

**UNRAVELLING CONTRACTUAL CHALLENGES
FACED BY THE CONSTRUCTION INDUSTRY IN A
PANDEMIC SITUATION: THE CASE OF COVID-19**

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DECLARATION

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The above candidate has carried out research for the Masters dissertation under my supervision. I confirm that the declaration made above by the student is true and correct.

Name of the supervisor: Ch. QS. Dr. (Mrs.) Anuradha Waidyasekara

Signature of the supervisor:

Date: 30.11.2022

DEDICATION

***...To My Family,
My Partner
and
My Supervisor
Who Always
Encouraged Me
to Go on
Every Adventure...***

ACKNOWLEDGEMENT

This research study succeeded because of the dedication of numerous individuals and organisations who committed their time, knowledge, and effort. Hence, I should convey my honour and gratitude to everyone who committed to this work in different ways.

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ABSTRACT

Unravelling Contractual Challenges Faced by the Construction Industry in a Pandemic Situation: The Case of COVID-19

The construction industry cannot be exempted, as it has faced huge issues due to COVID-19 pandemic. Among them, contractual challenges, which have legal implications, can lead to many disputes and it raised to assist contractors in claiming a loss, expenses, and extension of time. Conflicts arise between parties to the contract and among the majority of stakeholders. A successful contractual implication can manage the contractual challenges arising within construction job sites. Following questions are addressed to manage these unprecedented situation-related contractual conflicts: ‘what are the contractual challenges faced by the construction industry?’, ‘what are the most applicable contractual provisions to a pandemic situation?’, and ‘what are the strategies to unravel the contractual challenges in a pandemic situation?’.

The questions were discussed by descriptive elucidation of existing literature. A Systematic Literature Review (SLR) was conducted to identify contractual challenges encounter during a pandemic. Disruption in project works, issues in the supply chain, labour shortage and productivity loss, delayed payments, and nine other main contractual challenges were identified through SLR. Multiple-mixed qualitative methodological research choice was adopted aligning the inductive approach and qualitative survey strategy.

First, the document review was conducted and analysed by reviewing the internationally popular forms of contract, FIDIC and locally popular forms of contracts standard bidding Documents (SBDs). Consequently, contractual provisions for pandemics in a few standard forms of construction contracts and case laws were synthesised. Adjustments for Changes in Legislation/Law, Force Majeure, Compensation Events, Right to Claim, Extension of Time, and Exceptional Events were identified as main contractual provisions as outcomes of the document review. Moreover, semi-structured interviews were conducted adopting the purposive sampling method and each respondent had experience and knowledge about contractual challenges and was involved in construction projects during the pandemic period. Thirty-four contractual challenges were identified including price increments and the uncertainty in project commencement through literature review and interviews. Finally, the study provided individual strategies for identified fourteen contractual challenges, to prepare for future pandemics and to minimise the destructive impact of contractual challenges due to any pandemic.

Keywords: Contractual Challenges; Contractual Provisions; COVID-19 Pandemic; Strategies

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LIST OF ABBREVIATIONS

- CCC - Contractual Challenges due to COVID-19
- COVID-19 - Infectious Disease Caused by the SARS-CoV-2 Virus
- EOT - Extension of Time
- FIDIC - Standard forms of contracts published by International Federation of Consulting Engineers (French name Fédération Internationale Des Ingénieurs-Conseils)
- SBD - Standard Bidding Document
- SLR - Systematic Literature Review
- WFH - Work From Home
- WHO - World Health Organisation

CHAPTER 1 - INTRODUCTION

1.1. Background

The construction industry is a good example of a more dynamic, risky and challenging business (Mills, 2001). Due to the nature of the construction industry, it is perpetually facing serious problems including low productivity, low quality, delays, and cost overrun (Memon, Rahman, & Azis, 2011). As well as Tarawneh (2014) identified that the construction environment is characterised by a high level of competition, complex operations, high-risk conditions and stressful and well knowledgeable clients. Corona virus/ COVID-19 pandemic situation is a serious problem facing the construction industry similarly to the other industries in the world (Bailey, Bouchardie, & Madalena, 2020).

As stated by Roshana, Kaldeen, and Banu (2020), the Corona virus/ COVID-19 was reported in December 2019 and spread over the world resulting in millions of cases. According to World Health Organisation (WHO), the virus is more active and aggressive than other viruses due to the speed and ways of spreading (Pathirana, 2020). Therefore, COVID-19 was announced as a “General Health Emergency of International Concern” by the WHO on 30th January 2020 (Roshana et al., 2020). COVID-19 pandemic led to capricious socio-economic aftermath along with the downfall of the construction industry (Winch et al., 2021). Due to the continuity of COVID-19, the purview of governments and the private sectors of many countries is that, this pandemic may drastically affect the economy of any country (Franzese, 2020). Therefore, most countries have decided to limit the movements of people and encouraged people to adhere to the concept of Work From Home (WFH) and this concept was adopted by many industries with the COVID-19 pandemic (Gamil & Alhagar, 2020). With the implication of the WFH concept, people used remote working while some workers lose their jobs (Sihombing, 2020). The issue was unlike in other sectors, physical presence is the main requirement in the construction sector and the application of WFH was not suitable for the construction industry (Faculty of Humanities and Social Sciences, 2020).

Moreover, Jreidini (2020) mentioned that several challenges and constraints are directly set upon the construction industry including increment of project time and cost due to disruptions in site works and material supply along with COVID-19. Similarly, Ramya (2019) mentioned the calamity induced by the Corona virus, disrupted the completions as well as outstretched the delays and overrun of construction projects. The findings of Mansoor, Alsaud, and Yas (2021) revealed that the project cost and the labour cost are considerably high after the pandemic situation in construction projects compared to the costs before the pandemic. Along with COVID-19 the construction works have been delayed due to restrictions to the movements, material supply delays and working with limited workers causes impairments to maintain planned schedules (Faculty of Humanities and Social Sciences, 2020). The existing supply chain in the construction industry already has been disrupted and cannot predict future matter of contention along with the supply chain (Ataei et al., 2021).

Osuizugbo (2020) stated that contractors should take the responsibility of adapting applicable COVID-19 formulations related to the construction industry introduced by the government. As Alsharif, Banerjee, Uddin, Albert, and Jaselskis (2021) mentioned, the majority of construction stakeholders predicted a considerable growth in the number of contractual conflicts within the construction sites in the industry as a whole along with the COVID-19. Besides, the authors predicted that most of the forthcoming claims related to COVID-19 would be between the client and the contractor. Moreover, most of the disputes have incurred or are occurring due to the absence of a proper loss sharing mechanism related to a pandemic (Ramya, 2019). Though, if there is a strong relationship and powerful collaboration among construction stakeholders in a project, it is easy to smoothly cripple most of the disputes that arise due to existing crisis (Ogunnusi, Hamma-Adama, Salman, & Kouider, 2020).

As mentioned by the Faculty of Humanities and Social Sciences (2020), many contractors were suffering from delays in payment for government-funded projects and certain clients were hesitant to fund projects based on the existing insecure situation. The authors further mentioned that the contractors needed to do adjustments

to contractual agreements regarding the time and cost of construction projects. In construction projects, not only incentives for time and cost-saving but also there are penalties for time and cost overruns (L. Liu & Zhu, 2007). Nevertheless, some standard forms of contracts like FIDIC, published by the International Federation of Consulting Engineers, will ordinarily provide provisions for expanding time and compensations for the costs under several sub-clauses (Jayathilaka & Waidyasekara, 2022a). However, the contractors are seeking their entitlements for time extensions and additional costs to survive within the industry through overcoming delays and disruptions that occurred as a result of the current pandemic situation (King, Rahman, Fauzi, & Haron, 2021).

If there is any crisis happens, the responsible parties have main significant obligations to find appropriate solutions for the situation and to hold it back from happening again (Gates, 2020). Even though there are lack of reviews related to the COVID-19 outbreak, it is current requisite to pay attention to challenges and constraints on the construction industry based on the prevailing situation (Gamil & Alhagar, 2020).

1.2. Problem Statement

Whereas the construction sector is one of the key sources of strength in the economy of any country, there should be necessary actions to encounter the challenges due to pandemic situations and should contest to overcome the negative impact which can arise from pandemics (Bsisu, 2020). King et al. (2021) stated that, construction stakeholders are facing multitude of contractual challenges with delayed projects due to Corona virus outbreak. Most of the construction stakeholders had never experienced any pandemics such as COVID-19 outbreak and many disputes may occur regarding contractual provisions within construction industry (Laing, 2020). Legal provisions in several contractual documents related to construction contracts may vary from country to country, project to project (Ogunnusi et al., 2020). Despite, the contractual challenges experienced by the construction industry due to the prevailing crisis, numerous parties are still inciting construction stakeholders to rely upon the available legal provisions related to uncertain circumstances in contractual documents (Alsharif et al., 2021).

According to Bailey et al. (2020), the COVID-19 outbreak should contractually consider under the category of ‘force majeure’ but also it should be concerned under ‘changes in legislations’ clause in contractual documents to properly investigate the real influence on the construction industry. Findings of Kawmudi, Jayasooriya, Rupasinghe, and Ariyaratna (2019) present that construction stakeholders have never expected this type of situation even under the force majeure category.

It was evident that the construction industry is always embroiled in protracted and costly dispute resolution procedures (CLC, 2020). In addition, Sierra (2021) stated that, the terms of both time and money are related to disputes in construction projects and the most common conflicts are about finance related and time related failures. Moreover, the author disclosed that the prevailing pandemic situation has aggravated both of these problems. Therefore, it is prudent to address the pandemic's impact at the beginning and end of the crisis in order to prepare for any future potential and learn lessons for future preparations (Iqbal, Ahmad, Waqas, and Abrar, 2021).

In Sri Lanka, the construction sector is taking fourth place as the highest major contributor to the development of economies (De Silva, Rajakaruna, & Bandara, 2008). The impact of COVID-19 outbreak has assaulted the country's macroeconomic stability widely in Sri Lanka (Roshana et al., 2020). According to Pathirana (2020), in Sri Lanka, construction companies should pay attention to find solutions not to the total issue but to the minor level matters to overcome diverse impacts relate to this type of pandemics. Therefore, proper unifications of strategic and operational decisions are needed. Moreover, it is current requisite to pay attention on contractual challenges other than general challenges in the construction industry due to COVID-19 outbreak, impact on the stakeholders, what are the adjustments that need to be done for available contractual provisions as well as how to minimise the negative impact of contractual challenges to the construction industry in a pandemic situation. Hence, this research addressed questions such as:

- What are the contractual challenges faced by the construction industry in a pandemic situation (COVID-19)?

- What are the suitable contractual provisions relating to a pandemic in construction contracts and the needed adjustments for available provisions?
- What are the challenges with implementing contractual provisions in the case of the COVID-19 pandemic?
- What are the appropriate strategies for the construction industry to unravel the contractual challenges in a pandemic situation?

1.3. Aim

The research aim is to unravel the contractual challenges faced by the construction industry during the COVID-19 pandemic situation.

1.4. Objectives

- Critically review the contractual challenges relate to the construction industry in a pandemic situation (COVID-19)
- Evaluate the applicability of available contractual provisions and case laws relate to a pandemic situation
- Investigate the challenges with the implementation of contractual provisions in the case of COVID-19 pandemic
- Propose strategies for construction industry to unravel the contractual challenges in a pandemic situation

1.5. Research Methodology

The research has been conducted using the multi-method qualitative approach. The Followings are the adopted qualitative data collection and data analysis techniques.

Systematic Literature Review (SLR)

A researcher can review existing literature using several methods, among them, Systematic Literature Review (SLR) was selected for this research to achieve research objectives. The worth of the systematic review depends on what the researchers have done, what was found and the comprehensibility of the review (Moher et al 2009). The aim of SLR was to find contractual challenges faced by the construction industry,

specially in a pandemic situation through reviewing already published articles related to the research topic. Emerald Insight, Science Direct and Scopus were the three databases preferred to find articles to conduct SLR.

Document Review

To gather contractual provisions and Case Laws related to a pandemic situation, this study has adopted, document review analysis under the qualitative research method. The standard form of construction contract published by the International Federation of Consulting Engineers (FIDIC) is the most extensively used international standard form of construction contract globally (Seifert, 2005). Standard Bidding Documents (SBD) specific to Sri Lanka and FIDIC which is popular internationally, were incorporated into this document review. In addition to the standard forms of contracts, available case laws which can apply to unforeseen situations like COVID-19 pandemic were reviewed within this study to assist construction parties to unravel the contractual challenges easily.

Interviews

Prior to the in-depth interviews, a preliminary interview round was conducted to find whether parties to the contract (clients and contractors) faced difficulties due to contractual challenges during the pandemic. Thereafter, in-depth semi-structured interviews were executed with professionals in the construction industry to authenticate the identified contractual challenges, contractual provisions and solutions concerning the research topic to cover research objectives.

Content Analysis

Collected qualitative data had been analysed with the support of content analysis. The content analysis was conducted manually and using NVivo software as well. The NVivo software helped the researcher to spend less time to analyse collected qualitative data and finally the outputs were presented as graphical representations.

1.6. Scope and Limitations

The study was focused on the contractual challenges faced by the construction industry in a pandemic situation to identify available contractual provisions in standard forms of contracts for those challenges and how to unravel them finding the best strategies. Besides, this research is conducted on contractors' perspective. Moreover, this research study is limited to the standard form of construction contract published by the International Federation of Consulting Engineers (FIDIC) and Standard Bidding Documents (SBD) which is using local construction projects (Sri Lankan) when reviewing applicable contractual provisions.

1.7. Chapter Breakdown

The research study includes five main chapters. Introduction, Research methodology, Literature synthesis, Data collection, analysis and discussion, as well as Conclusions and recommendations are the chapters included in this research study. The chapter breakdown shows the details of chapters of the research study with a compressed arrangement and is presented in Figure 1-1.

1.8. Chapter Summary

The chapter endowed a brief introduction to the research through the background study. The research problem was clearly described in the problem statement. The aim and objectives of the research study have explained the expectation of the research. Further, the research methodology has presented the process to obtain the aim while fulfilling the objectives of the research. Moreover, this chapter described the scope and limitations of the project. Finally, the chapter breakdown provided an inclusion of the research study briefly.

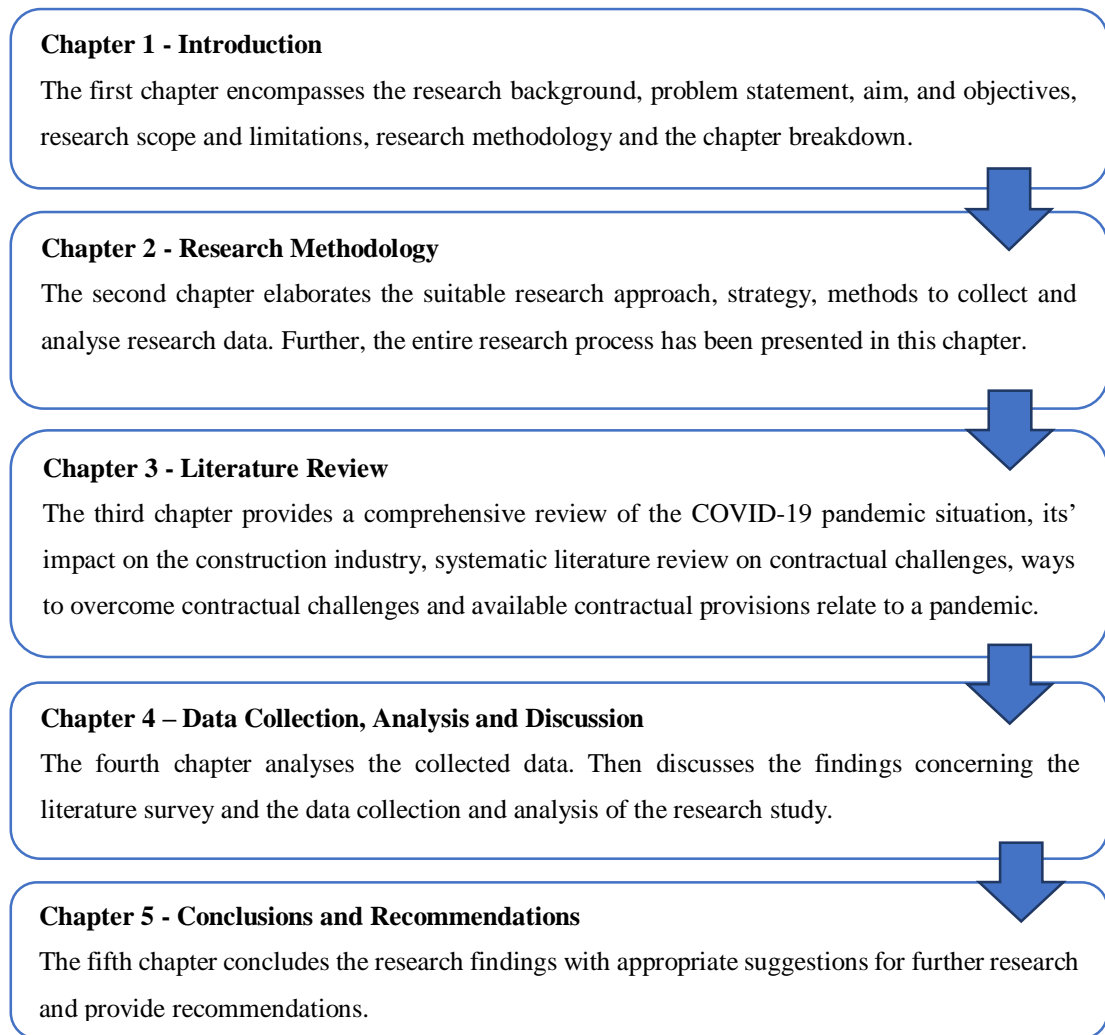


Figure 1-1: Chapter Breakdown

CHAPTER 2 – RESEARCH METHODOLOGY

2.1. Introduction

Research should be methodologically demonstrated; i.e. the concept, problem, objectives, method, design, and research hypothesis should be discussed in detail (Lamanauskas, 2020). Chapter One has attested the research problem and described the aim and objectives of the study. Chapter Two presents the methodology for the research study. Initially, this chapter briefly describes the research design. It consists of research philosophy, research approach, methodological choice, specific research strategies and research techniques. Subsequently, the steps applied to develop the systematic literature review were also discussed. Finally, a compressed review of the research process was performed within this chapter.

2.2. Research Design

As mentioned by Saunders, Thornhill, and Lewis (2007), research could acquire the expected output by interconnecting all elements of the research methodology. According to the research onion elucidated by Mark Saunder, which has been presented in Figure 2-1, there are important decisions that a researcher shall need to make when developing a research methodology.

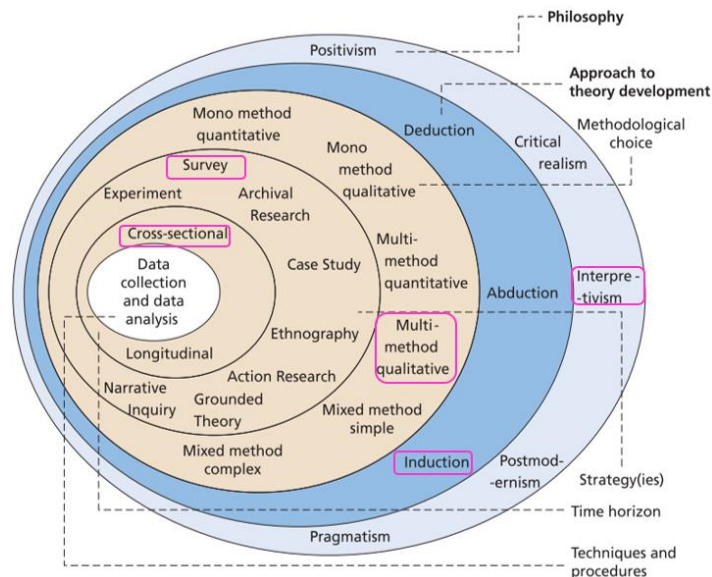


Figure 2-1: Saunder’s Research Onion
Adapted from: Saunders, Thornhill, and Lewis (2007)

Saunders et al. (2007) mentioned that the research onion's main layers are Research philosophy, Approach to theory development, Methodological choice, Strategy, Time horizon, Techniques, and Procedures as presented in Figure 2-1. The adopted research design for this study was addressed under the following topics.

2.3. Philosophical Position Specific to the Research

The beliefs and guiding principles of a research project are its research philosophy (Santos, 2021). According to Easterby-Smith, Thorpe, and Jackson (2015), researchers can get help to clarify the issues related to the research design using research philosophy. The research philosophy contains assumptions about how the researcher views the world and reality (Saunders, et al. 2019).

According to the research onion, there are five main philosophies named positivism, critical realism, interpretivism, postmodernism and pragmatism. The differences among philosophical positions are typically based on the characteristics of ontological, epistemological and axiology assumptions (Saunders, et al. 2019). Moroi (2020) stated that ontology is simply, how the researcher give a meaning to the gathered data and epistemology is how the researcher uncover knowledge in the context that going to investigate. Moreover, the author mentioned that axiology considers what are the characteristics of different aspects of research such as participants, data, and audience. This research study focused on human experiences, the reasons for their acting and also tend to apprehend the subjective meaning of social action. In-depth study with a small sample and qualitative research approaches for data gathering and analysis were adopted in this research. This research aims to build good substantial interpretations and understandings of different contexts and social worlds using Interpretivism research philosophy.

Considering characteristics of each philosophical view, this study has adopted, an interpretivism research philosophy incorporating Saunder's research onion. This philosophy is highly suitable for business research because business situations are complex and unique (Saunders et al., 2019).

2.4. Approach to Theory Development of the Research

The second layer of Saunderson's research onion presents how to approach the research. Accordingly, there are mainly three approaches namely, inductive, deductive, and abductive. In general, inductive research focuses on theory development through data collection and analysis. Typically, interpretivism research is inductive. In inductive inference, established premises are harnessed to produce untested conclusions (Saunders et al., 2019). As mentioned by Saunders et al. (2019), "research using an inductive approach to reasoning is likely to be particularly concerned with the context in which such events take place. Therefore, the study of a small sample of subjects might be more appropriate" (p. 155). This study focused on theory development after the data collection process and planned to develop theories that related to the literature through the explored collected data. The researcher has identified the inductive method as the appropriate approach to theory development for the research study.

2.5. Methodological Choice of the Research

According to Creswell (2014), "research approaches are plans and the procedures for research that span the steps from broad assumptions to detailed methods of data collection, analysis, and interpretation" (p. 31). Research approaches are the ways to examine research objectives (Naoum, 2007). The author has pointed out two primary research approaches, 'Qualitative' and 'Quantitative'. Despite, Creswell (2014) has mentioned an additional research approach named 'Mixed Approach' as well. The qualitative method is one research approach that deal with phenomena using experiences, relations, and behaviours rather than statistical methods to analyse numeric data (Hennink, Hutter, & Bailey, 2020). According to Creswell (2014), "qualitative research is an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem" (p. 32). Similarly, Macdonald and Headlam (2009) report that this approach helps to understand the reasons for the research problem and encourages researchers to act against those reasons. Goertz and Mahoney (2012) have pointed out the qualitative approach as the most flexible research approach than other approaches.

It was necessary to propose strategies and recommendations for the construction industry to unravel the contractual challenges in a pandemic. Qualitative research techniques were needed to ensure that the gathered information through literature review is reasonable to unfold the research problem and achieve research objectives. Mohajan (2018) emphasised that the qualitative research approach has several advantages, such as describing the experiences and capturing the context. In addition, the author states, “the purpose of this approach is to describe and interpret issues or phenomena systematically from the point of view of the individual or population being studied, and to generate new concepts and theories” (p. 2). After considering the characteristics, advantages, and suitability of the three research approaches, the multi-method qualitative approach has been selected as the most acceptable approach to conduct the research.

2.6. Research Strategy of the Research

Rahi (2017) has defined the research strategy as “a process of collecting and interpreting data with a clear objective” (p. 2), while Cavaye (as cited in Wilson, 2016) defined the research strategy as “a way of going about one’s research, embodying a particular style and employing different methods” (p. 91). Figure 2-2 shows five main research strategies found in social science.

