An examination of the retention practice in the New Zealand construction industry

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A thesis submitted to
Auckland University of Technology
in fulfilment of the requirements for the degree of
Doctor of Philosophy (PhD)

January 2015

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Auckland, New Zealand

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List of Abbreviations

ANOVA - Analysis of Variance

ASA - American Subcontractors Association

AUTEC - Auckland University of Technology Ethical Committee

BSRIA - Building Research and Information Association, UK

CCA - Construction Contracts Act 2002

DLP - Defects Liability Period

ICE - Institution of Civil Engineers

JCT - Joint Contracts Tribunal

MWD - Ministry of Works and Development

NEC - New Engineering Contract

NZCF - New Zealand Contractors Federation

NZIA - New Zealand Institute of Architects

NZIOB - New Zealand Institute of Building

NZIQS - New Zealand Institute of Quantity Surveyors

NZS - New Zealand Standard

NZSTCF - New Zealand Specialist Trade Contractors Federation

PIS - Participant Information Sheet

SME – Small Medium Enterprises

SPSS - Statistical Package for the Social Sciences

UK - United Kingdom

US - United States of America

List of Publications

Conference Papers

1. Raina, P., &Tookey, J. E. (2012, 28-30 June). *The Purpose of Retentions: A Review of the Existing Literature.*Paper presented at CIOB world construction conference "Global Challenges in Construction Industry", Colombo, Srilanka.
2. Raina, P., & Tookey, J. E. (2011, 16-18 Feb). *Construction defects and monetary retentions in construction projects:A review of case law*. Paper presented at the 4th International Conference of Construction Engineering and Project Management (ICCEPM – 2011), Sydney, Australia.
3. Abeysekera, V., Raina, P., & Neitzert, T. (2009, May 20-22). *Building Theory on Monetary Retention Regimes*. Paper presented at the meeting of the Fifth International Conference on Construction in the 21st Century (CITC-V) "Collaboration and Integration in Engineering, Management and Technology", Istanbul, Turkey.
4. Raina, P., & Tookey, J. (2013, 20-22 November). *The perceptions of retentions: A case of New Zealand.* In T.W. Yiu & V. Gonzalez (Eds), 38th Annual Conference of the Australasian Universities Building Educators Association (AUBEA), Auckland, New Zealand.

Symposiums

Raina, P (2012, 28th August). The status of retentions in the New Zealand construction industry: PhD wok in-progress, 6th Annual postgraduate symposium, AUT University, Auckland, New Zealand.

Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Priyanka Raina

Acknowledgments

Not the easiest 5 years of my life, having gone through the saddest and happiest times, from losing loved ones to creating lives. Pondering whether this is an end or a fresh beginning. Nevertheless writing this acknowledgement gives me a feeling of immense contentment and a feeling of gratitude for all those who were a part of this journey. Was it not for the incredible support from all those involved, accomplishing this milestone would have been a dream.

First and foremost I would like to acknowledge my primary supervisor, Professor Dr. John E. Tookey. It's due to his guidance, incredible support, patience and encouragement that this completion has been possible. I would also like to thank my secondary supervisor Professor Thomas Neitzet for his encouragement and feedback. In addition to that I would like to thank Dr. James Rotimi and Dr. Dave Moore for providing useful insights during the initial stages of my research. I would also like to extend my gratitude to Dr. Vasantha Abeysekera for introducing me to this subject area.

Funding is a very important part of any research work. I wish to acknowledge Building Research Levy, New Zealand (BRANZ) for awarding me with the scholarship for pursuing this PhD study. I am also grateful to the School of Engineering AUT University for awarding me with a graduate assistantship which helped to cover the tuition fee for the course of the study. Without this help it would have been hard to purse this dream.

I am very grateful to my research participants including the experts and the participants of the questionnaire survey for their valuable time and input. Special thanks to Peter Degerholm and Simon Guillemin for their useful inputs and advice throughout the data collection stage. I would also like to extend my sincere thanks to all my friends and colleagues at the AUT Built Environment Department for providing encouragement and support all through my studies. Special thanks to Amila and Thanuja for spending their valuable time helping me compile the thesis and for their critiques.

Last but not the least my family has been a constant source of support and strength towards the completion of my research journey. Firstly I pay my respect to my late mother-in-law Kishni Kachroo who provided the preliminary support and encouragement to take up this challenge. I wish you were here to see me achieve this milestone. My gratitude goes to my parents for their immeasurable support throughout my life and especially through this PhD. Their words and acts of encouragement kept me going. Without their support it was an impossible task, I hope I have made you proud. I am grateful to my brother Siddhartha for always keeping track of my progress and for his ever encouraging words. I will be ever grateful to my sister-in-law and brother-in-law Jyoti and Rakesh Bhan for supporting me during the first few months in a new country where I came to pursue my post graduate studies.

Love to my two babies Zorin and Aania who I brought into this world during this PhD journey. Thank you both for bringing so much happiness and strength into my life. Finally my husband Abjeet deserves all the appreciation for providing the moral support to reach to the end of this journey. His continuous support, patience and encouragement for all my work has helped me all the way through. Having you beside me has added enormous strength to my life.

Dedication

To the most important people in my life:

My loving parents Karuna and Shiban Krishen Raina – for their unconditional love, encouragement and endless support.

My two shining stars Zorin and Aania – for giving me the biggest honour of motherhood during my PhD journey.

AND

My better half Abjeet Kachroo – for loving, supporting and always believing in me.

Ethical Approval

The ethics application for this research project was approved by the Auckland University of Technology Ethics Committee, AUTEC Reference number 11/164.

Abstract

The payment mechanism of construction projects is different compared to other industries. For every payment made to a contractor or subcontractor a sum of money is held back which can vary from a low of 2% to as high as 10%. This deduction is a phenomenon peculiar to construction and is known as retention, practised in the construction industry for well over a century. Retentions are held by both clients and contractors and as such involve the whole supply chain. However the effect the practice has on each party varies significantly as a result of which there have been serious debates regarding its continuation world over. Much research and a number of enquiries have been carried out in other countries such as the US, UK and Australia. There is anecdotal evidence suggesting issues around retentions in New Zealand however there is a lack of empirical research on this subject area. This raises the need for undertaking this research to find out the present status of retentions in the New Zealand construction industry. It is in this context, that this research aims to examine the practice of retentions in the New Zealand construction industry with the main focus on identifying the issues surrounding the practice and exploring feasible alternatives to replace retentions. The study also focuses on finding the purpose of retentions and weighing its detriments and benefits in order to determine the value in the continuation of a practice which dates back to the early 19th century when construction markets were so very different.

The current research has adopted a mixed methods approach comprising of three stages of data gathering; preliminary data collection by interviewing experts and gaining rich experiential data from them followed by an industry wide questionnaire survey. The data collected by the two approaches was then validated using a qualitative survey once again utilizing experts from the construction industry in New Zealand. The techniques used for data analysis were descriptive and inferential statistics and thematic analysis.

The findings of the research study revealed that retentions fulfill a number of purposes

in construction contracts, the primary one being performance security. It was further determined that performance security includes a range of purposes from insolvency to defect rectification. The research found that problems with regards to the practice are prevalent in the New Zealand construction industry and it was identified to be extremely serious especially from the sub-contractors perspective. Further the research found a number of issues attached to the practice of retentions; the main issue being the security of retention monies. The study weighed the costs and benefits of the practice and it was found that the benefits of the practice are greater for one party i.e. the clients and the costs are greater for the other two i.e. the contractors and subcontractors. The study found that even though there are issues with the use of trust accounts however in order to secure retentions it was a feasible alternative. Finally the study identified a range of issues with the current retention regime used in New Zealand and proposed a few guidelines or factors such as performance security characteristics of client, retention withhold/release mechanism, contractor's performance history, financial stability of main contractor that could impact upon setting up of retention regimes. Based on the findings of the study the overall recommendation among others is that the current practice of retention in New Zealand needs to be reviewed. There is a need to implement changes for the practice to be fair for all the parties involved and to improve the productivity of the construction industry.

Chapter 1

Introduction

1.1 Background to the study

The word performance has an important role to play in any industry or sector that one can think of. Its significance in the construction industry is not any less. Performance related issues in the construction industry have been raised and criticized in the past decade or two. The Latham (1994) and Egan (1998) reports are leading examples apart from many other white papers published world over. Across different industries and sectors there are different ways and measures to weigh and reward performance. The construction industry is however different to other industries. With its complexities due to multi-party involvement the performance measures or securities are in the form of monetary incentives. One such security used to protect the project performance in the construction industry is known as retention.

The payment mechanism of construction projects is different compared to other industries. For every payment made to a contractor or subcontractor a sum of money is kept back until later in the contract (Hughes, Hillebrandt, & Murdoch, 1998). The amount of money withheld can vary from a 2% - 10% depending upon the contract document. This deduction is a phenomenon peculiar to construction and is known as ‘monetary retention’ or simply as ‘retention’. Only a part of the money is reimbursed on handing over the project for occupation or use (usually about half is held back) and the balance released only at the end of defects liability period (DLP) or the maintenance period which can vary from 3 months up to a year.

The retention system is an important and peculiar feature to the building industry. In the

present day construction industry, retention is the most commonly used performance security (House of Commons, 2002). Retention or withholding of cash from subcontractors by the main contractor and from the main contractor by the client is commonplace within the industry. As reported by Hughes, Hillebrandt, & Murdoch, (2000) most construction contracts are subject to cash retention. There is evidence to show that retention was widely used in history as far back as from 1840's within the traditional procurement process in the UK (TaylorWessing, 2003). Thereafter the practice spread widely as far as the USA and other parts of the world where it is well entrenched now. In New Zealand the system of retentions has similarly had its place since 1892 (Bayley & Kennedy-Grant, 2003).

There have been debates and discussions in the past decade or so on the merits and demerits of retentions (Abeysekera, 2002; Construction Manager, 2002; Fullerton, 2000). In general subcontractors are of the opinion that, retentions should not be held and the client or owner/employer (in some cases the main contractor) hold diametrically opposite views. This has created some polarity between the parties and furious debates within the construction industry bodies such as contractors' and subcontractors' associations, who have sought respective governments to intervene on behalf of them to address the issue by passing legislation to abolish retentions, more so in the UK and US. Some countries such as US have abolished its use (in public contracts in some States) whereas in other countries such as the UK they have tried and failed to have it abolished (House of Commons, 2002; Bausman, 2004).

Anecdotal evidence suggests problems around the practice of retentions in the New Zealand construction industry as well. However there is a lack of empirical research on this topic area within New Zealand. With the recent collapse of Mainzeal Property and Construction Ltd (the third largest construction company in New Zealand) in February 2013 the issue of retentions has once again sparked debate within the NZ construction industry (Ninness, 2013). It has been reported in the news that with Mainzeal having gone into liquidation millions of dollars of sub contractor's money has been lost in retentions (Steeman, 2013a). This is not the first instance when due to company failures retention monies have been lost altogether. This indeed is a significant issue related to retentions within the construction industry world over with many other issues which

will be discussed later.

With the industry having undergone radical changes in the past few decades or so the existence of the historical retention practice seems to be odd. Therefore this research with the help of its aim and objectives intends to examine the practice of retentions in the New Zealand construction industry. The aim of this investigation is to establish the issues surrounding the practice and explore feasible alternatives. A further need is to assess the value in the continuation of a practice which dates back to the early 19th century when construction markets were so very different. Moreover the need for academic research on this topic area has been recognised in New Zealand by various industry professionals (Miller, 2008; "Retentions issue goes to Wellington," 2013). Having recognised the dearth of research on this topic this research intends to examine the dynamics related to the retention practice (i.e. its purpose, the issues, alternatives) in the New Zealand construction industry.

1.2 Justification for the study

Much research and many enquiries have been made in relation to the retention practice world over, more so in the US, UK and Australian construction industries in the past two decades or so. The UK parliament had appointed 'The Trade and Industry Committee' back in 2002 to conduct an enquiry regarding the retention practice. The report named 'The use of retentions in the UK construction industry' was published by the House of Commons in November 2002. The report recognised the fact that the retention practice is out-dated in the modern day construction industry and placed heavy burden on many companies especially the SME's. Yet due to client mistrust the abolition of retentions through legislation was not considered as a feasible option. However the report stated that adopting integrated supply chain management, engineering the change in attitudes and encouraging the culture of trust between clients, contractors and subcontractors would lead to a better productivity, fewer defects and greater client satisfaction. Such changes would eventually eliminate the need for retentions, but this change would take time (House of Commons, 2002).

In the US research on 'Alternatives to 10% retainage' was sponsored by the Building Construction Industry Advisory Committee in 1992. This research also recognised

retentions as an outdated practice enhancing the problem of inadequate cash flow in the US construction industry. However elimination of retentions was not considered as the most favoured alternative. Many alternatives were suggested by industry professionals for the improvement of the practice (Ahmad & Barnes, 1992) which will be discussed later. Another research in US on the topic of 'Retainage Practice in the Construction Industry' was published by 'Foundation of the American Subcontractors Association, Inc.' in November 2004. This research used the survey instrument to obtain input from a large sampling of members of the construction team. The study found contrasting views between the owners and contractors/subcontractors. But overall the study found that the US construction industry was moving towards a more balanced approach towards the retention policy keeping in mind the legitimate needs and concerns of the parties. The acceptance of alternatives to the retention practice was taking effect with changing attitudes and legislative initiatives (Bausman, 2004).

In Australia a recent inquiry was commissioned and published in November 2012 by the NSW government on the topic of 'Construction Industry Insolvency in NSW'. An in-depth inquiry was made with regards to the retention monies. It was found that different forms of bank guarantees were used widely on large commercial projects; however cash retention was still the most common form of security used in subcontract agreement. Performance bonds were rarely used even though it was an alternative. A lot of issues were identified with regards to the retention practice from the subcontractor's perspective, which will be discussed later. The existence of retentions was not questioned however the inquiry clearly stated that the retention system was abused and placed a considerable strain on the supply chain predominantly the subcontractors. It was also found that when used appropriately retentions do play an important role in providing security for performance in contract works. With regards to the abuse of the practice there was unanimous support for the protection of retention funds by placing them in trust accounts (Collins, 2012).

In New Zealand with the very recent collapse of Mainzeal in February 2013 (nation's third largest builders) the issue of retentions has sparked a lot of debate. It is estimated by a large subcontractor group that retentions owed made up about one third of the money owed to subcontractors and was said to be in 'millions' (Steeman, 2013a). It was estimated that subcontractors and suppliers were $70 million out of pocket with the

collapse of Mainzeal. The first liquidators report released indicated the values of retentions held over subcontractors on completed works to be $18.3 million (Subbies drop, 2013). Similarly in March 2012 Alliance construction NZ went into liquidation and as a result subcontractors' retention monies were lost which accounted to over $1.5mil ("Construction Company Limited (In Liquidation)," 2012). Another example is the collapse of Goodall ABL and Hartner Constrution back in 2000 and 2001 respectively leading to a substantial loss of subcontractors' retention monies (Wycherley, 2001). The collapse of Hartner construction lead to the formation of the Construction Contracts Act (CCA) in 2002 with an aim to secure subcontractors' payments (What will the, 2013). The above are just few examples with many such insolvencies having resulted in the loss of retention monies in the New Zealand construction industry severely impacting the subcontractors' cash flow and financial stability.

A review of the previous studies on this topic carried out in other countries, have helped identify a number of issues attached to the practice. In addition to that studies have also tried to investigate solutions or alternatives to mitigate the problems in relation to retentions. Anecdotal evidences suggest that there are issues related to the retention practice in the New Zealand construction industry. The issues seem to be not very different to the ones been identified in the other parts of the world. Having recognized that the retention practice has its place in the New Zealand construction industry and there are a number of issues surrounding the practice the need for the current study is justified due to a lack of empirical research in this topic area. Moreover there is need to establish through empirical research the value in the continuation of a practice which was introduced in the construction industry almost two centuries back.

1.3 Aim and objectives

The main aim of this research is to examine the issues related to retentions in the New Zealand construction industry and explore feasible alternatives or better practices to replace retentions. An emphasis is also placed on determining, the value in the continuation of a practice which dates back to the early 19th century by determining the purpose of retentions and the detriments and benefits of retentions. Therefore keeping in mind the aim of the research, the following objectives have been formulated;

1. To determine the actual purposes of retentions as used in the current day construction industry and to what extent retentions fulfil the purpose for which they exist. This objective will help to identify the value in the continuation of a practice which dates back to the early 19th century.
2. To determine the issues and their significance surrounding the practice currently. This objective is to examine the current practice in order to identify the issues and propose feasible alternatives.
3. To identify and weigh the detriments and benefits of the retention practice. Based on weighing the detriments and benefits this objective will once again help in determining whether the current practice should be upheld as it is or there is a need for change.
4. To examine the awareness and feasibility of some alternatives currently being used or could be used in place of retentions. This is a continuation of objective 2 of this study.
5. To propose guidelines or basis to set up retention regimes. In continuation with objective 1 the study will determine the issues with the current retention regime and propose guidelines or basis for setting up retention regimes.

1.4 Research questions

Given the significance of the study the research questions have been formulated in line with the five objectives of the research study and are as follows:

1) What is the actual purpose of retentions as against the intended purpose for which retentions were introduced in the construction industry and do retentions fulfill the purpose for which they exist?
2) What are the current issues surrounding the practice of retentions and their significance in the NZ construction industry?
3) Are the detriments of the practice greater than the benefits or is it the other way round?
4) What alternatives are being used or could be used in place of the traditional retention practice?
5) What guidelines could be used to devise a retention regime for construction contracts?

1.5 An overview of the research methodology

The research essentially involves four stages of problem identification, data collection and analysis, synthesis and validation of the research findings and conclusions and recommendations. The various stages of the research are briefly explained as follows.

The first stage of the research study involved a systematic literature review to gain knowledge and understanding regarding the subject of the research problem. The review included understanding the purpose of retentions, studying the current practice and the issues in similar economies and alternatives or better practices to mitigate retention related issues. The study further examined the detriments and benefits of the practice for the different parties affected by the practice.

The next stage of the research process comprised of data collection and data analysis. The research design for the study utilized a mixed-method approach in line with the philosophical position of pragmatism adopted for this study (detailed in section 3.4.1). A common way to approach mixed-methods research in through triangulation. The current study employs methodological triangulation to collect both qualitative and quantitative data. The preliminary investigation related to the study was made by interviewing experts from the NZ construction industry. This was followed by administering an industry wide online questionnaire survey. The data collected by interviewing experts was analysed using thematic analysis. The data collected by the questionnaire survey was analysed using descriptive and inferential statistics.

The third stage involved the exercise of validation and synthesizing the research findings. The research findings obtained by the expert interviews and questionnaire survey were validated using expert opinions by way of a qualitative survey. The validation exercise was followed by synthesizing the findings of the three approaches with reference to the relevant literature.

The fourth and final stage of the research study was the concluding exercise. Conclusions and recommendations were drawn and presented on the basis of the syntheses of the research findings using different approaches.

1.6 Scope and limitations

It is essential to state the limitations of the study in order for the research findings to be interpreted appropriately. Firstly since the research has utilized a survey strategy, the validity of research findings is subject to the accuracy of the responses provided by the interviewees and the reliability of the questionnaire survey. Creswell (2012) states that the reliability of any survey is based on the way participants interpret the survey questions. The semi-structured expert interviews were limited to 2-4 participants from each group i.e. the clients, consultants, contractors and subcontractors from the New Zealand construction industry (totaling 13 participants). It should also be noted that the elements included in the questionnaire survey were limited to the literature review and semi-structured interviews. The participants for the research study could only be approached through organizations such as New Zealand Contractors Federation, Specialist Trade Contractors Federation and professional institutes. The questionnaire responses were not consistent across the group of participants. 8% of the participants belonged to the client group, 15% were consultants, 18% were head contractors and the remaining 59% were subcontractors. However the overall response rate for the questionnaire survey was 21%. Finally the literature review study will reveal that the literature related to the subject area of study is quite limited and also not upto date. This means that this study will act as a foundational study for further research especially in the context of the New Zealand construction industry.

1.7 Outline structure of the research thesis

Chapter 1 – The first chapter provides an overview of the research study beginning with the background to the study followed by the justification for conducting the current research. The next section presents the aim and objectives of the study followed by the research questions. The chapter further outlines the overview of the adopted research methodology for the study. The last two sections present the scope and the limitations of the study and the outline structure of the thesis.

Chapter 2 –The second chapter presents the literature reviewed around the subject area of retentions. Firstly it provides the description of the practice itself followed by its background and significance. This is followed by studying the purpose of retentions, its

status in NZ and the rest of the world, its detriments and benefits and the alternatives to the retentions practice.

Chapter 3 –This chapter outlines the research methodology adopted for the conduct of this research study. It starts by understanding research and research methodology followed by the analysis of the problem including its scope and nature. The chapter then justifies the philosophical position adopted by the researcher for this research study followed by the research approach, strategy and the techniques used for data collection and analysis. Further the data collection and analysis process is described. The chapter concludes by discussing the issues of reliability, validity and the ethical considerations.

Chapter 4 –This chapter presents the findings of the semi-structured interviews conducted with the experts. The chapter begins by introducing the participants profile followed by the discussion of the findings. The findings have been presented under five sections in line with the five research objectives presented in Section 1.3.

Chapter 5 – The fifth chapter presents the analyses and results of the questionnaire survey. The findings are once again presented under five sections in line with the five research objectives presented in Section 1.3. The chapter also presents the findings of the validation exercise conducted using a questionnaire survey once again in line with the research objectives.

Chapter 6 – This chapter presents a synthesis and discussion of the qualitative and quantitative research findings presented in Chapters 4 and 5. The syntheses are presented under five main sections as per the research objectives of the study.

Chapter 7 – The last chapter concludes the thesis by presenting the collated findings relating them to the research questions. On the basis of the findings of the research a list of recommendations are presented in relation to the practice of retentions.

Chapter 2

Literature Review

2.1 Introduction

The aim of this research study is to investigate the practice of retentions in the New Zealand construction industry. The primary focus of this chapter is to examine relevant literature that form the foundation of this study. This chapter is structured into six main sections starting with understanding the practice of retentions, its significance and the background to the practice. The remaining five sections present relevant literature in line with the five objectives of the study starting with the purpose of retentions. The next section discusses the status of the retention practice around the world and in New Zealand with the key focus on the issues related to retentions. The next section presents the detriments and benefits of the practice for the different parties i.e. the clients, contractors and the subcontractors. Section six presents some alternatives being used or that could be used in place of the retention practice. The last section discusses the retention regimes, their impact and their significance in construction contracts. Finally the chapter ends with a summary of the key features of the review.

2.2 What are retentions?

In its essential form, retention is a sum of money kept back from interim or progress payments due to a contractor or subcontractor until later in the contract (Gilbreath, 1992; Hughes et al., 1998; Turner, 1983). The accumulated money through retention is actually earned by the conractor as a part of the progress payment based on the interim valuation of work completed, however not payable until the final stage of the contract (Davis, 1991). With the establishment of the project cost the client applies a deduction

to the overall project cost. The precise value of retention is written in the contract (House of Commons, 2002). The retention is commonly between 5%-10%, of the total value of the contract, however the figure can be lower or considerably higher. It can also be ascertained differently, as it has become increasingly popular to set up retention as a fixed amount rather than a percentage (say $100,000) or to vary the absolute amount or percentage representing retention as the work progresses (Gilbreath, 1992). The retention system was introduced to the construction industry, in order to ensure the availability of funds to help defray the cost of completion of project in case of insolvency of the contractors executing the project (House of Commons, 2002).

Retentions are known by different names in different countries. The term "retention" is used in the United Kingdom, Ireland, South Africa, Hong Kong, Australia and New Zealand. The terms "retention fund" and "retention money" are also used (Champion, 2005; Davis, 1991). Davis (1991) states that the term retention fund is used informally since it is rarely set aside and may refer simply to the source of payment. Further he states that the term retention money too is incorrect because even though it constitutes a debt, it does not necessarily signify money held by the employer. The term "retainage" is used in the United States and appears to have the same function as retentions. The standard forms in Canada use the term "holdback" although it fulfills a different purpose compared to retentions which will be discussed later (Davis, 1991).

The client holds on to the retention money until the completion stage of the contract. The retention sum is released once the client is reasonably assured by the architect/engineer that the project is completed as per the terms of the contract, and progress payments have been accurately prepared (Wyatt, 2003). The retention release mechanism is such that half of this is released to the main contractor once the project is certified practically complete whereas the other half is withheld until the end of the defects liability period or the maintenance period, during which the contractor must rectify any defects identified. The defects liability period is normally one year after the certificate of practical completion is issued (House of Commons, 2002). The contract should usually set out the option for the client to make use of the accumulated money in satisfaction of any claims against the contractor (e.g. for liquidated damages in the event of failure to complete the works on time) (Hughes *et al*, 1998).

The retention relationship has two components: one between the client and the contractor and the other between the contractor and the subcontractors (TaylorWessing, 2003). More specifically, those between the client and the main contractor referred to as the upstream retention (Baumgartner, 2003). Conversely the one between the main contractor and the subcontractors is known as downstream retention (Baumgartner, 2003). The retention relationship is illustrated in Figure 2.1.

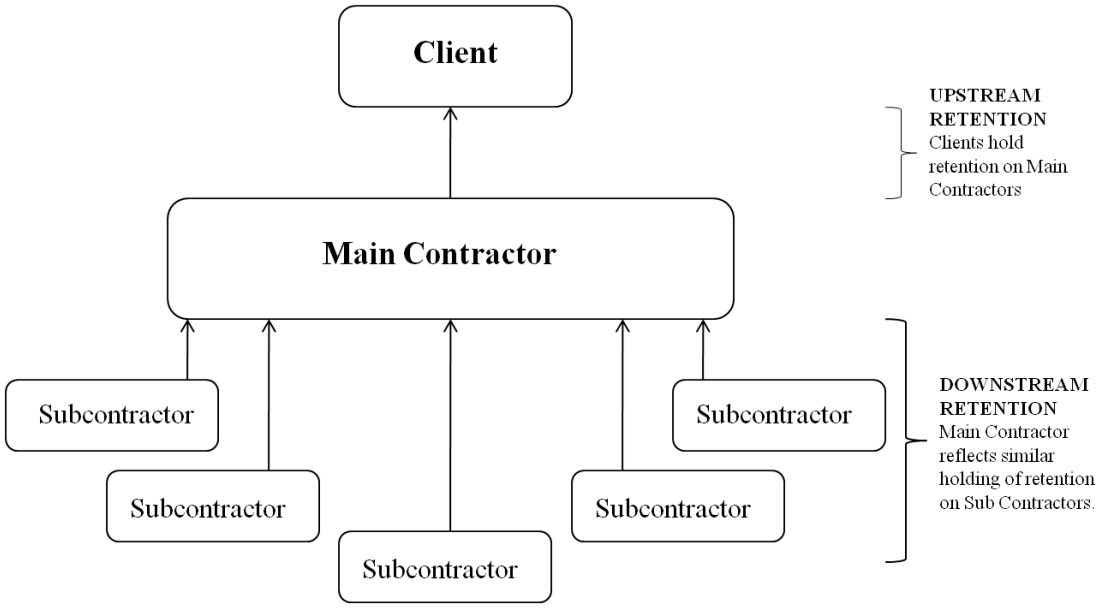


Figure 2.1: **The Retention system**

Main contractors subject to cash retention commonly apply the retention down the contract chain to the subcontractors. The United Kingdom Parliament (2002) had been advised that the subcontractor retention would remain same as the retention stated in the main contract regardless of the value of the subcontract. By and large all the firms involved in construction projects have to wait for the release of half of the retention monies till the certificate of practical completion is issued; and longer for the release of remaining retentions. Most of the times subcontractors have to apply for the release of their retentions which adds up to the administrative cost for all concerned (House of Commons, 2002).

2.2.1 Historical background of retentions

The concept of retentions or retainage (as known in the US) is at least as old as the Industrial Revolution (Wyatt, 2003). According to the report published by the UK parliament the original retention system began in the Victorian times and was first utilized in railway construction during the 1840s. The rapid expansion of the rail network at the time created a high demand for construction labourers with an increase in the number of construction companies. Due to the increasing rate of insolvency (frequent at that time) among such construction companies and the consequent delays to building projects, the clients needed a mechanism to protect themselves and came up with a solution. This mechanism was to deduct a sum of money called 'retention' from payment certificates in order to be assured that there was availability of funds to help them recover the cost of completion. This practice spread to the rest of the construction industry, and until today, the retention system has become a vital part of any contract document for construction projects (House of Commons, 2002).

Champion (2005) however contends that the system of retentions has been in practice since the early nineteenth century. According to him it was first used in lump sum contracting in the UK for both building and civil engineering works. An example he stated was that of a form of contract drafted for the Military Barrack Office in 1805 which had provisions for stage payment and retention at 12% of the value of work certified and for the last payment to be made three months after completion. Further he states that the use of retention provision was common throughout the nineteenth century, the primary objective being protection against non-performance. The deduction of retention was as high as 20% of the contract sum or even more. The first standard form of contract came out only in the 1870s and contained the retention provision.

From its origin in the UK the practice of retentions has become widespread in other countries. Investigations reveal that the idea of withholding a percentage of the contract sum is a common practice. However what is not common is the rate or the percentage at which this money is withheld (Abeysekera, 2002). There appears to be no historical evidence why different rates of retention are being used world over.

2.2.2 Significance of retentions

The significance of retentions might not be justifiable considering the fact that it accounts for a small percentage of the contract sum (5-10% most of the times). However on closer examination its importance can be seen, especially in the event of the owner or contractor going insolvent.

It is well known that, margins in the construction industry are quite low when compared to other sectors (Arditi, Koksal, & Kale, 2000; Davis, 1991; Mochtar & Arditi, 2001). Therefore even with retention of 3%, its loss could deprive the contractor/subcontractor of its profit on the contract. Also in the event of non-recovery of retentions the contractor may suffer loss on the contract. Next of importance is the figure or the contract sum to which retention is applied. A reasonable sized project in the current market would be close to or exceed $1M. On larger projects than that that sum may be payable under a monthly certificate alone (Davis, 1991). As an example the annual output of the UK construction sector is estimated at £65 billion. It has been estimated that an application of 5% retention to construction contracts removes at least £3.25billion from the cash flow of the UK construction sector (House of Commons, 2002). Similarly in New Zealand the construction sector generates $30 billion in revenues annually (New Zealand Government, 2013). Considering an average of 5% retentions $1.5 billion is estimated to be removed from the cash flow of the NZ construction sector.

2.2.3 Retention regimes

All components of a retention provision in a construction contract are referred to as a retention regime as shown in Figure 2.2 below. Retention regimes have three components i.e. retention rate, limit of retention and release mechanism. Retention rate is referred to the stipulated percentage deducted by the client from the progress payments depending on the contract document to be made to the contractor. The retention limit referred to the capping provided on the total amount of money to be retained by the client i.e. if the percentage deduction from contractor's payments is more than the capped value then the deduction will be limited up to the capped amount.

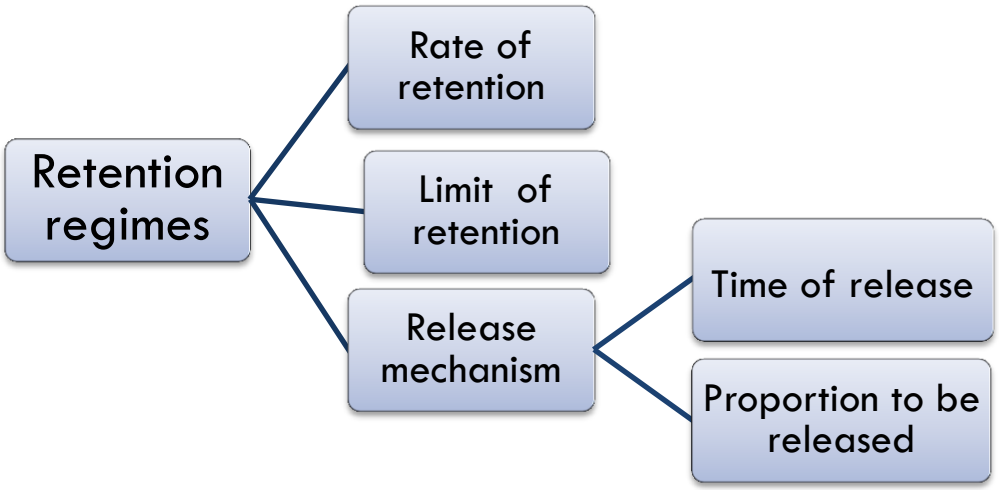


Figure 2.2: Components of a retention regime

The release mechanism has two components: time of release and proportion of total retention money to be released. It has been found that almost all standard forms of contracts are in an agreement on the timings of release of retentions. First portion of the retentions held to be released at the time of practical completion and the remaining portion at the end of defects liability period. Few differences have been identified on the proportion to be released. The contract documents generally set the retention regime by following the provisions from standard form of contracts. Few examples are presented in Table 2.1 below.

Table 2.1: Retention regimes as per Standard conditions of contract

Contract	Rate of retention	Limit of retention	Release Mechanism
NZS 3910	Sliding regime	$200,000	50 % @ hand over and remaining 50%@end of DLP
NZIA SCC1	Sliding regime	$200,000	40% @ handover and remaining 60% @end of DLP
AS 4000:1997	10% of contract sum	5% of contract sum	50% release at practical completion and 50% @ the end of DLP
JCT – IFC 98	5% of the contract sum unless a lower percentage is agreed by the parties		50% release at practical completion and 50% @ the end of DLP

There are other standard forms of contracts commonly in use. These generally do not specify the percentage retention required but provide guidelines to set the retention regime between parties. These standards are JCT 98, New Engineering Contracts (NEC), ICE conditions of contract etc. The topic will be discussed in detail later on in the chapter.

2.2.3.1 Practical Completion

Practical completion is an event defined in construction contracts as the point at which the work on the project is completed fulfilling all practical intents and purposes except the remaining trivial defects (Murdoch & Hughes, 2000).

NZS 3910:2003, in clause 10.4.1 defines practical completion as that stage in the execution of the work under the contract when the contract works or any separable portion are completed except for minor omissions and minor defects:

- Which in the opinion of Engineer the contractor has reasonable grounds for not promptly correcting; and
- Which do not prevent the contract works or separable portion from being used for their intended purposes; and
- Rectification of which will not prejudice the convenient use of the contract works or any separable portion (Standards New Zealand, 2003).

2.2.3.2 Defects Liability Period

Most conditions of contract make provision for a defects period which usually commences on the date of practical completion of the contract works. In the JCT condition of contract it is now referred to as the 'rectification period'. The duration of the DLP is usually fixed (adjustable sometimes) and is often (not always) 6 or 12 months. For example the JCT and ICE conditions opt for a fixed duration, whereas NEC3 and MF/1 conditions are a bit flexible with regards to the duration (Barrett, 2009).

It is apparent from the definition of practical completion that the project is generally not defect free at the time of issue of the practical completion certificate. Hence all construction contracts generally include a defects liability period during which all the

defects identified in the work will be rectified by the contractor. This is intended to ensure that the contractor shall deliver a defect free project at the end of defects liability period.

Such a provision in construction contracts where a contractor is responsible for carrying out the repairs is proven to be cheaper and more efficient than the client repairing the defects himself or engaging a third party to repair the defect, (Asian Projects & Construction Updates, 2003). The contractor performance during this period has been ensured by the provision of retention money in contracts. Some of the provisions for the defects liability period from NZS 3910:2003, clause 11.2 are as follows:

- The contractor shall be liable for all defects from defective workmanship and material but not responsible for the fair wear and tear. He shall rectify those defects arising before the end of defects liability period.
- The principal is entitled to hire a new contractor by giving notice to the old contractor in case the latter fails to rectify the defects. In this case the principal can recover the cost of such work from the old contractor.
- During this period the contractor may be instructed by the engineer to search for any defect and if the defects are such that the contractor is not liable for them the work can be treated as a variation.
- The remedial work during the defects liability period also includes any loss or damage to the contract by the contractor during the defects liability period and the preparation of an as built drawing and operation & maintenance manual if required by the special condition of contract.

2.3 Purpose of retentions

Retention is a phenomenon practised in the construction industry for well over a century. It is a contractual mechanism enforced by legislation in most parts of the world. However some countries have abolished this practice finding other provisions of dealing with the risk, for which retentions exist. Others have tried to outlaw the practice but failed, yet others seem to be content with the ongoing practice and find it useful, which is why it is important to understand as to why it is so (Abeysekera, Raina, & Neitzert, 2009). To achieve this objective it is first of all important to understand the ‘purpose of

retentions' or why are retentions used in today's construction industry.

The construction industry has a range of risk mechanisms and securities to ensure delivery of the construction product. These include performance or retention bonds, insurance policies, warranties and guarantees, statutory provisions and other contractual provisions. Given this multitude of risk transference mechanisms, it would seem sensible to establish if indeed retentions are now either outmoded or superseded by other mechanisms or if in fact they are the most effective mechanisms that exist to ensure completion of works. This will ascertain whether there is any value in the continuation of the practice of retentions. Clough *et al* (2005) states that there continues to be considerable discussion regarding the need for retainage with the contractor having provided the owner with a performance and payment bond. However they contend that the bonds come into play only on breach of contract by the contractor.

Most of the standard forms of contract have retention provisions and retention clauses; however, none of these standard forms of contract precisely defines the purpose of retentions or their usage (Abeysekera, 2008). This is a significant observation in the establishment of the role of retentions. Given that there is no precise definition within the contract of their usage for the client, it could be inferred that they are held because they can be rather than they are essential for contract completion. This is in accordance with the observations laid out by Hughes *et al* (1998) who stated that even with the existence of other forms of financial protection (i.e. performance bonds etc.) retentions are conventionally preferred. The reasons for this being simplicity (they are in the contract already), acceptance as the norm and requiring no further documentation. Champion (2005) similarly notes that the principal value of retentions is in their administrative convenience. This could well be a significant observation if it were demonstrable. As a conceptual rationale for use their existence as an option meaning that they should be used is very troubling. This contention does to a degree guide subsequent elements of the research being proposed.

With the industry having undergone radical changes in the past couple of decades or so the use of retention seems odd. The report of the UK trade and industry committee on retentions states that "it is an outdated practice which should not be necessary in a modern, productive industry which delivers a high quality product" (House of

Commons, 2002). Williams (2005) concurs that "given the volatile circumstances in which retainage originated, it is a historical oddity that retainage remains commonplace today when construction markets are so very different".Champion (2005) in agreement with the above statements, states that a number of industry-led groups in the UK have rendered retentions as an obsolete practice and inconsistent with the modern management of contracts. Hence there seems to exist some form of disconnect between the actual and the intended purpose of retentions. The existing literature on retentions sets out a number of its uses; perhaps it is important to understand whether retentions are actually serving the purpose they are set up for.

A review of the existing literature suggests that retentions exist for a variety of purposes. The retention system being peculiar to the building industry dates back to the 1840s. The original intent or purpose of its introduction into the construction contracts was to ensure the availability of funds to help defray the cost of completion in case of insolvency (very common in those times) (House of Commons, 2002). However Champion (2005) contends the use of retentions as early as 1805 in construction contracts, stating its purpose as a security against poor performance. Further he states that the use of retentions was common throughout the nineteenth century acting primarily as some protection against non-performance.

Banwell (1964) stated the principal function of retentions to be "to encourage the contractor to fulfill his obligations during and after the completion of the works and to provide some form of insurance to the client should he fail to do so". As per the definition, the purpose of retentions is twofold: firstly to act as an incentive for the contractor to perform the contract and secondly to protect the employer in case the contractor defaults (Davis, 1991). Retention is an age old phenomenon which exists in the construction industry. The evidence is its existence in the New Zealand construction industry since 1892. Since this time the retention concept was introduced to the construction contracts it became a popular form of performance security. Retentions act as performance security in the following ways;

a) Acts as a fund for the client/employer in case the contractor fails to perform the required work due to insolvency (Hughes *et al*., 2000).

b) To motivate the contractor to complete any minor outstanding items and repair defects after the work is finished (Hughes *et al*, 2000).

c) To motivate the contractor to complete the work – when used for this reason retention becomes a form of price incentive (Gilbreath, 1992). It is in the interest of the contractor to finish the work early in order to have the retentions disbursed sooner.

d) To cover the risk of latent errors or omissions – in case any defects appear after the practical completion stage, the client can use the retained amount to rectify those defects (Gilbreath, 1992).

e) To encourage the contractors to return to work after a planned demobilization – if the value of the remaining work to be done constitutes a minor price incentive, the contractor may be encouraged to return to site to complete the work in order for the release of a larger retention amount (Gilbreath, 1992).

f) "The retention fund is available to the employer for the purposes of underpinning contractual performance, in particular rectifying, or inducing the contractor to rectify, any defects in the work appearing during the defects liability period which starts from the date of practical completion to the date specified in the contract" (Murdoch & Hughes, 2002).

g) Retention motivates tradesmen to return to the project to complete small unprofitable punch-list items. It also provides the contractor with a sum to get corrected defective works in case a subcontractor abandons the project and provides funds to pay the mechanic's lien claims of unpaid suppliers (Fullerton, 2000).

h) Retainage provides the owner a margin of financial security in case overpayment has been made for a portion of the work (Wyatt, 2003).

Apart from the already mentioned uses of retentions various authors and publications have identified a number of different purposes of retentions which have been tabulated in Table 2.2. All or most of the purposes stated in the table include a common element of performance security in one form or the other ; be it to rectify defects or non-

performance due to insolvency or simply to encourage good performance. Some of the uses of retentions are valid for the construction period whereas the rest are for the defects liability period or the maintenance period. The difference between the construction period and the defects liability period is that during construction the contractor/subcontractor is available on site whereas after practical completion the contractor is off site and the motivation to come back to site to rectify any defective or incomplete work has to be considerably high. The latter argument can be supported by the findings of Hughes *et al* (1998) that the retention fund becomes limited after the payment of the retention money for practical completion. This amount may be insufficient in case of contractor or subcontractor not being able to perform due to serious defects and causing delays. Another argument in support of this notion by Wearne (1989) is that the retention amount may not be helpful in case the contractor determines that his resources can earn him more money if used in other contracts rather than to gain the retentions back.

Table 2.2The purposes of the retention system

S No	Type of Source	Article/Reference	Definition/Purpose of Retentions	Main theme	Purpose Code
A1	Conference Proceedings	(Abeysekera, 2003)	Head contractors (and clients) point out that as so long as industry produces defective work with performance related problems, retentions must and will remain. the function of retentions is that it guarantees the performance and quality of workmanship of the sub and main contractor	Rectify defects Performance security	P3, P4
A2	Book	(Allensworth, 2009)	The purpose of retainage is to preserve a fund of money that will be available to assure final completion and to correct defects in the work. Retainage also gives the owner, lender, and sureties extra security or protection against other issues that might arise, such as defective work, unpaid subcontractors, or liens filed late in or after the construction process.	Motivation to finish the job Leverage to get defects put right. Funds to pay mechanic's lein.	P5, P3, P9
A3	Report	(Bausman, 2004)	In addition to protection against contractor insolvency, proponents have encouraged its use to provide a 'buffer' for the valuation of work installed, remedy defects found during turnover of the facility, and encourage contractor performance.	Protection against insolvency Financial security in case of overpayment Remedy defects during defects liability period Encourage performance i.e. performance security.	P6, P7, P2, P4
A4	Book	(Bennett, 2003)	To provide an inducement to complete the work on time, because the retainage will be released upon completion, and to produce a quality project. So owners feel a need to retain moneys for such cases as contractor failure to remedy defective work or contractor-caused claims against the work that the owner may have to settle.	Motivation for prompt completion, Leverage to get defects put rights.	P5, P3
A5	Journal Article	(Champion, 2005)	Perhaps the overriding reason why retention provisions are used is administrative convenience.	Administrative convenience.	P8
A6	Book	(Chappell, 2003)	This retention fund is also useful at the end of the job to ensure that making good of defects is carried out.	Rectify defects during DLP.	P2
	Book	(Clough, Sears, & Sears, 2005)	Owners look on retainage as further protection against possible eventualities such as contractor failure to remedy defective work, settlement of liens or other claims against the project, collection of damages from the contractor for late completion, payment of damages to others caused by the contractor's performance, and similar claims that the owner may be called upon to settle. Owners also regard retainage as an additional inducement for the contractor to maintain orderly progress of the work, produce quality construction, and keep the work on schedule.	Leverage to get defects put right Funds to pay mechanic's lein Performance security Quality assurance Motivation for early or timely completion.	P3, P9, P4, P10, P5
A7	Report	("Retentions: Striking out cash retentions," 2007)	Cash retention is the most prevalent form of protection against sub-standard work on a construction project. A 'fund' to put towards the cost	Quality assurance Rectify defects during DLP	P10, P2, P5

			of the contractor not finishing the job or the cost of correcting any defects in the finished building. The main purpose of retention is to give a client certainty that the contractor will complete the work and fix any problems that emerge within an agreed period of time after this.	Motivation for timely or early completion.	
A8	Report (Magazine)	(Fullerton, 2000)	"The owners and the general contractors feel that retention is necessary to insure prompt completion of the project. Retention will motivate tradesmen to return to the project to complete small unprofitable punch-list items. Retention provides the owner and general contractor with money to correct defective work if a subcontractor abandons the project and provides funds to pay the mechanic's lien claims of unpaid suppliers".	Motivation for prompt completion Performance security Rectify defects during construction Funds to pay mechanic's lien.	P5, P4, P1, P9
A9	Book	(Gilbreath, 1992)	1) To motivate the contractor to complete the work. 2) To cover the risk of latent errors or omissions. 3) To encourage contractors to return to the work after a planned demobilization.	Motivation for prompt completion Rectify defects during defects liability period Performance security e.g. complete outstanding work.	P5, P2, P4
A10	Report	House of Commons, 2002	"We note that, while construction clients felt that the use of retentions afforded them a degree of assurance and control over the rectification of faults and gave some level of insurance against insolvency by the contractor.	Leverage to get defects put right Protection against insolvency.	P3, P6
A11	Book	(Hughes et al., 1998)	They are well understood, do not require any documentation apart from the contract itself and are by definition readily accessible. Hence where the client claims to have suffered from a contractor's mis-performance, a compensation fund is immediately available. Moreover, this may be the most powerful weapon in cases of "won't perform" – the view has been expressed that this is the lever which is most likely to bring a sub-contractor back to site to remedy defective work.	Administrative convenience Performance security Remedy defective work during DLP Remedy defects during construction. Leverage to get defects put right. Protection against insolvency.	P8, P4, P2, P1, P3, P6
A12	Journal Article	(Hughes et al., 2000)	"The primary purpose of this retention is to provide a fund for the employer in the event that the contractor fails to perform because of insolvency. A secondary purpose is to motivate the contractor to complete any minor outstanding items and repair defects after the work is finished".	Protection against insolvency Motivation for prompt completion Repair defects during DLP.	P6, P5, P2
A13	Book	(Huse, 2002)	"The employer may want to withhold a portion of each interim payment, an amount known as retention money, as a form of security of performance.	Performance security	P4
A14	Book	(Jones & Baylis, 1999)	From the employer's point of view it is a useful system as it represents some protection against the inclusion of defective work in a valuation and which is therefore included in the amount of an interim certificate. It	Protection against defective work Security for performance Remedy defects during the defects liability	P3, P4, P2

			also provides security for the performance by the contractor of his obligations. Its main purpose, however, is to provide the employer with a fund during the defects liability period following practical or substantial completion, should the contractor fail to return and make good any defects of which he is notified"	period.	
A15	Book	(Kennedy-Grant, 1999)	A fund from which to defray the cost of making good any default by the contractor in completion or in the quality of work.	Leverage to get defects put right Quality assurance.	P3, P10
A16	Book	(Knocke, 1993)	There is normally a defects liability provision in building contracts which provides that the contractor shall make good defects or repair and maintain works for a certain period after completion.	Repair defects during the defects liability period.	P2
A17	Magazine	(Latham, 1997)	It is supposed to be a mechanism whereby clients can build up a fund during the project that will act as an inducement to the contractor to remedy defects.	Leverage to get defects put rights.	P3
A18	Book	(McInnis, 2001)	Retentions provisions empower the employer to retain an agreed percentage of each payment due to the contractor as security for performance of the works and as some protection against insolvency of the employer.	Performance security Protection against insolvency.	P4, P6
A19	Book	(Murdoch & Hughes, 2002)	"The retention fund is available to the employer for the purposes of underpinning contractual performance, in particular rectifying, or inducing the contractor to rectify, any defects in the work appearing during the defects liability period which starts from the date of practical completion to the date specified in contract"	Performance security Rectifying defects during defects liability period.	P4, P2
A20	Book	(O'Leary, 1999)	The purpose of the retainage is to provide the owner with a degree of financial protection in the event contractor fails to faithfully complete all of the terms and conditions of the contract. The retainage also provides a financial incentive to some contractors to remain on the job.	Financial security to the owner in case of non-performance. Incentive for the contractor to remain on the job or finish the job.	P4, P5
A21	Book	(Pettigrew, 2005)	"In Chapter eleven of his Report, Sir Michael identified the following 'The retention system is supposed to be a mechanism whereby a client can build up a fund during the course of a project which will act as an inducement to the contractor to remedy any defect during the liability period.	Rectify defects during defects liability period.	P2
A22	Report	("Procurement strategy for construction-related services," 2002)	"Retention money has long been a feature of contracts. The concept is simple – a set proportion of the money due under the contract is withheld to encourage the contractor to complete the works and remedy any defects.	Motivation to complete work on or before time Leverage to get defects put right.	P5, P3
A23	Magazine	(Russel, 2002)	– To provide the employer with funds to rectify a failure by the contractor to complete the work to the standard required. – To provide an incentive for contractors to return to site to remedy defects following handover of the works.	Performance security Rectify defects during DLP.	P4, P2
A24	Journal Article	(Stockenberg, 2001a)	The legitimate purpose of retainage has always been to ensure owners	Motivation for prompt or timely	P5, P4

			that the contractors properly and timely complete the work.	completion Performance security.	
A25	Book	(Wearne, 1989)	The amount is then 'released' (paid) if the contractor has completed his obligations such as rectifying poor work. The potential advantage to a promoter is that a contractor should have the incentive to complete his obligations.	Rectify defects during DLP Performance security.	P2, P4
A26	Magazine	(Wessely, 2002)	The whole idea of retention is to safeguard against defects that may only emerge in a job after it's completed.	Rectify defects during DLP	P2
A27	Report	(Wyatt, 2003)	Retainage is money withheld by an owner from progress payments due to the contractor to assure project completion. Retainage provides the owner a margin of financial security in case overpayment has been made for a portion of the work".	Performance security e.g. to assure project completion Financial security in case of overpayment	P4, P7

2.3.1 An analysis of the purpose of retentions

Although the retention system was introduced to protect the client from contractor insolvency, the periodic reform in the provisions of retention system fulfils many purposes. An analysis of the purpose of retentions was carried out by using the data tabulated and presented in Table 2.2. Table 2.2 sets out the different purposes of retentions identified in a total of 28 publications including books, journal articles, magazines, reports etc. This has been done to gather the varied purposes of retentions as stated by different authors and organizations. From every publication the purpose/purposes of retention have been identified and subsequently the main theme stated. Ten main themes (purposes) have been identified from the tabulated data and presented in Table 2.3 below. The ten themes have been coded as P1 - P10 and the authors or publishers as A1 - A27 corresponding to the data in Table 2.2. A matrix has then been formed with the purposes on one axis and the publications/authors on the other as presented in Table 2.4. This has been done to find out what these authors/publications have said regarding the purpose of retention. The last row of Table 2.4 shows by way of numbers the purpose identified by maximum publication followed by the rest. Having found the numbers with the help of the matrix as shown in Table 2.4 the purposes are ranked and numbered in the order of most recurring to the least recurring in column 3 of Table 2.3.

Table 2.3: Description of purposes of retentions with ranks

Code	Description of purposes of retentions	Rank
P1	Rectify defects during construction	5
P2	Rectify defects during defects liability period	2
P3	Leverage to get defects put right	3
P4	Performance security e.g. to assure project completion or complete outstanding work or in case of non-performance or won't perform	1
P5	Motivation/Incentive for early or timely completion	3
P6	Protection against insolvency	4
P7	Financial security in case of over payment	5
P8	Administrative convenience	5
P9	Funds to pay mechanic's lein	5
P10	Quality assurance	5

Table 2.4: Retention purpose matrix

			Purpose of Retentions									
S No	**Type of Source**	**Article**	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**	**P7**	**P8**	**P9**	**P10**
1	Conference proceedings	A1			✓	✓						
2	Book	A2			✓		✓				✓	
3	Report	A3		✓		✓		✓	✓			
4	Book	A4			✓		✓					
5	Journal article	A5								✓		
6	Book	A6		✓								
7	Report	A7		✓			✓					✓
8	Magazine	A8	✓			✓	✓				✓	
9	Book	A9		✓		✓	✓					
10	Report	A10			✓			✓				
11	Book	A11	✓	✓	✓	✓		✓		✓		
12	Journal article	A12		✓			✓	✓				
13	Book	A13				✓						
14	Book	A14		✓	✓	✓						
15	Book	A15			✓							✓
16	Book	A16		✓								
17	Magazine	A17			✓							
18	Book	A18				✓		✓				
19	Book	A19		✓		✓						
20	Book	A20				✓	✓					
21	Book	A21		✓								
22	Report	A22			✓		✓					
23	Magazine	A23		✓		✓						
24	Journal article	A24				✓	✓					
25	Book	A25		✓		✓						
26	Magazine	A26		✓								
27	Report	A27				✓			✓			
	Total		**2**	**13**	**9**	**14**	**9**	**5**	**2**	**2**	**2**	**2**

From this literature review analysis it can be concluded that most authors/publications have identified the primary purpose of retentions to be P4 i.e. "Performance Security" and P2 i.e. "Rectifying defects during the defects liability period". Out of the 27 publications 14 have identified performance security and 13 have identified rectifying defects during DLP as the primary purpose of retentions. This is followed by 9 each having identified P3 i.e. 'leverage to get defects put right' and P5 i.e. 'motivation/incentive for timely or early completion' as the secondary purpose of retentions. Next of importance is the use of retentions as a 'protection against insolvency' (P6) supported by 5 authors, followed by the remaining purposes P1, P7, P8, P9, P10 as shown in Table 2.4.

Another conclusion drawn from the literature review analysis is that retention is

perceived to be used for many different purposes. However the primary purpose identified for its existence in the construction industry seems to be performance security and defect rectification. Defect rectification is also a part of performance security. The purposes around defects have been identified in three parts i.e. defect rectification during construction (P1), defect rectification during DLP (P2) and leverage to get defects put right (P3) as seen in Table 2.2. Therefore it can be concluded that most or rather all the publications have identified the primary purpose of retentions to be around defective work.

Retentions serve a number of purposes and as established in the literature the purpose of retentions has changed over a period of time. Thus a knowledge gap has been identified to find out the purpose of retentions as used in the current day construction industry. Also whether retentions fulfil the objective or purpose for which they exist to ascertain the value in the continuation of the retention practice.

2.3.1.1 Retention and defects

Barrett (2009) explicitly states "the function of retention, where the contract makes provision for the deduction of retention, is to provide security for the rectification of those defects for which the builder is responsible". The common element associated with retentions and defects, stated in the conditions of contract is the release of the remaining portion of retentions at the end of the defects liability period. The defects liability period varies in length between 3 and 12 months depending on value and scope of the project. Thereafter a certificate of substantial or practical completion is issued to the contractor by the architect/engineer. During the defects liability period the contractor has an obligation and entitlement to complete outstanding works and to remedy any defective work.

Most forms of contracts have provisions for defects liability or a defects correction period. Indeed it has been observed that defects are part of the culture of the construction industry, represented by a "defects liability" period in the standard forms of contract (Latham, 1997). This construction delivery and subsequent defects liability period is supported by specially defined retention percentages and periods over which the money is to be released.

A typical definition of a defect is provided in the New Engineering Contract (NEC) as being 'a part of the works which is not in accordance with the works information or the contract'(McInnis, 2001). In these circumstances it is the obligation of the contractor to remedy any defects in the contract works whether or not he has been instructed to do so by the supervisor/engineer (Chappell, 2006). This is a somewhat perverse position from an industry standpoint. It could be contended that construction is the few, if not only, industries in which it is up to the client (i.e. customer) to 'inspect in' quality on the basis of arbitrary standards and limited knowledge. This would be analogous to buying a car from the showroom and having to undertake a full mechanical, electrical and finishes inspection on the day of purchase.

2.3.1.1.1 Do retentions work in rectifying defects?

Literature suggests the primary purpose of retentions to be around the rectification of defective work. However Klein (2003c) states that the occurrence and causes of defects have nothing to do with retentions supported by a research carried out by BSRIA (Building Research and Information Association, UK) revealing that retention monies were not used for the purpose of rectifying defects. This was also acknowledged by the House of Commons' trade and industry committee. Conversely a key finding of the report of the same committee which motivated against banning retentions was that clients do not currently have confidence that defects will be remedied by contractors. It was contended that there was an on-going requirement to have a specific contractual remedy in place to ensure defect rectification (House of Commons, 2002). Conversely opponents of retentions hold diametrically opposed views and consider it as an outdated practice in the modern construction industry. They contend that the existence of the retention mechanism codifies the existence of defects in construction and precludes the possibility that the industry can achieve modern, professional, defect free culture (National Specialist Contractors Council, 2007). Quality, in the context of retentions, is that product performance level which can be 'gotten away with' by the contractor.

Another purpose of retentions associated with defects is to motivate the contractor to complete any minor outstanding items and repair defects after the work is finished (Hughes et al., 2000). It may be argued here that if retentions are held for repairing defective work after the practical completion, then the purpose of holding retentions

during the construction period is not justified. During the construction period the contractor is available on site to repair any defects that may appear in the works carried out. Consequently any defect claims can be settled with the on-going payment claims, and the retentions per se are redundant. In other words if the contractor calculates that it can earn more money on new contracts, rather than expediting old defects claims, the contractor may abandon the work at any stage - delaying completion of the project (Wearne, 1989). Retentions will therefore be only useful in the event that the contractor is either off-site or otherwise defaults, as the pool of money withheld will tend to act as a security for the client to employ another contractor to finish the work or to remedy any defects. However if this pool of money is not sufficient to remedy those defects then the purpose of withholding retentions is defeated. Therefore one of the objectives of this study is to find out whether retentions act as an incentive to avoid or eliminate defective work in the context of New Zealand.

2.4 Status of retention practice

The retention system has been into practice in the construction industry since the early19th century. Its existence therefore in the current day practice seems to be questionable, especially with a lot of debate and discussion regarding the practice in the past two decades in the US and UK construction industries (Abeysekera, 2002; Fullerton, 2000; Williams, 2005). The intention here is to gain knowledge regarding the evolution of the practice and its status including the issues and impacts of the practice in New Zealand and other parts of the world.

2.4.1 Retentions in New Zealand

In New Zealand the retention system has existed since 1892 whereby the retention rate was originally set at 25%. The original justification for the imposition of retentions was to protect those parties (contractor/subcontractor) from whom the monetary deductions were made. Retentions allowed them to place a charge over the monies due from the owner under the contract and a lien over the owner's land or chattels involved in the contracts (Security of Payment Team, 1997). However after the repeal of the Contractors' and Workman's Liens Act (1939) in 1987, the justification of the purpose of retentions was reversed. Monetary deductions have continued, but the rationale has

been changed from using the accumulated fund to protect those from whom the retentions are deducted towards protecting those who deduct the retentions i.e. owner or the main contractor. The fact that the purpose of retentions was reversed is quite intriguing considering that the client was seen as more worthy of protection than the supplier of services. This is in effect under the 'guise of performance, completion or maintenance retention' (Bayley & Kennedy-Grant, 2003). At the time of the repeal of the Liens Act (1939), the retention rate was 25%. The figure of 25% was established in 1892. However the revised regime created was a regime whereby 10% was retained on the first $200,000, 5% on the next $800,000 and 1.75% thereafter, with a ceiling of $200,000 as shown in Figure 2.3. The dollar limit works out to a threshold contract price of NZ $ 9M, which is an 'effective rate' of just 2.22%. Evidently the effective rate will decline further as the value of the project increases (Abeysekera, 2006).

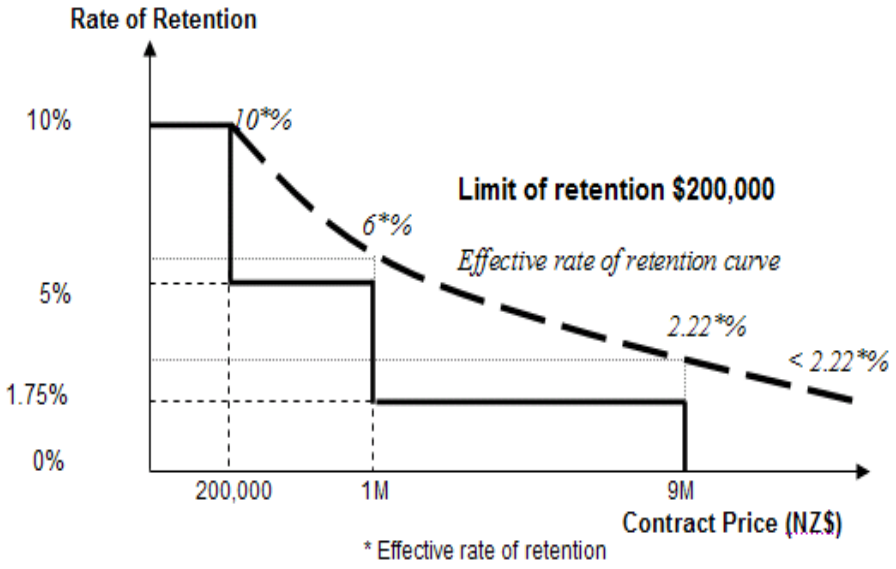


Figure 2.3: **Common retention regime in New Zealand**

Source: (Abeysekera, 2006)

The most commonly used standard form of contract in New Zealand is NZS 3910:2003, which states a sliding retention regime along with the maximum amount to be retained and also specifies the retention release mechanism. The release mechanism is the same as the one that is universally followed i.e. 50% release at the time of practical completion and the rest at the end of the defects liability period. However the retention rate and the amount to be retained are completely different from the rest of the world. Another standard condition of contract used by the industry is Standard Conditions of

Contract SCC 2007 1st Edition (SCC1) prescribed by the New Zealand Institute of Architects (NZIA), which also suggests the same retention regime as indicated in Fig. 2.3. However SCC1 differs from NZS3910:2003 by suggesting a release of 40% at the time of issue of practical completion certificate and the rest 60 % at the end of the DLP.

NZS3910:2003 also provides an opportunity for clients/contractors to set their own retention regime. This indicates that the retention rate and the limit of retention may not be same for all projects. This option has been found more popular in the industry where clients mostly set their own retention regimes. Though the standard form of contract provides the flexible option but does not provide any basis to set the retention regime, due to which differences in retention regimes have been observed from project to project and organisation to organisation.

2.4.1.1 Evolution of the retention practice

The retention system in New Zealand was first identified in the Contractors' and Workmen's Liens Act 1892. This was based on the American Model tracked back to 1791 where the statutory provision of liens for Master Builders in Maryland, USA was provided (What will the, 2013). However the periodic reform saw a number of changes to the original retention system especially with regards to the rate of deduction of the retention sum. Even today retention is an integral part of the construction contracts here in New Zealand.

The 1892 Act stated "An employer or contractor shall retain in his hands one-fourth part of the money payable under the contract to the contractor or sub-contractor until the expiration of thirty-one days after the completion of the work" (New Zealand Government, 1892). The subsequent acts i.e. Wages Protection and Contractors' Liens Act 1908 and Wages Protection and Contractors' Liens Act 1939 also stated the same percentage retention. However Section 26 of the Statutes Amendment Act 1951 substituted a graduated scale in place of the flat rate of 25%. It stated a deduction of 25% for the first £2,000 diminishing to 5% of the excess over £100,000. Further the Wages Protection and Contractors' Liens Amendment Act 1952 abolished the 25% rate completely. The percentages were finally amended by section 2(1) of the 1961 Amendment Act and were on a sliding scale as follows;

a) 10 percent of the first $200,000 or part thereof.
b) 5 percent of the next $400,000 or part thereof.
c) 2 1/2 percent of the next $1,000,000 or part thereof.
d) 1 percent of the next $2,000,000 or part thereof.
e) ¼ percent of any amount in excess of $4,000,000 (Merwood, 1980; Smellie, 1979).

Further development with regards to retention was seen in the New Zealand standard form of contracts. NZS (1964) provided for retentions at the level of 10% which seemed to be inclusive of retentions prescribed by the Liens Act. The Ministry of Works and Development MWD (1981) form of contract stated a slightly different retention regime. This was 10% on payments until they reached a limit of 5% of the contract price. A later form of the MWD provided in its special conditions an upper limit of $100,000 in contracts exceeding $2,000,000 (Turner, 1983). There is no evidence, stating the reason behind the evolution of practice with regards to the percentage of retention deduction from contracts.

The original justification for the imposition of retentions was to protect those parties (contractor/subcontractor) from whom the monetary deductions were made. The purpose of the Contractors' and Workmen's Liens Act 1892 and the subsequent 1908 and 1939 acts was to protect contractors, subcontractors and workmen for the payments due to them. However a number of problems were identified with the application of the Acts. The 1939 Act was finally repealed in 1987 after long periods of consultation from 1964 till 1987. At the time of the repeal of the 1939 Act the then Minister of Justice Rt. Hon. Geoffrey Palmer said regarding retentions that;

"*I am completelysatisfied that it is not possible to reach agreement with the industry on the reform of the revised Liens Act, and the reason is that the interests of the contractors and subcontractors are diametrically opposed to each other. Contractors prefer to hang on to retention money for as long as possible and subcontractors prefer to be paid and soon as possible. The time has arrived to let the building industry work its own solution – a task I believe has already commenced".*

2.4.1.1.1 Retention Abuse after the repeal of the 1939 Act

With the purpose of retentions being reversed after the repeal of the Act the use of pay-when-paid and pay-if-paid clauses became widespread by the head contractor against their subcontractors. Pay-when-paid and pay-if-paid clauses have been a common feature of construction contracts. The purpose of the pay-when-paid clause was to defer the contractor's obligation to pay his subcontractor till he gets paid by the client. Similarly as per the pay-if-pay clause the contractor had no obligation to pay his subcontractor in case he had not been paid by the client (Kennedy-Grant, 1999). Consequently some head contractors made use of these clauses to use the subcontractors' retained money to fund their future projects (Bayley & Kennedy-Grant, 2003).

Before 1987 most disputes occurred at the end of the projects. However after the repeal of the 1939 Act the frequency of the disputes increased and in some cases it occurred even before the commencement of the work on site. The reason behind the disputes was the lack of statutory protection after the repeal of the Act. The positive cash flow generated by retentions deducted by head contractors from subcontractors would depend upon the scale of the project. Larger the project greater will be the cash generated by retentions for the head contractor. As a result the value of disputes rose quickly into millions of dollars and those who held the disputed monies benefitted from the interest earned until the resolution of the dispute (Bayley & Kennedy-Grant, 2003).

2.4.1.2 Status of retentions after 1987

Retention practice has continued unabated in New Zealand like most other countries. The practice has sparked a lot of debate world over in the past decade or so with numerous calls for the abolishment of the practice in the US and UK (Aussie takes on retentions battle, 2013; Northeastern Subcontractors Association, 2006; NSCC, Jan 2008; Williams, 2005). There is much argument around the pros and cons of the retention policy with diverse views from different parties in the industry i.e. clients, contractors and subcontractors. Whereas much research has been carried out in other countries there is dearth of empirical research with regards to the practice in the New Zealand construction industry. The retention system is very well established in the New Zealand construction industry even if it has its negative impacts. Anecdotal evidence

suggests that in New Zealand too the problem of retentions is commonplace (Miller, 2008; NZLC SP3, 1999). With the recent collapse of Mainzeal in February 2013 the issue has been much in papers and news with millions of dollars of subcontractors monies lost in retentions (Steeman, 2013a; Subbies drop, 2013).

The New Zealand construction industry is largely unregulated. Over the years it has experienced the boom and bust cycles like many other countries and amidst all that provided a number of opportunities for "fly-by-nights, industry cow-boys and rogue contractors" to function and prosper (Abeysekera, 2003). The industry witnessed a number of major insolvencies from the late 1980's i.e. after the repeal of the 1939 Act. The number of insolvencies increased since 1998 with failures of many head contractors resulting in the consequential failure of a large number of subcontractors (Bayley & Kennedy-Grant, 2003). As a result 'security of payment' became an important issue in the New Zealand construction industry. A Ministry of Commerce survey was carried out in 1996 after strong concerns expressed by sub-contractors with regards to payment problems in the construction industry. The results with regards to retentions are shown in Table 2.5 below.

