer Appendix D Table 4.7.4.17).

4.7.4.18 Contract Administration Stage – Insurance (FIDIC Red Book / ICTAD SBD2)

There were no causes of disputes found during the desk review related to Contract Administration Stage – Insurance (FIDIC Red Book / ICTAD SBD2).

4.7.4.19 Contract Administration Stage – Claims, Disputes and Arbitration (FIDIC Red Book / ICTAD SBD2)

28% of the respondents agreed that FIDIC Red Book / ICTAD SBD2 have got mitigation measures to mitigate disputes that may occur due to Contract Administration – Claims, Disputes and Arbitration related causes of disputes (Refer Appendix D Table 4.7.4.19).

4.7.4.20 Contract Administration Stage – Force Majeure (FIDIC Red Book / ICTAD SBD2)

76% of the respondents agreed that FIDIC Red Book / ICTAD SBD2 have got mitigation measures to mitigate disputes that may occur due to Stage 4 Contract Administration – Force Majeure related causes of disputes (Refer Appendix D Table 4.7.4.20).

4.7.4.21 Overall Contract Administration Stage causes of disputes

61% of the respondents agreed that FIDIC Red Book / ICTAD SBD2 have got mitigation measures to mitigate disputes that may occur due to Stage 4 Contract Administration related overall causes of disputes.

4.8 Dispute Resolution Provisions in FIDIC Red Book / ICTAD SBD 02 to resolve disputes that may occur due to causes of disputes

The respondents to the questionnaires, during the questionnaire survey, were requested to provide their opinion on if FIDIC Red Book / ICTAD SBD 02 have inbuilt resolution provisions to resolve the disputes that may occur due to the causes of disputes identified in chapter 4.3 Desk Review - Causes of Disputes in relation to the main stages discussed in Chapter 4.4 - Categorization of Causes of Disputes in to Main Stages of Construction Process.

The answers were given in form of Yes or No. For the evaluation purpose, Yes was given score one and No was given a score of zero. The outcome was evaluated as per the main stages of construction process as depicted below.

4.8.1 If FIDIC Red Book / ICTAD SBD 02 have inbuilt resolution provisions to resolve disputes that may occur due to causes of disputes related to Selection of Procurement Method and Contract Type Stage

Only 50% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got resolution provisions to resolve disputes that may occur due to Stage 1 Selection of Procurement Method and Contract Type related causes of disputes (Refer Appendix D Table 4.8.1).

4.8.2 If FIDIC Red Book / ICTAD SBD 02 have inbuilt resolution provisions to resolve disputes that may occur due to causes of disputes related to Designing and Drafting of Tender Documents Stage

52% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got resolution provisions to resolve disputes that may occur due to Stage 2 Designing and Drafting of Tender Documents related causes of disputes (Refer Appendix D Table 4.8.2).

4.8.3 If FIDIC Red Book / ICTAD SBD 02 have inbuilt resolution provisions to resolve disputes that may occur due to causes of disputes related to Tendering Stage

Only 32% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got resolution provisions to resolve disputes that may occur due to Stage 3 Tendering related causes of disputes (Refer Appendix D Table 4.8.3).

4.8.4 If FIDIC Red Book / ICTAD SBD 02 have inbuilt resolution provisions to resolve disputes that may occur due to causes of disputes related to Contract Administration Stage

Under the chapter 4.5 above, the Contract Administration Stage related causes of disputes were categorized into the FIDIC Red Book / ICTAD SBD 02 Conditions of Contract respectively. In this chapter, the listed causes of disputes under Conditions of Contract were analysed to understand if questionnaire respondents believed that FIDIC Red Book / ICTAD SBD 02 Conditions of Contract respectively have got resolution provisions to resolve disputes that may occur due to causes of disputes.

4.8.4.1 Contract Administration Stage – General Provisions (FIDIC Red Book / ICTAD SBD 02)

78% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got resolution provisions to resolve disputes that may occur due to Stage 4 Contract Administration – General Provisions related causes of disputes (Refer Appendix D Table 4.8.4.1).

4.8.4.2 Contract Administration Stage – The Employer (FIDIC Red Book / ICTAD SBD 02)

45% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got resolution provisions to resolve disputes that may occur due to Stage 4 Contract Administration – The Employer related causes of disputes (Refer Appendix D Table 4.8.4.2).

4.8.4.3 Contract Administration Stage – The Engineer (FIDIC Red Book / ICTAD SBD 02)

46% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got resolution provisions to resolve disputes that may occur due to Stage 4 Contract Administration – The Engineer related causes of disputes (Refer Appendix D Table 4.8.4.3).

4.8.4.4 Contract Administration Stage – The Contractor (FIDIC Red Book / ICTAD SBD 02)

72% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got resolution provisions to resolve disputes that may occur due to Stage 4 Contract Administration – The Contractor related causes of disputes (Refer Appendix D Table 4.8.4.4).

4.8.4.5 Contract Administration Stage – The Nominated Sub-contractor (FIDIC Red Book / ICTAD SBD 02)

93% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got resolution provisions to resolve disputes that may occur due to Stage 4 Contract Administration – The Nominated Sub-contractor related causes of disputes (Refer Appendix D Table 4.8.4.5).

4.8.4.6 Contract Administration Stage – The Staff and Labour (FIDIC Red Book / ICTAD SBD 02)

48% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got resolution provisions to resolve disputes that may occur due to Stage 4 Contract Administration – The Staff and Labour related causes of disputes (Refer Appendix D Table 4.8.4.6).

4.8.4.7 Contract Administration Stage – Plant, Material and Workmanship (FIDIC Red Book / ICTAD SBD 02)

79% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got resolution provisions to resolve disputes that may occur due to Stage 4 Contract

Administration – Plant, Material and Workmanship related causes of disputes (Refer Appendix D Table 4.8.4.7).

4.8.4.8 Contract Administration Stage – Commencement, Delays and Suspension (FIDIC Red Book / ICTAD SBD 02)

96% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got resolution provisions to resolve disputes that may occur due to Contract Administration – Commencement, Delays and Suspension related causes of disputes (Refer Appendix D Table 4.8.4.8).

4.8.4.9 Contract Administration Stage – Tests on Completion (FIDIC Red Book / ICTAD SBD 02)

There were no causes of disputes found during the desk review related to Contract Administration Stage – Tests on Completion (FIDIC Red Book / ICTAD SBD 02).

4.8.4.10 Contract Administration Stage – Employer's Taking Over (FIDIC Red Book / ICTAD SBD 02)

There were no causes of disputes found during the desk review related to Contract Administration Stage – Employer's Taking Over (FIDIC Red Book / ICTAD SBD 02).