Experiments	<ul style="list-style-type: none"> • Can use to examine cause and effect relationships among variables • Involves in variable testing where the impact of one variable can be seen with other variables
Surveys	<ul style="list-style-type: none"> • Information is collected by interviews or pre designed questionnaire
Archival Analysis	<ul style="list-style-type: none"> • Reports the incidence and prevalence relates to a specific phenomenon
Histories	<ul style="list-style-type: none"> • Can use to explore past issues • Can adopt especially when no relevant person is alive to give answer or to report about particular issue
Case Studies	<ul style="list-style-type: none"> • Written description of a problem or a situation • Presents small group problems or focus on a particular issue • Preferred when researcher has little control on events

Figure 2-2: Types of Research Strategies

Adapted From: Yin (2014)

The aim, topic, and scope of a research are manipulated by research strategy (Easterby-Smith et al., 2015). However, research strategy is the path to deciding which research to undertake and how to conduct it (Cuervo-Cazurra, Mudambi, Pedersen, & Piscitello, 2017). The ‘survey’ was selected as the research strategy to achieve the research aim. According to Goundar (2019), “studies employing surveys method gather data through the form of questionnaires, which can be paper-based or web-based” (p. 31). The survey method allows researchers to use different data collection methods in quantitative and qualitative research approaches like interviews and focus group discussions (Singleton & Straits, 2010). Figure 2-3 presents the difference between the steps of qualitative and quantitative surveys. It uses *Confidence interval* as CI and *Linear structural relations* as LISREL.

Steps	Qualitative Survey	Statistical Survey
1. Defining knowledge aims		
Topic (material object)	any topic	any topic
Aspect (formal object)	diversity	frequency distribution
Empirical domain	any population (collection)	any population (collection)
Unit of data collection	members of population	members of population
Knowledge function	primarily description	primarily description
2. Sampling		
Method of selection	diversity; by purpose	probability; by chance
Criterion for size (N)	saturation, coverage of population diversity	precision of estimate (CI)
3. Data collection		
Measurement level	any	any
Method of collection	any	any
4. Analysis		
1st-level analysis	diversity analysis	distribution analysis
Unidimensional description	coding data (downward and upward) in objects, dimensions and categories	counting frequencies descriptive statistics estimating parameters
2nd-level analysis	<i>case oriented:</i> combinatory synthesis of diversity: property-space analysis, typology construction <i>concept oriented:</i> holistic synthesis by core concept	<i>unit oriented:</i> cluster analysis, homogeneity analysis <i>variable oriented:</i> correlation, factor-analysis, index construction, scaling
3rd-level analysis	deterministic explanation: combinatory analysis QCA, pattern analysis	probabilistic explanation: discriminative analysis, regression, LISREL
Explanation		

Figure 2-3: Comparison of Qualitative Survey and Quantitative Survey

Source: Janse (2010)

Janse (2010) also mentioned that “qualitative research differs from quantitative research based on the iteration of data collection and analysis” (p. 6). According to Fink (2012), the qualitative survey method can explore the experiences of people subjected to respective questions. The research needed to identify the contractual challenges and strategies to overcome those challenges relate to the construction industry in a pandemic situation (COVID-19), evaluate the applicability of available contractual provisions and case laws relate to a pandemic situation, investigate the challenges with the implementation of contractual provisions in the case of COVID-19 pandemic and to propose strategies and recommendations for construction industry to unravel the contractual challenges in a pandemic situation. Considering the characteristics of qualitative surveys, the researcher identified the qualitative survey as the most appropriate research strategy for this study.

2.7. Time Horizon of the Research

The *time horizon* is the research time frame and the adjacent layer before the core of Saunder’s research onion. After considering the researcher’s requirements, the cross-sectional route was identified as the suitable time horizon. According to Arunaditya (2016), cross-sectional research is undertaken to resolve problems or answer question-solving. As per the author, research strategies such as experiment (limited), survey, case study, or grounded theory is used in cross-sectional research. Among them, this research study employed the survey method.

2.8. Research Techniques and Procedure of the Research

Naoum (2007) declared that data collection and data analysis are essentially constituted within research techniques. As brought up by authors, even though there are different techniques that can be applied for data collection and data analysis, the researcher should select the preferable techniques for their research considering the research aim and objectives. Technique and procedure refer to the data collection and analysis methods (Arunaditya, 2016). As Tobi and Kampen (2018) mentioned, despite the availability of identical techniques for each approach, it is good to pay researchers’ attention to other approaches and related techniques (Interdisciplinarity Research).

2.8.1. Data collection

Any research can use measuring, questioning, watching, reading, or any applicable method to collect data. In primary data collection, data is collected indirectly, and the researcher cannot manipulate actual data (Macdonald & Headlam, 2009). According to Naoum (2007), data collection depends on the data source. Under Goundar (2019), primary and secondary data sources are the main two data sources for research.

Figure 2-4 illustrates the categorisation of primary and secondary data sources for data collection of research.

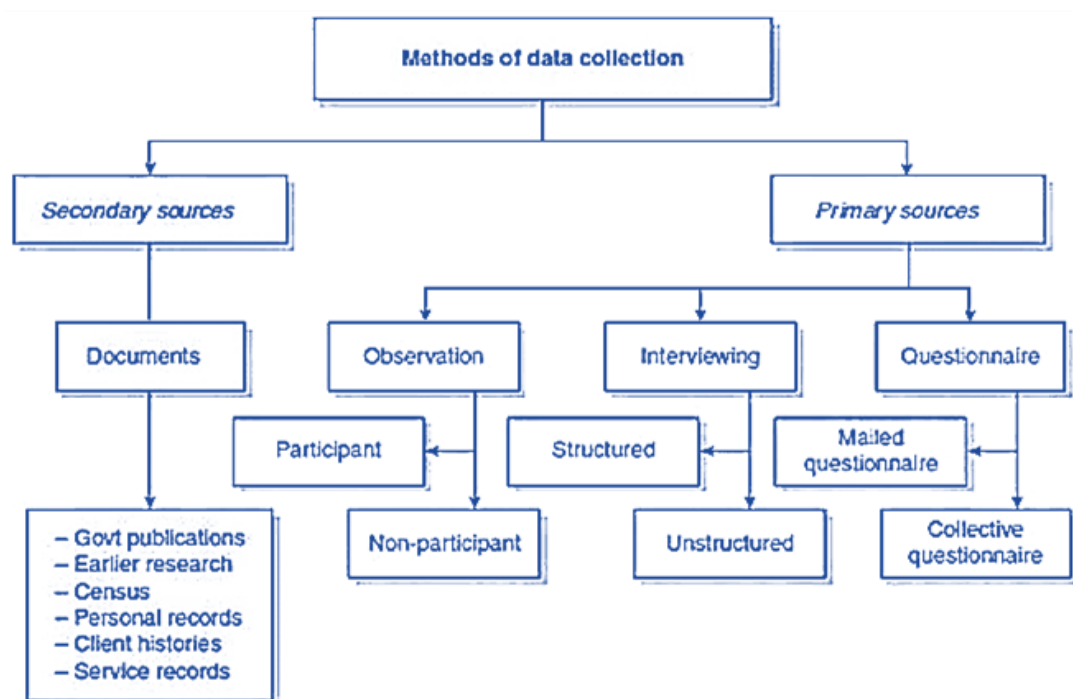


Figure 2-4: Methods of Data Collection

Source: Kumar (2011)

Based on the methodical choice discussed in Section 2.5, this research study was chosen the multi-method qualitative approach which include preliminary interviews, document reviews, and in-depth interviews to collect data.

Secondary sources of data collection

Literature Review: A literature review demonstrates what has been done, what has to be done, as well as what are the contradictions in existing literature related to

relevant research topics (Chandrasekhar, 2002). A study by Snyder (2019) supported literature review as a “basis for knowledge development, create guidelines for policy and practice, provide evidence of an effect, and can engender new ideas and directions for a particular field” (p. 339). The traditional literature review was used to overview the previous research related to a pandemic situation in the construction industry.

A researcher can review existing literature using several methods such as critical literature review, meta-analysis, and systematic literature review (Grant and Booth 2009). Systematic Literature Review (SLR) was selected to identify contractual challenges related to a pandemic. As Jesson, Matheson, and Lacey (2011) summarised, Table 2-1 presents the difference between traditional and systematic literature reviews.

Table 2-1: Traditional Review Vs Systematic Review

	Traditional Review	Systematic Review
Aim	To gain a broad understanding and description of the field	Tightly specified aim and objectives with a specific review question
Scope	Big picture	Narrow focus
Planning the Review	No defined path. Allows for creativity and exploration	Transparent process and documented audit trail
Identify Studies	Searching is probing. Moving from one study to another following up leads	Rigorous and comprehensive search for all studies
Selection of Studies	Purposive selection made by the reviewer	Predetermined criteria for including and excluding studies
Quality Assessment	Based on the reviewer’s opinion	Checklist to assess the methodological quality of studies
Analyse and Synthesis	Discursive	In tabular format and short summary answers
Methodological Report	Not necessarily given	Must be pretended for transparency

Source: Jesson et al. (2011)

Document Reviews: In the qualitative approach, researchers use multiple forms of data, such as interviews, observations, documents, and audio-visual information,

rather than rely on a single data source (Creswell, 2014). According to Kumar (2011), the documentary review is the most common secondary data collection method. Qualitative documents can be public or private documents such as newspapers, meeting minutes, official reports, journals, books, letters, and e-mails (Creswell, 2014). A documentary review was done in this study to find challenges faced by the parties to the contract while implementing contractual provisions during the COVID-19 pandemic.

This study review included the FIDIC 1999 red book and FIDIC 2017 red/ yellow/ silver books from the FIDIC book series. Among the locally popular SBD series of documents, SBD 01 (use for works contracts between Rs. 10.0 million and Rs. 100 million), SBD 02 (use for works contracts over Rs. 100 million), SBD 03 (use for works contracts up to Rs. 10 million), and SBD 04 (use for works contracts where the contractor is culpable for both design and construction of the construction works upon specified approvals of the Employer) were incorporated to find contractual provisions in this study.

Primary sources of data collection

Preliminary Interviews: Mora, Deakin, Reid, and Angelidou (2019) mentioned that preliminary interviews are useful to decide whether to proceed as planned, modify, or change the approach in the study. Identifying the actual nature of challenges faced by the construction industry due to the COVID-19 pandemic was necessary in advance to in-depth interviews. It was required to gather information on whether parties to the contract faced difficulties due to contractual challenges during the pandemic. Based on the gathered information through literature review, preliminary interviews were conducted with contractors who have faced contractual challenges during COVID-19 pandemic period.

In-depth Interviews: According to Mora et al. (2019), the preliminary interview is a preliminary study that can predetermine the applicability of the research process. In qualitative research, *interviewing* is a set of techniques for generating data from individuals and or groups, utilising structured, semi-structured, or unstructured

questioning formats (Jackson, Drummond, & Camara, 2007). According to Pandey and Pandey (2015), “interview is a two-way method which permits an exchange of ideas and information” (p. 59).

In the qualitative approach, researchers can conduct face-to-face interviews over the phone, using the internet, or engages in focus group interviews. These interviews generally involve open-ended questions to elicit views and opinions from participants (Creswell, 2014). Semi-structured interviews were conducted to achieve the research objectives with open-ended questions to collect qualitative data to gather information from the industry experts. All the interviews were conducted using virtual platform (using ZOOM technology) and the duration of interviews were around 45-60 minutes.

2.8.2. Data analysis

Kaul (as cited in Pandey & Pandey, 2015) defined data analysis as “studying the organised material to discover inherent facts and the data are studied from as many angles as possible to explore the new facts” (p. 70). The analysis includes arranging, accounting, and explaining the collected data. Data analysis can be done manually or using computer-aided software. Content analysis is one of the (data analysis) techniques that can be analysed and code textual data (Dumay & Cai, 2015).

Qualitative research findings were analysed via the Content Analysis technique. According to Guthrie, Petty, Yongvanich, and Ricceri (2004), content analysis is one of the most common analysis methods that can apply in investigating the frequency of responses. Software programmes like ‘NVivo’ can minimise that time by making a logical choice for qualitative data analysis over hand coding (Creswell, 2014). Beyond that, NVivo software can organise data and analyse the written information on behalf of the researcher to interpret, construct conclusions, and take actions (Greener & Martelli, 2018). This study used the NVivo 12 plus software to analyse data, together with manual content analysis.

2.9. Research Process

The research process presents how to fulfil the aim and objectives the research study.

It provides a step-by-step guide to the research and Figure 2-5 illustrates the research process adopted in this research. Accordingly, first, the research problem was identified, followed by formulating the aim and objectives during the background study. Then, the study has conducted systematic literature review followed by collecting multiple qualitative methods to collect research data. All qualitative data were analysed using NVivo software and manual content analysis. Finally, the conclusions and recommendations were developed through research findings.

2.10. Chapter Summary

Chapter three is about the way of the research study has been conducted. As well as the methodology for this research study has been described step by step. First, the research design was identified. The qualitative research method was identified as the applicable methodical choice for the research study after considering the characteristics and suitability of three main research choices. The suitable research techniques were found based on previous research. Qualitative surveys and document review were used as the main research strategies and described in this chapter in detailed manner. Finally, the research process was presented at the end of the chapter in Figure 2-5 and it shows the series of actions to achieve the outcome of the research study.

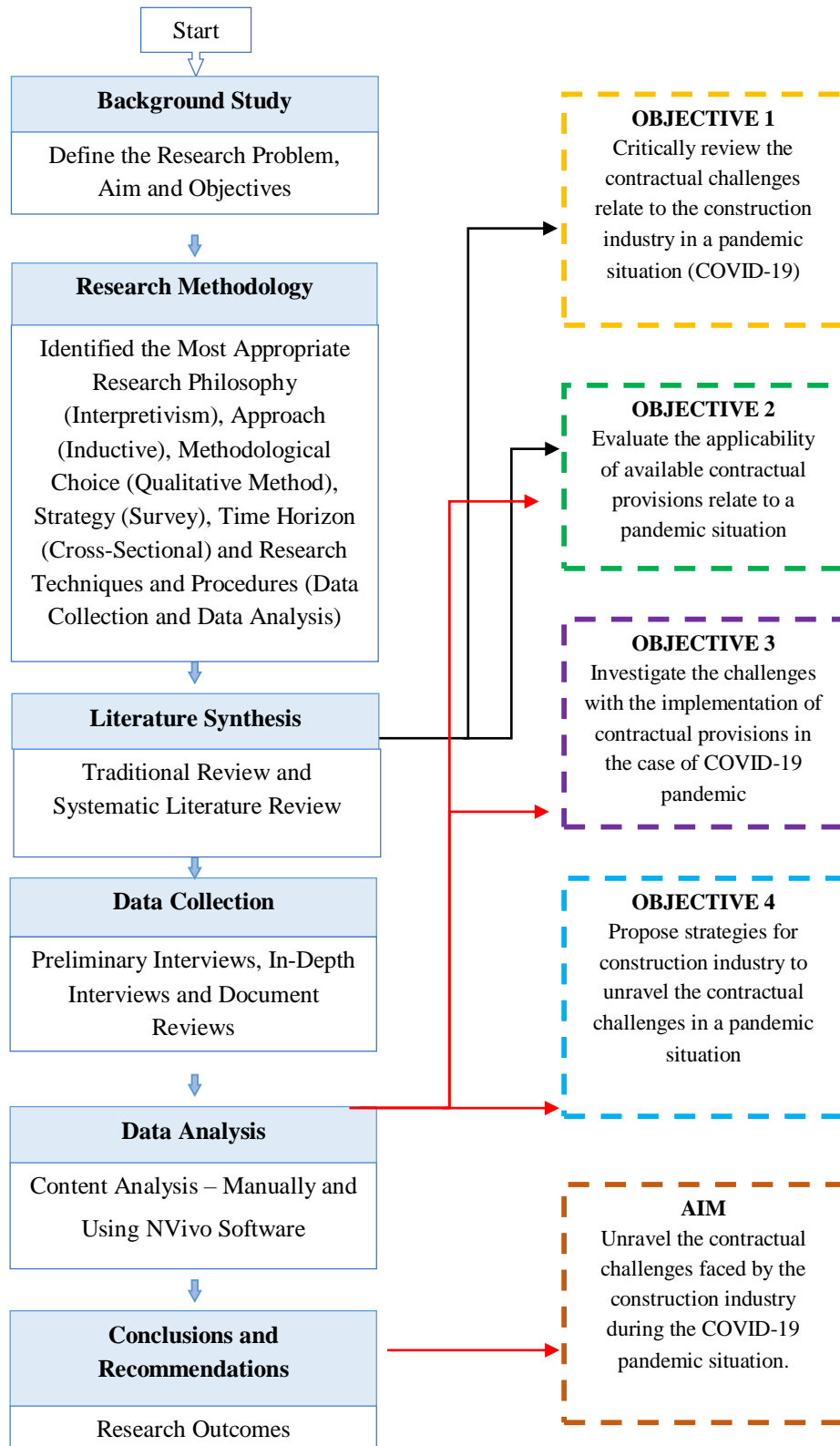


Figure 2-5: Research Process

CHAPTER 3 – LITERATURE SYNTHESIS

3.1. Introduction

This chapter has critically synthesised previous literature relate to the research study while chapter one has donated an abbreviated introduction to the background of the research study. Initially, chapter three attested the impact of COVID-19 pandemic to the world construction industry by systematically reviewing literature on challenges faced by the construction stakeholders due to pandemic situations. Subsequently, contractual provisions strategies to unravel the challenges faced or to be faced by the construction industry have demonstrated through systematic review via findings of the previous researchers. Essentially, findings on COVID-19 have perceived the seriousness of this crisis to the human being and to the whole world.

3.2. COVID-19 as a Pandemic

There have been various pandemics encountered in the past where it caused for numerous serious cases as well as deaths while contrarily affecting economy, security, and wellbeing of human being around the globe (Qiu, Rutherford, Mao, & Chu, 2017).

3.2.1. Idea of a pandemic

People around the world had turmoil about what is a ‘pandemic’ and what are the most effective contrivances to perceive any crisis as a pandemic? (Morens, Folkers, & Fauci, 2009). Morens, Folkers, and Fauci (2009) stated pandemic as an “extensive epidemic” which have the capacity to spreads among any region, country or worldwide. An ‘epidemic’ is an infectious disease which arises among community (Anomaly, 2014). According to Last (2001), Dictionary of Epidemiology defines the term pandemic as an epidemic which can spread on a wide area over international boundaries by disturbing many people. Kelly (2011) described the word ‘pandemic’ using simple words as “an epidemic occurring worldwide”.

The world has been affected by crisis such as Spanish Flu (1918), Asian Flu (1957) and Hong Kong Flu (1968) during last century and Severe Acute Respiratory Syndrome - SARS (2002), Swine flu (2009) as well as Ebola (2014) were there during

near past (Vithana, Bandara, & Jayasooriya, 2020). 1918 influenza, SARS, Ebola and H1N1 influenza were some outbreaks that infected to the world population severely in the past (Ries, 2020). COVID-19 is the current prevailing crisis which was announced as a pandemic by World Health Organisation (WHO) along with the expeditious diffusion over the world (Husien, Borisovich, & Naji, 2021).

3.2.2. COVID-19 pandemic and the world

Morens et al. (2009) stated a pandemic is enormous plague which might bode as far as transparency and consistency. As mentioned by Alsharif et al. (2021), COVID-19 is an unexpected pandemic situation that can be called a large health catastrophe in decades. According to the authors, this tragedy is causation for not only the phenomenal number of deaths and hospitalisations but also high economic slowdown and business disruption. COVID-19 novel outbreak was highly infected among the countries and committed not only social impacts but also economic impacts over international boundaries (Sohrabi et al., 2020). Therefore, the main challenges were to minimise the social impact while minimising the economic effect of the Corona virus (WHO, 2020). Alenezi (2020b) stated, travel restrictions, limitations to public gatherings, school close downs, enhancement of health facilities and other certain intercessions were used as some common measures to neutralise the spread of several pandemics.

First and foremost, countries worldwide promulgated travel limitations within and among the countries and introduced lockdowns while quarantining the people with the strew of Corona virus (Haider et al., 2020). An evaluation was required to identify the level of impacts and uncertainties on the economy along with COVID-19 (Uchehara, Hamma-Adama, Obiri, Jafarifar, & Moore, 2020). Moreover, Iqbal et al. (2021) declared that, communal lockdowns were taken to diminish the impact of COVID-19 to the regular operations of industries such as construction, manufacturing, transportation and aviation. As discussed by authors, construction projects also faced to delays, disruptions and resource related issues with the changes in sequence of day-to-day operations of several industries.

3.3. COVID-19 Pandemic and the Construction Industry

The construction industry plays a crucial role in the development of the economic growth of any country and it has been attested that the construction industry has turned out to be one of the leading industries inside the globe (Vaardini, Karthiyayini, & Ezhilmathi, 2016). In addition, the construction industry is always link with the other industries directly or indirectly (Tripathi & Jha, 2018). When considered the environment of the construction industry, it is continuously facing rapid changes (Enshassi, Mohamed, & Abushaban, 2009). In addition, construction projects involves numerous risks and the management of these risks also comes under project management (Ali & Kamaruzzaman, 2012).

According to the findings of Mokhtariani, Sebt, and Davoudpour (2017), time, cost, and quality represent the main attributes of a construction project, which cannot be accurately determined or evaluated before contracting and cease of the project. The success of construction projects is one of the frequently discussing subject matter in project management (Thomas & Fernández, 2008). This success refers not only to the project completion within expected time and cost but also to the achievement of scope objectives (Ika, 2008). Frimpong, Oluwoye, and Crawford (2003) stated project success is achieving project objectives and goals as planned and it means the successful technical performance as well as perform within budgeted cost and planned time. Aviantara (2020) brought up the ‘pandemic’ as a critical risk factor which ought to discuss within construction industry which can affect the project success.

Porter (2020) reported that there are multiple questions remains within the construction industry along with the pandemic situations which have not been answered yet. Therefore, understanding and analysing the consequences of pandemics to the construction industry is an essential because it plays an extensive role in economic development (Laing, 2020). Production processes and good supply interrupted, many companies abode their services, people lose their jobs and the global financial situation has been shown sudden downturn (Fernandes, 2020). Further, Ogunnusi et al. (2020) stated that construction projects were substantially affected by COVID-19 and it could slow down the construction process and caused for delays and disruptions. Faculty of

Humanities and Social Sciences (2020) reported that, based on the records of Department of Census and Statistics in Sri Lanka, there are almost ninety-five thousand (95,000) people survive with the job opportunities in local construction industry. Moreover, authors stated that due to COVID-19 pandemic situation, most construction projects have reduced the labour utilisation in line with government directions to reduce the impact from the pandemic. Also, Sri Lanka has done an Income Tax Revisions by reducing tax rate applicable on Construction Industry to 14% from 28% with this pandemic (Pricewaterhouse Coopers, 2020).

As mentioned previously, the construction industry plays a main role as a fundamental pillar in any country's economy (Famiyeh, Amoatey, Adaku, & Agbenohevi, 2017). Construction stakeholders has noticed the coming issues along with the curfew and lockdowns such as work with limited human resources, difficulties to proceed with estimated timeline as well as expenditures which not included within the initial cost estimation (Faculty of Humanities and Social Sciences, 2020). Withal, construction stakeholders should be capable enough to answer for following questions such as, what the absolute recommended practices are to make secure the construction industry against a pandemic situation? and what are the unprecedented impacts and consequences of the COVID-19 on the construction industry? (Porter, 2020). Husien et al. (2021) explained that some of the impacts by cause of COVID-19 were more wrathful and pathetic for all construction practitioners in the construction industry.

As summarised by Iqbal et al. (2021), construction industry in most of the counties investigate the applicable approaches to overcome the negative impacts which may arise due to pandemics such as the novel Corona virus is a fundamental need to obstruct an economic downturn (Zamani, Rahman, Fauzi, & Yusof, 2021).

The identified impact on construction industry in some countries as well as the government responses for them are presented in Table 3-1.

Table 3-1: COVID-19 Impact on Construction Industry in Globally

Country	Impact and Government Response
United Kingdom (UK)	<ul style="list-style-type: none"> • 1st Quarter (2020) – Lost 2.1% of Contribution to the GDP from Construction industry • The government announced to design policies to support the construction industry
Australia	<ul style="list-style-type: none"> • Almost 76,500 number of employees lost their jobs during the months of March to May and the worth of work was around 182,000 dollars
New Zealand	<ul style="list-style-type: none"> • Construction works suspended • The government announced to design policies to support the construction industry and boost the economy
India	<ul style="list-style-type: none"> • Investments on construction projects were reduced • Almost 34% of lost their jobs
Nepal	<ul style="list-style-type: none"> • Many contractors suffered from revenue losses during pandemic period due to site management and salary payments
Maldives	<ul style="list-style-type: none"> • More than 7,000 employees in the construction industry suffered from COVID-19 • Construction sector faced losses due to project delays

Source: Iqbal et al. (2021)

3.3.1. Threats to the construction industry

Construction industry always filled with uncertainties and having risky nature which causal for discussions constantly (Ahiaga-Dagbui & Smith, 2014). Risk was characterised as a ramification of uncertainty that might actually affect project objectives (Rafindadi, Mikic, Kovacic, & Cekic, 2014). Risks and uncertainties can cause for negative or positive impact to the construction projects (Eldosouky, Ibrahim, & Mohammed, 2014). According to Khawas and Aghaei (2020), construction stakeholders should have preferable sense to understand uncertainties and risks in early stages relate to construction projects for a better satisfaction of the own organisations itself.