Table 2.5: Results of Ministry of Commerce Survey

Retentions	Subcontractor	Head contractor
All retentions received on time or within 30 days of when due.	11%	47%
More than half of retentions paid on time or within 30 days of when due.	36%	81%
None of retentions received within 90 days of when due.	29%	0.5%

(Source: Bayley & Kennedy-Grant 2003)

Table 2.5 suggests that after the repeal of the Liens Act problems with regards to recovery of retentions starting emerging. The issue being more prominent with regards to subcontractors' retentions as against the head contractors' retentions held by their clients.

The results of the survey conducted were forwarded to the New Zealand law

commission. Problems with regards to late progress and retention payments were highlighted. In addition to that the subcontractors' concern with regards to lack of prompt payment and blockage of cash flow which was attributed to the head contractors was also presented. Pay-when-paid and pay-if-paid clauses and quick resolution of contract disputes was also presented as an issue mainly for the subcontractors (Bayley & Kennedy-Grant, 2003).

The New Zealand Law Commission later published its report "Protecting Construction Contractors" in 1999. This was followed by submissions by G. Bayley and P. Degerholm NZ Building Subcontractors Federation Inc (NZBSF) CEO to both the Government and Ministry of Commerce. The submissions appealed for the adoption of the recommendations made by the Law Commission's report. The government was further advised of a forthcoming insolvency of a major Auckland contractor (Goodall ABL), owing unsecured creditors approximately $20.4 million.

All these incidences lead to the formation of Construction Industry Working Group to deal with payment related problems in the construction industry. The only way to deal with the problems was through legislation (Bayley & Kennedy-Grant, 2003)

2.4.1.2.1 Introduction of the Construction Contracts Act 2003 (CCA)

The issue with regards to the Security of Payment became prevalent after the repeal of the 1939 Act with the incidence of a number of insolvencies in the construction industry. Like many other countries New Zealand too was driven to enact payment specific legislation. The UK was the first nation to introduce the Housing Grants Construction and Regeneration Act in 1996. The latest being the Construction Industry Payment and Adjudication Act 2012 in Malaysia. In New Zealand the CCA came into force in April 2003 in the wake of the liquidation of some high profile companies because of indebtedness (Bayley & Kennedy-Grant, 2003; Degerholm, 2003). As per Bayley & Kennedy-Grant (2003) prior to the establishment of the CCA there was no statutory protection for payment to those who carried out work in New Zealand after the repeal of the 1939 Act.

In general the provisions of the CCA are designed to guarantee prompt payment to parties in a construction contract by warranting them to receive progress payment (s.16-

22). Also to pursue progress payments under dispute by referring them to rapid adjudication process (s.25). As per Degerholm (2003) the CCA can help in the recovery of retentions by treating the release of retentions no different to any other payment. In the event of the payer withholding retentions, or prolonging the period of payment after the submission of a claim, solid reason should be given. If the reason for withholding payment includes a defect list then only the estimated cost of remedial work should be deducted. This consequently will reduce the payee's risk of their full retention from being held for a long period of time. Moreover with the abolition of the pay-if-pay and pay-when-paid clauses a main contractor cannot hold retentions on his subcontractor till the head contract retentions have been released. The CCA was successful in resolving a number of problems caused due to insolvencies. It was also successful in improving the time frame for payments when correct procedures were followed therefore benefitting the New Zealand construction industry as a whole (Rees-Webbe, 2009).

However evidences suggest that payment problems still persist in the New Zealand construction industry due to the inadequacies in the solutions offered by the CCA (Ramachandra & Rotimi, 2011). It has been found that issues especially with regards to retentions are still prevalent (Rees-Webbe, 2009).The CCA in New Zealand like most other countries fails short to provide a proper or correct method of protection with regards to retentions. As per Abeysekera (2005);

"*Security of payment is a fundamental premise for creating a sustainable business environment. The CCA is a major piece of legislation in that direction but fails short when it comes to meeting this important premise. Over the last decade, a number of well-known construction companies have gone bankrupt raising the need for an effective strategy for managing this risk, the risk of losing interim payments and also retention payments*."

As mentioned earlier many other countries such as the UK, Australia, Singapore and Malaysia have payment related legislations in place like the CCA in New Zealand. However none of them except two have strategies in place to protect retentions. The security of payment legislation in two Australian states i.e. Western Australia (WA) and Northern Territory (NT) (s.11 – schedule 1 – division 9) provides a special feature related to retentions. The Act requires the principal to hold the retention monies on trust

until being paid to the contractor upon the completion of obligations under the contract (Ramachandra, 2013).

2.4.1.3 Recent issues in New Zealand

"Out of the ashes of the Hartner Construcion collapse in 2001 rose the 2002 Construction Contracts Act, which aimed to give subcontractors a degree of security around payments. Just over 10 years later, it seems nothing much has really changed, with subcontractors again bearing the brunt of another major construction company failure"(What will the, 2013).

The recent collapse of two large construction companies; Alliance Construction in March 2012 and Mainzeal (nation's third largest builders) in February 2013 in New Zealand has bought the issue of retentions back into debate. In the case of Alliance construction the liquidator's report suggested the value of liabilities well in excess of the assets of the company. With regards to retentions the retentions withheld by the company were shown as $600,000.00 and the retentions payable to the creditors as $1,532,500.00 respectively. Thus the amount of retentions payable to creditors was well in excess of the retentions withheld ("Construction Company Limited (In Liquidation)," 2012) amounting to $932,500.

The recent liquidation of Mainzeal had a significant impact upon the subcontractor fraternity in New Zealand. The main subject of debate is the unsecured retention monies with reports suggesting millions of dollars worth of subcontractor's money being held up as retentions. It was suggested that retentions made up about one third of the money owed to subcontractors which was used by Mainzeal (Steeman, 2013a). The first liquidators' report suggested subcontractors and suppliers lost at least $70 Million as a result of the collapse. Out of $70 Million debt $18.3 Million is estimated to be in retentions (Subbies drop, 2013).

The issue of loss of millions of dollars by way of retentions seems to be grave as suggested by several reports. The NZSTCF have taken the issue up to the parliament ("Retentions issue goes to Wellington," 2013). The main issue seems to be around the security of retention monies ("What's the damage from Mainzeal?," 2013). The subcontractors are urging for legislative changes seeking security for the retention

monies held from their contracts.

It can therefore be concluded that the issue with regards to the retention practice in the New Zealand construction industry is a serious one. The current study with the help of empirical research seeks to recognize the depth of the issues that exist relating to this historical practice. The next section will discuss the general issues in relation to the practice and its impact.

2.4.2 Retention Issues and Impacts

Retention mechanism impacts the whole construction supply chain starting from the client/employer to the contractor, subcontractor and the suppliers. As such it involves every participant with a financial stake or administrative responsibilities in a project (Wyatt, 2003). There is much debate regarding the detriments and benefits of the retention policy. The proponents of retentions argue that it acts as a form of financial protection for the owners and ensures performance while imposing minimal financial hardship on contractors. They are of the opinion that due to the difficulty in getting contractors back on site to remedy defects, retention is a good practice since it keeps the contractors on their toes and focused on the job in hand (Boyes Turner, 1st March 2005). Whereas research shows that the opponents of the practice believe that retention reduces competition and increases project cost, provides a financial disincentive for timely completion of the work, and places a financial hardship upon contractors and subcontractors (Bausman, 2004). The opponents also believe that the system is often abused by employers who withhold payment unreasonably, their objective being either to speed up work and/or to achieve cost savings with only marginal interest placed in indemnifying the employer against defects. This unreasonable withholding of payment places significant pressure on contractor/subcontractor cash flow. It is well known that the margins in the building industry are tight and unpaid retention funds can easily wipe out a contractors/subcontractors profit or even cause a loss on a project.

Retentions have attracted criticism over the past few years especially in the US and UK. It may be worthwhile to understand what and where the real problem lies. According to Hughes et al (1998), the retention system has a significant negative impact on the efficiency of the construction industry. Uncertainty and risk are multiplied by non-

payment or long delays of retention disbursement. Lal (2009) indicates that deliberate delays in the release of retention monies in order to maintain clients' cash flow have become increasingly common problem. He further points out that a delay in issuance of certificates of Making Good Defects is another mechanism to delay the release of retention monies. Odeyinka, Lowe, and Kaka (2008) suggest that the delays in approving contractors' invoices/claims and settling payments and release of retention monies, impact upon the constructors' cash flow negatively. The industry is thus deprived of funds, which could have been put into better use. Unfortunately late payment and refusal to pay remains a common means of securing additional short term cash flow. A report published by the SEC Group UK states that "retention monies were used entirely for the benefit of the authority. The monies were either available for the council's general use or were put to some specific use such as financing capital programmes, investment or reducing borrowing and improving cash flow" (Specialist Engineering Contractors' Group, 2004). A considerable delay in the release of retention is commonplace and continuing to cause difficulty in the construction industry. This is particularly the case in the event of insolvency of any party in the payment chain, when the retention may be lost altogether.

Another issue is associated with sub-contractors whose work gets completed at the early stages of the construction. These subcontractors are particularly disadvantaged by retentions because their retentions are usually held until the main contract is completed. Lal (2009) contends that the release of retention in main contracts creates an unfair situation to subcontractors as their money is usually being held up until the release of the main contractors' retentions. This unfairness leaves subcontractors at the mercy of others as they are not able to influence completion and/or the expiry of the DLP. In addition to this there is exposure to the danger of late payment or non-payment. Uher (1991) observed that the practice of general contractors holding retentions on all subcontractors, regardless of the nature of their work, is unnecessary and unfair. Indeed retentions for subcontractors such as demolishers, excavators, land cleaners and similar, whose work by its nature is either finished or free of maintenance the holding of retentions is an unfair practice (Uher, 1991).

It can therefore be summarized that the sub-contractors are suffering most from the practice of retentions. They are the main opponents of the retention practice as against

clients or the main contractors for whom retentions is a source of extra capital, which they could use for other purposes e.g. financing other projects. This is an unfair practice of holding other people's money and using it for one's own benefit, although it could be debated. One might be of the opinion that it may be practicable to put the money to some use as an investment to gain better returns as against keeping it in a bank or a trust.

2.4.3 Retentions in other parts of the world

The practice of retentions has been identified as a financial burden, especially to small and medium sized contracting firms and the fund is subject to misuse by the parties who hold it (Stockenberg, 2001a). It is suggested that delays in the release of retention monies impacts the contractors' cash flow negatively (Odeyinka et al., 2008; Sin, 2006).

Studies have been carried out in the US and UK to find out the impact of retentions on the cost of construction. The annual output of the UK construction sector has been estimated at £65 billion. Considering the application of retentions to be 5% on a construction contract an amount of at least £3.25 billion is removed from the cash flow of the UK construction sector. The majority of firms which are affected negatively by this system are the SME's. Anecdotal evidence provided in the UK by SECG (Specialist Engineering Contractors Group) suggests the impact of retentions on businesses especially SME's to be substantial. Due to the severe impacts of retentions on the cash flow of the SME's many calls for the abolition of retentions have been made from that particular sector of the industry (House of Commons, 2002).

Similarly in the US some studies have been carried out and the proponents of retentions argue that retainage reduces competition and increases the cost of construction, causing contractors to increase contract price by an average of 2.2% and subcontractors to increase contract price by an average of 3.6% (Retainage Practices Spark Debate, 2005). Ahmad and Barnes (1994) note that the policy of retentions is one of the major contributions to the economic factors which cause business failures in the US construction industry. A study carried out by the American Subcontractor Association (ASA) revealed that a considerably higher percentage (91%) of members were more likely to pursue a project if no retainage was withheld. Also it was indicated by 69% of

the members that the bid prices would be lowered by an average of 3.1% if the project did not require retainage. Studies by other researchers in the US also show similar relationships between price and payment and also that lowering the retainage percentage would result in construction savings (Bausman, 2004).

In Australia a recent enquiry on the topic of Construction Industry Insolvency in NSW presented a number of issues related to retentions. The main issue highlighted was the great difficulty faced by subcontractors in getting their retentions released from head contractors. The subcontractors in the report opined that they rarely see the return of all of their retention monies. In circumstances where subcontractors found recovering retentions to be both extremely costly and time consuming, retentions were not recovered and therefore lost altogether. The report further cited the negative impact of retention monies on the pricing throughout the contracting chain. The report did not question the existence of retentions however the money to be protected and the rights of both contractors and contractors to be safeguarded.

Knowing the fact that 90% of the New Zealand Construction Industry consists of SME's and a bulk of work is performed by the subcontractors it would be useful to find out similar impacts of retentions and the views of the contractors and subcontractors on the issuesrelated to retentions.

2.5 Costs and Benefits of the retention practice

Retention mechanism impacts the whole construction supply chain starting from the client/employer to the contractor, subcontractor and the suppliers.As such it involves every participant with a financial stake or administrative responsibilities in a project (Wyatt, 2003). Retentions are held by clients as well as the contractors. Main contractors subject to cash retentions commonly apply retention down the contract chain to the subcontractors (TaylorWessing, 2003). There has been much debate regarding the detriments and benefits of the retention policy in the past two decades or so (Abeysekera, 2002; Construction Manager, 2002; Fullerton, 2000). The proponents of retentions argue that it acts as a form of financial protection for the owners and ensures performance while imposing minimal financial hardship on contractors. They are of the opinion that due to the difficulty in getting contractors back on site to remedy defects,

retention is a good practice since it keeps the contractors on their toes and focused on the job in hand (Boyes Turner, 1st March 2005). Whereas research shows that the opponents of the practice believe that retention reduces competition and increases project cost, provides a financial disincentive for timely completion of the work, and places a financial hardship upon contractors and subcontractors (Bausman, 2004). The opponents also believe that the system is often abused by employers who withhold payment unreasonably, their objective being either to speed up work and/or to achieve cost savings with only marginal interest placed in indemnifying the employer against defects. This unreasonable withholding of payment places significant pressure on contractor/subcontractor cash flow. It is well known that the margins in the building industry are tight and unpaid retention funds can easily wipe out a contractors/subcontractors profit or even cause a loss on a project.

Mainly subcontractors are of the opinion that retentions should not be charged and the owner holds a diametrically opposite view (Retainage Practices Spark Debate, 2005). This has created some polarity between the parties and furious debates within the construction industry bodies such as contractors' associations and sub contractors' associations (Mazurkiewicz, 2001; National Specialist Contractors Council, 2007; Stand against unsecured retentions in Christchurch, 2013). Some countries such as US have abolished its use (in public contracts in some States) whereas in other countries such as UK they have tried and failed to have it abolished (House of Commons 2003; Bausman 2004).

Whether retention is a good or bad system may be a topic of debate. Opinion varies according to if a benefit accrues. For example clients/owners have different perceptions regarding retentions compared to contractors or sub-contractors. The purpose of this section is to firstly study the different perceptions of retentions as held by clients, contractors and subcontractors. Secondly to study the impact of the retention practice on different parties involved in the construction supply chain and on the construction industry at large. Having studied the perceptions and impacts the section aims to appraise the pros and cons of the practice thus being able to weight the costs as against the benefits of the practice. This will help in assessing whether there is a value in the continuation of the practice or there is a real need for change.

2.5.1 Retentions: the perspective of client/owner

The legitimate purpose of retentions as per Stockenberg (2001a) is to guarantee clients that the contractor properly and timely complete the contract. Clients or owners do not believe that there is any possibility to complete the work without holding retentions (Ahmad & Barnes, 1994). Without holding retentions they believe that contractors cannot be held responsible for things such as: undone work, correction of poor quality work, code compliance, delivery of warranties, guarantees, operating instructions, parts information, compliance with mechanics lien law, occupancy and other permits, inspection reports, as-built drawings, etc (Ahmad & Barnes, 1992). Abeysekera (2003) too contends that retentions are a must in construction contracts as long as the construction industry produces defective work with performance related problems. This is in line with the findings of Dodsworth (2003) that clients feel that until quality and efficiency in the industry have improved the system of retentions is the most effective way at present open to clients to ensure defect rectification before payment of final account.

Hughes et al (1998) found in a study that the purpose of retentions to rectify defects during the DLP was accomplished. Similarly a study conducted by the American Subcontractors Association (ASA) found that clients strongly believe that retentions provide the owner with the confidence that defects would be rectified. It also helps accelerate submission of closeout documents and is necessary to get punchlist items completed (Bausman, 2004).

Construction clients feel that retention is a necessary practice to ensure prompt completion of the project.

- Retention will motivate tradesmen to return to the project to complete small unprofitable punch-list items.
- Retention provides the owner and the contractor with money to correct defective work if a subcontractor abandons the project and provides funds to pay the mechanic's lien claims of unpaid suppliers.

In New Zealand the general opinion of clients is that contractors have proven time and

time again that financial retentions imposed upon them are necessary as "a handshake and promise is simply not enough" (Gurton, 2008). In the opinion of one of the consulting organizations in New Zealand the sub-contract retentions should be held right to the end of the project and the client should be protected at any cost. The general view is that holding back money has a much more material incentive for the contractor to meet his contractual obligations. The retention system is well established and when managed properly as set out in the various contract conditions works reasonably well (Prakash, 2008).

As such the practice of retentions does not impact upon the clients negatively in any way because they are the uppermost tier and holding on to the monies for their protection. However it does impact upon them negatively due to the increase in the cost of construction as the retentions costs are built into the project cost (Wyatt, 2003). However they still feel that, until quality and efficiency in the industry will improve, "the existing system of retentions is the most effective way at present open to clients to ensure that defects are rectified before payment of the final account" (Dodsworth, 2003).

2.5.2 Retentions: the perspective of head contractor

Clients and main contractors alike believe that retention is necessary to ensure on-time completion and satisfactory delivery of the project (Fullerton, 2000). However according to Dodsworth (2003) main contractors' perception were diverse with clients favouring the system of retentions, preferring the abolition of retention except against their subcontractors in situations where they were themselves subject to retentions. Some contractors viewed retentions as causing "immense harm to the competitiveness and the viability of small and medium-sized firms a mechanism that has no place in a modern construction industry dependent upon the most advanced skills in technology and engineering". In a study by Ahmad & Barnes (1992) the head contractors felt that the amount withheld by 10% retention was unrealistically high and that it impedes their cash flow. They also felt that the clients should not earn interest on retentions. Like owners contractors are also affected by the raised cost of construction due to the inclusion of retentions (Wyatt, 2003).

In New Zealand industry sources say that while many main contractors say that retentions are not theirs to use the reality is that many do. Contractors hold the view that subcontractors are very slow at attending to remedial work and a monetary incentive is the only reasonable approach. They believe that the issue of unscrupulous main contractor taking advantage of the system has been taken care of by legislation by the introduction of the Construction Contracts Act in 2002 (Miller, 2008).

2.5.3 Retentions: the perspective of subcontractors

Many subcontractors experience poor treatment by their main contractors; beginning with the tender process, along with the unethical practices that exist including late payments and the withholding of retentions (Hinton, 2011).

According to Fullerton (2000), subcontractors feel that retention is unnecessary, counter-productive and abused for the following reasons:

- Clients and main contractors have contractual warranties to protect them from subcontractors who fail to complete work or perform defective work.
- Performance and payment bonds provide sufficient protection and make retention unnecessary.
- Retention can be counterproductive to the project debtors by increasing subcontractor cost on the project and increasing their bids.
- Retention partially finances the project. The client demands and receives labour and materials early in a project but does not pay until the following month. The subcontractor will not receive profit or even some of their cost until long after labour and materials have been supplied. Main contractors usually pass on the retention burden to subcontractors, while construction material suppliers demand prompt payment in full. The subcontractor is caught in the middle and usually bears the financing burden of this retention system.
- It affects subcontractors cash flow who work on long term projects especially those whose work occurs early on in the schedule (Wyatt, 2003).

Retention increases subcontractors cost and risk in doing business. However, any

intelligent subcontractor would have had built this increased cost in the project price, and the client would ultimately be paying a higher price for the project. However, if competition or lack of good sense keeps a subcontractor from integrating these costs in their tender prices, additional strain is placed on the weakest segment of the construction industry economically. Subcontractors are often the least capitalized and weakest to withstand additional risk. Probably, this may be the very reason subcontractors end up bearing the burden of the retention problem. Under-capitalized subcontractors present the most risk of financial default and often have the least economic leverage to demand better contract terms (Fullerton, 2000).

According to Fullerton (2000), the retention system is abused at times. Clients will often hold retention long after a project is complete, essentially using retention to enforce a contract warranty periods. Main contractors will sometimes continue to hold retention on subcontractors, even after the client has reduced the retention and made a payment to the main contractor. These practices essentially force a subcontractor to finance clients, main contractors and eventually the projects. Many subcontractors are extremely well organised and are better capitalized than their clients or main contractors. In these cases, the main contractor can be at a greater credit risk than the subcontractor. Retention can be duplicative and unnecessary protection with well-capitalized subcontractors and/or payment and performance bonds.

Subcontractors in NZ in general feel that retention is an unfair practice. They define retentions as unsecured interest free finance provided for an unfixed term to debtors of uncertain credit worthiness. They can probably be seen as the most vulnerable party involved in the retention system. As a general rule, main contractors forward the retention burden to subcontractors, while construction material suppliers demand prompt payment in full. Thus, the subcontractor is caught in the middle and usually bears the financing burden of the retention system. Evidence suggests that the issue of retentions with regard to subcontractors in NZ is a major one. In NZ the sub-contractors contend that at least $500 million of industry funding is provided by sub-contractors and builders interest free and unsecured (Miller 2008). Moreover it is also found that clients tend to abuse the power of retentions and extend the retention period as far as possible and a separate legal action has to be entered in to counter claim. In an interview with a sub-contractor organization the sub-contractor was of the view that in its original form

the retention is a fair practice only if it would work the way it was meant to be; which was not the case. Retentions are mostly delayed or totally lost. The only way of dealing with the problem of retentions would be legislation. It was suggested that subcontractors in New Zealand had to claim their retentions back as they were not handed back at the end of the job ("Construction Company Limited (In Liquidation)," 2012)

2.5.4 The advantages and disadvantages of retentions

Retentions impact, directly or indirectly on all stakeholders within the industry with the direct impact being on the clients, contractors and the subcontractors. Tables 2.6, 2.7 and 2.8 respectively lists out the advantages and disadvantages for a client, contractor and a subcontractor organization. Table 2.9 shows by way of figures the number of advantages and disadvantages for each party.

Table 2.6: Advantages and disadvantages for a client organization

	Advantages	**Disadvantages**
1	Retentions act as a means of financial protection to the principal or the client organisation that employs contractors or subcontractors. It helps the owner/contractor with a fund to pay the mechanics lien claims of unpaid suppliers, in case of a contractor/subcontractor abandoning the work (Fullerton 2000).	Retentions can and does produce cash flow problems for contractors and subcontractors , resulting in substantial borrowing at a sometimes hefty rate, which results in higher construction costs for owners or the client(Clough et al., 2005)
2	Retentions ensure for the prompt completion of the project for the client and also help motivate sub contractors to come back and rectify otherwise unprofitable small items of work. Also in case the sub contractor abandons the work or becomes insolvent it leaves the client with funds to pay for any incomplete or defective work and also pay for supplier items.	
3	Retentions act as partial finance for the project wherein the client receives the material and labour early on in the project but does not pay until month's later (Fullerton 2000).	
4	Improves the owner's cash flow at the expense of the contractor and sub contractors. The client can enjoy the interest earned over the retention money.	
5	Retention funds acts as an advantage for the principal or owner for bolstering their reserves or for extraneous purposes such as financing their capital programmes or investment.	
6	Retentions take care of the project performance for the client; delivery of a defect free project from the contractor.	

Table 2.7: Advantages and disadvantages for a contracting firm

	Advantages	Disadvantages
1	Retention money encourages the contractor to complete the project as early as possible so as to get back a part of the retention money earlier after the issue of certificate of practical completion.	The retention mechanism acts as an opportunity cost to the contractor, which is equal to the loss of interest on the amount of money that is retained (Hughes et al, 2000).
2	The remaining part of the retention sum which is held up till the end of the defects liability period encourages the contractor to deliver a defect free and complete project at the end of the defects liability period.	Payment risk- payment delays- principal or the client refuses to reimburse retention under the guise of shortcoming in the project. Big loss for the contractor.
3	The current retention regime in New Zealand is an asset to the main contractors and acts as a positive cash flow and helps in investment opportunities due to surplus cash. As a result of this the contractors do not have to rely upon commercial banks for work in capital. The known fact being that construction business has always been perceived as risky by commercial banks This is especially true for the contractors who mainly outsource bulk of their work (Abeysekera, 2007).	Disadvantage for those contractors who produce complete and defect free projects as their portion of the retention money is held up till the end of the defects liability period.
4	Improves the contractor's cash flow at the expense of the sub contractor. The contractor can finance his other projects with the accumulated retention money.	

Table 2.8: Advantages and disadvantages for a subcontracting firm

	Disadvantages
1	The subcontractors whose works usually takes place early on in the project e.g. a piling subcontractor experiences delays in the release of the retention money. It adds on an excessive burden to such subcontractors. Reason being that the release of the sub-contractors retention is tied to the main contractor's final payment (Hughes et al, 2000).
2	The subcontractor bears the burden of the retentions in the sense that his money is held up for long thus restricting him from undertaking other jobs which is unfair as compared to the suppliers who require prompt payment that too in full. This payment is also a burden on the subcontractor (Fullerton 2000).
3	The contract terms in New Zealand are such that retentions for sub contractors are released only when the head contractor's retention is released and not when the subcontractors complete their works (Abeysekera, 2003).
4	Big risk for the sub contractors in the event of the head going insolvent. In the following case it can be very difficult for the subcontractor to obtain his retention funds unless any special arrangements have been made (Hughes et al 2000).
5	Payment risk for subcontractors- sometimes the main contractors pay very late or even do not pay at all. It is an unfair practice of withholding retentions by the main contactors, often for no reason than to maintain their own cash flow. This has an adverse impact on the cash flow of the specialist contractors. This cost is even more added up by the cost of actually chasing the overdue retentions.
6	Subcontractors face another disadvantage when compared to head contractors in being at a greater risk with respect to interim payments and retention moneys. Reason being that they do not have access either to Payment bonds or retentions bonds when compared to main contractors (Abeysekera, 2003).

Table 2.9: Analysis of advantages and disadvantages

	Client	Contractor	Subcontractor
Advantages	6	4	0
Disadvantages	1	3	6

The table suggests that retentions always act as an advantage to the clients, most of the times to the contractors except for a few issues and always impact negatively on the subcontractors. The analysis suggests that the current retention regime is technically doing what it was designed to do. i.e. protect the client. The client is advantaged the most from this, the contractor by passing the buck down manages to neutralise the negative effects and sometimes gain a slight advantage of positive cash flow. But the sub-contractor being at the bottom of the ladder ends up with all the negative effects of retention. Therefore retentions clearly act as an advantage to one party and a disadvantage to the other.

The question arises that is retention a fair practice in its present form or whether other ways need to be explored to change the current retention system to make it more effective and fair for all parties. Having analysed the costs and benefits of retention from the literature the current study aims to weigh the costs and benefits of the practice in the New Zealand construction industry.

2.6 Alternatives to retention

As far back as in 1964 Sir Harold Banwell proposed the abolition of retentions in his report famously known as the Banwell report (Banwell, 1964). The International Labour Office (ILO) in 1987 recommended the reduction of retention money to improve contractors' business environment (Adams, 1997). The House of Commons report (2002) explicitly states "given the doubtful benefits and the clear disadvantages of retentions, it would obviously be in everyone's interest for such an inefficient – and frequently harmful – practice to disappear". Sir Michael Latham (1994) in his report 'Constructing the Team' reported that the retention system was not working the way it was meant to be. He therefore suggested retention bonds as a better alternative to the retention system. Sir John Egan in his 2002 report stated that "In a relationship of

collective responsibility, responsible behavior and mutual interest, characterized by integrated teams; payment delays and retentions cease to be a significant issue" (Egan, 2002). However till date the retention practice seems to be a part of most conditions of contract used world over. Even after much debate and discussions and calls for the abolishment of retentions the practice continues unabated in most parts of the world.

With the existence of performance and payment bonds contractors and subcontractors feel that retentions are unnecessary and a financial burden to them (Wyatt, 2003). However Clough et al (2005) contend that contract bonds come into play only on breach of contract by the contractor. Some of the common emerging alternatives to retentions are payment of interest on retained funds, retention escrow accounts, substitution of securities or bonds, e.g. performance or retention bonds, line item release, and limiting subcontractor retention. The purpose of this section is to explore and present any common alternatives or better practices used in place of retentions in different parts of the world. For the purpose of this research it will be useful to find out whether any alternatives are being used in place of retentions in the New Zealand construction industry. Also does the industry perceive that the use of any other alternatives would be useful for the industry as a whole? The following sections present few of the alternatives

2.6.1 Abolishing retentions and alternative practices

The retention system is peculiar to the construction industry and is practiced in most parts of the world from its inception in the early 19th century in the UK. Retentions have attracted criticism over the past two decades especially in the US, UK and Australian construction industries.

The call for the abolition of retention had gained currency about a decade ago in the UK. A number of industry groups got together to get retentions abolished. The Federation of Master Builders had joined forces with the Specialist Engineering Contractors group to stamp out retentions ("FMB joins SEC group to combat retentions ", 2003). A suggestion was made in 2003 to set a target date of 2005 to abolish retentions with the government playing the principal role as the largest procurer of work and the body most capable of setting an example and also capable of enacting

legislation to ensure compliance. However as quoted by Pearman (2003b) the government had stated that the abolition could be enacted only if the industry was able to deliver at least 70% of projects on time, within budget and defect free. Further the Department of Trade and Industry (DTI) in the UK had indicated that the abolishing of retention by 2007 would be 'challenging' in response to a select committee report recommending the abolition of retentions. Finally the UK government seemed content with the status quo and suggested that retentions will serve their purpose until such time that the industry is able to give 90% of projects defect free as opposed to an earlier requirement of 70% defects free (Willock, 2003).

In US too calls were made for abolishing the practice of retentions especially by the American Subcontractors Association (ASA) stating that it is an 'antiquated' practice (Mazurkiewicz, 2001). However a survey conducted by the ENR (Engineering News Record) showed that 60% of the respondents supported keeping retainage and 40% wanted it eliminated (Voters want to keep retainage, 2000). The practice has therefore continued however a lot of research has been carried out to explore feasible alternatives to reduce the detrimental effects of retainage. To specifically deal with the retention issues the U.S. government modified the Prompt payment Act in 2001 with the following retention related provisions (McGreevy, 2002; Touran, Atgun, & Bhurisith, 2004);

- Restricting the government on holding not more than 5% retainage, unless the agency can justify a higher rate;
- Requiring interest to be paid on funds that are not paid on time;
- Requiring general contractors to pay subcontractors (progress payments as well as release of retainage) within seven days of receipt of funds from the government;
- Allowing a party not paid on time to get its attorney's fees if it has to sue.

Many states in the US have passed similar laws that apply specifically to private contracts or apply to both public and private contracts. Such types of statutes have gained even more popularity. Some alternatives being used in the U.S will be discussed in the next section.

In Australia a recent enquiry into the Constriction Industry Insolvency in NSW did not

recommend prohibiting retentions however security of retentions was identified as significant (Collins, 2012). Furthermore in Western Australia the Construction Contracts Act 2004 provides a default of holding retention monies on trust. In Queensland, licensing of contractors includes disclosure, monitoring and reporting of financial positions, and the Subcontractors' Charges Act 1974 enables subcontractors to secure statutory charge over money owed to them by their contractor (Ensoll, 2013).

The retention debate has intensified in New Zealand after the collapse of Mainzeal. On a similar vein this study aims to find out the perception of the industry regarding abolishing retentions and the need for imposition of legislation for any changes to take effect.

2.6.2 Alternatives to retentions

Some of the alternatives that are being used in other parts of the world or that could be used in place of retentions are described as follows;

Escrow/Trust Accounts

The use of an escrow account ensures that retention monies are kept in a separate account and are prevented from being used by the holder of the retention funds i.e. the clients or the contractors. An escrow account also protects the retention funds from the creditors in case the owner has financial difficulties or becomes insolvent. Latham (1994) and Hughes et al (1998) had recommended securing construction money by using trust accounts, to protect against client insolvency. Studies carried out have suggested that the use of escrow/trust accounts to hold retention monies seems to be an accepted form of security. However escrow accounts do have administrative costs which could cause an additional financial burden to clients.

Nevertheless in the US 14 states have legislation regarding escrow accounts for retentions (Bausman, 2004). The Australian enquiry suggested unanimous support from the participants regarding retention monies to be held in trust accounts until they are due and payable (Collins, 2012). The feasibility of using trust accounts in New Zealand to protect retentions is not known. This study aims to throw some light on this issue.

Bonds in lieu of retentions

In the US public sector works it is a common requirement for the contractor to supply their client with a payment and performance bond as an additional protection against poor performance. Furthermore the contractors can also require payment and performance bonds from their subcontractors for similar reasons. Ahmad and Barnes (1994) claim that the bonding process in itself is generally viewed as a prequalification process that screens out firms unable to effectively perform the project scope. Some industry organizations in the US argue that payment and performance bonds should be used as a substitute to retentions else the owner has double protection (Bausman, 2004). In the US contractors often favour a payment and performance bond in lieu of retentions because it can cost up to seven times less to fund the bond requirements than to fund retention requirements (Specialist Engineering Contractors' Group, 2004).

Another form of surety protection is the use of retention bonds in place of retentions. Sir Michael Latham (1994) reported that the retention system was disliked by contractors and subcontractors, and suggested the use of retention bonds as a better alternative to retentions. Retention bonds are legally enforceable financial guarantees whereby the bondsman, often a bank or an insurance company, agrees to pay a lump sum if the contractor or subcontractor defaults. It ensures that the contractor or subcontractor is paid fully as the work is completed (Hughes et al., 1998). TaylorWessing (2003) contend that the use of retention bonds can result in improved cash flow for the contractor which could be put to good use elsewhere in the construction industry and arguably reduced costs. The use of retention bonds was noted to be common in European and International contracts and some major UK clients. In one of the sates in the US the use of retention bonds by the contractors is on 100% of the projects. However contractors support disappears if only the subcontractors are allowed to use retention bonds in lieu of retentions, because in that case it is the contractor who is forced to fund the project retentions (Stockenberg & Limbaugh, 2002 as cited in Bausman, 2004). Despite the given advantages of retention bonds its use is not widely preferred. In New Zealand the standard form of contract NZS3910 provides a provision for the use of retention bonds in lieu of retentions. However the problem identified with the use of bonds are its complexity and the immature bonding market in New Zealand (Miller, 2008). Moreover for contractors/subcontractors especially the

SME's it would increase their cost as there would be more assets tied up to have a bond in place thus impacting their cash flow negatively.

Other alternatives used in the US

Regulations for the use of securities in public contracts, acceptable to both the parties to substitute retentions are in place in 40% of the US states. Three states have extended the practice to private sector as well (Mendes, 2003). Another practice used in the US is the line item release of retentions. It is a practice whereby retained funds are released when a separately identifiable portion of the work is satisfactorily completed. The practice is being used in a few states in the US (Stockenberg & Limbaugh, 2002 as cited in Bausman, 2004). This practice is particularly beneficial for those subcontractors whose works get completed earlier on in a project e.g. demolishers, excavators or foundation contractors. Legislation requiring the contractors to be permitted to hold no more retention from a subcontractor than what their clients are holding from them is being strongly supported by the American Subcontractors Association (ASA, 2002 as cited in Bausman, 2004). The awareness or feasibility of these alternatives or better practices is unknown in New Zealand. The current research will help throw some light on these.

2.6.3 Limits of alternatives

Alternatives like bonds and warranties do provide a certain degree of protection to clients, however they tend to function only in some professional sectors i.e. steelwork, electrical work rather than in the general construction market. As a result of that they have not been used commonly (House of Commons, 2002). Further the explanation for the continued use of retentions is that they are set in the conditions of contract, which is followed through the entire construction industry. Further as per the House of Commons report (2002) those alternatives may consistently be more or as expensive to the clients or contractors. Moreover obtaining alternatives can be difficult for the SME's. Finally the conclusions drawn from the UK Select Committee report was that the only solution to the retention problem was cultural change. The opponents of retentions feel that retentions have no place in a relationship based on trust. Therefore the real solution lies in introducing changes in attitudes between clients, contractors and subcontractors. This obviously would be a long term process involving significant changes in procurement, resulting in a product of high quality by increased productivity and performance. These

ideas and recommendations were made by Latham (1994) and Egan (1998) in their respective reports "Constructing the team" and "Rethinking Construction".

2.7 Setting up Retention Regimes

Retentions are an integral part of most condition of contracts used world over. There are different types of retention regimes used across the world. The components of a retention regime include retention rate, limit of retention and release mechanism as previously described in section 2.2.3. Every standard form of contract states these components of the retention provision. Most standard forms of contract seem to be in agreement with regards to the limit of retention and the release mechanism. What seems to vary is the rate at which retentions are deducted from contracts. The amount of retention can range anywhere from 5% to 15% or even more, although it reduces sometimes as the job progresses (McGreevy, 2002).

The purpose of this section therefore is to study the different retention regimes used world over and to highlight the issues especially with regards to the unique retention regime New Zealand follows. The current study aims to identify any issues in relation to the current retention regime and propose some guidelines for setting up retention regime in construction contracts.

2.7.1 Significance of different retention regimes

Retentions are held both by the clients and the contractors. The clients hold retentions when they make payments to the contractors and the contractors when they make payments to the subcontractors. If the payer goes bankrupt, the payee stands to lose all their monies as it is highly unusual for the payer to provide a payment guarantee. Thus the quantum of money withheld is an important concern for payees. As the amount of money held by the payer increases, there is a greater risk for the payee. Whether the quantum of money held is a reasonable reflection of the risks involved is unknown at present. Payers do not seem to distinguish between risky and non-risky contractors (or subcontractors) by treating them alike (Abeysekera, 2008). This appears wasteful and not value-adding.

2.7.2 Retention regimes and impacting issues

There are many factors that seem to impact on retention regimes including the impact retention regimes have on users (clients, contractors, subcontractors etc.). Das (2008) study identified a number of factors affecting in the setting up of retention regimes during the DLP as presented in Table 2.10. Type and size of projects, industry characteristics, relationships between contracting parties are some. There are many other issues some of which are discussed below.

Table 2.10: Factors affecting the setting up of retention regimes

	Categories	**Factors**	**Description**
1	Type of Project	Project type	Building, Civil, Petrochemicals etc.
2	Project Characteristics	Complexity of project	
		Value of project	
		Type of defects	Routine/unusual
3	Defect Characteristics	Likelihood of defects occurring	
		Cost of defects	
4	Type of Procurement	Procurement method	Such as Design & build, Alliance etc
5	Procurement Characteristics	Right to extend the duration of DLP	
		Quality of design consultants	In Design & build projects
		Contractor performance history	
		Materials and workmanship guarantees	
6	Performance security characteristics of contractor	Parent company guarantees	
		Non performance during DLP	
		Performance bond covering DLP	
		Financial stability of main contractor	
7	Performance security characteristics of client	Security for retention withheld	Such as trust account use
8	Retention withholding/release mechanism	Release mechanism with sectional completion	Refer to separate portions as per NZS3910
		Cash retention	
		Retention bond	
		Accepted norms	As per NZS3910
		Impact on contractor's cash- flow	
9	Economic characteristics	Impact on contractor's margin	Higher retention rate may result in higher margins.
			High cost of capital may result in higher margins
10	Performance incentive characteristics	As an incentive to complete work during DLP	Incentive to complete as-built, incentive to attend the emerging defects in time

Source: Das (2008).

Impact on Costs

Greater the money held, greater is the impact on cash flows: On the one hand, the payer benefits by withholding payments as they pay less and minimise their financing costs. On the other hand, the payee incurs extra costs sourcing funds from private financiers. In recessionary economic conditions the impact could be devastating with diminishing lines of work in capital (Bill, 2009). Thus the amount of money held should be a thoughtful decision for an efficient industry and not be an arbitrary one.

Double Dipping

Not only do clients hold retentions from contractors but contractors too do so when they make payments to subcontractors. This duplication seems wasteful although large scale contractors use this practice to create a large pool of surplus money to the extent that they would not need commercial banks to provide lines of credit for construction work (Abeysekera, 2006). In other words, retentions act as a cash cow for main contractors who outsource their work (Abeysekera, 2008a). Table 2.11 illustrates clearly the idea of double dipping of retentions. Thus for some contractors this duplication seems to add value but for others it creates waste.

Table 2.11 Typical Main Contractor/Subcontractor Retention Scheme in New Zealand

Main Contract Value	Retention Scaled		Subcontract Subs 85%	Retention 10%	Retention Profit $	Retention Profit %
$500,000	$35,000	7.0%	$425,000	$42,500	$7,500	1.5%
$1,000,000	$60,000	6.0%	$850,000	$85,000	$25,000	2.5%
$2,000,000	$95,000	4.8%	$1,700,000	$170,000	$75,000	3.8%
$3,000,000	$112,500	3.8%	$2,550,000	$255,000	$142,500	4.8%
$4,000,000	$130,000	3.3%	$3,400,000	$340,000	$210,000	5.3%
$5,000,000	$147,500	3.0%	$4,250,000	$425,000	$277,500	5.6%

Defects Profiles

Defects arise due to many reasons. These include mistakes of the designers, failures of manufacturers and poor workmanship. Defects that arise during construction due to poor workmanship are generally rectified before handover. However, workmanship related defects that arise during the defects liability period need to be rectified at no extra cost. Ideally, retention moneys should be sufficient to attend to these. Thus

understanding cost and time impacts of defects is an important issue when setting up retention regimes.

Performance History

It was mentioned earlier that in general the current usage of retentions does not differentiate between a good and a not so good contractor (or subcontractor). They are treated alike with the same retention regime imposed on all. This appears to be unfair and wasteful with no reward for good performance. In other words, the underlying assumption seems to be that historical performance has no relevance to current or future performance. This is an issue that needs further investigation in relation to its link with retention regimes. If true, there seems to be a case for imposing the same regime for all contractors. Moreover, the link between retentions as an incentive or a disincentive for performance needs to be established too.

Fair Play

Sliding retention regimes as used in NZ are friendly to large contractors who outsource work. Abeysekera (2003, 2005) has pointed out that they have the opportunity to leverage retention moneys to create a large surplus pool of money by differentiating retention regimes. This may lead to unfair competition (as the playing field is not level). Clients who take note of such possibilities might decide to create retention regimes so as to minimise such possibilities and thereby create an efficient market structure.

Security of Payment

This is an important issue for industry. If the payer goes bankrupt, the payee stand to lose all their moneys as it is extremely rare for the payer to provide a payment guarantee (Abeysekera, 2008). Thus the quantum of money held is an important concern for payees. Greater the amount of money held by the payer, greater is the risk for the payee. Whether what is held is a reasonable reflection of the risks involved is unknown.

Business Drivers

It must be remembered that it is the payer who sets the retention regime (and not the payee). The payer has the power to strategically manipulate it to suit its own business and/or other needs. The payee could either reject or respond appropriately. These drivers need to be understood too. For example, the drivers of a public body may be

quite different to those of a property developer and depending on these differences, the types of retention regimes may also be different but not without consequences. Setting regimes without a good understanding of the consequences would be futile.

Having studied all these issues the current study aims to find out the issues around the retention regimes used in New Zealand.

2.7.3 Retention regimes - New Zealand and world practice

There are different types of retention regimes but one that seems to be used commonly in NZ is as shown earlier in Figure 2.3 in relation to the work done by main contractors (Abeysekera, 2006). It is a sliding regime as the rate reduces with the size of project. Retentions are capped at $200,000 with half released on practical completion and the remainder at the end of the defects liability period. This is a unique retention regime peculiar to NZ, a scheme reinforced by practice rather than by reason (Abeysekera *et al*, 2009). Some of the underlying assumptions on which this regime seems to have been set up are as follows:

- Smaller projects need larger retentions; larger project need less retentions with the following implication that the larger the project, the lesser the risk.
- Rate of retention should be a constant for projects less than a certain value (i.e. $200k).
- Retentions required should drop rapidly as the size of the project increases for smaller value projects than for larger projects.
- Retention rates should not decline smoothly but in steps.
- There should be three steps (for projects less than 200k, less than 1M and those above).
- Total amount of retentions should be capped irrespective of the size of the project.
- Retentions should be capped at $200,000 and the limit is static (and not adjusted with time).

There are other regimes used in NZ and overseas and these can be referred to as flatregimes wherein a flat rate is applied to all payments for holding payments due to a contractor. This is by far the common regime employed overseas. At present the

applicability of a sliding regime or a flat regime or a hybrid regime being better for the industry is unknown. Different conditions of contract have different provisions and are presented as follows;

NZS 3910:2003

This New Zealand standard conditions of contract suggest a sliding retention regime as indicated in Fig. 2.3 earlier. It has capped the maximum amount of retention to $200,000 with provisions for release as 50% at the time of issue of practical completion certificate and remaining 50% at the end of defects liability period. Along with these stipulated values this document also provides the opportunity for clients to set their own retention regime (Standards New Zealand, 2003).

NZIA Standard Conditions of Contract SCC 2007 1st Edition (SCC1)

This document suggests the same sliding retention regime, the maximum amount of retention and the timings for retention release as specified in NZS 3910:2003. The only difference is SCC1 suggests releasing 40% at the time of practical completion and retaining 60% till the end of the defects liability period (N.Z. Institute of Architects, 2007).

AS 4000:1997

This Australian standard refers to retention as a form of security and specifies security shall be provided in accordance with item 13 & 14 of the document. These items are specified in Table 2.11 below. This standard specifies the retention rate as 5% of the contract sum provided and there is no agreed rate between parties. It also states that if no rates have been stated in a contract document then the default rate will be 10% deduction until a limit of 5% is reached (AS 4000, 1997).

Table 2.12: AS 4000:1997 Retention provisions

AS 4000:1997	Security means: Cash, Retention moneys, bonds or inscribed stocks……., interest bearing deposit……, an approved unconditional undertaking……, other form approved by the party. Item 5.1 Provision: Security shall be provided in accordance with Item 13 or 14. All delivered security, other than cash or retention moneys, shall be transferred in escrow. Item 13 Urgent protection If urgent action is necessary to protect WUC (work under the contract), other property or people and the Contractor fails to take the action, in addition to any other remedies of the Principal, the Superintendent may take the necessary action. If the action was action which the contractor should have taken at the Contractor's cost, the Superintendent shall certify the cost incurred as moneys due from the Contractor to the Principal. If time permits, the Superintendent shall give the Contractor prior written notice of the intention to take action pursuant to this clause. Item 14 Care of the work and reinstatement of damage 14.1 Care of WUC Except as provided in sub-clause 14.3, the Contractor shall be responsible for care of: a) The whole of WUC from and including the date of commencement of WUC to 4:00 pm on the date of practical completion, at which time responsibility for the care of the Works (except to the extent provided in paragraph (b)) shall pass to the principal; and b) Outstanding work and items to be removed from the site by the Contractor after 4:00 pm on the date of practical completion until completion of outstanding work or compliance with clause 29, 30and 35. (29 Quality, 30 Examination and Testing and 35 Defects Liability) Without limiting the generality of paragraph (a), the Contractor shall be responsible for the care of unfixed items accounted for in a progress certificate and the care and preservation of things entrusted to the Contractor by the Principal or brought on to the site by subcontractors for carrying out WUC. 14.2 Reinstatement If loss or damage, other than that caused by an expected risk, occurs to WUC during the period of the contractor's care, the Contractor shall, at its cost, rectify such loss or damage. In the event of loss or damage being caused by any of the expected risks (whether or not in combination with other risks), the Contractor shall to the extent directed by the superintendent, rectify the loss or damage and such rectification shall be a deemed variation. If loss or damage is caused by a combination of expected risks and other risks, the Superintendent in pricing the variation shall assess the proportional responsibility of the parties.

The Joint Contracts Tribunal, IFC 98 – Form of building contract

This UK standard although does not have any term called retention but it has a provision for interim payment which suggest the valuation will be 95% of the work properly executed and 97.5% will be given for interim payment at practical completion. This indicates a 5% total retention with 50% release at practical completion i.e. 2.5% retained for the defects liability period.

There are other standard forms of contracts commonly in use. These generally do not

specify the percentage retention required but provide guidelines to set the retention regime between parties. These standards are JCT 98, New Engineering Contracts (NEC), ICE conditions of contract etc.

Furthermore the rates for withholding payments seem to vary from country to country and from one standard form of contract to another. Moreover, it seems to vary from project to project as well even within an organization as shown in Table 2.12 below.

Table 2.13: **Projects with different retention regimes in New Zealand**

Project	Retention Regime
Auckland International Airport	NZ 3910 sliding regime
Air NZ Simulators (two projects each $4M)	5% of Contract Price with a limit of $125,000. Defects liability retention 50%
Britomart - $100 M	10% on first $15M + 5% on next 30M + 2.5% thereafter. Limit of retention $ 3.5M. Defects liability retention 50% from last separable portion
Britomart Chief Post Office ($25M)	Retention rate 10%, Limit of retention 5%, Defects liability retention 50% from last separable portion

(Source: Abeysekera et al, 2009)

Therefore it is important to establish a basis for setting up retention regimes in construction contracts and the current study aims to find out factors that could help in establishing retention regimes in construction contracts.

2.8 Summary of the Literature Review and its implications for the research

From the literature review conducted in this chapter it can be observed that the literature related to the subject area is quite limited and not up to date. Refer to the research limitations section 1.6 in Chapter 1. Further the chapter summarised that issues surrounding the retention practice are numerous. Firstly the literature review suggested that retentions exist for a number of purposes in construction contracts. Therefore a gap was identified in terms of the actual and intended purpose of retentions. This study will help in determining the actual purpose of retentions as used in the current day construction contracts. It will also determine the extent to which retentions fulfil the purpose or objective for which they exist. This will further help in determining the value

in the continuation of a practice which dates back to the Victorian times.

Further the literature has examined the issues surrounding the practice of retentions world over. A number of issues impacting upon the different parties were identified including the impact of the practice on the construction industry specifically with regards to the cost of construction and the impact of retentions on the performance of contractors/subcontractors. The financial impact of retentions on contractors and subcontractors was also found to be important. In the context of New Zealand there is anecdotal evidence suggesting a number of issues surrounding the practice however a lack of empirical research was identified and therefore a gap. This research aims to identify the actual issues related to the practice in order to explore feasible solutions to resolve the issues or lower their impact upon the affected parties.

The research also examined the issues around the different retention regimes used world over, with no rational behind the deduction of 10%, 5% or 2.5%. More peculiar in the case of New Zealand which follows a sliding regime stated in NZS3910 conditions of contract. The research aims to delve deeper in order to find out this difference behind the deduction of different percentages and further to propose guidelines to develop a suitable retention regime for a construction project. Apart from all these issues the literature reviewed alternatives or practices used in other parts of the world to replace retentions. As previously mentioned that in some other parts of the world retentions have either been abolished or replaced by better practices. Therefore a need was established to explore any alternatives or practices that could replace retentions in the New Zealand construction industry which could better serve the purpose for which retentions exist.

The review also examined the benefits and costs or advantages and disadvantages of the practice for different parties. The aim was to find out whether the value of costs associated with the practice are more or the practice is overall beneficial to the construction industry at large. This would once again help in establishing the value in the continuation of the practice in its current form.

Various studies have been carried out in the US, UK and Australia relating to the retention, whereas there is a lack of information/publications related to the retention

practice in NZ. As to why it is so is quite intriguing. One of the reasons might be that the industry is well aware of the facts however due to the size of the economy and the construction industry here in New Zealand the problem has not been bought forward and addressed. This first study will help unfold the issues and practices surrounding the retention system in the New Zealand construction industry.

Chapter 3

Research Methodology

3.1 Introduction

This chapter outlines the process adopted for the entire research study. It explains the way in which the entire work was carried out to achieve the aim and objectives of the study. The chapter begins by understanding the fundamentals i.e. research and research methodology and the nature of the problem. This is followed by understanding the key elements of the research methodological design including the philosophical position, research approach, research strategy and the techniques adopted. Each section provides an overview of the design followed by the rational for the selection of the appropriate approach used. The chapter further discusses the data collection and analysis methods utilized with a detailed explanation of both the qualitative and quantitative phases separately. The last two sections list out the validity and reliability measures and the ethical considerations adopted for the study. Finally a summary of the key issues is presented.

3.2 UnderstandingResearch and Research Methodology

The term ‘research’ refers to a careful and logical process of investigation to attain answers to problems of interest (2008). The purpose of a research study is to thoroughly and systematically examine a problem with an aim to explain or interpret phenomena. Research aims at contributing to current knowledge and therefore a good research needs to be critical, analytical, organized and be able to communicate findings effectively (Collis & Hussey, 2003; Sekaran, 2003). As a result, a ‘scientific mode of enquiry’ is necessary to find answers to problems of interest. However in a ‘scientific mode of enquiry’ the reality is that there is more than one-way of doing science (Tan, 2008).

This in turn is linked up to the science of finding out, which is referred to as research methodology (Babbie, 2007).

Research methodology is the "entire process of the research study" (Collis & Hussey, 2003). It is a model involving theoretical principles and a framework to provide guidelines about how research is conducted (Sarantakos, 2013).In essence it is the use of a combination of methods or procedures to enquire into a particular situation (Easterby-Smith, Thorpe, & Lowe, 2002). Broadly explained by researchers Creswell, 2007; Dainty, 2008; Payne & Payne (2004) research methodology comprises of methods, technical practices used to identify research questions, data collection and analysis, presentation of findings, and the sets of philosophical assumptions that justify the use of particular methods. Research methodology can consist of the following aspects as per:Brannen (2005) and Cooper and Schindler (2006)

i. Research approach (quantitative, qualitative)
ii. The methods of data collection, why and what data should be collected.
iii. How will the data be analysed?

Therefore the selection of an appropriate research methodology is essential for the conduct of effective research. Buchanan and Bryman (2009) suggest that the choice of research methodology should consider a number of issues including research objectives, epistemological concerns, norms of practice, resource availability, historical, political, ethical and personal factors. Silverman (2005) states that like theories, methodologies cannot be true or false, or right or wrong they can only be more or less useful. For that reason a certain methodology may be more suitable to investigate a particular problem than the others. The nature of the research problem and its objectives should drive the selection of an appropriate methodology required for the conduct of the research (Babbie, 2007; Easterby-Smith et al., 2002; Hussey & Hussey, 1997). As a result the next section aims to analyze the problem in order to determine the appropriate methodology and paradigm which will be utilized for this research.

3.3 Analysis of the problem

As stated in Chapter 1, a need for empirical research has been identified on the topic of retentions in the New Zealand construction industry. Even though there is anecdotal

evidence to suggest that there are issues surrounding the practice of retentions however hardly any empirical data to suggest the depth of these issues. Therefore the problems being addressed by this research may be described as:

- A lack of understanding of the actual purpose of retentions as against the intendedpurpose for which retentions were introduced in the construction industry.
- A lack of knowledge regarding the depth of issues surrounding the practice in the New Zealand construction industry.
- A lack of knowledge regarding the awareness and feasibility of any alternatives being used or that could be used in place of retentions in the New Zealand construction industry.
- A lack of understanding or lack of a basis on which retention regimes are set in the construction industry.

The most important step in a research study is the formulation of the research questions (Yin, 1994). Corbin and Strauss (2008) further argue that the selection of the research methodology for the conduct of the research should be dictated by the research questions. Clear and precise research questions have the ability to identify what is to be measured or explored, while ensuring the rigor of the research i.e. the validity and reliability. A few characteristics of workable research questions are presented in Table 3.1.

Table 3.1: Characteristics of workable research questions

Clear	Easily understood and unambiguous.
Specific	Concepts are at a specific enough level to connect to data indicators.
Answerability	Can see what data is required to answer them and how the data will be obtained.
Interconnectedness	The questions are related to each other in some meaningful way, rather than being unconnected.
Substantively relevant	The questions are interesting and worthwhile, justifying the investment of the research effort.

(Source: Punch, 1998)

Having identified the research problem along with the aim and objectives as already stated in Chapter 1 Table 3.2 reinstates the research objectives and questions. Further sections 3.3.1 to 3.3.3 describe the research problem in terms of its scope, nature and complexity. As stated by Tyden (1994) these factors contribute significantly in influencing the degree to which the research results contribute in solving the research problem.

Table 3.2: Research objectives and questions

Objectives	Research Questions
To determine the actual purposes of retentions as used in the current day construction industry.	What is the actual purpose of retentions as against the intended purpose for which retentions were introduced in the construction industry?
To review the status of retentions in the NZ construction industry emphasizing on the issues of the practice and its impacts on the different parties.	What are the current issues around the practice of retentions in the NZ construction industry?
To identify the costs and benefits of the retention practice.	What are the advantages and disadvantages of the retention practice?
To examine the awareness and feasibility of some alternatives currently being used or could be used in place of retentions.	What alternatives are being used or could be used in place of the traditional retention practice in the NZ construction industry?
To propose guidelines or basis for setting up retention regimes.	What guidelines could be used to devise retention regimes for construction contracts?

3.3.1 Scope of the problem

The scope of the problem refers to the regularity and applicability of the research problem across the industry considered. The issue of retentions in the construction industry is both specific and generalisable. As per Collis and Hussey (2003) generalisability refers to the application of research results to cases or situations other than those studied in the research. The problem is specific in that it has not been addressed in the NZ construction industry. This has been established in the literature review. Undoubtedly some of the aspects of the problem being addressed can be specific depending on the country and the size of the industry, where the practice of retentions is a part of the construction contracts. However the solution of the problem should be as generalisable as possible to the whole construction industry at large.

Thusmethodology and the methods used must be able to deliver a broadly generalisable result.

3.3.2 Nature of the problem

It is important to understand and define the nature of the problem in order to select the appropriate research methodology (Babbie, 2007). A research project can be classified into exploratory, explanatory, descriptive or predictive depending on the 'purpose of it'(Neuman, 2007). An exploratory study looks for patterns, ideas or hypotheses, rather than try to test or confirm a hypothesis. It is suited best if the subject area is new and little information is available to undertake the study (Neuman, 2007). It is usually qualitative in nature and provides answers for 'what' questions. Explanatory studies in contrast seek to understand variables by discovering and measuring causal relationships among them. They are mostly quantitative in nature and address the 'why' questions. Further, descriptive research helps in answering the 'how' and 'who' questions (Neuman, 2007). Descriptive research helps to describe phenomenon as it exists (Vogt, 2005), while identifying and maintaining records of all the elements of a phenomenon, process or system (Fellows & Liu, 2003). Finally predictive research is undertaken to envisage the outcomes of future occurrences and behaviors (Fellows & Liu, 2003). Neuman (2007) however proposes that some research studies have multiple purposes; but the main or the dominant purpose needs to be identified.

There have been debates and discussions in the past decade or so pertaining to the practice of retentions in the US and UK construction industries (Ahmad & Barnes, 1994; Bausman, 2004; Fullerton, 2000; House of Commons, 2002). There is enough anecdotal evidence to identify the problems around retention practice. However there is a dearth of empirical research in this area. Especially in the context of the New Zealand construction industry there is lack of both anecdotal as well as empirical data regarding the practice of retentions. Given there is a lack of research associated with this practice the exploratory nature of the research problem becomes apparent. Moreover the research questions for this study seek answers to the 'what' questions as presented in Table 3.2.

Therefore, the research problem in the first place incorporates the establishment of an understanding of the current retention practice in the NZ construction industry. Denzin

and Lincoln (1994) argue that a qualitative description can provide a rich understanding of processes and meanings which cannot be measured in terms of quantity. Indeed an understanding of the current practice of retentions can be expressed in qualitative terms by including the perceptions of clients, contractors, consultants and subcontractors. However when it comes down to assessing the performance of the practice e.g. its purpose, the costs and benefits associated with retentions it can be better articulated in quantitative terms. As a result, the research problem may be qualitative in the way that the practice is perceived within the industry, but its description is rather quantitative in nature. Thus this study will utilise a mixed-methods approach to get answers to the research questions. Even though this study does have some aspects of descriptive and explanatory traditions, its key purpose is explorative. The next section will further help in justifying the use of the mixed method approach for this research.

3.4 Research methodological design

The intention of any research study is to add value to the existing knowledge by identifying, investigating and creating solutions to an unsolved problem (Remenyi, Williams, Money, & Swartz, 1998). Gill and Johnson (2002) describe the process of finding solutions to the research problems as *"not a clear cut sequence of procedures followed by a neat pattern, but a messy interaction between the conceptual and empirical world".* In almost similar line with them Booth, Colomb, and Williams (2003) state that *"research follows crooked paths, taking unexpected turns even looping back itself".* Thus the whole process of research is uncertain and risky however the selection of a suitable research design would help to minimize the possibility of any failures.

Research design is "the logical sequence that connects the empirical data to a study's initial research questions and, ultimately, to its conclusions' (Yin, 1994). Further, a research design follows procedures of work, which helps to establish the approaches and techniques that could be adopted for the study. It looks into the philosophical underpinnings which help in identifying the overall research strategy (collection, analysis, interpretation of data and conclusions) (Easterby-Smith et al., 2002). Kagioglou, Cooper, Aouad, and Sexton (2000) presented a research design in the form of a layered approach consisting of research philosophy, approaches and techniques as

shown in Figure 3.1. It is also in line with the concept of 'research onion', as per Saunders, Lewis, and Thornhill (2007) including philosophy, approaches, strategies, method choices, time horizons, data collection and analysis techniques and procedures. The approach basically shows that the research philosophy guides the research approaches which in turn help in the selection of the appropriate research strategy and finally the research techniques. The following sections further describe the research philosophy, research approach, research strategy and the techniques used to attain answers to the research questions.

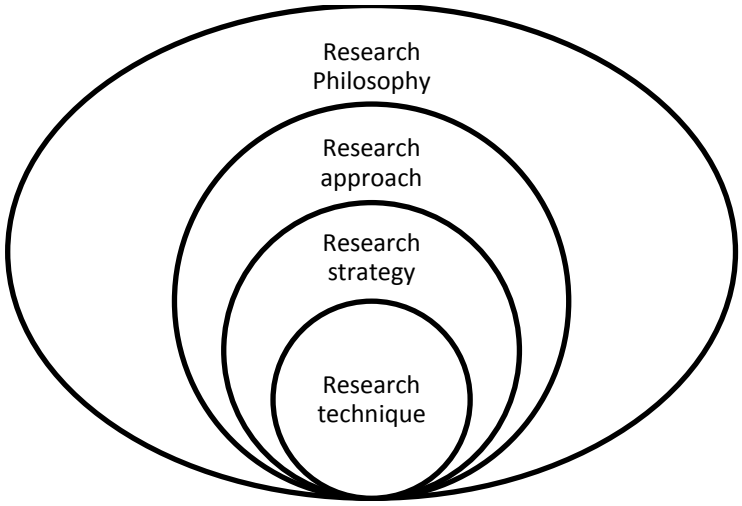


Figure 3.1: Layered or onion approach

Source: (Kagioglou et al., 2000)

3.4.1 Philosophical Position of the research

Philosophical positions and stances refer to the core philosophical or epistemological assumptions of the methodology (Greene, 2006). Easterby-Smith et al. (2002)note that research philosophies lay the foundation for an appropriate research design and claim that failure to adhere to philosophical issues can impact negatively upon the quality of the research. Its importance has been recognised by Collis and Hussey (2003) claiming that philosophical issues govern the way you write your thesis.

Further Easterby-Smith et al. (2002) identify three reasons for understanding the philosophical issues related to the research. Firstly, it can assist in clarifying research designs. Secondly, its awareness can help the researcher to identify which design will

work for the particular study and which will not. Thirdly, it can help the researcher identify or even create designs outside his past experience.

Literature suggest two main research philosophies namely positivism and interpretivism (social constructivism). As per Easterby-Smith et al. (2002) they can be placed at two far ends of a continuum where one end is interpretivism and the other is positivism and in between there are other emerging philosophies such as pragmatism and post-positivism (Crossan, 2002) which are discussed in the following sections. These philosophies in turn are based on different stances taken by the researcher of ontology, epistemology and axiology which are explained further.

Ontology refers to the nature of knowledge – as to what actually exists. (Creswell, 2007; Saunders et al., 2007; Tan, 2002).Thus it seeks to identify the nature of reality, which is seen in the differences in assumptions about what reality is and whether or not it is measurable. Epistemology refers to the study of knowing, that is, how we know what we know (Creswell, 2007; Tan, 2002). Therefore epistemology explains the relationship between the researcher and the knowledge disciplines (Guba & Lincoln, 2005). Lastly axiology refers to the values that the researcher places on the research (Saunders et al., 2007). It comprises of values, ethics and belief system of a philosophy; and also involves assumptions relating to the value the researcher attaches to the knowledge (Creswell, 2007).

3.4.1.1 Positivism

Positivists stress on objective knowledge, empirical regularities and deductive tests and argue that reality exists independent of the mind (Tan, 2002). Positivism is based on thorough observation and measurement of the objective reality in the world. The main emphasis of the research is on testing and refining existing laws and theories. Positivists tend to use quantitative research methods that function on a strict set of rules of logic and research activity focused at understanding the fundamental causes of natural phenomenon (Amaratunga, Baldry, Sarshar, & Newton, 2002; Easterby-Smith et al., 2002; Tashakkori & Teddlie, 1998).

The ontological assumption held by positivist is that the structure and nature of reality is pre-determined. This is defined as “realism” Johnson & Duberley (2000) or

"objectivism" (Saunders et al., 2007). Further the epistemological view held under positivism is that the validity of any phenomenon can be regarded as knowledge only if it is observable and measurable (Collis & Hussey, 2003). The positivist approach therefore has very little room for making amendments or adjustments to the collected data thus minimizing bias (Crossan, 2002). Lastly with regards to the methodological stance positivists tend to investigate social phenomenon by embracing a clear quantitative approach (Crossan, 2002).

3.4.1.2 Interpretivism

Interpretivism also known as Phenomenology attempts to understand the world as it is known (Cormack, 2000). Interpretivists believe that reality depends on the perception of a person or the subject (Fellows & Liu, 2003). In this paradigm as per Collis and Hussey (2003) the individual and the world are interdependent and hence what is investigated cannot remain unaffected by the research process. The ontological belief of interpretivists is that reality is subjective. It is a social product constructed by humans as social actors depending on their beliefs and value systems. It attempts to reduce the gap between the researcher and what is researched (Bailey, 2007; Collis & Hussey, 2003). The epistemological position of interpretivists suggests that the knowledge created is not independent of the researcher and therefore is called value laden. Lastly with regards to the methodological view, using an interpretivism paradigm the researcher is more likely to adopt a qualitative approach. This enables the researcher to carry out extensive discussions with a group of participants to enquire into a situation (Guba & Lincoln, 1994).

Table 3.3 shows a comparison between the two main research paradigms i.e. positivism and interpretivism each sitting on the opposite ends of a spectrum. The current study endeavours to investigate the issues around the retention practice in the New Zealand construction industry. Also other aspects related to it i.e. the purpose of the practice, the costs and benefits and the alternatives used or that could be used in place of retentions. Therefore the problem investigated in this study is neither to do with the testing of an existing theory nor to develop a new theory. The study is about finding answers related to an existing problem in the NZ construction industry. Thereforehaving looked at the two far ends of the philosophical spectrum and compared the characteristics of both it

can be concluded that neither of the two paradigms is suitable for this study.

Table 3.3: Comparing positivism and interpretivism

	Positivism	**Interpretivism**
The observer	Must be independent	Is part of what is being observed
Human interest	Should be irrelevant	Are the main drivers of science
Explanations	Must demonstrate causality	Aim to increase general understanding of the situation
Research progress through	Hypothesis and deduction	Gathering rich data from which ideas are induced
Concepts	Need to be operationalised so that they can be measured	Should incorporate stakeholder perspectives
Units of analysis	Should be reduced to the simplest terms	May include the complexity of the whole situation
Generalizations through	Statistical probability	Theoretical abstraction
Sampling requires	Large numbers selected randomly	Small number of cases chosen for specific reasons

(Source: Easterby-smith et al., 1991)

3.4.1.3 Pragamatism

A relatively new paradigm in social research is pragmatism and it links theory to practice (Denzin &Lincoln, 2011). This paradigm or worldview arises as a result of actions, situations and consequences rather than antecedent conditions (Creswell, 2009). The main focus of pragmatism is towards the outcome of the research and the main concern is towards applications and finding solution to problems (Patton, 2003). In the view of Pansiri (2005) pragmatic researchers believe that knowledge and social reality are based on beliefs and habits which are socially constructed by the process of institutionalization, legitimation and socialization. In other words knowledge and social reality are historical and truth therefore cannot be determined once and for all. Further pragmatism believes that multi-methods can be employed to better understand the research question. Therefore its nature is pluralistic and oriented towards "what works best" in practice (Vogt, 2005). Pragmatic paradigm provides reasonable flexibility for the current research as against positivism and interpretivism. Following are some flexibilities as stated by Creswell (2009):

- The researcher has a freedom to choose the research methods, techniques and procedures that are most suitable and meet the researcher's needs.
- The world is not absolutely unified and therefore pragmatic researchers believe

that singular and multiple realities exist.