4.8.4.11 Contract Administration Stage – Defects Liability (FIDIC Red Book / ICTAD SBD 02)

There were no causes of disputes found during the desk review related to Contract Administration Stage – Defects Liability (FIDIC Red Book / ICTAD SBD 02).

4.8.4.12 Contract Administration Stage – Measurement and Evaluation (FIDIC Red Book / ICTAD SBD 02)

79% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got resolution provisions to resolve disputes that may occur due to Contract Administration – Measurement and Evaluation related causes of disputes (Refer Appendix D Table 4.8.4.12).

4.8.4.13 Contract Administration Stage – Variations and Adjustments (FIDIC Red Book / ICTAD SBD 02)

86% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got resolution provisions to resolve disputes that may occur due to Stage 4 Contract Administration – Variations and Adjustments related causes of disputes (Refer Appendix D Table 4.8.4.13).

4.8.4.14 Contract Administration Stage – Contract Price and Payment (FIDIC Red Book / ICTAD SBD 02)

91% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got resolution provisions to resolve disputes that may occur due to Contract Administration – Contract Price and Payment related causes of disputes (Refer Appendix D Table 4.8.4.14).

4.8.4.15 Contract Administration Stage – Termination by Employer (FIDIC Red Book / ICTAD SBD 02)

100% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got resolution provisions to resolve disputes that may occur due to Stage 4 Contract Administration – Termination by Employer related causes of disputes (Refer Appendix D Table 4.8.4.15).

4.8.4.16 Contract Administration Stage – Suspension and Termination by Contractor (FIDIC Red Book / ICTAD SBD 02)

100% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got resolution provisions to resolve disputes that may occur due to Contract Administration Stage – Suspension and Termination by Contractor related causes of disputes (Refer Appendix D Table 4.8.4.16).

4.8.4.17 Contract Administration Stage – Risk and Responsibility by Contractor (FIDIC Red Book / ICTAD SBD 02)

47% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got resolution provisions to resolve disputes that may occur due to Contract Administration

Stage – Risk and Responsibility by Contractor related causes of disputes (Refer Appendix D Table 4.8.4.17).

4.8.4.18 Contract Administration Stage – Insurance (FIDIC Red Book / ICTAD SBD 02)

There were no causes of disputes found during the desk review related to Contract Administration Stage – Insurance (FIDIC Red Book / ICTAD SBD 02).

4.8.4.19 Contract Administration Stage – Claims, Disputes and Arbitration (FIDIC Red Book / ICTAD SBD 02)

41% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got resolution provisions to resolve disputes that may occur due to Contract Administration – Claims, Disputes and Arbitration related causes of disputes (Refer Appendix D Table 4.8.4.19).

4.8.4.20 Contract Administration Stage – Force Majeure (FIDIC Red Book / ICTAD SBD 02)

90% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got resolution provisions to resolve disputes that may occur due to Stage 4 Contract Administration – Force Majeure related causes of disputes (Refer Appendix D Table 4.8.4.20).

4.8.4.21 Overall Contract Administration Stage causes of disputes

66% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got resolution provisions to resolve disputes that may occur due to Stage 4 Contract Administration related overall causes of disputes.

4.9 Summary

The methodology of the research was as elaborated in chapter three (3) of this report. In chapter four (4), the data collected vide, desk review and the questionnaires survey were evaluated with an aim of achieving the research objectives.

The questionnaire survey was conducted to validate data collected vide desk review. The questionnaires were emailed to one hundred and twenty (120) professionals and forty one (41) responded.

The causes of disputes found during the desk review were categorised into four main stages of construction process.

Stage 1 – Selection of Procurement Method and Contract Type

Stage 2 – Designing and Drafting of Tender Documents

Stage 3 – Tendering

Stage 4 – Contract Administration

The causes of disputes were categorized into each and every stage of construction process. The Stage 4 – Contract Administration related causes of disputes were sorted under FIDIC Red Book and / or ICTAD SBD 02 Conditions of Contract.

It was analysed if surfacing of precursor situation of disputes of different causes, prior to actual dispute occurrence, could be identified as foreseeable hints of disputes of construction contracts.

It was also analysed if FIDIC Red Book / ICTAD SBD 02 have inbuilt mitigation measures to mitigate the disputes that may occur due to the causes of disputes identified.

Finally it was analysed if FIDIC Red Book / ICTAD SBD 02 have inbuilt resolution provisions to resolve the disputes that may occur due to the causes of disputes identified.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

Mainly in Sri Lanka construction contracts are prepared based on standard conditions of contracts such as ICTAD or FIDIC. ICTAD is used for local contracts, whereas FIDIC is used for International contracts. In International Contracts, at least one party to the contract is not based in Sri Lanka. These conditions of contracts have withstood test of time as FIDIC Red Book has been first published in the year 1999 and ICTAD SBD 02 Second Edition has first been published in the year 2007. These conditions of contracts have got all features for being included in contracts of most complex projects. But disputes are on the rise. Gunarathna and Fernando (n.d), have stated that magnitude of having conflicts in Sri Lankan construction industry was continuously increasing with time.

As such in this study, it is investigated to see if FIDIC red Book and ICTAD SBD 02 have actually got in-built features to manage the disputes that are occurred. Disputes occur due to various causes. Therefore, it was necessary to identify true causes of disputes. The impetus of causes of disputes emerges in different stages of construction process. As such, it was also essential to identify the stages that causes of disputes were belonging to. Hence, the causes of disputes were categorized in to four main stages of construction namely, Selection of Procurement Method and Contract Type, Designing and Drafting of Tender Documents, Tendering and Contract Administration. The Contract Administration is the stage, where physical construction is carried on. The physical construction is governed by a contract. In accordance with this research study, the contracts are based on either FIDIC Red Book or ICTAD SBD 02. Hence, it was required to relate Contract Administration related causes of disputes to FIDIC Red Book and ICTAD SBD 02 Conditions of Contract. The disputes are most of the time emerge as surprises to parties to contracts. This becomes a huge threat to successful completion of projects. Therefore, it is always beneficial for parties to know if a dispute is on the way. As such, it was advantageous to identify foreseeable hints for disputes that may occur. As known, prevention is better cure. If a dispute can be mitigated before occurrence, it is good for general health of a project. In doing so, the relationships will not be sore and budget will not go up. Therefore, an effort was made to investigate if FIDIC red Book

and ICTAD SBD 02 have got adequate dispute mitigation measures. Recently, the alternative dispute resolution (ADR) methods have become very useful for parties to disputes as those take less time and less money compared to litigation. Though, ADR methods are cheaper, they are not free of charge. The parties to disputes still need to spent time and money on those. In these circumstances if parties to disputes can resolve issues within the contractual provisions of FIDIC red Book and ICTAD SBD 02, it becomes a huge relief. Hence, it is examined to ascertain if FIDIC red Book and ICTAD SBD 02 have got suitable dispute resolution provisions to resolve disputes that are occurred due to various causes of disputes emerge in different stages. All in all, the aim of the study is to investigate adequacy of dispute mitigation and dispute resolution measures available in conditions of contracts used for construction projects in Sri Lanka.