Frequently occurring risks due to uncertainties are about planned cost and the estimated duration of the projects (Flyvbjerg, Garbuio, & Lovallo, 2009). In addition,

it can affect to the quality of the work, project performance as well as productivity (Mills, 2001). Most of the times unforeseen or unexpected situations, pandemics or adverse weather conditions can be causal for cost overruns, delays and disruptions in site activities (Siemiatycki, 2015). Moreover, construction projects currently have been adversely influenced by the pandemic ‘COVID-19’, and the virus will keep on affecting the other industries also, for a time of the future (Ataei et al., 2021).

Current construction projects, even moderate-sized projects are typically multidisciplinary in nature and more participants such as designers, contractors, subcontractors, specialists, construction managers, and consultants are involving with the construction process (Iyer & Jha, 2005). Traditionally, the main stakeholders in a project such as a contractor and a client have more influence on the performance of any project (Deshmukh & Menkudle, 2019). Construction sector is having strong connection with risks and uncertainties than other industries (Rafindadi et al., 2014). Therefore, the effect of the COVID-19 outbreak has been impacted badly not only to the contractors but also to the employers who are financing construction projects (Bailey et al., 2020). Along with the spread of Corona virus, the construction stakeholders had to deal with a number of risks due to several uncertainties in construction projects (Albertini, 2020).

Alenezi (2020a) stated, payments delay by the main contractor to the subcontractors was one of the issues faced by the construction industry during the COVID-19 pandemic situation. According to the author, there is a possibility to clear the issue fairly by discussing together with all parties involved. Risks cannot be wiped out, yet surely may limit, transfer or held (Mills, 2001). The coverage termed ‘contingency’, which is the amount added by the contractors to the base estimate while bidding for projects (Lutz, 2020). The offer of the bidder along with the contingency amount should have capability to cover contractors’ potentials risks and thereby avoid future losses up to considerable extend (Sonmez, Ergin, & Birgonul, 2007).

3.3.2. Opportunities to the construction industry

Regardless of the threats to the construction industry, construction stakeholders have experienced more opportunities with the COVID-19 pandemic (Alsharef et al., 2021).

Assaad and El-adaway (2021) mentioned that the enhancement of technology adaption to the industries is a positive impact on the current pandemic. Added to that, positive impacts due to lower interest rates, engagement of new skilled workers to the industry and opportunities with demand increment in residential sector are some other plus points to the construction industry (Alsharef et al., 2021).

Ogunnusi et al. (2020) reported that opportunities unfolded in modern procurement planning, the requirement for virtual working and unique design considerations. Moreover, authors mentioned studies which can pave the way to develop supplementary contingency plans and a prominent working strategy in a reduced human contact are current necessities in construction industry during a pandemic.

3.4. General Challenges with a Pandemic in Construction Sites

Apart from job risk, employees and professionals who carry out their duties on construction sites are facing higher risk of exposure and infection from aerosol and droplet contamination (Zheng, Chen, & Ma, 2021). Pamidimukkala and Kermanshachi (2021) have identified challenges faced by the construction industry during COVID-19 pandemic based on the existing literature and were assorted to five categories: organisational, economic, psychological, individual, as well as moderating factors. In addition, authors mentioned, challenges with health and safety are the major issues faced by the contractors within the site and respective other challenges will be occurred due to health and safety issues.

The Corona virus pandemic has asserted significant obstacles to global economic development and has an unparalleled force on the construction sector (Alsharef et al., 2021). Moreover, Alsharef et al. (2021), American Society of Civil Engineers [ASCE] (2020) and Osuizugb (2020) also listed out few general challenges faced by the construction industry during the period of COVID-19 pandemic. All identified challenges are presented under five categories in Table 3-2.

Table 3-2: General Challenges Related to COVID-19 in Construction Sites

Category	General Challenges
Economic Factors	<ul style="list-style-type: none"> • High demand of suppliers and manufacturers • Project abandonment • Uncertainty in future projects and works • Delays and disruptions in supply chain • Payment delays and cashflow issues • Less accessibility to modern tools and equipment • Lack of funding • Suspensions or terminations of projects • Increase of claims and disputes • Less productivity in site works • Escalations in prices
Psychological Factors	<ul style="list-style-type: none"> • Isolation with the use of online platforms • Stress
Organisational Factors	<ul style="list-style-type: none"> • Unsafe working environment • Issues due to implementation of Work From Home (WFH) concept • Issues in managing workload with restricted access to sites • Less involvement of leadership, knowledge and skills • Delays in permits or license
Moderating Factors	<ul style="list-style-type: none"> • Issues on migrant employees • Gender based impacts
Individual Factors	<ul style="list-style-type: none"> • Difficulties when learning technologies and tools in virtual platform • Difficulties when adjusting to new schedules • Responsibilities for family • Feeling of less contribution to work

Adapted From: Pamidimukkala and Kermanshachi (2021); Alsharaf et al. (2021); American Society of Civil Engineers [ASCE] (2020) and Osuizugb (2020)

On the other hand, Zamani et al. (2021) mentioned, project duration, construction material and human resources are the three main factors related to the project operations. According to authors, project operations were delayed because COVID-19 smashed up these three factors.

Although parties to the contracts needed to re start project activities the innate labour intensive nature of construction project causes additional difficulties because construction activities needed to be completed onsite and the limitations on the feasibility of social distancing on construction sites (Zheng et al., 2021). Most frequent reasons for project delays occur because of the daily working period has been curtailed and absence of employees to the assigned work on time (Alenezi, 2020b). Construction parties should always be aware about uncertainties, incompleteness and unforeseeable circumstances, that factors affecting construction costs (Elhag, Boussabaine, & Ballal, 2005).

Delayed payments and escalation of project cost are finance related challenges faced by the construction industry along with the prevailing crisis (Zamani et al., 2021). Moreover, Luo, Liu, Li, Chen, and Zhang (2020) had identified issues related to successful project delivery, communication among parties and advanced design preparation as well. Moreover, construction parties should be in touch with health and safety on site, economic cost, practicable legal exposures, human resource obtainability, disruption of the supply chain and subcontractors, the concerns related to the regular evolution of challenges due to a pandemic while concentrating all possible challenges that are going to happen in future (Sierra, 2021).

3.5. Contractual Challenges in Construction Sites

The triumph of a project will based on how that project clinch its objectives with relation to attributes such as cost, quality and duration (Malkanathi, Premalal, & Mudalige, 2017). As mentioned by Skitmore and Ng (2003), contractual characteristics can influence the actual construction cost and duration in construction projects.

According to the interpretation of "Law Insider" (2022) 'Contractual Challenges' can outline as "any differences arising out of the interpretation, application, administration, or alleged violation of the collective agreement" ("Law Insider", 2022). Also, contractual challenges faced by the contractors may be due to unjustly, improper or unreasonable acts of the Employer ("Law Insider", 2022) .

Gamil and Alhagar (2020) explained that the contractors are also bound to face legal issues as a consequence of the nonconformity of contractual terms which is formed since the suspension of the project and unanticipated fluctuation of material price. The authors have recognised the most noticeable impacts of COVID-19 are the suspension of projects, labour impact and reduction in number of jobs, time overrun, cost overrun, and financial implications.

Kabiru and Yahaya (2020) reviewed the impact of COVID-19 and brought to light that professionals had to face some legal challenges in the construction industry. Among them contractual issues were brought up in order to provide an assistant to contractors in claiming loss and expenses and extension of time (EOT) (King et al., 2021). The pandemic raised number of challenges at the level of the workforce, low or halting productivity, production time and costs, along with disputes in contractual formulas for construction projects (Husien et al., 2021).

3.5.1. Contractual challenges in construction sites in general

Disputes or Contractual challenges have arisen when a party or parties seek their entitlement for any damages or specific performance from the other party (Chong and Phuah 2013). The authors have summarised contractual challenges that can be faced by construction stakeholders during the pre-contract stage, construction stage and post-construction stage in general. Figure 3-1 presented the contractual challenges in general during the construction stages when there is not any pandemic situation.

As reported by Kiraz and Ustun (2020) COVID-19 has similar behaviour like outbreaks such as SARS or Ebola. As stated by authors the world has faced a huge baneful situation which no one could foresee its impact. The contractual provisions,

stakeholder' obligations, as well as contractual challenges also may differ from the general situation in pandemics like COVID-19 (Andres et al. 2020).

Pre Contract Stage	<ul style="list-style-type: none"> • Estimating and pricing • Design information • Insurances • Performance bond submission 	<ul style="list-style-type: none"> • Site possession • Work program • Tender documentation and requirements
Construction Stage	<ul style="list-style-type: none"> • Accessing to site • Compensation/loss and expenses • Default on notice • Delay and extension of time • Discrepancy and inconsistency of information • Fluctuation of price • Interference/problem by subcontractors and suppliers • Interference/problem by professionals • Interim payment • Partial possession • Period of honouring certificates 	<ul style="list-style-type: none"> • Postponement or suspension of work • Practical completion • Quality of workmanship • Set off by the employer • Site and nature of work • Standard and quality of material • Statutory obligations • Supply difficulties • Testing and inspection • Valuation and measurement • Contractual variations • Weather
Post Contract Stage	<ul style="list-style-type: none"> • Defect liability period • Defects • Determination • Dispute resolution • Final account and certificate 	<ul style="list-style-type: none"> • Liquidated damages • Outstanding claim and set off • Retention monies or fund • Unresolved variations

Figure 3-1: Contractual Challenges During Construction Phases in General
Adapted From: Chong and Phuah (2013); Anwar et al. (2020)

3.5.2. Contractual challenges in construction sites in a pandemic situation

As stated by Niraula, Goso, and Kusayanagi (2008), COVID-19 pandemic has been a huge threat to the contractual performance in many industries including the construction sector and proper contract administration is one of the main challenges faced by the construction stakeholders along with this crisis. The construction organisations have been daunted with COVID due to the uncertainties and less awareness about contractual challenges resolution (Andres et al, 2020). COVID-19 outbreak reminds the researchers about the need of creative responses to contractual

challenges arising with pandemics (Pedamon and Assileva, 2021). Hence, to identify the specific contractual challenges due to a pandemic situation, a systematic literature review was conducted. The following subsections present the process and the findings of systematic literature review in as descriptive way.

3.5.2.1. Systematic literature review

As defined by Biolchini et al. (2005), a systematic review is a “specific scientific methodology of research, developed to gather and evaluate the available evidence pertaining to a focused topic”. Besides, the systematic review aims to comprehensively identify all relevant studies to answer a particular question, and assess the validity of each study to sum up with a conclusion (Petticrew & Roberts, 2006). A comprehensive SLR can address the current state of the respective topic in the field, what are the further research priorities as well as what are questions should be answered by a researcher in the respective field (Page et al., 2021). When selecting articles in a SLR, a researcher should focus on the search terms, inclusion and exclusion criteria as well as the appropriate keywords when searching articles to review (Moher et al 2009). The keywords considered for the SLR have presented in Table 3-3.

Table 3-3: Key Words for the SLR

Key Words	Limitations
COVID, Corona, Construction, Contractual Challenges, Contractor	Language: English Time: 2020-2022 Topic: Construction Industry

Subsequently, the reporting guideline for quality review, Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) was adopted to improve the quality of review the articles in the research. According to Selcuk (2019), the PRISMA guideline consists of a four-phased flow diagram and the phases are;

- 1) Phase 1: Identification
- 2) Phase 2: Screening
- 3) Phase 3: Eligibility
- 4) Phase 4: Inclusions.

Within the four phases stated above eight stages were incorporated to get the maximum outcome from the review and the steps are presented in Table 3-4.

Table 3-4: Steps of SLR

Key Words	Limitations
Initial review	How the construction industry affected by the pandemics
Objective	Find the contractual challenges faced by the construction industry
Criteria for considering studies	Papers that addressed pandemic situations along with the impact of the construction industry
Strategy to obtain the studies	Research articles in three databases (Emerald Insight, Science Direct, Scopus)
Eligibility	Articles from the year 2020 to 2022; peer-reviewed and proceedings
Data collection	Exclusion of repeated articles; read of abstracts, and read of the full article
Quality assessment	Articles analysed by the authors
Synthesis results	Results are presented under suitable topics

Source: Benachio et al. (2020)

Search strategy

Emerald Insight, Science Direct and Scopus were the three databases selected to conduct SLR. When following the steps of SLR, initially 328 articles were identified in the first. Then 44 articles which suitable to answer the research problem were selected. The article search was performed using the search query “Contractual Challenges” AND “Pandemic” AND “COVID” OR “Corona” AND “Construction” AND “Contractor” AND “Issue” OR “Problem” (the Boolean operators “AND” is used to link the two fields, and “OR” is to combine the two fields). Articles from subject areas such as Medicine, Biochemistry, Earth and Planetary Sciences, Environmental Science, Nursing, Immunology and Microbiology, Psychology, Agricultural and Biological Sciences, Neuroscience, Veterinary were eliminated when searching the articles to get the best results. One of the most important search criteria was the article published year.

To incorporate the most novel articles to review, the articles which have been published in the year 2020 and 2021 were considered. According to Cochrane handbook for systematic reviews of interventions (2019), a SLR should clearly formulate the research question. Therefore, the boundaries of the research should be clearly identified. Accordingly, the search strategy included Journal articles, Conference papers, Book chapters and Books in the "construction" field and was limited to the articles which included the terms "Contractual Challenges" with the "COVID or Corona" in the title, abstract, keywords or full text.

Data extraction from data bases

Keywords are one of the major elements in research studies that help to discover information easily before reviewing the papers (Norouzi et al. 2021). An analysis of keywords was done within this study using a co-occurrence network using the software called VOS viewer and presented in Figure 3-2. Articles identified through three databases were used to create the network. The frequency of each keyword is presented by nod size, and the relationship among keywords are presented through links. Three colours are used to present the three clusters.

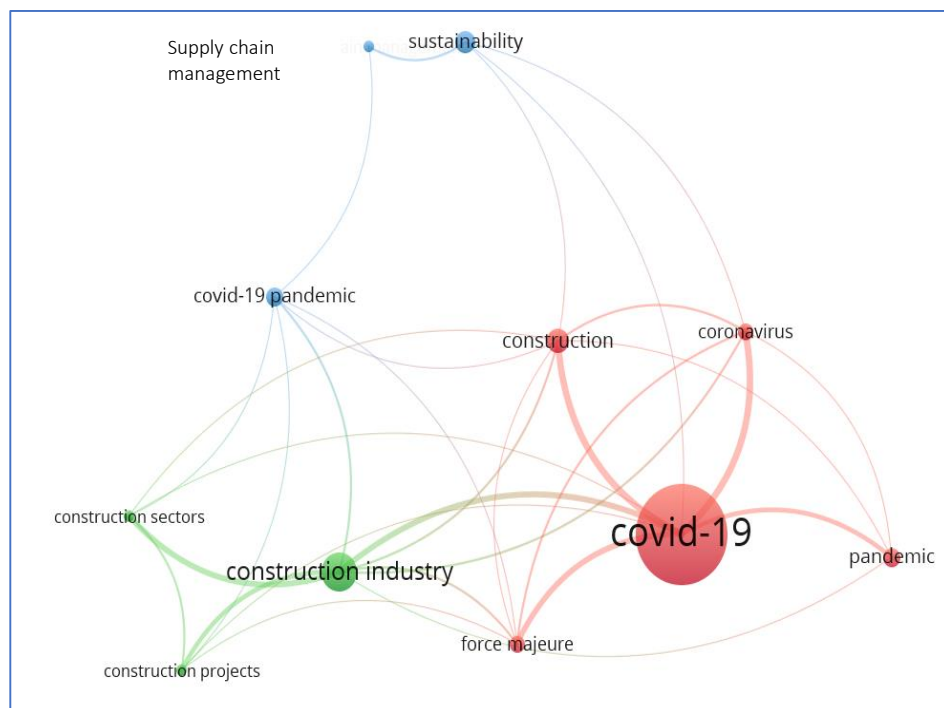


Figure 3-2: Co-occurrence of Authors Key Words

Cluster 1 in Figure 3-2 consisted of five keywords (COVID-19, Corona Virus, Construction, Force Majeure and Pandemic), cluster 2 consisted of 3 keywords (COVID-19 Pandemic, Supply Chain Management and Sustainability) and cluster 3 consisted of 3 keywords (Construction Projects, Construction Sector and Construction Industry).

The flow diagram was used to present the process that adapted to extract data from databases. Figure 3-3 illustrates the article selected for the SLR through the PRISMA method. First, the article search was performed using the search query and duplicated articles were removed from the list ($328-5-2=321$). Simultaneously, articles not relevant to the study were removed. Then the title, keywords, abstract, year, source title and access type, and authors were exported to an excel document. The document screening began by analysing the title, keywords, and abstract. The inputs not relevant to the study were removed from the list directly, while doubtful and important articles were noted for further screening ($321-220=101$).

As the next step, the filtered articles were assessed through reviewing the full text, and the articles not available to refer to full text and the irrelevant to the study were excluded from the list ($101-81=20$). Finally, the list of articles was concluded, including the articles with the most significant contents and findings to the study.

The selected articles for the review addressed the general challenges faced by the construction industry during a pandemic situation and contractual challenges during a pandemic situation. After reviewing full articles, 20 articles were selected to synthesis in the paper. Among them, 15 contractual challenges were identified. Most of the authors do not directly address the contractual challenges by giving the term 'contractual' but indirectly identify contractual challenges within their studies.

Table 3-5 present the key findings of the systematic literature review.

IDENTIFICATION OF STUDIES VIA DATABASES AND REGISTERS

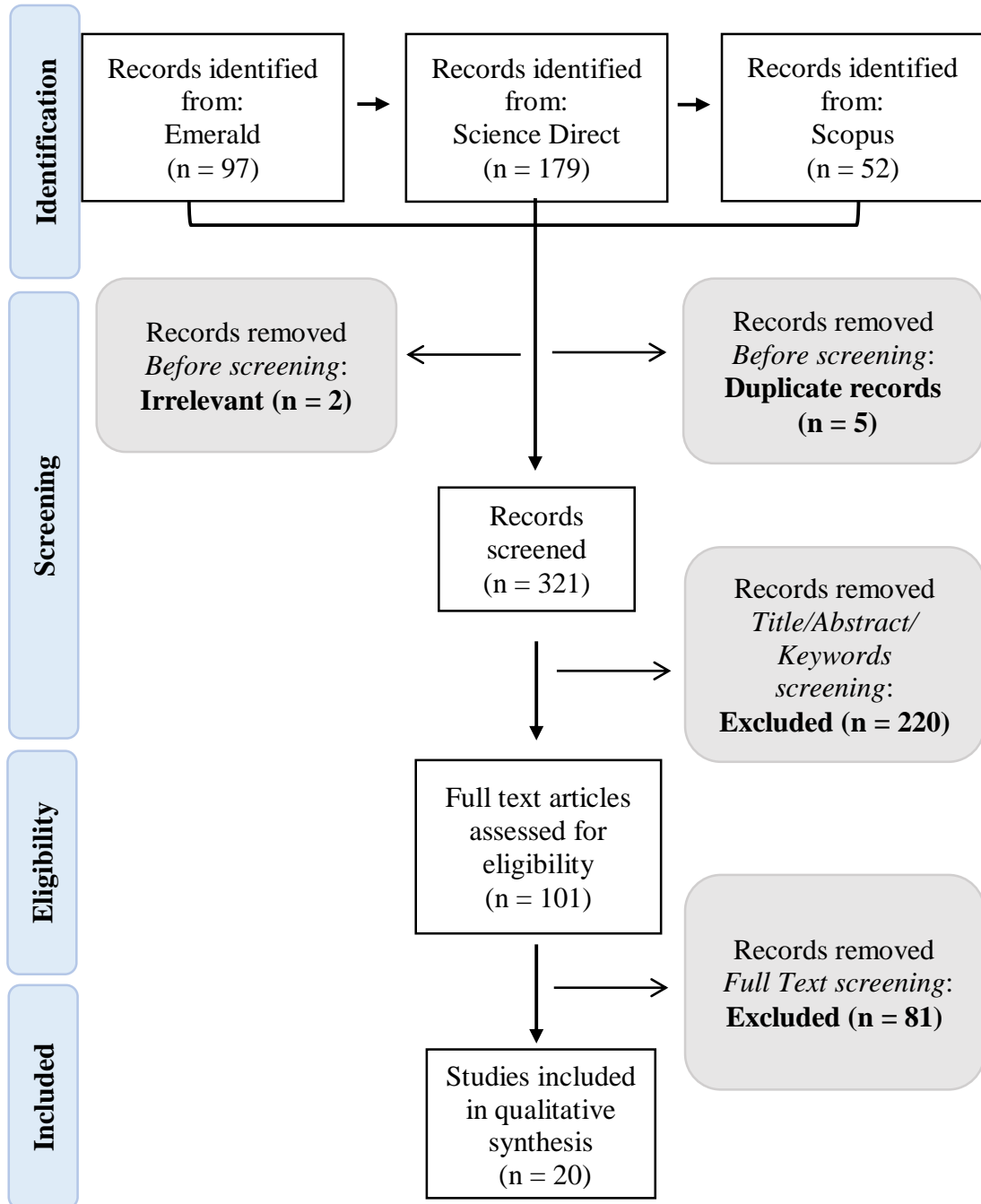


Figure 3-3: Flow Diagram of SLR

Table 3-5: Contractual challenges due to a pandemic situation in construction industry

Contractual Challenges due to COVID-19 (CCC)	Sources of References																				Frequency
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	(F)
CCC 1: Increment in project cost	√	√	√	√	√		√	√	√			√			√		√	√	√	√	14/20
CCC 2: Increment in project time	√		√		√		√	√	√				√		√		√		√	√	11/20
CCC 3: Disruption in project works	√	√				√	√		√	√	√			√		√		√			10/20
CCC 4: Issues in supply chain	√			√				√		√			√	√	√	√		√	√		10/20
CCC 5: Labour shortage and productivity loss	√		√						√					√	√	√			√	√	8/20
CCC 6: Delayed payments	√	√	√								√	√	√		√				√		8/20
CCC 7: Cash flow issues	√											√			√		√		√		5/20
CCC 8: Suspension of work					√				√				√	√							4/20
CCC 9: Project termination					√	√								√							3/20
CCC 10: Uncertainty in new projects execution								√	√				√								3/20
CCC 11: Failure in claim notifications of contractors within the relevant period			√																√		2/20
CCC 12: Cannot secure site efficiency	√																				1/20
CCC 13: Failure in implementing quality monitoring and control processes			√																		1/20
CCC 14: Interpretation of the contract language				√																	1/20
CCC 15: Liquidated damages					√																1/20

1) Amoah et al. (2021); 2) Agyekum et al. (2021); 3) Aladag et al. (2021); 4) Al-Mhdawi et al. (2022); 5) Assaad and El-Adaway (2021); 6) Casady and Baxter (2020); 7) Ebekoziem and Aigbavboa (2021); 8) Ephrem and Appaadurai (2020); 9) Hussain et al. (2021); 10) Israhadi (2020); 11) Januarita and Sumiyati (2021); 12) Mohamed & Elhegazy (2021); 13) Pamidimukkala and Kermanshachi (2021); 14) Pedamon and Assileva (2021); 15) Rehman, Muhammad, Sami et al. (2021); 16) Salami, Ajayi, and Oyegoke (2021); 17) Sierra (2021); 18) Simpeh et al. (2021); 19) Singh and Leo (2021); 20) Wendy et al. (2021).

Frequency of identified contractual challenges

The frequency of the contractual challenges stated by the researchers has presented in Figure 3-4.