- 'Truth' is that what works at that time and not based on a duality between reality independent of the mind or within the mind.
- The how and what of research is based on the intended consequences.
- Pragmatists hold the view that research always occurs in social, historical, political and other contexts.
- Pragmatists accept the existence of an external world that is independent of the mind, as well as that lodged in the mind.
- Finally for a researcher using mixed methods, pragmatism is perfect since it opens the door for using multiple methods, different assumptions and world views as well as different forms of data collection and analysis.

3.4.1.4 Research paradigm suitable for this study

The aim of this study is to examine the dynamics related to the retention practice in the New Zealand construction industry. A number of research questions were formulated keeping in mind the main aim which has been presented in Table 3.2 earlier. In the pursuit to finding answers to questions it is essential to determine what knowledge claims are being made from the research, the strategies used for the enquiry and the methods used for data collection and analysis.

A researcher initiates a research based upon certain assumptions regarding the study as to how and what they will learn during their inquiry. This as per Creswell (2009) is known as knowledge claim. In this regard what methods should be used in order to gain knowledge to address the research problem (i.e. epistemology), the researcher is not influenced by a pre-determined world view as to what is acceptable knowledge. Hence the study undertaken for this research was not initiated particularly with either the view of a positivist or an interpretivist. In addition to that it was believed that this research was not directed by any theories, be it grand or middle-range or experience through observation or measurement of objective reality. It is simply directed towards the research questions which were developed out of reviewing the existing literature. Thus the priority of this research lies in understanding the research problem and the application of the most appropriate approaches and methods to derive knowledge about the problem rather than considering certain methods as being more important.

Pragmatism has received recognition for entertaining the use of mixed-method research i.e. both qualitative and quantitative (Tashakkori & Teddlie, 1998). This study intends to utilise both the qualitative and quantitative research strategies. For example this study collects the views of participants with regards to the significance or the depth of the issues surrounding the retention practice which involves quantification in terms of the variables used. On the other hand answers to questions like what is the purpose of retentions, what are the advantages and disadvantages of the retention practice, what alternatives could be used in place of the practice are sought by the researcher. The research therefore utilises a mixed-methods approach to find answers to the research questions. As a result this research study can be placed under the pragmatic world view where the research is expected to choose the methods and procedures that can best meet the research aims and objectives.

3.4.2 Research approach

The next important element encapsulated within the research methodological design is research approaches. This comes next to the research philosophy as per the layered or onion approach as shown in Figure 3.1. Research approaches aid the researcher in the selection of a suitable research design to be used in terms of the type of data to be collected, sources of data and the techniques to be used for data collection and analysis (Easterby-Smith et al., 2002). Tashakkori and Teddlie (2010)and Williams (2007)classify research approaches into quantitative, qualitative and mixed methods. The classification of these approaches is mainly based upon the data collection and analysis techniques, the level of flexibility required within the research design, the objectives and the research questions posed (Mack, Woodsong, MacQueen, Guest, & Namey, 2005). The following sections discuss the different research approaches, followed by the research approach used for this study.

3.4.2.1 Qualitative, Quantitative and Mixed Methods

A qualitative researcher is a part of the research process and thus qualitative approach is inclined towards the interpretivism paradigm(Amaratunga et al., 2002). Qualitative approach seeks to gain insights by understanding people's perception of the world (Fellows & Liu, 2003). Therefore it is empirical research where the data is non-numeric (Punch, 1998). According to Creswell (2009)qualitative research follows an inductive

process by collecting detailed information from participants followed bygrouping that information into categories or themes. Subsequently the categories or themes could be developed into broader theories, patterns or generalisations which can be compared to the existing literature on the subject or with personal experiences. As per Easterby-Smith et al. (2002)the study may be based on a small sample of respondents and in need of a different kind of data so as to establish different views of phenomena. Denzin & Lincoln (1994) state that qualitative research can provide a rich understanding of processes and meanings to give a fuller understanding of the phenomena under investigation. It is an approach that explores experiences, attitudes and behaviours using interviews, observations or focus groups (Denzin, 2010; Parahoo, 2006). On a similar note Mack et al. (2005) state that qualitative research involves formulating new theories using flexible ways of collecting people's opinions in the form of in-depth interviews, focus groups, and participant observation. In addition to that Creswell (2007) suggests that the qualitative approach uses research strategies such as case studies, grounded theory, ethnography, content analysisand phenomenological data. Apart from these thematic analysis has also been identified as a foundational method for qualitative data analysis since it provides skills which are useful in conducting many other forms of qualitative analysis rather than a standalone methodology (Braun & Clarke, 2006; Ryan & Bernard, 2000).

Quantitative approach unlike qualitative approach treats the researcher and research as independent entities and is therefore inclined towards the positivism paradigm (Creswell, 2009). Its main focus in on counting and classifying features and constructing statistical models and figures to explain what is observed. Statistical data is generated using large-scale survey research, using methods such as questionnaires or structured interviews (Amaratunga et al., 2002). Therefore quantitative research is empirical in nature where the data is in the form of numbers (Punch, 1998). Further Fellows and Liu (2003) and Gill and Johnson (2002) both agree in stating that quantitative approach collects factual data to establish, validate or confirm relationships. This in turn contributes towards the development of a conceptual and theoretical structure prior to its testing through empirical observation. Hence quantitative research employs a clear deductive approach. The deductive approach only requires measurement of specific concepts in hypothesis (Blaikie, 2009). Therefore commonly a

hypothesis is tested by collecting quantitative data targeting a large sample size. Finally at the end of the research study, results are expected to be generalised to the population (Blaikie, 2009; Saunders et al., 2007).

Therefore qualitative and quantitative approaches lie on opposite sides of a spectrum in the same way like the two main research paradigms of positivism and interpretivism. Table 3.4 lists out the difference between the two approaches as stated by (Mack et al., 2005).

Table 3.4: Differences between qualitative and quantitative research approach

Characteristics	Quantitative	Qualitative
General framework	• Seeks to confirm hypotheses regarding phenomena • Instruments use more rigid style of eliciting and categorizing responses to questions • Uses highly structured methods such as questionnaires, surveys, and structured observation	• Explores phenomena • More flexible, iterative style of eliciting and categorizing responses to questions • Semi-structured methods such as in-depth interviews, focus groups, and participant observations.
Analytical objectives	• To quantify variations • To predict causal relationships • To describe characteristics of populations	• To describe variations • To describe and explain relationships • To describe individual experience • To describe group norms
Question format	• Close-ended	• Open-ended
Data format	• Numerical (obtained by assigning numerical values to responses)	• Textual (obtained from audiotapes, videotapes, and field notes)
Flexibility in study design	• Study design is stable from beginning to end • Participants' responses do not influence or determine how and which questions researchers ask next • Study design is subject to statistical assumptions and conditions	• Some aspects of study are flexible (for example, the addition, exclusion, or wording of particular interview questions) • Participants' responses affect how and which questions researchers ask next • Study design is iterative; that is, data collection and research questions are adjusted according to what is learned

(Source: Mack et al., 2005)

Having looked at Table 3.4 above it can be determined that the two research approaches i.e. qualitative and quantitative stand distinctively apart. However many researchers have stressed upon the use of combining both the approaches due to the benefits accrued (Bryman, 2012; Creswell, 2009; Johnson & Onweugbuzie, 2004). Literature suggests

the importance of not considering them as two ridged divisions since a combination of two enables the researcher to gather the advantages from both approaches (Gill & Johnson, 2002; Tashakkori & Teddlie, 2010). Besides that a combination of the two approaches could assist with the possibility of avoiding the weakness of each (Fellows & Liu, 2003). Further Yin (1994) suggests that there is a strong and essential common ground between the two approaches. Amaratunga et al. (2002) suggest that quantitative and qualitative approaches could complement each other. A quantitative study could assist the qualitative side during the design, by finding a representative sample and locating deviant samples. Similarly qualitative data could help the quantitative approach during design by aiding with conceptual development and instrumentation. From a philosophical point of view as already discussed in section 3.4.1.3 pragmatism tends to utilise mixed method research approach (Tashakkori & Teddlie, 1998).

3.4.2.2 Research approach suitable for this study

Having discussed the nature and the scope of the problem earlier in sections 3.3.1 and 3.3.2 and the benefits and flexibility of using a combined approach, this study will utilise the mixed-methods approach. It has also been discussed earlier in section 3.4.1.4 that this study complies with a pragmatic philosophical position which allows the use of mixed methods i.e. qualitative and quantitative. Mackey and Gass (2005)describe a multi-method approach as one where the researcher may present and discuss both quantitative and qualitative data in the same report, or use methods associated with both types of research in collecting data or conducting studies. A common way to approach multi-method research is through triangulation. Brown and Rodgers (2002)note seven types of triangulation: data triangulation, theory triangulation, investigator triangulation, methodological triangulation, interdisciplinary triangulation, time triangulation and location triangulation.The approach utilized in this study is methodological triangulation, which is similar to the most common understanding of the term triangulation as stated by Macky and Gass (2005). “Triangulation is the use of multiple methods of obtaining data in a single investigation in order to arrive at the same research findings”. When using triangulation, it is important to be specific about what type of data is required from the study, and the specific aims of the proposed methods (Brannen, 1992).

Further Miles and Huberman (1994) suggested four possible research designs that employ research methods associated with both the approaches as shown in Figure 3.2. The first design suggests that both the qualitative and quantitative data is collected simultaneously. The second suggests a multi-wave survey is conducted parallel to continuous fieldwork. The third and the fourth designs subsequently are focused on studies with the collection of data one after the other. The third design consists of a qualitative exploration stage followed by a quantitative stage e.g. collection of data by questionnaire distribution and a final qualitative stage to verify data. The fourth and the final design is the opposite of the third one where the sequence is quantitative, qualitative and quantitative respectively.

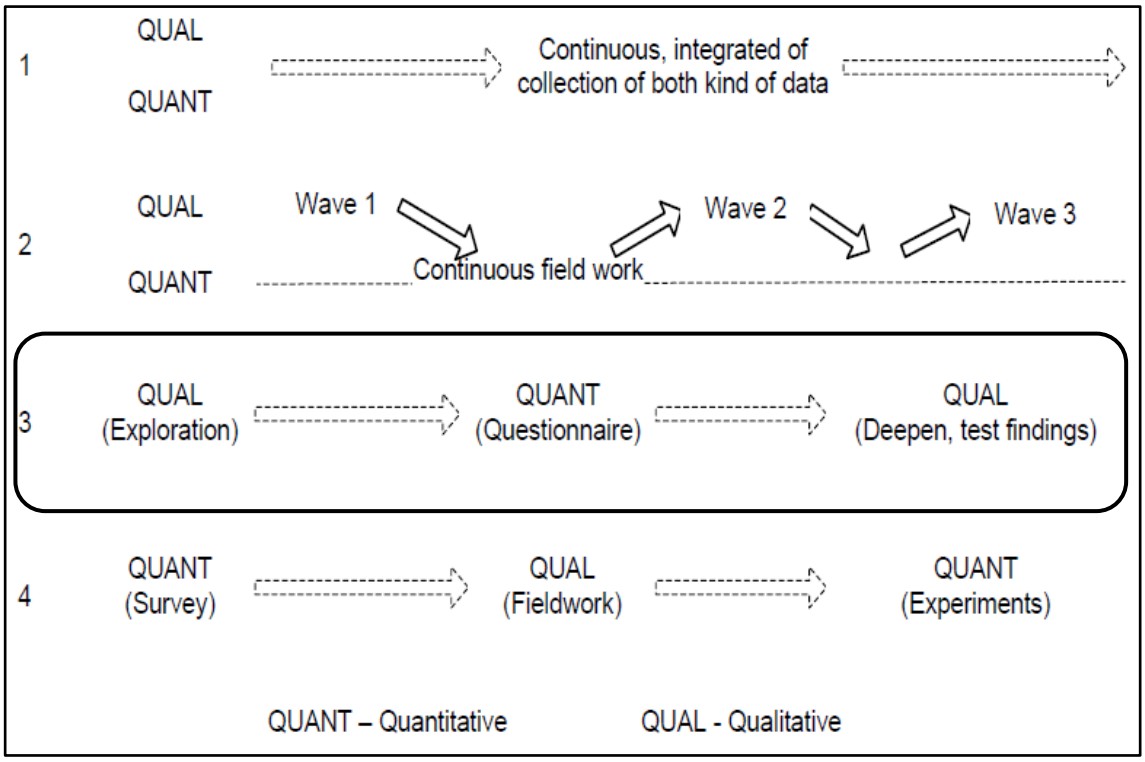


Figure 3.2: Illustrative designs linking qualitative and quantitative approaches

Source: (Miles & Huberman., 1994)

This study employs a structured approach to data collection depending upon the nature of the research subject. The research design utilised for this study is option number 3 as shown in Figure 3.2. Firstly the literature review helps to establish that the issue of retentions has sparked debates in the construction industry world over. Having identified the lack of empirical research on this topic in the New Zealand construction industry the first stage of data collection utilises a qualitative investigation approach.

Aligning with the research objectives the first set of data was gathered by including the opinions of experts regarding the practice of retentions in New Zealand. This was an inductive process of theory building using a small sample of construction practitioners. This is a theory building exercise in the sense of gathering data regarding retention perspective and creating hypothesis based on the gathered data. This was followed by the quantitative approach in the form of administering a New Zealand wide questionnaire survey. The purpose was to quantify the constructs discovered from the initial stages i.e. the literature review and the opinion of the experts. The main emphasis being on comparing the perceptions of the different industry groups i.e. clients/consultants, head contractors and subcontractorsregarding the retention practice. The last and final stage was a set of follow-up interviews (qualitative), again with experts as part of the validation exercise to test the findings of the data collected in the first two stages.

Therefore the philosophical underpinnings along with the nature of the problem and the research questions, the type of data required and the benefits of using a mixed method approach validate the use of a mixed method approach for this study.

3.4.3 Research strategy

The next significant phase of a research project is the selection of an appropriate research strategy or research design. The two terms have been used interchangeably by different authors. Research strategy can be defined as the ways in which research will be carried out i.e. data collection and analysis. Tan (2002) defines research design as the plan for getting from the research questions to the conclusions. On a similar vein Bryman and Bell (2011)describe research design as the ways in which data will be collected and analysed in order to answer the research questions posed and therefore provide a framework for undertaking the research.

Researchers suggest a number of factors that guide the selection of an appropriate research strategy for a study. As per Saunders *et al*. (2007) these include the research objectives and questions, the adopted research philosophy, the amount of time and resources available for data collection. Tashakkori and Creswell (2008) on the other hand argue that the research problem, researcher's personal experience and the audience should guide the selection of a suitable research strategy. In addition to these Yin

(2003)stated that the type of research questions, the extent of control the researcher has over behavioural events, and the ability to focus on contemporary events can help guide a researcher towards the selection of an appropriate strategy.

Saunders *et al*. (2007) classify research strategies as experiment, survey, case study, action research, grounded theory, ethnography and archival research. Yin (2003) on the other hand categorizes them as experiment, survey, archival analysis, history and case study respectively. Table 3.5 presents a list of different research strategies along with factors which assist the researcher to adopt the appropriate strategy for their study.

Table 3.5: Research strategies and their factors for applicability

Research Strategy	Generally suitable for	Form of research question	Requires control over behavioural events	Focuses on contemporary events
Survey	Descriptive Exploratory Explanatory	Who, what, where, how many, how much	*No*	*Yes*
Experiment	Exploratory Explanatory	How, why	Yes	Yes
Archival analysis	Exploratory Explanatory	Who, what, where, how many, how much	No	Yes/No
History	Exploratory	How, why	No	No
Case study	Descriptive Exploratory Explanatory	How, why	No	Yes
Action Research	Explanatory	How, why	No	Yes
Grounded theory	Exploratory Explanatory	How, why	No	Yes/No
Ethnography	Descriptive Exploratory	How, why	Yes/No	Yes

(Source: Adapted from - Saunders *et al*., 2011; Yin, 2003)

3.4.3.1 Research strategies in general

Table 3.6 lists out 8 types of research strategies that can be used for a research study depending upon their applicability. Following is a description of the research strategies used in general.

i. Survey – Tan (2002) defines survey as a systematic method of collecting primary data based on a sample. As suggested by (Saunders et al., 2007) survey strategy is very popular in business and management research and enables the collection of large amount of data from a large population relatively cheaply.

The advantage of a survey design is that both qualitative and quantitative data can be collected using methods or techniques such as questionnaires, structured observations and structured interviews. However this type of design has its drawbacks too which are: difficulty in achieving the truthfulness and accuracy of the data collected; data collected can be limited due to the use of the common method i.e. questionnaire where the number of questions might be limited; the progress could be delayed due to dependency on others' responses for information (Blaxter, Hughes, & Tight, 2006; Saunders et al., 2007).

ii. Experiment –An experimental strategy is undertaken on a sample of the population within a controlled environment to test if there is a causal relationship between the variables under investigation (Baker, 2000). Blaxter et al. (2006)suggest that an experiment is a scientific method used for formulating and testing hypothesis by thoroughly designing and testing. However an experimental design has its limitations too in management research due to ethical reasons such as: working with people, people's willingness to participate in experiments, difficulty in arriving at a representative sample and lastly it may be costly and there might be issues associated with the experiment designs and conducting environments (Saunders et al., 2007).

iii. Archival analysis –As suggested by Saunders et al. (2007) and Yin (2003) an archival strategy can be used for exploratory, explanatory and descriptive research. The strategy involves collecting data from archives which include data from administrative records and documents, both recent and historical to understand or draw lessons about the past, present and future (Tan, 2002). However the constraint with archives is the availability and accessibility of data and the precise nature of the data. Plus the data collected from these sources is inevitably secondary data as the data has been previously collected for different purposes (Saunders et al., 2007).

iv. History –This type of strategy is usually exploratory in nature and helps to answer the how and why type questions. In this the researcher can collect data by exploring historical events (Yin, 2003).

v. Case study – Yin (2003) describes a case study as an empirical inquiry which involves the investigation of a contemporary phenomenon within its real-life context, particularly when the boundaries between phenomenon and context are not clearly evident. Further a case study can be applicable where the researcher explores an event or activity or one or more individuals in-depth (Creswell, 2009). Case studies can also be used to test theories, guided by a hypothesis (Tan, 2002). Data in a case study can be collected using a number of techniques such as interviews, participant observations, archival documents or records, and audio visual materials (Williams, 2007). Case studies can be classified into single cases v. multiple cases and holistic cases v. embedded cases. A holistic case study involves an organization as a whole for the investigation whereas an embedded case study refers to a study of the sub-units of an organization. It is better to have multiple case studies in order to generalize the findings (Yin, 2003).

vi. Action research - Bryman (2012) defines action research as a strategy where the action researcher and members of a social setting work together in the analysis of a problem and in the development of a solution based on the analysis. Action research consists of a spiral process involving the discovery and analysis of facts leading to action planning and action taking. These actions in turn are evaluated and applied to future projects. Therefore in academic terms, action research contributes towards the development of theory (Saunders et al, 2007). However this approach like others too has its downsides of lacking rigour and for being too partisan in approach (Bryman, 2012).

vii. Grounded theory –Grounded theory is concerned with the development of theory out of data and the approach is repetitive in the sense that the process of data collection and analysis goes one after the other (Bryman, 2012). Theory is formed through data collected via a series of observations (Fellows & Liu, 2003; Saunders et al, 2007). Creswell (2009) further explains that the use of grounded theory is appropriate when the researcher aims to derive a general, abstract theory of a process, action, or interaction which is grounded in the views of the participants involved in the study.

viii. Ethnography –Ethnography deals with the study of an entire group sharing a common culture (Leedy & Ormrod, 2001). Therefore to understand a group of people it is important to engage in an extended period of observation (Silverman, 2005) which will involve the researcher to immerse himself within a natural setting (Creswell, 2009). Ethnography adopts an inductive approach to study the social world. The research process needs to be flexible in order to integrate any changes obtained through observations. It is best suited to gain insights and to understand a particular context from the perspective of the participants involved in the context.

3.4.3.2 Research strategy suitable for this study

The previous section assisted the researcher in understanding the various research strategies used in general. Having outlined the various strategies and assessed their suitability, the most appropriate research strategy for this research is the survey strategy. The nature of this research study is exploratory which has already been discussed earlier andall the questions are primarily in the nature of 'What'. For example, what is the purpose of retentions? What are the issues surrounding the retention practice? What are the advantages and disadvantages of the retention practice?

As suggested by Yin (2003) two types of research strategies can help answer the 'What' type questions i.e. survey and archival analysis. Hence the use of any other type of research strategy for this study is ruled out. Further archival analysis was not a feasible strategy due to the unavailability and inaccessibility of recent and historical administrative records/documents on retentions. Moreover the objective of the study is to obtain perceptions and experiences regarding retentions from industry practitioners and a wider population which can be achieved using the survey strategy. Kelley, Clark, Brown, and Sitzia (2003) recognize that a survey strategy is highly efficient where a large sample from a pre-determined population is involved. In addition to that survey methods are relatively inexpensive, which was an important constraint of this study due to limited funding. This study employed two methods of the survey strategy i.e. semi-structured interviews and a questionnaire survey which are discussed in the following section.

3.4.4 Research techniques

Research techniques or methods are defined as the procedures adopted for the collection and analysis of data (Crotty, 2003). Techniques can be qualitative or quantitative in nature depending upon the data collection instruments used, data analysis procedures and forms of data produced (Saunders et al., 2007). Apart from these two the concept of mixed methods emerged into research later on. Therefore in order to obtain answers to the research questions a researcher can employ either qualitative, quantitative or mixed methods (i.e. a mix of qualitative and quantitative). The following sections briefly describe these three methods followed by the method employed for this study.

3.4.4.1 Research techniques in general

Following is a description of the research methods used in general.

i. Qualitative and quantitative methods –

Creswell (2009), Mack et al (2005) and Williams (2007) classify research methods into qualitative and quantitative. Quantitative methods refer to any data collection technique usually questionnaires and data analysis procedures such as graphs or statistical analysis that generate numerical data. Qualitative methods on the other hand use data collection techniques such as interviews and data analysis procedures for categorizing data such as thematic analysis that generate textual or non-numeric data.

Another difference between the two methods is the flexibility in data collection associated with each method. Mack et al (2005) suggest that quantitative methods are generally inflexible due to the use of questionnaires (with usually closed ended questions) with all participants given a similar set of questions and the choices to be made in the same order. Due to this inflexibility participants are unable to express their views beyond the choices offered. In addition to this, the researcher is required to have a clear understanding of the questions and the best way to word them and to present a range of possible responses. The benefit however is that the researcher is allowed to carry out meaningful comparisons of responses across participants.

Qualitative methods on the other hand provide more flexibility to the researcher in

terms of spontaneity and adaptation of the interaction between the researcher and the participants (Mack et al, 2005). The use of open-ended questions in an enquiry provides this flexibility. Moreover open-ended questions also provide freedom to the participants to respond in the way they wish. Qualitative methods therefore seem to be less formal, enabling the researcher to acquire in-depth information from the participants, depending upon the subject of enquiry.

ii. Mixed methods –

The name mixed-methods is self-explanatory referring to the use of both qualitative and quantitative data collection and analysis techniques for a single research enquiry (Creswell, 2009; Johnson & Onwuegbuzie, 2004). Researchers have identified the advantages of using mixed methods for better research findings. Amaratunga et al (2002) contend that the use of mixed method for measuring the same phenomena compensates for the weakness of one individual method by counter balancing with the strengths of the other method. For example the use of surveys with closed ended questions provides only limited responses and limits the views of respondents in terms of their insights and ideas (Oppermann & McKercher, 2000). This weakness could be overcome by the use of open ended questions by using the interview method.

Creswell (2009) and Tashakkori & Teddlie (1998) explain that using mixed-methods, data can be collected either concurrently or sequentially. Creswell (2009) further explains that concurrent form of data collection refers to both qualitative and quantitative data being collected at the same time. Whereas sequential form of data collection requires one form of data to be collected and analyses before the second form.

3.4.4.2 Research technique suitable for this study

Having discussed the nature of this research study, the research questions, the type of data to be collected and the advantages of using mixed-methods, the most suitable technique for data collection for this study is mixed-methods. This is in line with the pragmatic position of the research as well as the mixed-methods approach utilised for this study.

This study adopted sequential data collection approach involving three phases. The first phase of data collection was carried out by reviewing the literature about the problem being investigated. This was followed by collecting opinions about retentions from the New Zealand construction industry experts. Due to the lack of much research regarding the retention practice in New Zealand the best way was to approach the industry. Data in the first phase was collected by interviewing a small sample of industry experts. Semi-structured interviews with open ended questions were used to gather as much information as possible. The interviews helped in gaining an in-depth understanding regarding the use of retentions in the New Zealand construction industry. The history of the practice, the issues surrounding the practice and the perspective of the different groups (clients, contractors, subcontractors and consultants) regarding retentions was recorded. The data gathered in this stage was qualitative in nature.

The second phase of data collection involved an extensive questionnaire survey to gain information from the wider population of the industry. Based on the first stage and the literature review certain variables were derived. The survey aimed to measure the significance of these variables. The questionnaire yielded both quantitative and qualitative data since it had both close and open-ended questions.

The third and final phase of data collection was aimed at validating and extending the findings from the questionnaire survey. The validation exercise was conducted usingexperts again by way of a short qualitative questionnaire survey. Therefore a sequential mixed-method data collection technique adopted for this study overcame the limitations arising in each stage. The next section will explain in detail each phase of data collection and analysis and the processes involved.

3.5 Data collection methods

Literature suggests a variety of data collection techniques that can be used for a research study. Depending upon the nature of the data collected either numerical or textual it can be classified into quantitative or qualitative. Interviews, questionnaires, document analysis, observations are some of the examples of data collection techniques. The previous section explains the use of sequential mixed methods i.e. qualitative and quantitative techniques used for this study. The following subsections will present a detailed outline of the three phases of data collection used in this study.

3.5.1 Phase 1 – Semi structured interviews

Due to the lack of research on retentions in the New Zealand construction industry the best way to collect rich and experiential data on the research questions was by way of interviewing experts in the industry. Interviews are one of the main data collection methods used by social researchers and provide an opportunity for direct interaction between the researcher and the research participants. Punch (1998) contends that interviews provide an in-depth understanding of what people think about a particular research question. In a similar veinKing (1994)suggests that qualitative research interviews are best suited when exploratory work is required before carrying out a quantitative study. Therefore for this particular study the use of interview is best suited as the initial technique for data collection.

Qualitative interviews are usually categorized into unstructured, semi-structured and structured depending upon the degree of structure and standardizations adopted by the researcher (DiCicco-Bloom & Crabtree, 2006; Matthews & Ross, 2010). This research utilized the semi-structured, in-depth interview technique due to the flexibility offered by this method. This method allows improvisation to the interview script and its nature supports the investigation of participants' experiences and feelings (Denscombe, 2010; Myers & Newman, 2007). The foundation for the semi-structured interviews was based upon the initial literature review conducted. The interviews as suggested by Denscombe (2010) were conducted on a one-to-one basis. Such interviews are simple to arrange and the opinions come from a single interviewee. In addition to that the interviewer has the upper hand to control the interview.

Participants for interviews were selected using the following criteria: expertise in the subject area of inquiry, their high standing in the industry, and sampling technique. For the interviews the selection of the number of participants was a contentious issue in-order to provide statistical significance. In line with that Guest, Bunce, and Johnson (2006) suggest that a purposive sampling approach for selecting interview participants is used and is often guided by data saturation. In a study conducted by them it was found that data saturation is achieved by interviewing the first 12 interviewees. In a similar vein Dick (1990) articulates that interviewing can cease once two successive interviews provide little or no additional information to be added to the analysis. A

similar approach was utilized for this study and 13 semi-structured interviews were conducted. The profile of the participants consisted of key personnel from construction client, contractor, subcontractor and consultant organizations. Detailed profile information of the participants is given in Chapter 4.

The interview questionnaire contained five sections with questions in line with the five research objectives of the study. A list of indicative questions in appended as Appendix B1.All the questions were open-ended to gather as much information as possible. All the interviews were conducted face-to-face. The time and place for the interviews was decided by prioritizing the convenience of the interviewees. All the participants were guided by the researcher by phone or e-mail about the research project. All the necessary documents including participant information sheet, consent form and a list of indicative questions was sent to the participants prior to the interview date fixed. All the interviews were tape recorded with the consent of the participants and notes taken where necessary. This made the process of transcribing easy and also helped to get an accurate account of the conversations. "Express scribe" software was used by the researcher to transcribe the interviews.

3.5.2 Phase 2 – Questionnaire survey

In addition to interviews questionnaires are an appropriate data collection technique in a survey research design/strategy. They are designed to gather information in the form of facts and opinions by questioning participants directly (Denscombe, 2010). Questionnaires can generate responses from a large number of participants using standardized questions (Saunders et al., 2007). Furthermore the research questions for this study are in the form of 'what' and views were to be captured from many respondents at once. Therefore in line with Saunders et al. (2007), questionnaire survey was used in the current study to extend knowledge gained from the first phase of data collection. The following sections describe in detail the design and development of the questionnaire, administration, sampling strategy and the strategies used to improve the response rate.

3.5.2.1 Questionnaire design and development

The questionnaire for this study was designed and developed keeping in mind both the

respondents and the research objectives. The questions were designed with the aim of capturing 'opinions' (i.e. variables record how respondents feel about something or what they think or believe is true or false), 'behaviour' (i.e. respondents experience with the particular problem being investigated), 'attributes' (i.e. respondent characteristics and how opinions and behavior differ between the different groups) from the survey respondents (Saunders et al, 2007). The questions developed were based on the literature reviewed and other studies conducted in other parts of the world mainly in the US and the UK. In addition to that the questionnaire was further refined based on the findings of the semi-structured interviews conducted in the first phase of data collection.

The questionnaire consisted of eight sections, the first five sections being in line with the five research objectives i.e. the purpose of retentions, the current status of retentions in New Zealand, the costs and benefits of the retention practice, alternatives to retentions and system to devise retention regimes. The next two sections were specifically for contractors and subcontractors respectively. These two sections aimed to find out the direct impact of retentions on the two parties. The last section was related to the demographic information of the participants. The questions were arranged in a logical order without any pre-requisites to make sure that the flow of the questions was smooth. This in turn would help the respondents to understand the purpose of each section.

The questionnaire was designed with a combination of open and close-ended questions. The questionnaire is appended as Appendix B2. The main reason for the inclusion of open-ended questions was to gather respondents' insights with regards to certain important issues. In addition to that every close-ended question was provided with an option of "other" giving the respondents a choice to make additional comments deviating from the list provided.

Closed questions included the following types: categorical, rating and list type questions. List type questions were used to mainly determine the profile of the respondents' i.e. their profession, type of organization etc. Categorical questions were used to collect data to understand the depth of the issues with regards to the retentions practice in the New Zealand construction industry. The questions had usually five or three response categories e.g. not at all, rarely, sometimes, most of the times, always

and yes, no, not sure. In addition to these there were a few more categorical questions. Rating questions were used to get opinions from the respondents about the use of retentions in the construction industry i.e. their purpose, their current status in New Zealand, their costs and benefits, alternatives to the practice and system to devise retention regimes. In order to determine respondents' level of agreement or disagreement a five-point Likert scale was used (strongly disagree, disagree, neither agree nor disagree, agree, strongly agree). Three, seven and nine-point scales are also used for rating type questions however a five-point scale is normally preferred (Saunders et al, 2007). A 5-point scale helps the respondents to spread their views across reasonably than having to select from a much limited (3-point) or an unreasonably large (7 or 9-point) response category.

All the questions were written in plain and simple English for easy understandability and to avoid ambiguity. The final version of the questionnaire was created after a number of discussions with the research supervisor and colleagues in academia and industry. The questionnaire was pilot tested among the same group of people to identify any difficulties in accessing or answering the questions, completing and collecting responses and to estimate the time taken to complete the survey etc.

The survey link was sent out to the targeted population from the New Zealand construction industry. The first page of the online survey link presented the Participant Information Sheet (PIS). A copy of the PIS is appended as Appendix A3. The PIS provided comprehensive information relating to the research topic i.e. the purpose of the research, its benefits, time taken to complete the survey, the layout of the survey, instructions to complete the survey, information relating to privacy and the researcher's and supervisor's contact details.

3.5.2.2 Questionnaire administration

Saunders et al (2007) classifies questionnaires into seven types depending upon the way they are administered as shown in figure 3.3 below. It has been identified in the literature review that the issue of retentions affects the whole construction supply chain, the ones being directly affected are the clients, contractors and the subcontractors. Therefore the expected sample is dispersed across a large geographical area. This study used the self-administered internet questionnaire to cover the large sample size as

shown in Figure 3.3. It was not possible to reach out to the potential participants to carry out structured interviews face to face or over the phone. Therefore interviewer-administered technique was ruled out.

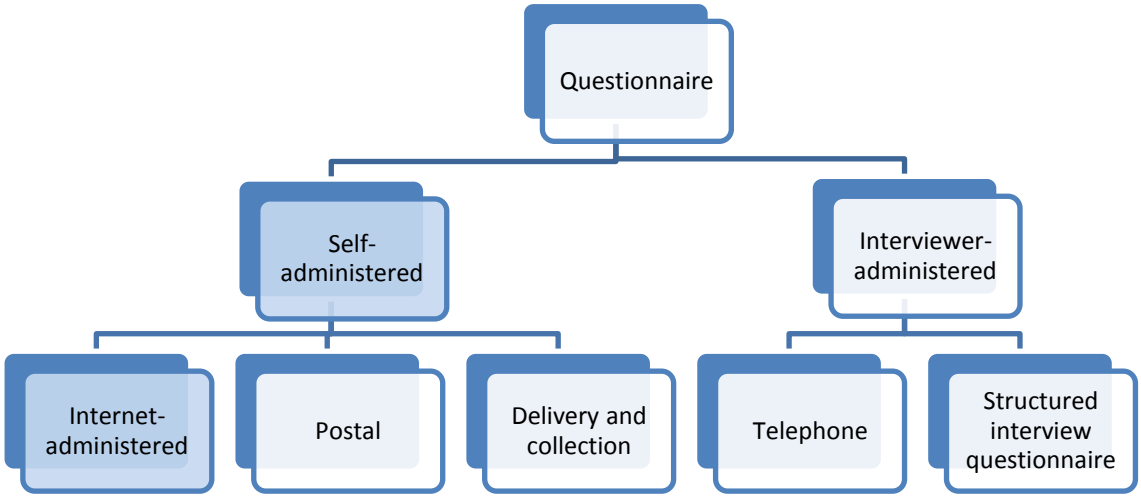


Figure 3.3: Types of questionnaires

Source: (Saunders et al., 2007)

Internet-administered questionnaire was preferred above postal and delivery and collection after considering the theoretical and practical aspects of administering the survey. Saunders et al (2007) suggest that the following key factors influence the choice of a questionnaire:

i. Respondents characteristics from whom the data is to be collected;
ii. Importance of reaching a particular person as respondent;
iii. Importance of respondents' answer not being contaminated or distorted;
iv. The sample size required for analysis, depending upon the expected response rate;
v. Number and type of questions being asked for data collection.

Table 3.7 further shows the difference in attributes of the three types of self-administered questionnaires. Taking into account the important attributes the internet-administered questionnaire was found to be most suitable for this study. Saunders et al (2007) contend that the questionnaires administered via internet especially the ones

administered in conjunction with an e-mail ensure that the intended respondent answers the questionnaire. This in turn guarantees the reliability of responses collected over the other methods i.e. postal or delivery and collection. Taking into account the characteristics of the targeted respondents, prior contact with trade associations and professional bodies was the most effective way to reach the potential participants. This in turn confirmed that the participants were able to use an internet-administered questionnaire.

Another issue affecting the reliability of the data is the contamination of respondents' answers (Saunders et al., 2007). However with the use of internet-administered questionnaires the likelihood of data distortion or contamination is low as compared to the other two options. Further with regards to the length of the questionnaire an internet based questionnaire offers more benefits compared to the other two methods. Reason being that in an internet based questionnaire what matters is the number of screens and not the number of pages depending on the number of questions. Therefore there is an opportunity to have more questions within each screen or section of the questionnaire. For the current study the printable survey consisted of 16 pages with a total of 25 questions to be responded by all participants and an additional 9 questions were specific to the contractor or subcontractor groups. However with the internet-administered survey there were a total of 6 screens plus 2 for the specific respondents.

A major disadvantage with the internet-administered survey is a low response rate as suggested by Saunders et al (2007) compared to the postal and deliver and collection methods. However internet based questionnaire was preferred for this study due to the other benefits of cost and time saving in data collection and processing. Moreover with the use of electronic media the data collected can be directly imported into the statistical software used for data analysis.

From a practical perspective, the questionnaire was administered among representatives of client organizations, consultants, contractors and subcontractors. Additionally architects, engineers, project managers and quantity surveyors were also targeted to participate in the questionnaire survey. In order to make contact with the potential participants the initial contact was made with construction trade and professional associations of New Zealand. . The online tool used to administer the survey was

"Survey Monkey" (http://www.surveymonkey.com). This online tool provides facilities to design questionnaires collect responses and import data onto statistical packages such as SPSS used for analysis.

Table 3.6: Main attributes of self-administered questionnaires

Attribute	Internet and Intranet Mediated	Postal	Delivery and collection
Population's characteristics for which suitable	Computer-literate individual who can be contacted by email internet or intranet	Literate individuals who can be contacted by post, selected by name, household, organization, etc.	
Confidence that right person has responded	High if using email	Low	Low but can be checked at collection
Likelihood of contamination or distortion of respondent's answer	Low	May be contaminated by consultation with others	
Size or Sample	Large, can be geographically dispersed		Dependent on number of field workers
Likely response rate	Variable: 30% reasonable within organizations/via intranet, 11% or lower using internet	Variable, 30% reasonable	Moderately high, 30-50% reasonable
Feasible length of questionnaire	Conflicting advice; however, fewer 'screens' probably better.	6-8 A4 pages	6-8 A4 pages
Suitable types of question	Closed questions but not too complex; complicated sequencing fine; if using IT, must be of interest to respondent	Closed questions but not too complex; simple sequencing only; must be of interest to respondent	
Time taken to complete collection	2-6 weeks from distribution (dependent on number of follow-ups)	4-8 weeks from posting (dependent on number of follow-ups)	Dependent on sample size, number of field workers, etc.
Main financial resource implications	Web page design, although automated expert systems providers are reducing this dramatically	Outward and return postage, photocopying, clerical support, data entry	Field workers, travel, photocopying, clerical support, data entry
Data input	Usually automated	Closed questions can be designed so that responses may be entered using optical mark readers after questionnaire has been returned	

(Source: Adapted from Saunders et al., 2007)

In terms of the time allowed for collecting the responses from the survey, the study followed the guidelines suggested for data collection by internet based questionnaires. As per Saunders et al (2007) 2-6 weeks is a reasonable time depending upon the number of follow-ups. The link for the questionnaire was originally sent out on the 3rd of April 2013 with an intended closing date of 8th of May 2013. Two follow up reminders were

sent out within the 6 weeks of time allocated. It was observed through the online system that the respondents contacted through their trade associations and professional bodies started responding only after the 17th of April. This was because of the time taken to send out the link through the newsletters etc. Keeping that in mind the survey was kept open for an additional 3 weeks till the 29th of May.

3.5.2.3 Questionnaire sampling method

As per the decided sampling frame, the sample should contain representatives from client, contractor and subcontractor organizations. These are the three groups directly affected by the retention practice. Apart from the parties directly affected the other players within the construction industry also observe the practice and their views and opinions were also considered as necessary. These include consultants such as engineers, architects, quantity surveyors, project managers and legal experts. The sample for the study was mainly drawn from the sampling frame which included members of trade associations and professional institutes. The following associations were contacted;

- NZSTCF – New Zealand Specialist Trade Contractors' Federation
- NZCF – New Zealand Contractors Federations
- NZIOB – New Zealand Institute of Building
- DBH – Department of Building and Housing
- NZIA – New Zealand Institute of Architects
- NZIQS – New Zealand Institute of Quantity Surveyors.
- Registered Master Builders Federation
- Certified Builders of New Zealand

Access to contact details of members of these organizations was not possible due to privacy reasons. Some of the organizations such as NZSTCF, NZIQS and NZCF suggested sending out the electronic link for the survey to their members through email ormonthly e-newsletters. Some organizations such a Registered Master Builders Federation and Certified Builders of New Zealand did not respond to the request send to participate in the research. The NZIA provided a list of their members with their e-mail addresses. Apart from the above mentioned organization, the researcher was able to

source contact detail of potential participants through the New Zealand Yellow pages and other personal contacts and from the internet. Contact with them was made directly by the researcher through email. Consequently the questionnaire was administered to the participants directly by the researcher. No sampling method was used for sending the survey link to the participants through trade associations and professional institutes. However the selection of participants from the NZIA was done using simple random sampling from the list provided of 300 registered architects. Out of the population a sample of 140 architects was drawn by selecting random numbers using a simple random sample. Cochran's formula for continuous data was used to calculate the sample size (Bartlett, Kotrlik, & Higgins, 2001). The formulas used for calculation are given below. The sample was determined using the following conditions, t-value = 1.96 for the alpha level of 0.05; estimate of standard deviation in the population (s) = 1.25; and acceptable margin of error (d) = 0.03. The standard deviation for population size was calculated using the number of points on the likert scale and the number of standard deviation. A 5-point likert scale was mainly used for the questionnaire. The standard deviation was therefore calculated using s = 5 (number of points on scale)/4 (number of standard devaitions). Thus the value of standard deviation equals 1.25.

Equation 3.1: Minimum sample size (n)

$$n = (t^2 \times s^2)/d^2$$

$$n = \frac{1.96^2 \times 1.25^2}{5 \times 0.3^2} = 267$$

Equation 3.2: Adjusted sample size (N)

$$N = n/1 + (\frac{n}{population})$$

N = 267/ (1+267/600) = 185

Table 3.8 presents the questionnaire distribution list along with the number of responses and response rate received for each category. Overall 187 usable responses were collected from a total of 890 sent. The overall response rate calculated was 21% with an individual response rate from some organizations being as low as 10%. A low response rate was expected after early contacts were made with the trade associations and

professional institutes. Getting responses for this kind of a survey within the New Zealand construction industry was a real challenge irrespective of the type of questionnaire survey employed, which in this case was internet based. However Saunders et al (2007) suggest that an 11% response rate for an internet administered survey is reasonable. Although the response rate for certain groups was low, but the overall response rate of 21% was reasonable. Moreover the survey offered a sufficient sample for statistical analysis required for this study. The statistical analysis was carried out between the groups i.e. client/consultants, head contractor and subcontractor and the total sample as a group. The client and consultant groups were merged for statistical analysis based on their similar responses. Before merging the groups an appropriate statistical test (independent samples t-test) was performed to compare the mean differences between the individual groups.

Table 3.7: Questionnaire distribution list and responses rate

No.	Medium of distribution	No. of questionnaires distributed	No. of participants attended	No. of usable questionnaires	Response rate (%)
1	NZCF	200	20	20	10
2	NZIQS	150	17	17	11
3	NZSTCF	250	86	83	33
4	Direct administration to NZIA members	140	39	35	25
5	Direct administration to selected participants	150	34	32	21
	Total	**890**	**196**	**187**	**21%**

Further it could be argued that the systematic differences between the responders and non-responders could invalidate the research findings. However Fowler (2008) and Grady and Wallston (1998) contend that even with a low response rate research findings can be valid provided there are no systematic differences between responders and non-responders. The most important factor in assessing the effect of a response rate on the validity of the research findings is the non-response bias (Fowler, 2008). Therefore in order to ensure validity of the research findings researchers widely recommend investigating the non-response bias (Gehlbach, 1993; Parashos, Morgan, & Messer, 2005).

In order to investigate the non-response bias Armstrong and Overton (1977) suggest the use of independent samples t-test. In the current study this was done by dividing the total number of responses into three groups and running the t-test between the first one third of the responses and the last one third. Although differences for few questions were found while running the test, however overall there was no difference found between the responders and the non-responders.

3.5.3 Phase 3 – Validation survey

This research examines the practice of retentions in the New Zealand construction industry with an objective to identify the issues around the practice and the impacts of the practice on different parties. In addition to that the study intends to make recommendations based on the findings to improve the way in which the practice is running currently. Therefore experts were employed to validate and extend the findings from Phase 1 (semi-structured interviews) and Phase 2 (questionnaire survey) of the research study. A short survey was sent out to the experts with a summary of the research findings and further questions to validate and extend the findings. The questionnaire consisted of open ended questions. King (1994) suggests that a qualitative approach is best to validate and clarify research findings using a quantitative approach.

Five experts were chosen to validate the findings from the first two stages of the study. The selection was made on the basis of the interviewee's experience working in the industry and their position within the organizations. The experts held top management roles in their respective organizations. The detailed profile of the experts is presented in Chapter 5.

The experts were sent out e-mail invitations to participate in the questionnaire survey. A structured questionnaire based on the research findings was prepared and directed to the SME's for their opinions and comments. The questionnaire contained the outline of the key research findings. The information collected from the validation exercise further strengthened and improved the research findings from phase 1 and phase 2 of the study.

3.6 Data analysis

Within the selected pragmatic position of the research both qualitative and quantitative

data can be analyzed using either qualitative or quantitative analysis methods. For this research study, thematic analysis was used as the qualitative technique and statistical methods were used to analyze quantitative data. The following sections describe each method in details.

3.6.1 Qualitative data analysis techniques used for this study

Literature suggests thematic analysis, discourse analysis and content analysis as techniques for qualitative data analysis. Compared to content and discourse analysis thematic analysis is considered to be highly qualitative as it helps to analyse data under themes. Braun and Clarke (2006) suggest that thematic analysis is widely used and forms the basis for other methods of data analysis. They further state that thematic analysis is preferred over content or discourse analysis due to the flexibility it offers. It also does not fall into any extreme epistemological position. Therefore in accordance with the chosen pragmatic position for this research thematic analysis was chosen as the suitable technique for textual data analysis.

Qualitative data was collected using both the survey techniques i.e. interviews and survey. Open ended questions were used to collect responses from the participants. The analysis involved reviewing the interview transcripts and the open ended questions of the questionnaire to identify themes within the content of the qualitative data. The semi-structured interviews conducted with experts were organized under different themes identified based on the research questions. Further the responses of the open-ended questions were also included under the identified themes. After identifying the themes the views of each participant group i.e. clients, consultants, contractors and subcontractors were presented separately. This helped to compare and contrast the views of each group regarding the particular theme. Chapter 4 presents in detail the themes and the views of the participant groups.

3.6.2 Quantitative data analysis techniques used for this study

The development of a number of computer software applications has aided the quantitative data analysis process and made it easier. However these softwares have their strengths and limitations and need to be used cautiously (Lee & Fielding, 1991). Computer softwares have the advantage of rapidly handling large volumes of data. In

addition to that data can be easily manipulated and displayed in a number of ways (Robson, 2002). Thus the data analysis process becomes more comprehensive, transparent and replicable in turn increasing the reliability and validity of the data analysis. SPSS (Statistical Package for Social Science) is a very powerful and one of the most widely used software for quantitative data analysis (Bryman, 2012; George & Mallery, 2011). Therefore for this study SPSS version 20 was used to carry out the statistical analysis related to the questionnaire survey.

Descriptive and inferential statistics are a part of quantitative data analysis (Fink, 2012). Descriptive statistics is a measure used to summarise or describe data and inferential statistics is used to draw inferences about a population using a representative sample (Tan, 2002). Descriptive statistics are used to measure central tendency measures of mean, median and mode, and variability measures of range and standard deviation. Inferential statistics on the other hand are used for the reduction of data and hypothesis testing to relate the findings to the population (Fink, 2012). For the current study the questionnaire was analysed using descriptive and inferential statistics. SPSS software used for this study offers solutions to all kinds of analysis e.g. descriptive statistics and bivariate statistics (means, t-test, ANOVA) which the current study intends to perform.

For this study the most common descriptive statistics of mean and standard deviation along with frequency distribution was used to analyse the responses of categorical as well as rating questions. Inferential statistics was utilized to compare means using t-tests. The study utilized t-tests for independent sample t-test and one way ANOVA to test the statistical difference in the mean values of different groups of respondents. The questionnaire collected responses regarding the practice of retentions from different group of participants. Given the nature of the problem the use of ANOVA was found to be appropriate. In cases where there are more than two samples to be compared ANOVA is the most effective statistical technique. Another advantage of ANOVA is that it can be used effectively even when the number of observations is different in each group which is the case in this research study.

Responses from four groups i.e. clients, consultants, contractors and subcontractors were expected to be collected. However the response rates from the client and consultant group being low it was decided to merge the two groups of respondents. For

that purpose an independent sample t-test was performed to find the statistical differences in the mean value of the two groups. The following hypothesis was tested (Gaur & Gaur, 2006):

> H_0: $\mu_1 = \mu_2$; there is no statistically significant difference between the two groups on the dependent variable where μ_1 and μ_2 are means of two groups.
>
> H_1: $\mu_1 \neq \mu_2$; there is a statistically significant difference between the two groups on the dependent variable.

The accept/reject decision in testing hypothesis involves a probability value which is usually considered to be 95% confidence level that the decision made is right. In other words, there is only 5% chance that the decision is wrong and that the populations are different. Therefore usually a p-value of less than 0.05 is considered in rejecting the null hypothesis.

Further ANOVA was used to find the mean differences between two or more groups. This study employed ANOVA to find the differences in opinion among major groups of participants i.e. client/consultant, contractor and subcontractor regarding the different aspects of retentions. The following hypothesis was tested for performing ANOVA. As with independent t-test ANOVA used the confidence interval of 95% to reject the null hypothesis.

> H_0: $\mu_1 = \mu_2 = \ldots\ldots \mu_k$; all population means are equal.
>
> An alternative hypothesis is that at least one of the means is different.

In case of differences between the groups in ANOVA an additional step needs to be performed. Rejection of the null hypothesis tells us that all population means are not equal, and does not show which group means are different from which others. Therefore a 'Post_Hoc' is performed to find the different groups(s). The commonly used Tukey-B's 'Post-Hoc' was utilised for this study.

The detailed analysis is presented in chapter 5.

3.7 Reliability and validity of the research findings

Fellows and Liu (2003) suggest that a successful research depends on the validity and applicability of its findings and conclusions. Reliability and validity checks for both the qualitative and quantitative approaches are necessary and an important consideration in any research (Malhotra & Birks, 2007). The following sections will explain the measures of reliability and validity used for the current research.

3.7.1 Rigour in qualitative research

Qualitative research is often questioned by positivists for its trustworthiness, probably because their concepts of reliability and validity cannot be easily addressed in naturalistic work. With the help of a rigorous research process more trustworthy findings can be obtained (Given, 2008). The term rigour is a concept or a way by which the research process is legitimized and the quality of the research is ensured by the researcher (Giddings & Grant, 2009; Tobin & Begley, 2004). Lincoln and Guba (1985) suggest four elements which help to determine how rigorous and trustworthy the research is. The four elements are credibility, transferability, dependability and confirmability.

"Credibility" has been defined as a fit between participants' views and the researcher's interpretation of them (Tobin & Begley, 2004). The degree to which the findings of a study can be transferred or applicable to a new situation is referred to as "transferability"(Hoepfl, 1997). Further "dependability" refers to the ability of the research study to adapt to changes in the studied environment and to new inputs over the time during research (Hamberg, Johansson, Lindgren, & Westman, 1994). Finally "confirmability"emphasizes on the neutrality of the findings which are clearly extracted from the data, without any opinions or pre-conceived notions of the researcher (Brown, Stevens, Troiano & Schneider, 2002).

In line with the above elements the researcher has ensured to maintain rigour in qualitative data in the following ways. The indicative questions for the interviews comprised of a set of standardized questions based on the findings of the literature review. The participants of a sufficient number (13) were drawn from construction industry practitioners in New Zealand with a high standing. Their position in the

organization, number of years of work experience, sound knowledge and experience related to the subject of enquiry were the main criterion for their selection.

Further to improve the quality of the interview the participants were sent out a participant information sheet at the time of invitation to participate. This ensured that suitable participants were chosen for the research. Moreover it gave the participants a brief description about the research topic and its aims and objectives before the actual interview. Further information regarding the participants' profile (profession, number of years of experience, field of specialization, professional involvement) was obtained from them.

All the interviews were recorded with the help of a digital voice recorder after obtaining consent from the participants. This allowed the interviewer to concentrate fully on the questions. In addition to that the interviews were transcribed accurately giving the opportunity to present direct quotations from the interview when presenting research findings, thus increasing the reliability and validity of the study.

3.7.2 Validity

Validity refers to the ability of generalizing the research findings outside a study, the quality of measurement, and the proper use of procedures (Neuman, 2007). A measurement instrument is valid if it measures what it intends to measure (Amaratunga et al, 2002). Yin (1994) and Gill and Johnson (2002)state that there are two dimensions for measuring validity which are internal and external validity. Internal validity warrants that the researcher investigates what he claims to be investigating. External validity refers to generalization of the research findings i.e. the findings can be used beyond the immediate research sample or setting in which it took place.

A questionnaire survey was employed for this study to gather data from a large sample of construction practitioners regarding their views and opinions about the practice of retention in New Zealand. With regards to the internal validity of the questionnaire it is necessary to consider content validity, construct validity and criterion related validity (Fink, 2012; Saunders et al., 2007).

- *Content Validity* refers to the extent to which the questionnaire provides adequate coverage of investigative questions. Content validity is usually

established by careful definition of research (i.e. the literature review) and discussing with experts or panels of individuals;

- *Construct Validity* refers to the extent to which measurement questions actually measure the presence of constructs (i.e. attitude scales, aptitude scales) intended to measure;
- *Criterion Related Validity* also known as predictive validity is concerned with the ability of the questions to make accurate predictions.

In this research, content validity of the questionnaire data was ensured by a thorough literature review and the questions were refined further taking into consideration the data from the semi-structured interviews from Phase-1 of the study. The questions were designed carefully keeping in mind the research questions to ensure that the responses yielded answers to the questions posed. The questionnaire had five main sections in line with the five research objectives with the questions being laid out in a logical order. The questionnaire underwent several revisions after discussions with the research supervisor and other knowledgeable academics within the subject area. Further the questionnaire was pilot tested among experts in the field. The feedback received from the pilot study ensured that the data collected through the questionnaire answered the research questions. Construct validity and criterion related validity were considered less as they need more exploration and may not be applicable (i.e. predictions).

Generalization of research findings was achieved by proper sample selection. The sample for the survey was chosen in a way that it represented the population covering the whole of construction industry including those directly affected by the retention practice and also those who observe them in use. Although the response rate was low for certain groups however it was adequate to perform a satisfactory statistical analysis. Furthermore two groups with low response rates were merged and a statistical test performed between the two groups indicated no significant difference in terms of the responses. Further the findings from the questionnaire survey were validated using SME's. SME's were chosen from leading construction companies and construction trade and professional organizations.

Further as stated by Saunders et al (2007) and Denscombe (2010) that the use of multi-methods for investigating a phenomenon ensures the validity of research findings. On a

similar note this study used the literature review and semi-structured interviews as a preliminary investigation into the retention practice. The findings were extended with the help of the questionnaire survey. The findings from both were further triangulated and validating using experts.

3.7.3 Reliability

Reliability refers to consistency of research findings by the data collection methods and techniques used (Saunders et al., 2007). In context of this study reliability is the degree to which the questionnaire will yield similar results each time it is used under similar conditions with the same participants (Nunnally & Bernstein, 1994). Therefore reliability ensures that the findings are unbiased and free from errors. (Mitchell, 1996) and Saunders et al (2007) note three ways of assessing reliability;

- *Test re-test* involves testing the correlation of questionnaire responses to two different time periods under similar conditions. Often it is recommended to use this method with other methods as it is practically not possible to get respondents to answer similar set if questions a second time.
- *Internal consistency* refers to correlating the responses to questions with each other in a questionnaire. This therefore measures the consistency of answers across either all questions or subgroups of questions of the questionnaire. Studies have mostly used Cronbach's alpha in finding reliability through internal consistency.
- *Alternative form* ensures the reliability of questions by comparing the responses to an alternative form of the same question or group of questions.

In relation to the test re-test for the purpose of reliability this approach was not considered appropriate due to two reasons. Firstly the survey was anonymous and secondly reaching the participants a second time was very difficult. The idea of using an alternative form of survey was impossible too since that would increase the length of the questionnaire unnecessarily which in turn could affect the response rate. Therefore the participant profile information was used as a measure of reliability for this study. The participant profile section consisted of the following questions; type of profession, number of years of experience, number of projects undertaken. Detailed profile of the participants is presented in Chapter 5. It was found that more than 50% of the

participants have more than 25 years of experience working in the industry and more than 85% have undertaken over 50 projects. In addition to that the composition of the professions indicates an equal response across different professions indicating unanimity in findings. This ensures reliability of the research findings.

3.8 Ethical considerations of the research study

Research ethics is a prime concern of the researcher as much as the research objectives (Mack et al., 2005).The study and practice of making good and precise decisions while engaging in a research study is termed as ethics (McMurray, Pearson, Scott, & Pace, 2004). Saunders et al (2007) defines it as the behavior of a researcher towards the research participants or the people affected by the research. Therefore strong emphasis was placed to conduct the research in an ethical, responsible and accountable manner.

The guidelines and principles for ethical approval differ from organization to organization and are based on cultural and social contexts. Research ethics for this study was set in line with the Auckland University of Technology Ethics Committee (AUTEC). Ethical approval was sought from AUTEC before the commencement of data collection for the research study. A copy of the ethical approval letter (Reference number: 11/164) is attached as Appendix A1.

As per the AUTEC ethics guidelines the researcher followed the research protocols of the "Treaty of Waitangi" involving three principles of partnership, participation and protection. The three principles of the Treaty of Waitangi have been incorporated in the design and implementation of the project in the following ways;

i. Partnership - The partnership with the participants was implemented with mutual benefit to both the parties. This research was not meant to benefit any particular group and treated all the participants irrespective of their race, religion or creed. Each participant was treated with respect and dignity. A copy of the research report would be made available to the participant if requested by them.

ii. Participation - The main role of the participants in this research was the sharing of their knowledge and information regarding the research area. The participants' consent to participate in the research study was sought using a

consent form before the interview was conducted (see Appendix A3 for the consent form). A signed copy of the consent form was obtained from the participants. The participants were sent out a Participant information sheet along with an invitation to participate in the study prior to the interview. The PIS provided detailed information regarding the purpose and benefits of the research. The interviews were tape recorded with the consent of the participants. All the participants were made aware that the participation was voluntary and could be withdrawn at any stage without any negative consequences. With regards to the questionnaire survey completing the survey was considered as the consent for participation. Participants were not expected to or involved in the other stages of the research.

iii. Protection – To protect the privacy and confidentiality of each participant the identity of each participant was not revealed in the findings of the study. Each participant's identity and the data provided by them was not disclosed to other participants. The interviews were tape recorded and transcribed by the researcher. The research employed an online questionnaire survey in the 2nd phase of data collection. The URL link to access the questionnaire was emailed to the participants either directly by the researcher or through their representative organizations. Once the survey was closed all the data was collected and downloaded to the researcher's personal computer for the purpose of analysis. The online tool Survey Monkey used for administering the survey, considers privacy of the data collected quite seriously. The data therefore was private and confidential.

3.9 Chapter summary

The chapter provides a step by step approach towards the selection of an appropriate research methodology chosen for the conduct of this research. The philosophical position, the research approach and the strategies adopted were discussed in detail. Further all the information related to data collection and analysis was presented. The chapter at the end presented the measures taken to ensure reliability and validity followed by the ethical considerations. The next two chapters will discuss the data collection and analysis of both the qualitative and quantitative approaches used.

Chapter 4

Data Presentation and Analysis – Expert Interviews

4.1 Introduction

This chapter presents the results of the semi-structured interviews conducted with experts from the New Zealand construction industry. The experts included representatives from client, contractor and subcontractor organizations. Apart from the three groups consultants were also recruited as part of the study.

The main focus was around the investigation of the dynamics related to the retention practice in the New Zealand construction industry. The questions were aligned to the five research objectives of the study and emanated from the literature review conducted. The list of indicative questions is provided and appended as Appendix B1. The purpose of the interviews was to extend the knowledge gained about retentions from the literature review. With a lack of empirical research on this topic area in the New Zealand construction industry the best way to gather rich experiential data was by way of interviewing experts. Moreover the purpose of the interviews was also to refine the questions for the next stage of the study i.e. industry wide questionnaire survey.

The chapter is divided into six sections starting with the profile of the interviewees'. This is followed by the five sections: understanding the purpose of retentions and whether retentions fulfill their purpose; the current status of the retention practice in the New Zealand construction industry including the main issues surrounding the practice; the advantages and disadvantages of the practice; alternatives to the retention practice and guidelines to devise retention regimes in construction contracts.

4.2 Profile of the interviewees

The experts interviewed were selected with due consideration to their backgrounds, field of involvement, their exposure to and involvement with the practice of retentions. Key persons, sectors and sub-sectors of the construction industry in NZ were considered in the selection of participants (e.g. contracting, subcontracting, clients, and consultants).

A total of 13 interviews were conducted face to face with the interviewees in line with the research aim and objectives. The initial contact with potential participants was made by way of e-mail and telephone calls. The initial e-mail provided an overview of the research purpose and objectives along with the time taken to complete the interview. After obtaining a positive response from them, participants were sent out a detailed participant information sheet (Appendix A2) stating the purpose and objectives of the research. Participants' were also sent out a list of indicative questions for the interview (Appendix B1). Table 4.1 presents a detailed profile of the participants.

As seen in Table 4.1 the experts for the interview represent client groups (government and private), representatives from contracting and sub-contracting organizations and consultants. The profiles for the experts include the organization/sector they represent, their position/profession in the respective organization and the number of years of work experience held. All the interviewees held very high positions in their respective organizations with 8 out of the 13 having an experience of 40 years and plus in the industry. The remaining 5 have also been working in the industry for 20 plus years which adds reliability to the responses and findings. Moreover their high standing in their organization also indicates their suitability for the research terming them as experts. Each interview was between 45-60 minutes. All the interviews were recorded and transcribed. For the purpose of anonymity the interviewees have been assigned an ID and in the findings their ID no is used as reference. The findings have been presented under five different sections in line with the five research objectives as follows.

Table 4.1: Profile of participants for interviews

Interviewees ID	Representative organization	Position/Profession	Work experience in years
R1	Government client	Manager Project Management Office	20
R2	Large client organization	Director Property Services	40
R3	Government client	Senior Procurement Manager	22
R4	Contracting Federation	Executive Officer	40
R5	Contracting organization	Commercial Risk Manager	40
R6	Contracting organization	Commercial Manager (Infrastructure)	40
R7	Contracting organization	Managing Director	40
R8	Subcontracting organization	Director	20
R9	Subcontracting organization	Managing Director	35
R10	Subcontracting organization	Executive Director	45
R11	Subcontracting organization	Managing Director	20
R12	Construction Consulting Firm	Chief Engineer (Construction contracts)	40
R13	Dispute resolution firm	Managing Director	40

4.3 The purpose of retentions

This section summarizes the views of the interviewees regarding the purpose of retentions. Firstly the participants were asked to comment on the purpose of retentions and secondly do retentions fulfill the purpose or objective for which they exist. Further interviewees' opinion was sought regarding the primary purpose of retentions as found in the literature of acting as an incentive to avoid or eliminate defects. Lastly their opinion was sought for the type of defects that retentions cater for in case retentions are meant for defective work. Table 4.2 presents excerpts from the transcript regarding interviewees' opinion about the purpose of retentions.

Table 4.2: The reported purposes of retention

Interviewee's ID	Purpose of retentions
R1	For me the primary purpose is to ensure that the contractor performs the contract. So if there are defects in what has already been done those retentions can be used to rectify those defects.
R2	The purpose of retentions is to really ensure that the contractor fulfils their obligation under the contract. By and large it is a useful and

	necessary tool.
R3	To help prevent wilful default and poor quality and by that the contractor walking off the contract, walking off the site, to pay for it if they go bust. To pay for the transfer of a new contract firm to site procurement and set up a new contract for them and delays. So in the quality aspect of it ensure that contractors come back within the contract period of defects liability period and put right any issues with quality.
R4	I don't really know would be my answer, I am going to ask a few people why do you hold retention and I suspect the answer is that they hold retention so that they can reinstate the contract if the contractor goes into default or remedies something if the contractor goes into default. But then what is a performance bond for, it seems that it is just about the same thing, possibly.
R5	Well I think clients just want some insurance that the contractor will perform his obligations, particularly after practical completion, that the contractor will come back and fix any defects and as you probably know in most cases retentions reduce by about 50 per cent at practical completion. So the client just wants extra insurance that the contractor will attend to his duties.
R6	Security of performance. That once you've paid for something it will have been done properly and that the guy will be back and complete the contract works.
R7	Retentions are good. They make sure that the contract is completed properly. Yeah and the maintenance period is, the contractor goes back and does any maintenance through that period so I think retentions are a good thing, yeah.
R8	Retentions are like a performance bond. So it's to guarantee that the sub-contractor will return to complete any defects arising within the defect liability period.
R9	It seems to me, the main purpose of retention is to provide cash flow from our perspective, our client which is the contractor, and I would suggest that the contractor will use the argument from their perspective, the client. In reality I really think that's the reason for retentions being held. When the Lien Retention Act was repealed that's essentially why I think retention was held.
R10	I suppose my definition of retentions is that they are unsecured, interest-free, open-ended with no term, loans to high-risk individuals or businesses involved in construction. So they are very clearly to me a form of financing for businesses that may have very great difficulty in getting any other form of finance. The fact that they're called retentions is just to dress it up in other terms to justify holding other people's money. The background to it has been to basically guarantee performance of the contract, the sub-contract or whatever. It's also a multi-tiered thing in that it goes from the owners or whoever's promoting the building to the head contractor but typically in New Zealand about, anywhere between 75 and 85 or 90 per cent of the work on major construction projects is not done by the contractor, it's done by sub-contractors.

R11	The main purpose of retentions is a performance based payment, so if you don't perform you will not get your full money and you are accountable for it. I can see the point in it but I am not sure if there are other ways to do it, it's a bit like when you buy a TV or something you don't pay half of it and see how it goes in three months. You have warranties and those sorts of things. So I think that is a much better way to set it up.
R12	I guess it's to give some additional security to the employer or the principal that if the worst happens half way through the job that it's not going to be left with a half completed project and an empty bank balance and no easy way of incentivising the contractor to carry on with the work. Now I'm not saying that's a good purpose, but I think that's the sort of thing that lies behind the way people apply retentions.
R13	I think the purpose is to incentivise the performance of the work and the performance of the remedial work.In my early days as a quantity surveyor when the Liens Act was repealed and retentions were a statutory hold back and they didn't really achieve what they were set out, I'm not sure what the purpose was, it goes back to 1908. So no one really knew what they were there for but I do remember in my first payment schedule or payment certificate that I would produce as an honest quantity surveyor, oh they've just repealed the Liens Act, what do we do? Oh take retentions off anyway because no one… So the practice sort of evolved and of course from someone paying why would you want to pay 100 per cent when you could pay 90 per cent or something less?

Table 4.2 suggests that the opinion of most of the interviewees regarding the purpose of retentions was broadly around security of performance or to incentivize performance. It ensures that the contractor/subcontractor (depending upon the relationship i.e. client-contractor or contractor-subcontractor) fulfil their obligations under the contract. It was recognized that retentions are mainly around defects, poor quality and remedial work. Also in the event of a contractor or subcontractor going bust or into a default situation the money held as retentions could be utilized either to pay off or employ a replacement to finish off unfinished work or attend to remedial work. The use of retentions was mainly recognized during the defects liability period (DLP). A cynical view from one of the subcontractors (R9) about the purpose of retentions was to provide cash flow to the contractor especially after the repeal of the 1939 Lein's act in 1987 in NZ (Wages Protection and Contractors' Leins Act 1939). Another subcontractor (R10) shared a similar opinion about retentions acting as form of finance.

Do retentions deliver their objective or purpose?

On being asked if retentions deliver their objective or purpose the views were a bit diverse. The representatives of the client group by and large think that retentions are necessary and a useful tool. However client R1 recognised that 95% of the times retentions are taken and returned and all they do is impact upon the contractor's cash flow. In his words;

> It's the situations where there are defects and the contractor is either unable or unwilling to address those that then the retentions are called upon. In my experience and I've been in contracting for coming up 20 years, I've been engineer to the contract for 15 of those, I could probably count on one hand the number of times we've needed to call up and use a significant proportion of the retentions. On occasion retentions have been used as a mechanism for accepting a lesser product, which is really an odd thing in my view. I don't think that's the intent at all and it shouldn't be.