5.2 Conclusion

Identifying causes for disputes which frequently occur in Sri Lanka was the first and foremost objective of this research study. There were ninety one short listed causes of disputes included in the questionnaire. The respondents to the questionnaires agreed that 81% of the listed causes were true causes of disputes. The validity of the remainder of the study was always dependant on this conclusion. Now, as bulk of the listed causes of disputes was considered to be true causes of disputes, the rest of the conclusion also becomes valid and true.

Categorising causes of disputes in to main stages of construction process was the second objective of the study. The identified causes of disputes were categorised into four main stages of construction process as Stage 1 – Selection of Procurement Method and Contract Type – This is early stage of construction process. After investment decision is taken by the developer, the project team decides on the method of procurement that is suitable for the construction of the particular project and selection of type of contract which fulfils the requirements of the client., Stage 2 – Designing and Drafting of Tender Documents – This is the stage where concept, schematic and details designs are completed and tender documents are prepared., Stage 3 – Tendering – During this stage the bidders are short listed, tender invitations are sent out, tender documents are issued, tender quarries are answered, tender submissions are received, tender evaluations and negotiations are carried out, and contract awarding process is completed and Stage 4 –

Contract Administration – This stage starts from the award of the contract and finishes when completion certificate is issued at the end of the defects liability period.

As third objective of the study, the causes of disputes were related to FIDIC Red Book and ICTAD SBD 02 Conditions of Contract by listing them under each and every heading of conditions of contract. All the Contract Administration related causes of disputes were appropriately related and listed under FIDIC Red Book and ICTAD SBD 02 headings of Conditions of Contract during the desk review. Hence, it was apparent that Contract Administration related causes of disputes have a direct relationship and relevance with FIDIC Red Book and ICTAD SBD 02 Conditions of Contract.

Identifying precursor situation, as a hint, prior to occurrence of a dispute, was the fourth objective of the study. The respondents to the questionnaires, during the questionnaire survey were asked to reveal in relation to the main stages identified in Chapter 4.4 whether the surfacing of precursor situations of disputes of different causes are actually could be identified as hints for disputes. Overall 83% of the respondents agreed that precursor situations of disputes that are occurred with regard to identified causes of disputes during Contract Administration Stage which has direct relevance to FIDIC Red Book and / or ICTAD SBD 02 Conditions of Contract serves as hints for disputes.

The respondents to the questionnaires, during the questionnaire survey, were requested to provide their opinion on if FIDIC Red Book / ICTAD SBD 02 have inbuilt mitigation measures to mitigate the disputes that may occur due to the causes of disputes identified in chapter 4.3 in relation to the main stages discussed in Chapter 4.4 which is related to achieving of fourth objective of this study. 61% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got mitigation measures to mitigate disputes that may occur due to identified causes of disputes during Contract Administration Stage which has direct relevance to FIDIC Red Book and / or ICTAD SBD 02 Conditions of Contract.

As of achieving of final objective the respondents to the questionnaires, during the questionnaire survey, were requested to provide their opinion on if FIDIC Red Book / ICTAD SBD 02 have inbuilt resolution provisions to resolve the disputes that may occur due to the causes of disputes identified in chapter 4.3 in relation to the main stages discussed in Chapter 4.4. 66% of the respondents agreed that FIDIC Red Book / ICTAD

SBD 02 have got resolution provisions to resolve disputes that may occur due to Contract Administration related causes of disputes which has direct relevance to FIDIC Red Book and / or ICTAD SBD 02 Conditions of Contract.

5.3 Recommendations

Overall 95% of the respondents agreed that precursor situation of disputes that is occurred due to Selection of Procurement Method and Contract Type related causes of disputes serves as hints for disputes. 50% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got mitigation measures to mitigate disputes that may occur due to the causes of disputes identified for the same stage. 50% of the respondents also agreed that FIDIC Red Book / ICTAD SBD 02 have got resolution provisions to resolve disputes that may occur due to Selection of Procurement Method and Contract Type related causes of disputes. However, 90% of the respondents agree that the causes, categorized under Selection of Procurement Method and Contract Type Stage, are true causes of disputes. Hence, it seems apparent that respondents do not believe that the embedded causes of disputes during the Selection of Procurement Method and Contract Type in the construction process have been adequately addressed in FIDIC Red Book / ICTAD SBD 02 in terms of mitigation and resolution. Therefore, it is recommended that the governing bodies of construction in Sri Lanka take note of these findings and take action to alleviate these deficiencies.

Around 85% of the respondents agreed that precursor situation of disputes that is occurred due to Designing and Drafting of Tender Documents related causes of disputes serves as hints for disputes. 49% of the respondents agreed that FIDIC Red Book / ICTAD SBD have got mitigation measures to mitigate disputes that may occur due to the causes of disputes identified for the same stage. 52% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got resolution provisions to resolve disputes that may occur due to Stage 2 Designing and Drafting of Tender Documents related causes of disputes. However, 84% of the respondents agree that the causes, categorized under Designing and Drafting of Tender Documents Stage, are true causes of disputes. Hence, it seems apparent that respondents do not believe that the embedded causes of disputes during the Designing and Drafting of Tender Documents stage in the construction process have been adequately addressed in FIDIC Red Book / ICTAD SBD

02 in terms of mitigation and resolution. Therefore, it is recommended that the governing bodies of construction in Sri Lanka take note of these findings and take action to alleviate these deficiencies.

Overall 84% of the respondents agreed that precursor situation of disputes that is occurred due to Tendering related causes of disputes serves as hints for disputes. Alarmingly, only 18% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got mitigation measures to mitigate disputes that may occur due to Tendering related causes of disputes. Disturbingly, only 32% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got resolution provisions to resolve disputes that may occur due to Tendering related causes of disputes. However, 76% of the respondents agree that the causes, categorized under Tendering Stage, are true causes of disputes. Hence, it seems apparent that respondents do not believe that the embedded causes of disputes during the Tendering stage in the construction process have been adequately addressed in FIDIC Red Book / ICTAD SBD 02 in terms of mitigation and resolution. Therefore, it is recommended that the governing bodies of construction in Sri Lanka take note of these findings and take action to alleviate these deficiencies.