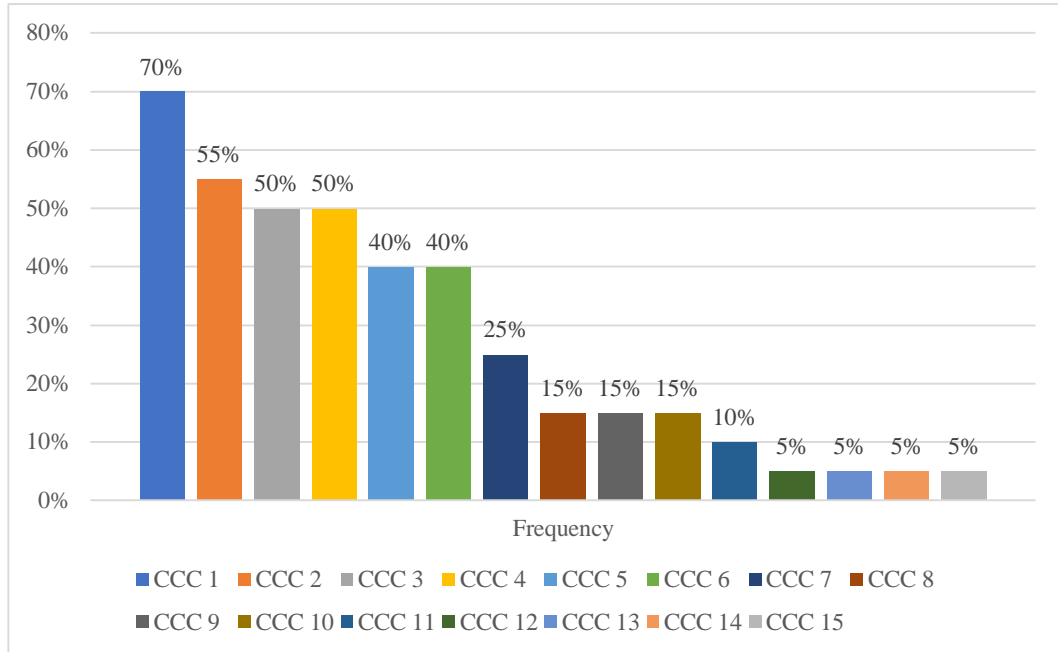


Figure 3-4: The frequency of contractual challenges mentioned by the researchers

Increment in project cost has been identified in 70% of research articles as a contractual challenge with a pandemic. The research articles identified increment in project time, Disruption in project works, and Issues in the supply chain as the prominent contractual challenges of the construction industry. Altogether, this study identified 15 contractual challenges as stated in Table 3-5.

3.6. Contractual Provisions Related to a Pandemic Situation in Construction Industry

There was much ambiguity and uncertainty regarding how to encounter the pandemic on construction sites due to the scarcity of definite construction-related guidelines and best practices (Budds, 2020). Even though, the government and health organisations have published guidelines to overcome the spread of the virus in the worksites, there have not been any specific guidelines for employees in construction industry (Afkhamiaghda & Elwakil, 2020). Following sub sections describe

regulations/act/ordinance/circulars/guidelines, contractual implications and contractual provisions related cases applicable to a pandemic situation.

3.6.1. Regulations/act/ordinance/circulars/guidelines

Various countries and organisations have established a series of guidelines and suggestions for infection prevention (Zheng et al., 2021).

- COVID-19 - Temporary Measures Act (Singapore).
- Health and Safety Guidelines for Sri Lankan Construction Sites to be adopted during COVID-19 outbreak (Construction Industry Development Authority – CIDA).
- Development of the Sri Lankan construction industry – The way forward after COVID-19 (Construction Industry Development Authority – CIDA).
- Quarantine and Prevention of Disease Act - 1897 (Health and Safety Guidelines for Sri Lankan Construction Sites to be adopted during COVID-19 outbreak).
- Quarantine and Prevention of Diseases Ordinance – 2020.
- International Federation of Consulting Engineers (FIDIC) COVID-19 Guidance Memorandum (To users of FIDIC standard forms of works contract).
- Phase I COVID-19 construction guidelines for the safety of returning construction workers (Washington).
- Gazette Extraordinary No. 2167/18 (COVID-19 announced as a quarantinable disease for the purposes of the existing Quarantine Regulations passed under the Ordinance in 1925 and 1960 – Sri Lanka).
- Gazette Extraordinary No. 2168/6 (Defining the proper authority and a diseased locality – Sri Lanka).
- Gazette Extraordinary No. 2197/25 (Restriction of movement and guidelines to be followed in public places – Sri Lanka).
- Act building and construction industry COVID-19 safety guidance.
- COVID-19 construction contract checklist in common and civil law countries.

As mentioned by Ogunnusi et al. (2020), the construction industry has been substantially troubled by COVID-19 pandemic and construction stakeholders have given full attention on standard forms of contracts such as FIDIC. Seifert (2005) stated that the International Federation of Consulting Engineers FIDIC is the extensively used international form of construction contract in the world. Further, FIDIC tries to evade disputes by minimising variations to a factual limit after which a substitute process should be agreed (Besaiso, Fenn, Emsley, & Wright, 2016). According to King et al. (2021), the government should revise the contracts of government projects to assist the contractor to claim losses that delayed due to lockdown, and further should allow Extension of Time to cover the period which projects stopped or suspended.

3.6.2. Contractual implications related to COVID-19

As stated by Piper (2020b), World Health Organisation (WHO) defines *epidemic* as:

“The occurrence in a community or region of cases of an illness, specific health-related behaviour, or other health-related events clearly in excess of normal expectancy” (p. 1).

Further, Nicoll (2011) stated that WHO provides the following as a *pandemic*:

“a pandemic is an epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people” (p. 542).

Furthermore, Bailey et al. (2020) expressed, contractually, incidents like COVID-19 situation usually engage with contractual provisions come under unforeseen events. In line with the authors, contractual provisions come under unforeseen events commonly befall under two categories named ‘force majeure’ and ‘changes in legislations’ which may yield a heterogeneous legal effect.

Force Majeure

According to FIDIC (1999), a comprehensive term ‘force majeure’ indicates to events unforeseeable at the time the contract was entered into, outside the affected party’s control, which cannot be prevented or overcome, and lead to a party not being able to perform some or all of its obligations.

The majority of internationally used construction contracts (for example, FIDIC, JCT, NEC) have specific force majeure protocols, though, there is not any standard legal definition of force majeure (Kabiru & Yahaya, 2020). Rathbone, Grenfell, and Wright (2020) declared that, force majeure clauses customarily include a list of events that will constitute force majeure, but force majeure clause does not include precise wording applicable to COVID-19 pandemic, the party perusing to believe in the force majeure clause will require to examine the wording of the clause attentively.

According to the explanation of Salami et al. (2021) in contractual language, COVID-19 pandemic would fit with the force majeure clause if it is specifically mentioned under events such as “disease outbreak”, “epidemic” or “pandemic”. As per the authors, parties should concern does the contract contain wording such as ‘**or any other causes beyond our control**’ after the list of specific force majeure events. The unfavorable effects of COVID-19 had a considerable impact, such as impacting onsite work activities, the bill of quantities, project completion, law of contract or being the reason for Force Majeure events in the construction industry (Zamani et al., 2021).

The test of force majeure event must need to satisfy the following criteria:

1. The event must be beyond the reasonable control of the affected party
2. The affected party must have taken all reasonable steps to seek to avoid or mitigate the event or its consequences
3. The affected party’s ability to perform its obligations under the contract must have been prevented, impeded or hindered by the event (Kabiru & Yahaya, 2020).

In most contractual agreements, pandemics like COVID-19 has not been considered as a ‘force majeure’ event (Coerderoy & Ben, 2020). Chivilo, Fonte, and Koger (2020) declared that, the provisions covered by a force majeure or excusable delay clause might differ, because it should not be assumed that any contractual language addressing excusable delays directly applies to the COVID-19 pandemic. Moreover, authors highlighted that a cautious review of the language of any force majeure provision needed to be take upon to ascertain whether impacts arising from the COVID-19 outbreak are contained as an excusable delay.

Changes in law

This is the next contractual provision is relevant to legal effects. It concerns changes in legislation/law (Bailey et al., 2020). When compared to force majeure, change in law provisions in construction and engineering contracts might grant a right to both an extension of time for the contractor and compensation for the unavoidable costs aroused because of a change in law (FIDIC, 2017). Table 3-6 presents a comparison between force majeure clause and changes in legislation/law clause in standard forms of contracts.

Table 3-6: Comparison of Force Majeure and Changes in Law Clauses in Standard Forms of Contracts

	Force Majeure	Changes in Law
Event Covered	Government action	Introduction of new law
Performance Affected	Prevention Delay	Cost increase or decrease Delay in completion
Relief Granted	Excuse from the affected obligations	Price increase or decrease Extension of time

Source: Ford and Bloch (2020)

Under various forms of contract, containing the FIDIC forms, a force majeure event would generally entitle a contractor to an extension of time for critical delay derived due to the event, but not to compensation for costs yielded during the period of delay, except in agreed upon circumstances (FIDIC, 1999). As often, the precise wording of the applicable clauses are important (Bailey et al., 2020). Elder, Huiginn, and Black (2022)'s opinion that, if the provision does not contain language to that effect, thus it is needed to examine whether COVID-19, or its effect on the construction project, is considered by a different concept, such as "Act of God", action by government, or a catch-all provision.

Change in law/legislation clause would be further beneficial than the force majeure clause in the prevailing COVID-19 situation, where the contract may still be performed yet there is delay and elevated cost because adhering to the government regulations (Ford & Bloch, 2020).

As mentioned by Paor, Honlet, Klasener, Young, and Schouwenburg (2020) contractors are advised to recover additional costs occurred due to pandemic through the change of laws provision as mentioned by FIDIC Guidance Memorandum. Nevertheless, parties to the contract should analyse the additional time and costs occurred as well as contractual provisions under force majeure and legislation changes to be aware about the way of risk allocation between parties (Baker, 2021). Nevertheless, Ramya (2019) mentioned there will be a high involvement of contractors, clients, subcontractors, suppliers, tenants as well as insurance entities with the disputes related to COVID-19 in future. Table 3-7 provides contractual clauses related to a pandemic situation regarding international and local forms of contracts.

Table 3-7: Applicable Contractual Provisions for a Pandemic Situation

Clause	FIDIC 1999 (Red)	FIDIC 2017 (Red/Yellow/Silver)	SBD 1	SBD 2	SBD 3	SBD 4
Adjustments for Changes in Legislation/Law	13.7	13.6/13.7	45.1	13.6		13.6
Force Majeure/ Exceptional Events	19.0	19.0		20.0	12.2	20.0
Compensation Events			44.1			
Right to Claim	20.1	20.1		19.1	9.4	19.1
Extension of Time (EOT)	8.4	8.4/8.5		8.4	6.3	8.4
Exceptional Events		18.0				

There are coming issues related to the construction industry along with the curfew and lockdowns in many countries (Faculty of Humanities and Social Sciences, 2020). Baker (2021) analysed the contractual provisions related to a pandemic which would include the provisions such as force majeure, changes or extra work, changes in applicable law, payment scheme, suspension and termination.

Table 3-8 provides a detailed description and entitlement of each clause that refers to a pandemic situation as per the standard forms of contracts.

Table 3-8: Summary of the Entitled Contractual Provisions

Entitlement	Form of Contract
<ul style="list-style-type: none"> • When the government announced, ‘Work from Home’ or ‘imposed curfew’, and prevented site operations, as per the conditions of the form of contract, the Contractor can maintain a claim under Sub-Clause 45.1 [Change in Law], prevention of work due to governmental directives and/or action following the vested power to the competent authority. In this situation, the Contractor can claim only associated Cost due to Changes in Legislation because the Sub-Clause 45.1 is silent about the adjustment to Time. • Therefore, the Contractor has the liberty to claim an EOT, according to Sub-Clause 44.1 (m) [Compensation Events], for the prevention of work due to governmental directives and/or action in accordance with the vested power to the competent authority. 	ICTAD/SBD/01
<ul style="list-style-type: none"> • When the government announced, ‘Work from Home’ or ‘imposed curfew’, and prevented site operations, as per the conditions of the form of contract, the Contractor can maintain a claim pursuant to Sub-Clause 13.6 [Adjustments for Changes in Legislation], prevention of work due to governmental directives and/or action in accordance with the vested power to the competent authority. In this situation, the Contractor can claim both EOT and associated Cost, due to Changes in Legislation. • The Contractor can maintain a claim pursuant to Clause 20 [Force Majeure] due to the event or circumstances ‘beyond a Party’s control’. • If the event is a Force Majeure and the Contractor suffered delay or incurred Cost, the Contractor can claim both EOT pursuant to Sub-Clause 8.4 [Extensions of Time] and associated Cost under Sub-Clause 19.1 [Contractor’s Claims]. 	ICTAD/SBD/02
<ul style="list-style-type: none"> • When the government announced, ‘Work from Home’ or ‘imposed curfew’, and prevented site operations, as per the conditions of the form of contract, the Contractor can maintain a claim pursuant to Sub-Clause 9.4 [Right to Claim] and 6.3 [Extension of Time], prevention of work due to governmental directives and/or action in accordance with the vested power to the competent authority. • If the event is a Force Majeure, Sub-Clause 12.2 [Force Majeure] is silent about the EOT and associated costs related to a respective event. 	ICTAD/SBD/03
<ul style="list-style-type: none"> • When the government announced, ‘Work from Home’ or ‘imposed curfew’, and prevented site operations, as per the conditions of the form of contract, the Contractor can maintain a claim pursuant to Sub-Clause 13.6 [Adjustments for Changes in Legislation], prevention of work due to 	ICTAD/SBD/04

Entitlement	Form of Contract
<p>governmental directives and/or action in accordance with the vested power to the competent authority. In this situation, the Contractor can claim both EOT and associated Cost, due to Changes in Legislation.</p> <ul style="list-style-type: none"> • The Contractor can maintain a claim pursuant to Clause 20 [Force Majeure] due to the event or circumstances ‘beyond a Party’s control’. • If the event is a Force Majeure and the Contractor suffered delay or incurred Cost, the Contractor can claim both EOT pursuant to Sub-Clause 8.4 [Extensions of Time] and associated Cost under Sub-Clause 19.1 [Contractor’s Claims]. 	
<ul style="list-style-type: none"> • When the government announced, ‘Work from Home’ or ‘imposed curfew’, and prevented site operations, as per the conditions of the form of contract, the Contractor can maintain a claim pursuant to Sub-Clause 13.7 [Adjustments for Changes in Legislation], prevention of work due to changes in the Laws or such interpretations, made after the Base Date. In this situation, the Contractor can claim both EOT and associated Cost due to Changes in Legislation. • The Contractor can maintain a claim pursuant to Sub-Clause 8.4 (d) ‘Unforeseeable shortages in the availability of personnel or Goods caused by an epidemic or governmental actions or Clause 19 [Force Majeure] due to the event or circumstances ‘beyond a Party’s control’. • If the event is a Force Majeure and the Contractor suffered delay or incurred cost, the Contractor can claim both EOT pursuant to Sub-Clause 8.4 [Extensions of Time] and associated Cost under Sub-Clause 20.1 [Contractor’s Claims]. 	FIDIC (1999) Red Book
<ul style="list-style-type: none"> • When the government announced, ‘Work from Home’ or ‘imposed curfew’, and prevented site operations, as per the conditions of the form of contract, the Contractor can maintain a claim pursuant to Sub-Clause 13.6 [Adjustments for Changes in Legislation], prevention of work due to governmental directives and/or action in accordance with the vested power to the competent authority. In this situation, the Contractor can claim both EOT and associated Cost due to Changes in Legislation. • Sub-Clause 8.5 (d) Unforeseeable shortages in the availability of personnel or Goods (or Employer-Supplied Materials, if any) caused by an epidemic or governmental actions will not be the relevant Clause when proximate cause governmental orders to prevent the pandemic. However, this clause will be relevant if there is delay/disruption to the supply chain, mainly foreign supplies. • Sub-Clause 8.6 [Delays Caused by Authorities] will not apply for this situation, only if any authority will not delay any approval other than the normal approval period. • Clause 18 [Exceptional Events] clause will be relevant if delay/disruption to supply chain, mainly foreign supplies. 	FIDIC (2017) Red Book/Yellow Book/Silver Book

According to Assaad and El-adaway (2021), governments of many countries continuously passing laws and regulations, and the construction industry expected to address the pandemic upon the provision, such as ‘changes in legislation/law’ where both time extension and compensation for additional costs available, when force majeure clause provides provisions for an extension of time only. Further, since there are more difficulties to deal with a pandemic base on one main contractual provision, changes are necessary in the contract language for force majeure clauses as well (Jayathilaka & Waidyasekara, 2022c). Moreover, parties to the contract should pay attention whether they are going to depend on the available clauses and terminologies related to pandemic or are they going to adjust available provisions with respect to the crisis COVID-19 (Stemler, 2022).

In addition, Hansen (2020) developed a model presented in Figure 3-5 using research works related epidemics and pandemics like SARS, MERS, and COVID-19 to take decisions under force majeure provisions when there is a pandemic situation.

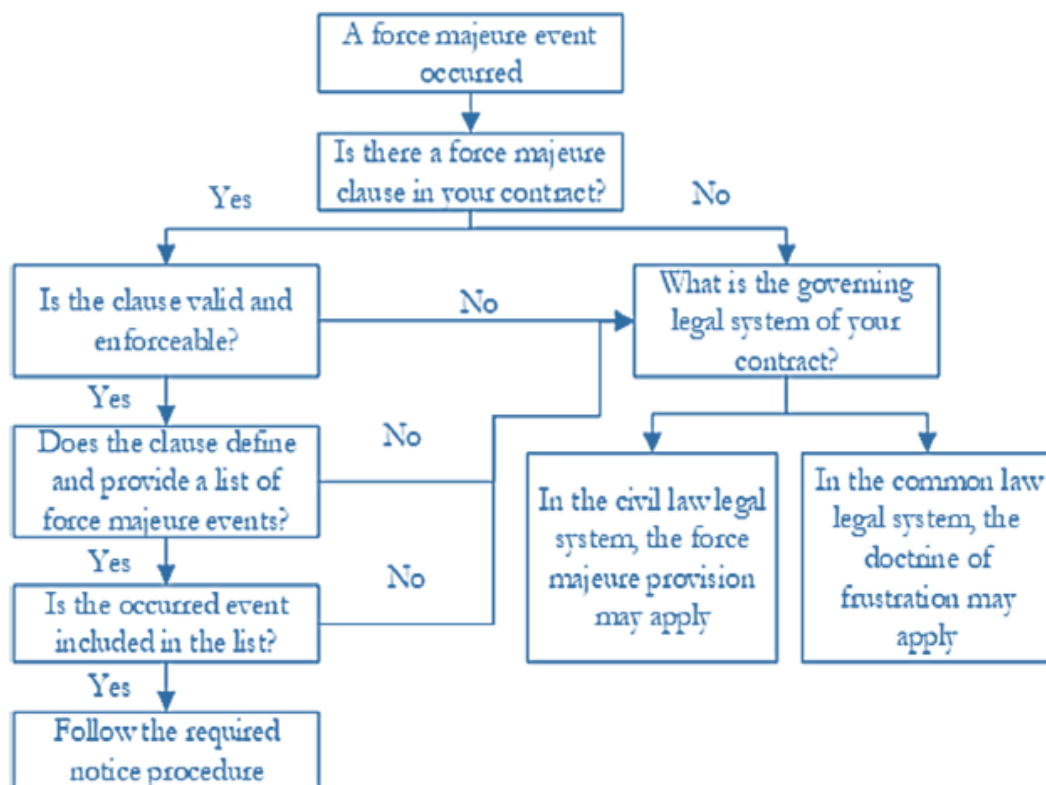


Figure 3-5: Force Majeure Model

Source: Hansen (2020)

According to Hansen (2020), as presented in Figure 3-5, if there is any event occurred and the parties have a doubt whether the event is force majeure or not, first step is to check whether there is a particular clause for force majeure and if the answer is 'no' the parties have to proceed with the governing legal system of the respective contract. According to the author, if there is a valid force majeure clause available in the contracts, the next step is to check whether the event is listed under the available force majeure clause. The prevailing doubt of the parties to the contract in the construction industry is, whether pandemics can be covered under existing force majeure clauses in standard forms of contracts since the event 'pandemic' is not listed under the clause (Hansen, 2020).

3.6.3. Contractual provisions related cases applicable to a pandemic situation

Dealing with the force majeure clause is crucial when there is a pandemic situation and carefully drafted contractual provisions would be able to ensure that parties are not liable when the situation is out of their control (Benarroche, 2020a). Moreover, when there are more case laws available to apply for unforeseen situations it may help construction parties to unravel the contractual challenges easily, but the issue is the unavailability of applicable case laws related to unforeseeable circumstances (Cartwright, Viator, Dennis, & Munoz, 2020).

Since this is the first time that most construction stakeholders face a pandemic situation like COVID-19, many disputes have occurred, are still occurring, and may occur in the future regarding contractual provisions available in the construction industry (Jayathilaka & Waidyasekara, 2022b). Parties to the contract in construction projects should be aware about the construction industry related case laws which can apply to pandemic situations for the future use of potential contractual issues (McLennan, 2021).

Contractual provisions related to cases from countries such as the United States (US), France, England and Wales, Ghana, Singapore and China which are applicable to a pandemic situation are as follows.

United State (US)

New York courts use strict interpretation for legal issues.

Cartwright, Viator, Dennis, and Munoz (2020) stated, US courts believe in the express language, and events particularly listed in the delay clause will excuse performance as well as decide that whatever construction delay arise due to the COVID-19 pandemic is way beyond the “reasonable control of the parties,” and investigated by force majeure clauses. Moreover, State of California, identify that the party applying the clause to prove reasonable efforts to evade the consequences of the force majeure event.

A decision given for *JN Contemporary Art LLC vs Phillips Auctioneers, LLC, No. 1:20-cv-04370-DLC (S.D.N.Y. 2020)* in the Southern District of New York has presents the COVID-19 pandemic as a ‘natural disaster’ that is beyond the parties’ ‘reasonable control’, and therefore, setoff the force majeure clause (McLennan, 2021).

McLennan (2021) stated, the case *Rudolph vs United Airlines Holdings, Inc., 2021 WL 534669, at *7 (N.D. Ill. Feb. 12, 2021)*, related to US District Court provided that there ought to be a certain point where a force majeure event ends, and a schedule change or irregular operation commence. Moreover, author mentioned that the mere presence of a force majeure event was not sufficient and proving causation was necessary as well as defendant could not count on the force majeure clause.

Moore and Cornelius (2021) stated, Texas Supreme Court held that a force majeure event is not an excuse for nonperformance when a prior material breach has occurred. Moreover, author discussed that, in the construction industry context, a contractor seeking to claim a pandemic as an “Act of God” force majeure excuse for its failure to meet a specific turnover date would have to demonstrate that no concurrent delays existed.

Following cases suggest pandemics may fall into a “catch-all” provision:

R & B Falcon Corp. vs. American Exploration and LLC vs. ConocoPhillips

In the context of pandemic related government regulations, the more stringent state or local government stay-at-home orders that did not exempt construction activities could arguably be the type of regulation constituting an excusable event under an applicable force majeure provision (Moore & Cornelius, 2021).

The case of *Am. Nat. Red Cross vs. Vinton Roofing Co.*, 629 F. Supp. 2d 5, 9 (D.D.C. 2009) highlighted that an act of god such as pandemic situations cannot be avoided by parties before it happens or cannot be prevented (McLennan, 2021).

Germany

Demanded standards are connected with the High Supreme Court Verdicts. As mentioned by Haas and Markovic (2021), if the circumstances are related to ‘force majeure’ or ‘act of god, when the claimant grants legal/ contractual merit, entitles to get time extensions, and can grant the additional cost suffered totally or some.

France

According to Haas and Markovic (2021), *Lebeaupin vs Richard Crispin & Co*,¹² *McCardie J* case referred that an epidemic might amount to an event of force majeure. As mentioned by authors, in general, if the situation comparatively uncontroversial, even though an event of force majeure has literally originated from an exact set of facts is a question of fact in every case.

The case of *General Construction Co. Ltd vs Ibrahim Cassam & Co. Ltd* provides following two characteristics to consider an event as a force majeure event under Court of Civil Appeal:

- The event needs to be unforeseeable/unpredictable at the time of conclusion of the contract
- The event must be irresistible/ Insurmountable (Piper, 2020a)

Piper (2020) stated, it is important to remarking that epidemics outbreaks have not consistently been identified as force majeure events and in 2014, the epidemic of H1N1 flu which was officially declared and anticipated ahead of the implementation of health regulations, did not comprise an event of force majeure. In addition, author mentioned

that similar reasoning might perfectly be related to the current COVID-19 pandemic and outbreak, which include both a natural element which is the virus itself as well as governmental element (curfew) measures which lead the execution of contracts further difficult.