Client R2 described retention as acting as a carrot to ensure compliance (referring to the carrot and stick approach). R3 stated that the fulfilment of its purpose depended on amount of retention withheld compared to the amount of work being done and the risk involved. He further stated that the level of retention withheld depended upon the contractor and the experience of working with him. He stated the fact that within his organization which was a government client the history of companies goes bust on them was not quite huge. Whereas from his past experience in the UK working in the private sector the number of small and medium sized contracting firms going bust within a period of 3-4 years was high. For situation like those retentions were quite handy.

The representatives of the contracting organizations presented mixed views regarding retentions delivering the purpose for which they exist. Respondent R4 was not sure if retentions deliver their objective. R6 and R7 thought that retentions most of the times deliver what they are meant for and is a fairly good practice. Respondent R5 said that the use of retentions was questionable and unfair especially for contractors since in most cases the client holds retentions as well as a performance bond from them. In the words of R5;

> One could very well ask why does the client want to hold 10 per cent retention during construction and a 10 per cent bond, so he's effectively got 20 per cent of money in the bank if you like. And indeed the bond, maybe this is a bit of a different issue, but some bonds, what we call unconditional, on-demand and the principal can just walk into the bondsman office and say, I want my money please,

> without any default by the contractor at all. No defects in the job. Now a person would be most unwise to do that and it would cause all sorts of ruckus, but that's what the bond says.

The subcontracting group on the contrary held the view that retentions do not deliver the objective for which they exist. They think that the system is not working the way it is meant to be and is being abused by main contractors. Some of the opinions held by subcontractors are as follows;

> R11 - I think that depends on the ethics of the contractor probably more than anything. Someone like ourselves, we don't need to have those purse strings held over for us. We will return to complete defects but I'm sure there are people that don't and that would be the purpose of it.

> R8 - Retentions are a fact of life that we've had to live with since day one. It makes no difference to how we perform on the job.

> R10 - Its objective, as far as head contractors are concerned, is to obtain cheap, unsecured finance. So it is delivering that objective for head contractors. But they dress it up under the name of a performance incentive. It's hugely valuable to head contractors so really this whole retention issue needs to be discussed at two levels. In other words between the owner and the head contractor and then between the head contractor and the sub-contractors.

Finally the consultants held the opinion that retentions do deliver their purpose to a certain extent even though one of them described retentions as a "crude stick".

Do retentions act as an incentive to avoid or eliminate defective work?

Literature suggests that the primary purpose of retentions is performance security and mainly around defect rectification and that retentions act as an incentive to avoid or eliminate defective work (House of Commons, 2003). Participant's opinion was sought to find out their agreement or disagreement with the identified purpose and since retentions are around defective work what kind of defects do retentions cater for?

There was a general disagreement by most of the respondents except the client group who believe that retentions to an extend help to avoid or eliminate defective work. However they believe that it does not act as a driver of getting it right the first time, it just helps to get the contractor back to site in case a defect appears after completion. According to R2;

> I don't think retentions eliminate defective work per say. In fact I think there are two issues at the moment that NZ is concentrating on, one of which is productivity

> and the other is work quality and I think the work quality is quite a low standard throughout the industry. And although retentions do act as an incentive for the contractor to remediate defects and unfortunately this often happens only at the end so they don't seem to act as sufficient incentive to do the work right the first time. They certainly act as an incentive to come back and remediate as long as the retentions are being held".

The representatives of the contractor and subcontractor group held similar opinion regarding retentions and defective work. According to them they do not produce defect free work because retentions are held against them. They believe that they go and do the job to the best of their ability with the incentive of winning the next job or for word of mouth. The consultant group also held very similar views. Some of the views from respondents are as follows;

> R5 –Contractors don't sit there and say I'd better do good work otherwise my retention is going to get held. The contractor just tries to do the best he can anyway'. Similar views were held by the representatives of the subcontractor group.

> R9–It doesn't even act as a catalyst for us when we get a defects list to do it quickly, do it better, do it whatever we do, we would just do it as a part of the contract, part of the obligation under the contract. Certainly not because of the retention.

> R12 – I don't think they achieve defect-free work but they certainly give an option to you to call the contractor back and to incentivise him to give some attention to defects in a somewhat clumsy way because, of course, when the defects might be most apparent, at the time of practical completion, what do we do? We give half the retentions back. Which sort of suggests that maybe we were over-deducting in the past or maybe that the objective of incentivising them to get to practical completion is at least part of the reason that we have retentions in the first place. But defect-free work, I can't quite see why that would necessarily flow from holding back money. There are better ways of achieving that.

Lastly with regards to the type of defects that retention caters for there seemed to be no clear answers except a few. R1 was of the opinion that they are there to cover for the defects which would arise as a part of the contractor's scope of the works. R2 and R11 thought that they exist for workmanship issues whereas R5 and R6 thought that they exist for any type of defects since the conditions of contract do not state the type of defect that retentions are meant for. R8 and R12 held similar opinions regarding the unfairness of the system to hold money for defects that are beyond the control of the contractor or subcontractor and might not be his responsibility.

4.4 Current status of the retention practice in New Zealand

The interviewees were asked to comment on the current status of the retention practice in the New Zealand construction industry. Retention practice affects the different parties i.e. client, contractor and subcontractors in different ways. Also the money held in retentions is different depending upon the size of the contract and the conditions of the contract. Therefore opinion of the interviewees was sought regarding the fairness of the practice for all the parties in the construction industry and the adequacy of funds collected by way of retentions. Further interviewees were asked to describe the problems or issues associated with the practice of retentions and the effects of the practice on the respective parties.

Fairness of the practice and the adequacy of funds

Regarding the fairness of the practice the clients feel that overall it is a fair practice. All of them did recognize the fact that it impairs the cash flow of the contractor significantly which may deter his capability to tender for more work. However R1 and R2 were of the opinion that contractors build the cost of retentions into their pricing and the client ends up paying the price of retentions. R2 stated that;

> I think it is a bit of democracy, so in an imperfect world I guess retention will be continued to be held for the foreseeable future in the absence of an alternative. I don't know of any other practice that will yield the same degree of certainty that you can grab the contractor by the ears and pull him back in line and ask him to come back and fix defects.

Client R3 highlighted the fact that from time to time the level of defects is well in excess of the retentions held especially with the sliding scale. The practice would be much fairer and less risky for the contractor if the principle had to provide a principle's bond or the money to be lodged in a trust account assuring the security of retention funds. Regarding the adequacy of funds held by way of retentions all the clients had experienced situations where the money held was not adequate to fix the defects in case the contractor defaulted or just abandoned the work. R1 suggested that it ultimately came down to relationship. Quoting R1;

> There have been instances where there is less money held in retentions than the value of the work to rectify. That's when you start to have a conversation with the contractor about whether we're interested in contracting with you in the future if that's what you're going to do because contracting is all about relationships.

The contractor group held mixed opinions regards the fairness of the practice. R4 felt that retentions are not fair as it affects the contractor's cash flow and that the practice is more traditional than any rational attached to it. In the opinion of R5 retention practice has been there for centuries and not changed much. It is a fair practice and becomes unfair when the clients insist on holding a bond as well. He stated that sometimes as contractors they insist upon providing a bond in lieu of retentions to their client. That was a better way because bond is far cheaper than the cost of finance or capital held out through retentions. R6 was not sure whether the practice is fair or not, but said that the practice creates pressure on the sub-contractor and is an imposition on them. In the opinion of R7 if the practice was scaled and done properly it was fair.

The opinions of the subcontractor group were similar with regards to the fairness of the practice. They generally felt that the practice was not fair in its current form. However R8 and R11 held the opinion that in principle it was a fair practice if it worked properly but since that does not happen, it is completely unfair since the only person that wears it is the subcontractor at the end. R9 thought that it is unfair because holding 10% of contract say for a $1M job is a $100K and for a sub-trade a $100K is a lot of money. R10 held similar views with the opinion that the amount of money held is totally irrelevant in terms of the potential defects. Especially in R10's industry of supplying structural pre-cast concrete components, there was very less chance of a 10% of the contract value being a defect issue. R 9 also highlighted the unfairness of holding on to retention monies for long periods of time i.e. till the completion of the project for certain trades. He stated that;

> I don't think it's right, that you hold it for a period for the practical completion of a contract. If you think about it a lot of these terms, a lot of these practices are a carryover from the Lien Retention Act, which was held for something completely different and it was fear and at least there was legislative control to the extent that you could do something about it. You can't really, well no; you're less able to do something about it now than you were when the Lien Retention was in. So no, in answer, it is not fair. It's not equitable.

Respondents R12 and R13 (consultants) believed that having a security of performance is a very good idea and retentions are one way of achieving it. However R12 thought that it is not the most efficient way of doing it since it drains the contractor's cash flow and R13 described it 'as a crude stick to assure performance'. Regarding the adequacy of funds held R12 stated that;

> If the contractor goes into liquidation, generally no, depending on at what stage the contractor goes into liquidation. But if the job's half done it almost always costs significantly more to go through the default proceedings and get another contractor in to finish. So there's almost always a short fall in funds, way more than 10 per cent or 5 per cent or one and three quarter per cent. So the purpose of retentions is defeated and touse retentions alone to protect it against that situation you'd have to have 50 per cent retentions and that wouldn't do the industry much good. There are better ways of incentivising contractors.

Issues and impacts of the retention practice

All the interviewees except one held the opinion that there were problems associated with the retention practice in the New Zealand construction industry. Table 4.2 presents excerpts from the transcripts regarding the issues related to retentions identified by the respondents.

Table 4.3: The reported issues with retention practice

Interviewee's ID	Issues with retentions
R1	For some contractors the impact on cash flow can be significant. For others it doesn't matter. For some principals managing retentions, the holding of them in their financing systems can be a problem. If they don't have a particularly sophisticated financing system it can be difficult to track.
R2	There is a huge cash flow issue with retentions. And another issue with retentions today is (commercial world in particular), where on the really big projects there are few NZ contractors who do the work actually themselves. So it is really construction management and relationship. All the work is being done by the subcontractors. So there has been a practice in the industry of the contractor doing quite well because he is holding on perhaps to the maximum retention on the subcontractors at 10% whereas he is being charged on a sliding scale right down to 2.5%. So that is a significant cash flow issue for the subcontractor and a benefit for the head contractor.
R3	It can affect the contractors' cash flow particularly the smaller players who only have a couple of contracts each year.
R4	I don't see it as a problem in the industry but I don't see any reason for having retentions. Especially when they already, they being the principle already has got performance bond in place, has got insurance provisions in place and this is just another example of holding on to the money. So it affects the contractor because of cash flow. I mean at the present time contractors at some place have got just about a 2% profit margin on their process which is very tight. If you then consider that retentions are 5% they are actually then going backwards while they are building the job and so retentions seriously affect the contractors' cash flow particularly during the global financial crisis.

R5	We will hold retentions on most of our sub-contractors. Yes it can be hard on them, particularly on the early trades, like piling, so two months after the contract's been awarded they've finished their work and the sub-contract might say well you'll get half your retention back when we get practical completion. And you get the other half when we get defects completion.
R6	Yes there are issues especially for the sub-contractors, unless they are achieving a return that is higher than the retention value they're effectively doing the work for nothing, or relying on the income from previous jobs to actually keep themselves going. That is in straight cash terms. Of course there are other forms of providing security such as bonds but that can limit them in other ways, it can restrict their ability to use their own money. So it's a bit of a tough nut this one.
R7	I don't see it as a problem. I think it is a good practice to bond the contractor to doing the job and finishing it so that the principal has got a complete and finished job and that I think is good.
R8	There is a problem around the practice and it is that the money that's being retained is either being retained un-contractually in an inappropriate manner beyond the level to which it would be required to effect defects, beyond the time that it should be with respect of how long the defect liability is. The practice should be reviewed and some light thrown so that people can see how it currently works and how it probably should work.
R9	I do see it as a major problem to the sub-trades in that however you look at it they are an unsecured creditor. If you have a look at a construction, the compilation of a construction contract in financial terms, rule of thumb, and this has progressively got bigger over the last twenty years, rule of thumb sub-trade is 80 per cent, a prime contractor is 20 per cent. So 80 per cent of every hundred dollars is out there as unsecured creditor. To me that is not sound business.
R10	The issue is that it is abused as a means of interest free finance to high-risk borrowers with no fixed end date.
R11	There is a significant problem, there is probably not a problem with the purpose of them which is on completion or practical completion and why they were originally there for a performance based payment. Most people don't really have a problem with that, it's the fact that they are not being paid out on time and you got to fight for them and they end up being a squabble for them and pretty much at the moment the margins in the industry are so low it is all sitting in your retentions. So you could wait year and a half sometimes two years that's you banging on the door to get them. So it is more about the timing and the process of retentions than it is actually about the principle of retentions.
R12	One of the things it does is it puts a big cash flow drain on contractors. Contractors have been known to go into liquidation and holding back a significant sum of money is perhaps a contributor to that. That's not to say that I'm necessarily advocating we should give the money to the contractor right up front and tell him to get on with the job because that could incentivise bad behaviour as well. So there's a bit of a balance there.
R13	So I think when there's an insolvency the money, the worst of the money

	that's actually held back is the retentions and that money is often, two, three, four, five years old and money that is being paid, particularly when the builder goes broke, there's an imbalance. The subcontractors are the ones who are the victims of the retention regime.

Although the client group agreed that there was a problem around the practice of retentions however in their opinion it was not a significant one. The main issue identified by the clients and the contractors was around the impairment of cash flow due to retentions. However R1 stated that the impact on the cash flow for some contractors could be significant whereas for others it did not matter. An interesting finding from R1 was that there were issues with some principle's managing retentions and holding of them in their financing systems. In the absence of sophisticated financing systems tracking of retentions could be a significant issue. This can end up building up the cost of the entire programme not just one project. R2's opinion was that there are major cash flow issues surrounding retentions however it was not a major problem within the industry and there are whole lot other problems that supersede it.He later also added another problem related to the security of retentions i.e. in case of the party holding onto the retention money goes into liquidation. He further added that the major problem was with the subcontractors who enter into contracts without the understanding and knowledge of the contract. He therefore pointed that any contractor or subcontractor entering into a contract should have a good understanding of the commercial risks.

Three out of the four contractors agreed that there is a problem around the practice. Interviewee R5 felt that it is hard on the subcontractors particularly on the early trades since their money is held for long periods of time. For example a piling sub-contractor might finish their work two months into the contract and the sub-contract agreement states the release of half of the retention monies after practical completion which might be a year or two years depending upon the size of the project. However he stated that within their company there were different ways to deal with different subcontracts. Sometimes there were no retentions held on early trades and at other times retentions were released after a certain time irrespective of the practical completion of the project. R6 described retentions as a 'tough nut'. He described the issue related to retentions as severe especially when the construction market was tight and margins were really low.

The subcontractors seemed to be the ones bearing the brunt of the retention practice. All the respondents described the issue of retentions as a 'major' or a 'significant' problem in the NZ construction industry. The main problem with the practice as described by R11 was the fact that they are not being paid out on time and subcontractors got to fight for them and with the low margins in the industry all the money sits in retentions. R10 held similar views, according to him the head contractor had an added incentive by holding on to retentions for as long as possible. He stated that many head contractors did not voluntarily offer to pay off the retentions to the sub-contractors. In case the subcontractor demanded the payment of retentions he was told that either the retentions are not due or they have not received the final payment from the client. Further in case the subcontractor does not demand the payment of retention money the head contractors tend to retain it and in case the contractor goes bust the subcontractor's money is lost forever. R9's opinion was that the sub-trades in the industry act as unsecured creditors. According to R9 the compilation of construction contracts in financial terms as a rule of thumb the sub-trades are 80% and prime contractors 20%. So 80% of every $100 is out there as unsecured credit. R11 stated that the money that was being retained was either being retained un-contractually in an inappropriate manner beyond the level to which it would be required to effect defects and beyond the time that it should be with respect of how long the defect liability period was.

The consultants R12 and R13 also identified the problems associated with the practice. R12 highlighted the fact that contractors do go into liquidation and holding back a significant sum of money was perhaps a contributor to that. R13 called it a 'cancerous sore' and believed that the issue around retentions is not any worse than it has ever been. R13's views with regards to the problem were quite intriguing having touched on the productivity issue which is much into criticism currently in the NZ construction industry. According to R13 the purpose for which retentions exist could be achieved more effectively in other ways. Tying up millions of dollars in insecure and wrong hands is not productivity. Productivity is about putting the money to best use and that might include training and adequate management and quality inspections rather than paying a bank interest. R 13 thinks that subcontractors paying overdraft on their interest is a big overhead and that money could be diverted to productive pursuits to improve the quality of the construction work. Better solutions could be created with some

intelligent thinking.

4.5 Costs and benefits of the retention practice

In line with the third objective interviewees'opinion was asked regarding costs of the practice and benefits associated with it. They were further asked to comment on the necessity of retentions and if there was a hidden cost behind the use of retentions.

Although the client group overall did agree that there are costs associated with the practice of retentions however being on the receiving end the practice has its benefits for them. They do not see an alternative to the practice that would work as good as retentions to bring back the contractor. In R1's opinion the practice of retentions being removed from construction contracts did not sound as a feasible solution due to the following reason;

> Until contractors demonstrate a self-managed principle of delivering defect-free outcomes then I think the principal needs some mechanism and if money is the only motivation then money it has to be. Yes, principals pay for that but equally on a contract-by-contract basis I think it becomes fair.

R3 acknowledged the fact that the lesser the money tied up in retentions and bonds the better it is for the construction industry. He stated that neither retentions nor bonds were a perfect solution because in either case the capital is tied up however it was required because it is a tough job to get the contractors back. R2 held similar opinion and reiterated that in the absence of a better system he did not perceive any changes to take place with regards to the current practice of retentions. He stated that;

> It is an imperfect system in an imperfect world but it is hard to conceive of a better system so I cannot see any changes happening to it.

Respondent R2 and R4 both referred to retention as a carrot referring to the 'carrot and stick approach'. R2 thinks that if the carrot does not work then it acts as a stick.

The representatives of the contracting group came up with mixed opinions regarding the costs and benefits of the practice. R4 and R5 do not think that that there are any benefits of the practice as such to them as contractors. R4 and R6 believe that on the surface it appears that the costs are greater than the benefit of the practice considering the construction industry at large. R7 on the other hand thought that the benefits of the practice were greater than the costs associated with it. R4 commented that if retentions

are there to remedy defective work during the DLP then there are probably better ways of doing it. He also highlighted the fact giving an example that there are hidden costs associated with retentions. R4 stated that;

> If you have got a $1M job let's say for simplicity the retention rate is a flat 10% so retentions are going to be a $100,000 on a $1Million job. The contractor knows that and he knows that he's got to have a $100,000 sitting in the bank or available in an overdraft. If it is in an overdraft he knows that he has to pay an interest on that and so if he knows that retentions are going to be applied, a good contractor and I would like to think most contractors will add that percentage to their rates, somewhere spread across. Maybe it is in their overheads or preliminary or general aspects of their contract schedule. It could be in there or it could just be evenly spread across all these rates. So he works around his rates from first principle's and then turns around and says and I am adding 10% to cover my retentions. So that is a hidden cost.

A bond in lieu of retentions was a better alternative in the opinion of R4. Contractor R5 agreed to the fact that it does benefit them as additional cash flow. However R5 mentioned that they provide the client with a performance bond as well on top of retentions and none of the subcontractors provides them with a bond. In R5's opinion retentions are a 'fact of life' and it is quite fair on the part of the client to hold on to some security over the contractor. R6 referred to retentions as a 'stick' but also said that it is an encouragement for performance. He said that it probably benefitted in the following way;

> Probably meaning that the subcontractors have to be more efficient at what they do to make sure that they are in and out quickly. They can do things for a cheaper price because they can't afford to do it for more than they have allowed.

The subcontractor group alike thought that retention practice does not have any benefits for them as they are at the receiving end of it. Except R8 who thought that it is good for the cash flow when it is paid out. R8 also added that it was helpful in the early stages of building relationships, when working with someone not known as it may help to build trust. As an example she stated the following;

> I think it's helpful, in the early stages of building relationships I think it's very useful. When you are working with someone that you don't know, I think it's nice to have a level of comfort that, say I am employing you to come in and give us a new driveway, do the concrete around the driveway and stuff but I have got no idea of your company and things. So it would be nice for me to have a level of comfort in holding five per cent, ten per cent retentions of your work that will be released upon the completion of the job to my satisfaction or to the agreed contract. But once you have built a level of trust, once you have paved six or seven driveways, is it really still, at that eighth driveway, is it still as valuable to me as it was on that

> first driveway? And I don't think so, that is my opinion. I think it definitely becomes less valuable once a relationship is formed and improved over time.

R9 believed that overall the cost is greater than the benefit of the retention practice. In his opinion retentions acted as a bit of incentive for the subcontractors to carry out the job properly due to the financial penalty held against them. However there was a financial cost (a hidden cost) associated with retentions and the value of retentions was somehow accounted for in the compilation of the bid. As per R 9;

> There's a financial cost, we have to account to our suppliers. First and foremost we have to account to our payroll; secondly we have to account to our suppliers. With our suppliers, there is no such thing as a retention regime, so we've got to account for that. So somehow it's got to be financed and so yeah there is a financial cost.

> Yes there is a hidden cost; we will put a financial cost into our submission to allow for the servicing of the value of the money that is going to be held in retention. It's speculation on the amount because you have no idea how long the construction programme is going to go, you've no idea how money cash, so it's really just an educated guess. But there is a value that we do account for.

Similarly in R 10's opinion there were no benefits of the retention practice rather it had negative effects of encouraging the practice of using other people's money. He stated that the cost of the practice was that it encourages unethical people to be in the industry. He further stated the negative effects of the practice saying that;

> In some ways it's an incredibly negative effect on the construction industry because it permits under-resourced contractors to get into the business without adequate finance and take very high risks, which if they pay off, fine for the head contractor, if they don't, they haven't lost any money because it's other people's money. So I think in reality retentions have an adverse effect on the quality of the whole construction industry within New Zealand, simply because it provides the opportunity for abuse and for incompetent or unethical people to involve themselves in the industry.

In the views of R 11 the holding of retentions was not at all beneficial because it did not work the way it was meant to work. In her opinion the costs were much more than the benefits of the practice. She stated that although the original idea might have been valid however in her opinion there could be better ways to incentivise performance. She stated that;

> I don't see any benefit besides from a client or contractors perspective it is an assurance on if something goes wrong later they have got some money held and you are in a stronger position then it is technically a benefit but that is only looking at a small section of the whole supply chain. If you look at the benefit of it for the

> overall industry no it is not beneficial because it does not work the way it is meant to be working. Also there is no incentive to work well first time around.
>
> For us the costs have always been greater because it's just the time spent on what time your retentions are due and what they should be, correcting them when they are not right, chasing them up, the cost of you holding them up while you are not being paid, the costs of you losing them.

Consultants R12 and 13 also held similar opinions as subcontractors stating that the costs of the practice are greater than the benefits. R13 thinks that it achieves its goal in a crude way however also thinks that in many cases with retentions the outcome would be no different if no retentions were withheld on contracts. R 12 describes it as a 'blunt instrument' to incentivise performance. As per R12 retentions drain out working capital of the people (contractors and subcontractors). R13 feels that there is a big hidden cost of funding those retentions and assumes that it creates a kind of laziness that is not needed in the industry rather the industry needs vitality or enthusiasm for doing it right the first time than willingness to fix it up if it goes wrong. R12 elaborated the costs and benefits of the practice as follows;

> Well the costs are draining working capital of the people that you're relying on to do your work. Perhaps increased risk for those people, contractors and sub-contractors, that they might not get paid that slice of their revenue. So those are the costs. And the benefits are that it sounds like a good idea to hang on to some money to incentivise people but it may not be anything like enough or it may be far too much, it's just a very blunt instrument.

4.6 Alternatives to retentions

In this section interviewees were asked to comment about the awareness of any alternatives that are currently being used in place of the traditional retention practice in New Zealand. Secondly their opinion was sought regarding any better alternatives or system that could be used in place of retentions. Finally they were asked to comment on the feasibility of trust accountsfor securing retention monies.

The awareness of alternatives being used in place of retentions

With regards to the alternatives currently being used all the respondents were aware of the option of using bonds in lieu of retentions as per NZS 3910. It is the clients that usually hold bonds from the contractors on top of the usual retentions that they hold. R1 who represented the government client said that they did take bonds from their

contractors on top of retentions and that too only bank bonds. They did not use bonding or insurance companies due to the lack in level of confidence with alternative market places. R3 informed about a practice followed in their organization of putting their works into packages, like a package contract. So they have a definite number of projects in one year and a number of projects in the next and similarly in the next. The benefit of doing that was to incentivize the contractor to actually deliver and minimize defects because on the basis of that they get the contract package for the next year. That way it was a lot easier to get a contractor back to site if he gets a bit more of work and that is if he performs well. R 2 highlighted the fact that bonds are more difficult to get released unless they are on demand. Therefore retentions were still a relatively effective form of security for the clients.

All the representatives of the contractors group were aware of the bond option in place of retentions and said that they were becoming more common. R 4 stated that the reason for bonds becoming more common was that the contractors recognise that retentions are quite large. He said that;

> I mean if they provide a bond in lieu of retention then they can arrange that through an insurance company where as the contract goes through that sliding scale their payment for that bond provision will slowly increase on their way through the contract and that's a lot cheaper than actually not having money in the bank if you understand what I mean in terms of cash flow.

Interviewee R6 affirmed that their company sometimes had to provide a performance bond as well as a retention bond depending upon the complexity of the project, even though his company was publicly listed. He said that they preferred to provide bonds in lieu of retentions just to ensure that they don't have cash impediment on the project. The reason he stated was "because you don't always make margin on projects either". He further pointed out the fact that retentions are the most effective form of encouragement to get work done because they are "cold hard cash". His opinion about bonds was as follows;

> Bonds don't seem to mean as much. You can't see it because you've got your cash, I mean its cost obviously but you can't see it. Because instead of someone holding on to fifty thousand dollars of your money, they've just got a piece of paper that says if you muck them about completely they'll go and take some money out of the bond. So I think in reality cash is more powerful to the contractor and in most cases it's probably more expensive to the sub-contractor. I think bonds, depending on where they go to get them, should be cheaper. But once again I think contractors would prefer the cash, not only that it's perceived to be better security, but also to

> enhance or to ensure that they don't have negative cash flow.

The subcontractors were aware of the option of bonds in place of retentions however their views were not favorable towards the use of bonds. As per R11 there was nothing in place to replace retentions looking at the real purpose of retentions which is to incentivize performance. However a form of performance bond could replace retentions but there would be a lot of issues around that. The rest of the subcontractor representatives held similar opinions regarding bonds. Even though bonds could be an option in place of retentions but bonds could be quite expensive. R 8 stated that putting up a bond upfront would mean impair the cash flow of a subcontractor. It would be very hard for a subcontractor to tie up $200,000 upfront as a bond. In line with R 8's views R 9 confirmed that even though bonds are available but they are quite expensive especially for subcontractors.

Consultants R12 and R13 were aware of retention bonds however in their experience they were not widely used in the industry.

Alternatives or practices that could be used in place of retentions

Regarding alternative practices that could be implemented to replace retentions or improve the current system the responses were varied. Although most of the respondents 12 out of 13 held the view that there was definitely need for change, only few came up with ideas for alternative practices.

There were some interesting insights from the representatives of the client organizations regarding attitude change for a better and productive construction industry which are as follows;

> R1 - I think changing the way that we contract, the nature of the contract, can make a big difference. For instance when I was at North Shore we did an early contractor involvement project. Because of the relationship that we built up as we talked about the risk, the various risks, who carried that risk? What was the cost implication of that risk? How was it built into the price? There was a level of trust and confidence between the parties that meant that not only did we finish that contract well ahead of time, we finished it with almost zero defects. The attitude of the contractor and the attitude of the engineer and the engineer's staffwere such that everybody was working on a best-for-project basis and it showed. It would be great if we could get that on everything but that would require quite a quantum shift in attitudes in the industry.

> R2 - I think more emphasis on quality during the course of the project should start to lift quality and productivity. I have heard major contractors say that upto 35% of the cost of their job can be the remediation of defects which is incredible and it goes across all the sub trade. So it really is a question of upping the quality at all stages and really a lot of that comes down to the choice of C and SC and far better supervision capability than we currently have. The industry still relies on a number of its supervisors who are far more comfortable and experienced in managing direct labor than subcontract labor and supervision of subcontract labor has always been and still is a very weak point in the industry.

> R 3 - Whether there would be a more efficient way of doing I am not sure, but sometimes say if you take the tourism industries, in the UK all the travel agents sign up, most of the travel agents sign up to one central body and they'll pay a fee, basically an insurance fee every year, that if you book a flight or your holiday with them and they go bust, the central sort of insurance policy, pays out for your holiday costs. So if the operator goes bust, you know, they'd be out. So would it be actually much more efficient to have one central pool for the entire industry and do something like that? Maybe that might be more efficient but I don't know how you'd police that.

The contractor group overall were of the opinion that even though there is a need for change to the current practice however the practice is well entrenched and could not come up with any idea or alternative for change. However similar to the client group they also recognized the fact that there was a need for an attitude change in the industry. This could be bought to practice by working in a collaborative arrangement in order to reduce defects and deliver quality work and therefore improve productivity of the industry overall.R 4 added that if retentions were to be held then;

> I think that is a really good thing to do if you are going to insist upon retentions then the retention should be paid into an escrow account of some sort or a trust or something. That makes a hell of a lot of sense and it then directly deals with insolvency by principle or bad practices by the principle.

Further the subcontractor group strongly believed that there is a need in the way the current practice is running because it is unfair for the subcontractor fraternity. All the four respondents however had slightly different views. In R8's opinion it was valid to hold retentions but it was very important to secure those retentions. She strongly believed that some form of trust account or joint account could be a solution so that the contractor did not have direct access to the retention funds. In case of contractor insolvency the retentions funds would not be lost altogether if held in a secure account. R9 strongly believed that in order for the construction industry to move forward there was a strong need to come up with an alternative to the present retention arrangement.

In line with R8's views R9 also suggested that the use of trust accounts could be looked into. He mentioned the example of tenancy bond where the money is paid to a third party and is securely held. R11 held similar views regarding the need for a culture change within the industry and believed that any change could be bought to practice only through legislation. She said that the only thing that could replace retentions could be a form of performance bond however also mentioned that there would be lot of issues around that. R10 affirmed the need for change by saying that;

> The way it's administered and practiced should be changed. As I said the risk should be recognised, the length of holding etc., and the level, those are all things that should be addressed specific to what the risk in the particular sub-contract is. But also alternatives should be considered. They have been considered and nothing has been developed that is perfect or that's acceptable. So although there's need for change, I don't have an answer. Obviously bonds have been suggested in the past; they're not without problems.

Consultants R12 and R13 were of the opinion that bonding may be a feasible option for main contractors but were not sure if it would work well for subcontractors or just create a friction in the system by everybody having to get bonds from their banks. R12 however was not sure if bonds could replace retentions because bonds are typically released at the time of practical completion. He suggested that if a system was developed whereby contractors were expected to provide larger bonds lasting all the way through till the DLP then retentions could be replaced by the use of such bonds. R13 spoke in favour of bonding and thought that there was a place for it in the market. His views about bonding are as follows;

> Where there's actually a lot of trust between builders and sub-contractors, where there's an ongoing relationship I don't see why you need to have a project specific retention. I object to provisions in a contract, which says I can offset money owed against one contract against another one and that's what creeps into some sub-contract agreements. I think that's wrong. However if I had a continuous working relationship with Joe Moggs Builders Limited and I'd done ten million dollars of work with them over the years, I'd be more than happy that they'd have a half a million-dollar bond of mine that covers all the retentions or whatever. A hundred thousand or whatever, that actually says you don't have any retentions on me but you've got a bond and if I fall over, whatever work's in place that I haven't remedied, you've actually got a bond you can call on. Now for me that would actually be good because I'd be getting my payments and I think there's a real opportunity for building like, if we can build that, I see that as actually having the insurance.

Opinion regarding the use of trust or escrow accounts to safeguard retentions

With regards to holding of money in a trust account there were mixed opinions from all the respondents. Some of them thought that it was a very good option and raised no concerns whereas the others thought that there were challenges around the use of trust accounts and did not consider it as a feasible option.

According to R1they did not see a need for trust accounts because a bank bond is similar to that. If the money is held somewhere then holding it with the bank as a bond is as valid as a trust account as per R1. The challenge around the trust account was of holding it with a third party which would add a layer of complexity. R2's opinion as a client representative was different and there was no concern shown regarding the money being held in a trust account. R2 held the view that any contractor should be able to ask for his retentions to be held in a trust account with an appropriate mechanism for releasing the funds. R2 did state the slight administrative cost involved however believed that in order to de-risk a project and increase certainty one should be prepared to accept that cost. In R3's opinion the idea of an independent trust account sounded good. Although he mentioned that it was not an issue for a government client (which was his case) because they were cash rich. But for private clients it was a sound idea to secure retentions.

All the contractors alike thought that a trust account was a good idea and a feasible option to secure the retention funds. R4 said that it would make a big difference and would deal with the insolvency or bad practice by the principle. R6 thought the idea as good but it might just be a hassle however if there could be a streamlined way of doing it then there was no reason for it not to be a feasible option. R7 thought that is was a good idea especially for the private clients.

The subcontractor group was also positive about the use of trust accounts except R10 who believed that it was an alternative however not a good or ideal one. R11 believed that holding money into a trust account was a fairer system because the money did not belong to either party. In her opinion the need was to ensure that the trust account was right with the flow of money. There would be issues around as to who signs it in case it is held up by a client/contractor going bust and it could end up with a sort of trust

account business where the money is sitting and the business is gathering interest from it. So it is not a perfect alternative however still better than where it is sitting presently. The general feel of the industry as per R11 would be to hold money in a trust account at least so that the money is secure with less chances of losing the retention money as a result of insolvency. As per R9 holding money in a trust account would assure them that if there was a dispute at the end of the job they would have someone who could sit down and listen to both sides of the argument and make a ruling. So that would possibly improve the cash flow within the industry. R8 also agreed to the idea of holding retention in a trust account and said that the idea was pretty consistent with what most people in the industry are saying.

Consultants R12 and R13 held slightly different opinions with regards to the use of trust accounts. R12 described the use of trust accounts comparing it to a metaphor 'plugging holes in the dyke'. As per R12's views;

> If the structure is unstable is that really going to stabilize it? Further there would be a certain amount of processing cost involved, lawyers involved and difficulty in getting the money released from a third party who might be worried about being held accountable for releasing it prematurely. Therefore it was not a very tidy solution and I would not advocate it as an alternative.

R13 on the other hand thought that there was a place for trust accounts. However the concern raised by him is as follows;

> Instead of locking it in the hands of the builders to actually fund their businesses, which does at least oil the wheels of the construction industry, it's actually taking it out of the industry and if there's escrow accounts someone's making money on that.

4.7 Guidelines for setting up retention regimes

Different rates of retentions are used world over ranging from 5% to 15%. New Zealand typically follows a unique retention regime. The purpose of this section was to gather opinions from the respondents about the fairness of the sliding retention regime used here in New Zealand as opposed to the flat regime used in other parts of the world. Secondly if retentions were to continue what factors could govern the setting up of an appropriate retention regime for construction projects.

Fairness of the sliding retention regime

In response to the fairness of the sliding retention regime most of the respondents except the subcontractor group seemed to be in agreement that a sliding regime used in New Zealand is fairer than a flat one used elsewhere. R1 thought that it was a sensible approach. However he also added that the ultimate decision about the regime should be made on a contract by contract basis. There was a need to look at the sort of defects one might end up dealing with and how much it would cost to fix. He gave an example within his company of using different regimes for different contracts as follows;

> Yes we have used the sliding regime for very large contracts. We may not hold it at two hundred thousand; we might shift it out to five hundred thousand at 10% and then start to reduce it after that on very, very large ones. But more often than not I think for the particularly large ones we'll use the standard 3910 as a sliding regime.

R2 suggested that it was designed more around the smaller projects where the level of retentions never gets down to 2.5%. R4 said that the practice was traditional and also the recognition of the fact that as the projects become larger in terms of value, holding on to 10% say of a $300M job is a lot of money. As per R4 the client groups recognize that there is probably no need to have that huge an amount of money being held as retention for the purpose for which they are withheld. R6 commented that he was unaware where the sliding scale originated from. He assumed that it was maybe due to the fairly small size of the industry. If there was a $50,000 contract there was a need of greater security than just 2% of the $50,000. He said the numbers had not changed for a while and the regime was 50 odd years old. Things have trebled or quadrupled in that time, and maybe it was time for another look at those numbers because it might be that they are probably either not sufficient or no longer appropriate. R7 held the opinion that a sliding regime is the best and that it should be made mandatory in all the contracts. However he added that if retentions were to be held beyond 3 months after practical completion then contractors should be able to provide a bond for it.

Some respondents identified the benefits of a sliding regime. R5 said that the concept of a sliding scale had value. It was good because it works somewhat like an insurance policy. He stated an example as follows;

> Let's say a contractor has a public liability policy for 10 million dollars of cover. So

> it will cover him for all claims up to 10 million. Let's say that's going to cost you a hundred thousand dollars a year in premium. If you go back to the insurer and say, well actually we want 20 million now, that's not going to cost you two hundred thousand. It's probably only going to cost you a hundred and twenty thousand. So the insurer looks at it and says, well my biggest risk is at the bottom end of the scale, I'm always going to be liable for the first million, I'm not often going to be liable for the last 10 million. So the premiums are adjusted that way. And I see that the retentions work the same way. So the risk to the client is what's the potential value of a defect? Is it 5 per cent of the contract or 10 per cent or whatever? So well it's always going to be 5 per cent or something. So that's the risk that wants to be covered. So I think there's definite merit in the sliding scale. It's not always used. Most of our contracts have it.

Subcontractors in general on the other hand thought that the sliding scale was totally unfair for them and a means of cash making business for the head contractor. They suggested that 80% of the jobs in the industry were done by the subcontractors. In the opinion of R8 the level of retentions could vary completely even if a subcontractor signs a contract under 3910. R9's opinion was that it is not a fair practice. R9 said that a good portion of their contracts are valued under $200K. In the roofing industry the roofing aspect of contract is 10% so having a $2M contract with a 10% regime up to $200K, and then 5% and 1% creates a positive cash flow for the main contractor and his money and unsecured creditor status shakier.

Consultant R12 thought that looking at it internationally it was quite an unusual practice of holding back 10%. But then looking at the smaller end of the scale it may make some sense where one might not be concerned with other securities such as a performance bond. He also threw some light on the history behind the sliding regime of which none of the other respondents had an idea.He stated that;

> Way back in 1908 New Zealand Parliament passed an Act called the Wages Protection and Contractor's Leins Act. That was repealed in 1989 but that obliged, it was there for the protection of workmen and sub-contractors but it did so in a fairly clumsy way. And that obliged people entering into construction contracts to hold back money to serve as a fund for the protection of those individuals. In 1989 I think it was, or it might have been 1990, when that Act was repealed, we had nothing to replace it for a number of years until the Construction Contracts Act came along. But people hung on to that familiar scale of 10 per cent, 5 per cent and I think the Act said one and three quarter, but certainly 3910 has said that. So it's a bit of an anachronism in terms of those precise numbers. And I've often thought what the logic of that is? Why wouldn't we just have a flat rate? Which might be 5 per cent or it might be 2 per cent or whatever, why does suddenly the need for holding that money loom larger on smaller contracts than on larger ones, so that's a bit of a funny one.

R13 thought that the sliding scale was better than a flat one unless there is a flat percentage with a cap. He thought that a flat rate of 10% on a million dollar contract with hundred thousand in retentions was ridiculous and according to R13 a lot of subcontractors would inadvertently sign them off. In R13's opinion it was important to look around what international best practice is.

Factors in determining retention regimes

When asked about factors that could help in determining a retention regime for construction contracts few respondents (3 out of the 13) had no answers others managed to provide some interesting ideas and insights. The excerpts from the transcripts are presented in Table 4.4 below.

Table 4.4: Factors in determining retention regimes

Interviewee's ID	Purpose of retentions
R1	Scale, risk profile, what might be problems that could arise, how significant those are. And what you'd want to do or have in your principal's pocket to deal with that if it arose. You have to give some thought to the impact on the contractor's cash flow. And whether or not holding that level of bond is likely to be so adverse on the contractor that they wouldn't be able to do the job.
R2	No comments
R3	R3 - I think you've got to look at the principals; you've got to look at the type of work being undertaken, decide the contract and the principal's portfolio of work. So is it a hundred projects or is it one project? The type of contractors who are liable to be tendering. Are they small contractors or are they larger well-established contractors? That's probably about it really. The history of claims against retentions and default is the other one isn't it?
R4	Let's say we are still going to have a retention regime of some sort but let's make the first line as the reason for this retention regime and then figure out ok if it is for covering the DLP and then turn around and say what's the value of that going to be, how do I get to the value of that by the end of the contract and work it out on that basis.
R5	Well it's all just a matter of what risk the client perceives with contract A as against contract B. Contract A might be just for earthworks to excavate a platform and maybe spread some base course on it. Contract B may be for the builder to actually put the whole building on it or do the piling or whatever. And so the client might say well there's a less risk of something going wrong in the first contract than the later one, so I only need a small level of retention. There are all these things.

R6	The greatest risk is going to be towards the end of the project or towards the end of that particular sub-contractors work, so probably look at the general values of the sub-contracts if that's an easy thing to do. I don't know where you get that information from. So you get a feel for an average size contract and you might break it down into contracts in two bands, it might be up to two million dollars is treated separately from contracts over two million dollars. And just look at the potential risk at the completion, or towards the end of the completion of that sub-contract package, because that's the biggest risk for the contractors. For example at the Sylvia Park shopping centre the sub-contractor went into liquidation six weeks before one of the stages was due to be opened and Multiplex had to get an alternative in to finish the job at great expense to meet the programme. So in that case the retentions didn't cover the cost, but that's an extreme situation. I think apart from, I think you just have to look at the average and try and gauge what security you would want which would be reasonable. It might be affected industry to industry, for example service trades might be different from structural trades because the risks in the structural trades are probably a lot less than in a service trade. But it's much easier just to have one set of rules for everyone.
R7	No comments, the current regime is best.
R8	If you look at a rating system where you've got Moodys or S&P where they assign ratings to the banks so you're AA+ or AA+++ you know, I believe that means you are, you've got a level of trust from the marketplace in your, there's a lot of talk about banks being down-graded so let's use banks as an example. As a bank you are able to get money cheaper if you've got a better rating. If you're not strong in financials, if you basically borrow too much, if you trade poorly your ratings get downgraded which means it costs you more to borrow money. I believe the fairest way to hold retentions would be to base it on some form of rating systems and I don't know what shape that would take how you would assign ratings. But companies that prove themselves over a period of time I believe should be treated with a better rating and should be basically assigned the cheaper costs to borrow in the construction equivalent of that. That would be my fair compromise on retentions and the treatment of those funds I believe should be handled in more of a bond type manner whereby it's not just about the money outstanding and the interest on that money, it's the cost of carrying those funds. The longer those funds go on there should be an obligation on the person that's holding that money for a longer period to pay more back.
R9	I think that probably the primary focus that I would be intent on would be doing what was good for one was good for the other and if you use that rationale I think you would come up with a fair and reasonable solution instead of having the inequitable position that we're in at the moment.
R10	The first thing to do is say what are you trying to achieve? What's the purpose of it, and acknowledging that? And at the moment that's totally irrelevant to the whole system. The whole system is really just a financing issue.
R11	It depends on the type of contract. It is usually within the contract and you can get a whole variety of subcontracts.

R12	Ideally there should be some sort of risk analysis done. If you are going to have retentions then they shouldn't be totally arbitrary but that's hard to do. It's hard to predict what the future will be. Most people don't do it and they seize upon established traditions like 10 per cent, 5 per cent, one and three quarter per cent, on the basis that they're less likely to be criticised if they get it wrong. Yeah that's probably all I want to add.
R13	No comments

As suggested by the experts in Table 4.4 a number of factors could help in determining retention regimes for construction contracts. Most of the respondents stated that the risk could be a main factor, where the need would be to quantify the risk factor involved with each project or each sub trade within a project. R4 and R10 on similar lines stated that there was a need first of all to understand the purpose of the having a retention regime and then work it around on that basis. An interesting input from R9 was that it should be devised in a way that "what was good for one was good for the other".The other factors that came up are as follows;

- Scale or size of the project
- Type of contract
- Type of contractor liable for tendering
- Type of trade
- A rating system for the contractors/subcontractors
- Impact on contractor's cash flow
- History of claims against retentions and defaults

4.8 Chapter summary

This chapter has presented the results of the semi-structured interviews carried out with experts including representatives from the client, contractor, subcontractor and consultant organizations in the New Zealand construction industry. Data was analysed under four different groups i.e. clients, contractors, subcontractors and consultants. The opinions of the experts have been presented in line with the key themes covered by the research. The questions for the interviews were divided under 5 objectives as per the research aim. Different groups held varied views with regards to each objective.

It was found that purpose of retentions seems to be around incentivising performance; however they don't seem to fulfil the purpose for which they exist since they do not work the way they are meant to.The current practice seems to be working well for clients and contractors since they are on the receiving end and do not have much to lose. It is the subcontractors who are mainly suffering due to retention abuse. Comparing the costs and the benefits of retentions, the practice seems to have a lot of cost associated with it. On the surface it appears that the costs seem to outweigh the benefits of the practice since there is a lot of cash flow issues associated with the use of retentions.

There doesn't seem to be any alternatives currently being used in place of retentions in the NZ construction industry. The findings of this study suggest that even though most experts believe that there could be better ways of handling performance related issues for which retentions exist however none seemed to have a clear idea regarding an alternative practice. A sliding retention regime used in New Zealand seems to be a fairer one than a flat one used in other parts of the world. Lastly the quantification of the risk involved in each project could be a major factor in determining a retention regime for a contract.

The next Chapter will present results of the industry wide questionnaire survey and will help extend the findings from the expert interviews.

Chapter 5

Data Analysis and Results – Questionnaire Surveys

5.1 Introduction

This chapter will present the results obtained from the questionnaire surveys. The first questionnaire survey was the industry wide survey administered amongst the construction practitioners in New Zealand. The results of the questionnaire are presented under six sections starting with the demographic information of the participants. This is followed by the five sections presenting the five themes identified which are in line with the five objectives of this research study. The themes are; the purpose of retentions, the current status of the retention practice in New Zealand, the costs and benefits of the practice, the alternatives to the practice and the guidelines for setting up retention regimes. The questionnaire consisted of both closed and open ended questions. Therefore the analysis consists of statistical techniques for quantitative data and thematic analysis for qualitative data.

The Chapter further presents the findings from the second questionnaire survey for the purpose of validation. The findings from stage one and stage two were collated and presented to 5 experts for the verification of the findings and for their opinions. The results are once again presented under five sub-sections in line with the five research objectives.

5.2 Demographic information of participants

Even though in the questionnaire survey the demographic data was included as the last section (Section H) for a better response to the survey. However for analysis purpose

the demographic information is presented first. Under the general information section participants were required to state their profession, the type or business or organization working for, number of years working in the construction industry, the nature of business their company is involved in, the number of employees in their company and the region of New Zealand where their business or company is operating. The demographic details of participants are presented in Table 5.1 as follows;

Table 5.1: Demographic details

Percentages showing type of organization/business		
Type of organization/business	**Numbers**	**Percentage**
Government/Council	7	4%
Private developer	4	2%
Architectural/Engineering practice	13	7%
Project/Construction management practice	11	6%
Contracting firm	34	18%
Sub-contracting or specialist trade firm	110	59%
Construction law/dispute resolution firm	3	1%
Others	5	3%
Total	187	100%

Percentages showing types of profession		
Profession	**Numbers**	**Percentage**
Project Manager	30	13%
Engineer	15	6%
Architect	15	6%
Quantity Surveyor	30	13%
Contractor	34	15%
Builder	2	1%
Subcontractor	97	41%
Legal/Dispute resolution expert	3	1%
Other	9	4%
Total	235	100%

Major Industry Groups		
Major Industry Groups	**Numbers**	**Percentage**
Clients	14	7%
Consultants	29	16%
Contractors	34	18%
Subcontractors	110	59%
Total	187	100%

Work experience in years		
Number of years	**Numbers**	**Percentage**
0-5 years	3	2%
6-10 years	8	4%
11-15 years	13	7%
16-20 years	24	13%
21-25 years	37	20%
More than 25 years	102	54%
Total	187	100%

Nature of construction business		
Nature of business	**Numbers**	**Percentage**
Residential building construction	67	22%
Commercial building construction	98	33%
Construction trade services	69	23%
Property development	19	6%
Heavy construction	34	11%
Others	14	5%

Number of years company has been in business		
Number of years	**Numbers**	**Percentage**
0-5 years	3	2%
6-10 years	21	4%
11-15 years	18	7%
16-20 years	28	13%
21-25 years	24	20%
More than 25 years	93	50%
Total	187	100%

Number of employees employed by the business		
Number of employees	**Numbers**	**Percentage**
0-5	43	23%
6-10	20	10%
11-15	20	11%
16-20	19	10%
21-25	13	7%
26-30	9	5%
31-35	7	4%
More than 35	56	30%
Total	187	100%

Percentages showing geographical location of the business		
Location	**Numbers**	**Percentage**
Northland	33	7%
Auckland	94	19%
Waikato	49	10%
Bay of Plenty	37	7%
Gisborne	15	3%
Hawke's Bay	22	4%
Taranaki	20	4%
ManawatuWanganui	29	6%
Wellington	44	9%
Tasman	17	3%
Nelson	19	4%
Marlborough	17	3%
West Coast	17	3%
Canterbury	45	9%
Otago	21	4%
Southland	22	4%
Other	4	1%

The major industry groups

The three groups directly affected by retentions are the clients, contractors and the subcontractors. Other players in the industry also observe the practice and are termed as consultants. These include engineers, architects, quantity surveyors, project managers, legal experts and quantity surveyors. From the literature review it was found that different groups within the industry hold different views with regards to retentions. Therefore for the purpose of analysis four major groups were identified for the study. These groups were identified by the type of organization or business that the respondents worked for and their professions. Table 5.1 presents the breakup for the type of business/organization that the respondents worked for.

As seen in Table 5.1 a total of 187 people responded to the survey. The majority of

participants more than half were from the sub-contracting or specialist trade business comprising a huge 59%. The next group of respondents was from contracting business equaling to an 18%. This was followed by Architectural/engineering practice 7%, Project/Construction management practice 6%, Government/Council 4% Others 3%, Private developers 2% and lastly construction law dispute firm at 1%.

Respondents were further asked to state their professions. In terms of professions too the major group was that of the subcontractors comprising 41% followed by the contractors at 15%. Project managers and quantity surveyors were both equal at 13% followed by the architects and engineers again equal to 6% each. The smallest group of professionals was that of builders and legal experts both at 1%.

For analysis purpose based on their organization/business and the professions of the respondents they were divided into four major groups i.e. clients, consultants, contractors and subcontractors. The representatives from the government/council and the private developers were grouped under clients. Representatives from Architectural/Engineering practice, Project/Construction management practice and legal and dispute resolution firms were grouped under consultants. The other two groups were straight forward i.e. contractors and subcontractors. A breakdown of the major groups of clients, consultants, contractors and subcontractors is shown in Table 5.1.

It can be seen from Table 5.1that the responses from the client group were significantly low compared to the other three groups. After having a closer look at the results of the survey, the responses from the client and consultant group were found to be similar. Therefore for the purpose of analysis the responses from clients were merged with that of consultants. This was done by performing an independent sample t-test to test for the equality of means for the two groups prior to merging their responses. The t-test was performed at every section of the analyses, so that the merger could not distort them. The analysis therefore has been presented majorly under three groups named as Client/Consultant – 23%, Contractor – 18%, Subcontractor – 59%.

Experience in the construction industry

Participants were asked to indicate the number of years they have worked in the construction industry. Table 5.1 shows the distribution of the participants and the

number of years they have worked in the industry. Distribution of the participants' experience working in the industry shows that over 50% of them had more than 25 years of experience while 20% have worked for 20-25 years in the industry. Participants with 16-20 years, 11-15 years and 6-10 years were 13%, 7% and 4% respectively. Only 2% of the respondents have worked for less than 5 years. This adds reliability to the research findings.

Nature of business

Respondents were asked to indicate the nature of business that their company is involved in and the number of years their company or organization has been into business. They were also asked to indicate the number of employees the business employs. The distribution as shown in Table 5.1 indicates that majorly the respondents were involved in commercial, residential and construction trade services with 33%, 22% and 23 % respectively. 11% respondents worked for the heavy construction industry and 6 % for property development. This shows that that there is adequate representation from all the sectors of the construction business adding reliability to the findings.

With regards to the number of years the company (the respondent works for) has been into business Table 5.1 shows the break up in terms of numbers and percentage. Table 5.1 indicates that 50% of the companies for which the respondents work have been in business for more than 25 years. 20% of the companies have been into business between 21-25 years. Only 2% of the companies have been into business for less than 5 years. This data further adds reliability to the research findings.

In relation to the number of employees the business employs Table 5.1 indicates that 30% of the businesses employ more than 35 employees representing very large construction enterprises. On the other hand 23% employ less than 5 employees representing very small organizations. Further small to medium size enterprises include employee numbers ranging from 6-10, 11-15 and 16-20 representing 10%, 11% and 10% respectively adding up to 31%. Large organizations include employee count ranging between 21-25, 26-30 and 31-35 with 7%, 5% and 4% respectively adding up to 16%. Therefore the survey results have adequate representation from firms of different sizes ranging from very small to very large enterprises adding further reliability to the

findings.

Geographical region

The aim of the survey was to collect a representative number of responses across New Zealand. Therefore participants were asked to indicate the geographical region(s) that their business operates in. Table 5.1 shows that responses represented all the regions of New Zealand. Auckland being the largest and the most populated the representation was highest at 19% follows by Waikato 10%, Canterbury and Wellington at 9% each. The representation from rest of the regions was between 3-7% as seen in Table 5.1.

5.3 The purpose of retentions

Literature suggests a number of purposes of retentions and there seems to exist some disconnect with regards to the actual and intended purpose of retentions. Retention is an age old practice and was introduced into the construction industry for a reason far back in the 1800's. With the industry have undergone radical changes in the past few decades the intention is to understand the actual purpose of retentions as used in the current day construction industry. The views of participants were therefore sought regarding the purpose of retentions and to what extent retentions serve the objective for which they exist. This section of the questionnaire consisted of three parts. The first question was open ended where participants' opinion was sought regarding the primary purpose of retentions. This was followed by asking them the extent to which retentions deliver their objective or purpose for which they are used. Finally respondents' level of agreement or disagreement was sought with regards to the different purposes of retentions as identified in the literature.

5.3.1 The purpose of retentions in the New Zealand construction industry

This section presents the analysis of the open ended question seeking opinion from participants regarding the purpose of retentions as used in the current day construction industry. Data has been analyzed under 3 major groups i.e. client-consultants, contractors and subcontractors. The justification for using three major groups is described in the next section 5.3.2. The question was open ended and out of 187

participants 178responded to the question. The responses were analysed using thematic analysis. All the respondents were allocated ID numbers e.g. the client group was numbered as CL1, CL2, CL3 etc. Followed by the consultants numbered as CO1, CO2, CO3 etc., contractors numbered as C1, C2, C3 etc., and finally the subcontractors as SC1, SC2, SC3 etc. All the responses along with the respondents ID numbers are attached as Appendix C1. For analysis purpose all the responses were studied manually by the researcher and main themes drawn from the responses. A total of 14 themes were identified from the open ended responses studied. The themes or the purposes identified have been numbered or coded as P1, P2, P3……..P14 for analysis purpose and are presented in Table 5.2.Themes P1 to P9 are identical to the ones identified in the literature and also used in section 5.3.3 further in the chapter. In addition to those five more themes P10 to P14 were identified from the open ended responses.

All the responses were studied manually and were allocated a theme or themes. Table 5.2 further presents the results of the analysis. The table presents the purposes and the corresponding respondents' ID's regarding their opinion about the purpose of retentions. The table also shows the number of responses from the different categories for each theme or purpose. Table 5.2 suggests that the main purpose of retentions is P1 (performance security) with a total of 37 responses. This is closely followed by P2 (to ensure that the contractor fulfills their obligation under the contract) and P3 (to guarantee that the contractor/subcontractor will return to remediate defects within the defects liability period) with a total of 36 responses each. Next of importance is P6 (to prevent default and poor quality work) with a total of 31 responses. 18 respondents think that retentions are there for defect remidiation (P4) and 16 respondents feel that it is just for quality assurance e.g. workmanship, materials, accuracy and safety (P13). P10 (to provide money for maintenance or remedial work) and P14 (to cover for the 12 months warranty period in construction contracts) are next important purposes of retentions with 13 responses each. However it can be noted that the responses for these purposes are mainly from the subcontractor group. Further the lesser important purposes include P5 (to act as an incentive for the contractor to remediate defects) and P8 (to provide cash flow to client/contractor) with a total of 11 responses each. Again with respect to P8 the responses are only from the subcontractor group. The other purposes identified by few respondents are P9 (to act as a source of interest free finance), P12 (to provide a sum to be called upon in case of insolvency), P11 (to act as an incentive to the

contractor to finish works in time) and P7 (to act as an extra insurance for the client to make sure the contractor attends to his duties) with 7, 7, 6 and 1 response respectively.

Apart from the coded responses there were some responses which did not match any of the codes and are as follows;

SC38 – So that the clients/contractors can have a bargaining tool when trying to get the project complete.

SC46 - For contractors to keep something over sub-contractors heads - they are often used as a bargaining chip to favorably (in favor of the contractor) finalize accounts. Allows contractors to keep something back from which to deduct contra charges (rightfully or wrongfully charged) - by keeping retentions, contractors do not always worry about notification of contras until the final account negotiation because they know they get another bite of the cherry.

SC 92 – Power

Table 5.2: The purpose of retentions

Code	Purposes	Groups	Respondent ID	N (Frequency)	Total
P1	Performance security i.e. to assure project completion/complete outstanding work.	Client - Consultants	CO2, CO4, CO6, CO7, CO8, CO10, CO11, CO19, CO20, CO22, CO23, CO25, CO27	13	37
		Contractors	C4, C5, C6, C13, C16	5	
		Subcontractors	SC2, SC3, SC5, SC13,SC16, SC20, SC29, SC31, SC37, SC340, SC47, SC53, SC65, SC68, SC87, SC101, SC106, SC107, SC109	19	
P2	To ensure that the contractor fulfills their obligation under the contract.	Client - Consultants	CL1, CL2, CL7, CL9, CO7, CO14, CO21, CO24, CO26, CO29	10	36
		Contractors	C4, C8, C16, C17, C18, C30, C32, C33, C34	9	
		Subcontractors	SC5, SC19, SC21, SC22, SC24, SC25, SC30, SC31, SC32, SC35, SC37, SC39, SC48, SC75, SC82, SC95, SC102,	17	
P3	To guarantee that the contractor/subcontractor will return to remedy any defects within the defects liability period.	Client – Consultants	CL1, CL2, CL3, CL10, CL11, CL12, CO9, CO29,	8	36
		Contractors	C3, C7, C10, C13, C19, C22, C25, C27, C28	9	
		Subcontractors	SC1, SC10, SC14, SC23, SC24, SC36, SC49, SC51, Sc58, SC59, SC62, SC73	12	
P4	Defect remidiation.	Client – Consultants	CO4	1	18
		Contractors	C14, C15	2	
		Subcontractors	SC6, SC8, SC11, SC12, SC18, SC28, SC33, SC43, SC44, SC45, SC81, SC90, SC98, SC99, SC106	15	
P5	To act as an incentive for the contractor to remedy defects.	Client – Consultants	CO12, CO15, CO17, CO21	4	11
		Contractors		0	
		Subcontractors	SC15, SC17, SC27, SC30, SC46, SC77, SC107	7	
P6	To prevent default and poor quality work.	Client – Consultants	CL4, CL5, CL8, CL9, CL13, CL14, CO1, CO3, CO4, CO12, CO13, CO14, CO18	13	31
		Contractors	C10, C12, C21, C30, C33	5	
		Subcontractors	SC26, SC33, SC34, SC46, SC49, SCS51, SC55, SC70, SC75, SC83, SC97, SC99, SC100,	13	
P7	To act as an extra insurance for the client to make sure the contractor attends to his duties as per the contract.	Client – Consultants	CO2	1	1
		Contractors		0	
		Subcontractors		0	

P8	To provide cash flow to the client/contractor.	Client – Consultants Contractors Subcontractors	 SC3, SC4, SC40, SC43, SC45, SC46, SC48, SC60, SC72, SC80, SC103	0 0 11	11
P9	To act as a source of interest free finance.	Client – Consultants Contractors Subcontractors	 SC7, SC51, SC67, SC72, SC78, SC85, SC108	0 0 7	7
P10	To provide money for maintenance or remedial work.	Client – Consultants Contractors Subcontractors	CL6, CO11, C3, C9, SC63, SC64, SC65, SC78, SC79, SC84, SC93, SC105, SC106	2 2 9	13
P11	To act as an incentive to the contractor to finish works in time.	Client – Consultants Contractors Subcontractors	CL6, CO14 C17 SC22, SC52, SC74	2 1 3	6
P12	To provide a sum to be called upon in case of insolvency.	Client – Consultants Contractors Subcontractors	CO5, CO9, CO14, CO18 C11, SC19, SC35	4 1 2	7
P13	Quality assurance e.g. workmanship, materials, accuracy and safety.	Client – Consultants Contractors Subcontractors	 C1, C2,C6, C16,C22, C24, SC14, SC42, SC52, SC71, SC76, SC82,SC86,SC88, SC96, SC103	0 6 10	16
P14	To cover for the 12 months warranty period in construction contracts.	Client – Consultants Contractors Subcontractors	 C31 SC3, SC9, SC14, SC41, SC57, SC61, SC62, SC66, SC74, SC80, SC89, SC105	0 1 12	13

5.3.2 The extent to which retentions fulfil their purpose in the present day construction industry.

In addition to the above participants' opinion was sought to indicate the extent of their agreement or disagreement with the stated objective. For the purpose of analysis the client and consultant group has been merged. In real life situation the consultants seem to represent the clients thus it was expected that the opinions of consultants and clients could be in agreement. Similarly it could be expected that the head contractors and subcontractors may hold similar opinions. In order to verify these differences statically an independent samples T-test was performed. The differences in views were determined using following hypotheses. The significance level of 95% was considered for accepting or rejecting the null hypothesis.

> H_0: $\mu_1 = \mu_2$; No statistically significant differences between the two groups on the dependent variable, where μ_1 and μ_2 are the means of the two groups.
>
> H_1: $\mu_1 \neq \mu_2$; Statistically significant differences between the two groups on the dependent variable

Table 5.3 represents the results of the independent sample T-test between clients and consultants, and head contractors and subcontractors. As observed in Table 5.3 the Sig. (2-tailed) or p-value (.355) of greater than .05 indicates no evidence to reject the null hypothesis that there are no differences in the mean values of clients and consultants with regards to the purposes. On the other hand the p-value of .004 indicates that head contractors and subcontractors are of different opinions. This confirms that the clients and consultants are in agreement while the head contractors and subcontractors are in disagreement in relation to objective for which retentions exist in the NZ construction industry. This therefore justifies considering three major groups: client-consultants, head contractors and subcontractors forfurther analysis.

Table 5.3: Independent samples t-test – clients and consultants

Groups	N	Mean	Std. Deviation	t	df	Sig. (2-tailed)
Client	14	3.929	0.730	-.935	40	.355
Consultants	28	4.107	0.497			
Contractors	34	3.353	1.152	2.922	140	.004
Subcontractors	108	2.685	1.165			

Further analysis considered the one-way ANOVA to determine the statistically significant differences between the three major groups. To determine the differences the following hypotheses were tested. The criterion for accepting or rejecting the hypothesis was set as .05. If the p-value is less than .05, the null hypothesis is rejected. The results of the ANOVA are given in Table 5.4.

H_0: $\mu_1 = \mu_2 = \ldots\ldots \mu_k$; all population means are equal.

Alternative hypothesis is that at least one of the means is different.

Table 5.4: One-way ANOVA – Extent to which retention fulfil their purpose

Group	N	Mean	Std. Deviation	df	F	Sig.
Client - Consultants	42	4.048	0.582	2	26.042	0.000
Contractors	34	3.353	1.152			
Subcontractors	108	2.685	1.165			
Total	**184**	**3.120**	**1.195**			

The ANOVA results revealed a significantly different opinion between the three major groups about the extent to which retentions deliver their objective. Table 5.4 shows that the mean values of the three major groups are statistically different. The calculated values of F = 26.042; df =2 and p = 0.000 confirms the rejection of the null hypothesis. However these results do not inform where the actual difference exists among the groups. Thus a Post-Hoc Tukey-B's test was performed on the responses in order to detect the group with different opinion. The results of Post-Hoc Tukey-B's test are presented in Table 5.5.

Table 5.5: Extent of fulfilling retentions purpose – Post hoc Tukey –B's test

		Subset for alpha = 0.05		
Groups	**N**	**1**	**2**	**3**
Subcontractors	108	2.685		
Contractors	34		3.353	
Clients - consultants	42			4.048

As observed in Table 5.5 the subcontractor and contractor group with a mean of 2.685 and 3.353 respectively reported that retentions 'sometimes' fulfill the purpose for which they exist. However a closer scrutiny of values suggests that subcontractors are more inclined with the opinion that retentions 'rarely' fulfill their purpose whereas head contractors believe that retentions fulfill their purpose 'sometimes'. Clients-consultants

on the other hand are of the view that retentions most of the times (with a mean value of 4.048) serves its purposes on construction projects.

5.3.3 Views in relation to different purposes of retentions

In this section participants' opinion was sought regarding the different purposes of retentions. Participants were asked to indicate the extent of their agreement or disagreement with the nine stated purposes as identified in the literature. Three groups were considered for the analysis of this question too. One-way ANOVA was carried out to find out the difference in opinion of the three major groups regarding the different purposes of retentions. To determine the differences the following hypotheses were tested. The criterion for accepting or rejecting the hypothesis was set as .05. If the p-value is less than .05, the null hypothesis is rejected. The results of the ANOVA are given in Table 5.6. The results showing the values of df equal to 2 and a p value of less than .05 confirms the rejection of the null hypothesis.

H_0: $\mu_1 = \mu_2 = \mu_3$; all population means are equal.

Alternative hypothesis is that at least one of the means is different.

Table 5.6: One-way ANOVA – Views in relation to different purposes of retentions

	Purposes	df	F	Sig.
P1	Performance security i.e. to assure project completion/complete outstanding work.	2	11.307	.000
P2	To ensure that the contractor fulfills their obligation under the contract.	2	12.008	.000
P3	To guarantee that the contractor/subcontractor will return to remedy any defects within the defects liability period.	2	10.821	.000
P4	Defect rectification.	2	12.171	.000
P5	To act as an incentive for the contractor to remedy defects.	2	9.704	.000
P6	To prevent default and poor quality work.	2	5.050	.007
P7	To act as an extra insurance for the client to make sure the contractor attends to his duties as per the contract.	2	5.671	.004
P8	To provide cash flow to the client/contractor.	2	14.136	.000
P9	To act as a source of interest free finance.	2	21.577	.000

The rejection of the null hypothesis suggests that the mean values of the three groups are statistically different in relation to each statement related to the purpose of retentions. The purposes have been labelled as P1, P2, P3 etc. in Table 5.7 for further analysis and reference. The results of the one way ANOVA do not inform where the actual difference exists among the groups. Therefore to find out the differences that exist among the groups in relation to each purpose Post-Hoc Tukey-B's test was performed.

The results of the Tukey-B's test are presented in Table 5.8. The respondents' perceptions as observed are presented in the Table under the comments column. As observed in table 5.7 the overall perception of subcontractors for purposes P1, P2, P3, P4, P5, P8 and P 9 is between 'neither agree nor disagree' and 'agree'. For the remaining purposes P7 and P8 their opinions are neutral i.e. 'neither agree nor disagree'. Further the Contractor group's 'agree' to the statements P1, P2 and P3. For the purposes P4, P5, P6, P7 their perceptions are between 'neither agree nor disagree' and 'agree'. For the remaining two purposes P8 and P9 they hold neutral views i.e. 'neither agree nor disagree'. Finally the Client – consultants group 'agree' to the statements P2, P3, P4, P5 and P7 whereas 'disagree' to P8 and P9. Their opinion is between 'agree' and 'strongly agree' in relation to P1 and between 'neither agree nor disagree' and 'agree' in relation to P6.

Further analysis was carried out to rate the different purposes of retentions to find out the important ones on the basis of the mean values given to each purpose by the respondents. Table 5.8 shows the ranking given on the basis of the mean values of each purpose. The rankings can be seen in 4 columns the first one being the overall ranking based on the overall mean followed by the ranking of the individual group.