As much as 83% of the respondents agreed that precursor situations of disputes that are occurred due to overall Contract Administration Stage related causes of disputes serves as hints for disputes. 61% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got mitigation measures to mitigate disputes that may occur due to Contract Administration related overall causes of disputes. 66% of the respondents agreed that FIDIC Red Book / ICTAD SBD 02 have got resolution provisions to resolve disputes that may occur due to causes of disputes related to the same stage. However, 81% of the respondents agree that the causes, categorized under Contract Administration Stage, are true causes of disputes. Even though, fairly higher percentage of respondents believe that the embedded causes of disputes during the Contract Administration Stage in the construction process have been adequately addressed in FIDIC Red Book / ICTAD SBD 02 in terms of mitigation and resolution, still, it seems there is much room for improvement. Therefore, it is recommended that the governing bodies of construction in Sri Lanka take note of these findings and take action to improve current provisions.

5.4 Further Studies

A comprehensive research study needs to be done to see how FIDIC red Book and ICTAD SBD 02 conditions of contracts could be improved in terms improving dispute identification, mitigation and resolution aiming at if not international at least Sri Lankan construction industry. Due to the importance and scope of this study, it is recommended that governing bodies of construction in Sri Lanka should pay attention in terms of organizing and funding the research study.

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7.0 APPENDIX A: LIST OF CAUSES OF DISPUTES

8.0 APPENDIX B: CATEGORIZATION OF LIST OF DISPUTES IN TO STAGES OF CONSTRUCTION PROCESS

9.0 APPENDIX C: SORTING OF CONSTRUCTION ADMINISTRATION RELATED CAUSES OF DISPUTES INTO FIDIC RED BOOK GENERAL CONDITIONS AND/OR ICTAD/SBD/02 CONDITIONS OF CONTRACT

10.0 APPENDIX D: DATA EVALUATION TABLES

11.0 APPENDIX E: QUESTIONAIRE

APPENDIX A - LIST OF CAUSES OF DISPUTES AS PER LITERATURE SURVEY

1. Kumaraswamy (1997) attempted to examine causality of disputes. In that, he sought to determine the root causes, which means the underlying reason of the problem, which, if eliminated, would prevent recurrence and proximate causes, which immediately precedes and produces the effect.

1.1 The root causes identified by Kumaraswamy (1997) include the following:

- Unfair risk allocation;
- Unclear risk allocation;
- Unrealistic time/cost/quality targets by the client;
- Uncontrollable external events;
- Adversarial industry culture;
- Unrealistic tender pricing;
- Inappropriate contract type;
- Lack of competence of project participants;
- Lack of professionalism of project participants;
- Client's lack of information or decisiveness; and
- Contractor's unrealistic information expectations.

1.2 Proximate causes identified by Kumaraswamy (1997) include the following:

- Inadequate brief;
- Poor communications;
- Personality clashes;
- Vested interests;
- Changes by client;
- Slow client responses;
- Exaggerated claims;
- Estimating errors;
- Other (eg. Works) errors;
- Internal disputes (eg. In jvs);
- Inadequate contract administration;
- Inaccurate design information;
- Incomplete tender information;
- Inadequate design documentation;
- Inappropriate contractor selection
- Inappropriate payment modalities; and
- Inappropriate contract form.

2. Semple, Hartman, and Jergeas (1994) described that the fundamental causes and real costs associated with conflicts and disputes in Canadian Construction Industry were not well understood. They identified the following causes as common causes of claims which might end up as disputes.

   - Acceleration;
   - Restricted access;
   - Weather / cold; and
   - Increase in scope.

3. Watts and Scrivener (1993) identified most frequent sources of disputes as listed below;

   - Violation of operational provisions in the agreement;
   - Variations;
   - Negligence in tort; and
   - Delay.

4. As per Waldron (2006), the main issues that lead to disputes were as follows;

   - Variations to scope,
   - Contract interpretation,
   - Extension of time claims,
   - Site conditions,
   - Late, incomplete or substandard information,
   - Obtaining approvals,
   - Site access,
   - Quality of design and
   - Availability of resources.

5. Cheung and Yiu (2006) listed, as follows, general types of disputes in the order of perceived significance following a literature review, interviews and a questionnaire survey;

   - Variations due to site conditions,
   - Variations due to client changes,
   - Variations due to design errors,
   - Unforeseen ground conditions,
   - Ambiguities in contract documents,
   - Variations due to external events,
   - Interferences with utility lines,
   - Exceptional inclement weather,
   - Delayed design information and
   - Delayed site possession.

They, further, identified the basic factors that drive the development of disputes. Those include;

- Project uncertainty,
- Contractual problems and
- Opportunistic behaviour.

6. As per Acharya, Lee, and Man Im, (2006), there were six critical conflicting factors in construction projects in Korea; which would be helpful for project planners and implementers in assessing and taking proactive measures for reducing the adverse effects of conflict. The six critical conflicting factors were;

- Differing site condition,
- Public interruption,
- Differences in change order evaluation,
- Design errors,
- Excessive contract quantities variation and,
- Double meaning of specifications.

7. Cheung and Pang (2014) described that traditionally subject matter approach has been used to identify the construction disputes. The diagnostic approach aims to uncover the underlying causes that lead to disputes. They believe that this approach is more informative as far as understanding construction disputes is concerned.

7.1 Subject Matters

- Change of scope,
- Change conditions,
- Delay,
- Disruption,
- Acceleration and
- Termination

- Determination of the agreement
- Payment related
- The site and execution of work
- Time related
- Final certificate and final payment and
- Tort related

- Contract terms
- Payments
- Variations
- Extensions of time

- Nomination
- Re-nomination
- Availability of information

- Payment
- Performance
- Delay
- Negligence
- Quality and administration

- Variation due to site conditions
- Variations due to client changes
- Variations due to design errors
- Unforeseen ground conditions
- Ambiguities in contract documents
- Variations due to external events
- Interferences with utility lines
- Exceptional inclement weather
- Delayed design information
- Delayed site possession

- Variations
- Ambiguities in contract documents
- Inclement weather
- Late issue of design information/ drawings
- Delayed possession of site
- Delay by other contractors employed by the client (e.g. Utility companies)
- Postponement of part of the project

- Valuation of variations
- Valuation of final account
- Failure to comply with payment provisions

- Payment
- Delay
- Defect/quality
- Professional negligence

- Ambiguous contract documents
- Competitive/ adversarial attitude
- Dissimilar perceptions of fairness by the participants

- Project uncertainty
- Contractual problems

- Opportunistic behaviour
- Contractors' financial position
- Cost of conflict and culture

7.2 Underlying Causes

- People,
- Process
- Product

- Management
- Culture
- Communications
- Design
- Economics
- Tendering pressure
- Law
- Unrealistic expectations
- Contracts
- Workmanship

- Technical,
- Legal
- Managerial dispute issues must have a contractual reference

- Construction contracts
- Unpredictable events

- Dispute is the formation of a position to maintain in conflict

- Dispute can be viewed as a class or kind of conflict that require resolution

- Construction dispute is the opposition of interests, values or objectives

- Construction dispute is linked with difference in perspectives, interests and agenda of human beings

- Construction dispute is the incompatibility of two (or more) people's (or groups') interests, needs or goals

- Dispute requires resolution is associated with distinct justifiable issues

- Construction disputes are due to unrealistic expectation, lack of team spirit and misunderstandings

8. El-Razek, Bassioni and El-Salam (n.d.), identified the following as causes of Disputes by researching the international literature.