England and Wales

English courts have used a tentative approach to the aftermath of the COVID-19 pandemic based on force majeure provisions: for example, in the High Court judgement in *Fibula Air Travel Srl vs Just-US Air Srl [2020] EWHC 3048 (Comm)*, a party could not depend on the pandemic to bring on a force majeure clause to dodge from its obligations before government restrictions and ‘failure or delay in the performance of any obligations under the agreement’ would last for a period (McLennan, 2021).

In the lack of express language addressing ‘pandemics’ or ‘infectious disease’ courts will not be accept arguments, that the existence of COVID-19 is adequate to bring on a force majeure clause (McLennan, 2021). Cheung (2020) stated, even the government was unable to adhere public procurement law under pressure of the COVID-19 pandemic, the High Court in London has regulated that landlords are allowed to retrieve rent and service charges unsettled to them by tenants whose businesses were required to close by coronavirus restrictions.

Based on the case *Entertain Video Limited and Others v Sony DADC Europe Limited and Others*, the Technology and Construction Court in the recent time reviewed the meaning of a force majeure clause which might have implications for how these clauses are explained within construction contracts.

Fenwick (2021) stated the clause, “Neither party shall be liable for its failure or delay, if such failure or delay is caused by circumstances beyond the reasonable control of the party affected including but not limited to riot, civil commotion, malicious damage, etc. as well as pandemics” and as per the mentioned clause, current COVID-19 situation will comes under force majeure clause.

Saudi Arabia

The Saudi Arabian Supreme Court published decision *No. M/45/M of 08/05/1442AH (the KSA Decision) 2020*, and the decision demonstrated how contracts governed by Saudi law will be impacted by COVID-19. The Saudi Arabian Supreme Court has verified that COVID-19 considered as an ‘emergency event’ and will be regarded as a force majeure if emergency event showcased certain conditions (McLennan, 2021).

Ghana

Some standard forms of contracts do not have the word ‘prevent’ and on behalf of that there may another term (Lucy & Chambers, 2019). In the case of *Tennants (Lancashire) Ltd vs CS Wilson & Co Ltd [1917] A.C. 495* provides the following requirement for parties to the contract which should be there when seeking the entitlements; “Parties shall put their full effort to minimise the impact, void or overcome the circumstances of force majeure”.

When dealing with a pandemic, *Seadrill Ghana Operations Ltd vs Tullow Ghana Ltd [2018] EWHC 1640* case also important because key importance in the context of the pandemic is highlights there. In this case the Court recommended that “the force majeure event must be causative to the contractual breach and that reasonable steps to avoid the effects of force majeure event must be taken” (Lucy & Chambers, 2019).

Figure 3-6 illustrates a summary of the cases described above. Most of the cases presents that the force majeure clause is not enough to cover losses due to a pandemic situation.

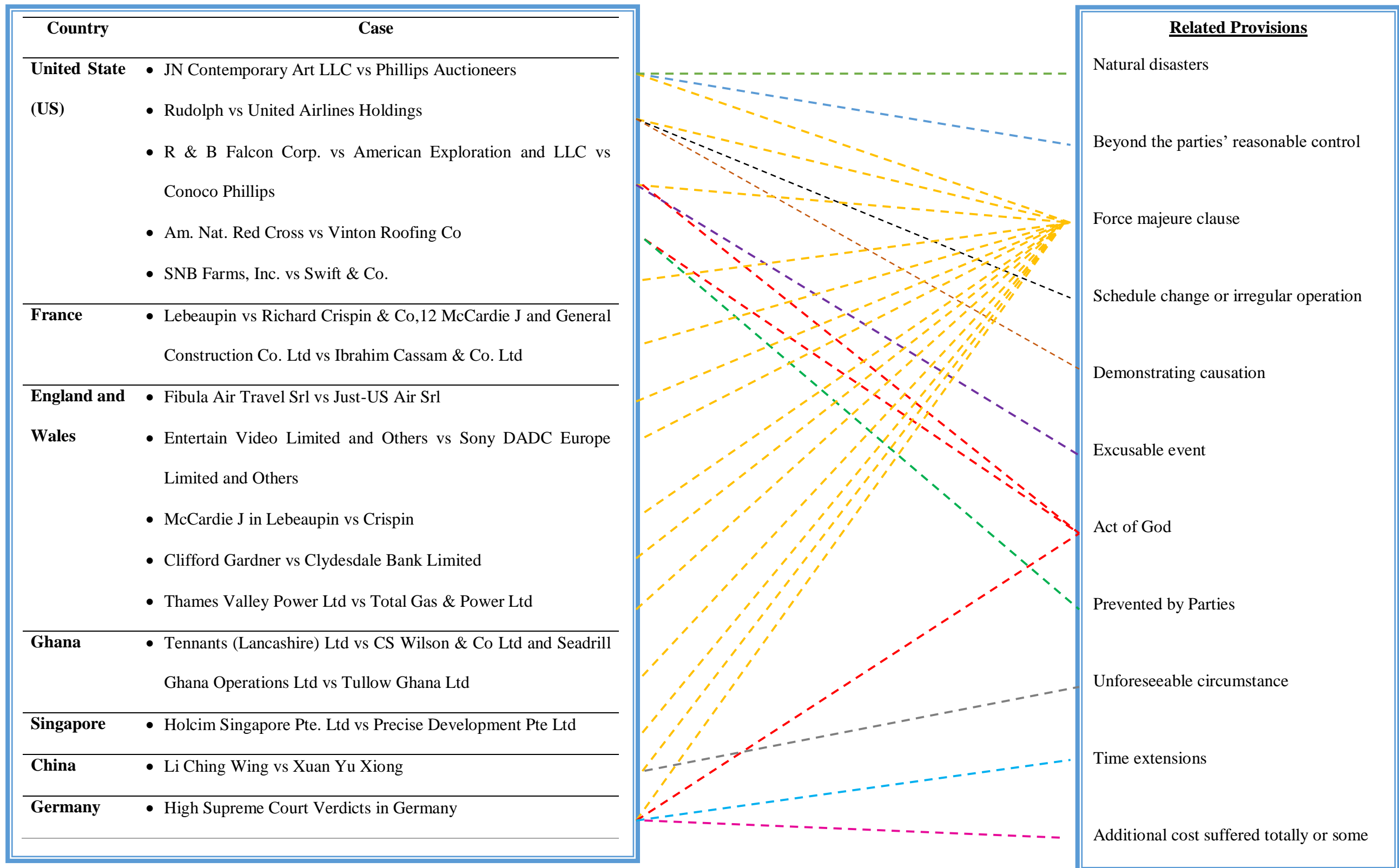


Figure 3-6: Summary of the Case Law Findings

3.7. Strategies to Deal with Pandemics

With connection to COVID-19 industries currently know that a major epidemic was on the horizon and that SARS, MERS and Ebola were initial warnings of a more intense health crisis (MacMillan, 2021). Nations immediately launched the highest level emergency response plan because of the outbreak of COVID-19 (Liu, Yue, & Tchounwou, 2020). Withal, government and non-government organisations shall need to get proper steps to minimise the impacts on health of the people and economy of the countries from the outbreaks such as COVID-19 which have been potentially affected world (Ministry of Health and Indigenous Medical Services, 2020).

When consider the construction industry which is mostly works carryout onsite environment, required more concerned to overcome challenges occurred due to pandemics like COVID-19, but both onsite and offsite activities must be effectively managed (Alsharef et al., 2021).

3.7.1. Strategies to deal with general challenges in construction sites during a pandemic

One of the methods to curtail the impact of COVID-19 in the construction industry is to recognise the arising problems that the industry stakeholders are facing in this complex situation (Zamani et al., 2021). Pamidimukkala and Kermanshachi (2021) reported that workforce protection, project performance protection, and protecting project continuity are main considerations when discussing about how to address challenges effectively. The construction industry needs to work hard in order to overcome the adverse effect of COVID-19 by reducing the number of labours on site and adjusting the offsite work to evade uncertain conditions (Iqbal et al., 2021). In accordance with Fernande (2020), with the help of training and educating employees on organisations' COVID-19 policies employers can preventing mental, physical, and emotional difficulties of Employees. Further, Governments in many countries tended to prepare contingency plans to maintain countries' economy (Chivilo et al., 2020).

Similarly, Ogunnusi et al. (2020) mentioned that the contractors may create and maintain comprehensive contingency plans with the help of experience from COVID-

19 for the future. Additionally, the author mentioned that re-establishment of the construction industry against pandemics can be done by stakeholders of construction projects through adapting modern technologies to the projects. Further, contractors and the government should adjust their procedures according to the situation to minimise the productivity losses happening due to less involvement of workers (Quezon & Ibanez, 2021). Although, the projects thus far in the process need to be given consideration with the help of the better safety practices for employees that lead to prevail the crisis in the mediocre situation of COVID-19 (Iqbal et al., 2021). As authors mentioned such protocols are like, maintain the social distancing among employees, one worker one task, using innovative technologies to monitor, and disinfecting the tools and equipment after usage.

Furthermore, Schober (2020) introduced following safety measures to be prepared for future pandemics faced by the construction industry and presented in Figure 3-7.

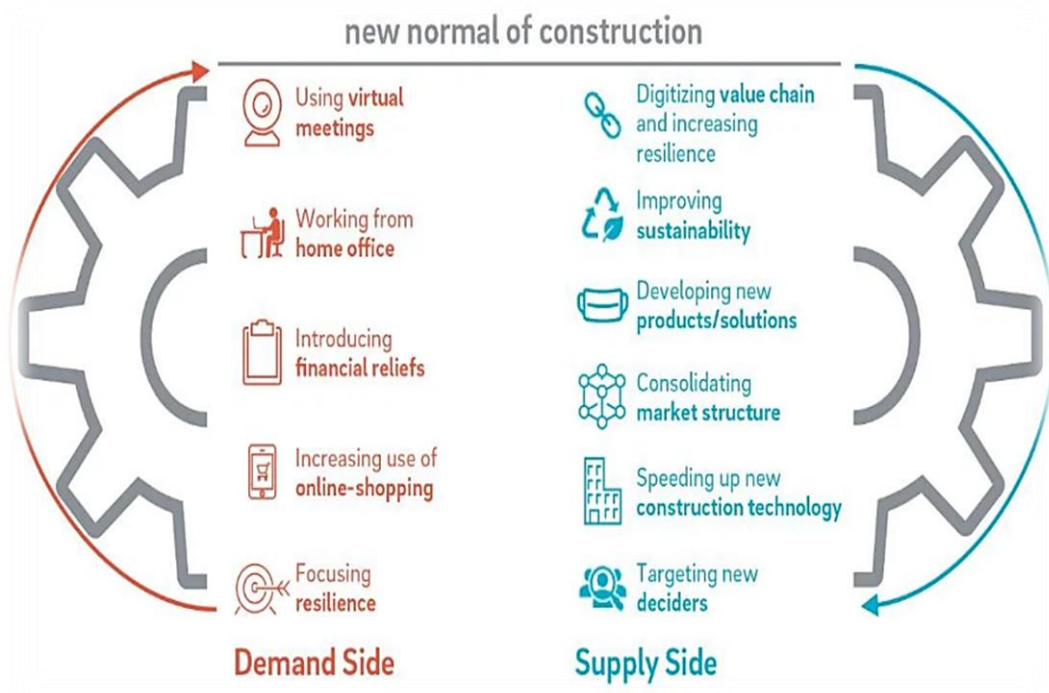


Figure 3-7: Safety Measures for the Construction Industry

Source: Schober (2020)

Promoting the use of new technologies, hosting virtual meetings and constantly communicating with the remote site workers helps to minimise workers anxiety and stress (Pamidimukkala & Kermanshachi, 2021). Contracting parties should use effective communication to successfully deliver projects on time and within budget (Gunduz & Elsherbeny, 2020). Therefore, highly technical advanced communication system which was called as teleworking has been encouraged use in job sites to maintain communication network among the workers when governments announced WFH during COVID catastrophe (Greer & Payne, 2014). Consistent degitalisation, adjust the scale of operations, make the business flexible, improvements to the value chain, green transformation, invest more on research and development and examining the possibility of strategic acquisitions are some suggestions for players in the construction industry to deal with pandemics successfully (Schober, 2020).

3.7.2. Strategies to deal with contractual challenges in construction sites during a pandemic

Even there are more challenges, the pandemic would not influence the construction projects in the future, due to the government and the people have picked up to handle the problem effectively and efficiently (Shibani, Mahadel, Hassan, Agha, & Saidani, 2021). Pamidimukkala and Kermanshachi (2021) mentioned that the contractors should pay attention to the legal issue that could be faced in the future due to delay in projects and uncontrollable prices of material. Moreover, Porter (2020) advised that the contractors should talk to respective insurance provider about the prevailing situation and should request available gains to prevent from coming financial challenges. The government should supply financial aid or financial loan to the organisations that are facing a harsh financial crisis (Biswas et al., 2021).

Table 3-9 presents a summary of strategies that can apply to identified contractual challenges gathered though previous research works which would be able to deal with some contractual challenges successfully.

Table 3-9: Strategies to Deal with Contractual Challenges

Contractual Challenges due to COVID-19 (CCC)	Suggested Strategies - Literature Findings
CCC 1: Increment in project cost	<ul style="list-style-type: none"> • Must have contingency measures (Switzer, Wang, & Hirschvogel, 2020).
CCC 2: Increment in project time	<ul style="list-style-type: none"> • Advantages and disadvantages of project closures and delays should be addressed in risk analysis (Stephany et al., 2020). • Extending project deadlines and conducting analysis to identify delays (Pamidimukkala & Kermanshachi, 2021).
CCC 3: Disruption in project works	<ul style="list-style-type: none"> • Split up employees into teams and shifts (Switzer, Wang, & Hirschvogel, 2020). • Mapping supply chains (Pamidimukkala & Kermanshachi, 2021).
CCC 4: Issues in supply chain	<ul style="list-style-type: none"> • Conducting risk analysis (Stephany et al., 2020). • Mapping supply chains (Pamidimukkala & Kermanshachi, 2021). • Improving procurement strategies (De Silva et al., 2008).
CCC 5: Labour shortage and productivity loss	<ul style="list-style-type: none"> • Split up employees into teams and shifts and must have contingency measures (Switzer, Wang, & Hirschvogel, 2020).
CCC 6: Delayed payments	<ul style="list-style-type: none"> • Companies must secure sufficient liquidity (Zheng et al., 2021). • Pandemics related compliance plans can protect contractors from payments issues (Dennis, 2020).
CCC 7: Cash flow issues	<ul style="list-style-type: none"> • Contractors can assure the profit levels by accepting only secure contracts that they will be get paid (Anysz & Rogala, 2019). • Conducting risk analysis (Stephany et al., 2020).

Contractual Challenges due to COVID-19 (CCC)	Suggested Strategies - Literature Findings
	<ul style="list-style-type: none"> • Companies must secure sufficient liquidity (Zheng et al., 2021). • Pandemics related compliance plans can maintain positive cash flow (Dennis, 2020).
CCC 8: Suspension of work	<ul style="list-style-type: none"> • Cooperative and fair legislation (Husien et al., 2021)
CCC 9: Project termination	<ul style="list-style-type: none"> • Determine the rights and obligations of parties related to extensions of time and additional costs in suspension or termination (Yadeta, 2020)
CCC 11: Failure in claim notifications of contractors within the relevant period	<ul style="list-style-type: none"> • Cooperative and fair legislation (Husien et al., 2021). • Carefully review the terms in the standard forms of contracts (Yadeta, 2020).
CCC 14: Interpretation of the contract language	

3.8. Chapter Summary

The literature synthesis chapter could strengthen the chapter one of the research study through incorporating more literature related to the research topic. The chapter three reviewed contractual challenges and solutions for the contractual challenges relate to the construction industry in a pandemic situation. Available contractual provisions relate to a pandemic situation has been briefed with the support of SBD and FIDIC standard forms of contracts. Altogether, fifteen contractual challenges have been identified and nineteen strategies could identify to minimise the impact of identified contractual challenges with the support of previous studies.

CHAPTER 4 – DATA COLLECTION, ANALYSIS AND DISCUSSION

4.1. Introduction

Chapters One, Two, and Three of this study included an introduction to the research, research methodology, and literature review based on available knowledge, respectively. In the next step, Chapter Four presents how data was collected and analytically demonstrates the collected data. The data analysis was done while achieving the study’s objectives and discussed the findings comprehensively. This chapter presents an analysis of data gathered through semi-structured interviews. Findings of the literature synthesis supported building up this chapter. The results of the analysis were interpreted using graphical and tabular representations. The research findings and the outcome of the literature synthesis were finally compared.

4.2. Administration of the Data Collection Process and Background Information

The data collection process and background information are discussed under this heading. Figure 4-1 presents the main steps of the data collection process for the study.



Figure 4-1: Data Collection Process

Accordingly, the following headings of this chapter describe the data collection process and background information.

4.2.1. Background information of preliminary interviews

The research strategy consisted of surveys and in-depth interviews using semi-structured interview guidelines as a data collection tool. Relevant documents were reviewed to gather more accurate information for the study. At the beginning of the data collection process, preliminary interviews were held to determine the feasibility of selecting projects that faced difficulties due to contractual challenges during the COVID-19 pandemic. During the preliminary interviews, a discussion was made with the contractor and the respective client of the building and civil engineering projects. At that point, it was identified that it was more effective to conduct interviews with contractors only because most clients did not face many contractual challenges from their side. According to the preliminary interviews, the contractor referred to as one of the “Parties to the Contract” in the usual form of contracts is the party who has suffered/is still suffering the most due to the COVID-19 epidemic. After the preliminary interviews, experts from a project which was at the pre-contract stage and post-contract stage during the COVID-19 pandemic were interviewed using semi-structured interviews.

4.2.2. Profile of interview respondents

Ten contractor organisations which are well-known construction companies in Sri Lanka have been selected for this study. They have CS1 and CS2 highest gradings for building works as given by the Construction Industry Development Authority (CIDA). Most project locations were in Sri Lanka, while a few projects were in foreign countries. Altogether sixteen respondents who have knowledge and experience about contractual challenges and have been involved in construction projects during the pandemic period were interviewed. Table 4-1 presents the profile of respondents.

Nine projects were Sri Lankan government-funded projects, while two were foreign-funded. The remaining projects belonged to private clients in Sri Lanka or other countries. These selected projects have faced contractual challenges due to the COVID-19 pandemic.

Table 4-1: Profile of Respondents

Respondent Code (RC)	Project Code (PC)	Profession	Designation	Industry Experience (Years)				Project Stage	Project Type	Standard Form of Contract	Employer	Location
				5-10	10-15	15-20	Above 20					
AR 1	A 1	Quantity Surveyor (QS)	Chief QS		√			Pre-Contract	Building	SBD 02	Private Sector Organisation in Sri Lanka	Sri Lanka
AR 2	A 2	Quantity Surveyor	Chief QS		√			Post-Contract	Water Supply	SBD 02	Government of Sri Lanka	Sri Lanka
BR 1	B 1	Quantity Surveyor	Project Manager			√		Post-Contract	Building	FIDIC 1999 RED	Private Sector Organisation in Sri Lanka	Sri Lanka
CR 1	C 1	Quantity Surveyor	Contract Administrator		√			Pre-Contract	Road	FIDIC 1999 RED	Government of Sri Lanka	Sri Lanka
CR 2	C 2	Quantity Surveyor	Contract Administrator			√		Post-Contract	Building	SBD 02	Private Sector Organisation in Sri Lanka	Sri Lanka
DR 1	D 1	Quantity Surveyor	General Manager		√			Pre-Contract	Building	FIDIC 1999 RED	Singapore	Singapore
DR 2	D 2	Quantity Surveyor	General Manager		√			Post-Contract	Building	FIDIC 2017 RED	Maldives	Maldives
ER 1	E 1	Civil Engineer	Project Manager		√			Pre-Contract	Water Supply	SBD 02	Government of Sri Lanka	Sri Lanka
ER 2	E 2	Civil Engineer	Project Manager		√			Post-Contract	Building	FIDIC 2017 YELLOW	Government of Sri Lanka	Sri Lanka
FR 1	F 1	Quantity Surveyor	Site QS	√				Post-Contract	Building	FIDIC 2017 YELLOW	Government of Sri Lanka - Foreign Funded	Sri Lanka
GR 1	G 1	Civil Engineer	Project Manager				√	Post-Contract	Road	FIDIC 1999 RED	Government of Sri Lanka	Sri Lanka
HR 1	H 1	Civil Engineer	Project Manager		√			Pre-Contract	Building	FIDIC 1999 RED	Government of Sri Lanka	Sri Lanka
HR 2	H 2	Civil Engineer	Project Manager		√			Post-Contract	Building	FIDIC 1999 RED	Government of Sri Lanka - Foreign Funded	Sri Lanka
IR 1	I 1	Quantity Surveyor	Senior QS	√				Post-Contract	Building	SBD 02	Government of Sri Lanka	Sri Lanka
JR 1	J 1	Civil Engineer	Project Manager				√	Pre-Contract	Road	FIDIC 1999 RED	Government of Sri Lanka	Sri Lanka
JR 2	J 2	Quantity Surveyor	Project Manager			√		Post-Contract	Road	FIDIC 1999 RED	Government of Sri Lanka	Sri Lanka

4.2.3. Content of the interview guideline

The interview guideline was structured under four sections. The first section (Section A) was about the respondents' details. The second section (Section B) consisted of the questions about the contractual challenges faced by the respondents as per their knowledge. Section C, the third section, was structured to gather information about available contractual provisions related to a pandemic situation and the incorporated contractual provisions for respondent's projects to emphasise the entitlements of the respondents for the contractual challenges encountered. The final section (Section D) was included in the interview guideline and collected the respondents' suggestions to minimise the impact of contractual challenges related to a pandemic situation.

Annexure 1 provides the interview guidelines. The following sections discuss the interviewees' responses in detail.

4.3. Analysis of the Findings and Discussions

The relevant data were collected through semi-structured interviews with the respondents with experience due to COVID-19. The collected data were analysed using NVivo software and manually and presented under forthcoming headings to investigate the followings:

- The contractual challenges faced by the construction industry in a pandemic situation (COVID-19).
- The suitable contractual provisions relating to a pandemic in construction contracts and the needed adjustments for available provisions.
- The challenges with implementing contractual provisions in the case of the COVID-19 pandemic.
- The appropriate strategies for the construction industry to unravel the contractual challenges in a pandemic situation.

Discussions under the following headings accomplish all objectives of this research study by analysing the findings of data collection in this research study.

4.3.1. Impact of the pandemic on construction organisations – Generic aspects

The first question asked by the respondents was how the organisations were affected by the COVID-19 pandemic. The frequent answer of all respondents was that COVID-19 affected all industries and organisations very awkwardly. In accordance with every respondent, the situation in all countries is not similar during the pandemic. DR1 mentioned that construction sites in some countries, e.g., Singapore, China, Maldives, and Bangladesh, have not been closed; their works probably continued at a lesser progress rate. Further, off-site work is done from home. DR1 further mentioned that, like many countries, the respective authorities in Sri Lanka have taken action and requested from the people to prevent movement and imposed a lockdown. Such situations compelled the contractors to shut down the construction sites for a period, and organisations were also closed.

According to respondent AR1, the day-to-day work of the organisation was affected, and the organisation faced huge cashflow issues because of payment delays from the clients. Moreover, AR1 mentioned that most contractors have decided not to bid for government-funded projects for some time due to the uncertainty in payments. As per the answers from the respondents for question 1, most projects were suspended due to lockdowns and curfews. Contractors experienced a loss of profit from most projects. Respondent DR1 from organisation D stated that since the organisation is mostly engaging with overseas projects, it had to suspend projects in some countries such as Maldives and Bangladesh because people worldwide are also impacted by this pandemic. Hence, organisation D has been suffering from time and cost-related issues for years due to COVID-19. As ER1 mentioned, a pandemic creates two types of impacts, i.e., *immediate impacts*, which contractors face just after the lockdown, curfew, or other actions, and *residual impacts* coming afterwards.

However, the construction stakeholders had to face all difficulties successfully during the pandemic. HR1 mentioned one strategy used by organisation H was the ‘Bear Minimum Cost’ concept. The respective contract was constituted with a clause in the particular conditions which describes the Bear Minimum Cost concept, and the meaning is: If a pandemic situation comes, the contractor will not charge unreasonably

for all the additional costs incurred due to the pandemic. However, with the parties' mutual understanding, the contractor will charge a reasonable amount for the expenses that had to bear due to direct activities related to the pandemic. This cost is paid under engineer's approvals (for example, the cost of providing separate accommodation and facilities for labour quarantines and costs for safety precautions due to the pandemic). In addition, this was considered a reimbursement cost. However, respondent BR1 stated that although the projects were heavily affected by the pandemic, they could survive within the industry as an organisation by taking suitable decisions on time.