It can be seen from table 5.8 that all the three groups are in agreement with regards to the most important purpose of retentions being P3 i.e. to guarantee that the contractor/subcontractor will return to remedy any defects within the defects liability period. This is followed by P1 i.e. performance security and P2 to ensure that the contractor fulfills their obligation under the contract with ranks 2 and 3 respectively. However with regards to P8 and P9 a statistically significant difference can be seen in the opinion of the three groups. Client-consultant and contractor group seem to have a

different opinion as against the subcontractor group who think that one of the main purposes of retentions is to act a source of interest free finance and to provide cash-flow to the client/contractor with a ranking of 3 and 4 respectively.

Table 5.7: Different purposes of retentions – Post hoc Tukey –B's test

			Subset for alpha = 0.05			Comment
Purposes	**Groups**	**N**	**1**	**2**	**3**	
P1	Subcontractors	108	3.593			Between ' neither agree nor disagree' and 'agree'
	Head contractors	34	4.029	4.029		'agree'
	Client - consultants	42		4.452		Between 'agree' and ' strongly agree'
P2	Subcontractors	109	3.495			Between ' neither agree nor disagree' and 'agree'
	Head contractors	34		4.000		'agree'
	Client - Consultants	43		4.395		' agree'
P3	Subcontractors	108	3.648			Between ' neither agree nor disagree' and 'agree'
	Head contractors	34		4.118		'agree'
	Client - consultants	43		4.442		' agree'
P4	Subcontractors	108	3.491			Between ' neither agree nor disagree' and 'agree'
	Head contractors	34	3.529			Between ' neither agree nor disagree' and 'agree'
	Client - consultants	42		4.405		' agree'
P5	Subcontractors	108	3.407			Between ' neither agree nor disagree' and 'agree'
	Head contractors	33	3.848	3.848		Between ' neither agree nor disagree' and 'agree'
	Client - consultants	43		4.256		'agree'
P6	Subcontractors	108	2.694			' neither agree nor disagree'
	Head contractors	33	3.212	3.212		Between ' neither agree nor disagree' and 'agree'
	Client - consultants	42		3.310		Between ' neither agree nor disagree' and 'agree'
P7	Subcontractors	108	3.176			' neither agree nor disagree'
	Head contractors	34	3.500	3.500		Between ' neither agree nor disagree' and 'agree'
	Client - consultants	43		3.837		'agree'
P8	Client - consultants	40	2.100			'Disagree'
	Head contractors	34	2.647			' neither agree nor disagree'
	Subcontractors	110		3.518		Between ' neither agree nor disagree' and 'agree'
P9	Client - consultants	42	1.762			'Disagree'
	Head contractors	34		2.735		' neither agree nor disagree'
	Subcontractors	110			3.564	Between ' neither agree nor disagree' and 'agree'

Table 5.8: Ranking of different purposes of retentions – major groups

Purposes	Overall			Client - Consultants			Head contractors			Subcontractors		
	Mean	Std. dev.	Rank	Mean	Std. dev.	Rank	Mean	Std. dev.	Rank	Mean	Std. dev.	Rank
P1	3.870	1.073	**2**	4.452	0.772	**1**	4.029	0.834	**2**	3.593	1.144	**2**
P2	3.796	1.116	**3**	4.396	0.791	**4**	4.000	0.853	**3**	3.495	1.191	**5**
P3	3.919	1.037	**1**	4.442	0.700	**2**	4.118	0.880	**1**	3.648	1.105	**1**
P4	3.707	1.107	**4**	4.405	0.665	**3**	3.529	1.187	**5**	3.491	1.115	**6**
P5	3.685	1.145	**5**	4.256	0.928	**5**	3.848	1.034	**4**	3.407	1.168	**7**
P6	2.929	1.232	**9**	3.310	1.115	**7**	3.212	1.111	**7**	2.694	1.264	**9**
P7	3.389	1.137	**6**	3.837	0.949	**6**	3.500	1.161	**6**	3.176	1.151	**8**
P8	3.049	1.631	**7**	2.100	1.236	**8**	2.647	1.454	**9**	3.518	1.635	**4**
P9	3.005	1.697	**8**	1.762	1.122	**9**	2.735	1.543	**8**	3.564	1.662	**3**

5.4 Current status of retention practice in New Zealand

Retention practice has sparked a lot of debate world over with a number of issues being attached to the practice. This section of the questionnaire intends to identify the problems and issues with regards to the practice in the New Zealand construction industry. Participants' were first of all asked to identify whether or not there was a problem with regards to the practice followed by the level of seriousness of the problem. Participants' were also asked to comment briefly about the issues with regards to the practice. Finally respondents' level of agreement or disagreement was sought with regards to a list of issues around retentions identified in the literature.

In addition to the above, the questionnaire consisted of two separate subsections. Those two sub-sections were specifically for the contractor and the subcontractor group respectively. The reason for having a specific section for the two groups was because it is the contractors and the subcontractors on whom the retentions are held and are the ones bearing the brunt of the practice. The aim was to gather information regarding the administration of the current practice i.e. rate of retention, the timing of release etc. Further their opinion was sought regarding some issues specific to the particular group which were identified from the literature.

5.4.1 Problem with retention practice in New Zealand construction industry

Participants were asked to indicate their agreement or disagreement with regards to the practice of retentions being a problem in the New Zealand construction industry. The question had a 'yes', 'no' or 'not sure' response type. Figure 5.1 shows the overall response of the participants and 79% of the respondents believe that 'yes' there is a problem with regards to the retention practice in the New Zealand construction industry. 12% do not think that there is a problem and 9% were not sure whether there is a problem or not.

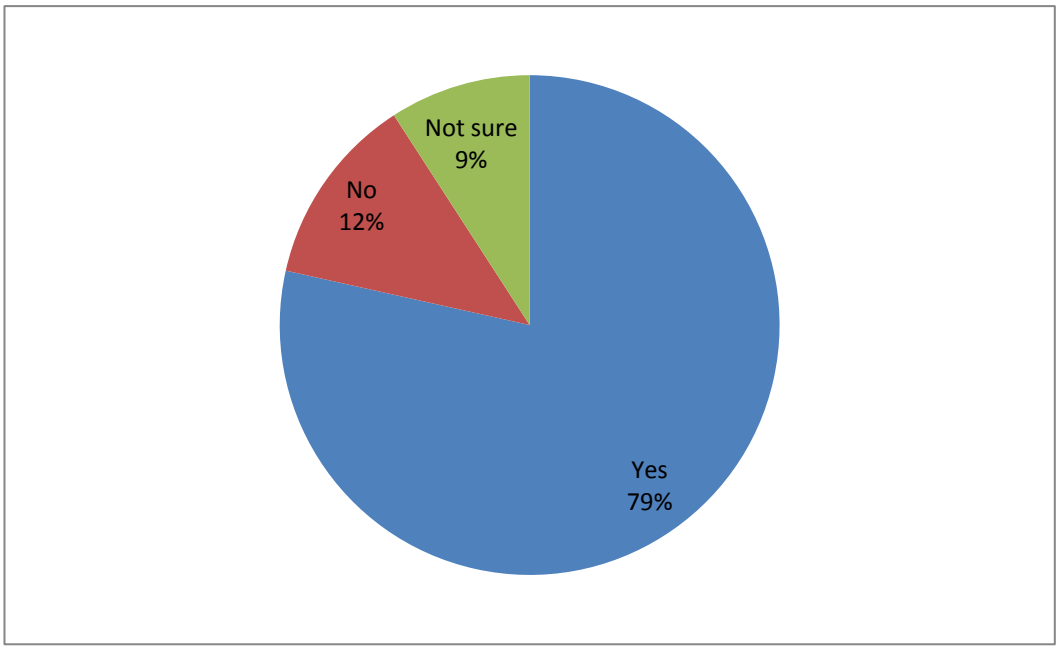
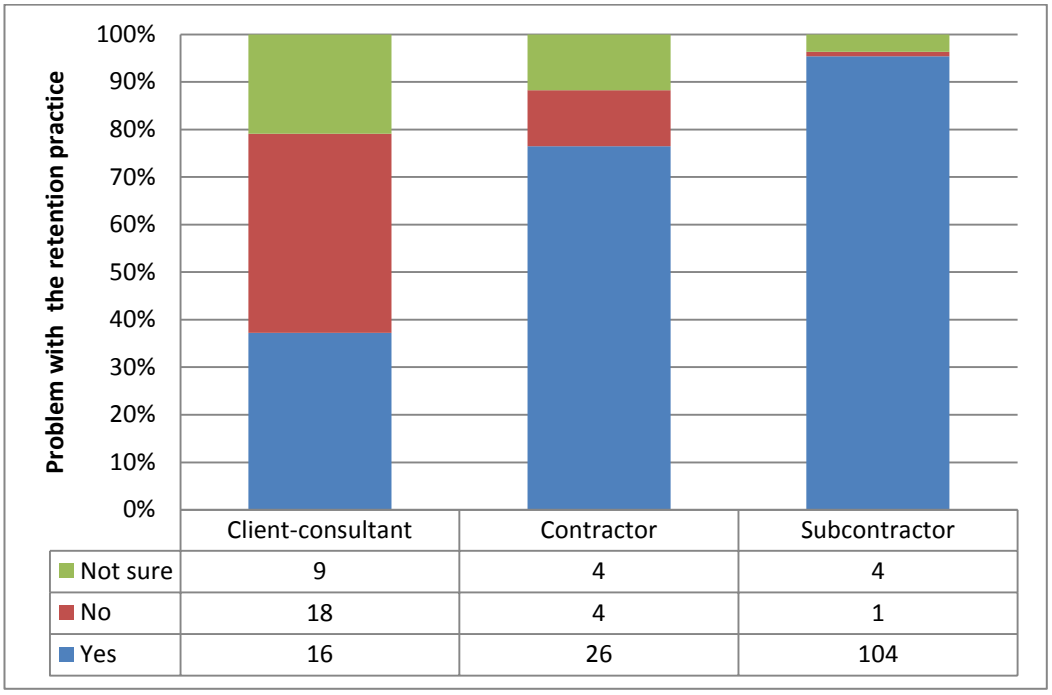


Figure 5.1: Problem with regard to retention practice

However a closer look at the responses from the three major groups can be studied in Figure 5.2. It can be seen that the opinion of the client-consultant group is not similar to that of the other two groups. 37% of the respondents from the client/consultant group believe that there are problems whereas 42% think that there is no problem with regards to the retention practice. The contractor and subcontractor group on the other hand believe that there are problems around the practice with 76% and 95% respectively, responding in favor of the statement. 12% among the contractor group think that it is not a problem whereas only 1% amongst the subcontractors shares the same opinion of retentions not being a problem. 12% and 4% of the contractors and subcontractors were not sure about retentions being a problem in the New Zealand construction industry.



	Client-consultant	Contractor	Subcontractor
Not sure	9	4	4
No	18	4	1
Yes	16	26	104

Figure 5.2: Problem with regard to retention practice: major groups

5.4.1.1 Retention problem: significance

In relation to the previous question of retentions being a problem in the construction industry respondents' opinion was sought regarding the significance of the problem. The question was for the respondents whose response was a 'yes' to the previous question. Figure 5.3 shows the overall response and a total of 40% respondents feel that the problem is extremely serious followed by 31% giving a rating of very serious. 21% respondents feel that the problem is moderately serious and only 8% feel that it is slightly serious. However when we take a closer look at the individual groups the opinions vary.

Figure 5.4 presents the results of the individual groups and their opinion regarding the seriousness of the problem related to retentions in terms of numbers as well as percentages. In terms of a percentage 51% of the subcontractors feel that the problem is extremely serious followed by the client/consultants at 23% whereas only 11% contractors hold similar views. 46% of contractors think the problem regarding retentions is very serious followed by 29% subcontractors and 18% the client/consultants. 29% of the contractors followed by 18% each of subcontractors and client/consultants think that the problem is moderately serious. Lastly 41% of the

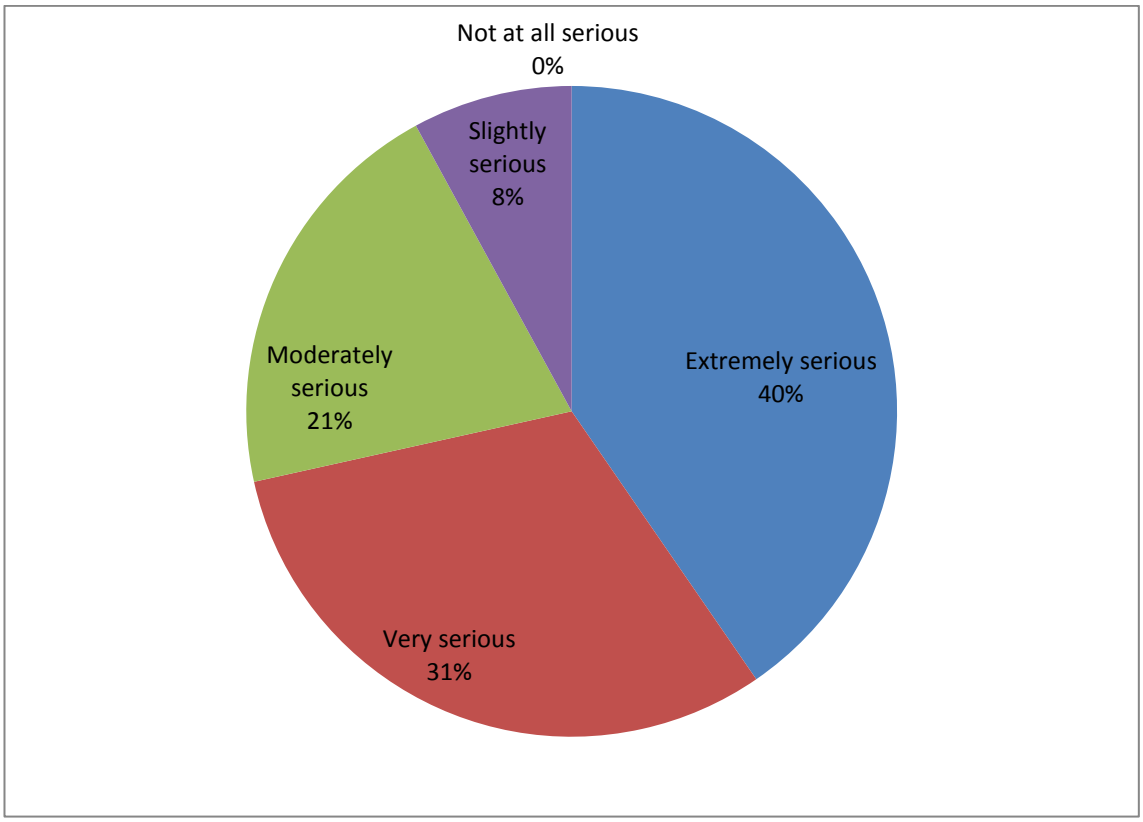
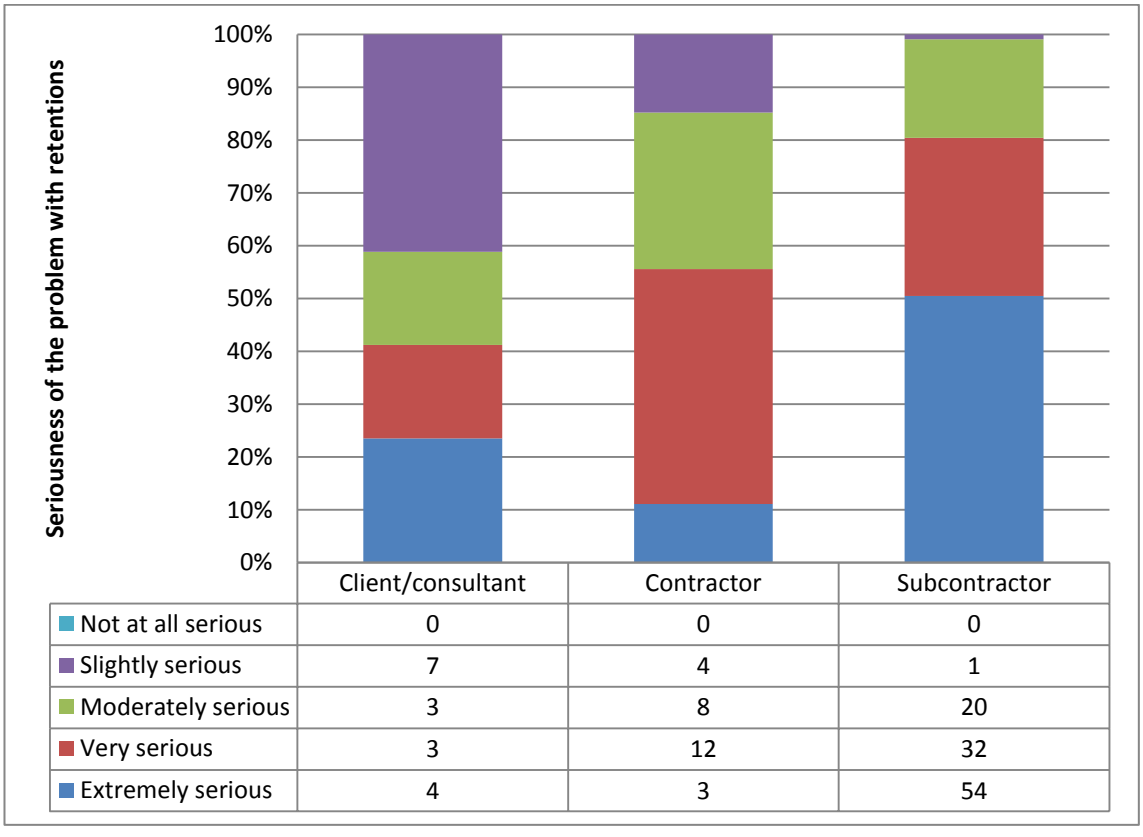


Figure 5.3: Retention problem: significance



	Client/consultant	Contractor	Subcontractor
Not at all serious	0	0	0
Slightly serious	7	4	1
Moderately serious	3	8	20
Very serious	3	12	32
Extremely serious	4	3	54

Figure 5.4: Retention problem: significance: Major groups

Client-consultants think that the problem is slightly serious followed by 15% contractors and only 1% subcontractors holding a similar view. None of the respondents thought that the problem was not at all serious.

5.4.2 Issues with retention practices

For this question respondents were asked to briefly explain the issues related to the retention practice in the New Zealand construction industry. The question was open ended so as to collect as much feedback from the participants regarding retention related issues surrounding the industry currently. Data was analysed under three major groups. A total of 158 responses were received for this question. Thematic analysis was used for the analysis and main themes were drawn after manually studying the transcript of the responses from the participants. The same I.D. numbers used for respondents were retained for this question as used in section 5.3.1. All the responses along with the respondents ID numbers are attached as Appendix C2. After manually studying all the responses a total of 14 themes were identified from the open ended responses. The themes have been coded from IS1 to IS14 as shown in Table 5.9.

Table 5.9: Issues related to retentions

Code	Issues	Groups	Respondent ID	N (Frequency)	Total
IS1	Pay if and pay when continued.	Client - Consultants Contractors Subcontractors	CL1 SC10, SC35, SC41, SC42, SC79, SC87	1 0 6	7
IS2	Unnecessary withholding of retentions.	Client - Consultants Contractors Subcontractors	CL1, CO4, CO12, CO15, CO21 C3, C18, C19 SC3, SC6, SC8, SC9, SC10, SC13, SC14, SC21, SC27, SC34, SC35, SC37, SC42, SC43, SC62, SC65, SC77, SC78, SC82, SC87, SC92, SC96, SC106, SC107, SC109	5 3 25	34
IS3	Non-payment or loss of retentions in case of liquidation or insolvency	Client – Consultants Contractors Subcontractors	CL2,CO29 C16 SC6, SC18, SC25, SC29, SC30, SC36, SC47, SC48, SC65, SC75, SC78, SC80, SC87, SC88, SC91, SC106, SC108	2 1 17	20
IS4	Negative effect on contractors/subcontractors cash flow	Client – Consultants Contractors Subcontractors	CL5, CO17, CO24, C6, C9, C17, C24, C30, SC4, SC13, SC22, SC36, SC57, SC58, SC69, SC70, SC84, SC90, SC99	3 5 11	19
IS5	Clients pay the price of retentions as it is built into the tender price	Client – Consultants Contractors Subcontractors	CL5	1 0 0	1
IS6	Hard job maintaining the account related to retentions and chasing retentions.	Client – Consultants Contractors Subcontractors	CL7, CO9, C21 SC41, SC42, SC43, SC45, SC46, SC48, SC51, SC52, SC80, SC82, SC85, SC95, SC96, SC105	2 1 14	17
IS7	Main contractors holding more retention on the subcontractors than what is being held on them due to the retention structure.	Client – Consultants Contractors Subcontractors	CL13, CO13, CO25 C15 SC8, SC20, SC26, SC29, SC38, SC46, SC52, SC56, SC63, SC84, SC93, SC106	3 1 12	16
IS8	Poor understanding of NZS3910	Client – Consultants Contractors Subcontractors	CO4	1 0 0	1

IS9	Different rules regarding retentions for different projects.	Client – Consultants Contractors Subcontractors	CO7, CO8 SC42, SC45	2 0 2	4
IS10	Poor awareness about how retentions work and why they are in place	Client – Consultants Contractors Subcontractors	CO7 SC3, SC19	1 0 2	3
IS11	The inappropriate use of subcontractors retentions by main contractors.	Client – Consultants Contractors Subcontractors	CO9, CO10, C5 SC1, SC5, SC7, SC13, SC17, SC20, SC28, SC29, SC31, SC38, SC40, SC44, SC46, SC48, SC56, SC60, SC64, SC65, SC67, SC68, SC70, SC78, SC80, SC83, SC88, SC97, SC98, SC100, SC101, SC104, SC105, SC106, SC108	2 1 33	36
IS12	Security of retentions.	Client – Consultants Contractors Subcontractors	CO11, CO22, CO29 C4, C13, C14, C16, C34 SC5, SC8, SC12, SC15, SC16, SC22, SC23, SC24, SC29, SC31, SC33, SC34, SC43, SC47, SC49, SC53, SC55, SC63, SC66, SC76, SC100, SC101, SC104	3 5 23	31
IS13	Late or non-payment or short-payment of retentions.	Client – Consultants Contractors Subcontractors	 C7 SC4, SC6, SC14, SC22, SC27, SC46, SC51, SC62, SC72, SC73, SC78, SC85, SC89, SC93, SC94, SC99	0 1 16	17
IS14	Very high rate of retention.	Client – Consultants Contractors Subcontractors	CO8 SC32, SC71, SC89, SC94, SC110	1 0 5	5

Table 5.9 further presents the results of the analysis. The table presents the issues (identified themes) and the corresponding respondents' ID's regarding their opinion about the retention related issues in the New Zealand construction industry. The table also shows the number of responses from the different categories for each theme or issue. Table 5.9 suggests three most important issues as per the frequency count by the number of responses. The first one being the inappropriate use of subcontractors retentions by the main contractor (IS11) with a total of 36 responses out of which 33 are from subcontractors. This is closely followed by IS2 i.e. the unnecessary withholding of retentions with a total of 34 responses out of which 25 are from subcontractors, 5 from client-consultants and 3 from the contractors. The next important issue is the security of retention monies with a frequency count of 31, 23 being from the subcontractors, 5 from the contractors and 3 responses from the client-consultants.

The next five issues identified on the basis of the frequency count have been considered to be of medium importance. The first one being the non-payment or loss of retentions in case of insolvency or liquidation with a frequency count of 20, followed by negative effect on the contractors/subcontractors cash flow with a total frequency of responses equaling 19. Next of importance are IS6 and IS13 both with a total of 17 responses. These issues are 'hard job maintaining the account related to retentions and chasing retentions' and 'late, non-payment or short-payment' of retentions. The last issue of medium importance is IS7 i.e. the main contractor holding more retention on the subcontractor than what is being held on them due to the retention structure with a total count of 16.

The remaining six issues were considered as low importance with frequency count of less than 10. The first one being 'the continuation of pay if and pay when clauses' with a total of 7 responses. 6 respondents (5 subcontractors and 1 client-consultant) indicated that the rate at which retentions are held is very high (IS14). 4 respondents (2 subcontractors and 2 consultants) stated that there were different rules regarding retentions for different projects. Only 3 respondents identified the issue IS10 regarding the poor awareness about how retentions work and why they are in place. The last two identified issues by 1 respondent each was the 'poor understanding of NZS3910' and 'clients paying the price of retentions as it is built into the tender price'.

Apart from the coded responses there were some responses which were unique and interesting and are presented as follows;

CO23 –"the problem only exists for poorly organized main contractors and subcontractors during a period of low work volumes".

C4 – "I don't believe the issue is so much with the retention practice, but more about the security of the retentions withheld. The retention regime is structured in such a way that the contractor will usually be cash positive because of it, especially if the contractor has provided a bond in lieu of retentions, and many contractors rely on that cash positive position to keep their business operating. The fact that the contractor will likely be cash positive also influences the level of margin they apply to their tender as it is supported by the interest gained or use of the retention money. So if the retention practice in NZ is to change, the effect on all parties will need to be considered to ensure undue financial pressure is not applied to any individual party - it may require gradual introduction".

C7 – "In most cases there is no problem with retentions. We do a lot of work for government and local government / Councils. In every instance there has been no problem with the release of retentions. We have had some issues working for private companies where retentions payment at end of practical completion, have not been paid, paid late or short paid. This has a huge effect on our business, as we do not know whether this money will come until after the maintenance period, generally 6 or 12 months after project completion.

C12 – "Retentions are at times used by Clients as a means to ensure that Contractors not only fixes defects but any work that needs doing at the end of the project including damage caused by others. By Clients holding all the retentions until all defects are rectified, Contractors are also forced to do the same, thereby penalising Subcontractors who are remiss. Notwithstanding what contracts state in this regards, the realities are different".

C17 – "Retentions undermine the contractor's relationship by deeming them 'incapable' of delivering a sound quality job. Retentions act more like a 'bullying' tactic where it is the client or main contractor/construction company that has not delivered to spec or to budget. The sub-contractor is squeezed on what they are owed in retentions at the discretion of the primary contractor. The sub-contractors actually fund the project and carry the majority of the risk, hence why when full retentions are not paid out and when you have them owing from several projects this impacts business negatively causing unnecessary stress on the sub- trades".

SC2 – "Only a problem when contractors/subcontractors don't know what they are doing, what is or is not acceptable, not controlling contracts entered, and admin thereof. Big gripe over positive main contractor cash flow off subs is a real issue but (1) subs do not normally have to provide a bond whereas main contractors do, (2) Main Contractor's carry the bulk of risks from many trades, (3) Main Contractor's margins are wafer thin below margin for error / risks for prolonged periods (4-5 years every decade). It is up to subs to limit to a reasonable level the positive cash flow of Main Contractors via subs. E.G. refuse to accept 10% flat or even 5% on larger subcontract values over $1 mil and instead

insist upon prorata head contract retentions throughout the months, or something in between, e.g. default 3910 scale, or 5%. Easy. Positive cash flow of course is disincentive to Main Contractors to release final retentions but that is up to subs to police that with reduced gap between Main Contractor retentions and subs retentions, then chase releases, and avoid Main Contractors or attach a healthy risk premium when quoting to miscreants".

5.4.3 Views in relation to the current practice of retentions in New Zealand

In this section participants' opinion was sought regarding statements in relation to the current practice of retentions in New Zealand including the different issues surrounding the practice. These were identified from the literature and from the experts interviewed in the first phase of data collection. Participants were asked to indicate the extent of their agreement or disagreement with the stated statements. Three groups were considered for the analysis of this question too. One-way ANOVA was carried out to find out the difference in opinion of the three major groups regarding the different statements about the current practice of retentions in New Zealand. To determine the differences the following hypotheses were tested. The criterion for accepting or rejecting the hypothesis was set as .05. If the p-value is less than .05, the null hypothesis is rejected. The results of the ANOVA are given in Table 5.10. The results showing the values of df equal to 2 and a p value of less than .05 confirms the rejection of the null hypothesis except for statement I9 for which the P value is .444.

H_0: $\mu_1 = \mu_2 = \mu_3$; all population means are equal.

Alternative hypothesis is that at least one of the means is different.

The rejection of the null hypothesis further suggests that the mean values of the three groups are statistically different in relation to each statement related to current status of retentions in New Zealand. The statements have been labelled as I1 - I13(I1-I5 about current practice and I6 – I 13 about issues) in Table 5.10 for further analysis and reference. The results of the one way ANOVA do not inform where the actual difference exists among the groups. Therefore to find out the differences that exist among the groups in relation to each statement Post-Hoc Tukey-B's test was performed.

Table 5.10: One-way ANOVA – Views of current retention practice

Code	Statements regarding current practice	df	F	Sig.
I1	The current practice of retentions is fair for all the parties involved in the construction business.	2	41.078	.000
I2	The current practice of retentions is working well in its current form and no changes are required to the current practice.	2	50.516	.000
I3	The practice of holding retentions is more traditional than any rational attached to the practice.	2	30.485	.007
I4	Subcontractors typically bear the burden of retentions.	2	38.637	.000
I5	The practice of retentions was fair for contractors and subcontractors if the funds were kept secure.	2	3.260	.041
I6	Retentions not being paid out on time is a significant issue for the sub-contractors.	2	14.915	.000
I7	The practice of retentions is abused as a means of interest free finance to high-risk borrowers with no fixed end rates.	2	30.523	.000
I8	The issue of retentions is adding to the problem of low productivity in the NZ construction industry in some way or the other.	2	18.157	.000
I9	Contractors and subcontractors fail to claim their retentions due to their lack of knowledge of contractual rights.	2	.815	.444
I10	The money held by way of retentions is being held un-contractually and in an inappropriate manner beyond the level to which it would be required to effect defects.	2	25.630	.000
I11	Contractor insolvency is the biggest threat for sub-contractors as they lose their retention monies.	2	24.169	.000
I12	There is a huge cash flow issue attached with the practice of retentions in NZ i.e. it impacts upon the contractors/subcontractors cash flow negatively.	2	29.723	.000
I13	Slow final payment of retentions is a serious problem currently faced by the industry.	2	17.765	.000

The results of the Tukey-B's test are presented in Table 5.11. The respondents' perceptions as observed are presented in the Table under the comments column. An overall view of table 5.11 suggests that the difference in opinion of the three major groups with regards to each statement about the current practice is statistically significant. However only in relation to statement I9, there is not a significant difference in the opinions of the three groups with a P value of 0.444.

As observed in Table 5.11statements I1 – I5 are related to the current practice. In relation to statements I1 and I2 the subcontractors with a mean of 1.486 and 1.336 seem to be in strong disagreement that the current practice of retentions is fair for all the parties and that the practice is working well in its current form. The contractor group too seem to be in disagreement with statements I1 and I2 with a mean of 2.625 and 2.281

Table 5.11: Current practice of retentions – Post hoc Tukey –B's test

Current Practices	Groups	N	Subset for alpha = 0.05			Comment
			1	2	3	
I1	Subcontractors	108	1.486			Between ' strongly disagree' and 'disagree'
	Head contractors	34		2.625		'neither agree nor disagree'
	Client - Consultants	42			3.158	'neither agree nor disagree'
I2	Subcontractors	109	1.336			'strongly disagree'
	Head contractors	34		2.281		'disagree'
	Client - Consultants	43			3.054	'neither agree nor disagree'
I3	Client - consultants	38	2.237			'disagree'
	Head contractors	32		3.469		Between 'neither agree nor disagree and 'agree'
	Subcontractors	108		3.833		'agree'
I4	Client - consultants	38	3.105			'neither agree nor disagree'
	Head contractors	32		3.849		'agree'
	Subcontractors	108			4.546	Between 'agree' and 'strongly agree'
I5	Head contractors	32	3.375			'neither agree nor disagree'
	Subcontractors	108	3.667	3.667		Between 'neither agree nor disagree' and 'agree'
	Client - consultants	36		4.056		'agree'
I6	Client - consultants	38	3.763			Between 'neither agree nor disagree' and 'agree'
	Head contractors	32		4.219		'agree'
	Subcontractors	108		4.569		Between 'agree' and ' strongly agree'
I7	Client - consultants	37	2.784			Between 'disagree' and 'neither agree nor disagree'
	Head contractors	31		3.645		Between ' neither agree nor disagree' and 'agree'
	Subcontractors	108			4.259	'agree'
I8	Client - consultants	38	2.368			'Disagree'
	Head contractors	32		2.875		'neither agree nor disagree'
	Subcontractors	108			3.537	Between ' neither agree nor disagree' and 'agree'
I9	Client - consultants	38	2.868			'neither agree nor disagree'
	Head contractors	32	3.125			'neither agree nor disagree'
	Subcontractors	107	3.122			'neither agree nor disagree'
I10	Client - consultants	38	3.079			'neither agree nor disagree'
	Head contractors	32		3.686		Between ' neither agree nor disagree' and 'agree'
	Subcontractors	108			4.370	'agree'
I11	Client - consultants	47	3.352			'neither agree nor disagree'
	Head contractors	32		4.219		'agree'
	Subcontractors	108		4.500		Between 'agree' and 'strongly agree'
I12	Client - consultants	38	3.211			'neither agree nor disagree'
	Head contractors	32		4.125		'agree'
	Subcontractors	108			4.569	Between 'agree' and 'strongly agree'
I13	Client - consultants	36	3.361			'neither agree nor disagree'
	Head contractors	32		4.000		'agree'
	Subcontractors	108			4.491	Between 'agree' and 'strongly agree'

respectively. The client-consultant group on the other hand do not seem to disagree neither agree with the two statements with mean values of 3.158 and 3.054 respectively. Client-consultants disagree with statement I3 whereas the head contractors partially agree and subcontractors agree that the practice of retentions is just traditional and there is no rational attached to the practice. In relation to I4 the views of the subcontractors are 'between agree and strongly agree' (M=4.546) that they are the ones who bear the whole burden of the practice. Contractors too agree with the statement I4 (M=3.849) whereas client-consultants 'neither agree nor disagree'. Lastly in relation to I5 the only group in agreement with are the client-consultants with a mean of 4.056. The head contractors and subcontractors on the other hand seem to 'neither agree nor disagree' with mean values of 3.375 and 3.667 respectively. A closer look at the mean value of subcontractors however suggests that their opinion seems to be between 'neither agree nor disagree' and 'agree'.

For further analysis statements related to the issues (I6 – I13) with a mean value greater than 3.5 ($M \geq 3.5$) are considered as important. Issues I7, I10, I11, I12 and I13 seem to be significant for the contractors and subcontractors with mean values greater than 3.5. Whereas for the same issues the opinion of the client/consultants group is in between i.e. neither agree nor disagree. I6 has been identified as an important issue by all the three groups with a mean value greater than 3.5 for all the three groups. Whereas in relation to I9 all the three groups hold similar opinion i.e. 'neither agree nor disagree' and with a mean value of less than 3.5 the issue is not considered as important. Issue I8 seems to be significant only for the subcontractor group with a mean value slightly greater than 3.5. Client-consultants seem to disagree with statement I8 whereas contractors seem to neither agree nor disagree with mean values less than 3.5.

5.4.4 Contractor and subcontractor specific questions

Retentions affect contractors and subcontractors the most because they are the ones whose money is held back from progress payments and are the ones who bear any negative effects of the practice. Therefore the aim of this section is to present specific information from contractors and subcontractors in relation to the current practice and issues specific to them. For the purpose of comparison each question has been presented and analysed side by side for the two groups. The following subsections present the

analysis for each question as presented in the questionnaire.

5.4.4.1 Percentage of retention withheld on contracts

Participants were asked to indicate the percentage of retentions which was usually withheld on the contracts undertaken. The question had multiple choices with three options. A fourth option (open ended) was also provided for any other responses other than the ones stated on the list. Table 5.12 lists out the summary of responses as follows:

Table 5.12: Rate of retention

Rate or percentage of retention withheld	Contractor Responses		Subcontractor Responses	
	N	Percentage	N	Percentage
5%	3	9%	5	5%
10%	12	35%	64	58%
Sliding scale as per NZS3910	18	53%	35	32%
Other	1	3%	5	5%

All 34 participants belonging to the contractor group answered the question. As seen in Table 5.12 more than half of the contractors said that retentions are held as per the sliding scale as stated in NZS3910. 35% of the respondents said that 10% of retentions were withheld from the payments made whereas only 9% said that 5% was deducted. Only 1 respondent chose the other option and stated that;

"the percentage varies depending on the project and the risk involved. Sometime 0% is retained".

Among the subcontractor group a total of 101 responses were received out of which majority i.e. 58% said that retentions are held at a rate of 10%. 32% stated that retentions are held as per the sliding scale and only 5% said that 5% retention is deducted from the progress payments. 5 subcontractors gave responses other than the ones in the list and are presented as follows;

"0-10%"

"0% - never perform a contract with retentions"

"If I have retentions they are commonly 10%"

"Scale on subcontracts over $1.5Million – we need to insist, never 10%"

"Some builders do not hold just the maintenance retention they hold the full 10% until final payment"

5.4.4.2 Percentage of retentions released at practical completion

Respondents were asked to indicate the percentage of retentions which was usually released at the time of practical completion. The question had multiple choices with three options. A fourth option (open ended) was also provided for any other responses other than the ones stated on the list. Table 5.13 lists out the summary of responses as follows:

Table 5.13: Percentage of retention released at practical completion

Percentage of retention released at practical completion	Contractor Responses		Subcontractor Responses	
	N	Percentage	N	Percentage
40%	3	9%	10	9%
50%	21	66%	70	64%
60%	6	19%	2	2%
Other	2	6%	20	25%

A total of 32 responses were received for this question from the contractor group. More than half of the participants of the contractor group said that 50% of retentions are released at the time of practical completion. 15 % said that 60% of retentions are released at the time of practical completion whereas only 9% stated a release of 40% upon practical completion. Only 2 responses were recorded under the other category out of which one said that 100% of retention is released at practical completion. One response under the other category stated that "it depends on the contract maybe 40%".

Amongst the subcontractor group a total of 102 responses were received. 64% respondents stated that 50% retention is released at the time of practical completion. Whereas only 9% and 2% stated that 40% and 60% retentions are released at the time of practical completion. 25% of the subcontractors responded under the other category and stated answers not provided on the questionnaire list. 7 respondents stated that none or 0% retention is released at practical completion. Other responses provided are listed as follows;

- "1 Months after PC"
- "3 months from payment date"
- "50% after 3 months"
- "50% where they are held"
- "It hardly ever is, just as common for full retention amount to be carried for

entire DLP".

- "If you are lucky"
- "Maybe but seldom 5%"
- "None normally 12 months later"
- "None until 6 months then 50% of retentions"
- "Sometimes not always"
- "Varies between 40%-50%"
- "Very seldom on time"
- "We try and get early 100% release due to our trade risk, generally works out OK".

5.4.4.3 Duration of Defects Liability Period (DLP)

Respondents were asked to indicate the duration of the DLP upon which the total retentions are released. The question had multiple choices with three options. A fourth option (open ended) was also provided for any other responses other than the ones stated on the list. Table 5.14 lists out the summary of responses.

A total of 31 responses were received for this question from the contractor group. More than half of the participants (62%) said that the usual length of DLP is 12 months upon which total retentions are released. 13% stated the DLP to be 3 months and only 6% said that the DLP was 6 months. A total of 6 responses were recorded under the other option out of which 3 stated that the DLP can vary depending on the type of project. Other 3 responses are as follows;

- "Services could be 6 -12 months"
- "Sometimes 24 months on infrastructure projects"
- "Varies on the type of project and economic condition"

Table 5.14: Duration of DLP

Duration of DLP upon which total retentions are released	Contractor Responses		Subcontractor Responses	
	N	Percentage	N	Percentage
3 months	4	13%	6	6%
6 months	2	6%	13	12%
12 months	19	62%	78	71%
Other	6	19%	12	11%

From the subcontractor group a total of 102 responses were received for this question

out of which 71% stated the DLP to be 12 months. 12 % chose the 6 months option and only 6% said that it is 3 months. 12 respondents provided responses other than the ones listed and are as follows;

- "1 TO 3 years"
- "12 months for performance bonds"
- "24 months"
- "90% of our retentions are paid before Practical Completion"
- "Depends on contract terms"
- "Depends on size of contract"
- "Generally longer than 12 months"
- "12 months or longer"
- "12 Plus a month or two waiting time"
- "Retentions often released a lot later than 12 months DLP".
- "The market rarely prices the increased DLP costs"
- "Varies"

5.4.4.4 The withholding and release of retentions

Under this section four different questions were asked to identify the frequency at which retentions are withheld, paid or not paid out on time and the frequency at which retentions are lost altogether. The response options were on a 1-5 scale with 1 being never and 5 being always. The analysis of the 4 questions is as follows:

How often are retentions withheld on the contracts undertaken? - As seen in Figure 5.5the responses from both the contractor and subcontractor group are almost similar. 46% of the respondents of the contractor group and 50% of the subcontractor group stated that retentions are most of the times held from the contracts undertaken. 25% of the contractors and 18% of the subcontractors said that they are always held. Whereas 18% of the contractors and 22% of the subcontractors said that retentions are held sometimes. Only 11% contractors and 9% subcontractors said that retentions are rarely withheld on the contracts undertaken. None of the respondents of the contractor group stated that retentions are never held on the contracts undertaken whereas only 1% of the subcontractors held that opinion.

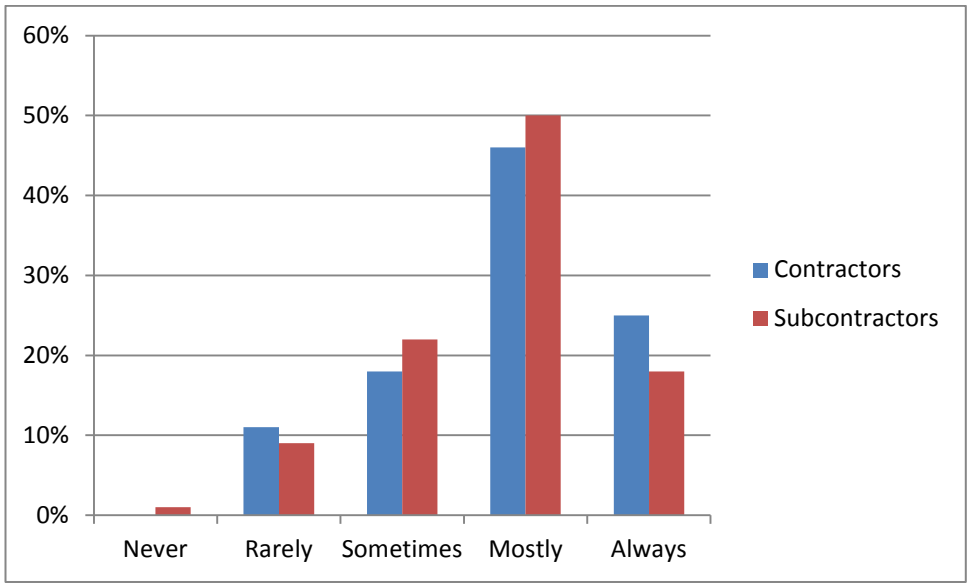


Figure 5.5: How often are retentions withheld on the contracts undertaken?

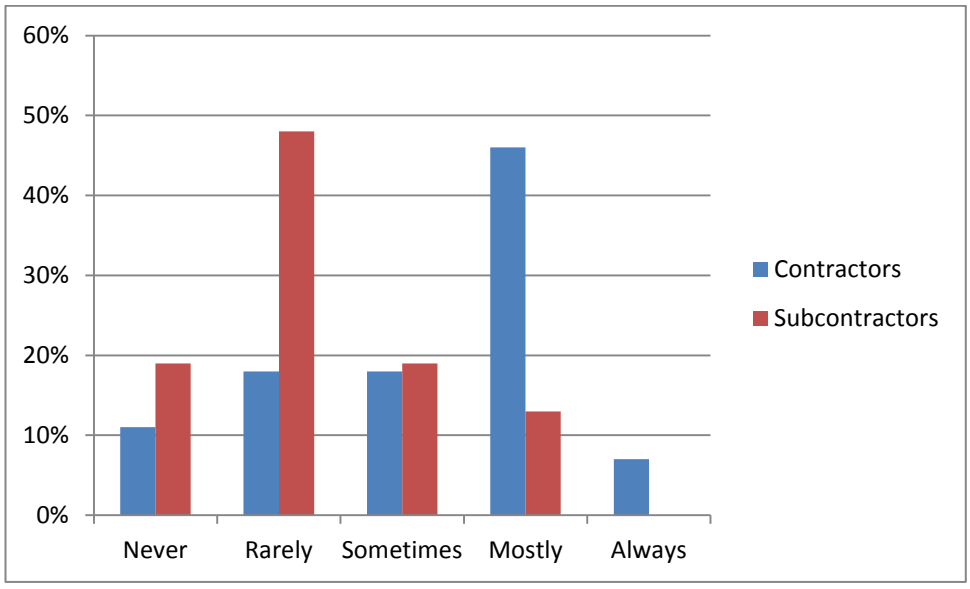


Figure 5.6: How often are retentions paid out on time

How often are retentions paid out on time?– As seen in Figure 5.6the opinions of the contractor and subcontractor in relation to this question are different. 46% of the contractors stated that retentions are 'mostly' paid out on time which is in contrast to the subcontractors view. 48% of the subcontractors said that retentions are 'rarely' paid out on time. Only 7% contractors said that they are paid out 'always' on time whereas none of the subcontractors held the same opinion. 18% each of the contractor group were in the favour of retentions being paid out 'rarely' or 'sometimes' on time. Whereas 19%

each of the subcontractor group said that retentions are either 'sometimes' or 'never' paid out on time. 11% of the respondents of the contractor groupdid state that retentions are 'never' paid out on time and only 13% of the subcontractors said that they are 'mostly' paid out on time.

How often are retentions not paid out on time? – On being asked about retentions not being paid out on time the opinions of the contractors and subcontractors were not similar as seen in Figure 5.7. 43% of the contractors said that it happens 'rarely' that retentions are not paid out on time and only 5% of the subcontractors held the same opinion. In contrast to that 53% of the subcontractors stated that it happens 'mostly' that retentions are not paid out on time and 29% of the contractors held the same view. Only 4% of the contractors chose the 'always' option whereas 17% of the subcontractors held the opinion that retentions are 'always' not paid out on time. 18% of the contractors and 23% of the subcontractors said that 'sometimes' retentions are not paid out on time. Only 1% of the subcontractors chose the 'never' option and 7% of the contractors held the same view.

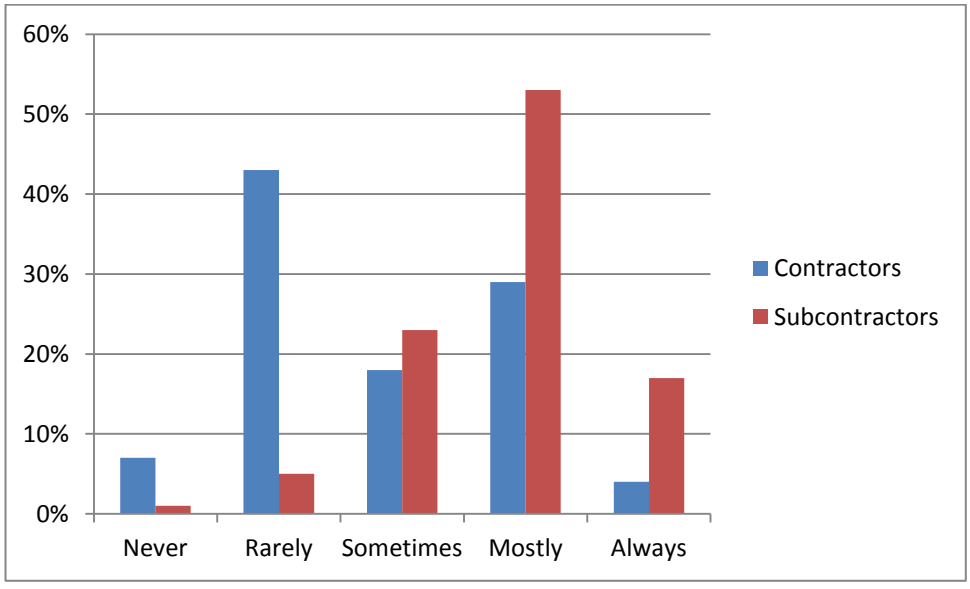


Figure 5.7: How often are retentions not paid out on time?

How often have retentions been lost all together? – Figure 5.8 below shows the responses for how often have retentions been lost all together. Majority of the contractors equalling 46% said that it has 'never' happened and only 12% of the subcontractors held the same view. 44% and 43% of the subcontractors respectively

stated that retentions are 'rarely' or 'sometimes' lost all together. 32% and 21% of the contractors respectively stated that retentions are 'rarely' or 'sometimes' lost all together. Only 1% of the subcontractors and none of the contractors said that it 'mostly' happens.

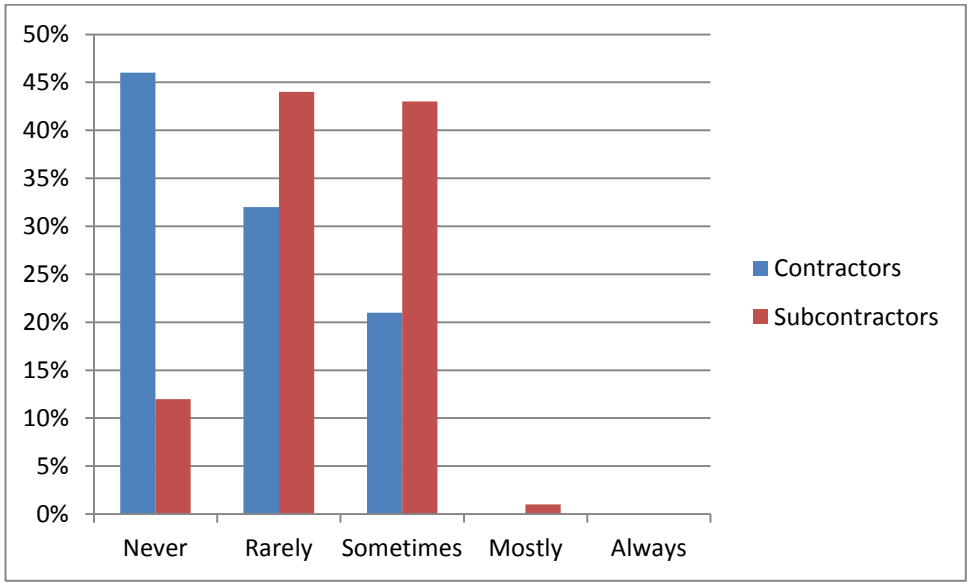


Figure 5.8: How often have retentions been lost altogether?

5.4.4.4.1 The amount of retentions

In this section respondents (contractors and subcontractors) were asked five different questions to identify retentions in terms of a $ amount withheld. Respondents were first of all asked to indicate the annual turnover of their company followed by the amount of retentions held by their client/contractors at that point of time. Respondents were then asked to specify the percentage of retention which was overdue and the proportion which was not yet due from the amount of retentions held. Finally the respondents were asked to indicate the longest they have waited in terms of months or years to collect their retentions. The response rate for this question was low. Only 19 respondents of the contractor group and 99 of the subcontractor group provided answers to this section. Out of which some respondents chose not to answer part of the questions. The responses have been tabulated and presented in Table 5.15 for contractors and 5.16 for subcontractors.

As seen in Table 5.15 for contractors the annual turnover of the companies is ranging from $1 Million to $1 Billion. In terms of the amount of retention held at that point of time the values ranged from as low as $50,000 to as high as $4.2 Million depending on

the annual turnover. From the responses of the contractors the proportion of overdue retentions does not seem to be significant. However it was by contrast highly significant in two cases (one where the amount of retentions overdue is 50% and second 30% equalling an amount of $500,000 and $70,000 respectively). The others are either 10% or less or none at all. For majority of the respondents the proportion of retentions which was not due (from the retentions held) was mostly 100%. In relation to the longest time a company has waited to receive their retentions back there were a range of answers starting from as low as 1 month to as long as 3 years. However the average wait time calculated from the responses received equals to 12 months which is a fairly significant time frame to get back the retention monies which actually belongs to the contractors.

Data for the subcontractors has been tabulated in Table 5.16 with the annual turnover of the companies ranging from as low as $180,000 to as high as $44 Million. With regards to the amount of money held up by contractors as retentions the amount as shown in the table is very significant with values ranging from thousands to million of dollars. The values for the proportion of overdue retentions are also very high ranging from a low of 10% to as high as 100%. On calculating the value of the overdue retentions, the total of the responses provided added up to $6,603,422.In relation to the longest wait time to receive retentions the numbers ranged from as low as 3 months to as high as 10 years with most of the responses showing a wait period of more than 12 months. Out of the responses received an average weight time to receive retentions back was calculated to be 24 months.

Table 5.15: The amount of retentions (contractors)

Respondent ID	Annual turnover($)	Amount of retentions held by client($)	Proportions of retentions overdue	Proportion of retention not yet due	Longest time waited to collect retentions
C2	20Million	50,000	0%	100%	I have experienced 12 months over without due justification. But given the size and weight of the companies I have worked for issues are elevated and resolved at senior levels.
C3	1Billion	Including bonds it would be in Millions	Can't say	Can't say	N/A
C4	218 M for our division	4.2 for our division, the balance of security is provided by bonds in lieu of retentions	0%	100%	12 Months
C5	15 Million	150,000	Nil	100%	18 Months
C6	30 Million	200,000	10%	90%	5 Months
C7	5Million	134,247	0%	134,247	N/A
C8	30Million	Not sure	Not sure	Not sure	18 Months
C9	115 Million	Not sure	N/A	N/A	36 Months
C10	10 Million	$659,768 in retentions and performance bonds	0%	100%	6 Months
C11	8 Million	200,000	4%	96%	N/A
C12	100 Million	Not sure	N/A	N/A	Over a year
C13	20Million	500,000	10%	90%	1 Month
C14	30 Million	1Million	0%	100%	12 Months
C15	35 Million	About 1 Million	50%	50%	3 Months
C16	30 Million	Varies with workload	10%	90%	9 Months

		and the stage of completion of each project			
C21	10 Million	250,000	0%	100%	2 Years
C22	18 Million	800,000 plus GST	200,000 plus GST	600,000 plus GST	3 Months
C24	2 Million	2% of turnover	30%	70%	N/A
C31	1Million	50,000	10%	90%	1 Year

Table 5.16: The amount of retentions (subcontractors)

Respondent ID	Annual turnover($)	Amount of retentions held by client($)	Proportions of retentions overdue	Proportion of retention not yet due	Longest time waited to collect retentions
SC1	2 – 3Million	$200,000	37%	63%	Anything from 1 - 13 months
SC2	30 Million	Lots but a fraction of lag and negotiation losses of variations which are by far larger (?) $ burden on subs - I have done this 30 years with several very different subtrades.	20%	80%	2 years
SC3	4.6 Million	including the Mainzeal monies $680k	60% (given some of this is Mainzeal)	40%	Generally 2 months after the 12 month period. We chase immediately, but you have no clout the work is done you can't threaten to with hold labour.
SC4	6 Million	30000	0	100%	2 1/2 years
SC5	6 Million	$187,600	$99,457	$88,157	3 years and waiting
SC6	11Million	898,000	25%	75%	2 - 3 years
SC7	10Million	740,000	20%	80%	36 months
SC8	6 Million	350,000	30%	70%	2.5 yrs
SC9	860,000	3160	$230	$2930	3 months
SC10	1.2Million	27,422	30%	70%	2+ years
SC11	3 Million	650,000	250,000	400,000	30 months
SC12	2.5 Million	Appx 20,000	40%	40%	18 months
SC13	300,000	8,000	70%	30%	16 months
SC14	Confidential	NA	NA	NA	2years

SC15	2 Million	Nil	NA	NA	around 12 months
SC16	8Million	0	0	0	0
SC17	3 Million	Nil	NA	NA	6months
SC18	4 Million	nil	NA	NA	2yrs
SC19	1 Million	Nil	Nil	Nil	2 Years
SC20	500,000	Nil	Nil	Nil	8 months
SC21	Confidential	0	NA	NA	18momths
SC22	3.6 Million	170,000	65%	35%	Up to 18 months
SC23	4 Million	330,000	40%	60%	18 months from PC
SC24	600,000	10,000	50%	50%	6 months
SC26	12Million in contract work PA that has retentions applicable. Other service related and small work does not have retentions applicable.	1,439,000 (note this represents work completed over more than an annual period (some contracts go for 2-3 years), but does show you how much retetion builds up for subcontractors.	382,000 overdue by greater than 3 months (27% overdue)	1,057,000	Up to 2 years aftre retetions due.
SC27	500,000	0.00	NA	NA	3 years
SC28	20 Million	50,000	80%	20%	10 years
SC29	12 Million	626,000	60%	40%	up to 12 to 18 months after warranty period has ended
SC30	5 to 6 Million	Fluctuating	Information not available at this time	NA	Over a year
SC31	16Million	1.2M	30%	70%	3 Years

SC33	9Million	500,000	100 %	0%	5 Years
SC34	12 Million	280,000	80%	20%	1 year
SC35	40 - 45 Million	1.5 - 2.0 Million	-	-	3 years
SC36	6 Million	180,000	20%	80%	24months
SC37	2.25 Million	Not much 8000	0%	All	3 Years to Mainzeal, now written off.
SC38	2.5 Million.	83,536plus gst	23%	67%	Two years five months.
SC39	5 Million	186,000	10%	90%	5 years
SC40	4 Million	60,000	10%	90%	2 years
SC41	4.5 Million	150,000 + GST	Too Hard -Guess at 20%	Guess 80%	Currently 1 Years and 9 months
SC42	5Million	Appx200,000	60%	40%	12 months and counting for $30K
SC43	40Million	120,000	10%	90%	1 year
SC44	40Million	2Million	30%	70%	Appx 2 Years
SC45	3Million	200,000	10,000	190,000	2 years
SC46	10 Million	about 600,000	30%	70%	At least 12 months after retentions were due
SC47	10Million	0	NA	NA	6 months
SC48	24Million	840,000	25%	75%	15 months
SC49	_	_	_	_	3 years
SC50	12 Million	_	_	_	3 years
SC51	12 Million	761,841	18.3%	81.7%	21 months
SC52	12 Million	200,000	10%	90%	-
SC62	3 Million	148,000	10%	80%	4 months
SC63	Appx 3.5-4 Million	Appx 200,000	10%	90%	18 months (Bear in mind we track our retentions very closely)
SC64	25Million	-	-	-	-
SC65	1.5Million	20,000	40%	60%	14months
SC66	1 Mil	20,000	None	100%	2yrs

SC67	Confidential	-	-	-	12 months, the odd one has drip fed upto 18 months
SC68	1.5 Million	150,000	20%	80%	12 months
SC69	$1Million	60-70,000	30%	70%	2 years
SC70	6Million	110,000	$45,000	$65,000	Appx 30 months
SC71	1.5Million	0	0	0	6 months
SC72	1.2Million	Zero, we refuse to accept them	NA	NA	15months
SC73	180,000	8000	100%	NA	3 years
SC74	300,000	NONE	NA	NA	NA
SC75	2 Million	60,000	Nil	100%	2 years
SC76	10 Million + gst	400,000	150,000.00	-	2years 6 months
SC77	10 Million	150,000	5%	95%	2 years
SC78	1.5 million	100,000	70%	30%	2-3 years
SC79	4 Million	100,000	75%	25%	24 Months
SC80	4Million	40,000	25%	75%	For ever never received due to company failures
SC81	7.5 Million	292,423	$292,378	$4,500	Three years
SC82	3.5 Million	30,000	-	-	-
SC83	700,000	0	NA	NA	5 years
SC84	500,000	38,000	30%	70%	16 months
SC85	No comment	2500	Nil	2500	3 months
SC86	1 Million	35,00	100%	0%	1.5 years
SC87	3 Million	60,000	0	100%	18 months
SC88	3.5Million	300,000	150,000	150,000	6 months
SC89	600,000-700,000	0	NA	NA	2 yrs
SC90	1.6 Million	60,000	50%	50%	2 Years
SC91	Confidential	NA	NA	NA	1 year
SC92	Confidentail	NA	NA	NA	18 months
SC93	N/A.	n/a	80%	20%	21 months, on a job that had a contract period of 8 months
SC94	480,000	$5,000	50%	50%	18 months
SC95	2.5Million	N/A confidential	30%	70%	24mths

SC96	2 Million	13,500	-	-	-
SC97	4Million	500,000	15%	85%	2 years
SC98	10 Million	350,000	10%	90%	Never Paid - we have lost a lot of retentions due to liquidations. Big values to Mainzeal and to Alliance.
SC99	10 million	420,000	40%	60%	Two years
SC100	1.7Million	90,000	45%	55%	Still waiting for some, usually relating to failure of the company holding the retention.
SC101	9 Million	300,000	100,000	200,000	2 years
SC102	44 Million	A substantial amount	60%	40%	24 months after due date
SC103	10million	Confidential	70%	30%	2 years
SC104	Confidential	NA	NA	NA	2 years
SC105	500,000	30,000 to 40,000	50%	50%	24months +
SC106	4 Million	150,000	50%	50%	4 months
SC107	5 Million	Nil	Nil	Nil	15 Months
SC108	10 Million	700,000	20%	80%	2 years
SC109	3 Million	85,000	15,000	70,000	Main contractors have gone into receivership and we havent been paid at all
SC110	10 Million plus	400,000	30%	50%	2 years

5.4.4.5 Retention issues specific to contractors and subcontractors

In this section participants' opinion was sought regarding the different issues related to the practice specific to the contractors and subcontractors. Respondents' were asked to indicate the extent of their agreement or disagreement with the stated problems as identified from the literature. The purpose of the section was to identify the significance of the issues associated with the contractors and subcontractors. The significance was tested using descriptive statistics (mean and standard deviation). According to the mean values obtained from the descriptive statistics, the significant issues with a mean value greater than 3.5 ($M \geq 3.5$) are shown in bold text as seen in Table 5.17 and 5.18. The issues have also been ranked 1 to 10 (for contractors) and 1 to 9 (for subcontractors) depending on their mean values in descending order of their means.

Table 5.17: Contractors' views in relation to retention issues

Rank	Issues	N	Mean	Std. Error	Std. Deviation
1	**The main issue with retentions is that the money is not secure.**	34	4.00	0.178	0.943
2	**The main issue with retentions is the huge amounts of unsecured money held for long periods of time.**	34	3.93	0.170	0.900
3	**The process of holding a performance bond as well as retentions by the client on the contractor is unfair for the contractors.**	34	3.89	0.226	1.197
4	**Retentions being lost altogether is very common in case the client goes bust.**	34	3.71	0.204	1.083
5	**Retentions would work well if the contractor's money was held securely.**	34	3.64	0.220	1.162
6	**The deduction of retentions causes serious cash flow issues for the contractor.**	34	3.64	0.187	0.989
7	**A lot of contracting firms have limited understanding of the contractual procedures and therefore they fail to get their retentions released on time.**	34	3.57	0.208	1.103
8	Retention is a fair practice if it would work the way it was meant to work.	34	3.48	0.202	1.051
9	The main issue with retentions is that they are not released on time.	34	3.39	0.208	1.100
10	Client's abuse of contractor's retentions is widespread.	34	2.89	0.195	1.031

Table 5.18: Subcontractors' views in relation to retention issues

Rank	Issues	N	Mean	Std. Error	Std. Deviation
1	**The main issue with retentions is the huge amounts of unsecured money held for long periods of time.**	96	4.40	.076	.747
2	**Retentions being lost altogether is very common in case of contractor insolvency.**	97	4.38	.077	.756
3	**The main issue with retentions is that the money is not secure.**	98	4.30	.087	.864
4	**Contractors use subcontractor's retentions to finance their subsequent projects.**	86	4.20	.087	.809
5	**Contractors abuse of subcontractor's retentions is widespread.**	98	3.91	.092	.909
6	**The main issue with retentions is that they are not released on time.**	98	3.80	.098	.973
7	**A lot of sub contracting firms have limited understanding of the contractual procedures and therefore they fail to get their retentions released on time.**	98	3.65	.102	1.006
8	**Retentions would work well if the subcontractor's money was held securely.**	98	3.59	.111	1.101
9	Retention is a fair practice if it would work the way it was meant to work.	96	2.85	.131	1.281

Apart from the listed issues afew more issues were highlited under the other (open ended) option by few subcontractors and are quoted as follows;

"It is not subcontractors not understanding the procedures, it is simply main contractors not releasing monies when it falls due as they collect interest on it, or are waiting for an influx of retentions from other projects to fill the holes of the money they have used to finance their current projects. Retentions are a cashflow for main contractors, they hold back more off subbies than the client holds off them".

"Because the person completing this questionnaire is very distrusting of main contractors our company does very little tender work and where possible we do the work directly for the client. At the moment we have no tender work on our books and it is our intention to continue this policy as much as possible".

"It's no use having retentions secure if they are still not paid on time".

"A number of items above talk about fair practice. For retentions to continue these need to be both secured and value reduced as a total no greater than that being held on the builder (for the subcontractors work). This value needs to be less than current practice. e.g. 10% for the first $200k. I can't remember the last time we had a profit margin anywhere near 10%, therefore we are cash funding our work until retentions are released".

"Retention monies also used as a tool for the contractor to get a discount at the time of release i.e.; if you agree to a lesser amount then the retention monies will be paid out".

"Most Contractors play dumb when it comes to releasing retentions, and want 20 types of

proof in triplicate that they owe you money in the first place. I have never failed to collect retentions from a solvent company, because we document carefully and keep chasing till we get paid. It is a waste of Admin resource, and yet another cost that cannot be costed against the job it should apply to".

"There is a lot of wasted time spend on trying to get retentions released. This effort would be better spent on building the business and growing rather than chasing QS for back money. Often the amount held as retentions is far greater than potential profit so subbies are subsidizing the client by default, even without taking into the possibility of the contractor going bust and taking the retention pool with them. Very unfair form of business and we hope your research manages to highlight the problem and the construction industry manages to shake this off and move to a better system".

"Main Contractors are now increasing the percentage of retentions to 10%. Combined with poor payment practice this starts affecting cashflow".

"In the case of Main Contractor failing (eg Mainzeal) subcontractors are unlikely to receive any money from receivers, however they are".

"Most financial packages do not handle retentions well, so the values are rarely agreed".

"It is widely known in our area that builders have the retentions released to them by the principle. They write out a cheque to the subbie for the retention amount. They do not send the cheque to the subbie until it gets nasty. They claim the GST and tax back on the unpresented cheque and use the subbies money and interest on the money. This practice is causing the small firms to fold".

"The amount of retentions held, 10% is unrealistic a 5% retention is more practical."

"Again - the problem with retentions is basic - the money already earned by one company is being used to finance another company at 0% interest with no security that the funds will ever be paid".

5.5 Costs vs. benefits of retention practice

At the surface of the whole retention debate it feels that the costs of the practice are higher than the benefits accrued. The intention of this section therefore is to gather opinion from the three groups i.e. clients, contractors and subcontractors regarding the advantages (benefits) and disadvantages (costs) of the retention practice and weight if the costs are greater or the benefits. The section has two parts; in the first one respondent's were asked to weight the costs as against the benefits of the retention practice. In the second section respondents' level of agreement or disagreement was sought with regards to a list of advantages and disadvantages in relation to the practice

of retentions as identified in the literature.