   - Delays in payments to contractors and resulting cash problems during construction
   - Inferior quality of design, drawings and/or specifications,
   - The contract documents have errors, defects, omissions, and poor management
   - Delays of approval of shop drawings, instructions and decision making
   - Restricted access
   - Faulty and/or late owner-supplied equipment and material
   - Unbalanced bidding , underestimation and incompetence of contractors
   - Stakeholders involved in the project
   - Relatively low profitability of the construction industry
   - Variations initiated by the owner/consultant (additive/deductive)
   - Acceleration and stop-and-go operations
   - Insufficient time for bid preparation and Inadequate investigation before bidding
   - Changed conditions
   - Increased of complexity and scale of building process
   - Weather

9. El-Razek, Bassioni and El-Salam (n.d.), following consultation with the industry experts, short listed the below mentioned causes of disputes as main causes of Disputes in Lebanon.

   - Delays in payments to contractors and resulting cash problems during construction
   - Inferior quality of design, drawings and / or specifications
   - The contract documents have errors, defects and omissions
   - Delays of approval of shop drawings, instructions and decision making

- Restricted access
- Faulty and / or late Owner-supplied equipment and material
- Unbalanced bidding, underestimation and incompetence of contractors
- Stakeholders involved in the project
- Relatively low profitability of the construction industry
- Variations initiated by the owner/consultant (additive/deductive)
- Acceleration and stop-and-go operations
- Insufficient time for bid preparation and inadequate investigation before bidding
- Changed conditions
- Increase of complexity and scale of building process
- Delay of Owner representative/ consultant in inspection work
- Unexpected changes in exchange, interest, and inflation rate
- Unexpected change in materials prices

10. Malak, Wood, and Yonis (2008) as continuing incidence of costly disputes in the construction industry had led to a common interest of researchers in different countries to identify the generic aspects of conflicts, claims, disputes and their resolution, undertook a comprehensive review of literature in the field of construction disputes and identified

- The relationship between procurement selection (with the inherent risk allocation) and
- The behavioural attitudes of key stakeholders as critical factors in the incidence of disputes.

APPENDIX B - CATEGORIZATION OF ABOVE LIST OF DISPUTES IN TO STAGES OF CONSTRUCTION PROCESS

1.0 Selection of Procurement Method and Contract Type

- Unfair risk allocation (1.1)
- Unclear risk allocation (1.1)
- Inappropriate contract type (1.1)
- Stakeholders involved in the project (8, 9)
- The relationship between procurement selection (with the inherent risk allocation) (10)

2.0 Designing and Drafting of Tender Documents

- Unrealistic time/cost/quality targets by the client (1.1)
- Client's lack of information or decisiveness (1.1)
- Inadequate brief (1.2)
- Inadequate contract administration (1.2)
- Inaccurate design information (1.2)
- Incomplete tender information (1.2)
- Inadequate design documentation (1.2)
- Inappropriate payment modalities (1.2)
- Inappropriate contract form (1.2)
- Quality of design (4)
- Design errors (6)
- Double meaning of specifications (6)
- People (7.2)
- Process (7.2)
- Product (7.2)
- Management (7.2)
- Culture (7.2)
- Communications (7.2)
- Design (7.2)
- Economics (7.2)
- Law (7.2)
- Unrealistic expectations (7.2)
- Contracts (7.2)
- Construction contracts (7.2)
- Inferior quality of design, drawings and/or specifications (8, 9)
- The contract documents have errors, defects and omissions (9)

3.0 Tendering

- Unrealistic tender pricing (1.1)
- Estimating errors (1.2)
- Inappropriate contractor selection (1.2)
- Determination of the agreement (7.1)
- Contract terms (7.1)
- Tendering pressure (7.2)
- Relatively low profitability of the construction industry (8, 9)
- Insufficient time for bid preparation and inadequate investigation before bidding (8, 9))
- Unbalanced bidding, underestimation and incompetence of contractors (8, 9)

4.0 Contract Administration

- Lack of professionalism of project participants (1.1)
- Contractor's unrealistic information expectations (1.1)
- Poor communications (1.2)
- Personality clashes (1.2)
- Vested interests (1.2)
- Changes by client (1.2)
- Slow client responses (1.2)
- Exaggerated claims (1.2)
- Estimating errors (1.2)
- Other (eg. Works) errors (1.2)
- Internal disputes (eg. In jvs) (1.2)
- Inadequate contract administration (1.2)
- Acceleration (2)
- Restricted access (2)
- Weather / cold (2)
- Increase in scope (2)
- Violation of operational provisions in the agreement (3)
- Variations (3)
- Negligence in tort (3)
- Delay (3)
- Variations to scope (4)
- Contract interpretation (4)
- Extension of time claims (4)
- Site conditions (4)
- Late, incomplete or substandard information (4)
- Obtaining approvals (4)
- Site access (4)
- Availability of resources (4)
- Variations due to site conditions (5)

- Variations due to client changes (5)
- Variations due to design errors (5)
- Unforeseen ground conditions (5)
- Ambiguities in contract documents (5)
- Variations due to external events (5)
- Interferences with utility lines (5)
- Exceptional inclement weather (5)
- Delayed design information (5)
- Delayed site possession (5)
- Differing site condition (6)
- Differences in change order evaluation (6)
- Excessive contract quantities variation (6)
- Double meaning of specifications (6)
- Change of scope (7.1)
- Change conditions (7.1)
- Delay (7.1)
- Disruption (7.1)
- Acceleration (7.1)
- Termination (7.1)
- Payment related (7.1)
- The site and execution of work (7.1)
- Time related (7.1)
- Final certificate and final payment (7.1)
- Tort related (7.1)
- Payments (7.1)
- Variations (7.1)
- Extensions of time (7.1)
- Nomination (7.1)
- Re-nomination (7.1)
- Availability of information (7.1)
- Payment (7.1)
- Performance (7.1)
- Delay (7.1)
- Negligence (7.1)
- Quality and administration (7.1)
- Variation due to site conditions (7.1)
- Variations due to client changes (7.1)
- Variations due to design errors (7.1)
- Unforeseen ground conditions (7.1)
- Ambiguities in contract documents (7.1)
- Variations due to external events (7.1)
- Interferences with utility lines (7.1)
- Exceptional inclement weather (7.1)
- Delayed design information (7.1)