4.3.2. Perception of contractual challenges due to a pandemic

Like other industries, the construction industry faced many challenges due to the COVID-19 pandemic. Among those challenges, contractual challenges are particularly important because they have legal enforcement from the contract. The parties to the contract have to seek legal relief for contractual challenges. Respondents interviewed from the projects at the pre-contract stage cited the contractual challenges faced during the pandemic. Among the identified nine contractual challenges, *price increments* and the *uncertainty in project commencement* were revealed through a systematic literature review. In addition, another seven contractual challenges were identified and presented in Figure 4-2.

Name	Sources	References
Contractual Challenges Pre Contract Stage	6	18
Uncertainty in Estimations and Prices of Items	4	4
Difficult to Quantify the Impact from a Pandemic	3	3
High Freight Charges	3	3
Uncertainty in Project Commencement	2	2
Uncertainty in Project Cost at Completion	2	2
Uncertainty on Risk Allocation	1	1
Difficulties in Claiming Additional Costs due to a Pandemic	1	1
Price Increments	1	1
Contractor had to Bear the Risk of Time and Cost	1	1

Figure 4-2: Contractual Challenges in Pre-Contract Stage During a Pandemic

AR1 declared that when bidding for some projects, if the contractor distributes risk components related to a pandemic among rates of the items, then the contractor may not be able to win that bid due to high rates. As per the respondent's opinion, if a contractor wins a project with lower rates without distributing the risk mentioned above, surely the contractor will face stupendous issues due to the prevailed situation of the country with the pandemic.

The interviews disclosed nineteen contractual challenges the contractors faced during the COVID-19 pandemic in the post-contract stage, as presented in Figure 4-3.

Name	Sources	References
Contractual Challenges Post Contract Stage	10	47
Issues in Supply Chain	7	7
Extension of Time for Completion	6	6
Project Cost Increment	4	4
Loss of Productivity	4	4
Labour Shortage	4	4
Expenses for Safety Measures	3	3
Shipment Delays	3	3
Disruptions to Project Activites	3	4
Material Damages and Wastages	3	3
Idling of Human Resources	1	1
Work Suspensions	1	1
Delay Caused by Authorities	1	1
Issues in Interpretations of Contractual Language	1	1
Delays in Engineer's Responses	1	1
Liquidated Damages	1	1
Difficulties in Sourcing Labour, Machineris and Material	1	1
Difficulties in Subcontractor Mobilisations	1	1
Payment Delays	1	1
Cashflow Issues	1	1

Figure 4-3: Contractual Challenges in Post-Contract Stage During a Pandemic

Most organisations arraigned that they had to face supply chain-related contractual challenges during the pandemic period. The literature review and interviews identified contractual challenges related to *supply chain issues, project cost increments, loss of productivity, labour shortages, disruption of project works, issues in interpretations of contractual language, liquidated damages, payment delays, and cash flow issues.*

4.3.3. Contractual provisions related to a pandemic situation based on standard forms of contracts

As the outbreak continues to spread, governments worldwide have resorted to varying public health measures, including movement restrictions, nationwide curfews, travel bans, and border closures to tackle the pandemic. Similarly, the Government of Sri Lanka initiated several endeavours to help the country to prevent, detect, and respond to the COVID-19 pandemic and strengthen its public health preparedness.

According to all respondents, the police curfew imposed to avoid violations of ‘provisions and regulations of the Quarantine and prevention of diseases Ordinance’ to prevent the spreading of COVID-19 restricted all types of movements within Sri Lanka. Later, ‘Work from Home (WFH)’ was announced for both the private and public sectors. Later, the Sri Lankan government declared to lift the curfew in some parts of the country, which was in effect for over two months. These actions restricted transportation and supply chains throughout the country.

The government urged to avoid large crowds, hence issued guidelines to manage workplaces with only essential participants in attendance. Therefore, as revealed from the data collection, most construction sites had to work with a limited number of human resources.

Simultaneously, ER1 mentioned that the government expected people to follow the proper strategy to prevent the spread of COVID-19. Hence contractors had to spend additional time and cost to adhere to the health guidelines. As mentioned by a majority of the respondents, contractors suffered from delays and disruptions with the government directives imposed to control the COVID-19 outbreak, together with additional unexpected expenses.

FIDIC 1999 and SBD 2 are the frequent standard forms of contracts used in the selected projects. Nevertheless, the respondents fully contributed to identifying suitable contractual provisions from the other standard forms of contracts as well. Table 4-2 presents a summary of the findings.

Table 4-2: Contractual Provisions for Pandemics Incorporated by the Contractors

Clause	FIDIC 1999 (Red)	FIDIC 2017 (Red/Yellow/Silver)	SBD 1	SBD 2	SBD 3	SBD 4
Adjustments for Changes in Legislation/Law	13.7	13.6/13.7	45.1	13.6		13.6
Subsequent Legislation					10.11	
Force Majeure/ Exceptional Events	19.0	18.0 /19.0		20.0	12.2	20.0
Compensation Events			44.1			
Right to Claim	20.1	20.1		19.1	9.4	19.1
Extension of Time	8.4	8.4/8.5		8.4	6.3	8.4
Variation	13.0	13.0	39.0/40.0	13.0	9.0	13.0
Health and Safety	4.8/6.7	4.8/6.7		6.6		6.6
Delay Caused by Authorities	8.5	8.5/8.6		8.5		8.5

All respondents mentioned that while considering the effects, the contractors submitted claims using contractual provisions in respective standard forms of contracts, requesting extensions for time for completion and associated costs to recover

the ‘effect of Prevailed Situation in the Country and Government Directives due to COVID-19 Pandemic’.

In addition to the contractual provisions identified through document review in Chapter Two, the respondents have incorporated several provisions when preparing claims for the pandemic. Contractors have used the provisions related to ‘delay caused by authorities’, ‘health and safety’ (comply with regulations), and ‘variations’ (as per the engineer’s instructions related to the pandemic) at the time of claim preparation in addition to the findings in literature synthesis.

4.3.4. Challenges with the implementation of contractual provisions

The doctrine of CR1, CR2, GR1, and HR2 was the contractor has prevented from expediting the works as naturally in the pandemic period during lockdown or curfew situations; hence prevented from fulfilling own obligations under the instant contract. As stated by JR1 and JR2, none could find the term ‘pandemic’ in available standard forms of contracts related to the construction industry.

BR1 mentioned that FIDIC does not define “epidemic” or “pandemic”. Hence it may be argued that COVID-19 does not fall under events prescribed in Force Majeure/Exceptional/Compensation Events clauses. Therefore, the contract provisions are silent on a pandemic situation faced or facing in future by the construction industry. Respondent AR2 declared that it is a current requirement to pay attention to contractual provisions available in the standard forms for situations like COVID-19 since the term “pandemic” is unavailable there.

Confirming the findings, construction projects executed during the pandemic period have consisted of claims related to the situation. Table 4-3 presents the state of the respondents’ COVID-19-related claims regarding the selected projects.

Table 4-3: States of the COVID-19 Related Claims of the selected cases.

Project Code (PC)	Claim for		Engineer's Determination	
	EOT	Cost	EOT	Cost Entitlement
A 1	√	√	Entitled	No Entitlement
A 2	√	√	Entitled	No Entitlement
B 1	√	√	Entitled	No Entitlement
C 1	√	√	Entitled	No Entitlement
C 2	√	√	Entitled	No Entitlement
D 1	√	√	Entitled	No Entitlement
D 2	√	√	Entitled	No Entitlement
E 1	√	√	Entitled	No Entitlement
E 2	√	√	Entitled	Not Responded
F 1	√	√	Entitled	No Entitlement
G 1	√	√	Entitled	No Entitlement
H 1	√	√	Entitled	Direct expenses at the site due to pandemic could covered reasonably (Bear Minimum Cost)
H 2	√	√	Entitled	No Entitlement
I 1	√	√	Entitled	Direct expenses at the site due to pandemic were covered up to the amount certified by the Engineer
J 1	√	√	Entitled	No Entitlement
J 2	√	√	Entitled	No Entitlement

In each project, the respondent is entitled to a reasonable extension of time for completion. COVID-19-related direct costs were granted (such as Polymerase Chain Reaction (PCR) test cost/ health precaution/ new labour accommodation costs/ material damages during the pandemic period were granted). Still, they did not allow for the overhead costs of that period. Moreover, the respondents JR1 and JR2 declared that the definition of the word 'Law' needs a clear description. As emphasised by JR1,

contractors argued that the ‘imposition of new regulations’ shall fall under the contractual provision of ‘changes in legislation’.

IR1 revealed that the issue was the majority of cost claims for additional costs caused due to the pandemic were addressed upon the provision ‘changes in legislation/law’. However, the ambiguities in the definition of ‘Law’ in some standard forms of contracts prevented the contractor’s entitlements of due cost. Further, DR2 emphasised that the FIDIC COVID-19 Guidance Memorandum (To users of FIDIC standard forms of works contract) has the following special direction:

Emergency laws or decrees that are issued right now across the world in different jurisdictions are likely to be treated as a change in Laws, given the broad definition of Laws provided in FIDIC forms. It should also be noted that this definition covers a wide range of legislation as well as regulatory actions from “any legally constituted public authority” and therefore, can apply to national parliamentary acts through to state-wide action and down to very local levels, such as a municipal order. Users should not be limited to thinking that the word “Laws” refers to legislation only.

Thus, the respondent DR2 stated that it would be more reasonable to follow the said guideline to clarify the ‘changes in legislation’ is the appropriate contractual provision of the instant contract to emphasise the contractor’s financial entitlement due to the pandemic. Moreover, ER 2 mentioned that it is clear evidence that the delay and disruption issues which caused to prevent the contractor from continuing the works as scheduled were predominantly due to the ‘changes in legislation’. Thus, it is noted that even though the root cause for the delays and disruption issues was ‘The COVID-19 pandemic’, the proximate cause shall be identified as “prevention of activities by the competent authority” by imposing regulations from time to time.

Nevertheless, ER2 stated, “it is apparent that the COVID-19 is affecting the project long term; thus, it shall be interpreted as the associated cost of the delays and disruptions to the works to be compensated to the contractor, where COVID-19 is beyond the control of the contractor”. Therefore, it is well justifiable that the

contractor shall be compensated with an extension of time for completion and associated cost incurred due to this long-term force majeure situation.

According to all respondents except HR1 and IR1, disputes have crystallised between contract parties due to rejecting some entitlements of the contractors submitted through claims. With the grounds mentioned above, most contractors seek the cooperation of Alternative Dispute Resolution (ADR) methods, mainly Dispute Adjudication and Dispute Arbitration, while few are going for amicable settlements after negotiations. Table 4-4 discusses the respondents' answers about the next step of the submitted claims.

Table 4-4: Contractor's Foresight for the Disputes

Project Code (PC)	ADR Method	Reason
A 1	Amicable Settlement	Tried to amicably settle the matters with mutual understanding because cost and time for Dispute adjudication/arbitration is high
A 2	Amicable Settlement	Tried to amicably settle the matters with mutual understanding because cost and time for Dispute adjudication/arbitration is high
B 1	Amicable Settlement	Tried to amicably settle the matters with mutual understanding because cost and time for Dispute adjudication/arbitration is high
C 1	Amicable Settlement	Tried to amicably settle the matters with mutual understanding because cost and time for Dispute adjudication/arbitration is high
C 2	Adjudication	Since the contractor had to spend additional cost due to pandemic situation, contractor has an entitlement to claim costs not only time
D 1	No	Employer was not willing to settle through adjudication or arbitration and contractor had to bear the cost

Project Code (PC)	ADR Method	Reason
D 2	No	Employer was not willing to settle through adjudication or arbitration and contractor had to bear the cost
E 1	Amicable Settlement	Since the contractor had to spend additional cost due to pandemic situation, contractor has an entitlement to claim costs not only time
E 2	Arbitration	Engineer has not responded to the claim, therefore, the had to seek the help of arbitration in accordance with the contract
F 1	Arbitration	Since the contractor had to spend additional cost due to pandemic situation, contractor has an entitlement to claim costs not only time
G 1	Adjudication	Since the contractor had to spend additional cost due to pandemic situation, contractor has an entitlement to claim costs not only time
H 1	No	Satisfied with the Engineer's determination
H 2	No	Employer was not willing to settle through adjudication or arbitration and contractor had to bear the cost
I 1	No	Satisfied with the Engineer's determination
J 1	No	Satisfied with the Engineer's determination
J 2	No	Satisfied with the Engineer's determination

However, as per ER2, FIDIC COVID-19 Guidance Memorandum (2020) declared that *“ultimately the Contractor may be entitled to an EOT for any resulting delay” under Force Majeure/Exceptional/Compensation Events due to the pandemic. Further, the “financial entitlements are more likely to flow from a change in laws route than from a Force Majeure/Exceptional Event route”*. Most respondents mentioned many improvements in Standard Forms of Contracts for several years. As DR1's consolidation, most contractors have been entitled to an extension of time for

completion but not for additional costs due to that extension of time for completion. Moreover, the remedies available (Time and Cost) under the provision for changes in legislation provision be effective only if there are changes in the law.

The question is how to compensate if there are no changes in the law for any duration within the pandemic period. Therefore, DR1 suggested that adjusting available contractual provisions to reform them, acceptable for any pandemic situation, including proper provision for pandemics for epidemics. The extension of time and applicable costs should be available for remedies by considering justly for parties. Anyhow, the respondent's preference is that the contractors should have acquirement to claim for the following in addition to Extension of Time (EOT) for completion. Therefore, the contractor shall be compensated for additional costs related to a pandemic.

- Head Office Overhead and Site Overhead
- Idling of Resources
- Extended Preliminaries
- Extended Price Escalation
- Disruption Cost Due to Loss of Efficiency
- Any Uncompensated Finance Cost

4.3.5. Strategies to overcome the pandemic related contractual challenges

Evidently, construction stakeholders have faced many difficulties with the COVID-19 pandemic. However, the interviewees stated that even with these difficulties, no pandemic could affect the construction industry in future because the construction stakeholders and the governments will know how to deal with the problem more effectively and efficiently, thanks to the COVID-19 pandemic. Strategies to unravel identified contractual challenges were summarised under different perspectives, depending on the respondents' suggestions. Figure 4-4 presents the approach to solving the contractual challenges due to **project cost increments**.

Name	Sources	References
Strategies - Project Cost Increments	5	13
Collaborative approach - Negotiate with the parties	3	3
Cover through claims	2	2
Adapt value engineering methods	2	2
Request scope reduction	1	1
Impose an action plan	1	1
Order major material at early stage	1	1
Pay advance for subcontractors in early stage	1	1
Reduce the cost of engineer's staff	1	1
Should have better interpretation for contractual provisions related to a pandemic	1	1

Figure 4-4: Strategies to Unravel the Contractual Challenges due to Project Cost Increments

As for respondents' opinions, the main recommendation is to carry out discussions between parties to the contract with the contract engineer's participation. BR1 stated, *"parties should meet around one table and try to find out the most suitable solution for the project time increment, but it should be tolerant to each party"*. HR2 mentioned that commercial benefits should be addressed more in standard forms of contracts and encouraged to do the cost-benefit analysis. If the parties choose arbitration or adjudication, in this case, parties typically tend to go for amicable settlement. Therefore, best option is to cost-benefit analysis and do necessary for future projects.

In construction contracts, value engineering is a mechanism the project team can employ to improve the project *value* by examining the function of each item or element and its associated cost. As mentioned by HR2, weighing the cost-to-benefit ratio allows the project team to suggest alternate construction methods, designs, or materials that improve the project value. Therefore, using the value engineering method provides significant direct cost savings to both parties. Further, the adoption of value engineering would substantially reduce the contract duration providing further benefits by reducing the time-related costs to the contractor.

Figure 4-5 presents the suggestions to unravel the contractual challenges due to **project time increments**.

Name	Sources	References
Strategies - Extension of Time	8	16
Collaborative approach - Negotiate with the parties	4	4
Use new technologies to accelerate projects activities	2	2
Adapt value engineering methods	2	2
Request scope reduction	2	2
Increase machinery usage and reduce labour	1	1
Incorporate experienced human resources	1	1
Cover through time extension claims	1	1
Request to reduce variations	1	1
Pay high attention to critical path activities	1	1
Impose an action plan	1	1

Figure 4-5: Strategies to Unravel the Contractual Challenges due to Extension of Time

The collaborative approach is the best action for issues that arise with time extensions, similar to the best solution for contractual challenges related to cost increments. In addition, construction industry stakeholders should pay attention to finding solutions through consistent digitalisation along and should be adjusted flexibly to meet the challenges of the coronavirus crisis. Moreover, most respondents emphasised that experienced contractors should be able to take advantage of the resulting opportunities. As stated by FR1, *“when considered the value engineering method, parties to the contract can achieve a considerable time saving which would be really useful in these uncertain times due to pandemic. Especially at a pandemic period, any reduction of the contract duration would reduce the price escalation risk borne by the contractor as well”*.

Figure 4-6 provides suggestions to unravel the contractual challenges due to **disruptions in project works**.

Name	Sources	References
Strategies - Disruption in Project Work	10	28
Provide accommodation for staff and labour	8	8
Introduce 'work according to shifts' for labours	8	8
Strictly adhere to the health guidelines	7	7
Maintain proper record keeping to claim losses	1	1
Increase machinery usage and reduce labour	1	1
Accelerate works with the available staff	1	1
Promote isolation	1	1
Maintain proper management within the job site	1	1

Figure 4-6: Strategies to Unravel the Contractual Challenges due to Disruption in Project Works

Extras to literature findings, maintaining proper record keeping regarding disruptions, practice machinery use than manpower, accelerating activities with the available capacity, and adequate site management are necessary to face contractual challenges that may arise in the future. In a pandemic situation, providing accommodation for site staff and labour, strictly adhering to health guidelines, and promoting isolation is essential to minimise disruptions to site activities. As stated by IR1, “when we are claiming time or cost for an event related to a pandemic, it should be evident that the contractor has taken preventive measure as soon as possible to minimise losses”. If the contractor has taken necessary actions, then the contractor is undoubtedly in the safe zone in any contractual challenge.

Figure 4-7 presents suggestions to unravel the contractual challenges due to **issues in supply chain**.

Name	Sources	References
Strategies - Issues in supply chain	10	22
Order major material at early stage	10	10
Purchase material as bulk quantities	9	9
Ask for credits from suppliers	1	1
Maintain material stocks properly	1	1
Maintaining proper material management at jobsite	1	1

Figure 4-7: Strategies to Unravel the Contractual Challenges due to Supply Chain Issues

Delays/disruptions to the supply chain, mainly foreign supplies, heavily affected construction projects during the pandemic. According to respondents, shipping delays happened and were suspended during the pandemic period. According to respondents, the force majeure clause must be reviewed to determine if contractors are entitled to extend the project time and any liable damages due to issues in the supply chain rise along with a pandemic situation. According to some engineers, supply shortages due to a pandemic is not a refusal to render performance by the contractor, and the contractor must undertake all reasonable efforts to ensure the procurement of materials on time. Therefore, contractors faced several contractual challenges related to issues in the supply chain. JR1 stated, “when contractors are seeking entitlements for these challenges due to COVID-19, they will realise that the impact could be minimised if they have pre-ordered major material and purchased bulk quantities in the early stages of the project”.

Figure 4-8 presents suggestions to unravel the contractual challenges due to **labour shortage and productivity losses**.

Name	Sources	References
Strategies - Labour Shortage and Productivity Losses	10	27
Strictly adhere to the health guidelines	9	9
Provide accommodation for labours	9	9
Give work target to available labours and provide incentive	4	4
Increase machinery usage and reduce labour	2	2
Promote isolation	1	1
Overtime working	1	1
Use new technologies to increase productivity	1	1

Figure 4-8: Strategies to Unravel the Contractual Challenges due to Labour Shortage and Productivity Losses

As the respondents mentioned, contractors must undertake all reasonable efforts to minimise productivity loss due to any situation.

Therefore, contractors have taken action to minimise the labour shortage by providing accommodation and other facilities during the COVID-19 period and spent additional costs to provide extra accommodation for labours, to disinfect and sanitise the workplaces and accommodations compelled on government instruction. Productivity loss is not always easy to establish and evaluate, especially in a pandemic situation. However, to conduct a meaningful analysis to grant entitlement for losses, the contractors should maintain an accurate, contemporaneous record. Besides, after several analyses, most contractors cannot recover the aforementioned additional costs due to the unavailability of explicit contractual provisions.

Figure 4-9 presents suggestions to unravel the contractual challenges due to **delayed payments and cashflow issues**.

As per the respondents, the best way is to discuss with each party on financial issues because all parties had to face difficulties due to the pandemic. However, the contractors still expect relief from the employers and the government because the contractors have taken necessary actions to minimise the impacts accordingly.

Name	Sources	Reference
Strategies - Delay Payments	8	8
Collaborative approach - Negotiate with the parties	5	5
Request payments as installments	2	2
Request payments in advance	1	1
Name	Sources	Reference
Strategies - Cashflow Issues	10	23
Apply for bank relief	8	8
Request material for credit basis from suppliers	7	7
Minimise unnecessary expenses at the site	2	2
Submit payment applications on time	2	2
Request concessions from the employer, suppliers and respective parties	2	2
Request payments in advance	1	1
Search for relief from the government	1	1

Figure 4-9: Strategies to Unravel the Contractual Challenges due to Delayed Payments and Cashflow Issues

Figure 4-10 presents suggestions to unravel the contractual challenges due to the **suspension of works and project terminations**.

Name	Sources	References
Strategies - Work Suspension	10	19
Try to avoid suspensions	8	8
Collaborative approach - Negotiate with the parties	5	5
Use remote setup to Work From Home (WFH)	4	4
Do necessary to prevent from suspensions	1	1
Claim for entitlements	1	1
Strategies - Project Termination	10	16
Try to avoid terminations	8	8
Collaborative approach - Negotiate with the parties	6	6
Claim for entitlements	1	1
Do necessary to prevent from termination	1	1

Figure 4-10: Strategies to Unravel the Contractual Challenges due to Work Suspensions and Terminations

Regularly and diligently completing the construction works and as per the contract within the specified time is a fundamental contractual obligation for a contractor. If a contractor fails to complete the works within the prescribed time, and where no extension of time has been granted, an Employer or Client typically has the contractual right to impose liquidated damages and sometimes other related charges or to terminate the contract in the worst-case scenario.

Many contractors had successfully claimed time extensions for completion under the contract when their projects were suspended due to the pandemic situation but not for costs incurred. Therefore, the advice from the respondents was to try to avoid suspensions and carry out the work by putting best efforts. Moreover, try to prevent terminations because sometimes the cost will be less to carry out the project during the pandemic than the loss due to terminations.

Figure 4-11 presents suggestions to unravel the contractual challenges due to **uncertainty in new project executions**.

Name	Sources	References
Strategies - Uncertainty in New Project Execution	6	6
Collaborative approach - Negotiate with the parties	5	5
Try to accelerate the project commencement	1	1

Figure 4-11: Strategies to Unravel the Contractual Challenges due to Uncertainty in New Project Execution

It was evident that most contractors are facing difficulties due to uncertainty in new project executions due to the COVID-19 pandemic. As mentioned by respondents BR1, FR1, GR1, and IR1, the respective organisations decided not to bid for new construction projects during the pandemic period due to several qualms, including uncertainty in project execution. BR1 emphasised that a collaborative approach which means taking action after discussing with the respective parties is necessary because all parties face difficulties with the pandemic-related uncertainties.

The respondent further mentioned that parties to the contract in construction projects should avoid acting as enemies and do their best to unravel the contractual challenges faced by each party.

Figure 4-12 presents suggestions to unravel the contractual challenges due to **failure in claim notification on time**.

Name	Sources	Reference
Strategies - Failure in Claim Notifications on Time	10	13
Strictly adhere to the conditions of contract and avoid failures	6	6
Use electronics methods to notify within the pandemic period	4	4
Give responsibility to particular person	2	3

Figure 4-12: Strategies to Unravel the Contractual Challenges due to Failure in Claim Notification on Time

As mentioned by IR1, “... even though the construction projects have been closed for some period, the contractor has carried out the work related to claims on time using

electronic methods such as e-mail and online platforms. Since there was an allocated person for the respective work organisation, I could not face any difficulties related to claim notification on time.” Similarly, some other respondents also suggested using available facilities to complete every possible activity in a construction site to avoid difficulties due to any pandemic.

Figure 4-13 presents suggestions to unravel the contractual challenges due to **failure to secure site efficiency**.