5.5.1 Weighing costs and benefits

Respondents were asked two questions both related to weighing costs and benefits of retentions. The first question was to choose from the four given options; the options being the benefits outweigh the costs, the costs outweigh the benefits, the benefits and costs are somewhat equal and not sure. The second question was related to weighing costs and benefits in terms of a ratio i.e. out of a 100% how much would they give to costs and how much to benefits. The respondents had to choose from five given options; the options being costs:benefits equals 70:30, 60:40, 50:50, 40:60, 30:70, with the option of giving any other input apart from the ones provided in the list. The analysis was carried out by comparing the opinions of the three groups by calculating percentages and is presented as follows;

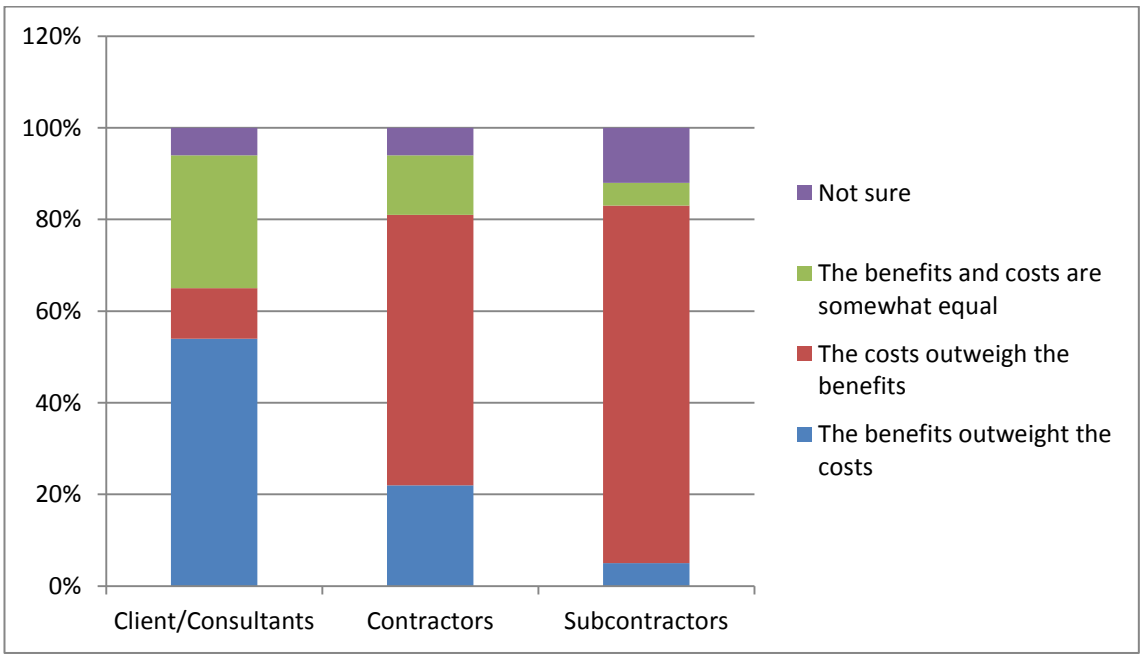


Figure 5.9: Weighing costs and benefits

Figure 5.9 above illustrates in terms of percentage the opinions of the three groups in relation to the costs and benefits of the retention practice. It can be seen that the opinions of the three groups are significantly different. Majority of the respondents of the client/consultant group (54%) believe that the benefits of the retention practice outweigh the costs, whereas 22% of the contractors hold the same opinion. On the other hand only 5% of the subcontractors believe that the benefits of retentions outweigh the

costs associated with the practice. In relation to the second option 78% of the subcontractors and 59% of the contractors hold the opinion that the costs outweigh the benefits. Whereas only 11% of the respondents from the client/consultant group hold the same view. 29% of the survey participants of the client/consultant group believe that the benefits and costs of the practice are somewhat equal and only 13% of the contractors and 5% of the subcontractors hold the same view. 6 % of the client/consultants, 6% of the contractors and 12% of the subcontractors were not sure about the response to this question.

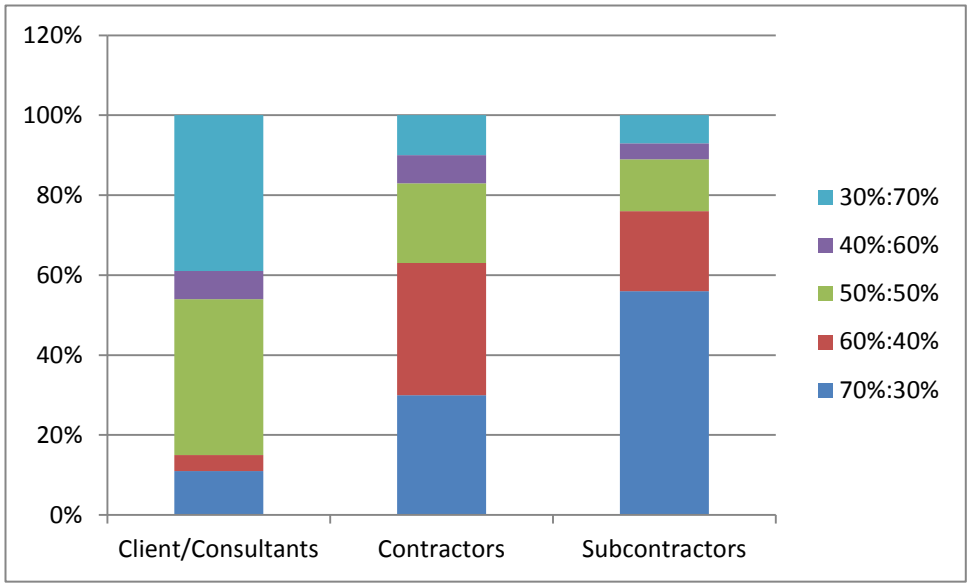


Figure 5.10: Weighing costs and benefits in terms of a ratio

Figure 5.10 above illustrates in terms of a ratio the costs and benefits of the retention practice as presented for the three groups. The views of the three groups are significantly different for this question too. A majority of the subcontractors (56%) said that the ratio of costs to benefits of retentions is 70%:30% whereas 30% of the contractors and only 11% of the client/consultants agreed to the same view. The next option was a cost to benefit ratio of 60%:40% to which 33% of the contractors and 20% of the subcontractors agreed. Only 4% of the clients/consultants held the same opinion. 39% of the client/consultants thought that the cost to benefit ratio is equal i.e. 50%:50%, whereas 20% of the contractors and 13% of the subcontractors held the same view. The next option was a ratio of 40%:60% i.e. the benefits outweigh the costs slightly to which only 7% each of the client/consultants and contractors and 4% of the subcontractors agreed. The last option was the 30%:70% cost to benefits ratio 39% of the

client/consultants followed by 10% of contractors and 7% of the subcontractors held the same opinion. Respondents also had the option of providing any other response other than the ones stated on the list and are presented as follows;

- "As there are no benefits the ratio is 100:0"
- "If retentions secure, 30:70"
- "99:01"
- "Retentions require working capital or borrowings. There is NO benefit of retentions to a sub-contractor".
- "I'd rate 15:85".
- "100:0 There are no benefits"
- "There is no benefit to a subcontractor at all".
- "I can see no benefit of retentions over a bond system once the contract has been finished".
- "100:0 until the funds are kept secure. Then it would be 50:50".
- "90:10"

5.5.2 Costs vs. benefits: Participant views

In this section participants' opinion was sought regarding statements in relation to the costs and benefits or in other words disadvantages and advantages of the retention practice. These were identified from the literature and from the experts interviewed in the first phase of data collection. Participants were asked to indicate the extent of their agreement or disagreement with the stated statements. Three groups were considered for the analysis of this question too. One-way ANOVA was carried out to find out the difference in opinion of the three major groups regarding the different statements about the costs and benefits of the retention practice. To determine the differences the following hypotheses were tested. The criterion for accepting or rejecting the hypothesis was set as .05. If the p-value is less than .05, the null hypothesis is rejected. The results of the ANOVA are given in Table 5.19. The results showing the values of df equal to 2 and a p value of less than .05 confirms the rejection of the null hypothesis.

H_0: $\mu_1 = \mu_2 = \mu_3$; all population means are equal.

Alternative hypothesis is that at least one of the means is different.

Table 5.19: One-way ANOVA – Costs vs. benefits: participant views

Code	Statements regarding current practice	df	F	Sig.
CB1	By and large the practice of retentions is beneficial to the whole construction supply chain.	2	22.705	.000
CB2	Retentions help in improving the productivity of the construction industry by incentivizing performance.	2	27.100	.000
CB3	Retention is a good practice if it would work the way it was meant to be.	2	13.501	.000
CB4	Retentions encourage bad practice of using other participant's money rather than as an incentive for quality work.	2	17.116	.000
CB5	Contractors and subcontractors build in the price of retentions into their bid price, thus increasing project cost and the client ending up paying for it.	2	3.696	.027
CB6	Retentions encourage bad payment habits.	2	31.269	.000
CB7	Retention wipes out the already marginal profit margin placing significant pressure on contractors/subcontractors.	2	26.859	.000
CB8	Retention increases subcontractor and contractor financial failures.	2	28.168	.000

The rejection of the null hypothesis further suggests that the mean values of the three groups are statistically different in relation to each statement related to current status of retentions in New Zealand. The statements have been labelled as CB1 - CB8 in Table 5.19 for further analysis and reference. The results of the one way ANOVA do not inform where the actual difference exists among the groups. Therefore to find out the differences that exist among the groups in relation to each statement Post-Hoc Tukey-B's test was performed.

The results of the Tukey-B's test are presented in Table 5.20. The respondents' perceptions as observed are presented in the Table under the comments column. An overall view of table 5.20 suggests that the difference in opinion of the three major groups with regards to each statement about the costs and benefits is statistically significant. The first three statements in Table 5.19 and 5.20 are the benefits or the advantages of the practice and the rest five are the costs or the disadvantages associated with the practice.

As observed in Table 5.20 in relation to statements CB1 and CB2 the subcontractors with a mean of 1.888 and 2.0respectively seem to be in disagreement with the two statements. In their opinion the practice of retentions is not beneficial to the whole construction supply chain and that retentions do not help in improving the productivity

of the construction industry by incentivising performance. The contractor and the client-consultant group on the other hand 'neither agree nor disagree' with statement CB1. However contractors share the same opinion as subcontractors with regards to CB2 whereas the client-consultant group's opinion is between 'neither agree nor disagree' and 'agree'. Further with regards to statement CB3 the opinions of the three groups are slightly different. The subcontractors 'neither agree not disagree' with statement CB3 whereas the contractors opinion is slightly different being between 'neither agree nor disagree' and 'agree'. The clients however agree that retentions is a good practice if it would work the way it was meant to be.

Table 5.20: : Costs and benefits of retentions – Post hoc Tukey –B's test

Current Practices	Groups	N	Subset for alpha = 0.05			Comment
			1	2	3	
CB1	Subcontractors	110	1.888			'disagree'
	Head contractors	34		2.710		'neither agree nor disagree'
	Client – Consultants	43			3.222	'neither agree nor disagree'
CB2	Subcontractors	110	2.000			'disagree'
	Head contractors	34	2.226			'disagree'
	Client – Consultants	43		3.529		Between 'neither agree nor disagree' and 'agree'
CB3	Subcontractors	110	2.953			'neither agree nor disagree'
	Head contractors	34		3.581		Between 'neither agree nor disagree and 'agree'
	Client – consultants	43		4.029		'agree'
CB4	Client – consultants	43	2.667			Between 'disagree' and 'neither agree nor disagree'
	Head contractors	34		3.323		'neither agree nor disagree'
	Subcontractors	110			3.943	'agree'
CB5	Subcontractors	110	2.486			Between 'disagree' and 'neither agree nor disagree'
	Head contractors	34	2.581	2.581		Between 'disagree' and ' neither agree nor disagree'
	Client – consultants	43		3.111		'neither agree nor disagree'
CB6	Client – consultants	43	2.500			Between 'disagree' and 'neither agree nor disagree'
	Head contractors	34		3.483		Between 'neither agree or disagree' and 'agree'
	Subcontractors	110		4.009		'agree'
CB7	Client – consultants	43	2.722			'neither agree nor disagree'
	Head contractors	34		3.742		'agree'
	Subcontractors	110			4.273	'agree'
CB8	Client – consultants	43	2.722			'neither agree nor disagree'
	Head contractors	34		3.484		Between 'neither agree nor disagree' and 'agree'
	Subcontractors	110			4.122	'agree'

Further with regards to the disadvantages of the practice the subcontractors are in

agreement with statements CB4, CB6, CB7 and CB8. Only in relation to statement CB5 their opinion is between 'disagree' and 'neither agree nor disagree'. The contractors' opinion in relation to statement CB5 is between 'disagree and neither agree or disagree', CB4 is 'neither agree nor disagree' and in relation to CB7 is 'agree'. They are in slight agreement with statements CB6 and CB8 with an opinion between 'neither agree nor disagree' and 'agree'.

The client-consultant group on the other hand do not agree to any of the disadvantages associated with the retention practice. Their opinion for statements CB4 and CB6 is between 'disagree' and 'neither agree nor disagree'. Further the client-consultant group 'neither agree nor disagree' to statements CB5, CB7 and CB8.

Apart from the costs and benefits listed respondents had the choice of providing any other disadvantages or advantages associated with the retention practice. A number of open ended responses were received from the respondents. Some excerpts from the transcripts are listed below. A full list along with the respondent I.D's is attached as Appendix C3.

"Unfortunately the poor performing contractors drag down the reliable high performers who perhaps don't need retentions held".

"Poor financial management and wholesale default by clients causes failures of contractors".

"Retentions create lazy quality assessments and mask poor quality work amongst good quality work and delay the incentive for corrective action. Good subcontractors wait for their money while bad subcontractors delay good performance until money is due. Retentions encourage the latter. An industry without retentions will expose poor quality work as it happens and expose poor payment practice when the quality of the work is not in question".

"Retentions cause small businesses to fail or never make a profit".

"Increased administration costs both in recovering and issuing retention money".

"The cost of chasing outstanding retentions is high for the subbie with no guarantee of payment".

5.6 Alternatives to the practice of retentions

With a lot of ongoing debate regarding the retention practice world over a number of alternatives or better practices have been looked into and implemented in certain parts of the world. The purpose of this section is to find out the awareness and feasibility of any alternatives or better practices that could be used in the New Zealand construction industry in place of the practice of retentions. The aim in this section is to gather opinions from the respondents regarding alternatives to the retention practice. The section is divided into two parts. In the first section respondents were firstly asked about their awareness of any alternative practices used in place of retentions in the New Zealand construction industry. Participants' were also asked to comment on the requirement for change to the current practice of retentions. Further their level of agreement or disagreement was sought in relation to the abolishment of the practice and the requirement for legislative intervention. In the second section respondents' level of agreement or disagreement was sought with regards to a list of alternatives or better practices that could be used in place of retentions.

5.6.1 Changes to current practice

Under this section respondents were asked four different questions. The first two questions related to awareness of alternatives and the requirement for change to the current practice, were simple yes, no and not sure response type. The remaining two questions related to abolishment of the practice and the need for legislation were scale type with five options ranging from strongly disagree to strongly agree. The analysis of the four questions is presented as follows;

Awareness of alternative to retentions–Respondents were asked whether they were aware of any better system or alternatives to retentions that were being used currently in the New Zealand construction industry. The question had three responses yes, no and not sure. The responses have been compared for the three groups i.e. client-consultants, contractor and subcontractors as seen in Figure 5.11. Figure 5.11 below shows that 40% of the total respondents (out of which 11% client-consultants, 11% contractors and 18% subcontractors) are aware of alternative practices used in place of retentions in the New Zealand construction industry. On the other hand 48% of the respondents (8% client-

consultants, 6% contractors and 34% subcontractors) are not aware of any alternatives being used in place of retentions. The rest i.e. 13% of the total respondents were not sure about the response.

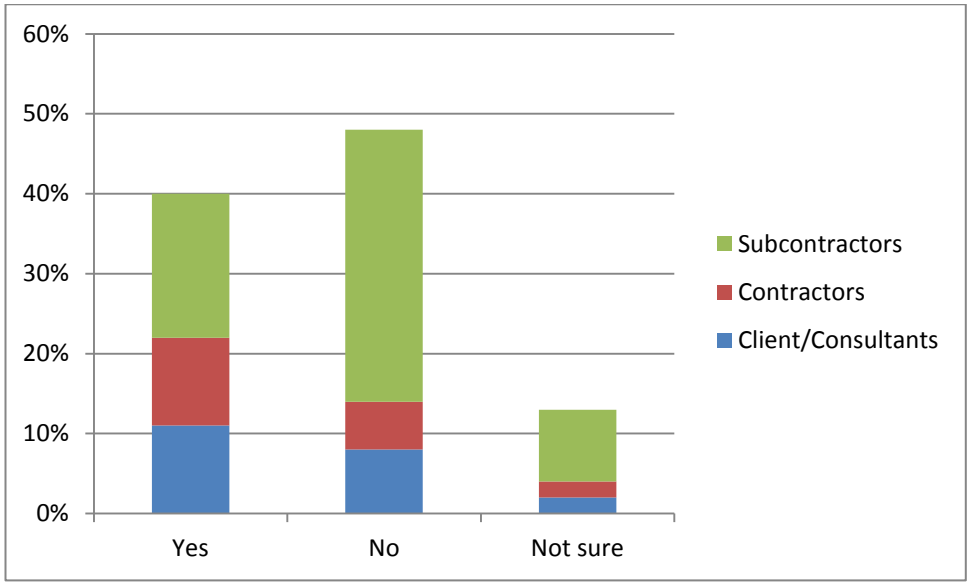


Figure 5.11: Awareness of alternatives

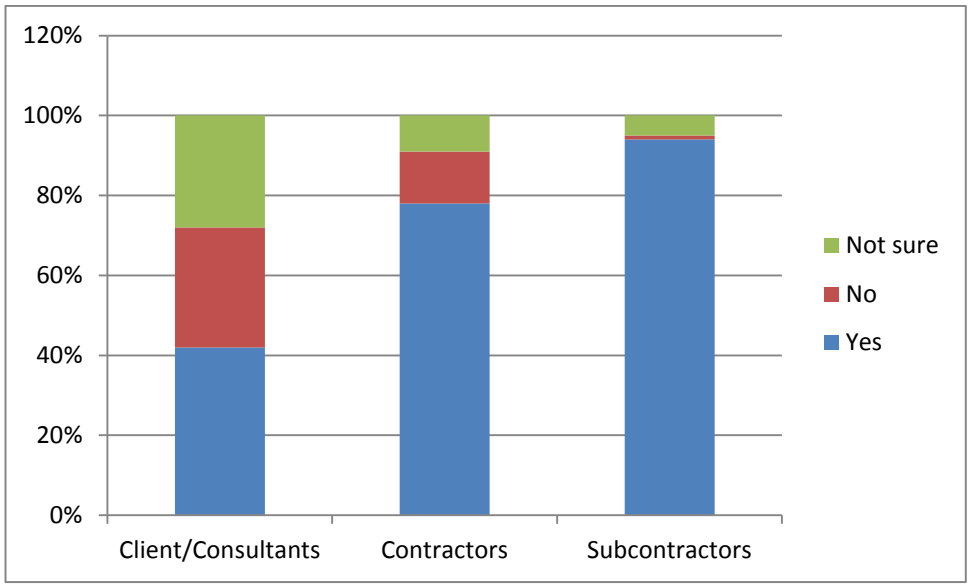


Figure 5.12: Changes required to current practice

Requirement for change to the current practice – Respondents' opinion was asked as to whether there were changes required to the way the current practice of retentions is working by a 'yes', 'no' and 'not sure' response option. Figure 5.12 (bar graph) shows

the responses of the three groups, each bar representing each group. 94% of the respondents from the subcontractor group, 78% from the contractor group and 42% from the client-consultant group responded 'yes' to the question. Whereas only 1% of the subcontractors, 13% of the contractors and 30% client-consultants responded with the option 'no'. The rest i.e. 28% of the client-consultants, 9% of the contractors and 5% of the subcontractors chose the 'not sure' option'.

Further in continuation to the question respondents were given an option (open ended) to briefly explain why or why not there was requirement for changes to the current practice and what kind of changes are required to devise a better system or replace retentions. A number of open ended responses were received from participants of all three groups. A majority of the respondents stated the use of bonds (performance, retention and on-demand) as a replacement to retentions. Security of retentions also emerged as a common theme from the responses especially the subcontractors. Most of them made suggestions for the security of retentions by way of trust accounts. A list of responses from the participants is attached as Appendix C4.Some interesting and important ones are quoted below:

"The way retentions are held for public sector work should be different to private sector work. Private sector work should be retained independent. No changes required for public sector work"

"The change required is to the understanding of NZS3910".

"Educate, ensure transparency within the contract works, and hold retentions differently".

"Ensure a speedy dispute resolution method such as adjudication resolves any disputes regarding retention whether its misuse or delay in the release of retention".

"Retentions are abused by main contractors. The Construction Contracts Act is ineffective in resolving these due to the long timeframes that retentions are held. If current retention systems are to remain the Construction Contracts Act needs to be changed to provide a form of security such that retentions are lost when a Payer goes into liquidation".

"We frequently are able to use the NZS 3910 Bond in Lieu option. This places higher hurdles on a mischievous Principal (or Engineer to Contract) to try and gain retentions funds. It also means that there is no temporary underpayment for work correctly performed. Perhaps there should be a default payment or charge for slow payment of retentions, much the same as interest chargeable on slow progress payments. While the presumption of most conditions of contract and subcontract agreements is that there is

equal ""power"" between the parties the reality is that the Principal has the money and the power. Perhaps the answer is that contractors/subcontractors can avail themselves of something like the Personal Properties Security Register (Companies Office). And by so doing they go to the top of the heap for recoveries should the Principal fall over. Any such security interest would be recoverable by a charging order from the District Court - it would need to be linked to the asset being constructed so that Principals or receivers could not transfer ownership until any residual obligations are resolved".

"This system of retentions is obviously being abused and is open to abuse from clients, consultants and main contractors depending on how various situations arise. It is the tail end user who gets left holding that can due to a lack of security over any retention fund. I prefer the system of a retention holding account held in trust by a law firm, accountants or bank with a fair distribution of any interest monies shared upon the release of contractual obligations. The cost of administration could be by a scale of fees that is automatically added to the contract or as part of the consultants' terms of employment and needs to be enforced by law for all building contracts".

"Abolish retentions, introduce professionalism across the trades, have the client pay a % up front to cover start of the project so the trades aren't funding the project and have the trades furnish a QA warranty or workmanship guarantee (which most of them have anyway, along with indemnity insurances) for work completed and introduce a better project management structure for the trades to operate under. Project Management should be mandatory on any project to mitigate the risks to all parties of failure".

"We do not use retention payments. Instead we use the practice of prewire charge of 50% of the job. If the customer is new and unknown, sometimes we ask for a deposit up front especially if there are goods which are needed that are not usually stocked in wholesalers, therefore carrying a restocking charge if not used or needed should customer either change his mind or not pay up".

"If the NZ government upheld consumer protection laws stringently, retentions would not be necessary. Fines could be imposed by a govt. regulated authority as OSH and Dept. of Labour do with non-compliance in safety and accidents".

"Sub-contractors have to finance the profit on a project for over a year, forcing up the cost of business. There is no way a main contractor should be allowed to hold more than is held on them nor should they be allowed to use that money other than having it in trust. Either bond or monies held in trust. A simple change to the construction contracts act would sort this out".

"Retention payments need to be automated when they fall due. Perhaps clients/main contractors could make full payment to the sub-contractors bank and the bank holds the retentions - and automatically releases them to the sub-contractor when the required period of time expires - or refunds them to the payer upon application".

"Shared risk is a better option where the sub-contractor or contractor provide a conforming bid at true cost plus agreed margins and contingencies and perform to a guaranteed maximum price. If there is scope creep then they are handled at cost plus agreed margin. If the project comes in under the guaranteed maximum price then both

parties share the residual. I.e. if a 1M contract comes in at 900K then both parties have 50K each. It is a win/win and drives efficiencies. Then both parties have a reason to ensure that costs are under control. It takes a contemporary view and both parties have to be able to trust each other. It takes away all the scraps and makes less money for lawyers. It works very well".

"The Consumer Guarantees Act should work to cover the issue of warranty and completion of work. Any money held should be in a system of legal trust to ensure it is only accessed for the purpose retained and available to the subcontractor at the end of the retention period".

"A third party adjudicator should be part and parcel of major construction anywhere in the world, retain the retention moneys, and be a cost to major development. The adjudicator must be paid; it would be a contractor in its own right. Costs would also be gained from the errant party, sub-contractors or main contractors carry insurance for failure of supplied goods etc."

"A well written contract protects the main contractor from the default of a sub-contractor. Careful consideration of a tenderers submission taking into account the reputation and proven reliability of the tenderer rather than just the lowest price minimises the risk to the main contractor. As a last resort, should a retention system be retained then the retention money MUST be held in trust and not be available to the retention holder as an interest free loan. This could be by way of all monies being held in a trust account with the appropriate documentation held by both parties. Alternatively Government could set up a body that will hold the retentions. Any interest received would be used to administer the fund".

Views about abolishment of the practice and the need for legislation–Respondents' level of agreement or disagreement was sought to find out their opinion about the abolishment of the retention practice from construction contracts and for he need for legislation to enforce any changes. The analysis for the two questionsconsidered the one-way ANOVA to determine the statistically significant differences between the three major groups. To determine the differences the following hypotheses were tested. The criterion for accepting or rejecting the hypothesis was set as .05. If the p-value is less than .05, the null hypothesis is rejected. The results of the ANOVA for the two questions are presented in Table 5.21.

H_0: $\mu_1 = \mu_2 = \ldots\ldots \mu_k$; all population means are equal.

Alternative hypothesis is that at least one of the means is different.

Table 5.21: One-way ANOVA – Views about abolishment of the practice and need for legislation

Question	Group	N	Mean	Std. Deviation	df	F	Sig.
Views in relation to the abolishment of the retention practice.	Client - Consultants	43	1.889	1.190	2	46.383	0.000
	Contractors	34	2.938	1.366			
	Subcontractors	110	4.039	1.128			
	Total	**187**	**3.380**	**1.472**			
Views in relation to the enforcement of legislation for any changes.	Client - Consultants	43	3.306	1.091	2	26.042	0.000
	Contractors	34	3.719	1.170			
	Subcontractors	110	4.573	0.680			
	Total	**187**	**4.146**	**1.033**			

The ANOVA results revealed a significantly different opinion between the three major groups about the respondents' views regarding abolishment of the practice and the need for legislation to enforce any changes. Table 5.21 shows that the mean values of the three major groups are statistically different. The calculated values of F = 46.383 and 26.042; df =2 and p = 0.000 confirms the rejection of the null hypothesis. However these results do not inform where the actual difference exists among the groups. Thus a Post-Hoc Tukey-B's test was performed on the responses in order to detect the group with different opinion. The results of Post-Hoc Tukey-B's test are presented in Table5.22.

Table 5.22: Views about abolishment of the practice and need for legislation – Post hoc Tukey –B's test

			Subset for alpha = 0.05		
Question	**Groups**	**N**	**1**	**2**	**3**
Views in relation to the abolishment of the retention practice.	Client – consultants	43	1.889		
	Contractors	34		2.938	
	Subcontractors	110			4.039
Views in relation to the enforcement of legislation for any changes.	Client – consultants	43	3.306		
	Contractors	34		3.719	
	Subcontractors	110			4.573

As observed in Table 5.22 in relation to the first question the client-consultants with e mean value of 1.889 disagree with the idea of the abolishment of the retention practice. The subcontractors on the other hand with a mean value of 4.039 agree to the idea of the abolishment of the retention practice. The opinion of the contractor group is in between i.e. neither agreeing nor disagreeing to the proposal of abolishment of the retention practice.

Further in relation to the second question as seen in Table 5.22 the client-consultants

with a mean value of 3.306 neither agree nor disagree with the view that legislation is required for any changes to the current practice of retentions. The contractors and subcontractors with a mean value of 3.719 and 4.573 respectively agree and strongly agree that legislation is required for any changes to be enforced in relation to the current practice of retentions in the New Zealand construction industry.

5.6.2 Views on alternatives to current system of retentions

In this section participants' opinion was sought regarding statements in relation to the alternatives or better systems that could be used in place of the traditional retention practice. These were identified from the literature and from the experts interviewed in the first phase of data collection. Participants were asked to indicate the extent of their agreement or disagreement with the eight different alternatives or better systems. Three groups were again considered for the analysis of this question too. One-way ANOVA was carried out to find out the difference in opinion of the three major groups. To determine the differences the following hypotheses were tested. The criterion for accepting or rejecting the hypothesis was set as .05. If the p-value is less than .05, the null hypothesis is rejected. The results of the ANOVA are given in Table 5.23. The results showing the values of df equal to 2 and a p value of less than .05 confirms the rejection of the null hypothesis except for three statements A1, A4 and A5. For the three statements all population means are equal.

H_0: $\mu_1 = \mu_2 = \mu_3$; all population means are equal.

Alternative hypothesis is that at least one of the means is different.

The rejection of the null hypothesis for the five statements further suggests that the mean values of the three groups are statistically different in relation to these statements. The statements have been labelled as A1 - A8 in Table 5.23 for further analysis and reference. The results of the one way ANOVA do not inform where the actual difference exists among the groups. Therefore to find out the differences that exist among the groups in relation to each statement Post-Hoc Tukey-B's test was performed.

Table 5.23: One-way ANOVA – Views in relation to alternatives to current system of retentions

Code	Statements regarding current practice	df	F	Sig.
A1	Maintaining the current practice however retentions to be deposited into an interest bearing escrow or trust account.	2	1.368	0.257
A2	Elimination of retentions with a payment or performance bond.	2	3.227	0.042
A3	Warranties and guarantees would work better as a performance management system than the current practice of retentions.	2	29.647	0.000
A4	Retention bonds are a good alternative to retentions.	2	1.226	0.296
A5	Line item release of retentions	2	0.989	0.374
A6	Limits on amount of subcontractor retention.	2	7.515	0.001
A7	Substitution of securities in place of retentions.	2	6.705	0.002
A8	Retention released on work completed early in the project.	2	7.250	0.001

The results of the Tukey-B's test are presented in Table 5.24. The respondents' perceptions as observed are presented in the Table under the comments column. An overall view of table 5.24suggests that the difference in opinion of the three major groups with regards to the five statements related to alternatives is statistically significant. For statements A1, A4 and A5 the opinions of the three groups are nearly same.

An overall look at Table 5.24 suggests that the difference in opinions of the three groups in relation to all the eight statements is not huge even though it is statistically significant. Contractors and subcontractors with a mean value of 3.406 and 3.699 respectively agree and client-consultants partly agree to alternative A1. In relation to A2 client-consultants neither agree nor disagree and contractors and subcontractors partially agree with mean values of 2.886, 3.406 and 3.485 respectively. Further in relation to A3 the opinions of all the three groups are significantly different. The client-consultants with a mean value of 2.056 disagree, whereas the contractors neither agree nor disagree and the subcontractors agree to the use of warranties and guarantees in place of retentions. For statements A4 and A5 all the three groups hold similar opinion i.e. a neutral opinion of neither agree nor disagree to the use of retention bonds and line item release of retentions.

Table 5.24: Alternatives to the retention practice – Post hoc Tukey –B's test

Current Practices	Groups	N	Subset for alpha = 0.05			Comment
			1	2	3	
A1	Head contractors	34	3.406			Between 'neither agree nor disagree' and agree
	Subcontractor	110	3.699			'agree'
	Client - Consultants	43	3.828			'agree'
A2	Client - Consultants	43	2.886			'neither agree nor disagree'
	Head contractors	34	3.406	3.406		Between 'neither agree nor disagree' and 'agree'
	Subcontractor	43		3.485		Between 'neither agree nor disagree' and 'agree'
A3	Client - consultants	43	2.056			'disagree'
	Head contractors	34		2.849		'neither agree nor disagree
	Subcontractor	110			3.683	'agree'
A4	Client - consultants	43	2.971			'neither agree nor disagree'
	Head contractors	34	3.219			'neither agree nor disagree'
	Subcontractors	110	3.311			'neither agree nor disagree'
A5	Client - consultants	43	2.912			'neither agree nor disagree'
	Head contractors	34	3.000			'neither agree nor disagree'
	Subcontractors	110	3.170			'neither agree nor disagree'
A6	Client - consultants	43	3.171			'neither agree nor disagree'
	Head contractors	34	3.188			'neither agree nor disagree'
	Subcontractors	110		3.808		'agree'
A7	Client - consultants	43	2.571			Between 'disagree' and 'neither agree nor disagree'
	Head contractors	34	2.938	2.938		'neither agree nor disagree'
	Subcontractors	110		3.353		'neither agree nor disagree'
A8	Client - consultants	43	3.059			'neither agree nor disagree'
	Head contractors	34	3.531	3.531		Between 'neither agree nor disagree' and 'agree'
	Subcontractors	110		3.875		'agree'

The alternative of limiting subcontractor retention received a neutral response from the respondents of the client-consultants and contractor group with mean values of 3.171 and 3.188. The subcontractors however agreed to alternative A6 of limiting subcontractor retention with a mean value of 3.807. In relation to the substitution of securities in place of retentions the client-consultants partially disagreed with a mean value of 2.571 whereas the contractors and subcontractors held neutral opinion of 'neither agree nor disagree' with mean values of 2.938 and 3.353 respectively. The responses for A8 by the three groups varied slightly. The client-consultant held a neutral opinion of 'neither agree nor disagree' whereas the contractors' opinion was in between 'neither agree nor disagree' and agree with mean values of 3.059 and 3.531 respectively. The subcontractors however agreed to the statement A8 with a mean value of 3.875.

Further analysis was considered for the alternatives to the retention practice. The statements with mean values greater than 3.5 ($M \geq 3.5$) were considered as important. The average mean value for each statement was considered taking into account the total number of respondents irrespective of their groups. Table 5.25 presents the statements with their average mean values. The important statements are shown in bold with mean values greater than 3.5. As observed in Table 5.25 only three alternatives i.e. A1, A6 and A8 out of the eight are considered as important with mean values greater than 3.5.

Table 5.25: Important alternatives to retentions

Code	Statements regarding current practice	Mean average
A1	**Maintaining the current practice however retentions to be deposited into an interest bearing escrow or trust account.**	3.671
A2	Elimination of retentions with a payment or performance bond.	3.347
A3	Warranties and guarantees would work better as a performance management system than the current practice of retentions.	3.186
A4	Retention bonds are a good alternative to retentions.	3.224
A5	Line item release of retentions	3.085
A6	**Limits on amount of subcontractor retention.**	3.561
A7	Substitution of securities in place of retentions.	3.112
A8	**Retention released on work completed early in the project.**	3.647

5.7 Retention regimes

The practice of retaining money in construction contracts is common in most parts of the world. However what is not common is the rate at which the money is withheld and the timing of release in some cases. There is no evidence to suggest the use of different rates of retentions world over. In fact it varies from project to project and from one company to another. New Zealand follows a unique sliding retention regime with the rate of retention ranging from 2% to 10% as per NZS 3910. With a lot of debate around the practice the purpose of this section is to find out the opinion of the respondents in relation to the retention regimes used in construction contracts. Three different questions were asked under this section. The first two questions were a ‘yes’, ‘no’ and ‘not sure’ response type to identify if there were problems in relation to retention

regimes in New Zealand and the opinion of using different retention regimes for different projects. Further respondents' level of agreement or disagreement was sought in relation to different statements relating to factors that could impact upon the setting up of retention regimes in construction contracts and consequently find out the important factors.

5.7.1 Problems with retention regimes

Under this section respondents were asked two questions. Firstly respondents' opinion was gathered to find out if there are problems in relation to the retention regimes used in construction contracts. Secondly participants were asked to comment on the fairness of the having different retention regimes for different projects. Both these questions were a 'yes', 'no' and 'not sure' response type.

Problem with regards to retention regimes used in construction contracts – Respondents' were asked if in their opinion there were problems with regards to the retention regimes used in construction contracts. The question had three responses to choose from 'yes', 'no' and 'not sure'. The responses have been compared for the three main groups. As observed in Figure 5.13the responses of the three groups vary significantly.

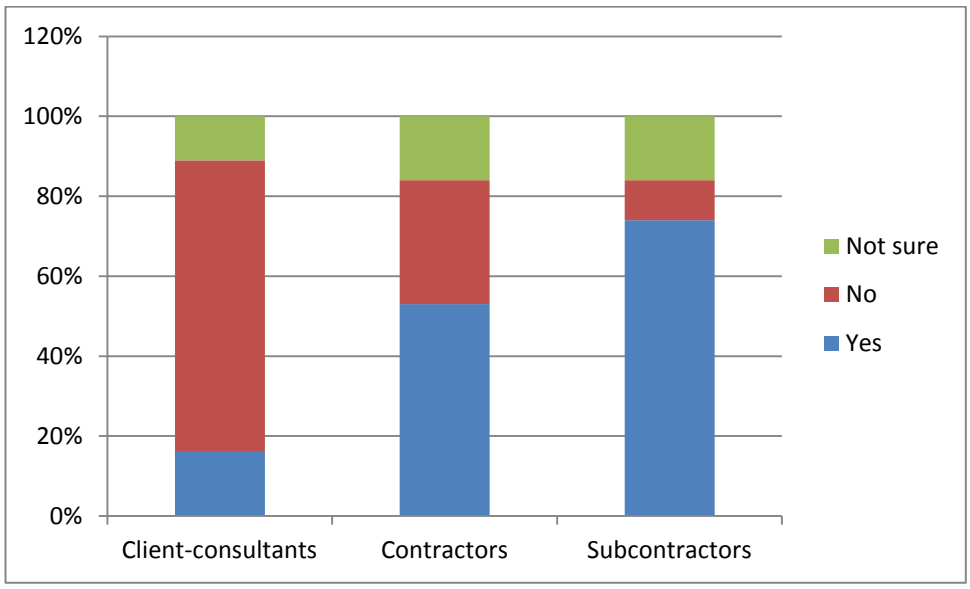


Figure 5.13: Problem with retention regimes

74% of the subcontractors and 53% contractors believe that 'yes' there is a problem in relation to the retention regimes used in construction contracts whereas only 16% of the

client-contractors hold the same opinion. 73% of the client-consultants believe that there are no problems with the retention regimes used in construction contracts. Only 31% contractors and 10% of the subcontractors hold the same view. The remaining 11% client-consultants, 16% contractors and 16% subcontractors were not sure of the response to the question.

In addition to the question above respondents were also given an option to provide additional comments regarding problems if any with the retention regimes used. A few respondents added the following comments;

"They should be a true reflection of the potential costs of default or remedial work".

"Subcontractor retentions should not exceed main contract retentions".

"the percentage is arbitrary and has no relationship to value of completed work (not to be confused with the cost of the work under the contract - e.g.a mechanical services system that operates effectively has a lot more value to building users than the steel and concrete structure)".

"Currently it is 10% reducing to 5% at practical completion. At times when there are issues, 10% is not sufficent to cover the risks. If you set the standard higher it is penalising everybody, if you set it lower, the retained balance is insufficent to provide the surety required and special retentions for approriate amounts will be required to be held. Its not a thing that can easily be standardised, the approriate retention would need to be set by the type of work, I do feel 10% works approriately at present".

"The percentages are too high when you consider how skinny margins are and how competitive the market is and always will be".

"Percentage of retencions should reflect real cost of replacement".

"It is difficult for a subcontractor to negotiate a different percentage of retentions in fear of losing the bid. Therefore, if retentions are being used they should be low and at a standard accepted by industry, not per job or contract".

"Needs to be a reduced flat scale. Should not apply to project under a certain value say

30k".

"Subcontractors retention percentage sould mirror the contractors' retention percentage".

"These seem to vary depending on the main contractor / client agreement. The retention system should be standardised across the industry".

"The main contractor retention value is disproportionally high compared to the sub contractor value; they should not be able to hold any more money than is being held on them. 12 months is too long to hold the final release, there are plenty of warranties in place to cover this time frame".

"All retentions that affect us require 10% held for a period of 12 months following the final completion of defects from the last contractor, fair? not at all".

"The percentage is far to high and the release date is far to long after completion".

"Retentions are generally more than the margin on a tendered project these days therefore it inhibits cashflow and profit".

"Universal retentions are applied to all industry. This should be dependent on the industry".

Fairness of using different retention regimes for different projects –Respondents were asked to comment on the fairness of use of different retention regime for different projects. The question was a 'yes', 'no' and 'not sure' response type and the responses have been presented and analysed for the three groups. As observed in Figure 5.14 the responses for the three groups vary significantly for this question too.

Whereas 78% client-consultants and 66% of the contractors believe that it is fair to have different retention regimes for different projects, only 39% of the subcontractors hold the same view. 45% of the subcontractors believe that it is not a fair practice followed by 31% contractors and only 8% client-consultants. 14%, 3% and 16% of client-consultants, contractors and subcontractors respectively were not sure of the response to the question.

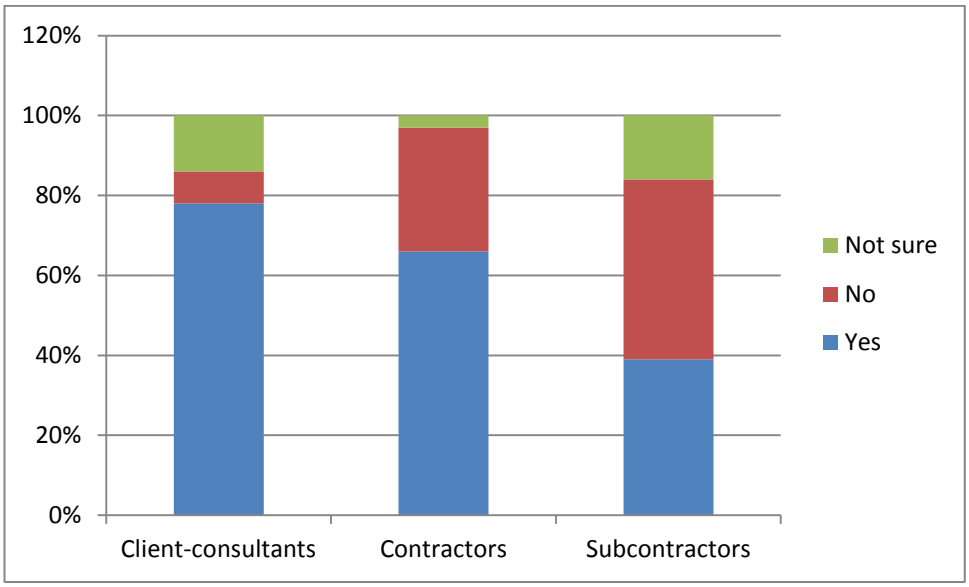


Figure 5.14: Different retention regimes for different projects

5.7.2 Factors impacting upon setting up of retention regimes

In this section participants' opinion was sought regarding statements in relation to the factors that could impact upon the setting up of retention regimes. These were identified from the literature and from the experts interviewed in the first phase of data collection. Participants were asked to indicate the extent of their agreement or disagreement with the eleven different factors that could impact upon setting up of retention regimes. The factors have been labeled as R1-R11 for analysis and reference as seen in Table 5.26. Three groups were considered for the analysis of this question too. One-way ANOVA was carried out to find out the difference in opinion of the three major groups. To determine the differences the following hypotheses were tested. The criterion for accepting or rejecting the hypothesis was set as .05. If the p-value is less than .05, the null hypothesis is rejected. The results of the ANOVA are given in Table 5.26. The results showing the values of df equal to 2 and a p value of less than .05 confirms the rejection of the null hypothesis except for three statements R3, R5 and R11. For the three statements all population means are equal.

H_0: $\mu_1 = \mu_2 = \mu_3$; all population means are equal.

Alternative hypothesis is that at least one of the means is different.

Table 5.26: One-way ANOVA – Views: factors impacting upon setting up of retention regimes.

Code	Statements regarding current practice	Df	F	Sig
R1	Type of project e.g. building, civil, renovation.	2	9.156	.000
R2	Project characteristics e.g. value of project, complexity of project.	2	5.504	.005
R3	Defect characteristics i.e. type of defect, likelihood of defect occurrence and cost of the defects.	2	0.893	.411
R4	Type of procurement method used.	2	4.212	.016
R5	Contractor's performance history.	2	2.793	.064
R6	Material and workmanship guarantees.	2	7.896	.001
R7	Parent company guarantee.	2	8.148	.000
R8	Financial stability of main contractor.	2	8.971	.000
R9	Performance security characteristics of client i.e. security for retention withheld such as use of trust account.	2	2.171	.117
R10	Economic characteristics i.e. impact on contractor's cash flow or impact on contractor's margin.	2	4.339	.014
R11	Retention withholding/release mechanism.	2	2.471	.087

The rejection of the null hypothesis for the remaining 8 statements further suggests that the mean values of the three groups are statistically different in relation to these statements. The results of the one way ANOVA do not inform where the actual difference exists among the groups. Therefore to find out the differences that exist among the groups in relation to each statement Post-Hoc Tukey-B's test was performed. The results of the Tukey-B's test are presented in Table 5.27. The respondents' perceptions as observed are presented in the Table under the comments column. An overall view of table 5.27suggests that the difference in opinion of the three major groups with regards to the eight statements is statistically significant. For statements R3, R5 and R11 the opinions of the three groups are nearly same.

An overall look at Table 5.27 suggests that the difference in opinions of the three groups in relation to 8 out of the 11 statements is not huge even though it is statistically significant. Client-consultants and contractors partially agree that the type of project (R1) and project characteristics (R2) could be factors in deciding a retention regime for construction contracts. Subcontractors on the other hand 'neither agree nor disagree' with both these factors with mean values of 2.950 and 3.111 respectively. All the three groups of participants 'neither agree nor disagree' that defect characteristics (R3) could be an important factor in setting up retention regimes. In relation to the next factor i.e. the type of procurement method used (R4) the subcontractors and contractors 'neither

agree nor disagree' whereas the client-consultants partially agree with a mean value of 3.5. Further the subcontractors and contractors believe that a contractor's performance history (R5) could be a significant factor in setting up retention regimes whereas client-consultants 'neither agree nor disagree' with R5.

Table 5.27: Factors impacting upon setting up of retention regimes – Post hoc Tukey –B's test

Current Practices	Groups	N	Subset for alpha = 0.05			Comment
			1	2	3	
R1	Subcontractors	108	2.950			'neither agree nor disagree'
	Head contractors	34		3.533		Between 'neither agree nor disagree' and 'agree'
	Client - Consultants	42		3.677		'agree'
R2	Subcontractors	109	3.111			'neither agree nor disagree'
	Head contractors	34	3.567	3.567		Between 'neither agree nor disagree' and 'agree'
	Client - Consultants	43			3.735	'agree'
R3	Subcontractors	38	3.111			'neither agree nor disagree'
	Head contractors	32	3.267			'neither agree nor disagree'
	Client - Consultants	108	3.382			'neither agree nor disagree'
R4	Subcontractors	36	2.979			'neither agree nor disagree'
	Head contractors	32	3.324	3.324		'neither agree nor disagree'
	Client - Consultants	108			3.500	Between 'neither agree nor disagree' and 'agree'
R5	Client - consultants	38	3.265			'neither agree nor disagree'
	Subcontractors	108	3.717	3.717		'agree'
	Head contractors	32		3.800		'agree'
R6	Client - consultants	38	2.857			'neither agree nor disagree'
	Head contractors	32		3.433		Between 'neither agree nor disagree' and 'agree'
	Subcontractors	108		3.684		'agree'
R7	Client - consultants	37	2.548			Between 'disagree' and 'neither agree nor disagree'
	Subcontractors	108		3.303		'neither agree nor disagree'
	Head contractors	32		3.667		'agree'
R8	Client - consultants	38	2.765			'neither agree nor disagree'
	Subcontractors	108		3.663		'agree'
	Head contractors	32		3.833		'agree'
R9	Client - consultants	38	3.382			'neither agree nor disagree'
	Head contractors	32	3.516			Between 'neither agree nor disagree' and 'agree'
	Subcontractors	107	3.776			'agree'
R10	Client - consultants	38	2.824			'neither agree nor disagree'
	Subcontractors	108		3.347		'neither agree nor disagree'
	Head contractors	32		3.600		'agree'
R11	Client - consultants	47	3.294			'neither agree nor disagree'
	Head contractors	32	3.655			'agree'
	Subcontractors	108	3.707			'agree'

For the factor materials and workmanship guarantees (R6) the opinions of the three groups varied slightly. The subcontractors agreed that it could be a significant factor

with a mean value of 3.684 whereas the contractors view was between 'neither agree nor disagree' and 'agree' with mean value of 3.433. Client consultants on the other hand 'neither agreed nor disagreed' to R6. Further moving on to R7 the views of client-consultants was between 'disagree' and 'neither agree nor disagree' whereas subcontractors held a neutral opinion of 'neither agree nor disagree'. Head contractors however thought that it could be significant factor with a mean value of 3.667. Financial stability of main contractor (R8) was considered as a significant factor by both subcontractors and contractors with mean values of 3.663 and 3.833 respectively. Client-consultants on the other hand held a neutral view of 'neither agree nor disagree' in relation to R8.

The means for the next factor performance security characteristics of client (R9) for all the three groups were homogenous. However the interpretation due to the mean values varied slightly. Client-consultants held a neutral opinion i.e. 'neither agree nor disagree' (M=3.382) whereas the contractors' opinion was in between 'neither agree nor disagree' and 'agree' (M=3.516). The subcontractors on the other hand were more inclined towards agreeing to factor R9 being significant with a mean value of 3.776. The opinion of client-consultants and subcontractors was similar in relation to R10 i.e. economic characteristics. Both the groups 'neither agreed nor disagreed' to R10 being a significant factor with mean values of 2.824 and 3.347 respectively. The head contractors on the other hand agreed to R10 being a significant factor with a mean value of 3.6. The mean values for the last factor R11 (retention withholding/release mechanism) as observed in the table are similar. A closer look at the mean values however suggests that the contractors and subcontractors 'agree' to R11 being a significant factor for setting retention regimes. Client-consultants on the other hand hold a neutral opinion of 'neither agree nor disagree' with a mean of 3.294.

Further analysis was considered for the factors that could impact upon the setting up of retention regimes. The statements or factors with mean values greater than 3.5 ($M \geq 3.5$) were considered as significant. The average mean value for the three groups was considered for the analysis and is presented in Table 5.28 below. The important statements are shown in bold with mean values greater than 3.5. As observed in Table 5.28 only 4 out of the 11 factors have been considered as significant i.e. R5, R8, R9 and R11with mean values greater than 3.5.

Table 5.28: Factors impacting upon setting up of retention regimes

Code	Factors	Mean
R1	Type of project e.g. building, civil, renovation.	3.386
R2	Project characteristics e.g. value of project, complexity of project.	3.471
R3	Defect characteristics i.e. type of defect, likelihood of defect occurrence and cost of the defects.	3.253
R4	Type of procurement method used.	3.268
R5	**Contractor's performance history.**	3.594
R6	Material and workmanship guarantees.	3.325
R7	Parent company guarantee.	3.173
R8	**Financial stability of main contractor.**	3.506
R9	**Performance security characteristics of client i.e. security for retention withheld such as use of trust account.**	3.644
R10	Economic characteristics i.e. impact on contractor's cash flow or impact on contractor's margin.	3.284
R11	**Retention withholding/release mechanism.**	3.611

5.8 The research validation exercise

A further step in the process of research is the verification or validation of the research findings. According to Patton (2002) a research validation exercise ensures the credibility of the research findings. Some experts were approached to provide validation of the study findings and to add further knowledge to the outputs by way of their personal opinions and perceptions. After the analysis of the data collected by the expert interviews (presented in Chapter 4) and the questionnaire survey (Sections 5.2 to 5.7) the researcher compiled a summary of the key findings emanating from the research investigations. These summaries were then presented to five experts in the form of a short research verification questionnaire attached as Appendix B-3. Since this was a validation exercise the survey was kept short because detailed opinions from experts had already been obtained through the interviews during the first stage of data collection. A description of the experts is given in the next section (5.8.1). The experts commented on the results presented to them and made further contributions to enhance the quality of the findings.

The following sub-sections provide an account of the profile of the experts and their opinions in relation to each objective of the study. The key findings in line with the five objectives are presented under each sub-section, followed by the opinions of the experts.

5.8.1 Profile of the experts

Table 5.29 provides an overview of the profile of the experts. The experts included representatives from client, contracting, subcontracting and construction consultancy organizations. All the experts surveyed for the verification exercise had 30 plus years of industry experience. The profile of the experts suggests that all the participants occupy very high levels in their respective organizations. Therefore their opinions for the validation exercise for this study are considered as adequate.

Table 5.29: Overview of the profile of the experts

Experts ID	Representative organization	Position/Profession	Work experience in years
E1	Construction Consulting Firm	Chief Engineer (Construction contracts)	40
E2	Contracting Federation	Chief Executive Officer	40
E3	Government client	Associate–Project Management	30
E4	Subcontracting organization	Director	30
E5	Subcontracting organization	Managing Director	35

5.8.2 Verification of the purpose of retentions

The following findings were presented to the experts for their opinions and further comments.

1. Retentions serve a number of purposes in construction contracts. The main purposes found to be;
   - Performance security.
   - To ensure that the contractor fulfills their obligation under the contract.
   - To guarantee that the contractor/subcontractor will return to remediate defects within the defects liability period.
2. The term performance security tends to cover a number of purposes. What does performance security cover?
3. Retentions seem to fulfill the purpose for which they exist only ‘sometimes’ in construction contracts.
4. Retentions do not act as an incentive to avoid or eliminate defective work.

Experts' opinion on the purpose of retentions

All the experts generally agreed with the presented purposes of retentions with some interesting comments adding on to the research findings. E1 commented that purpose 1 is very close to purpose 2 and purpose 3 is arguably a subset of purpose 2. E3 representing the clients stated that purposes 1 and 2 were covered by the performance bond and retentions were intended to provide the principal with the means to ensure remediation of defects. He further stated that where there is no performance bond retentions do provide some value to the principal against performance. Even though E5 agreed to the stated purposes of retention however from a subcontractor's perspective he said that retentions do act as source of interest free finance and that should be added as one of the purposes of retentions. Quoting E5;

"While there is a certain amount of validity and indeed in a number of instance 'justification', behind these three "purposes" being concluded, I consider the aspect of free capital being available to the payer should be included as one of the three".

Next in relation to the experts' opinions regarding the meaning of performance security the following responses were received;

E1 – "Provides incentive for contractor to finish the work and rectify defects rather than leave it part done and part paid"

E2 – "A sum of money is withheld from progress payments to provide a fund in the event that the contractor or subcontractor fails to perform the contract work up to completion (as opposed to the remediation of defects post completion)".

E3 – "Retentions provide performance security against failure to remedy defects in a timely manner".

E4 – "To perform a task to best practice".

E5 – "To complete in both a timely and competent manner".

It can therefore be summed up that performance security in terms of the purpose of retentions means to provide incentive to the contractor to complete the contract works in a timely and competent manner. It also provides a fund in case of non-performance and for rectifying defective work.

Further all the experts validated the finding by agreeing that retentions 'sometimes' fulfil they purpose for which they exist. The comments from the experts did reflect the

reason as to why retentions fulfil their purpose only 'sometimes'. Even though E1 agreed with the finding but added that performance can also be incentivised by other means e.g. bonds. E4 also held similar views that there could be other ways of incentivising performance. E2 described that it does work but it is a crude tool, the downside being that it is seen as a cash flow mechanism for the payer's benefit and not released when due. E4 from a subcontractor's perspective shared the same opinion that retentions are not released on time and that they rarely fulfil their purpose because they do not work the way they are meant to. On the other hand E3 representing the clients stated that retentions do provide security for the intended purpose and that contractors would be less inclined to remedy defects in the absence of a monetary implication.

Finally the experts helped in verifying that retentions do not act as an incentive to avoid or eliminate defective work. E2 stated that the emphasis is on achieving timely completion, with later rectification of defects and not on defect free performance. On a similar note E3 opined that retentions do not stop defective work from occurring, they simply provide the principal with leverage for their remedy.

5.8.3 Verification of the status of retention practice

The following findings were presented to the experts for their opinions and further comments.

1. The practice of retentions is not fair for all the parties in its current form.
2. The problem with regards to retentions was found to be 'extremely serious' from the subcontractors, 'very serious' from the contractors and 'moderately serious' from the client-consultant perspective.
3. The research identified a number of issues attached to the retention practice. The three main issues identified were;
    - The inappropriate use or abuse of subcontractors' retentions by main contractors.
    - Unnecessary withholding of retentions.
    - Security of retention monies.

Experts' opinion on the current status of the retention practice

All the experts agreed with the finding that retentions are not fair for all the parties in its

current form. In relation to the fairness of the practice most of the experts recognized the issues particularly between the contractors and the subcontractors. Therefore retentions in principle could be a fair practice (although debatable) if it would work the way it was meant to work. Following are some excerpts from the comments made by the experts regarding the practice not being fair in its current form;

E1 – "Particularly the main contractor holding back more from subs that is held against the main contractor"

E2 – "Retentions are unsecured and contractual arrangements to not facilitate their timely release. Clarity is needed regarding process for withholding and release of retentions when the relevant work is completed, and for properly applying retentions to defect remediation where a contractor/subcontractor defaults. "Pay when certified" clauses should be outlawed in relation to retention release."

E3 – "When contractors apply retentions to subcontractors which are disproportionate to the subcontractor's work".

E4 – "I think in principle it is fair to the owner and the head contractor and passed on to the subcontractors if it worked properly. If everybody did it as they are supposed to but they don't and that's just the reality and on the basis that they don't it is a completely unfair system because the only person that wears it is only the subcontractor. Generally when a principal is dealing with a contractor you are talking about large sums of monies and it is very difficult to justify not paying them and there is more leverage from a contractor to get it out from the principle. But when you go from the contractor to the subcontractor it is so dispersed and the risk is spread across so many people, it is easier for people to walk away with it. Some contractors are fantastic but some of them have made a business out of it by financing their next project by not paying that last 10% on retentions because they know they can hang on longer than what the subcontractor can".

E5 – "The 'trickle down' payment regime existing within the industry, although vastly improved with the advent of CCA, still results in the 'unsecured creditor' status of sub-trades".

Further in relation to the significance of the problem in relation to retentions the experts agreed with the findings. All of them agreed that the issues related to the subcontractors were quite significant and hence the problem was 'extremely serious' as far as the subcontractors were concerned. E2 recognized that the problem becomes more severe in situations of an economic downturn. Quoting E2;

"When people are having to trim down their expectations to meet the market, that just gives them less to operate on so they tend to rely more and more on the retentions flow coming back from jobs they've completed. I think that is actually an area where they have experienced the biggest loss is the retentions that are held and then the contractor disappears and there is no security of the money that is held. But often it comes back to

the reputation of the people that they go into contract with and they can't always control that. But if they support strong companies with better prices than dodgy companies, they are more likely to end up working for better and stronger companies. And therein is security in itself or less risk".

Finally the experts helped in verifying the findings related to the issues attached to the practice of retentions in the NZ construction industry. All of them agreed that the presented issues were quite significant for the New Zealand construction industry. However E3 added that these issues appeared to be between main contractor and subcontractor and not between the principal and the contractor. E4 once again reiterated that the problem or the issue was not with the practice of retentions but the way they were abused in the industry. Quoting E4;

"It is the principle behind retentions as to why they really exist we don't mind. If they were a flawless scheme and they would be paid and signed off as they should be then there would be a lot less issue around them. So the principle of retentions is not a problem but it the practice and process of them which is a problem. The industry is very poor with them and they use them for financing their next project and all those sorts of issues that happen. By that stage lot of those SME's can't fight, they don't have the resources to fight so they write them off, its two years down the track so they write off their retentions. SME's fight, fight and fight for their retentions but at the end they have to get on with their jobs. Ultimately they are completely lost and that is a significant issue".

5.8.4 Verification of costs and benefits

The following findings in relation to the costs and benefits were presented to the experts for their opinions and further comments.

1. The research found the detriments and benefits of retentions and that the costs of the practice are greater for two parties i.e. the subcontractors and contractors and the benefits are greater or one party i.e. the clients.
2. Even though the clients are aware of the costs associated with the practice but believe that there is no other mechanism that could serve the same purpose as retentions in construction contracts.
3. The main party bearing the costs of the practice are the subcontractors.

Experts' opinion on the costs and benefits of retention

Once again all the experts did agree that overall the costs of the practice are greater than the benefits and the main party bearing the brunt of retentions were the

subcontractorsbeing last in the line of payment. However E2 and E3 stated that retentions are probably a fact of life and it is understandable that a client wants to hold some security over a contractor. On the other hand E1 and E 4 believe that there could be better ways of incentivizing performance. Quoting E1;

"A better answer might be more widespread use of bonds coupled with a lower level of retention. 10% is excessive in comparison with most international practice and is a hangover from old, now repealed legislation".

E4 further added that it was not just the clients that benefits from retentions but also the main contractor since it provides cash flow for their next project. In other words probably the benefits of retentions are greater than costs for the head contractor. E2 from a contractor's perspective did agree that it benefits them with additional cash flow. Quoting E2;

"We do have some benefits of cash flow but again you need to put the whole thing on context, we also provide bond to the client and no subcontractors provide a bond to us. So with the cash flow goes risk the other way".

5.8.5 Verification of alternatives

The following findings in relation to the alternatives were presented to the experts for their opinions and further comments;

1. The study recognized a definite need for change to the way the practice is currently working and a need for legislation for any changes to be enforced.
2. Abolishment of the practice was not found to be a feasible alternative even though the subcontractors did agree with the alternative of abolishment.
3. The study found a number of respondents in the favour of use of bonds (performance, on-demand and retention).
4. The use of trust accounts to secure retentions was also advocated by a number of respondents.

Experts' opinion on the alternatives to retentions

The experts validated the finding 1 and 2 under this theme by agreeing that there is a definite need for change to the current practice and that legislation is really important to bring about any changes. They also agreed that abolishing the practice was not feasible

because of the nature of the construction industry and the risks involved. E4suggested the need for reviewing the pros and cons of all the alternatives and enforce legislation with the option that had the least harm. The other experts presented their opinions regarding the use of bonds and trust accounts. Following are some excerpts of the opinions provided;

E1 – "Yes for performance bonds, doubtful for retention bonds, probably yes for trust accounts".

E2 – "I am concerned that trust accounts may be unduly complex and costly, and therefore unworkable. I like the idea of retentions being deemed in trust, but not necessarily held in a separate trust account, provided that it is supported by a statutory mechanism for withholding and release where retentions are provided for in a contract, in much the same way as the CCA addresses progress payments. The latter in my view is more likely to address the poor industry behaviour.

E3 – "I would support on-demand retention bonds. I'm not sure how setting up retention trust accounts would work unless they were also on-demand. So a bond makes most sense, in my view".

Therefore even though the experts did provide their opinion in relation to the use of bonds and trust accounts however there were still doubts presented with the use of both to secure or replace retentions.

5.8.6 Verification of retentions regimes

The following findings in relation to the retention regimes were presented to the experts for their opinions and further comments;

1. The study found that there are issues related to the retention regimes particularly the rate at which retentions are withheld in the NZ construction industry. The rates at which retentions are withheld from contractors and subcontractors are different. The rate at which retentions are withheld is very high.
2. The study identified a need for standardization to the current regime.
3. It was found that the use of sliding scale and different retention regimes for different projects was a fair practice.

Experts' opinion on the retention regimes

Three out of five experts agreed with findings 1, 2 and 3 under this theme. All the

experts were in agreement that a flat 10% rate of retentions was too high and unusual. E2 commented about the 10% rate and stated that;

"I see a flat 10% and I shudder, I think that's obscene. Certainly when they get above, on contracts up to a million dollars, if you got a hundred thousand on the retentions it just seems absolutely ridiculous. A lot of subcontractors will inadvertently sign those off. Its' not that unusual to have a flat 10%, therefore there is a need to look at it from the point of view of what is international best practice".

Further in relation to the sliding scale E2 stated that the NZS3910 sliding scale was responsible for much of the retention imbalance, so he was not in favour of that, because it results in a positive cash flow for contractors. He also stated being wary regarding any kind of standardization as that may create inappropriate expectations that retentions should be held on all contracts. E3 asserted that the issue was between the main contracts and subcontractors and said;

E2 – "What we appear to be attempting to resolve is the way in which main contractors treat subcontractors. Legislation as an extension to the CCA might work provided it was clear and sufficiently flexible to apply to theactual requirements of individual projects".

5.9 Summary

This chapter has presented the analysis and findings from the questionnaire surveys in line with the research objectives as identified in Chapter 1. Analysis was carried out using both descriptive and inferential statistics. Statistical significance tests of t-test and One-way ANOVA were carried out to determine the difference in opinions of the three groups of participants. Thematic analysis was carried out for the open ended questions. The analysis helped in identifying the primary purpose of retentions and the main issues surrounding the practice of retentions in the New Zealand construction industry. The analysis further helped in weighing the costs versus the benefits of retentions for the three groups. It also helped to identify a few alternatives for a better system or to replace retentions. Finally some important factors were identified for setting up retention regimes in construction contracts.

Chapter 6

General Discussion of the research findings

6.1 Introduction

This chapter will present a synthesis of the research findings from both the qualitative and quantitative approaches used for data collection and analysis. Significant findings have been drawn together to address the research questions and deliver the research objectives to be presented in the final chapter of the thesis. All the data is collated and presented under five sections, in line with the five research objectives. Each section summarizes the findings from the expert interviews combined with the questionnaire surveys. Reference has also been made to the literature reviewed on the subject area of this study. Therefore this chapter provides a triangulated output of the current research study.

6.2 Purpose of retentions

As highlighted in the previous chapters there seems to be some form of disconnect between the actual and the intended purpose of retentions for which they were introduced in the construction industry. Literature identified a total of ten purposes of retentions which in itself was a significant finding. Moreover none of the standard conditions of contract explicitly states the purpose of retentions; hence a knowledge gap was identified. Therefore this section collates the findings in relation to the purpose of retentions in the New Zealand construction industry and the extent to which retentions deliver the objective for which they are used. Another sub-objective was to find out whether retentions act as an incentive to avoid or eliminate defective work.

6.2.1 Determining the purpose of retentions

Four measures were used to determine the purpose of retentions. Starting from the

literature review followed by the experts interviewed and the questionnaire surveys a number of purposes of retentions were identified. The literature reviewed suggested ten purposes of retentions (Section 2.3.1; Table 2.3). However an analysis of the literature (Section 2.3.1; Table 2.4) found the main purpose of retentions to be performance security i.e. to assure project completion or complete outstanding work or in case of non-performance or won't perform. The second important purpose of retentions as found in the literature was defect rectification during the DLP. 8 other purposes were identified and rated (Section 2.3.1; Table 2.3).

The opinion of the experts interviewed in the first phase of data collection was in line with the findings of the literature, suggesting the main purpose of retentions to be around performance security or to incentivize performance. In addition to that the experts recognized that retentions were mainly around defects, poor quality and remedial work. Other purposes were also identified such as the use of retentions as a protection against contractor/subcontractor insolvency in line with the ones found in the literature (Section 4.3; Table 4.2). Further the experts recognized the use of retentions mainly during the DLP. One purpose of retentions which the experts suggested (representatives of subcontractor group) and which was not found in the literature was to act as a form of finance or to provide cash flow to the contractor.

Further the analysis of the open ended question in the industry wide questionnaire survey found 14 purposes of retentions (Section 5.3.1; Table 5.2). However from the total responses received it was confirmed that the main purpose of retentions was performance security with a total of 37 responses. Two other purposes followed a close rating with 36 responses each which are; 'to ensure that the contractor fulfills their obligation under the contract' and 'to guarantee that that contractor/subcontractor will return to remediate defects within the DLP'. A fourth purpose with a total of 31 responses was 'to prevent default and poor quality work'. Other 10 purposes were also identified with a frequency count of less than 20. Even though these were identified by the respondents but not considered as important due to lesser frequency count.

The final analysis to determine the purpose of retentions was carried out by comparing and ranking (Section 5.3.3; Table 5.8) the responses of the three groups of participants i.e. the client-consultants, contractors and subcontractors with regards to the purposes of

retentions identified from the literature. There was a slight variation in the individual rankings of the groups however the common element was the ranking of the first two purposes which was in line with the findings of the open ended question. The overall ranking was considered for analysis purpose. The overall ranking suggested the main purpose of retentions to be 'to guarantee that the contractor/subcontractor will return to remedy any defects within the defects liability period' with a mean of 3.919. This was followed by 'performance security' with a mean of 3.870 and 'to ensure that the contractor fulfills their obligation under the contract' with a mean of 3.796.

Further analysis was considered to compare the opinions of the three participant groups in relation to the different purposes of retentions as identified from literature (Section 5.3.3; Table 5.8). It was found that all the three groups agreed or partly agreed to purposes P1, P2, P3, P4 and P5 and disagreed or partly disagreed to P6. The views in relation to P8 and P9 were diverse. Subcontractors partly agreed that retentions provide cash flow to the client/contractor (P8) and act as a source of interest free finance (P9), whereas the contractors and client-consultants disagreed or partly disagreed to P8 and P9.

Finally the experts helped in validating the three main purposes of retentions; the first being performance security, second to ensure that the contractor fulfills their obligation under the contract and third to guarantee that the contractor/subcontractor will return to remediate defects within the DLP. However one of the experts helped to confirm that purpose 2 was very close to purpose one and purpose 3 was a subset of purpose 2. This opinion was indeed quite valid and helped to conclude that performance security could be considered as a broad term including a number of other purposes or themes identified from the findings of the study. As an example performance security could include the following purposes identified during the various stages of data collection;

- To ensure that the contractor fulfills their obligation under the contract.
- To guarantee that the contractor/subcontractor will return to remedy any defects within the DLP.
- Defect remediation.
- To prevent default and poor quality work.
- Quality assurance e.g. workmanship, materials, accuracy and safety.

Further as per the opinion of the experts performance security in terms of the purpose of retentions was concluded as a means to provide incentive to the contractor to complete the contract works in a timely and competent manner. It also provides a fund in case of non-performance and for rectifying defective work. This is a significant finding of this research study. Another significant finding of the research and confirmed by an expert (representative subcontractor organization) was the purpose of retentions to act as a source of interest free finance for clients/contractor. This is primarily from the perspective of the subcontractors.