- Delayed site possession (7.1)
- Variations (7.1)
- Ambiguities in contract documents (7.1)
- Inclement weather (7.1)
- Late issue of design information/ drawings (7.1)
- Delayed possession of site (7.1)
- Delay by other contractors employed by the client (e.g. Utility companies) (7.1)
- Postponement of part of the project (7.1)
- Valuation of variations (7.1)
- Valuation of final account (7.1)
- Failure to comply with payment provisions (7.1)
- Payment (7.1)
- Delay (7.1)
- Defect/quality (7.1)
- Professional negligence (7.1)
- Ambiguous contract documents (7.1)
- Competitive/ adversarial attitude (7.1)
- Dissimilar perceptions of fairness by the participants (7.1)
- Project uncertainty (7.1)
- Contractual problems (7.1)
- Opportunistic behaviour (7.1)
- Contractors' financial position (7.1)
- Cost of conflict and culture (7.1)
- Workmanship (7.2)
- Technical (7.2)
- Legal (7.2)
- Managerial dispute issues must have a contractual reference (7.2)
- Unpredictable events (7.2)
- Delays in payments to contractors and resulting cash problems during construction (8, 9)
- The contract documents have errors, defects, omissions, and poor management (8)
- Delays of approval of shop drawings, instructions and decision making (8, 9)
- Restricted access (8 9)
- Faulty and/or late owner-supplied equipment and material (8, 9)
- Variations initiated by the owner/consultant (additive/deductive) (8, 9)
- Acceleration and stop-and-go operations (8, 9)
- Changed conditions (8, 9)
- Increase of complexity and scale of building process (8, 9)
- Weather (8)
- The contract documents have errors, defects and omissions (9)
- Delay of Owner representative/ consultant in inspection work (9)
- Unexpected changes in exchange, interest, and inflation rate (9)

- Unexpected change in materials prices (9)
- The behavioural attitudes of key stakeholders as critical factors in the incidence of disputes (10)

5.0 Third Party Interference

- Uncontrollable external events (1.1)
- Public interruption (6)

6.0 Construction Industry

- Adversarial industry culture (1.1)
- Relatively low profitability of the construction industry (8, 9)

7.0 Statements

- Dispute is the formation of a position to maintain in conflict (7.2)
- Dispute can be viewed as a class or kind of conflict that require resolution (7.2)
- Construction dispute is the opposition of interests, values or objectives (7.2)
- Construction dispute is linked with difference in perspectives, interests and agenda of human beings (7.2)
- Construction dispute is the incompatibility of two (or more) people's (or groups') interests, needs or goals (7.2)
- Dispute requires resolution is associated with distinct justifiable issues (7.2)
- Construction disputes are due to unrealistic expectation, lack of team spirit and misunderstandings (7.2)

APPENDIX C - SORTING OF CONSTRUCTION ADMINISTRATION RELATED VAUSES OF DISPUTES INTO FIDIC RED BOOK GENERAL CONDITIONS AND/OR ICTAD/SBD/02 CONDITIONS OF CONTRACT

1.0 General Provisions

- Contractor's unrealistic information expectations (1.1)
- Poor communications (1.2)
- Slow client responses (1.2)
- Obtaining approvals (4)
- Contract interpretation (4)
- Late, incomplete or substandard information (4)
- Delayed design information (5)
- Ambiguities in contract documents (5)
- Availability of information (7.1)
- Ambiguities in contract documents (7.1)
- Delayed design information (7.1)
- Late issue of design information/ drawings (7.1)
- Ambiguous contract documents (7.1)
- The contract documents have errors, defects and omissions (9)
- Delays of approval of shop drawings, instructions and decision making (8, 9)
- Double meaning of specifications (6)
- Contractual problems (7.1)
- Legal (7.2)
- Technical (7.2)

2.0 The Employer

- Restricted access (2)
- Site access (4)
- Delayed site possession (5)
- Delayed site possession (7.1)
- Delayed possession of site (7.1)
- Restricted access (8 9)
- Lack of professionalism of project participants (1.1)
- Personality clashes (1.2)
- Vested interests (1.2)
- Opportunistic behaviour (7.1)
- Managerial dispute issues must have a contractual reference (7.2)
- The behavioural attitudes of key stakeholders as critical factors in the incidence of disputes (10)
- Performance (7.1)

- Violation of operational provisions in the agreement (3)
- Competitive/ adversarial attitude (7.1)
- Dissimilar perceptions of fairness by the participants (7.1)

3.0 The Engineer

- Lack of professionalism of project participants (1.1)
- Personality clashes (1.2)
- Vested interests (1.2)
- Inadequate contract administration (1.2)
- Opportunistic behaviour (7.1)
- Managerial dispute issues must have a contractual reference (7.2)
- The behavioural attitudes of key stakeholders as critical factors in the incidence of disputes (10)
- Performance (7.1)
- Violation of operational provisions in the agreement (3)
- Competitive/ adversarial attitude (7.1)
- Dissimilar perceptions of fairness by the participants (7.1)
- Double meaning of specifications (6)
- Contractual problems (7.1)
- Technical (7.2)

4.0 The Contractor

- Site conditions (4)
- Unforeseen ground conditions (5)
- Interferences with utility lines (5)
- Quality and administration (7.1)
- Defect/quality (7.1)
- The site and execution of work (7.1)
- Unforeseen ground conditions (7.1)
- Interferences with utility lines (7.1)
- Contractors' financial position (7.1)
- Faulty and/or late owner-supplied equipment and material (8, 9)
- Differing site condition (6)
- Performance (7.1)
- Contractual problems (7.1)
- Technical (7.2)

5.0 Nominated Subcontractors

- Nomination (7.1)
- Re-nomination (7.1)

6.0 Staff and Labour

- Lack of professionalism of project participants (1.1)
- Personality clashes (1.2)
- Vested interests (1.2)
- Opportunistic behaviour (7.1)
- Managerial dispute issues must have a contractual reference (7.2)
- The behavioural attitudes of key stakeholders as critical factors in the incidence of disputes (10)
- Performance (7.1)
- Violation of operational provisions in the agreement (3)
- Competitive/ adversarial attitude (7.1)
- Dissimilar perceptions of fairness by the participants (7.1)

7.0 Plant, Material and Workmanship

- Availability of resources (4)
- Quality and administration (7.1)
- Defect/quality (7.1)
- Workmanship (7.2)
- Delay of Owner representative/consultant in inspection work (9)
- Other (eg. Works) errors (1.2)
- Performance (7.1)
- Increase of complexity and scale of building process (8, 9)