Name	Sources	References
Strategies - Failure to Secure Site Efficiency	10	28
Introduce new softwares to monitor works	4	4
Strictly adhere to the health guidelines	4	4
Use innovative technologies	10	11
Increase machinery usage and reduce labour	10	10

Figure 4-13: Strategies to Unravel the Contractual Challenges due to Failure to Secure Site Efficiency

CR1 mentioned that construction industry stakeholders should pay attention to finding solutions through consistent digitalisation alone and should get adjusted flexibly to meet the COVID-19 challenge. Moreover, the majority of respondents emphasised that experienced contractors should be able to take advantage of the resulting opportunities.

Most respondents mentioned that the Enterprise Resource Planning (ERP) system is an effective and efficient way to monitor data. As stated by IR1, “normally, the organisation is maintaining the ERP system. But the issue is that all relevant data are not feeding to the system always. But if the ERP system is maintained well, it would be easy to collect data at any time”. DR1 revealed “increased machinery and reduced labour force” as one successful method to minimise the viral spread. Most developed countries have quickly shifted to innovative technologies while reducing the labour force.

Figure 4-14 presents suggestions to unravel the contractual challenges due to the **failure to implement quality monitoring and control process**.

Name	Sources	References
Strategies - Failure to Implement Quality Monitoring and Control Processes	8	8
Collaborative approach - Negotiate with the parties	3	3
Setting up inhouse lab and conduct possible tests	2	2
Give priority to important tests and prepare schedule for the rest	1	1
Reduce the number of test repetition	1	1
Have strong quality monitoring process and allocated person for that	1	1

Figure 4-14: Strategies to Unravel the Contractual Challenges due to Failure to Implement Quality Monitoring and Control Process

Figure 4-15 presents the suggestions to unravel the contractual challenges due to **interpretations of the contractual language**.

Name	Sources	References
Strategies - Interpretation of the Contract Language	9	16
Standard forms of contract should include the term 'pandemic'	8	8
Pandemics should clearly describe under exceptional events	3	3
Use addendams if necessary	2	2
Remedies should be clearly describe	2	2
Collaborative approach - Negotiate with the parties	1	1

Figure 4-15: Strategies to Unravel the Contractual Challenges due to Interpretations of the Contractual Language

As most respondents mentioned, the main issue the contractors face is recovering additional costs due to COVID-19. Accordingly, most contractors have tried their best to recover those costs through a price fluctuation formula, but they could not recover all costs that occurred due to the pandemic. Therefore, every respondent agreed that the word pandemic should be clearly described in standard forms of contracts and remedies. JR2 stated, “*employers only pay for direct costs but should have provision to pay for overhead costs as well or should extract suitable provision from available provisions related to pandemic situations*”.

Figure 4-16,4-17,4-18,4-19 and 4-20 present the findings of the literature review and data analysis of the research study as the final output in a graphical representation.

4.4. Chapter Summary

Findings of the data collection process have been discussed throughout the chapter. The Chapter presented the analysis of data that were collected through documentary review and in-depth interviews under several headings. The document analysis provided the available contractual provisions and case laws which can apply to the construction industry in a pandemic situation. Moreover, contractual challenges and strategies to overcome those challenges have been identified and discussed in this chapter. Finally, research findings have been summarised in a graphical form at the end of the chapter.

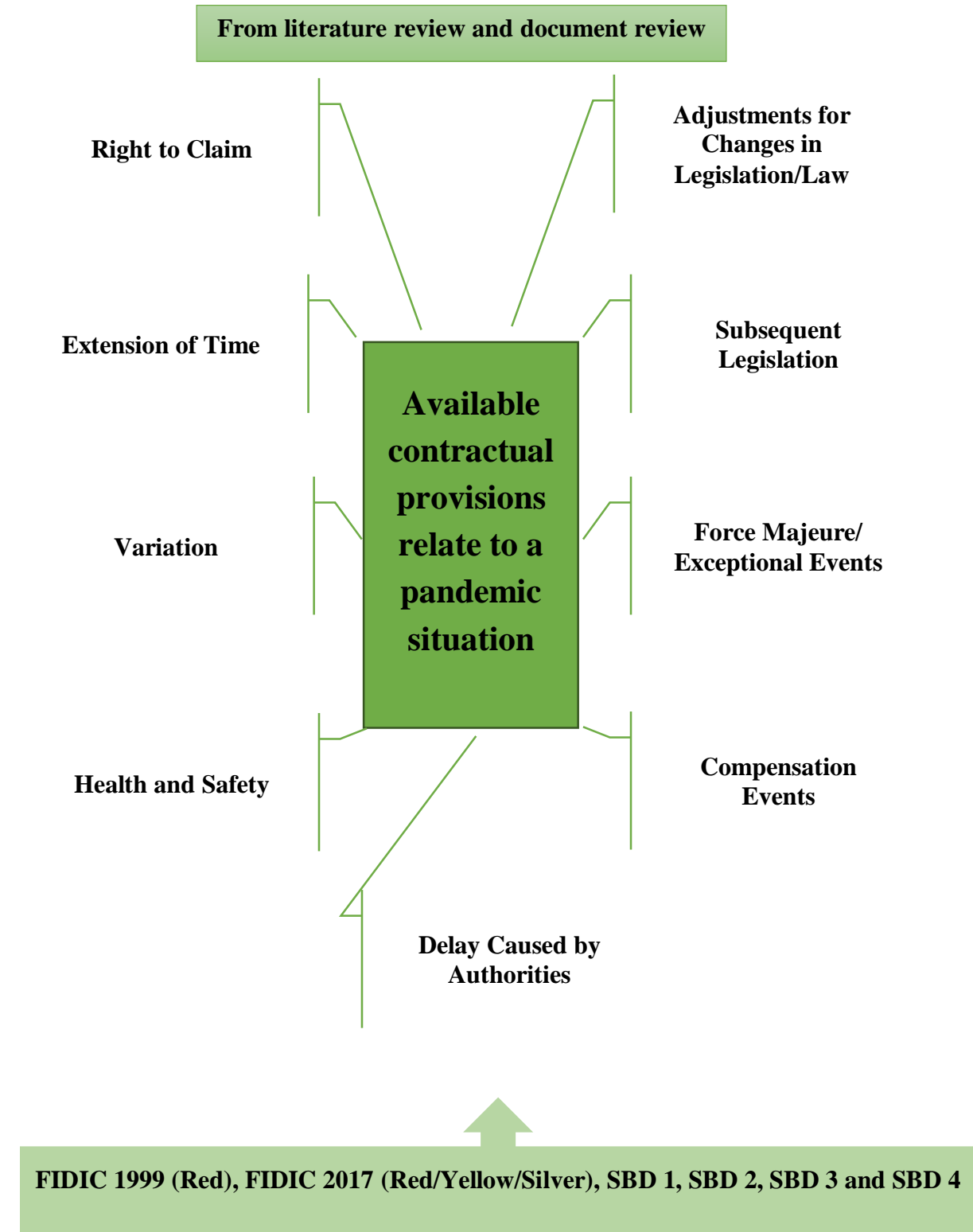
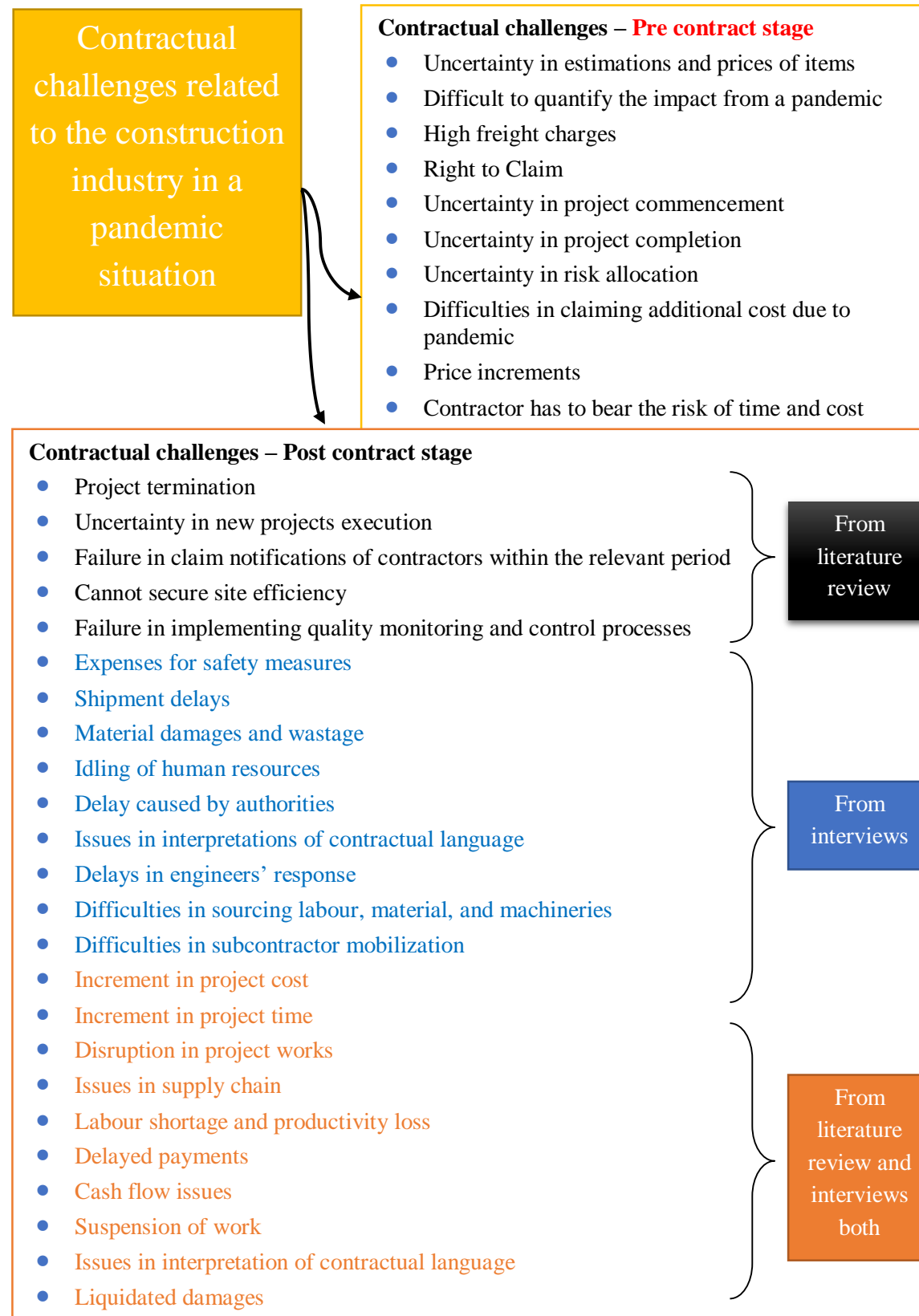


Figure 4-16: Research Findings – Challenges and Available Contractual Provisions

Strategies for construction industry to unravel the contractual challenges in a pandemic situation - 1

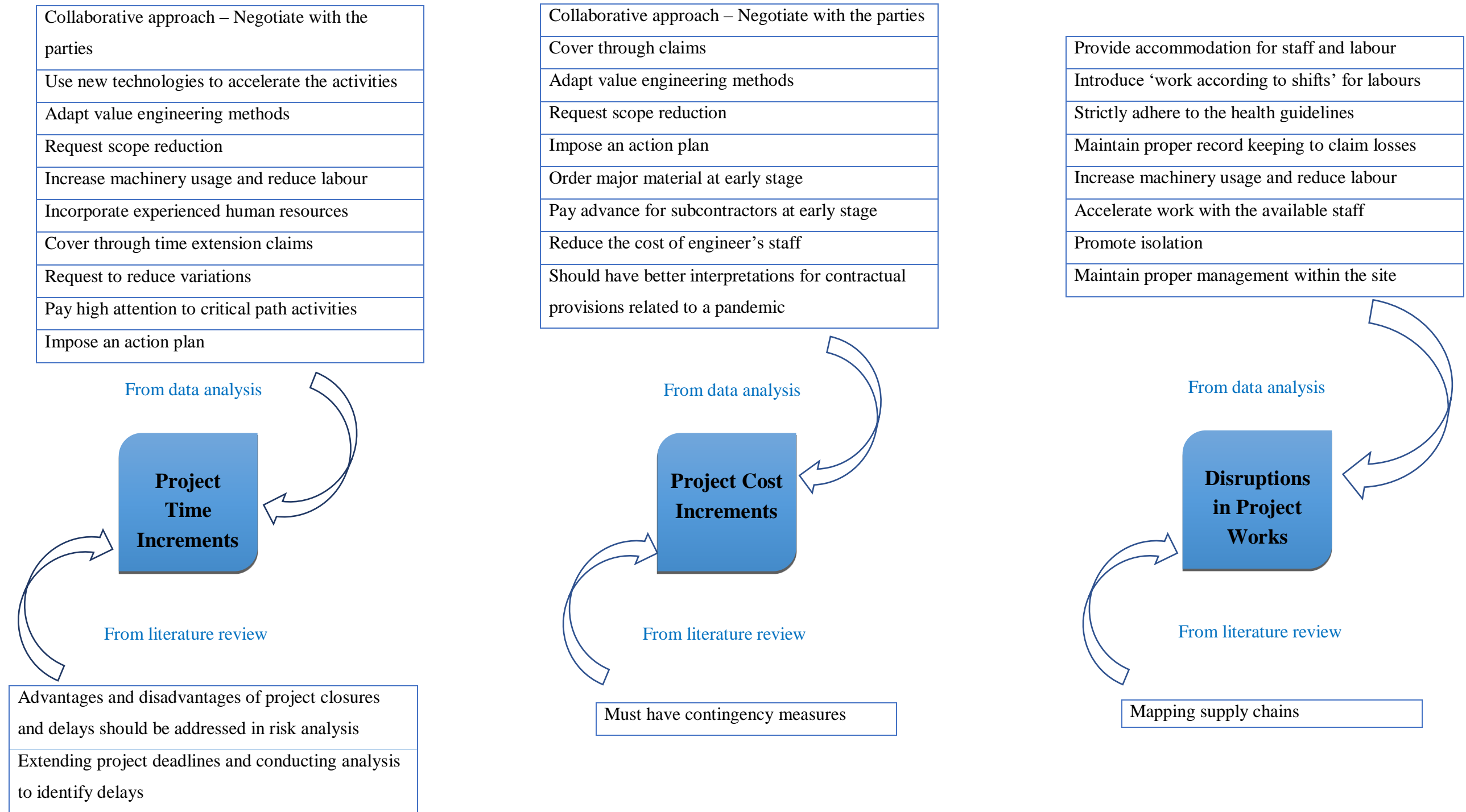


Figure 4-17: Strategies for Construction Industry to Unravel the Contractual Challenges in a Pandemic Situation -1

Strategies for construction industry to unravel the contractual challenges in a pandemic situation - 2

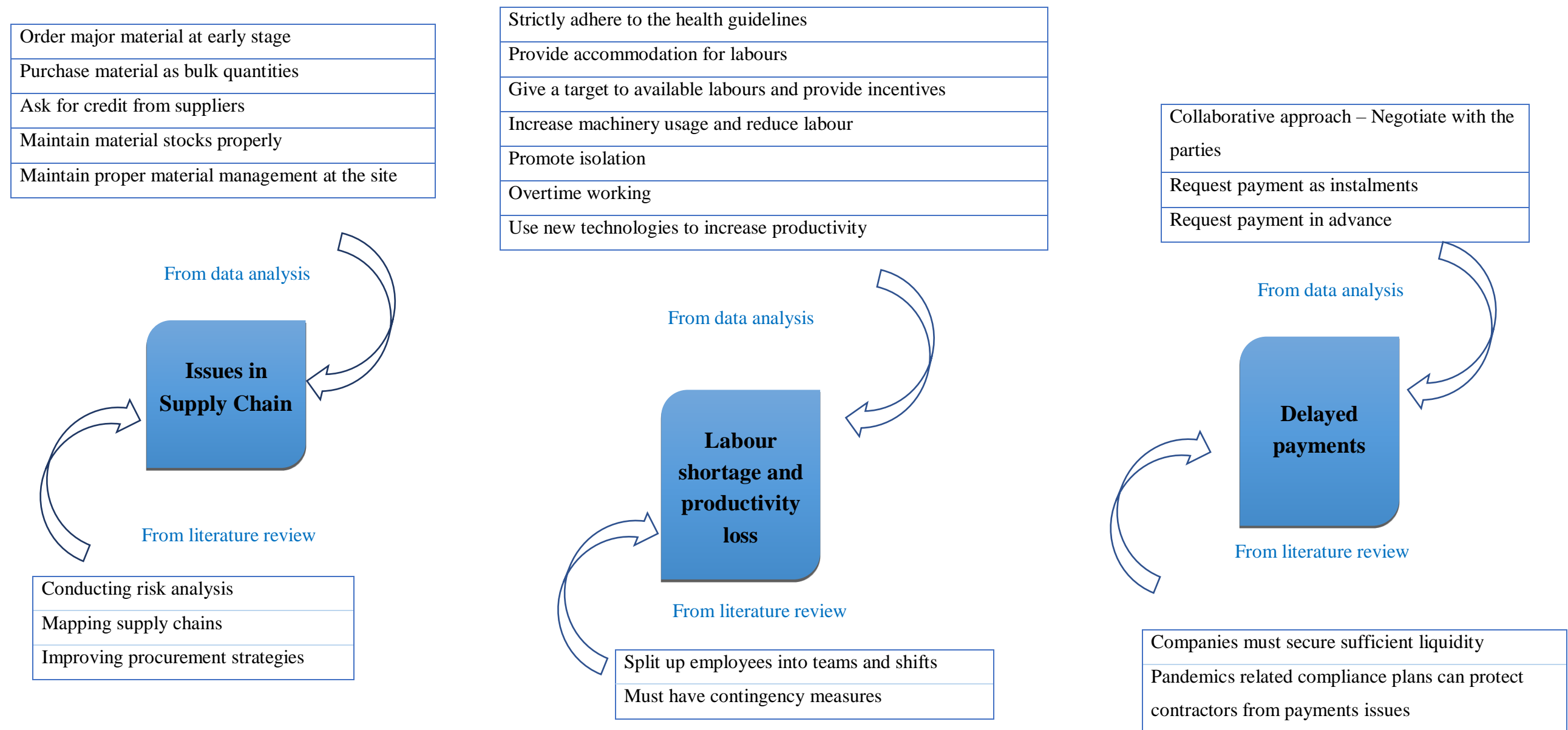


Figure 4-18: Strategies for Construction Industry to Unravel the Contractual Challenges in a Pandemic Situation -2

Strategies for construction industry to unravel the contractual challenges in a pandemic situation - 3

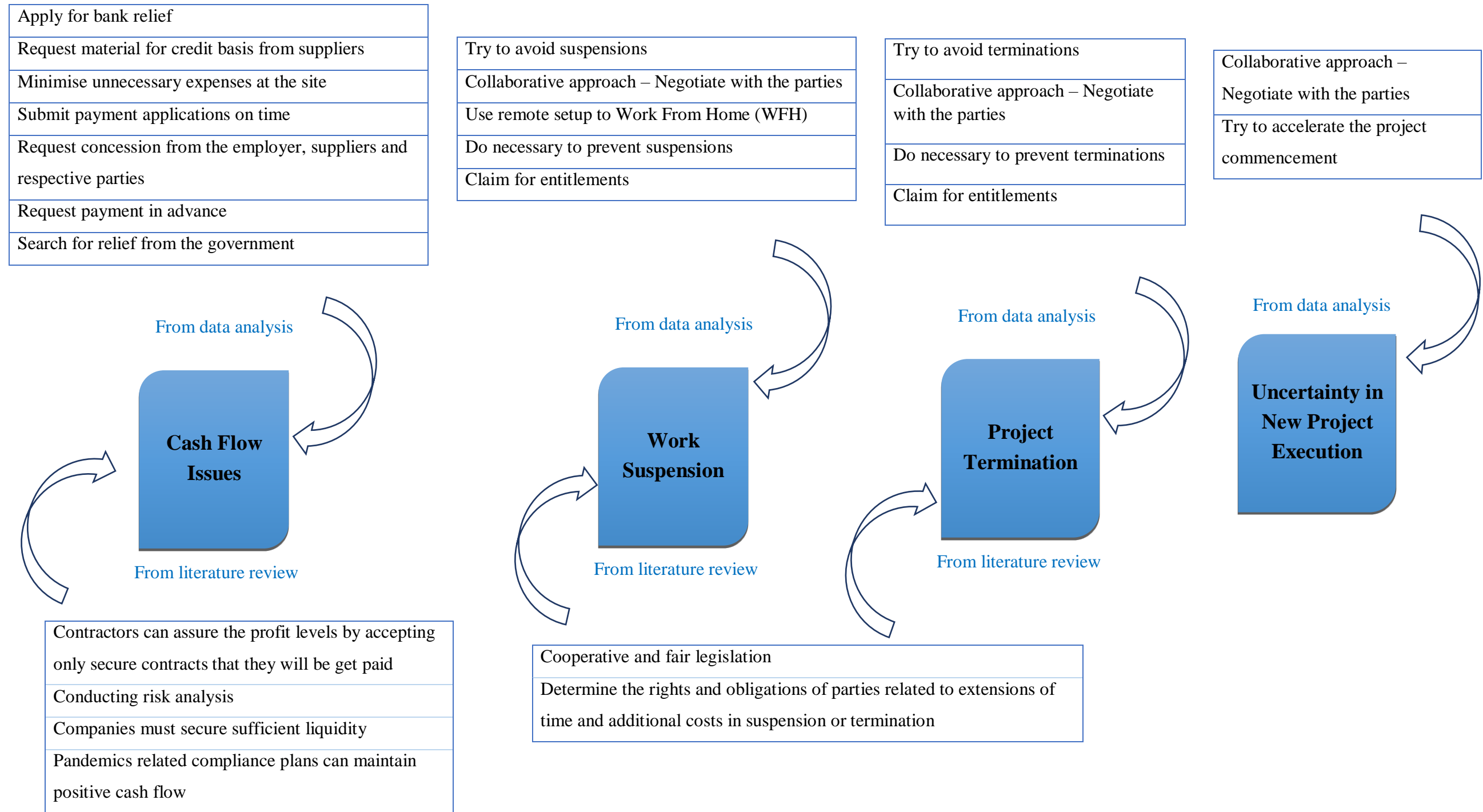


Figure 4-19: Strategies for Construction Industry to Unravel the Contractual Challenges in a Pandemic Situation -3

Strategies for construction industry to unravel the contractual challenges in a pandemic situation - 4

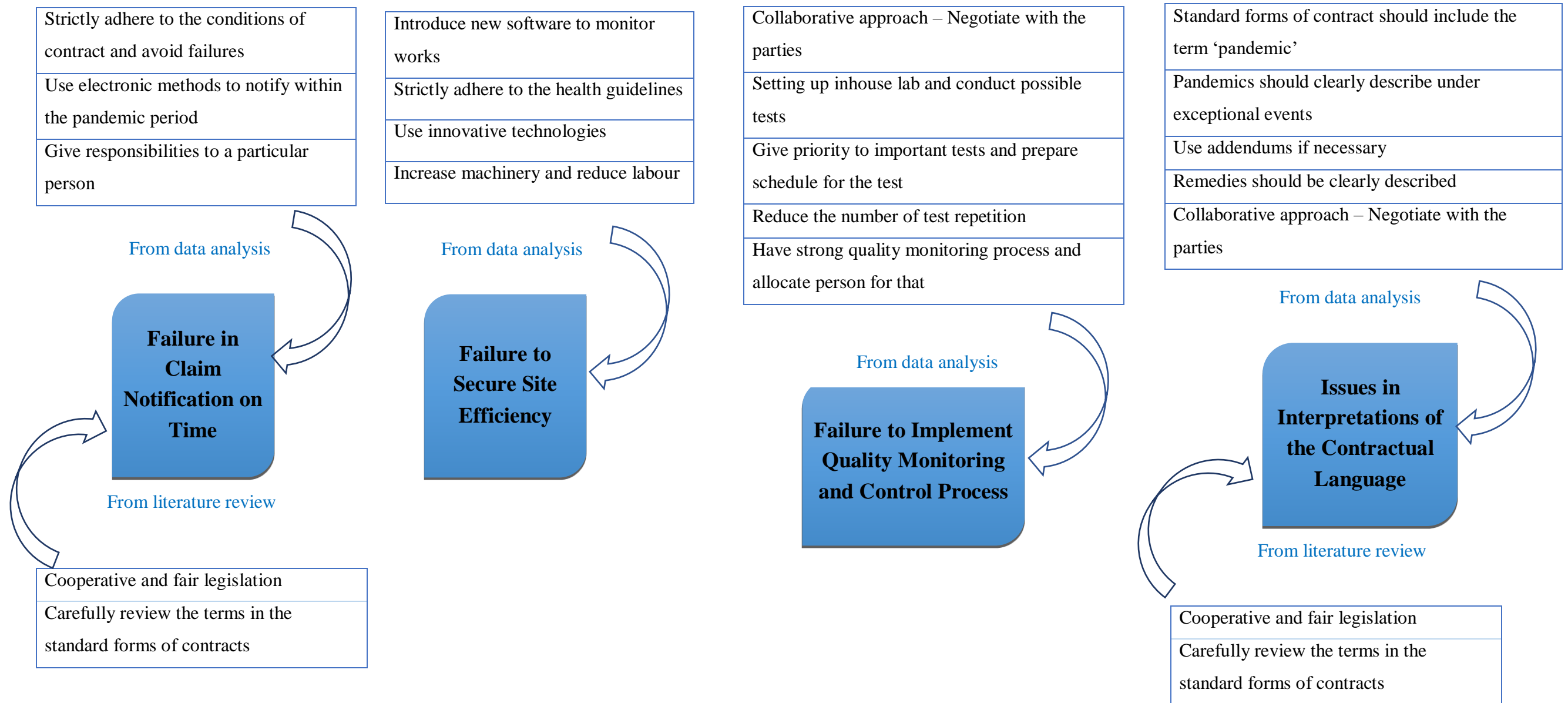


Figure 4-20: Strategies for Construction Industry to Unravel the Contractual Challenges in a Pandemic Situation -4

CHAPTER 5 – CONCLUSIONS AND RECOMMENDATIONS

5.1. Introduction

Chapter Five discusses the attainment level of the research aim and objectives. The key findings are concluded and extended as recommendations while highlighting the process followed to achieve the research objectives. The research mainly focused on contractual challenges the construction industry face. Therefore, this research provides excessive knowledge to industry practitioners about how to unravel the contractual challenges in a pandemic situation.