Therefore it can be concluded that even though retentions were introduced into the construction industry to provide protection against insolvency (House of Commons, 2002) the periodic reform has seen retentions serve a number of purposes. This has very well been established through the findings, having identified 14 different purposes of retentions, the primary purpose however being performance security. The fact that different people or professionals across the industry hold different opinions regarding the purpose of retentions is indeed quite intriguing. The purpose needs to be defined and stated in order for the appropriate deduction of the retention amount. The percentage of money held should be a thoughtful decision for an efficient industry and not an arbitrary one. The study therefore identifies the need for the purpose of retentions to be explicitly stated in any conditions of contract that include the retention provision.

6.2.2 Effectiveness of retentions

The expert interviews and the questionnaire survey were used to assess the extent to which retentions fulfill their purpose or objective for which they exist in construction contracts. The opinions of the three participant groups were analysed and compared. It was established that the opinions of the three groups were diverse. The interviews with the experts found that by and large the clients and consultants thought that retentions were an important and necessary tool. However they did recognize the fact that the deduction of retentions does impact the cash flow of the contractor/subcontractor negatively. The findings of the interviews were confirmed by the questionnaire survey in which it was found that client-consultants believe that retentions mainly fulfill their purpose “most of the times”.

The results of the interviews suggested mixed views from the experts of the contracting organizations. Whereas 2 out of the 4 experts believed that retentions deliver their purpose most of the times one of them was not sure whether it did and one held the opinion that the use of retentions on top of the performance bonds was unfair. The expert who was unsure about retentions serving its purpose held the opinion that "if retentions were for performance related issues then what was the purpose of a performance bond in construction contracts?"The response of the contractors from the questionnaire survey to this question was neutral.

Further the views of the experts of the subcontractor group was that retentions do not deliver the objective for which they exist because the practice was not working the way it is meant to be and is being abused by main contractors. The results of the questionnaire survey also revealed that subcontractors feel that retentions rarely fulfill the purpose for which they exist.

Overall it was found that retentions fulfill the purpose for which they exist only sometimes which can be considered as a neutral response. This finding was validated by the experts reflecting upon the reason as to why retentions fulfill their purpose only 'sometimes'. The neutral response is quite obvious since retentions involve multi parties and whereas retentions fulfill its purpose for one party (the clients) it does not fulfill it for the other (subcontractors) because of the various issues attached to it. Whereas clients believe that retentions provide security for the intended purpose subcontractors share the opinion that retentions do not work the way they are meant to. Literature reviewed stated that the original justification for having retentions in NZ back in 1892 was to protect the contractors/subcontractors. However after the repeal of the 1939 Act in 1987 the justification of the purpose was reversed i.e. retentions were held for the protection of clients (See Section 2.4.1).Therefore the existence of retentions in its current form can be debatable on the basis of the findings of this study. Especially knowing that subcontractors/contractors were protected by legislation under the Contractors' and Workman's Liens Act for about a century till the Act was repealed in 1987.

6.2.3 Incentive to avoid or eliminate defective work

To assess whether retentions act as an incentive to avoid or eliminate defective work both the qualitative and quantitative measures were used. The interviews with the experts suggested a general disagreement from most of the respondents regarding retentions acting as an incentive to avoid or eliminate defective work in contracts. As per the representatives of the contractor and subcontractor groups the reason for producing defect free work was not because retentions were withheld from their payments; but to carry out the job to the best of their ability with an incentive of winning the next job. The client-consultant group however felt that retention to a certain degree help to avoid or eliminate defective work. They further added that retentions do not act as a driver of getting it right the first time, they only help to get the contractor back to site in case defects appear after completion. The results from the questionnaire survey were found to be not definitive with the contractors and subcontractors holding a neutral view to the statement that retentions act as an incentive to avoid or eliminate defective work. The respondents of the client-consultant group however did agree that retentions help in avoiding or eliminating defective work. Further the opinions of the experts during the validation phase helped to conclude that retentions do not act as an incentive to avoid defective work. Therefore even though retentions are there to remedy defective work they are not there to produce defect free performance.

6.2.4 Concluding remarks

The synthesis of the research findings suggests that even though retentions were introduced into the construction industry to protect the clients from contractor insolvency (House of Commons, 2003); the periodic reform has seen retentions serve a number of purposes. However the study concluded that the main purpose of retentions is performance security. A need for the purpose of retentions to be defined and stated in the conditions of contract was identified.

Further with regards to retentions fulfilling their objective or purpose it was found that the views of the three participant groups were significantly different depending upon the benefits accrued to each party. However it was concluded that retentions ‘sometimes’ fulfill the purpose for which they exist. This finding will help to debate the existence of

retentions in construction contracts in its current form. Lastly it was established that retentions do not act as an incentive to avoid or eliminate defective work, they simply provide the principal with leverage for their remedy.

6.3 Status of retention practice in New Zealand

There have been debates and discussions around the practice of retentions world over with a number of issues surrounding the practice. Few countries have tried to abolish the practice in its entirety. Others have tried to implement alternatives or better practices to replace retentions. Therefore it is essential to find out the issues and its significance in order to mitigate its effects on the different parties affected by the practice of retentions. This is one of the key objectives of this study, particularly with regards to the New Zealand construction industry. The literature reviewed shows an absence of any empirical data in relation to such information within the New Zealand context, hence a knowledge gap. This section collates and presents the findings in relation to status of retentions in New Zealand primarily focusing on the issues and their significance. Various methods were used to identify the main issues related to retentions in New Zealand. The different methods are discussed in the following sub-sections.

6.3.1 Fairness of the practice

The response to the fairness of the current practice for all parties was found by using the interview and the questionnaire survey methods. It was found that the opinions regarding the fairness of the practice were not definitive. The practice is fair for one party (clients) whereas it is grossly unfair to the other (subcontractors).

The client-consultants (from the expert interviews) believe that it is a fair practice in its current form however they did accept the fact that it impairs the cash flow of the contractor. They also added that the contractors build in the cost of retentions at the time of pricing the project. They also recognized the fact that from time to time the level of defects is well in excess of the retentions held. This finding is in line with the findings of Hughes *et al* (1998) that the retention fund becomes limited after the payment of the retention money for practical completion. The amount may be insufficient in case of the contractor or subcontractor not being able to perform due to serious defects and causing delays. In this case the purpose of retentions becomes questionable. The findings of the

questionnaire survey suggested that the client-consultants held a neutral view in relation to the statement that the practice of retentions is fair for all the parties in the construction industry.

The experts from the contractor group on the other hand thought that it was a fair practice however it became unfair when the clients hold performance bond as well as retentions on them. The findings of the questionnaire survey suggested the views of the contractors and the clients to be neutral. However the subcontractor group believes that retentions are unfair because the practice did not work the way it was meant to, and was abused by head contractors. In their opinion the amount of money that was withheld was totally irrelevant in terms of the potential defects. The opinion of the subcontractor group from the findings of the questionnaire survey was similar; their opinion being between 'strongly disagree' and 'disagree'.

Further the results of the validation questionnaire helped to confirm that the practice is not fair for all the parties in its current form. Even though the experts commented that retentions in principle could be a fair practice (although debatable) however because it does not work the way it is meant to, it was established that it is an unfair practice. The main issue identified was between the contractor and the subcontractor. Therefore once again the continuation of a practice in its current form is a matter of debate if it is not fulfilling its purpose completely and is not fair for all the parties involved.

6.3.2 Problem with the retention practice and its significance

It was found from the expert interviews as well as the questionnaire survey that there is a problem in relation to the retention practice in the New Zealand construction industry. From the questionnaire survey 79% of the respondents chose the option 'yes' about retentions being a problem. However the responses of the individual groups varied. 37% of the client-consultants, 76% of the contractors and 95% of the subcontractors agreed that there is a problem around the practice of retentions. Whereas 42% of the clients, 12% of the contractors and 1% of the subcontractors did not think that there was any problem in relation to the retention practice.

From the experts interviewed although the respondents of the client group agreed that there are problems around the practice of retentions however in their opinion it was not

a significant one and there were whole lot of other problems that supersede it. The contractors on the other hand described the problem with regards to retentions to be severe. The opinions of the subcontractors were similar stating that the problem in relation to retentions was 'major' or 'significant'. This is in line with the findings of the literature that the issue with regards to subcontractors in NZ is a major one (Miller, 2008). The questionnaire survey further confirmed the significance of the problem related to retentions with 40% respondents saying that the problem is relation to retention was 'extremely serious'. 31% believed that the problem was 'very serious' followed by 21% saying that that the problem is 'moderately serious'. Only 8% of the respondents believe that the problem is 'slightly serious'. Once again for this question the individual results varied. Majority of subcontractors i.e. 51% believe that the problem is extremely serious. Majority of contractors 46% think that the problem is 'very serious', whereas majority of client-consultants i.e. 41% believe that the problem is 'slightly serious'. Overall it was found that out of the 79% respondents who believe that there are problems around the practice of retentions; none of the them stated that the problem in relation to retentions was 'not at all serious'.

The responses from the validation questionnaire helped to confirm that the problem in relation to retentions was extremely serious as far as the subcontractors were concerned. This was recognized by all the experts who responded to the validation questionnaire. Therefore the study helped to establish the significance of the retention issue in the New Zealand construction industry.

6.3.3 Issues with retention practices

To investigate the issues around the retention practices both qualitative and quantitative methods were utilized. The expert interviews, as well as the questionnaire surveys were used to find out the issues around the retention practice in the New Zealand construction industry.

From the experts interviewed the main issue identified by the respondents of the client and the consultant group was the huge impact on the contractor cash flow. Particularly due to the different retention regimes applied to the contractors and subcontractors. As suggested by Odeyinka, Lowe, and Kaka (2008)that delays in the release of retention monies, impact upon the constructors' cash flow negatively. The industry is thus

deprived of funds, which could have been put into better use. One of the consultants highlighted the fact that contractors do go into liquidation and holding back a significant sum of money was perhaps a contributor to that. Another issue identified by one of the experts was the management of the account related to retentions. According to him if the clients do not have sophisticated financing systems it can be very difficult to track retentions, especially for large projects that run for years. Both these issues have been categorized as medium priority from the findings of the questionnaire survey (See Table 6.1).

Further according to the experts of the contractor group the main issue with retentions was related to cash flow. The findings of the questionnaire survey were similar suggesting the main issue with retentions to be the negative effect on contractors' cash flow. The issue identified was that the clients hold retentions on top of the performance bonds which impair the contractor's cash flow and the profit margins. One of the contractors identified the issue with regards to the sub trades particularly the ones whose work finishes early on in the project e.g. piling sub trade. This is in line with the findings of Uher (1991) who observed that the practice of head contractors holding retention on all subcontractors, regardless of the nature of their work, is unnecessary and unfair. Another contractor recognized an issue particularly related to the subcontractors that unless the subcontractors are achieving a return that is higher than the retention value they are effectively doing the work for nothing.

The subcontractors seemed to be the ones bearing the brunt of retentions. The issue was described as 'major' or 'significant' by the experts interviewed. The main issue identified by the experts was related to the unnecessary withholding of retentions by the head contractors. The issue was categorized as high importance from the findings of the questionnaire survey (See Table 6.1). It was found from the opinions of the experts that head contractors had an added incentive by holding on to retentions for as long as possible. In case of subcontractors demanding the payment of retentions from their head contractors they are told that either their retentions are not due or the final payment from the client has not been received yet. This is in line with the findings of a report published by the SEC Group in the UK (Section 2.5.3). One of the experts stated that the sub trades in the industry act as unsecured creditors.

Further the findings from the questionnaire survey revealed a number of issues attached to the practice of retentions in the New Zealand construction industry. A total of 14 issues were identified and are presented in Table 6.1. The issues have been categorized into three i.e. high importance, medium importance and low importance (as per discussion in Section 5.4.2) and are presented in Table 6.1.

Table 6.1: Issues with retentions

Importance of Issues	Issues
High Importance	The inappropriate use of subcontractors retentions by main contractors
	Unnecessary withholding of retentions.
	Security of retentions.
Medium Importance	Non-payment or loss of retentions in case of liquidation or insolvency
	Negative effect on contractors/subcontractors cash flow
	Hard job maintaining the account related to retentions and chasing retentions.
	Late or non-payment or short-payment of retentions.
	Main contractors holding more retention on the subcontractors than what is being held on them due to the retention structure.
Low Importance	Pay if and pay when continued.
	Very high rate of retention.
	Different rules regarding retentions for different projects.
	Poor awareness about how retentions work and why they are in place
	Poor understanding of NZS3910
	Clients pay the price of retentions as it is built into the tender price

According to a comment made by a contractor in the questionnaire survey there was no problem with retentions while dealing with government clients e.g. the councils. However when dealing with private companies ,there were issues with the release of retentions at the time of practical completion where either retentions were not paid out at all, or paid out late or paid short. Another subcontractor commented that the problem existed only for those contractors/subcontractors who did not know what they were doing, what was acceptable and not acceptable, not being able to control and administer the contracts they have entered into with their contractors.

The validation questionnaire helped to verify the significance of the identified issues. The experts helped in establishing that the first three issues as presented in Table 6.1 are quite significant. One of the experts however added that these issues appear to be mainly between the contractor and the subcontractor and not between the principal and the contractor.

Further analysis was carried out to identify the importance of the issues around the retention practice found during the literature review. Once again the opinions of the three groups were found to be different in relation to the issues. However to find out the issues of importance an average of the means of the three groups was considered. Table 6.2 presents issues in order of their importance based on the average mean values. The issues ranked 1 to 6 are considered as important due to mean values greater than 3.5 suggesting that the respondents agree that these issues exist in relation to retentions in the NZ construction industry.

Table 6.2: Perception regarding issues with retentions

Issue	Mean Value (Average)	Rank
Retentions not being paid out on time is a significant issue for the sub-contractors.	4.184	1
Contractor insolvency is the biggest threat for sub-contractors as they lose their retention monies.	4.024	2
There is a huge cash flow issue attached with the practice of retentions in NZ i.e. it impacts upon the contractors/subcontractors cash flow negatively.	3.968	3
Slow final payment of retentions is a serious problem currently faced by the industry.	3.95	4
The money held by way of retentions is being held un-contractually and in an inappropriate manner beyond the level to which it would be required to effect defects.	3.712	5
The practice of retentions is abused as a means of interest free finance to high-risk borrowers with no fixed end rates.	3.563	6
Contractors and subcontractors fail to claim their retentions due to their lack of knowledge of contractual rights.	3.038	7
The issue of retentions is adding to the problem of low productivity in the NZ construction industry in some way or the other.	2.927	8

Therefore this study identified a number of issues surrounding the practice of retentions in NZ currently. It further helped to establish the main issues around the practice. Having identified the issues the task would be to find ways of mitigating these issues for a better and productive construction industry.

6.3.4 Views about the current practice of retentions

The questionnaire survey was used to examine views of the participants in relation to some statements related to the current practice. In addition to that the aim was to collect some data specific to the contractors and subcontractors in relation to the current practice and the issues specific to them. The purpose of this data was to strengthen the findings of the identified issues.

It was found that the respondents generally disagreed to the statement that 'the current practice of retentions is working well in its current form and no changes are required to the current practice'. In other words generally the respondents agreed that there is need for change to the way the current practice of retentions is working. Further it was found that all the respondents agreed to the fact that 'the subcontractors typically bear the burden of the retention practice'. There was also a general agreement to the statement that 'the practice of retentions was fair for contractors and subcontractors if the funds were kept secure'. Finally the respondents gave a neutral response neither agreeing nor disagreeing to the statement that 'the practice of holding retentions is more traditional than any rational attached to the practice'. These findings further suggest that there is a strong need for a review to the current practice of retentions.

Rate of retentions - Further in relation to the specifics to the contractors and subcontractors it was found that the rate at which retentions are withheld on majority of head contractors is as per the sliding scale as stated in NZS 3910. Whereas majority of the subcontractors stated that the rate at which their retentions are withheld is 10%. This is in line with the findings of Abeysekera (2006) stating how different rates of retention are applied on the head contractors and subcontractors in NZ. This has also been identified as an issue of medium importance in the current study (Refer Table 6.1). In relation to the percentage of retentions released at the time of practical majority of the contractors and subcontractors stated the release of 50% retentions at the time of PC. However some respondents also suggested the full retention amount to be carried for the entire DLP. This is again a significant issue related to the practice and has been identified in this study (Refer Table 6.1). The length of the DLP was found to be 12 months for majority of the contractors and subcontractors. However some of the subcontractors stated the DLP to be much longer than 12 months, one of them stating it to be up to 3 years.

The withholding and release of retentions - With regards to the withholding and release of retentions it was found that for a majority of the contractors and subcontractors retentions are withheld either 'always' or 'mostly' on contracts undertaken. Whereas when it came to the release of retentions on time the opinions of contractors and subcontractors differed. Majority of contractors (46%) stated that retentions are 'mostly' paid out on time whereas majority of subcontractors (48%)

stated that they were paid out 'rarely' on time. Few contractors (11%) and subcontractors (13%) stated that retentions are 'never' paid out on time. This is yet again a significant issue and has been identified earlier in the current study. Finally regarding loss of retentions it was found that subcontractors 'sometimes' (43%) or 'rarely' (44%) lose their retentions altogether. Whereas the figures for contractors were lower regarding the loss of retentions 'sometimes' (21%) and rarely (32%). 46% of the contractors said that retentions have 'never' been lost altogether whereas only 12% of the subcontractors held the same view.

The amount of retentions - Further data was collected from contractors and subcontractors in relation to the amount of retentions as a dollar value. It was found that the problem was more significant in relation to the subcontractors than the contractors. The data collected from the contractors showed the annual turnover of the companies ranged from as low as $1M to as high as $1 Billion. For subcontractors the range was from $180,000 to $44Million. The amount of retentions that was withheld at that point of time was found to range from $50,000 to $4.2M depending on the annual turnover of the company for the contractors. The dollar value for the subcontractor retention held at that point of time was found to be significantly high ranging from a few thousand dollars to millions of dollars. The value of retentions overdue was not significant in the case of contractors except in two cases where the percentage of retentions overdue was 50% and 30% equaling to an amount of $500,000 and $70,000. In contract the value of overdue subcontractor retentions ranged from 10% to as high as 100%. Upon calculating the dollar value of the overdue subcontractor retentions from the responses received the value added up to $6,603,422. Therefore the amount of retentions overdue in the case of subcontractors is significant and can be related to the issue of 'late payment of retentions' from the earlier findings.

Time to receive retentions - Further in relation to the longest wait time to receive retentions back it was found that contractors have to wait from 1 month to 3 years to get back their retentions. The average wait time calculated from all the responses received was found to be 12 months. Whereas for subcontractors the values for wait time were very high ranging from 3 months to as long as 10 years. Out of all the responses the average wait time calculated for subcontractors to receive their retentions back was found to be 24 months. This indeed is a significant issue related to retentions

considering the long period of time to get back one's own money.

Issues specific to contractors – A number of issues identified from the literature were presented to the participants to gain their opinion. Table 6.3 presents the issues in the order of importance with their mean values and ranks based on the mean values. A total of 10 issues were presented to the participants of the contractor group out of which 7 were identified as important with mean values greater than 3.5.

Table 6.3: Issues specific to contractors

Rank	Issues	Mean
1	The main issue with retentions is that the money is not secure.	4.00
2	The main issue with retentions is the huge amounts of unsecured money held for long periods of time.	3.93
3	The process of holding a performance bond as well as retentions by the client on the contractor is unfair for the contractors.	3.89
4	Retentions being lost altogether is very common in case the client goes bust.	3.71
5	Retentions would work well if the contractor's money was held securely.	3.64
6	The deduction of retentions causes serious cash flow issues for the contractor.	3.64
7	A lot of contracting firms have limited understanding of the contractual procedures and therefore they fail to get their retentions released on time.	3.57

Issues specific to subcontractors – A total of 9 issues identified in the literature were presented to the participants of the subcontractor group for their opinion. Out of the 9 presented issues 8 were found to be important with mean values greater than 3.5. Table 6.4 presents the issues in the order of importance based on the mean value scores.

Table 6.4: Issues specific to subcontractors

Rank	Issues	Mean
1	The main issue with retentions is the huge amounts of unsecured money held for long periods of time.	4.40
2	Retentions being lost altogether is very common in case of contractor insolvency.	4.38
3	The main issue with retentions is that the money is not secure.	4.30
4	Contractors use subcontractor's retentions to finance their subsequent projects.	4.20
5	Contractors abuse of subcontractor's retentions is widespread.	3.91
6	The main issue with retentions is that they are not released on time.	3.80
7	A lot of sub contracting firms have limited understanding of the contractual procedures and therefore they fail to get their retentions released on time.	3.65
8	Retentions would work well if the subcontractor's money was held securely.	3.59

Few other issues apart from the ones listed in Table 6.4 were identified by the subcontractors. One of the subcontractors stated that retentions were used as a tool for the contractor to get a discount at the time of release i.e. if a subcontractor agreed to a lesser amount than the one due, the retentions were paid out. Few others stated that there was a lot of time wasted trying to get retentions released. The contractors play dumb when it comes to the releasing of retention funds. It was a waste of administrative resources and yet another cost that cannot be costed against the job that it applies to. All this effort would be better spent on building the business and growing rather than chasing QS for back money.

6.3.5 Concluding remarks

The main aim of this section was to identify the issues surrounding the retention practice and its significance in the New Zealand construction industry. A number of methods were utilized to investigate and find the issues. The study helped to establish that the general feel of the industry is that there are problems with the current practice of retentions and that the practice is not fair for all the parties in its current form. It was found that majority of the subcontractors think that the problem with retentions is 'extremely serious' and majority of the contractors think that the problem is 'very serious'. Client-consultants majorly think that the problem is 'slightly serious'. Further the significant finding of the study was the identification of a range of issues (14 in total) and establishing the key issues attached to the practice of retentions in NZ. From all the findings the main issue was found to be the security of retention monies including the abuse of subcontractor retentions and the unnecessary withholding of retentions. It is further concluded that the following issues fall under the issues of security of retentions as identified from Tables 6.1, 6.2, 6.3 and 6.4.

- The inappropriate use of subcontractors retentions by main contractors.
- Unnecessary withholding of retentions.
- Non-payment or loss of retentions in case of liquidation or insolvency.
- Late or non-payment or short-payment of retentions.
- Retentions not being paid out on time is a significant issue for the sub-contractors.
- Contractor insolvency is the biggest threat for sub-contractors as they lose their

retention monies.

- Slow final payment of retentions is a serious problem currently faced by the industry.
- The money held by way of retentions is being held un-contractually and in an inappropriate manner beyond the level to which it would be required to effect defects.
- The practice of retentions is abused as a means of interest free finance to high-risk borrowers with no fixed end rates.
- The main issue with retentions is that they are not released on time.
- Retentions being lost altogether is very common in case the client goes bust.
- The main issue with retentions is the huge amounts of unsecured money held for long periods of time.
- Retentions being lost altogether is very common in case of contractor insolvency.
- The main issue with retentions is that the money is not secure.
- Contractors use subcontractor's retentions to finance their subsequent projects.
- Contractors' abuse of subcontractors' retentions is widespread.

Apart from the security of retentions the other major issue with retentions was found to be the impairment of cash flow due to low profit margins especially for the small scale subcontractors. In case of contractors it was the withholding of retentions on top of the performance bonds causing cash flow issues. The third major issue was the poor awareness and limited understanding of contractual procedures due to which contractors and subcontractors fail to claim their retentions. Another issue found was the maintenance of the accounts related to retentions. It was found that in the absence of sophisticated financing system it could be difficult to track retentions.

With a range of issues attached to the practice of retentions and the practice in itself not being fair for all the parties its continuation in the current form can be questionable. Moreover it was found in the literature that retentions have existed in the NZ construction industry since 1892 with the original justification of protecting the contractors and subcontractors (Bayley & Kennedy-Grant, 2003). However after the repeal of the 1937 Act the purpose was reversed without any rationale. Therefore if

subcontractors or contractors were protected till the year 1987 by the imposition of the Contractors' and Workman's Liens Act then why not in the current day construction industry. On the basis of these findings the current study takes the premise that the current practice of retentions needs to be reviewed.

6.4 Costs versus benefits of retentions

Another focus of this research was to weigh the costs as against the benefits of the retention practice. A study conducted by Ahmad & Barnes (1994) and Bausman (2004) in the US suggested polarization of opinions for different parties regarding the detriments and benefits depending on one's vantage point. Therefore the need to identify similar impacts was identified in context to New Zealand with no such data available. Weighing the costs and benefits will help in determining whether there is a value in the continuation of the practice as it is or the practice needs review. Both the qualitative i.e. the expert interviews and the quantitative methods i.e. the questionnaire surveys were used to assess the costs and benefits or in other word the disadvantages and advantages of the retention practice.

6.4.1 Weighing costs and benefits

Literature reviewed suggested that retentions have a direct impact on clients, contractors and subcontractors. From the analysis of the advantages and disadvantages of the retention practice (Section 2.5.4) carried out using the literature it was found that retentions are always beneficial for the client. For the contractors it was found that retentions are mostly beneficial except for a few issues and always impact negatively on the subcontractors.

The findings of the experts interviewed and the questionnaire survey were found to be somewhat similar to the findings of the literature. The opinion of the three groups was found to be different. From the experts interviewed it was found that the clients being on the receiving end think that the benefits of the practice are more than the costs associated with it. They did highlight the fact that there are costs associated with the practice and the clients end up paying for it, however according to them unless contractors demonstrate a self-managed principle of delivering defect-free product retentions are the best mechanism to protect clients. One of the clients accepted that the

system of retentions is an imperfect one in an imperfect world but it was hard to conceive a better system to replace retentions. This corroborates to the findings of a study carried out by Ahmad & Barnes (1994) suggesting that clients believe that there is no possibility that the contract works will be completed without holding retentions.

The opinion of the consultants (experts) however was different to clients. They thought that the costs associated with the practice are greater than the benefits. In their opinion retentions drain out working capital of the contractors and subcontractors and there is a huge hidden cost of funding those retentions. An interesting opinion from one of the consultants was that retentions create a kind of laziness not needed in the industry rather the industry needs vitality or enthusiasm for doing it right the first time than the willingness to fix up if it goes wrong. Further the findings of the questionnaire survey confirmed that the benefits of the practice outweigh the costs with majority of the client-consultants (54%) holding the opinion. However the questionnaire survey had a certain percentage of client-consultants (29%) holding the view that the costs and benefits of the practice are somewhat equal. Only a very small number (11%) of the client-consultants thought that the costs of the practice outweigh the benefits. Further in terms of costs and benefits ratio (costs:benefits) it was found that maximum percentage of client-consultants (39% each) chose the 30:70 and 50:50 option. The response from the validation questionnaire was also similar. These ratios imply and further confirm the clients position in New Zealand in relation to retentions i.e. even though the clients recognize the costs associated with the practice the benefits of the practice outweigh the costs for them.

Further from the experts of the contractor group the opinion regarding the costs and benefits seemed to be mixed. Few experts thought that there were hardly any benefits of the retention practice and that on the surface it looks like the costs are greater than the benefits. However one of the contractors thought that the practice had more advantages than disadvantages. One of the contractors did agree that retentions do benefit them with additional cash flow however he also stated that contractors provide the client with a performance bond on top of retentions whereas the subcontractors do not provide them with bonds. The findings of the questionnaire survey suggested that the majority of contractors (59%) believe that the costs of the practice outweigh the benefits whereas a lesser percentage (22%) holds the opposite view. 13% of the contractors also thought

that the costs and the benefits are somewhat equal. In terms of the cost benefit ratio it was found that 33% of the contractors chose the 60:40 option followed by 30% choosing the 70:30 option. This finding was confirmed by the validation exercise. The expert agreed that the costs are greater than the benefits and further added that there could be other ways of incentivizing performance. Therefore it was concluded that the costs of the practice are greater than the benefits for the contractors in New Zealand. This finding was in contrast to the literature which suggested that retentions mostly act as an advantage for the contractors suggesting the benefits to be greater than the costs.

The study found that all the experts of the subcontractor group alike think that the practice of retentions has no benefits for them since they are at the receiving end of it. In addition to that the practice does not work the way it is meant to and there can be better ways to incentivize performance than withholding retentions. In the opinion of one of the subcontractors, retentions had negative effects of encouraging the practice of using other peoples' money and encouraging unethical people to be in the industry. He stated that retentions indeed have a negative effect on the whole construction industry because its use permits under-resourced contractors to get into the business without adequate finance. Another expert stated that there is a financial cost that is hidden cost associated with retentions and the value of retentions is somehow accounted for in the compilation of the bid. However on a different note one of the experts (subcontractor) said that one benefit of retentions was that it was good for the cash flow when paid out. Another benefit according to the expert was that it is helpful in the early stages of building relationships, when working with someone not known as it may help to build trust. The findings of the questionnaire survey were in line with the opinions of the experts with 78% of the subcontractors stating that costs outweigh the benefits. In terms of the costs benefits ratio majority of the subcontractors 56% chose the 70:30 option followed by 20% choosing the 60:40 option. The experts helped to verify the opinion of the subcontractor group stating that retentions had absolutely no benefits for them and there could be other ways of incentivizing performance.

Therefore the research established that the main party bearing the costs of the practice is the subcontractors since the practice has hardly any benefits for the subcontractors' in New Zealand.

6.4.2 Costs versus benefits: participant views

Participants were presented with 8 different statements in relation to the advantages and disadvantages of retentions. The view of the 3 participant groups was found to be different in relation to each statement.

In relation to the statements regarding advantages of the practice it was found that client-consultants partially agreed that retentions help in improving the productivity of the construction industry by incentivizing performance. They also agreed to the statement that retention is a good practice if it would work the way it was meant to be. The contractors also partially agreed to this statement. The subcontractors however did not agree or partially agree to any of the advantages presented in the questionnaire survey. The subcontractors on the other hand agreed with 4 out of 5 statements in relation to the disadvantages of retentions. They agreed to the following disadvantages of retentions;

a. Retentions encourage bad practice of using other participant's money rather than as an incentive for quality work.
b. Retentions encourage bad payment habits.
c. Retention wipes out the already marginal profit margin placing significant pressure on contractors/subcontractors.
d. Retention increases subcontractor and contractor financial failures.

Contractors too agreed to statement c and partially agreed to statements b and d. The client group on the other hand did not agree with any of the disadvantages presented. They either disagreed or held a neutral view in relation to the disadvantages. The clients however agreed that contractors and subcontractors build in the price of retentions into their big price, thus increasing project cost. The opinion of the contractors in relation to this statement was neutral whereas the subcontractors partially disagreed with it.

Therefore in the context of New Zealand the study established that retentions have no benefits for the subcontractors and a few for the head contractor. The practice is there to protect clients and therefore the clients benefit fully from the practice. However with such findings it can be concluded the practice is not fair in its current form because of the imbalance of power and there is a need to review the practice.

6.4.3 Concluding remarks

The synthesis of research findings within this theme reveals that the practice of retentions is not fair for all the parties in the construction industry. It has its advantages and disadvantages and the results shows that the costs of the practice are greater for 2 parties i.e. contractors and subcontractors and the benefits are greater for 1 party i.e. the clients. Even though the clients are aware of the costs associated with the practice but believe that there is no other mechanism that could serve the same purpose as retentions in construction contracts. The findings of this research objective once again suggest that the main party bearing the burden of the retentions is the subcontractors. Therefore from the findings under this theme it can be concluded that there is a need to review the practice of retentions.

6.5 Alternatives to retentions

As highlighted in the previous chapters that there is a lot of ongoing debate regarding retention practice world over with a number of calls being made for abolishing retentions. A number of alternatives or better practices have been looked into and implemented in certain parts of the world. In particular the use of bonds and securing retentions by using trust or escrow accounts have been identified as better alternative to the retention system. Similarly the intention of this research was to investigate the opinion of industry in relation to abolishing retentions, need for legislation and the awareness and feasibility of any alternatives being used or that could be used in place of retentions. Both the qualitative (expert interviews) and quantitative (questionnaire survey) techniques were used to find out the requirement for change and alternative practice to retentions. The key findings of this objective of the study are presented under two sub-sections: changes to current practice and views on alternatives to current system of retentions.

6.5.1 Changes to current practice

Participants' views regarding the need for change to the current practice were gathered by using four different questions. The findings are as follows;

Awareness of alternatives to retentions – It was found from the questionnaire survey

that 40% of the respondents were aware of alternatives or better systems being used in place of retentions in the New Zealand construction industry. 48% were unaware of any alternatives being used in place of retentions.

From the experts interviewed it was found that all of them were aware of the option of using bonds in lieu of retentions as per NZS3910 however their use was not common within the NZ construction industry. However the opinion of most of the experts with regards to the use of retention bonds was not favorable. One of the experts from the client group stated that they hold bonds on top of retentions from their contractors. In the opinion of another expert, bonds were more difficult to get released unless they were on demand and hence retentions were still a relatively effective form of security for clients. The experts of the contractor group affirmed that the use of bonds was becoming more common however they also stated that retentions are a most effective form of encouragement to get work done because they are in the form of cash. The experts of the subcontractor group were totally against the use of retention bonds in place of retentions. In their view bonds could be quite expensive and to tie up $200,000 upfront would mean impairing cash flow of a subcontractor. Therefore it can be concluded that even though bonds in lieu of retentions are an option as per NZS3910 a large percentage of the professionals are not aware of the alternative. Most of those who are aware of the alternative are not quite in favor of the use of retention bonds.

Need for change to the current practice – In the opinion of the experts interviewed, the need for change to the current practice was recognized by most of the respondents however only a few had ideas or opinions regarding alternatives (See Section 4.6 for detailed ideas). The experts of the client and contractor group recognized that there was a need for an attitude change in the industry. Working collaboratively in order to reduce defects and deliver quality work and therefore improve the overall productivity of the construction industry. Two of the experts of the subcontractor group believed that it was important to secure retentions and thought that a form of trust account could help to solve the current issues around retentions. However one of them stated that if anything could be bought to replace retentions it could only be a form of performance bond however there would be a lot of issues around that. Another subcontractor (expert) suggested that the way retentions are administered and practiced should be changed.

The findings of the questionnaire survey suggested that a majority of participants (94% subcontractors, 78% contractors and 42% of client-consultants) believe that there is a need for change to the way the current practice is operating. However a certain percentage of participants (30% client-consultants, 13% contractors and 1% subcontractors) were against need for change and the remaining participants (28% client-consultants, 9% contractors and 5% subcontractors) were not sure whether there is a need for change to the current practice or not.

The study found a number of valuable comments (ways to improve the practice of retentions) under this question. A majority of them recognized the use of bonds (performance, retention and on-demand) as a replacement to retentions. Security of retentions by putting them into trust accounts was also a common theme across most of the responses. Some other kinds of changes respondents suggested are as follows (See Appendix C-4 for a detailed list of responses);

- The way of holding retentions for public sector works to be different to that of private sector since there were no issues with the public sector works.
- Changes required in the understanding of NZS3910.
- Educating the industry professionals, ensuring transparency within contract works.
- Ensuring a speedy dispute resolution method such as adjudication to resolve any disputes related to retentions whether misuse or delay in release of retentions.
- Changing CCA provisions to provide more security to retentions in case of the payer going into liquidation.
- Introduce default payment or charge for slow payment of retentions, same as the interest chargeable on slow progress payments.
- Holding retentions in a trust administered by a law firm, accountants or bank with a fair distribution of any interest monies shared upon the release of contractual obligations.
- Abolish retentions, introduce professionalism across the trades, and have the client pay a percentage up front to cover start of the project so that the trades aren't funding the project. Have the trades furnish a QA warranty or workmanship guarantee for work completed and introduce a better project

management structure for the trades to operate under. Project management should be made mandatory on any project to mitigate the risks to all parties of failure.

- Retention payments to be automated when they fall due. Clients/contractors could make full payment to the sub-contractor bank and the bank holds the retentions.
- Shared risk is a better option where the sub-contractor or contractor provide a conforming bid at true cost plus agreed margins and contingencies and perform to a guaranteed maximum price.

Further the validation exercise helped to confirm the findings. All the experts agreed that there was a need for change to the current practice. Based on the findings of the three stages it can be concluded that the current practice of retentions needs to be reviewed so that it is fair for all the parties involved.

Abolishment of the practice and need for legislation –The results of the questionnaire survey found the opinion of the three groups to be significantly different in relation to the views regarding the abolishment of the practice and the need for imposition of legislation for any changes. The clients-consultants disagreed with the idea of abolishing retentions, subcontractors on the other hand agreed with the idea whereas the contractors' held a neutral opinion. An average of the means of three groups suggested that the participants held a neutral view with the idea of abolishing the practice of retentions. However the experts opinion from the validation questionnaire survey confirmed that abolishing retentions was not a feasible option due to the nature of the construction industry and the type of risks that retentions mitigate.

Further in relation to the enforcement of legislation for any changes once again the views of the three groups were found to be different. It was found that the subcontractor group was in strong agreement and the contractors in agreement to the idea of enforcement of legislation. Client-contractors on the other hand 'neither agreed nor disagreed' with the idea. An average of the means of three group (M=3.866) suggested an overall agreement with the idea of enforcement of legislation for any changes. The experts opinion from the validation questionnaire helped to confirm the findings.

On the basis of the findings the study takes the premise that even though the subcontractors are in the favor of abolishing retention however it is not a favorable option especially from the clients' perspective and due to the nature of the construction industry and the risks involved. However the current practice is in need for review and implementation of any changes via legislation is pertinent.

6.5.2 Alternatives or better practices to replace retentions

Participants' opinion was sough with regards to some alternatives that could be used in place of retentions. A total of eight alternatives were listed in the questionnaire survey (Table 5.23, Section 5.6.2). The study found that the opinion of the three groups in relations to the alternatives were not significantly different. Out of the eight alternatives presented only three were found to be significant. The first one was maintaining the current practice however retentions to be deposited into an interest bearing escrow account. The second one being retention released on work completed early in the project. The last was limits on amount of subcontractor retentions. It was also noted that the opinions of the participants in relation to the other alternatives was neutral i.e. 'neither agree nor disagree'.

These findings clearly suggest that the industry is not very clear regarding any alternative practices however the security of retentions is an important issue and the industry is partially positive regarding the use of escrow accounts to secure retentions.

Experts' opinion in relation to the use of escrow/trust accounts–The study found that the experts held mixed opinions regarding the use of trust accounts to secure retentions. Two of the experts of the client group were positive regarding the use of trust accounts to secure retentions however one of the experts thought otherwise. The challenges would be holding it with a third party adding a layer of complexity. In addition to that there would be administrative costs involved however one expert opined that in order to de-risk a project and increase certainty one should be prepared to accept that cost. The consultants (experts) were not quite positive regarding the use of trust accounts. One of the consultants raised issues stating that trust accounts maybe unduly complex and costly and therefore unworkable and did not advocate it as an alternative. He however suggested the idea of retentions being deemed in a trust, but not necessarily held in a separate trust account, provided that it is supported by a statutory mechanism

for withholding and release where retentions are provided for in a contract, in much the same way as the CCA addresses progress payments.

All the experts of the contractor group agreed that to hold retentions in trust account was a sound idea especially when dealing with private clients. The experts of the subcontractor group too were positive regarding the use of trust accounts; however they also identified issues with their use. They believed that it was an alternative though not a good one compared to how retentions are dealt with currently.

It can be concluded that even though there are issues with the use of trust accounts, however in order to secure retentions they could act as a feasible alternative provided the issues associated with it are dealt with.

6.5.3 Concluding remarks

The findings of the study demonstrated that there is a definite need for change to the way the practice of retentions is currently working. Abolishing retentions was not found to be a feasible option due to the nature of the construction industry and the risks involved. However participants did agree that there was a need for legislation for any changes to be enforced. The opinions with regards to a feasible alternative were not definitive. The study did find a number of respondents in the favor of use of bonds (performance, on-demand and retention) in place of retentions and securing retentions by placing them into trust accounts. However a number of issues also were identified with the use of both. Nevertheless the use of trust accounts was found to be the best option to mitigate the risks related to retentions.

6.6 Retention regimes

Different types of retention regimes are used world over. It has been discussed earlier that New Zealand follows a unique sliding retention regime as per NZS3910 as against a flat one used in the other parts of the world. The rates for withholding payments seem to be arbitrary varying from project to project and from one company to another without any basis for the practice. Therefore the research identified the need to understand whether there are problems with the type of retention regimes used in construction contracts and the fairness of use of different regimes for different projects. Further some

factors have been identified that could help impact upon setting up of retention regimes in construction contracts.

6.6.1 Problem with retention regimes

It was found from the questionnaire survey that majority of subcontractors (74%) and contractors (53%) thought that there are problems in relation to the retention regimes used in construction contracts. However the client-consultants views differed with a majority (73%) suggesting that there was no problem with the retention regime. The study found the following issues surrounding the retention regime used in New Zealand;

- Percentage of retentions too high, generally more than the margin on a tendered project inhibiting cash flow and profit.
- Universal retentions being applied across all industry whereas it should depend on the type of trade or industry.
- Retention regime seems to be depending on the client – head contractor agreement. The system should be standardized across the country.
- The percentage at which retentions are held is arbitrary and has no relationship to the value of completed work.
- Retention rate should be a true reflection of the potential costs of default or remedial work.
- Retentions should not apply to projects under a certain value.
- Subcontractor's retention percentage should mirror the contractor's retention percentage.

Further from the experts opinion the study found that the flat rate of 10% used commonly in New Zealand was too high and unusual and there was a need to look at international best practice in relation to the rate at which retentions are held. The study also found that the NZS 3910 sliding scale was responsible for much of the retention imbalance and was not favorable since it results in positive cash flow for the head contractor.

Fairness of using different retention regimes for different projects – The results of the study revealed that majority of client-consultants (78%) and contractors (66%) believe that it is fair to use different retention regime for different projects.

Subcontractors held mixed views with 39% thinking that it was a fair practice and 45% thinking it was not fair to have different regimes for different projects. A small percentage of the respondents were not sure whether it was a fair practice or not.

Fairness of the sliding retention regime used in NZ – From the experts interviewed it was found that except the subcontractors rest of the participants agreed that a sliding regime used in NZ is fairer than a flat one used in other parts of the world. However one of the experts (client) thought that the ultimate decision about the regime should be made on a contract by contract basis. Looking at the sort of defects one might end up dealing with and how much it would cost to fix. One of the experts (contractor) recognized that the practice of retentions was traditional some 50 odd years old and things had trebled and quadrupled since then. It was probably time for another look on those numbers because it might be that they are probably either not sufficient or no longer appropriate. Another contractor added that a sliding regime should be made mandatory on all contracts however if retentions are held beyond 3 months after PC then contractors should be able to provide a bond for it. The consultants comparing it to international practice thought that the holding back of 10% was quite unusual, however looking at the smaller end of the scale they said that it made sense.

The study further identified the benefits of a sliding regime being similar to an insurance policy. The reasons for having a sliding regime were also speculated by many experts however none of them knew where it originated from. However an interesting finding of the study was the history behind the use of a sliding retention regime. One of the experts (consultant) stated that the percentages were replicated from the Wages Protection and Contractor's Liens Act of 1908 which was there for the protection of subcontractors and workmen and was repealed in 1989. There was nothing to replace the Act for a number of years till the introduction of the CCA.

Therefore from the findings it can be concluded that apart from the issues with the practice itself there are issues around the retention regime as well especially the 10% rate of retention. The use of a sliding regime seems to be fair however between the contractor and subcontractor there is an imbalance.

6.6.2 Factors impacting upon setting up of retention regimes

Section 2.7.1 of the literature review discussed the significance of different retention regimes. It was found that different retention regimes are used world over. Moreover in NZ it was found that it varies from project to project as well as within the same organization different rates of retention are used (Table 2.13, Section 2.7.3). Having discussed the significance the experts were asked to state factors that could impact upon setting up of retention regimes.

Most of the experts thought that risk could be a main factor where the need would be to quantify the risk factor involved with each project or each sub trade. Two of the experts stated that first of all there was a need to understand the purpose of having a retention regime and then work it around on that basis. One of the experts opined that it should be set up in a way that "what was good for one was good for the other". The study found the following factors that could impact upon setting up of retention regimes from the experts;

- Scale or size of the project
- Type of contract
- Type of contractor liable for tendering
- Type of trade
- A rating system for the contractors/subcontractors
- Impact on contractor's cash flow
- History of claims against retentions and defaults

Further the questionnaire survey was also used to assess the significance of the factors presented to the participants. A total of 11 factors were presented in the survey and the factors with an average mean value greater than 3.5 were considered as important. The study identified following factors to be important;

- Performance security characteristics of client i.e. security for retention withheld such as use of trust account.
- Retention withholding/release mechanism.
- Contractor's performance history.
- Financial stability of main contractor.

It was found that the mean values for the remaining factors was between 3.173 and 3.471 suggesting that the respondents held a neutral view.

6.6.3 Concluding remarks

From the above discussion it can be concluded that there are certain issues related to the retention regimes used in the NZ contracts. The need for standardization has been identified from the study. The use of a sliding scale and different rates of retention for different projects also seems to be a fair and better practice. Finally the study helped in identifying factors that could impact upon setting up of retention regimes in construction contracts.

6.7 Summary

This chapter has presented a synthesis of the research findings which involved the collated outputs of the qualitative and the quantitative approaches utilized for this study. The synthesis was presented under five sections (6.2 – 6.6) in line with the five research objectives presented in Chapter 1. The synthesis of the findings helped to establish the primary purpose of retentions and to what extent retentions fulfill their objective. The research also identified a number of issues attached to the practice and the significance of the issues. Thereafter the research weighed the costs and benefits and identified the costs and benefits of retentions for the three parties. Further the thesis identified the changes required to the current practice and the awareness and feasibility of using alternatives in place of retentions. Finally the thesis helped to identify some factors that could help in the setting up of retention regimes in construction contracts.

Chapter 7

Conclusions and Recommendations

7.1 Introduction

The aim of this chapter is to conclude the study on examining the practice of retentions in the New Zealand construction industry and to provide recommendations based on the findings of the study. The chapter begins with a review of the research aim and objectives and explains how these were achieved. This is followed by the study's contribution to the existing body of knowledge. The thesis finishes by considering recommendations made from the study followed by recommendations for future work.

7.2 Review of Aim and Objectives of the Research

The primary focus of this study was to examine the practice of retentions in the New Zealand construction industry including its purpose, the issues, advantages and disadvantages, alternative practices, retentions regimes. The study established that there are problems around the practice of retentions in the New Zealand construction industry. However there is a dearth of empirical research around this subject area, despite a lot of research and a number of enquiries being carried out in countries such as US, UK and Australia. Keeping this in mind the study established the five objectives which were presented in chapter one. A mixed methods approach consisting of Expert interviews, an industry wide questionnaire survey and a short validation questionnaire survey once again involving experts was utilized. Having established the problem the primary investigation involved the collection of rich experiential data by interviewing experts from the New Zealand construction industry including representatives from client, contractor, subcontractor and construction consultancy organizations. This was followed by administering an industry wide questionnaire survey to construction

practitioners (clients, consultants, contractors and subcontractors). Finally a short validation questionnaire was used to validate the research findings by including the views of five experts. The subsequent sections describe the fulfillment of the five research objectives.

7.2.1 Objective 1: To determine the purpose of retentions in construction contracts

The first objective of the study was to determine the purpose of retentions in construction contracts. A triangulated approach was used in data collection to fulfill the research objective.

The identification of the purposes of retentions was achieved by three means. These include the review of the literature in Chapter 2, the analysis of the expert interviews and the analysis of the questionnaire surveys. Right from the review of the literature it was found that retentions serve a number of purposes in construction contracts. The collated data from all the approaches identified a total of 14 purposes of retentions which are listed in Chapter 5 in Table 5.2. However the analysis of the results from all the approaches concluded that the primary purpose of retentions was security for performance. Therefore performance security in terms of the purpose of retentions was concluded as a means to provide incentive to the contractor to complete the contract works in a timely and competent manner. It also provides a fund in case of non-performance and for rectifying defective work. The study found another important purpose of retentions from the point of view of subcontractors, which was to act as a source of interest free finance for contractors. The study also found that retentions fulfill their purpose or objective only sometimes in construction contracts. Lastly under this objective the study found that retentions do not act as an incentive to avoid or eliminate defective work. Therefore even though retentions are there to remedy defective work they are not there to produce defect free performance. These findings therefore helped to fulfill the 1st objective.

7.2.2 Objective 2: To review the status of retentions in New Zealand

One of the key objectives of this study was to review the practice of retentions mainly in order to ascertain the issues around the practice and the significance of those issues. To

achieve this objective the research once again utilized a similar triangulated approach. The study found that overall the practice is not fair for all the parties in its current form only because it does not work the way it is meant to. The results revealed that the practice is fair for one party i.e. the clients and unfair for the contractors and subcontractors. Further the results of the study established that there are problems with regards to retentions in the New Zealand construction industry. It was also found that the problem overall is extremely serious. For the individual groups it was found that the problem is 'slightly serious' for the clients, 'very serious' for the contractors and 'extremely serious for the subcontractors'.

Under this objective the study identified a range of issues surrounding the practice of retentions in New Zealand. The study helped to identify a total of 14 issues. However the main issue was found to be security of retention monies including the abuse of subcontractors' retentions and the unnecessary withholding of retentions. The other issues that fall under the security of retentions have been listed in Section 6.3.3. Another major issue was found to be the impairment of cash flow especially for the small scale subcontractors. Other significant issues found were the poor awareness and limited understanding of contractual procedures and the poor maintenance of the accounts related to retentions. This finding adds to knowledge around the subject area of retentions particularly in the New Zealand context.

Further in relation to the current practice the study found that the rate at which retentions are held for contractors and subcontractors is different. The study also found that retentions are rarely paid out on time for majority of the subcontractors (48%) and never paid out on time for 13% of them. With regards to the loss of retentions the study found that for subcontractors retentions were lost altogether either 'sometimes' or 'rarely'. A dollar value of overdue subcontractor retentions was calculated and it was found that $6,603,422 retentions were held by contractors from their subcontractors. Finally the average wait time to receive retentions back was found to be 12 months for contractors and 24 months for subcontractors. All these findings further strengthened the earlier findings related to the retention issues and their significance in the New Zealand construction industry.

7.2.3 Objective 3: To weigh the costs and benefits of retentions

The third objective was to weigh the costs and benefits of the retention practice in the New Zealand construction industry. A triangulated approach was once again used to fulfill this research objective. The study found a polarity between the views of the three participant groups.

Literature (covered in section 2.5.4) suggested that retentions are always beneficial for the clients, mostly beneficial for the contractors except for a few issues and always disadvantageous for the subcontractors. The findings from the expert interviews and the questionnaire survey yielded similar results. The research found that the opinion of the three participant groups were different in relation to the costs and benefits depending upon the benefits accrued. It was found that, for the clients the benefits of the retentions outweigh the costs and that the cost benefit ratio is 30:70 for majority of clients. This was found to be in line with the opinions of the experts who recognized that there are costs associated with the practice however in the absence of an alternative the benefits of retentions are greater than the costs.

For the contractors from the results of the questionnaire survey the study found that the costs outweigh the benefits of the practice and the cost benefit ratio was found to be 60:40 for the majority of them. Further the experts from the contractor group confirmed that even though retentions do benefit them with additional cash flow however the costs for them are greater than the benefits. Their argument was that contractors provide their clients with retentions, on top of a performance bond, whereas the subcontractors do not provide a bond. From the subcontractors perspective the research found that retentions have no benefits for them because the practice does not work the way it is meant to work. Therefore the main party bearing the costs of the practice is the subcontractors.

Overall the study found that the benefits of the practice are greater for one party i.e. the clients and the costs are greater for the contractors and subcontractors. Therefore based on the findings it was concluded that the practice is not fair in its current form.

7.2.4 Objective 4: To examine the awareness and feasibility of some alternatives to retentions.

With a few countries having implemented alternative practices to the traditional practice

of retentions the purpose of this objective was to find out the opinion of the industry regarding the need for change to the current practice. Further the objective was to examine the awareness and feasibility of some alternatives that could replace retentions in New Zealand.

The study found that even though subcontractors are in the favour of abolishing retentions however it is not a favourable option especially from the clients' perspective and due to the nature of the construction industry and the risks involved. However it was found that majority of the industry practitioners are in favour of changes to be made to the current practice of retentions. Further a general agreement was found in relation to the need for change by the enforcement of legislation. In terms of awareness of alternative practices it was found that majority of the industry respondents were unaware of any alternative practices that could be used to replace retentions. It was found from the experts that even though bond in lieu of retentions was an alternative as per NZS 3910 their use was not common in the New Zealand construction industry. Even the subcontractors (experts) were not found to be in the favour of the use of retention bonds. The study found a number of valuable suggestions for the kinds of changes that could be implemented (see section 6.5.1).

From the list of alternatives presented in the questionnaire the respondents did not provide a clear consensus however based on the findings only three alternatives were found to be important. The first one was the use of trust accounts to secure retentions, the second one being retentions released on work completed early in the project and the last one was limiting the amount of subcontractor retention.

In the earlier section it was discussed and established that the main issue with the practice is the security of retentions and a number of respondents were found to be in the favour of use of trust accounts to secure retentions. However it was found that the opinion of the experts was mixed with regards to the use of trust accounts. Some favoured the use of trust accounts and the other identified a number of issues with the use of trust accounts. However the study concluded that even though there are issues with the use of trust accounts, in order to secure retentions it was a feasible alternative provided the issues associated are dealt with.

7.2.5 Objective 5: To propose guidelines or basis to set up retention regimes.

New Zealand uses a unique retention regime i.e. sliding scale as against a flat rate used in the other parts of the world. With the percentage of retentions varying from project to project and organization to organization the purpose of this objective in continuation to Objective 2 was to identify problems with the current regime and propose guidelines for setting up retention regimes in construction contracts.

It was found that the contractors and subcontractors believe that there are problems with the retention regime used in construction contractors, however the clients thought otherwise. The difference in opinion could majorly be because it is the contractors and subcontractors from whom retentions are deducted. A number of issues were identified in relation to the retention regime used (see section 6.6.1). The main issue identified was the flat rate of 10% which was too high and unusual compared to the other countries usually affecting the subcontractors. The study also found that the NZS 3910 sliding scale was responsible for much of the retention imbalance and was not favourable since it results in positive cash flow for the head contractors.

Under this objective the study further found that the use of different regimes for different projects was found to be a fair practice by majority of the respondents. The use of a sliding regime as against a flat rate was also found to be fairer.

Bearing in mind that the use of different regimes for different projects is fair the study further identified a number of factors that could impact upon setting up of retention regimes in construction contracts (see section 6.6.2).

7.3 Contributions of the Research

Given the lack of empirical data in relation to the subject area of retentions in New Zealand, this study has undoubtedly contributed to the body of knowledge. The information contained in the research has added some useful literature for future researchers. In addition to that the research provides essential data which could lay the foundation for implementing any changes to the current practice of retentions in New Zealand. The contributions of the research are outlinedas follows;

1. The study helped in determining the purpose of retentions as used in the current day construction industry. The primary purpose of retentions was found to be performance security. Another important purpose of retentions from the perspective of subcontractors was found to be to provide interest free finance to contractors. In terms of fulfilling their purpose it was found that retentions only fulfill the purpose for which they exist sometimes because they do not work the way they are meant to be.

2. The study established that even though retentions are there for defective work, their existence does not act as an incentive to avoid or eliminate defective work. They only help to get the contractor back to site in case defects appear after completion.

3. The study helped in establishing that problems around the practice of retentions are prevalent in the New Zealand construction industry and the problem is extremely serious.

4. The research has provided a list of issues attached to the practice of retentions in New Zealand. The research also established that the main issue was the security of retention monies. The research also identified other significant issues related to retentions.

5. The research helped to weigh the costs as against the benefits of retentions for the three participant groups. The research established that the benefits of the practice are greater than the costs for one party and the costs are greater than benefits for the other two i.e. the contractors and the subcontractors.

6. The study established that abolishing retentions was not a feasible option. However the practice was in need for change through the enforcement of legislation.

7. The study identified a number of alternative practices that could be used to replace retentions for a better and productive construction industry. Even with the issues with the use of trust accounts their use was identified as a feasible alternative to secure retention monies.

8. The study established that there are issues with the retention regimes used in construction contracts. The study also identified a range of issues in relation to the retention regimes used.

9. The study found that the use of a sliding scale used in New Zealand as compared to a flat rate used in other parts of the world was a fairer practice. The study also revealed that the use of different retention regimes for different projects was a fair practice. In line with that the study identified a range of factors that could be used to set up retention regime in construction contracts.

7.4 Recommendations

The process of the research and its findings has been substantial for the researcher. Extensive findings and recommendations have been developed for the New Zealand construction industry. The study makes the following specific and general recommendations.

7.4.1 Specific recommendations

1. One of the objectives of the study was to determine the purpose of retentions. The study found a total of 14 purposes of retentions as identified by the professionals of the New Zealand construction industry, the primary purpose however being performance security. The fact that different people or professionals across the industry hold different opinions regarding the purpose of retentions is indeed quite intriguing. Therefore there is a need to define and state the purpose of retentions. The study recommends the purpose of retentions to be included and explicitly stated in any conditions of contract that include the retention provision. This will further help in determining the percentage of retentions to be deducted in order to fulfil the purpose for which retentions exist.

2. The study found that problems in relation to the retention practice are prevalent in the New Zealand construction industry just like other countries. The problem with regards to retention was found to be extremely serious especially with

regards to the subcontractors. The practice is not fair for all the parties with a number of issues being attached to it. Based on these findings the study recommends that it is about time that the practice of retentions is reviewed and changes implemented for a better and productive construction industry.

3. The study found that the benefits of the practice are greater for one party i.e. the clients and the costs are greater for the other two i.e. the contractors and the subcontractors. Even though retentions are there to protect clients and if in principle the practice would work the way it is meant to it would be considered as fair in its current form even if it did not benefit the contractors or subcontractors. However because the practice does not work the way it is meant to and affects the contractors and subcontractors negatively there is a need to review the practice to reduce its detrimental effects on the contractors and subcontractors.

4. The study found that there is a definite need for change to the current practice of retentions and the implementation of any changes via legislation. The study found the use of trust accounts as the most feasible alternative to secure retention monies. Therefore the study recommends that parties to a construction contract explore the use of Trust Accounts to secure contractor and subcontractor retention monies.

5. The study found that there are issues with the retention regimes used in construction contracts especially the deduction of 10% from the subcontractors which is very high. The study therefore recommends that there needs to be some form of standardization with regards to the deduction of retentions especially the deduction of subcontractors retention.

6. Retention is an age old practice and its continuation in the same form is questionable with a range of issues attached to it and considering its detrimental effects on the construction industry at large. Client protection is deemed as important however considering the negative impacts of the retention practice and the practice not working well in its current form it is essential to review the practice.

7.4.2 Recommendations for future studies

The study recommends further research to be conducted in the following areas to expand the current research findings.

1. Empirical research on the subject area of retentions was found to be rare particularly in New Zealand. There was anecdotal evidence to suggest issues around the practice. The study did establish the key issues and their significance. However the study also identified a range of other issues that have a significant impact on the retention practice such as procurement style, SME contract practice, and industrial relationship. Further research can be carried out to look into these issues and find out their significance. Having looked at the issues in depth further research can help to identify ways to mitigate risks associated with those issues for a better and productive construction industry.

2. The study found the use of trust accounts as a feasible alternative to secure retentions, however a number of issues have also been identified with the use of trust accounts. It is recommended that further research into the use of trust accounts as a feasible alternative to retentions would help to uncover the benefits and detriments of trust accounts and determine whether their use as an alternative is feasible.

3. The study also found that some form of performance bond could replace retentions. Further studies to find out the feasibility of bonds to replace retentions could be carried out.

4. The research did establish that the costs of the practice are greater for two parties and benefits are greater for 1 party. However more specific research is required to quantify the costs associated with the practice. This could be done by studying the cash flow profiles of contractors and subcontractors. Further an assessment should be carried to assess whether the amount of moneys held is commensurate with the risks carried. This will further help to justify the true value in the continuation of the practice.

7.5 Concluding statements

This research has examined the practice of retentions in the New Zealand construction industry with a view to determine the issues surrounding the practice and explore feasible alternatives. An emphasis is also placed on determining the value in the continuation of retentions in its current form. The research took a pragmatic approach in order to gather three different perceptions from the parties directly affected by the retention practice i.e. client-consultants, contractors and subcontractors.

The study found that retentions serve a number of purposes in construction contracts and the primary purpose of retentions was found to be performance security. However retentions fulfill their objective or purpose only sometimes because they do not work the way they are meant to. Anecdotal evidences suggested problems around the practice of retentions in New Zealand. This study found that the problem in relation to retentions is extremely serious as far as the subcontractors are concerned. The other parties (contractors and clients) also think that the problem is very serious. The thesis found a number of issues attached to the practice apart from the main issue of the security of retention monies. A number of issues were also identified with the current retention regime used in New Zealand. The use of trust accounts was found to be a feasible alternative to secure retention monies. The study found that the costs of the practice are greater for two parties i.e. the contractors and subcontractors and benefits are greater for the clients. The research finally provided a set of guidelines for setting up retention regimes in construction contracts.

Retentions have a number of detrimental effects on the parties (contractors and subcontractors) and it also affects the construction industry at large e.g. issues of cash flow. The fact that the practice of retentions has continued unabated is quite intriguing. Especially in the case of New Zealand where the initial purpose of retentions when introduced in 1897 in the Lien's Act was to protect the workmen (contractors and subcontractors). Only after the Lien's Act was abolished in 1987 the purpose of retentions was reversed i.e. to protect the payer (client). It was after that the abuse of retentions started and is continued till date. The findings of this study suggest that it is time that the practice of retentions is reviewed and some alternatives or better practice be introduced to make the practice fair for all the parties and for a better and productive

the construction industry.

Finally it is hoped that the findings of this research study contribute to the existing body of knowledge and help inform the New Zealand construction industry for the implementation of any changes to the current practice of retentions.

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Appendix A-1

AUT
UNIVERSITY
TE WĀNANGA ARONUI O TAMAKI MAKAU RAU

MEMORANDUM

Auckland University of Technology Ethics Committee (AUTEC)

To: John Tookey
From: **Charles Grinter** Ethics Coordinator
Date: 20 July 2011
Subject: Ethics Application Number 11/164 **A rational basis for setting up a monetary retention regime in construction contracts.**

Dear John

Thank you for providing written evidence as requested. I am pleased to advise that it satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC) at their meeting on 27 June 2011 and I have approved your ethics application. This delegated approval is made in accordance with section 5.3.2.3 of AUTEC's *Applying for Ethics Approval: Guidelines and Procedures* and is subject to endorsement at AUTEC's meeting on 8 August 2011.

Your ethics application is approved for a period of three years until 20 July 2014.

I advise that as part of the ethics approval process, you are required to submit the following to AUTEC:

- A brief annual progress report using form EA2, which is available online through http://www.aut.ac.nz/research/research-ethics/ethics. When necessary this form may also be used to request an extension of the approval at least one month prior to its expiry on 20 July 2014;
- A brief report on the status of the project using form EA3, which is available online through http://www.aut.ac.nz/research/research-ethics/ethics. This report is to be submitted either when the approval expires on 20 July 2014 or on completion of the project, whichever comes sooner;

It is a condition of approval that AUTEC is notified of any adverse events or if the research does not commence. AUTEC approval needs to be sought for any alteration to the research, including any alteration of or addition to any documents that are provided to participants. You are reminded that, as applicant, you are responsible for ensuring that research undertaken under this approval occurs within the parameters outlined in the approved application.

Please note that AUTEC grants ethical approval only. If you require management approval from an institution or organisation for your research, then you will need to make the arrangements necessary to obtain this.

When communicating with us about this application, I ask that you use the application number and study title to enable us to provide you with prompt service. Should you have any further enquiries regarding this matter, you are welcome to contact me by email at ethics@aut.ac.nz or by telephone on 921 9999 at extension 8860.

On behalf of AUTEC, I wish you success with your research and look forward to reading about it in your reports.

Yours sincerely

Charles Grinter
On behalf of Dr Rosemary Godbold and Madeline Banda **Executive Secretary**
Auckland University of Technology Ethics Committee

Cc: Priyanka Raina priyanka.raina@aut.ac.nz

From the desk of ...
Dr Rosemary Godbold and Madeline Banda
Executive Secretary
AUTEC

Private Bag 92006, Auckland 1142
New Zealand
E-mail: ethics@aut.ac.nz

Tel: 64 9 921 9999
ext 8860
Fax: 64 9 921 9925
page 1 of 1

Appendix A-2

Participant Information Sheet

AUT UNIVERSITY
TE WĀNANGA ARONUI O TAMAKI MAKAU RAU

Date Information Sheet Produced:

13th June 2011

Project Title

A rational basis for setting up a monetary retention regime in construction contracts.

An Invitation

I am Priyanka Raina, studying for PhD in construction management at AUT University. I am undertaking research on the topic of retentions in the NZ construction industry under the guidance of my primary supervisor Dr. John Tookey who is an Associate Professor of construction management at the School of Engineering at AUT.

The aim of this study is to review the current practice of retentions in the NZ construction industry, objectively examine the alternatives to the current practice and consequently develop guidelines or basis for setting up retention regimes in construction contracts.

We invite you to participate in this research process. Your thoughtful and reasoned opinion will be valuable for the research. Your participation however is voluntary and you can withdraw at any time. Your withdrawal during the process will not cause any damage to you.

What is the purpose of this research?

The purpose of this research is to review the current practice of retentions in the NZ construction industry. There have been lots of debates and discussions regarding the retention practice in the US and UK with calls for the abolishment of the practice. However nothing is known about the status of the practice in the NZ construction industry. Hence there is a need to investigate the current status of the retention practice in the NZ construction industry. Another problem that is being addressed is the lack of understanding or a lack of a basis on which retention regimes are set in the construction industry. Therefore the other purpose of this research is to develop a guideline or a basis on which retention regimes can be set in the construction industry.

Data is expected to be gathered through interviews and questionnaire surveys. This study will result in a thesis and it is expected that 3-4 journal or conference papers will be published as a part of the research outputs.

How was I identified and why am I being invited to participate in this research?

Participants for this interview process have been recruited amongst different professional/public bodies identified within New Zealand for the purpose of this study. You have been selected being a member of that particular organisation/body and your contact details have been obtained from their website/yellow pages. Your selection has been made based on your experience and designation within the organisation.

What will happen in this research?

This project involves a review of the current retention practice in the New Zealand construction industry. It is known that the practice has raised a lot of debate and discussion in the US and UK construction industries and in some other parts of the world as well. There is some evidence to suggest that the practice has sparked some debate in the New Zealand construction industry too. This study therefore

aims to address this issue to the New Zealand building practitioners and gather data by way of interviews and questionnaire surveys.

You as a participant are invited to take part in this research process. Your involvement will be by way of answering a few open ended questions regarding your views and perceptions regarding the practice of retentions. The questions will be based on the following sub-topics:

- Current practice of retentions in the New Zealand construction industry.
- The purpose of retentions.
- The costs and benefits or the advantages and disadvantages of the retention practice.
- Alternatives that could be used in place of the retention practice.
- Guidelines for setting up retention regimes.

What are the discomforts and risks?

There are no anticipated discomforts or risks involved at any stage of the research. However potential discomfort or risk may be associated with the maintenance of privacy and confidentiality.

How will these discomforts and risks be alleviated?

The data gathered through the interviews will be treated as confidential and will be used only for analysis purposes to reveal the findings of the research study. Your name, designation and company information will remain completely anonymous and will not be revealed to any third party or to other participants at any point during or after the research. All the information gathered will either be stored in electronic form in the supervisor's or researcher's computer or under lock and key.

What are the benefits?

The findings and conclusions of this study would not only be useful to academics and practitioners in New Zealand but also to others worldwide for the purpose of setting up a retention regime. Furthermore, retentions have been a major problem in many countries. This study would provide insights regarding the practice of retentions in the New Zealand construction industry on how this issue may be resolved in order to improve the efficiency of the construction industry.

How will my privacy be protected?

This research does not seek to gather any personal information from the participants. Every care will be taken to ensure that any risk of breach of confidentiality arrangements is minimised. The raw data collected in the form of interview responses will be stored either in the researcher's personal computer or in a locked cabinet with access limited to the researcher and as per the strict guidelines of the AUT Ethics Committee.

What are the costs of participating in this research?

The cost associated with your participation is the time involved. The interview may take 45-60 minutes of your time.

What opportunity do I have to consider this invitation?

Please take a few days to consider this invitation. If you need further information or clarification regarding any aspect of the project kindly contact me or my supervisor directly. Our contact details are provided at the end of this sheet.

How do I agree to participate in this research?

A consent form has been send along with this Participant information sheet. By completing and signing the consent form you agree to participate in this research.

Will I receive feedback on the results of this research?

In case you are interested in the results of this research the findings will be made available to you at the end of the research either by e-mail or post.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, *Dr. John Tookey*, *john.tookey@aut.ac.nz*, +64 9 9219512

Concerns regarding the conduct of the research should be notified to the Executive Secretary, AUTEC, Madeline Banda, *madeline.banda@aut.ac.nz* , 921 9999 ext 8044.