8.0 Commencement, Delays and Suspension

- Acceleration (2)
- Weather / cold (2)
- Delay (3)
- Extension of time claims (4)
- Exceptional inclement weather (5)
- Delay (7.1)
- Disruption (7.1)
- Acceleration (7.1)
- Time related (7.1)
- Extensions of time (7.1)
- Delay (7.1)
- Delay by other contractors employed by the client (e.g. Utility companies) (7.1)
- Postponement of part of the project (7.1)
- Delay (7.1)
- Exceptional inclement weather (7.1)
- Inclement weather (7.1)

- Acceleration and stop-and-go operations (8, 9)
- Weather (8)

9.0 Tests on Completion (As per literature survey this is not a cause for dispute)

10.0 Employer's Taking Over (As per literature survey this is not a cause for dispute)

11.0 Defects Liability (As per literature survey this is not a cause for dispute)

12.0 Measurement and Evaluation

- Estimating errors (1.2)
- Differences in change order evaluation (6)
- Valuation of variations (7.1)
- Valuation of final account (7.1)

13.0 Variations and Adjustments

- Changes by client (1.2)
- Increase in scope (2)
- Variations (3)
- Variations to scope (4)
- Variations due to site conditions (5)
- Variations due to client changes (5)
- Variations due to design errors (5)
- Variations due to external events (5)
- Excessive contract quantities variation (6)
- Double meaning of specifications (6)
- Change of scope (7.1)
- Change conditions (7.1)
- Variations (7.1)
- Variation due to site conditions (7.1)
- Variations due to client changes (7.1)
- Variations due to design errors (7.1)
- Variations due to external events (7.1)
- The contract documents have errors, defects, omissions, and poor management (8)
- Variations initiated by the owner/consultant (additive/deductive) (8, 9)
- Changed conditions (8, 9)
- Unexpected change in materials prices (9)
- Legal (7.2)

14.0 Contract Price and Payment

- Payment related (7.1)
- Final certificate and final payment (7.1)
- Payments (7.1)
- Payment (7.1)
- Failure to comply with payment provisions (7.1)
- Payment (7.1)
- Delays in payments to contractors and resulting cash problems during construction (8, 9)
- Unexpected changes in exchange, interest, and inflation rate (9)

15.0 Termination by Employer

- Termination (7.1)

16.0 Suspension and Termination by Contractor

- Termination (7.1)

17.0 Risk and Responsibility

- Negligence in tort (3)
- Tort related (7.1)
- Negligence (7.1)
- Professional negligence (7.1)
- Project uncertainty (7.1)

18.0 Insurance

- Contractors' financial position (7.1)

19.0 Claims, Disputes and Arbitration

- Exaggerated claims (1.2)
- Internal disputes (eg. In jvs) (1.2)
- Cost of conflict and culture (7.1)

20.0 Force Majeure

- Unpredictable events (7.2)

APPENDIX D – QUESTIONAIRE

No.	Cause	Is this a hint for dispute occurrence? Yes / No	Is this a cause for dispute occurrence? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt measures to mitigate the resultant dispute? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt provisions to resolve the resultant dispute? Yes / No
1	**Selection of Procurement Method and Contract Type Stage**				
1.1	Unfair risk allocation	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
1.2	Unclear risk allocation	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
1.3	Inappropriate contract type	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
1.4	Hostile attitude of Stakeholders involved in the project	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
1.5	Improper risk allocation in procurement method selection	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
2	**Designing and Drafting of Tender Documents Stage**				
2.1	Unrealistic time/cost/quality targets by the client	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
2.2	Client's lack of information or decisiveness	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
2.3	Inadequate client's brief	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐

No.	Cause	Is this a hint for dispute occurrence? Yes / No	Is this a cause for dispute occurrence? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt measures to mitigate the resultant dispute? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt provisions to resolve the resultant dispute? Yes / No
2.4	Incorporation of inappropriate contract administration provisions	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
2.5	Inaccurate design information	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
2.6	Incomplete tender information	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
2.7	Inadequate design documentation	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
2.8	Selection of inappropriate payment modalities	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
2.9	Inappropriate contract form	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
2.10	Inadequate quality of design	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
2.11	Inadequate quality of specifications	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
2.12	Participation inappropriate Personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
2.13	Selection of inappropriate Construction Process	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
2.14	Undecided nature of ultimate Product	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐

No.	Cause	Is this a hint for dispute occurrence? Yes / No	Is this a cause for dispute occurrence? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt measures to mitigate the resultant dispute? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt provisions to resolve the resultant dispute? Yes / No
2.15	Inclusion of weak Construction Management process	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
2.16	Prevalent dispute avoiding industry culture	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
2.17	Miscommunication communication among stakeholders	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
2.18	Unfavourable economic condition	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
2.19	Unavailability of unbiased legal provisions	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
2.20	Unrealistic expectations of stakeholders	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
3	**Tendering Stage**				
3.1	Unrealistic tender pricing	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
3.2	Estimating errors	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
3.3	Inappropriate contractor selection	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
3.4	Unilateral determination of the agreement	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
3.5	Unfavourable Contract terms	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐

No.	Cause	Is this a hint for dispute occurrence? Yes / No	Is this a cause for dispute occurrence? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt measures to mitigate the resultant dispute? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt provisions to resolve the resultant dispute? Yes / No
3.6	Undue tendering pressure	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
3.7	Relatively low profitability of the construction industry	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
3.8	Insufficient time for bid preparation and inadequate investigation before bidding	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
3.9	Unbalanced bidding, underestimation and incompetence of contractors	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4	**Contract Administration Stage**				
4.1	**General Provisions**				
4.1.1	Contractor's unrealistic information expectations	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.1.2	Poor communications	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.1.3	Slow client responses	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.1.4	Late approvals	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.1.5	Improper contract interpretation	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐

No.	Cause	Is this a hint for dispute occurrence? Yes / No	Is this a cause for dispute occurrence? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt measures to mitigate the resultant dispute? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt provisions to resolve the resultant dispute? Yes / No
4.1.6	Late, incomplete or substandard information	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.1.7	Delayed design information	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.1.8	Ambiguities in contract documents	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.1.9	Unavailability of information	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.1.10	Late issue of design information/ drawings	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.1.11	Weak specifications	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.2	**The Employer**				
4.2.1	Restricted site access	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.2.2	Delayed site possession	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.2.3	Lack of professionalism of Employer's Personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.2.4	Personality clashes among Employer's personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.2.5	Vested interests of the Employer	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.2.6	Opportunistic behaviour of the Employer	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐

No.	Cause	Is this a hint for dispute occurrence? Yes / No	Is this a cause for dispute occurrence? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt measures to mitigate the resultant dispute? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt provisions to resolve the resultant dispute? Yes / No
4.2.7	Hostile Behaviour of Employer's personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.2.8	Lack of Managerial skills of Employer's personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.2.9	Weak performance of Employer's personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.2.10	Violation of operational provisions in the agreement by the Employer's personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.2.11	Competitive/ adversarial attitude of Employer's personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.2.12	Dissimilar perceptions of fairness by the participants of Employer's personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.3	**The Engineer**				
4.3.1	Lack of professionalism of the Engineer and his Personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.3.2	Personality clashes among the Engineer and his personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
No.	**Cause**	**Is this a hint for dispute occurrence?**	**Is this a cause for dispute**	**Does FIDIC and/or ICTAD**	**Does FIDIC and/or ICTAD**

		Yes / No	occurrence? Yes / No	SBD2 has inbuilt measures to mitigate the resultant dispute? Yes / No	SBD2 has inbuilt provisions to resolve the resultant dispute? Yes / No
4.3.3	Vested interests of the Engineer and his personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.3.4	Inadequate contract administration skills of the Engineer and his personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.3.5	Opportunistic behaviour of the Engineer and his personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.3.6	Lack Managerial skills of the Engineer and his personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.3.7	Hostile behaviour of the Engineer and his personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.3.8	Weak performance of the Engineer and his personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.3.9	Violation of operational provisions in the agreement by the Engineer and his personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐

No.	Cause	Is this a hint for dispute occurrence? Yes / No	Is this a cause for dispute occurrence? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt measures to mitigate the resultant dispute? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt provisions to resolve the resultant dispute? Yes / No
4.3.10	Competitive/ adversarial attitude of the Engineer and his personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.3.11	Dissimilar perceptions of fairness by the Engineer and his personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.3.12	Lack of contract interpretation skills of the Engineer and his personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.4	**The Contractor**				
4.4.1	Adverse site conditions	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.4.2	Differing site condition	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.4.3	Interferences with utility lines	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.4.4	Faulty and/or late owner-supplied equipment and material	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.4.5	Insufficient Contract amount	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.4.6	Lack of Quality assurance	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐

No.	Cause	Is this a hint for dispute occurrence? Yes / No	Is this a cause for dispute occurrence? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt measures to mitigate the resultant dispute? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt provisions to resolve the resultant dispute? Yes / No
4.4.7	Lack of managerial skills of the Contractor's representative	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.4.8	Lack of co-operation	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.4.9	Faulty setting out	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.5	**Nominated Subcontractors**				
4.5.1	Controversial nominations	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.6	**Staff and Labour**				
4.6.1	Lack of professionalism of Contractor's personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.6.2	Personality clashes among Contractor's personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.6.3	Vested interests of Contractor's personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.6.4	Opportunistic behaviour of Contractor's personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐

No.	Cause	Is this a hint for dispute occurrence? Yes / No	Is this a cause for dispute occurrence? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt measures to mitigate the resultant dispute? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt provisions to resolve the resultant dispute? Yes / No
4.6.5	Lack of managerial skills of Contractor's personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.6.6	Hostile behaviour of Contractor's personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.6.7	Violation of operational provisions by the Contractor's personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.6.8	Competitive/ adversarial attitude of Contractor's personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.6.9	Dissimilar perceptions of fairness by the Contractor's personnel	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.7	**Plant, Material and Workmanship**				
4.7.1	Unavailability of resources	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.7.2	Lack of quality and workmanship	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.7.3	Delay in inspection	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.7.4	Defects of works	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐

No.	Cause	Is this a hint for dispute occurrence? Yes / No	Is this a cause for dispute occurrence? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt measures to mitigate the resultant dispute? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt provisions to resolve the resultant dispute? Yes / No
4.7.5	Increase of complexity and scale of building process	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.8	**Commencement, Delays and Suspension**				
4.8.1	Acceleration	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.8.2	Adverse weather				
4.8.3	Delaying of work by the Contractor	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.8.4	Delay by other contractors employed by the client (e.g. Utility companies)	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.8.5	Extension of time claims	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.8.6	Disruption	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.8.7	Postponement of part of the project	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.8.8	Stop-and-go operations	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.9	**Tests on Completion (As per literature survey this is not a cause for dispute)**				

No.	Cause	Is this a hint for dispute occurrence? Yes / No	Is this a cause for dispute occurrence? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt measures to mitigate the resultant dispute? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt provisions to resolve the resultant dispute? Yes / No
4.10	**Employer's Taking Over (As per literature survey this is not a cause for dispute)**				
4.11	**Defects Liability (As per literature survey this is not a cause for dispute)**				
4.12	**Measurement and Evaluation**				
4.12.1	Estimating errors	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.12.2	Differences in change order evaluation	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.12.3	Faulty Valuation of variations	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.12.4	Valuation of final account	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.13	**Variations and Adjustments**				
4.13.1	Variations to scope				
4.13.2	Variations due to site conditions	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.13.3	Variations due to client changes	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.13.4	Variations due to design errors	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐

No.	Cause	Is this a hint for dispute occurrence? Yes / No	Is this a cause for dispute occurrence? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt measures to mitigate the resultant dispute? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt provisions to resolve the resultant dispute? Yes / No
4.13.5	Variations due to external events	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.13.6	Excessive contract quantities variation	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.13.7	Double meaning of specifications	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.13.8	Variations due errors, defects and omissions in Contract Documents	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.14	**Contract Price and Payment**				
4.14.1	Payment related issues	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.14.2	Final certificate and final payment related issues	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.14.3	Failure to comply with payment provisions	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.14.4	Delays in payments and resulting cash problems during construction	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.14.5	Unexpected changes in exchange, interest, and inflation rate	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐

No.	Cause	Is this a hint for dispute occurrence? Yes / No	Is this a cause for dispute occurrence? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt measures to mitigate the resultant dispute? Yes / No	Does FIDIC and/or ICTAD SBD2 has inbuilt provisions to resolve the resultant dispute? Yes / No
4.15	**Termination by Employer**				
4.15.1	Issues pertaining to termination by Employer	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.16	**Suspension and Termination by Contractor**				
4.16.1	Issues pertaining to Suspension and Termination by Contractor	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.17	**Risk and Responsibility**				
4.17.1	Due to tort related negligence	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.17.2	Due to professional negligence	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.17.3	Due to project uncertainty	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.18	**Insurance (As per literature survey this is not a cause for dispute)**				
4.19	**Claims, Disputes and Arbitration**				
4.19.1	Exaggerated claims	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐

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4.19.2	Internal disputes within JV etc.	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.19.3	Cost of conflict and culture	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
4.20	**Force Majeure**				
4.20.1	Unpredictable events	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
5	**Third Party Interference**				
5.1	Uncontrollable external events	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐
5.2	Public interruption	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐	Yes☐ No☐