5.1. Overviewing the Research Objectives and Research Process

The construction industry cannot be exempted, as it has faced huge issues due to COVID-19, similar to other sectors. Thus, the pandemic created several challenges for the construction stakeholders. Among them, contractual challenges, which have legal implications, can lead to many disputes and contractual challenges raised to assist contractors in claiming a loss, expenses, and extension of time. First, a comprehensive literature survey was conducted to review the literature on challenges faced by the construction industry in a pandemic situation under several headings.

The literature review discussed all objectives with the support of previous studies. After considering the characteristics, advantages, and suitability of research approaches, the qualitative research approach was selected for the research. After selecting the qualitative survey research strategy, a preliminary interview round was held before dealing with the in-depth interviews. Semi-structured interviews and document reviews were used as data collection techniques for the research. The qualitative data were analysed via manual content analysis and the NVivo software, and the outputs were presented as graphical representations. Suggestions were made to unravel the contractual challenges faced by the construction industry, and finally, the aim and objectives of the research study were successfully achieved.

Objective 1: Critically Review the contractual challenges relate to the construction industry in a pandemic situation (COVID-19)

A comprehensive literature synthesis reviewed on contractual challenges related to the construction industry in general as well as in a pandemic situation (COVID-19). In addition to the traditional literature review, the study developed a systematic review to find the contractual challenges faced by the construction industry in a pandemic situation with the support of Emerald Insight, Science Direct and Scopus databases. The PRISMA statement was used as a formal guideline for the Systematic Literature Review (SLR).

Construction delays, Disruption in project works, Cash flow issues, Delayed payments, Unsecured site efficiency, Escalation of project cost, Issues in the supply chain, Labour shortage and productivity loss, Failure in claim notifications of contractors within the relevant period, Failure in implementing quality monitoring and control processes, Interpretation of the contract language, Suspension of work, Project termination, Liquidated damages, and Uncertainty in new projects' execution were identified as common contractual challenges related to construction projects in a pandemic situation as outcomes of SLR.

Expenses for safety measures, Shipment delays, Material damages and wastage, Idling of human resources, Delay caused by authorities, Issues in interpretations of contractual language, Delays in engineers' responses, Difficulties in sourcing labour, material, and machinery, and Difficulties in subcontractor mobilisation were identified through in-depth interviews conducted with industry experts. Most identified contractual challenges are explicitly set upon the project time and cost. Nevertheless, standard construction contracts ordinarily provide provisions for expanding time and compensations for the costs under several sub-clauses. The construction stakeholders seek their entitlements for time extensions and additional costs to survive within the industry by overcoming delays and disruptions due to the current pandemic situation.

In addition to the contractual challenges identified above, strategies such as Having contingency measures, Address the advantages and disadvantages of project closures

and delays in risk analysis, Extending project deadlines and conducting analysis to identify delays, Split up employees into teams and shifts, Mapping supply chains, Improving procurement strategies, Secure sufficient liquidity, Use pandemics related compliance plans, Accepting only secure contracts that they will be get paid, Use cooperative and fair legislation, Determine the rights and obligations of parties related to extensions of time and additional costs, Carefully review the terms in the standard forms of contracts were identified through the comprehensive literature review in a pandemic situation. Most of the researchers have suggested strategies to overcome ‘contractual challenges faced by the construction industry in general’. Besides, it is prudent to know the strategies to overcome the destructive impact of ‘contractual challenges due to any pandemic’.

Objective 2: Evaluate the applicability of available contractual provisions and case laws relate to a pandemic situation

Unlike typical situations, a pandemic can create a different nature in the construction site. Hence, this study is an attempt to address the applicable provisions for contractual challenges faced during a pandemic to minimise the impacts at the beginning and the end of the crisis to prepare for future potential and learn lessons.

According to the interpretations of the contractual clauses in standard forms of contracts such as FIDIC and SBD, when the government announced ‘Work from Home’ or ‘imposed curfew’ and prevented site operations, as per the conditions of the form of contract, the contractor can maintain a claim under Change in Law/Legislation clauses, prevention of work due to governmental directives and/or action following the vested power to the competent authority. In this situation, the contractor can claim only associated costs due to Changes in Law/Legislation.

Moreover, the contractor has the liberty to claim an Extension of Time for Completion under the same clauses for the prevention of work due to governmental directives and/or action in accordance with the vested power of the competent authority. As per the interpretations of a different standard form of contracts, when the government

impose additional regulations due to a pandemic, then the parties to the contract should comply with the clauses relevant to legislation changes.

It is the only sub-clause in a construction contract document where the contractor can claim for cost or time or both. Exceptional event-related sub-clauses like the Force Majeure clause cannot be directly applied because it does not explicitly mention a Pandemic, but it says an Epidemic. Therefore, the parties to the contract will argue for a longer time regarding clauses related to pandemic situations to get compensation. This will affect an ongoing construction project which started before 2019 and the new projects where the clauses are not available to tackle this COVID-19 pandemic after considering the FIDIC Memorandum or similar documents.

In addition to the aforementioned contractual provisions, Subsequent Legislation, Compensation Events, Right to Claim, Extension of Time, Variation, Health and Safety, and Delay Caused by Authorities were identified as other contractual provisions that can get help when seeking losses due to a pandemic situation by the parties to the contract.

In addition, the study reviewed case laws that have addressed the available most common contractual provisions connected to the construction industry related to unravelling contractual challenges in a pandemic situation. According to the findings, the most common contractual provisions applicable to contractual conflicts in pandemic situations available in the construction industry are 'Force Majeure' and 'Changes in Legislation' clauses. Accordingly, the Laws in terms of the contracts have been changed in preventive measures of the COVID-19 pandemic. Parties to the contract should pay attention to whether they will depend on the available clauses and terminologies related to the pandemic or adjust available provisions concerning the crisis COVID-19. Since COVID-19 is a novel pandemic crisis, only a few cases are available within the construction industry. Most cases have mentioned 'pandemic' as an 'unforeseen situation beyond the reasonable control of the parties'.

Due to the unavailability of particular contractual provisions to 'pandemic' in the standard forms of contracts, identified cases will be provided ground for applicable

contractual implications to the contractual challenges faced by the construction industry in a pandemic situation. Pandemics occurred in the 1820s and 1920s; it can occur any time in the near future, and COVID-19 still prevails. Therefore, adjustments to available provisions in the form of contracts are essential to safeguard all parties related to the construction contracts to minimise the impact of contractual challenges due to pandemics.

Objective 3: Investigate the challenges with the implementation of contractual provisions in the case of COVID-19 pandemic

As identified from the literature and data analysis, the construction industry has faced many challenges and those caused to prevent the contractor from continuing the works as scheduled. According to the findings, 'Force Majeure' will not be the relevant clause since proximate cause is 'governmental directives' to prevent the pandemic. However, this clause will be relevant if there is a delay/disruption to the supply chain, mainly for foreign suppliers. Nevertheless, apparently, COVID-19 is affecting the project long-term; it shall be interpreted as the associated cost of the delays and disruptions to the works to be compensated to the contractor, where COVID-19 is beyond the contractor's control. Therefore, it is well justifiable that the contractor shall be compensated with an extension of time for completion and associated cost incurred due to this long-term force majeure situation.

Many disputes have been crystallised between parties to the contract due to the rejections of some entitlements of the contractors submitted through claims. Therefore, parties to the contracts sought relief from the Alternative Dispute Resolution Procedure. Moreover, the changes in the law clause will only apply since the delay and/or disruption happened due to governmental action following the vested power to the competent authority during the requested time extension period by the claimant. However, it was evident that the most impacted party due to the pandemic situation is the contractors, and the contractors' opinion was that they have acquirement to claim additional costs occurred related to Head Office Overhead, Site Overhead, Idling of Resources, Extended Preliminaries, Extended Price Escalation, Disruption Cost Due

to Loss of Efficiency, and any Uncompensated Finance Cost due to COVID-19 pandemic.

Objective 4: Propose strategies for construction industry to unravel the contractual challenges in a pandemic situation

This research aimed to unravel the contractual challenges faced by the construction industry during the COVID-19 pandemic situation. Hence, the final research outcome proposed applicable strategies for industry practitioners. The study identified ten suggestions to minimise the increment in project cost and twelve suggestions to minimise increment in project time. The collaborative approach, adopting the value engineering method, scope reduction, covering the losses through claims, and imposing action plans were common suggestions for the contractual challenges identified above. Another nine strategies were identified for contractual issues due to disruption in project works, and the most common suggestions were to provide accommodation for labours and introduce work shifts. Eight strategies for issues in the supply chain, nine strategies for the labour shortage and productivity loss, five strategies for delayed payments, and eleven strategies for cash flow issues were identified. As per the findings, the parties to the contracts should always try to avoid work suspensions and terminations by discussing the issues with each other. It is difficult to overcome the contractual challenges in situations like pandemics without proper communication.

Another five and four solutions were identified, respectively, to minimise the impact of work suspension and termination during the pandemic period. Acceleration of work and conducting discussions with the parties have been identified as the most appropriate solutions for uncertainty in new project executions. Another five strategies for failure in claim notifications of contractors within the relevant period, four strategies to secure site efficiency, and five solutions to avoid failure in implementing quality monitoring and control processes were suggested in this study. Another seven strategies were identified to minimise the impact of issues due to the interpretation of the contract language in standard forms of contracts. This research study suggests the responsible parties who engage with standard forms of contracts provide relief for

parties to the contracts through incorporating necessary adjustments for respective contractual clauses.

5.2. Contribution of the Study

5.2.1. Contribution to theory

The outcomes of the research can be utilised to enhance the knowledge in the areas related to construction industry such as contract administration, claims management, project management, supply chain management, risk management and dispute resolution.

5.2.2. Contribution to practice

It was evident that the majority of contractors and clients faced financial difficulties due to the COVID-19 pandemic. To remain able to act during and immediately after the crisis, companies must secure sufficient liquidity and be capable of reacting fast to any changes that may occur. By now, companies should already have ensured this is the case for their business. Moreover, the industry practitioners are encouraged to pay attention to strategies suggested by this research study to minimise any impact that occurred due to the COVID-19 pandemic. The end results of the study will be beneficial for the parties to the contract as well as other construction stakeholders to avoid the risk and uncertainty due to pandemics.

5.2.3. Limitations of the study

Basically, this research is limited to contractual challenges faced by the contractors in a pandemic situation. Further, this study was focused on standard forms of contracts SBD and FIDIC only.

5.2.4. Recommendations for further research

Based on the findings and the limitations of the research, the following recommendations are made for consideration in further research.

- The current study was limited to contractor's perspective. Thus, conduct a similar study to facilitate the clients to prepare them for future pandemics when investing for new projects.
- Investigate the available contractual provisions related to pandemic situation in standard forms of contracts such as Joint Contracts Tribunal (JCT) and New Engineering Contract (NEC) and suggest appropriate adjustments for changes for available clauses.
- Develop a methodological framework to minimise the delay/disruption faced by the construction supply chain, mainly the foreign suppliers during a pandemic situation.

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ANNEXURE 1 – INTERVIEW GUIDELINE

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Dear Sir/Madam,

Data Collection for Research Study – Research Based MSc.

Research - Unravelling contractual challenges faced by the construction
Topic: industry in a pandemic situation: The case of COVID-19
Supervisor: -

I am, a Research Scholar at Department of Building Economics University of Moratuwa, conducting research on the above topic. At present, I am continuing my research with the data collection. As such, “Survey” has selected as the research strategy. “Indepth Interviews” from construction projects and “Documents Reviews” are being used as the data collection techniques. The information provided will be purely used only for the research purpose, and there would not be specific references to any individual or an organisation. The outcomes related to the particular organisation/project are expected to share with the construction organisation for future improvements.

Thus, I would be grateful if you can support me on conducting interviews to fulfil my research objectives.

Thank You.

Yours Faithfully

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INTERVIEW GUIDELINE

**UNRAVELLING CONTRACTUAL CHALLENGES BY THE
CONSTRUCTION INDUSTRY IN A PANDEMIC SITUATION:
THE CASE OF COVID-19**

Section – A

- 1. Respondent name (Optional) :
- 2. Industry Experience (In years) :
- 3. Company CIDA grading :
- 4. Designation :

Section – B

CONTRACTUAL CHALLENGES RELATE TO A PANDEMIC

- 1. How did you/your organisation affect by COVID-19 Pandemic?
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.....
- 2. What are the contractual challenges faced/facing by you as a contractor relate to COVID-19 pandemic situation?
 - i. Projects at Pre-contract Stage (If Any)**
 - Contractual Challenges -
.....
.....
.....
 - Project Type -
 - Client -
 - Standard Form of Contract -
 - Commencement Date -
 - COVID Related Claims (if any) -.....
 - Incorporated Contractual Provision -
 - Responses to the Claims -

- If not satisfied with the responses what was the next step (Adjudication/Arbitration/Any other) -

ii. Projects at Post-contract Stage (If Any)

- Contractual Challenges -
.....
.....
.....
- Project Type -
- Client -
- Standard Form of Contract -
- Commencement Date -
- COVID Related Claims (if any) -.....
- Incorporated Contractual Provision -
- Responses to the Claims -
- If not satisfied with the responses what was the next step (Adjudication/Arbitration/Any other) -

Section – C

CONTRACTUAL PROVISIONS RELATE TO A PANDEMIC

3. What are the suitable contractual provisions in FIDIC book series and SBD book series applicable to a pandemic situation in addition to followings?

Clause	FIDIC 1999 (Red)	FIDIC 2017 (Red/Yellow/Silver)	SBD 1	SBD 2	SBD 3	SBD 4
Adjustments for in Changes Legislation/Law	13.7	13.6/13.7	45.1	13.6		13.6
Force Majeure	19.0	19.0		20.0	12.2	20.0
Compensation Events			44.1			
Right to Claim	20.1	20.1		19.1	9.4	19.1
Extension of Time	8.4	8.4/8.5		8.4	6.3	8.4
Exceptional Events		18.0				

4. COVID-19 is construed as a Force Majeure situation, within the natural catastrophe. What is felt by you as an industry expert?

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5. It is obvious that the Laws in terms of the Contracts have been changed in preventive measures of COVID-19 pandemic. Can the remedies available (Time and Cost) under the provision for Changes in Legislation be effective in this COVID-19 situation?

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6. Some countries have introduced new laws/circulars to deal with pandemics. If you aware about those please mention?

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7. Are there any suggestions to do adjustments in available contractual provisions to reform them which are acceptable for any pandemic situation?

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Section – D

STRATEGIES TO MINIMISE THE IMPACT OF CONTRACTUAL CHALLENGES RELATE TO A PANDEMIC

8. What would be the suggestions to minimise the impact on construction projects from following contractual challenges?

<u>IDENTIFIED CHALLENGES</u>	<u>SUGGESTIONS</u>
CCC 1: Escalation of project cost	•
CCC 2: Escalation of project time	•
CCC 3: Disruption in project works	•
CCC 4: Issues in supply chain	•
CCC 5: Labour shortage and productivity loss	•
CCC 6: Delayed payments	•
CCC 7: Cash flow issues	•
CCC 8: Suspension of work	•
CCC 9: Project termination	•
CCC 10: Uncertainty in new projects execution	•
CCC 11: Failure in claim notifications of contractors within the relevant period	•
CCC 12: Cannot secure site efficiency	•
CCC 13: Failure in implementing quality monitoring and control processes	•
CCC 14: Interpretation of the contract language	•
CCC 15: Liquidated damages	•

9. What Sri Lanka can do to minimise the impact of COVID-19 Pandemic within the construction industry in future?

.....

10. How is the construction industry in other countries going to deal with future pandemics?

.....

-THANK YOU FOR YOUR VALUABLE TIME AND SUPPORT-

ANNEXURE 2 – INTERVIEW TRANSCRIPT

INTERVIEW TRANSCRIPT

UNRAVELLING CONTRACTUAL CHALLENGES FACED BY THE CONSTRUCTION INDUSTRY IN A PANDEMIC SITUATION: THE CASE OF COVID-19

Section – A

1. Respondent name (Optional) :
2. Industry Experience (In years) : 11
3. Company CIDA grading : C1
4. Designation : Project Manager

Section – B

CONTRACTUAL CHALLENGES RELATE TO A PANDEMIC

11. How did you/your organisation affect by COVID-19 Pandemic?

Time and Cost issue was there.

Bear minimum Cost Concept- Clause added to particular conditions-If a pandemic situation comes, the contractor is not going to charge unreasonably for all the additional costs incurred due to the pandemic. But with the parties mutual understanding, the contractor is going to charge reasonable amount for the expenses that he had to bear due to direct activities in related to the pandemic. This cost is paid under engineer's approvals (for example: cost for providing separate accommodation and facilities for labour quarantines, costs for safety precautions). In additions this was considered as a reimbursement cost.

12. What are the contractual challenges faced/facing by you as a contractor relate to COVID-19 pandemic situation?

iii. Projects at Pre-contract Stage (If Any)

Difficult to quantify the impact from the pandemic

Difficulties of rate preparations

High Freight Charges

- Project Type – Building
- Client-Government
- Standard Form of Contract -FIDIC 1999
- Commencement Date – Before the pandemic
- COVID Related Claims (if any) – Time and Cost
- Incorporated Contractual Provision – Provisions in FIDIC
- Responses to the Claims – EOT and up to some extend we could cover direct expenses due to pandemic

If not satisfied with the responses what was the next step (Adjudication/Arbitration/Any other) – No, but trying to settle amicably

iv. Projects at Post-contract Stage (If Any)

- Contractual Challenges-
.....
.....
.....
- Project Type -
- Client -
- Standard Form of Contract -
- Commencement Date -
- COVID Related Claims (if any) -.....
- Incorporated Contractual Provision -
- Responses to the Claims -
- If not satisfied with the responses what was the next step (Adjudication/Arbitration/Any other) -

Section – C

CONTRACTUAL PROVISIONS RELATE TO A PANDEMIC

13. What are the suitable contractual provisions in FIDIC book series and SBD book series applicable to a pandemic situation in addition to followings?

Clause	FIDIC 1999 (Red)	FIDIC 2017 (Red/Yellow/Silver)	SBD 1	SBD 2	SBD 3	SBD 4
Adjustments for in Changes in Legislation/Law	13.7	13.6/13.7	45.1	13.6		13.6
Force Majeure	19.0	19.0		20.0	12.2	20.0
Compensation Events			44.1			
Right to Claim	20.1	20.1		19.1	9.4	19.1
Extension of Time	8.4	8.4/8.5		8.4	6.3	8.4
Exceptional Events		18.0				
Health and safety (comply for regulations)						
Variation clause (because engineer gave instructions relate to pandemic)						

14. COVID-19 is construed as a Force Majeure situation, within the natural catastrophe. What is felt by you as an industry expert?

No. they interpret runoff events only. It is subject to verifications. Need a proper interpretation.

15. It is obvious that the Laws in terms of the Contracts have been changed in preventive measures of COVID-19 pandemic. Can the remedies available (Time and Cost) under the provision for Changes in Legislation be effective in this COVID-19 situation?

No. this is applicable only if there are changes in law. What will be if there are no changes in law.

16. Some countries have introduced new laws/circulars to deal with pandemics. If you aware about those please mention?

Yes. Singapore had used proper circulars.

17. Are there any suggestions to do adjustments in available contractual provisions to reform them which are acceptable for any pandemic situation?

Should have proper provision for pandemics not only for epidemics

EOT+Cost should be there for remedies by considering fairly for parties

SBD should define the word 'Law' broadly

Section – D

STRATEGIES TO MINIMISE THE IMPACT OF CONTRACTUAL CHALLENGES RELATE TO A PANDEMIC

18. What would be the suggestions to minimise the impact on construction projects from following contractual challenges?

<u>IDENTIFIED CHALLENGES</u>	<u>SUGGESTIONS</u>
CCC 1: Escalation of project cost	<ul style="list-style-type: none"> • Try to claim for losses • Amicable settlement between parties
CCC 2: Escalation of project time	<ul style="list-style-type: none"> • Collaborative approach • Amicable settlement between parties
CCC 3: Disruption in project works	<ul style="list-style-type: none"> • Provide accommodation for staff • Introduce 'work according to shifts' for labours • Follow health guidelines strictly
CCC 4: Issues in supply chain	<ul style="list-style-type: none"> • Pre order material at the beginning of the project • Purchase material as bulk quantities

<u>IDENTIFIED CHALLENGES</u>	<u>SUGGESTIONS</u>
CCC 5: Labour shortage and productivity loss	<ul style="list-style-type: none"> • Strictly adhere to health regulations • Provide accommodation to labour
CCC 6: Delayed payments	<ul style="list-style-type: none"> • Amicable settlement between parties
CCC 7: Cash flow issues	<ul style="list-style-type: none"> • Discuss with the supplies and get material credit basis • Apply for bank loans
CCC 8: Suspension of work	<ul style="list-style-type: none"> • Try to avoid work suspensions • Amicable settlement between parties
CCC 9: Project termination	<ul style="list-style-type: none"> • Try to avoid terminations • Amicable settlement between parties
CCC 10: Uncertainty in new projects execution	<ul style="list-style-type: none"> • Try to postpone the commencement date till settle the pandemic up to considerable extend if applicable
CCC 11: Failure in claim notifications of contractors within the relevant period	<ul style="list-style-type: none"> • Strictly adhere to the conditions of contract and try to avoid failures
CCC 12: Cannot secure site efficiency	<ul style="list-style-type: none"> • Try to use new technologies • Use machineries more than labour
CCC 13: Failure in implementing quality monitoring and control processes	<ul style="list-style-type: none"> • Amicable settlement between parties
CCC 14: Interpretation of the contract language	<ul style="list-style-type: none"> • That is obvious that standard forms of contract should include the word ‘pandemic’ • Pandemics should clearly cover under exceptional events

<u>IDENTIFIED CHALLENGES</u>	<u>SUGGESTIONS</u>
CCC 15: Liquidated damages	<ul style="list-style-type: none"> • Amicable settlement between parties

19. What Sri Lanka can do to minimise the impact of COVID-19 Pandemic within the construction industry in future?
- Use innovative technologies within the construction industry
 - Try to produce new innovations to defeat pandemics
 - Government should get quick actions in a pandemic related to construction industry
 - CIDA has a main role to play
20. How is the construction industry in other countries going to deal with future pandemics?
- Bear minimum cost concept
 - Provisions in Standard forms of contracts should be changed
 - When considering FIDIC, the tsunami was not there but FIDIC 2017 they have included that. Like that it is better to address the pandemic as well
 - Parties to the contract should avoid acting as enemies and can implement collaborative action - Amicable settlement between parties
 - Implement DAAB (Dispute Avoidance and Adjudication Board)
 - Good to choose negotiations/ mediation method than adjudication/arbitration processes

-THANK YOU FOR YOUR VALUABLE TIME AND SUPPORT-