Whom do I contact for further information about this research?

Researcher Contact Details:

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Project Supervisor Contact Details:

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Approved by the Auckland University of Technology Ethics Committee on *20/07/2011*, **AUTEC Reference number** *11/164*

Appendix A-3

Participant Information Sheet

AUT UNIVERSITY
TE WĀNANGA ARONUI O TĀMAKI MAKAU RAU

Date Information Sheet Produced:

13th June 2011

Project Title

A rational basis for setting up a monetary retention regime in construction contracts.

An Invitation

I am Priyanka Raina, studying for PhD in construction management at AUT University. I am undertaking research on the topic of retentions in the NZ construction industry under the guidance of my primary supervisor Dr. John Tookey who is an Associate Professor of construction management at the School of Engineering at AUT.

The aim of this study is to review the current practice of retentions in the NZ construction industry, objectively examine the alternatives to the current practice and consequently develop guidelines or basis for setting up retention regimes in construction contracts.

We invite you to participate in this survey process. Your thoughtful and reasoned opinion will be valuable for the research. Your participation however is voluntary and you can withdraw at any time. Your withdrawal during the process will not cause any damage to you.

What is the purpose of this research?

The purpose of this research is to review the current practice of retentions in the NZ construction industry. There have been lots of debates and discussions regarding the retention practice in the US and UK with calls for the abolishment of the practice. However nothing is known about the status of the practice in the NZ construction industry. Hence there is a need to investigate the current status of the retention practice in the NZ construction industry. Another problem that is being addressed is the lack of understanding or a lack of a basis on which retention regimes are set in the construction industry. Therefore the other purpose of this research is to develop a guideline or a basis on which retention regimes can be set in the construction industry.

Data is expected to be gathered through interviews and questionnaire surveys. This study will result in a thesis and it is expected that 3-4 journal or conference papers will be published as a part of the research outputs.

How was I identified and why am I being invited to participate in this research?

Participants for this survey have been recruited amongst ten different professional/public bodies identified within New Zealand for the purpose of this study. You have been selected being a member of that particular organisation/body and your contact details have been obtained from their website/yellow pages. Your selection has been randomly made from amongst all the registered members of the organisation.

What will happen in this research?

This project involves a review of the current retention practice in the New Zealand construction industry. It is known that the practice has raised a lot of debate and discussion in the US and UK construction industries and in some other parts of the world as well. There is some evidence to suggest that the practice has sparked some debate in the New Zealand construction industry too. This study therefore

aims to address this issue to the New Zealand building practitioners and gather data by way of interviews and questionnaire surveys.

You as a participant are invited to take part in this research process. Your involvement will be by way of completing a questionnaire survey including closed and open ended questions. The questionnaire is basically divided into 6 parts to address and get answers to the five main research questions: The questionnaire seeks answers to the following sub-categories:

- Current practice of retentions in the New Zealand construction industry.
- The purpose of retentions.
- The costs and benefits or the advantages and disadvantages of the retention practice.
- Alternatives that could be used in place of the retention practice.
- Guidelines for setting up retention regimes.

What are the discomforts and risks?

There are no anticipated discomforts or risks involved at any stage of the research. However potential discomfort or risk may be associated with the maintenance of privacy and confidentiality.

How will these discomforts and risks be alleviated?

The data gathered through the questionnaire survey will be treated as confidential and will be used for analysis purpose to reveal the findings for research purposes. Your name or company information will remain completely anonymous and will not be revealed to any third party or to other participants at any point during or after the research. All the information gathered will either be stored in electronic form in the supervisor's or researcher's computer or under lock and key.

What are the benefits?

The findings and conclusions of this study would not only be useful to academics and practitioners in New Zealand but also to others worldwide for the purpose of setting up a retention regime. Furthermore, retentions have been a major problem in many countries. This study would provide insights regarding the practice of retentions in the New Zealand construction industry on how this issue may be resolved in order to improve the efficiency of the construction industry.

How will my privacy be protected?

This research does not seek to gather any personal information from the participants. Every care will be taken to ensure that any risk of breach of confidentiality arrangements is minimised. The raw data collected in the form of survey responses will be stored either in the researchers personal computer or in a locked cabinet with access limited to the researcher and as per the strict guidelines of the AUT Ethics Committee.

What are the costs of participating in this research?

The cost associated with your participation is the time involved. The questionnaire may take 25-30 minutes of your time to fill.

What opportunity do I have to consider this invitation?

Please take a few days to consider this invitation. If you need further information or clarification regarding any aspect of the project kindly contact me or my supervisor directly. Our contact details are provided at the end of this sheet.

How do I agree to participate in this research?

Completion of the questionnaire will indicate your consent to participate.

Will I receive feedback on the results of this research?

In case you are interested in the results of this research the findings will be made available to you at the end of the research either by e-mail or post.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, *Dr. John Tookey*, *john.tookey@aut.ac.nz*, +64 9

Concerns regarding the conduct of the research should be notified to the Executive Secretary, AUTEC, Madeline Banda, *madeline.banda@aut.ac.nz* , 921 9999 ext 8044.

Whom do I contact for further information about this research?

Researcher Contact Details:

Priyanka Raina, BArch (Hons), MCM
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AUT City Campus
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Email: priyanka.raina@aut.ac.nz
Phone: 9219999 ext 6635
Fax: +64 9 9219973

Project Supervisor Contact Details:

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Auckland 1142, New Zealand.
Email: john.tookey@aut.ac.nz
Phone: +64 9 9219512
Fax: +64 9 9219973

Approved by the Auckland University of Technology Ethics Committee on *type the date final ethics approval was granted*, **AUTEC Reference number** *type the reference number*.

Appendix A-4

Consent Form

For use when interviews are involved.

AUT UNIVERSITY
TE WĀNANGA ARONUI O TĀMAKI MAKAU RAU

Project title: ***A rational basis for setting up a monetary retention regime in construction contracts.***

Project Supervisor: ***Associate Professor Dr. John E. Tookey***

Researcher: ***Priyanka Raina***

- ○ I have read and understood the information provided about this research project in the Information Sheet dated 10th June 2011.
- ○ I have had an opportunity to ask questions and to have them answered.
- ○ I understand that notes will be taken during the interviews and that they will also be audio-taped and transcribed.
- ○ I understand that I may withdraw myself or any information that I have provided for this project at any time prior to completion of data collection, without being disadvantaged in any way.
- ○ If I withdraw, I understand that all relevant information including tapes and transcripts, or parts thereof, will be destroyed.
- ○ I agree to take part in this research.
- ○ I wish to receive a copy of the report from the research (please tick one): Yes○ No○

Participant's signature: .....

Participant's name: .....

Participant's Contact Details (if appropriate):

.....

.....

.....

.....

Date:

Approved by the Auckland University of Technology Ethics Committee on 20/07/2011 AUTEC Reference number 11/164

Note: The Participant should retain a copy of this form.

Appendix B-1

Appendix 4

Indicative questions for Interviews

AUT UNIVERSITY
TE WĀNANGA ARONUI O TAMAKI MAKAU RAU

1. **Purpose of retentions:**

i. In your opinion what is the main purpose of retentions and do you think retentions deliver what is apparently their objective?
ii. Retentions provide an incentive to contractors to avoid or eliminate defects. Is there evidence that retentions actually achieve this?
iii. If retentions are for defects then what type of defects matter or are retentions meant for a particular type of defective work?
iv. In your opinion is it possible to achieve a zero defect culture in the NZ construction industry? How do you think it can be achieved?

2. **Current status of retentions and the unique retention regime:**

i. What are your views/opinions and perceptions regarding the current practice of retentions in New Zealand in terms of its fairness, adequacy in terms of funds?
ii. Do you see retentions as a problem in the NZ construction industry? Where does the problem lie and how serious is it?
iii. Do you think there has been any improvement with the inclusion of the CCA?
iv. What are the effects of the practice positive or negative?
v. What are your comments/views regarding the unique retention regime NZ follows i.e. sliding regime as compared to a flat rate followed in the other parts of the world?
vi. Considering the current economic situation prevailing in the industry what are your comments regarding the perceived effects that the retention provision may have on the construction industry?

3. **Costs and benefits of the retention practice:**

i. What according to you are the benefits of the retention practice?
ii. Are retentions equitable and necessary? Is there a hidden cost i.e. is the cost greater than benefits?
iii. What is your opinion regarding retentions being held until completion of a project tying up the company capital for years on projects taking many years to complete?

4. **Alternatives to retentions:**

   i. Are you aware of any alternative that are being used in NZ in place of the traditional system of retentions?
   ii. With other forms of securities in place such as payment/performance bonds how effective do you think is the use of retentions?
   iii. Are there any changes that could be made to the NZ construction industry practice which are more likely to have an impact upon defects than the current system of retentions?
   iv. What is your opinion regarding trust or escrow accounts? Should retention money be held there? Do you consider it as a feasible alternative to retentions?

5. **Guidelines for developing retention regimes:**

   i. In your opinion is there a rationale behind the use of a sliding retention regime in NZ and a flat rate in other parts of the world?
   ii. What factors do you think could help in determining a retention regime for a construction contract

Appendix B-2

Retentions in the New Zealand construction industry

1. Information for participants

This research investigates the age old practice of retentions in the New Zealand construction industry. There have been lots of debates and discussions regarding the retention practice in the US and UK in the past decade or so with several calls for the abolishment of the practice. Anecdotal evidence suggests that there are issues around the practice in the NZ construction industry. With the recent collapse of Mainzeal the issue has sparked even more debate. Hence the need for this research to investigate how well the current practice is working, identify any problems or issues around the practice and present them to the industry along with some feasible alternatives if required.
This survey is being conducted among the NZ construction industry professionals who deal with retentions as well as those who observe them in use. You are identified as someone who can provide valuable input into this research. Your participation in this survey is highly appreciated. Your privacy and confidentiality will be strictly maintained. Completion of this questionnaire is considered as indicating your consent to participate.
All responses will be held anonymous. The data will be used only for my PhD research. The raw data will be seen only by myself and my primary supervisor. Once the research is completed the data will be deleted. The survey has a total of 8 sections and should not take more than 20-25 minutes of your time depending upon your responses. While section A-E and section H requires responses from all the participants, section F and section G are specifically meant for contractors and subcontractors respectively. Each section of the survey is in line with the research objectives as follows;

Section A - Purpose of retentions
Section B - Current status of retentions in NZ
Section C - Costs and benefits of the retention practice
Section D - Alternatives to the practice
Section E - System to devise retention regimes
Section F - Contractor specific questions (answer only if you are a contractor)
Section G - Subcontractor specific questions (answer only if you are a subcontractor)
Section H - General Information

The survey is open until 12th May 2013. Within this time you are free to start, discontinue, and continue until you complete the survey. You may choose to quit the survey now and continue later by closing the window. Please note that this survey needs to be completed from the same computer in order to avoid losing previously given responses.

Two follow up reminders will be sent in every two weeks from the receipt of survey link. A final reminder will be sent two days prior to closing of the survey. If any extension of time is required, the survey may be re-opened for another two weeks.

If you need any further information or clarification, please feel free to contact the researcher or the supervisor via the contact details given below. A summary of this research will be made available to you upon your request.

Thank you in advance for taking time to complete this research survey.

Researcher:
Priyanka Raina
Email: priyanka.raina@aut.ac.nz
Phone: +64 9 921 9999 Ext 6635 Mo: +64 21 02662680

Research Supervisor:
Associate Professor John E. Tookey
Email: john.tookey@aut.ac.nz
Phone: +64 9 921 9512

Disclaimer "While this research survey is being funded by BRANZ, the content has not been developed by or will be used by BRANZ directly".

2. Section A: Purpose of Retentions

Page 1

Retentions in the New Zealand construction industry

Research suggests a number of purposes of retentions. This sections intends to establish the actual purpose of retentions.

1. In your opinion what is the primary purpose of retentions? (explain briefly in a few words)

2. In your opinion to what extent do retentions deliver their purpose/objective as stated by you in Q1 above? (choose one option)

◯ Not at all ◯ Rarely ◯ Sometimes ◯ Most of the times ◯ Always

Please indicate in a few words the reason for the above rating.

3. Following are a few statements concerning the purpose of retentions. Please indicate the degree of your disagreement or agreement on a scale of 1-5. Use the following grading scale 1=strongly disagree, 2=disagree, 3=neither agree or disagree, 4=agree, 5=strongly agree (choose one). Each statement starts with "The purpose of retentions is"

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
Performance security i.e. to assure project completion/complete outstanding work.	◯	◯	◯	◯	◯
To ensure that the contractor fulfills their obligation under the contract.	◯	◯	◯	◯	◯
To guarantee that the contractor/subcontractor will return to remedy any defects within the defects liability period.	◯	◯	◯	◯	◯
Defect rectification.	◯	◯	◯	◯	◯
To act as an incentive for the contractor to remedy defects.	◯	◯	◯	◯	◯
To prevent default and poor quality work.	◯	◯	◯	◯	◯
To act as an extra insurance for the client to make sure the contractor attends to his duties as per the contract.	◯	◯	◯	◯	◯
To provide cash flow to the client/contractor.	◯	◯	◯	◯	◯
To act as a source of interest free finance.	◯	◯	◯	◯	◯

3. Section B: Current status of the retention practice in NZ

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Retentions in the New Zealand construction industry

This sections intends to gather information about the current practices being used with regards to retentions in the NZ construction industry.

1. In your opinion is there a problem around the practice of retentions in the NZ construction industry? (choose one)

◯ Yes ◯ No ◯ Not sure

2. If your answer to Q4 above is a yes then how serious is the problem with regards to retentions? (choose one)

◯ Extremely Serious ◯ Very serious ◯ Moderately Serious ◯ Slightly serious ◯ Not at all serious

3. Could you briefly explain the real problem with regards to the retention practice if any in the NZ construction industry?

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Retentions in the New Zealand construction industry

4. Considering the current status/practice of retentions in the NZ construction industry please indicate the degree of disagreement or agreement with the following statements on a scale of 1-5. Use the following grading scale to give your opinion (choose one) 1=strongly disagree, 2=disagree, 3=neither agree or disagree, 4=agree, 5=strongly agree

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
The current practice of retentions is fair for all the parties involved in the construction business	◯	◯	◯	◯	◯
The system of retentions is working well in its current form and no changes are required.	◯	◯	◯	◯	◯
There is a huge cash flow issue attached with the practice of retentions in NZ i.e. it impacts upon the contractors/subcontractors cash flow negatively.	◯	◯	◯	◯	◯
Slow final payment of retentions is a serious problem currently faced by the industry.	◯	◯	◯	◯	◯
Retention monies are being held un-contractually and in an inappropriate manner beyond the level to which it would be required to effect defects.	◯	◯	◯	◯	◯
Retentions not being paid out on time is a significant issue for the sub-contractors.	◯	◯	◯	◯	◯
The practice of retentions is abused as a means of interest free finance to high-risk borrowers.	◯	◯	◯	◯	◯
The issue of retentions contributes to the problem of low productivity in the NZ construction industry in some way or the other.	◯	◯	◯	◯	◯
Contractors and subcontractors fail to claim their retentions due to their lack of knowledge of contractual rights.	◯	◯	◯	◯	◯
With the industry having undergone radical changes the practice of holding retentions is more traditional than any rational attached to the practice.	◯	◯	◯	◯	◯
Contractor insolvency is the biggest threat for sub contractors as they lose their retention monies.	◯	◯	◯	◯	◯
Subcontractors typically bear the burden of retentions.	◯	◯	◯	◯	◯
The practice of retentions was fair for contractors and subcontractors if the funds were kept secure.	◯	◯	◯	◯	◯

Please indicate any other comments or issues that come to your mind with regards to the current practice of retentions.

4. Section C: Costs and Benefits of the retention practice

The purpose of this section is to weigh the costs as against the benefits (i.e. disadvantages against advantages) of the practice for all the parties in the construction business and draw valid conclusions.

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Retentions in the New Zealand construction industry

1. Weighing the costs as against the benefits of the retention practice in the NZ construction industry would you say that (choose one)

- ◯ The benefits outweigh the costs
- ◯ The costs outweigh the benefits
- ◯ The benefits and costs are somewhat equal.
- ◯ Not sure

2. Weighing the costs and benefits in terms of a ratio out of a 100%how much would you rate costs as against benefits i.e costs:benefits? Would you say...

◯ 70:30 ◯ 60:40 ◯ 50:50 ◯ 40:60 ◯ 30:70

Other (please specify)

3. Keeping in mind the costs and benefits of the retention practice please indicate the degree of disagreement or agreement with the following statements on a scale of 1-5. Use the following grading scale to give your opinion (choose one)
1=strongly disagree, 2=disagree, 3=neither agree or disagree, 4=agree, 5=strongly agree

	Strongly disagree	Disagree	Neither disagree or agree	Agree	Strongly agree
By and large the practice of retentions is beneficial to the whole construction supply chain.	◯	◯	◯	◯	◯
Retentions help in improving the productivity of the construction industry by incentivizing performance.	◯	◯	◯	◯	◯
Retention is a good practice if it would work the way it was meant to be.	◯	◯	◯	◯	◯
Retentions encourage bad practice of using other participant's money rather than as an incentive for quality work.	◯	◯	◯	◯	◯
Contractors and subcontractors build in the price of retentions into their bid price, thus increasing project cost and the client ending up paying for it.	◯	◯	◯	◯	◯
Retentions encourage bad payment habits.	◯	◯	◯	◯	◯
Retention wipes out the already marginal profit margin placing significant pressure on contractors/subcontractors.	◯	◯	◯	◯	◯
Retention increases subcontractor and contractor financial failures.	◯	◯	◯	◯	◯

Please indicate any other costs or benefits of the retention practice that come to your mind.

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5. Section D: Alternatives or better system in place of retentions

Many alternatives are being used in other parts of the world in place of the retention practice. This section intends to find out what could be a better alternative or system in place of retentions in the NZ construction industry.

1. Are you aware of any alternatives or any better system currently being used in place of the traditional system of retentions (i.e. holding of 10% or sliding scale) as a performance based security in the NZ construction industry?

◯ Yes ◯ No ◯ Not sure

2. In your opinion are there changes required to the way the current practice of retentions is working?

◯ Yes ◯ No ◯ Not sure

Briefly explain the reason for the above answer and what sort of changes are required to device a better system or replace retentions.

3. If the retention practice was proposed to be abolished totally what would your degree of disagreement or agreement be?

◯ Strongly disagree ◯ Disagree ◯ Neither agree or disagree ◯ Agree ◯ Strongly agree

Any comments please specify.

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Retentions in the New Zealand construction industry

4. To what extent do you disagree or agree that legislation is required for any changes to take place with regards to retentions?

◯ Strongly disagree ◯ Disagree ◯ Neither agree or disagree ◯ Agree ◯ Strongly agree

Any comments please specify.

5. Keeping in mind the alternatives/or a better system that could be used in place of the traditional system of retentions please indicate the extent of your disagreement or agreement with the following statements on a scale of 1-5. Use the following grading scale to give your opinion (choose one)
1=strongly disagree, 2=disagree, 3=neither agree or disagree, 4=agree, 5=strongly agree

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Maintaining the current practice however retentions to be deposited into an interest bearing escrow or trust account.	◯	◯	◯	◯	◯
Elimination of retentions with a payment or performance bond.	◯	◯	◯	◯	◯
Warranties and guarantees would work better as a performance management system than the current practice of retentions.	◯	◯	◯	◯	◯
Retention bonds are a good alternative to retentions.	◯	◯	◯	◯	◯
Line item release of retentions.	◯	◯	◯	◯	◯
Limits on the amount of subcontractor retention.	◯	◯	◯	◯	◯
Substitution of securities in place of retentions.	◯	◯	◯	◯	◯
Retention released on work completed early in the project.	◯	◯	◯	◯	◯

6. Section E: Retention regimes

Research suggests that different types of retention regimes are being used for different projects, not just across the industry but even within one single organization. The aim of the following questions is to find out any problems with the retention regime used and propose improvements if any.

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Retentions in the New Zealand construction industry

1. In your opinion is there any kind of problem with regards to the retention regimes used in construction contracts i.e. percentage of retentions withheld from contracts in the construction industry?

◯ Yes ◯ No ◯ Not sure

Add comments if any

2. In your opinion is it fair or reasonable or practical to have different retention regimes for different projects?

◯ Yes ◯ No ◯ Not sure

Add comments if any

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Retentions in the New Zealand construction industry

3. Please indicate the degree of agreement or disagreement with the following factors which could impact upon the setting up of retention regimes for a contract. Use the following grading scale to give your opinion (choose one).
1=strongly disagree, 2=disagree, 3=neither agree or disagree, 4=agree, 5=strongly agree

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Type of project e.g. building, civil, renovation.	◯	◯	◯	◯	◯
Project characteristics e.g. value of project, complexity of project.	◯	◯	◯	◯	◯
Defect characteristics i.e. type of defect, likelihood of defect occurrence and cost of the defects.	◯	◯	◯	◯	◯
The type of procurement method used.	◯	◯	◯	◯	◯
Contractor's performance history.	◯	◯	◯	◯	◯
Materials and workmanship guarantees.	◯	◯	◯	◯	◯
Parent company guarantee.	◯	◯	◯	◯	◯
Financial stability of main contractor.	◯	◯	◯	◯	◯
Performance security characteristics of client i.e. security for retention withheld such as use of trust account.	◯	◯	◯	◯	◯
Economic characteristics i.e. impact on contractor's cash flow or impact on contractor's margin.	◯	◯	◯	◯	◯
Retention withholding/release mechanism.	◯	◯	◯	◯	◯

Are you aware of any additional factors that could impact upon the setting up of retention regimes? If yes pls state below.

7. Section F: Contractor Specific Questions

This section of questions is specifically meant for contractors. Please answer only if you are a contractor else go to the next page or Section G.

1. Please indicate the percentage of retention usually withheld on the contracts undertaken?

☐ 5% ☐ 10% ☐ Sliding scale as per NZS3910

Other (please specify)

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Retentions in the New Zealand construction industry

2. Please indicate the percentage of retention usually released at the time of practical completion?

☐ 40% ☐ 50% ☐ 60%

Other (please specify)

3. Please indicate the usual length of the defects liability period upon which the total retentions are released?

☐ 3 months ☐ 6 months ☐ 12 months

Other (please specify)

4. Please indicate the approximate annual turnover of your company.

5. With regards to your experience working in the industry please answer the following questions;

	Never	Rarely	Sometimes	Mostly	Always
How often are retentions withheld on the contracts undertaken?	◯	◯	◯	◯	◯
How often are retentions paid out on time?	◯	◯	◯	◯	◯
How often are retentions not paid out on time?	◯	◯	◯	◯	◯
How often have retentions been lost all together?	◯	◯	◯	◯	◯

6. Please specify the amount of retentions held by your client/clients at this point of time?

7. With regards to the amount specified in Q6 above please indicate as a percentage the proportion of retentions overdue and the proportion of retentions not yet due?

Proportion of retentions overdue

Proportion of retentions not yet due

8. What is the longest you have waited (in months or years) to get or chase your retentions back?

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Retentions in the New Zealand construction industry

9. Please indicate your degree of disagreement or agreement with the following statements regarding the problems associated with contractors' retention practice on a scale of 1-5. Use the following grading scale to give your opinion (choose one) 1=strongly disagree, 2=disagree, 3=neither agree or disagree, 4=agree, 5=strongly agree

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
Client's abuse of contractor's retentions is widespread.	◯	◯	◯	◯	◯
The process of holding a performance bond as well as retentions by the client on the contractor is unfair for the contractors.	◯	◯	◯	◯	◯
The main issue with retentions is that they are not released on time.	◯	◯	◯	◯	◯
Retention is a fair practice if it would work the way it was meant to work.	◯	◯	◯	◯	◯
The deduction of retentions causes serious cash flow issues for the contractor.	◯	◯	◯	◯	◯
The main issue with retentions is that the money is not secure.	◯	◯	◯	◯	◯
Retentions would work well if the contractor's money was held securely.	◯	◯	◯	◯	◯
Retentions being lost altogether is very common in case the client goes bust.	◯	◯	◯	◯	◯
The main issue with retentions is the huge amounts of unsecured money held for long periods of time.	◯	◯	◯	◯	◯
A lot of contracting firms have limited understanding of the contractual procedures and therefore they fail to get their retentions released on time.	◯	◯	◯	◯	◯

Please indicate any other issues with regards to contractors retention practice.

8. Section G: Subcontractor Specific Questions

This section of questions is specifically meant for subcontractors. Please answer only if you are a subcontractor else go straight to the last page i.e. Section H.

1. Please indicate the percentage of retention usually withheld on the contracts undertaken?

☐ 5% ☐ 10% ☐ Sliding scale as per NZS3910

Other (please specify)

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Retentions in the New Zealand construction industry

2. Please indicate the percentage of retention usually released at the time of practical completion?

☐ 40% ☐ 50% ☐ 60%

Other (please specify)

3. Please indicate the usual length of the defects liability period upon which the total retentions are released?

☐ 3 months ☐ 6 months ☐ 12 months

Other (please specify)

4. Please indicate the approximate annual turnover of your company.

5. With regards to your experience working in the industry please answer the following questions;

	Never	Rarely	Sometimes	Mostly	Always
How often are retentions withheld on the contracts undertaken?	○	○	○	○	○
How often are retentions paid out on time?	○	○	○	○	○
How often are retentions not paid out on time?	○	○	○	○	○
How often have retentions been lost all together?	○	○	○	○	○

6. Please specify the amount of retentions held by your contractor/contractors at this point of time?

7. With regards to the amount specified in Q6 above please indicate as a percentage the proportion of retentions overdue and the proportion of retentions not yet due?

Proportion of retentions overdue

Proportion of retentions not yet due

8. What is the longest you have waited (in months or years) to get or chase your retentions back?

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Retentions in the New Zealand construction industry

9. Please indicate your degree of disagreement or agreement with the following statements regarding the problems associated with subcontractors' retention practice on a scale of 1-5. Use the following grading scale to give your opinion (choose one) 1=strongly disagree, 2=disagree, 3=neither agree or disagree, 4=agree, 5=strongly agree

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
Contractors abuse of subcontractor's retentions is widespread.	◯	◯	◯	◯	◯
Contractors use subcontractor's retentions to finance their subsequent projects.	◯	◯	◯	◯	◯
The main issue with retentions is that they are not released on time.	◯	◯	◯	◯	◯
Retention is a fair practice if it would work the way it was meant to work.	◯	◯	◯	◯	◯
The main issue with retentions is that the money is not secure.	◯	◯	◯	◯	◯
Retentions would work well if the subcontractor's money was held securely.	◯	◯	◯	◯	◯
Retentions being lost altogether is very common in case of contractor insolvency.	◯	◯	◯	◯	◯
The main issue with retentions is the huge amounts of unsecured money held for long periods of time.	◯	◯	◯	◯	◯
A lot of sub contracting firms have limited understanding of the contractual procedures and therefore they fail to get their retentions released on time.	◯	◯	◯	◯	◯

Please indicate any other issues with regards to subcontractors retention practice.

9. Section H: Background information

1. Please indicate your profession (choose as many as apply)

- ☐ Project Manager
- ☐ Engineer
- ☐ Architect
- ☐ Quantity Surveyor
- ☐ Contractor
- ☐ Builder
- ☐ Subcontractor
- ☐ Legal expert/Dispute resolution

Other (please specify)

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Retentions in the New Zealand construction industry

2. Please indicate the type of organization/business (please choose the category/categories that most closely represents your firm)

- ☐ Government/Council
- ☐ Contracting firm
- ☐ Private developer
- ☐ Sub contracting or specialist trade firm
- ☐ Architectural/Engineering practice
- ☐ Construction law/dispute resolution firm
- ☐ Project/Construction management practice

Other (please specify)

3. Please indicate the number of years you have been working in the industry?

- ◯ 0-5 years
- ◯ 6-10 years
- ◯ 11-15 years
- ◯ 16-20 years
- ◯ 21-25 years
- ◯ More than 25 years

4. Please indicate the nature of construction business your company is involved in? (choose as many as apply)

- ☐ Residential building construction
- ☐ Commercial building construction
- ☐ Construction trade services
- ☐ Property development
- ☐ Heavy construction

Other (please specify)

5. Please indicate the number of years your company has been in business?

- ◯ 0-5 years
- ◯ 6-10 years
- ◯ 11-15 years
- ◯ 16-20 years
- ◯ 21-25 years
- ◯ More than 25 years

6. Please indicate the number of employees your company employs?

- ◯ 0-5
- ◯ 6-10
- ◯ 11-15
- ◯ 16-20
- ◯ 21-25
- ◯ 26-30
- ◯ 31-35
- ◯ More than 35

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Retentions in the New Zealand construction industry

7. Which region of NZ is your business operating in? (choose as many as apply)

☐ Northland	☐ Taranaki	☐ West Coast
☐ Auckland	☐ Manawatu-Wanganui	☐ Canterbury
☐ Waikato	☐ Wellington	☐ Otago
☐ Bay of Plenty	☐ Tasman	☐ Southland
☐ Gisborne	☐ Nelson	
☐ Hawke's Bay	☐ Marlborough	

Other (please specify)

10. End of Questionnaire

You have now reached the end of the survey. Thank you very much for taking time to complete this survey. If you have any queries please do not hesitate to contact me by phone or email. If you would like to have a copy of my research findings or have any comments/suggestions, please drop me an e-mail and I will respond asap. Thanks again.

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Appendix B-3

Retention in the New Zealand construction industry

***1. It was found that retentions serve a number of purposes in construction contracts. The three main purposes were found to be;**
1) Performance security
2) To ensure that the contractor fulfils their obligation under the contractor
3) To guarantee that the contractor/subcontractor will return to remediate defects within the defects liability period.
Do you agree with these findings? Please provide any useful comments.

***2. In your opinion what does 'performance security' in terms of the purpose of retentions mean? Please describe briefly.**

3. Out of the 5 options of 'Always', 'Mostly', 'Sometimes', 'Rarely' and 'Never' it was found from the study that retentions fullfill the purpose for which they exist 'Sometimes'. Do you agree with this finding?

◯ Yes
◯ No

Any comments

4. It was found that retentions do not act as an incentive to avoid or eliminate defective work. Do you agree with the findings? Please add any specific comments.

◯ Yes
◯ No

Any comments

5. The research found that the practice of retentions is not fair for all the parties in its current form. Do you agree? Please add any useful comments.

◯ Yes
◯ No

Any comments

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Retention in the New Zealand construction industry

6. The research identified a number of issues attached to the practice of retentions, the main issue however was found to be the 'security of retentions'. do you agree with this?

◯ Yes

◯ No

Any comments

***7. The research found that the practice of retentions is not fair for all the parties in the construction industry. It has its advantages and disadvantages and the results shows that the costs of the practice are greater for 2 parties i.e. contractors and subcontractors and the benefits are greater for 1 party i.e. the clients. Even though the clients are aware of the costs associated with the practice but believe that there is no other mechanism that could serve the same purpose as retentions in construction contracts. The findings of this research objective once again suggest that the main party bearing the burden of the retentions is the subcontractors.**

Do you agree with the finding? Pleases specify any comments.

***8. The findings of the study recognized that there is a definite need for change to the way the practice of retentions is currently working. The responses with regards to abolishing the practice were not definitive. However participants did agree that there was a need for legislation for any changes to be enforced. The opinions with regards to a feasible alternative were not definitive. The study did find a number of respondents in the favour of use of bonds (performance, on-demand and retention) in place of retentions and securing retentions by placing them into trust accounts. However a number of issues also were identified with the use of both. Nevertheless the use of trust accounts was found to be the best option to mitigate the risks related to retentions.**

Do you agree with the findings? Please add any useful comments.

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Retention in the New Zealand construction industry

9. The study found that that there are certain issues related to the retention regimes i.e. rate of retention used in the NZ contracts e.g. rate of retention very high, retention rate to depend on type of trade and to reflect the potential costs of default or remedial work, retentions not to be applied to projects under a certain value, subcontractor retention percentage to mirror contractor's retention percentage.

The need for standardization has been identified from the study. The use of a sliding scale and different rates of retention for different projects also seems to be a fair and better practice.

What are your opinions about these findings? Do you agree disagree. Please provide useful comments.

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Appendix C-1

The purposes of retentions

ID	PURPOSE	Purpose Code
CL1	As an incentive on the contractor to 1) complete the contract wirks; and 2) remedy any identifed defects in work completed. The contractor claims payment for work completed to date. If the full amount of the claim is paid by the Principal - the contractor will have been paid the full value of overheads and profit associalted with that work. Thus, were the contractor to ""walk away"" from its obligations under the contract, the loss to the contractor would be minimal in terms of work completed to date. They lose only what they might have made had they completed the job. Retention are in two parts - full retentions (e.g.10% of value of work completed to date) until the work is ""practically complete""; and therefater 50% of the total retentions (as an incentive for the contractor to effect remedial work where required. If the contractor fails, then the Principal will have funds to complete / remedy works and cover any additional costs. In extreme cases the Bond (if one has been required) can also be called upon.	P2, P3
CL2	to ensure the contractor is financially tied to the completion of a contract. to ensure defects are rectified that develop after Practical Completion (beyond ""fair wear and tear"") is granted.	P2, P3
CL3	To hold funds to cover the costs or portion of the costs to repair any defects visible at time of practical completion or that become evident during defects liability to give some surety that the contractor will complete these.	P3
CL4	To protect the principal from loss due to default by the supplier.	P6
CL5	To hold substantial moneys in case of default by the contractor and to force repairs identified during the course of build. Example - mainzeal went into liquidation recently and retention moneys help to pay to complete the works by others.	P6
CL6	To provide for maintanace and give the contractor an incentive to finish the work in a timely fashion	P10, P11
CL7	To bind the main contractor to a completed project to the satisfaction of the end user.	P2
CL8	To protect clients financial interest in the new building if a builder folds and a new contractor is brought in.	P6

CL9	To provide motivation for the contractor to complete the work to the required standard and give the 'owner' some funds to undertake remedial works if the contractor doesnt complete.	P2, P6
CL10	To provide clinets with a degree of certainty that any defects detected at the conclusion of the defects liability period will be rectified by the contractor(s) involved with delivering the project.	P3
CL11	to keep binding interest in the projects completion beyond Practical comp	P3
CL12	To cover the cost of works which may contain a latent defect, and which does not manifest itself during the construction works. Retention is effectively a security mechanism to ensure that the contractor returns to site post completion to rectify any defects. Retention should be held in Trust so that the Client is unable to access it and use it as a source of finance.	P3
CL13	protect the client from poor trade practice unless of course main contractor goes out of business - mainzeal, leaky homes	P6
CL14	Provide protection to the employer for quality of the works, by way of a guarantee. If the contractor/ specialist contractor fails to correct defective work, the employer has funds to employ someone else to do so.	P6
CO1	To ensure there are funds available if the contract goes pear-shaped and additional costs are thereby incurred by the client.	P6
CO2	To provide the principal with some surety about the Contractor's commitment to the project both in terms of scope and programme to Practical Completion and in the Deflect Liability Period the holding of retentions is important tool to ensure that the work is completed or remedied to the satisfaction of Principal and architect.	P1, P7
CO3	To ensure contracts are completed should there be a failure of a contractor (through neglect or otherwise).	P6
CO4	As a financial assurance that the works are completed and defects are rectified, either by the Contractor or sufficient money available to engage a secondary party in the event of non-completion	P1, P4, P6
CO5	In my view retentions provide a monetary sum that can be called upon when a contractor becomes insolvent.	P12
CO6	To provide a monetary sum for a Principal to cover non performance by a contractor.	P1
CO7	to hold back an agreed percentage of any claim, making sure all work is completed to the satisfaction of the contracts engineer	P1, P2
CO8	protect the client from financial overexposure ensure performance during the latter stages of the project	P1
CO9	I view that here are two primary reasons. The first is to ensure completion of works identified for deferment after Practical Completion, and identified for remediation during or at the end of the Defects Liability Period. The second (and lesser requirement) is order for the Principal to have a portion of funds available to assist in the cost of arranging a new contractor in the event that the original contractor business collapses. An observation is that it	P3, P12

	also holds the focus of the contractor onto the current project (and its timely completion), rather than having them flit between projects.	
CO10	A performance incentive for contractors to complete contracted work.	P1
CO11	To keep money aside for remedial work and as a bond for continuing performance. (It should also be a as a safety net for non payment of legitimate work but current process does not seem to allow for this.)	P1, P10
CO12	Get people to fix things that are not done right first time Protect against default by the contractor or sub contractor	P5, P6
CO13	To provide some financial surety to the Principal in case of failure / default of the supplier.	P6
CO14	To protect the owner of the building from:- * the builder going into receivership. * over claiming on progress claims * extending the building period. * the builder walking away from the job when difficulties arise. * getting the job finished properly.	P2, P6, P11, P12
CO15	To protect the client and provide a incentive for contractors to rectify defective work.	P5
CO16	To hold a small sum back to ensure the contractor completes the works - particularly once the project is practically complete and during the defects period. At the end of a project there can be things that seem minor in cost but can be more than expected. Helps to ensure contractor will do minor adjustments.	P2, P3
CO17	To ensure that the contractor honours and makes it a priority, the obligation to fix any problems that arise from work performed.	P5
CO18	to protect the principle from financial loss in the event of the contractor or sub contractor not completing the work in accordance with the contract, either by absconding or by financial failure.	P6, P12
CO19	To hold contractors accountable to finishing the project to the required standard and quality.	P1
CO20	incentive to complete work to the required standard	P1
CO21	To provide financial security for the client against contractors that may fail to fully discharge their obligations under the contract eg remedy defects.	P2, P5
CO22	Retentions are an insurance to ensure complete performance by the Contractor or subcontractor and keeping a nominal sum of money to complete outstanding issues if the Contractor or subcontractor fails to perform to the Contract	P1
CO23	To ensure due performance by a contractor or sub contractor to provide ""goods"" in a contract situation	P1
CO24	To provide a contingency sum towards funding a future risk not yet realised and to incentivise contractors (incl Sub) to complete their remaining obligations through the theory that the sum owing is greater than the cost to complete and therefore greater cashflow and or profit is to come when the works are finished.	P2
CO25	To provide security to ensure completion of the building contract.	P1

CO26	To provide a contingency sum towards funding a future risk not yet realised and to incentivise contractors (incl Sub) to complete their remaining obligations through the theory that the sum owing is greater than the cost to complete and therefore greater cashflow and or profit is to come when the works are finished.	P2
CO27	To provide security to ensure completion of the building contract.	P1
CO29	Holding money as a threat to make the contractor firstly complete the project and secondly complete the maintenance.	P2, P3
C1	To assure quality in workmanship, materials and accuracy.	P13
C2	To guarantee the quality of work	P13
C3	The purposes of retentions is 2 fold - a financial incentive for contractors to undertake minor repairs in the defects liability period, and 2) should the contract fail to undertake timely repairs then the principal has some funds available to have the repairs done by others.	P3, P10
C4	To ensure performance by the contractor or subcontractor, with the quality of the performance being in accordance with the requirements of the contract documents.	P1, P2
C5	Money held back that would otherwise be paid until the other party perform / completes a services or task	P1
C6	Have a influence over the contractors quality and performance	P1, P13
C7	As A safe guard that the contractor will fix any items required under the maintenance period.	P3
C8	A retainer to ensure the contractor meets his contractual obilgations	P2
C9	I see it as a form of' 'insurance' for the client/ principal which allows him to put aside monies. This enables him to have sufficient funds to correct/ fix work or services, that are not up to standard and need to be put right.	P10
C10	For the princapal or head contactor to hold money back until the project is finished and a maintainance period so that if any defects occur that contractor will have to respond to get any items fixed or that money can be used to get someone else to fix those issues.	P3, P6
C11	The retetion money is kept to fix any defect in the work at the end of the maintenance period if the contractor was not able to do it. i.e. had gone out of business. The principal would then have money to call on another contractor to complete the work.	P12
C12	To provide a fund for Clients and Contractors to use if required to set off costs incurred due to non compliance or a breach of the (sub)contract	P6
C13	In most instances used as a means of performance by the main contractor during the course of the project and then as a tool to ensure any defects are rectified within a reasonable time after Practical Completion has been obtained usually at a reduced percentage	P1, P3
C14	Motivate the Main Contractor & Subcontractors to complete omissions & defects.	P4
C15	To withhold funds to cover any defects requiring remedial works	P4

C16	It is the retention of a sum of the consideration under a construction contract to ensure performance, ie that the contractors complete there obligations under a construction contract. As construction projects are one off specific design there is a need the ensure that the works contractors are contracted to undertake is completed correctly and perform for a duration typically under the cosntract the Defect Liability period, but the obligation extends further as found under the leaky building issues currently in the market. Remidies for issues outside the retentions period are sought through the legal systems and become costly and involved. Holding of retentions is a cost effective surety for these one off works which are genetrally complex to monitor quality control.	P1, P2, P13
C17	A monetary way of ensuring a job is delivered to standard and specification, to a specific time frame by the sub-trades. A form of warranty or guarantee if you will.	P2, P11
C18	To act as a carrot for subies to honour guarantees	P2
C19	Insurance against any faults that may require fixing after job completed	P3
C21	To cover the financial risk, should a copy go under mid way during a project as well as to ensure that funds are available to rectify defective work should a contractor or sub-contractor renegade on sorting this out.	P6
C22	A clients safeguard against defective workmanship during the latent defects period	P3, P13
C24	Ensuring the quality, safety and completeness of job has been carried out.	P13
C25	Performance incentive to make sure the contractor undertakes remedial works during the defects period.	P3
C27	The purpose of retentions is to cover any defects that fall within the 1 year warranty period that are not remedied by the sub contractor.	P3
C28	To ensure a contractor satisfies all warranty issues within the defects liability period	P3
C30	I believe companies use the retention and an insurance to get work completed correctly or if there are mistakes it ensures this can be corrected if the contractor does not make good the mistake.	P2, P6
C31	Retentions are to cover 12 month warranty period in construction projects.Should simply be covered by consumer act only as with any other product or service	P14
C32	To ensure that the work undertaken by you is as the principal believes it is as it should be done.	P2
C33	My undersatanding is thatit is a form of garanteeing that any work not completed or up to an exeptable standard can be resolved either by forcing the contractor to complete works to recieve his retentions or to pay a third party to complete the works.	P2, P6
C34	to hold contractors to stand by their work and garantees	P2
SC1	To ensure relevant parties carry out any remedial work that may be required for a set time after Practical completion	P3

SC2	Protect the Principal and in turn main contractor in respect to contractor / subcontractor performance, quality, and risks of non-performance visa-vis payments made which might be found to be excessive in event of failure / non performance of any contractor / subcontractor. Leverage on contractor / subcontractor to perform, during construciton through to defects remedial.	P1
SC3	They are like a performance bond, they are with held to ensure the contractor performs as contracted, and then after the contract is finished, to ensure they meet their obligations for the length of the warranty period i.e. the one year post practical completion.	P1, P14
SC4	To provide cashflow for the retention holder (usually the main contractor) so they can fund the next job	P8
SC5	To protect principal if Sub trade preforms poorly and make sure the job is completed to a standard	P1, P2
SC6	To remedy potential defects in the installation	P4
SC7	To fund the head contractors next project.	P9
SC8	The retention of money to get sub contractors back to fix issues. It allows main contractors to choose far lower subcontract prices than they might normally do without retention as it provides a cash backstop.	P4
SC9	To holdback payment until any contractor completion/warranty issues are sorted out.	P14
SC10	To ensure a contractor / sub contractor will return to remedy any faults during the defects liability period	P3
SC11	As security that defective work will be remedied	P4
SC12	For the builder / owner to hold back money to ensure remedial work gets done.	P4
SC13	To guarantee sub-contractor performance	P1
SC14	Retentions are an amount (normally 10%) held back for the warranty period (normally 12 months) to cover any warranties or faulty workmanship. It is in place to make sure you return to sort out any problems.	P3, P13, P14
SC15	To hold a contractor or subcontractor to fix problems in the warranty period after completion.	P5
SC16	Derisk for the principal	P1
SC17	An incentive for the subcontractor to go back and repair any issues	P5
SC18	Gives the client some assurance that if there is a problem with the product they have bought that it will be sorted by the supplier.	P4
SC19	To ensure that the work is completed in compliance with and to the standards set out in the provided contract documentation & to ensure that the owner retains sufficent of the value of the project to be avble to complete the works should the contractor fail.	P2, P12
SC20	To protect the client. (The person for whom the work is being carried out.)	P1
SC21	To guarantee performed works carried out in a contract for given period of time	P2

SC22	To insure work is completed correctly and on time by the sub contractor	P2, P11
SC23	In order to get subcontractors to complete defect during the maintenance period	P3
SC24	ensure final completion/ warranty issues are fixed by subcontractors	P2, P3
SC25	To ensure that the project is finished to a satisfactory standard	P2
SC26	A means to recover money in case a contractor/subcontractor fails to complete work correctly and another party needs to be engaged to correct any fault. Also a means to focus various parties to complete works correctly and not to put work schedules or quality at risk.	P6
SC27	As a finincial incentive to return to sort out any issues that may arise from one's particular sub-contract	P5
SC28	To ensure warranty issues that arise in a building project can be resolved between the main contractor and the building owner.	P4
SC29	To provide the client and main contractor with a form of cash guarantee relating to performance during project construction and the warranty period.	P1, P14
SC30	To ensure that the subcontractor performs his contractural duties - with some money retained during the defects period to ensure that if any problems arise they have an incentive to rectify.	P2, P5
SC31	To ensure the performance of contract / sub contract, warranties and guarantees are completed in accordance with the contract documents.	P1, P2
SC32	To hold the Sub- Contractor to continue to complete total job as specified for their Trade..	P2
SC33	Monies withheld in case there are recitifications issuses required on a contract in relationship to the part of the job the contractor or subcontrator is has been contracted to do. The monies can be used to off set any costs involved if the contractor or subcontractor doesnt forefill their duty in the recification work .	P4, P6
SC34	A $ provision to allow the builder to complete remedial works, should the subcontractor fail to do so.	P6
SC35	To ensure elements are finished correctly, to specification and on time. They are also used as a security to ensure contractor complete there works to the required standard. Retentions can aslo be used if a Company / sub-contractor goes into receivership. The Main Contractor can use the retention money to engage other contractors t complete the works. However, this oes not help the sub-contractor if the Main Contractor goes into receivership.	P2, P12
SC36	Ensure Defects are remedied during the defect warranty period	P3
SC37	Rententions are an amount of money a contractor or clientt holds from each payment, as an insurance that the job will be completed and fit for purpose.	P1, P2
SC38	So that clients/contractors can have a bargaining tool when trying to get the project complete.	P16

SC39	To allow the organisation requesting the work to be carried out some leverage at the conclusion of the works if the scope of work or requirements have not been adhered to.	P2
SC40	the intent is to provide a guarantee of product performance to the customer past the completion date. for most it is just a way of the contractor improving their cash flow.	P1, P8
SC41	To ensure a commitment to providing a quality installation as if it does not last or perform for 12 months you do not get that last 10%.	P14
SC42	Technically: To protect the client against poor workmanship or faulty products by reserving an agreed amount until final sign off of a project, or a specified time to allow for adequate use / testing of a product.	P13
SC43	Primary function to provide free cashflow for Main Contractor. Secondary function as supposed form of coercion for subcontractor to rectify faulty product.	P4, P8
SC44	TO BE HELD IN ORDER TO COVER THE POSSIBLE COST OF DEFECTS	P4
SC45	Original purpose was supposedly for the principal to have some money set aside to cover remedials and rework. Now its seems to be used by some main contractors as a general fund	P4, P8
SC46	Properly used: 1.) To provide some ""incentive"" for subcontractors to complete / finish remedial up until end of defects period 2.) To provide some funds for rectification of defects should a contractor / subcontractor fail to provide rectification Cynically: 3.) To assist contractors to manage their cashflows 4.) For contractors to keep something over sub contractors heads - they are often used as a bargaining chip to favourably (in favour of the contractor) finalise accounts 5.) Allows contractors to keep something back from which to deduct contra charges (rightfully or wrongfully charged) - by keeping retentions, contractors do not alawys worry about notification of contras until the final account negotiation because they know they get another bite of the cherry	P5, P6, P8
SC47	To ensure performance of the Contractor/ Sub contractor's contractual obligations during the construction and maintenance periods.	P1
SC48	It should be to ensure subcontractors do finish the work/any issues to the required quality standard but as well it is used instead to fund main contractors cash flow requirements.	P2, P8
SC49	to insure possible defects after compleation will be attended to by the partys involved, if the involved sub contractor does not fix the defects the retention money will allow the owner to employ other contractors to fix the defects and use the retentions for payment	P3, P6
SC51	While the primary purpose is to ensure any problems are fixed by the sub and if not then they canm be rectified by others and paid out of the retention But today subs retentions are used to bank roll building contractors	P3, P6, P9
SC52	To provide the client with a monetary buffer, supposedly keeping the head contractor and subcontractors on target with both	P11, P13

	programme and material, build quality.	
SC53	To ensure performance	P1
SC55	Retentions are to cover the main contractors expense to rectify failure of the sub contractor to deliver the finished product as tendered.	P6
SC57	To retain profits in order to see out the warranty period on a building/construction in the event if a warranty issue arising	P14
SC58	Retentions are made from payments so that the main Contractor has a lever to have sub-contractors return to fix any defects in there work once the contract has finished.	P3
SC59	To ensure that the main contractor for a project has money to cover any disputes with sub contractors within the defect period once the project is complete	P3
SC60	to fund builders cashflow	P8
SC61	To enable the end client to have the ability to ensure warrenties are taken care of	P14
SC62	To bind a sub contractor to warranty and defect liability perods, once these period are complete and the site is clear of all defects the retentions should be released.	P3, P14
SC63	To provide the end user with a security that any problems of remedial items get remedied as soon as possible to an acceptable standard.	P10
SC64	Funds to adddress remedial repairs or defects aring during the warranty period, should the installation contractor not make good within 14 days.	P10
SC65	To ensure performance on the contract by sub trades. i.e. that they complete the contract and fulfil their maintenance obligations.	P1, P10
SC66	To protect the customer in the warranty period.	P14
SC67	to fund the builders operation, it gives them ""free"" money for long periods of time, The Builder will tell you that it is to make sure that the job is done correctly but there are now much better ways of doing that, they just don't want to use them as it cuts a funding stream for them	P9
SC68	clients ability to withhold payments to secure completion of contracted works	P1
SC70	To hold my money for any problems that may occur over the retention period that i will not fix ,so they have my funds to put it right.	P6
SC71	To make sure the contractors follow up on initial problems or commissioning problems. Quality control if you like.	P13
SC72	To help fund construction companys. Acts as a fund and cashflow for them.	P8, P9
SC73	to make sure that work will repaired if it is found to be faulty in the first 12 months	P3
SC74	To insure job is completed on time to hold contractor to replace faulty equipment - warrente	P11, P14

SC75	Used as an incentive to ensure that we complete the contract as per specification. If we dont the money is used to fund third party repair work	P2, P6
SC76	gaurentee quality of work for period after work completed	P13
SC77	To enforce prompt remedial work and completion docs	P5
SC78	Official: To hold money back from the installers during a maintenace period to ensure repairs are performed. Reality: As a blackmail tool to ensure all the subcontractors get as builts, manuals etc done and for the builders to get interest on the subs money!	P9, P10
SC79	to ensure maintnenance work is done	P10
SC80	(a) To assist underfunded/under capitalised construction companies, developers and woulod be builders cash flow themselves in business (b) To provide a reserve pool of funds to cover waranty or performacen shortfalls in construction projects	P8, P14
SC81	To ensure any sub trades will undertake any mantainance issues	P4
SC82	Money that the customer holds back to ensure work is complete and there is no damage/faulty workmanship or goods.	P2, P13
SC83	Hold the contractor accountable for their work. If there are any faults with the contractors work and he does not make remedial work then the retention's can be used to make good the work.	P6
SC84	To ensure maintenance periods are met & maintenance/defect items are carried out in a timely manner	P10
SC85	To provide operating funds for the main contractor at the sub contractors expense.	P9
SC86	To give client protection against poor workman ship and product	P13
SC87	To have a finacial security over a contractor thus ensuring completion of a project prior to release of all money owed to the contractor	P1
SC88	A type of bond held against the subbie to guarantee they will remedy any faulty workmanship.	P13
SC89	warrenty period	P14
SC90	Retentions are retained so that the main contractor has control over sub-contractors to rectify any defects from work carried out on the contract.	P4
SC91	Used to hold the contractor responsible for any faults.	Not coded
SC92	power	Not coded
SC93	MAINTENANCE.	P10
SC94	There is no reason retentions should be kept as we sign garenttes for all work and have to pay our suppliers the full ammount	Not coded
SC95	retain a bond to insure work correctly done a(separate to warranty)	P2
SC96	To make sure suppliers quality of workmanship or product is of standard	P13

SC97	It is supposedly there to cover the cost of problems associated with the original work if the subcontractor fails to do it or is not around.	P6
SC98	For a portion of the sub-contractors revenue to be held back until Practical Completion has been achieved and defect liability has been reached. Retentions are both a 'carrot' to the sub contractor (to finish) and insurance to the head contractor against defects.	P4
SC99	It is to safeguard the client with regard to defective or incomplete installations at the conclusion of a contract in the event that the contractor is not available to meet their obligations.	P4, P6
SC100	The primary purpose was intended to protect the main contractors from costs incurred by sub-contractors who do not complete the job or cause the main contractor to incur costs to complete the job or to rectify problems.	P6
SC101	Client security	P1
SC102	The primary purpose of retentions is to ensure the execution of contractual obligations	P2
SC103	Workmanship Guarantee - Other reasons beyond primary reason: Unofficial but the fact of industry Tool for cash flow management by Client & Main Contractor. Negotiate payment or for one off deduction to release withhold money.	P8, P13
SC104	Money being held back by the client during maintenance liability period.	Not coded
SC105	to hold part of the contract money for the purpose of insuring the contractor completes his warrantee and maintenance periods	P10, P14
SC106	The primary purpose of retentions is so money is held by the client or main contractor to ensure all work is completed and any defects repaired, maintenance and warranty obligations are met before they are released.	P1, P4, P10
SC107	Incentive to remedy / complete outstanding jobs / defects.	P1, P5
SC108	If there is a problem the builder has a fund to correct should the sunnies choose not too In other words..... Fund main contractors who are effectively insolvent !	P9
SC109	In our industry being demolition the only purpose for retention is to ensure good contractor performance.	P1
SC110	I unsure, and who really knows why this is in place, somewhere on the retention money go round, there is somebody making money, in my case there is no need for retention as all work we complete has a warranty/guarantee when work is completed, legally I am committed to repairing any defects to work installed for a designated period.	Not coded

Appendix C-2

The issues with retentions

ID	Issues	Code
CL1	While the CCA was intended to stop the practice of ""pay if/when paid"" some contractor still apply the principle (now unwritten) to the sub-contract payments. Where the contractor goes into liquidation, clients / principals use retentions to complete contracts (in addition to calling up the bond - if one exists). In some cases, even though the cost of completing or remedying defects in a contract is less than the sum of bond + retentions, the difference is not returned to the contractor / receiver. Some developers withhold payment when due - claiming breach when none actually exists.	I1, I2
CL2	sub-contractors not being paid out when a Principal contractor goes into liquidation	I3
CL5	Contractors have a lot of cash tied up in retentions and this affects their balance sheet. The client will pay for the cost of capital as it is built into the tender price. Not with standing this, we are still in favour of retentions.	I4, I5
CL6	I believe that all contracts should be required to have some sort of retentions clause. Contracts such as the master builders and certified builders standard contract need some insurance to ensure a non-commercial client can withhold payment pending code compliance	Not coded
CL7	Smaller contractors have a hard job maintaining the amounts, lost at each deduction when they are often required to pay out sub-contractors in full	I6
CL13	Retention structure allows main contractor to hold more retentions that are being held on them allows main contractor to be underfunded and easy access to cash flow Poor business practice but if retentions not claimed - main contractor not obliged to pay outstanding retentions Main contractors attempting to do deals on outstanding retentions - 1 say 50% early release 2- for next project	I7
CO4	Contractors holding unreasonable retentions from subcontractors or using this as an excuse for non-payment. Also a poor understanding of NZS3910.	I2, I8
CO6	The retention practice does favour the client over the contractor. Accordingly it may not be considered equitable. However it can be covered by the contractor including the interest, generated by	Not coded

	the shortfall in cash flow, in the contract price.	
CO7	Many projects are completed under building contracts that have differing rules regarding retentions, and many people within the industry are unaware of how they work and why they are in place. retentions are not usually held in the appropriate manner, i.e. independent trust	I9, I10
CO8	It seems to relate to the scale of projects and the disproportional [excessive?] amount of retentions	I9, I14
CO9	I'm not sure what the 'real' problem. However, I view that it is incorrect to ascribe Main zeal's problems down to retentions; it is apparent that Main zeal's problems are well wide of retentions. If the retentions issue has been a significant cause of Main zeal's demise, then it would indicate very poor business and quality control practices in their work. I have observed that the way main contractors have used retentions with their subcontractors is probably faulty. It appears that some main contractors do not place retentions on the payments to their subcontractors, and therefore have difficulty in controlling their subcontractors and in having their subcontractors remediate work.	I6, I11
CO10	Sometimes retentions are used for other reasons than what they are there for.	I11
CO11	The retention is a promise by the client with no funds or security to it. Further as a guarantee for work a considerable portion is for subcontracted work which often does not tolerate retentions thus the main contractor carries the risk and the overheads of deferred payment.	I12
CO12	Where retentions are held for periods longer than permitted by the head contract between client and main contractor	I2
CO13	I don't believe there is a problem with retentions in the civil engineering sector. There is one in the Buildings Sector with regard to subcontractors being on a different retention regime to the main contractor	I7
CO15	Main contractors not releasing the monies to subcontractors.	I2
CO16	Contractors in alteration work not wanting to agree to contracts to formalise the process.	Not coded
CO17	Can create cash flow problems for contractors.	I4
CO21	Not releasing any unused retentions in a timely manner.	I2
CO22	Only problem is the securing of the retention such that the Contractor or Subcontractor will get the outstanding money once the contract has been performed.	I12
CO23	the problem only exists for poorly organised main contactors and sub-contractors during a period of low work volumes	Not coded
CO24	The distortion of natural cash flow to create an incentive to complete due to ""greater reward"" along with the long time frame with which it is held, creates free unrestricted use of the funds effectively owned by third parties, that if put to use rather than held in trust motivate the holder of those funds develop	I4

	unfair, unprofessional, unethical, and illegal acts to strangulate industry cash flow to avoid the negative cash flow, to avoid exposing the under-capitalisation of their business.	
CO25	The average contract nowadays has most of its value covered by subcontractors. The contractor holds maximum retentions on his subcontractors while having his overall retention reduced on the growing value of the work in progress. The contractor benefits grow as the value of work in progress grows.	I7
CO29	The contractor does the work but the client withholds retention from the contractor. This means the client is holding money that someone else owns. This money is seldom (if ever) identified within the Client's accounts as being someone else's money. If the Client falls over, the receiver / liquidator takes the money to repay debt and the contractor loses out. At the next level down, the main contractor holds retention on his sub-contractors and the same scenario plays out as in the paragraph above. As long as retentions are held unsecured, the retention system will fail in the event of an upstream insolvency.	I12, I3
C2	In my area of work it is not applicable, Geotech investigations and instrumentation, we always try and put a bond down instead	Not coded
C3	My poor experiences have all been when working (in the civil field) when subdivision developers use any ploy to delay or not make payment of held retentions. In the roading and major civil area retentions are not too much of an issue - and many clients allow Bond in Lieu.	I2
C4	I don't believe the issue is so much with the retention practice, but more about the security of the retentions withheld. The retention regime is structured in such a way that the contractor will usually be cash positive because of it, especially if the contractor has provided a bond in lieu of retentions, and many contractors rely on that cash positive position to keep their business operating. The fact that the contractor will likely be cash positive also influences the level of margin they apply to their tender as it is supported by the interest gained or use of the retention money. So if the retention practice in NZ is to change, the effect on all parties will need to be considered to ensure undue financial pressure is not applied to any individual party - it may require gradual introduction.	I12
C5	Monies are being held illegal contractually and in an inappropriately ways. It's also been used inappropriately as cash flow device.	I11
C6	minimises contractors cash flow and can cause payment defaults	I4
C7	In most cases there is no problem with retentions. We do a lot of work for government and local government / Councils. In every instance there has been no problem with the release of retentions. We have had some issues working for private companies where retentions payment at end of practical completion, have not been paid, paid late or short paid. This has a huge effect on our business, as we do not know whether this money will come until	I13

	after the maintenance period, generally 6 or 12 months after project completion.	
C8	Any one time a contractor has significant value held in retention for the unlikely event of not meet their contract requirements. We prefer a bond in lieu of retentions option.	Not coded
C9	Contractors are in business to make money, that's the bottom line. When the economy is depressed and they have to work to tighter margins, the money withheld will at least represent the profit on the contract. Provisional tax will be payable, bank interest charges are still payable, wages and costs need to be addressed. The likelihood is that the defects have been corrected at the contractors cost but he will still have to wait over 12 months when this money is potentially earning interest for the principal.	I4
C10	The retention money needs to be held by a trust account not by either the head contractor or the client, the client should be paying the retention money into a trust account that could be called upon by any party involved	I12
C11	Causes extreme cash flow issues for the contractor.	I4
C12	Retentions are at times used by Clients as a means to ensure that Contractors not only fixes defects but any work that needs doing at the end of the project including damage caused by others. By Clients holding all the retentions until all defects are rectified, Contractors are also forced to do the same, thereby penalising Subcontractors who are remiss. Notwithstanding what contracts state in this regards, the realities are different.	
C13	These funds are not currently secured to the rightful parties and are open to abuse from clients, consultants and contractors	I12
C14	Security of payment to subcontractors if the Main Contractor goes into liquidation	112
C15	Retentions are not being withheld correctly. Too great a percentage for subs etc.	I7
C16	In the situation when a main contractor fails the retentions which are held or are required to channel through the failed company fall into a pot of money the receiver has available to himself to settle debts. In situations where main contractors fail, these previously certified moneys held be the client should be treated separately from any other revenue due to the failed company, It gets very messy as the receiver still has obligations/ responsibilities to sought out performance issues for the work completed	I12, I3
C17	Retentions undermine the contractor's relationship by deeming them 'incapable' of delivering a sound quality job. Retentions act more like a 'bullying' tactic where it is the client or main contractor/construction company that has not delivered to spec or to budget. The sub-contractor is squeezed on what they are owed in retentions at the discretion of the primary contractor. The sub-	I4

	contractors actually fund the project and carry the majority of the risk, hence why when full retentions are not paid out and when you have them owing from several projects this impacts business negatively causing unnecessary stress on the sub- trades.	
C18	Too many times the retentions are not paid for various reasons	I2
C19	Money is held which you have no control over when it will be paid, you may be waiting for months for other contractors to fix their mistakes when there is nothing wrong with your work.	I2
C21	Mainly with the private sector & developers. Having to constantly chase up retention release. As main contractors the financial management and accounting of retention funds.	I6
C22	This has become an opportunity for clients to cash flow other projects. The main contractor is now funding their clients projects especially when you factor payment terms are now stretching beyond the so called ""20th of the month following""... and main contractors must also wait 12 months for the return of the retention held.	Not coded
C24	Retention causes financial dilemma to a contractor particularly on large projects because retention quite sometimes huge where profit margin is very low that causes liquidity problem.	I4
C28	It holds our profits from a job for the DLP. A retention Bond does not. We work mostly in infrastructure / govt. works so many of the problems faced in the commercial construction sector are not faced by us.	Not coded
C30	It is a cash flow issue. If you have a contract in place with warranties in place then this should cover any issues with workmanship	I4
C31	As earlier comment. If you buy an expensive house or car, boat, land etc. you agree to pay in full. There is a lot of legislation and laws to cover consumer protection all ready. Construction companies are like any other consumer	Not coded
C32	The ones that abuse it are the one that are the high stakes players and regard it as their right to abuse it	Not coded
C34	All retentions should be held by a third party	I12
SC1	Main contractors lie about Practical completion dates or are slow in providing them when requested. Retention periods (architectural trades) are generally for 3 months but there are also arbitrary periods of 6 - 12 used particularly by developers and for government work. The majority of builders use their sub-contractors retentions as a form of working capital Main zeal has $19 M of retentions which went into an over drawn bank account. That’s theft as far as I am concerned	I11

SC2	Only a problem when contractors / subcontractors don't know what they are doing, what is or is not acceptable, not controlling contracts entered, and admin thereof. Big gripe over positive main contractor cash flow off subs is a real issue BUT (1) subs do not normally have to provide a bond whereas main contractors do, (2) MC's carry the bulk of risks from many trades, (3) MC margins are wafer thin below margin for error / risks for prolonged periods (4-5 years every decade). It is up to subs to limit to a reasonable level the positive cash flow of MCs via subs. EG, refuse to accept 10% flat or even 5% on larger subcontract values over 1 mil and instead insist upon prorata head contract retentions throughout the months, or something in between, e.g. default 3910 scale, or 5%. Easy. Positive cash flow of course is disincentive to MCs to release final retentions but that is up to subs to police that with reduced gap between MC retentions and subs retentions, then chase releases, and avoid MCs or attach a healthy risk premium when quoting to miscreants.	
SC3	Retentions are often not collected correctly i.e. they hold 10% in full, rather than a sliding scale of 10% up to $200k, then reducing. The 50% portion is not paid out as soon as practical completion is gained, often 1 - 2 months passes before this money comes and at the end of the 12 month period they are not paid out on time either. Often the main contractor will deduct $500 from retentions for things like ""cleaning"" - and you can sign and agree and get your money within 7 days, or argue the point that you cleaned up after yourselves and get the money who knows when. All the control remains with the main contractor. The other problem is that say if the painter hasn't done his bit, no one gets their retentions at practical completion, they are not paid out on a per trade basis which they should be.	I2, I10
SC4	Retention are not paid in a timely manner and do not guarantee good workmanship. Therefore, they contradict the purpose of the CCA and prevent cash flowing in the industry.	I4, I13
SC5	The subcontractor has no input to the contract signed between the principal and the main contractor but has to sign a contract with the main contractor. The retentions are never secured in trust. Over the retention period (possibly 18 to 24 months) a developer or main contractor is operating on the retention funds which they do not own.	I11, I12
SC6	Retentions usually take considerably longer than the 12 months to get paid out. There's always an excuse from the builder as to why the retention hasn't been released. The threat that the builder may collapse (exactly what has happened with Main zeal and previously Hartner, Goodall, Tony Tay, Sefton just to name a few) within the defects liability means our retentions are at risk Builders always seem to manage to 'just finish' a project, most of our costs are in the last few months of the project, their last claims are left unpaid, plus retentions held, can all add up to be a considerably some of money owing .	I2, I3, I13

SC7	The head contractors use retentions to fund their businesses. As stated previously most head conditions of contract limit retentions to say a total of $200K. The head contractor passes the conditions of contract onto the subbies which (as an example) could mean 100K held on electrical, 100K on plumbing, 100K on mechanical, 100K on painting etc. and effectively ALL the retentions are being held by the subbies. This gives the head contractor no incentive to chase retentions from his end, as they are not being held anything! Also, contract retentions serve no purpose - if during the contract period we over-claim or cause damaged which needs to be rectified, the head contractor will simply with-hold payment or create a contra. The contract retention is purely money in their pocket. Abolishing retentions would also cause the head contractor to choose his subbies more carefully and perhaps not go with the lowest price but to select the subbies which are reliable and have a reputation of standing by their workmanship.	I11
SC8	I would argue that a bond system is fairer. The fact the main contractors hold far more money from subcontractors than is held on them is a significant reason why they would not want to ever achieve practical completion as it has a significant negative impact on their cash flow. Furthermore that money should as a minimum standard be held in trust not used as though it belongs to them. We currently have projects where the main contractors have been paid out months ago, yet still will not release the money and we cannot withhold labour as the projects are finished.	I2, I7, I12
SC9	If you need the money to pay your bills, taxes or staff you cannot access it. Retentions are being put on non-retention works as standard also. When the company you are sub-contracting to goes belly-up you have lost a lot of money and can go belly-up yourself. We don't get any interest on our money. Companies use it to bully you into fixing work that was damaged by other sub-contractors and won't let you claim it as an extra.	I2
SC10	Retentions are held for too long. This is because the ""countdown"" period doesn't start until the main contractor reaches practical completion. Meanwhile a sub-contractor could have finished their portion of the job months earlier but the defects liability period doesn't start until the main contractor has finished all trades Additionally, a main contractor often will not release retentions when due and requires many follow ups to release the money	I1, I2
SC11	Ensuring total retentions payments by the contractor (with inherent risks) and administration of the processes.	Not coded
SC12	There is no security for the money withheld. In most cases, due to tight pricing, the value of the retention can be most of the profit on the job. Therefore subcontractors are being penalized.	I12

SC13	Main contractors delaying the payment of retentions and using the retention money as a source of interest fee finance. The holding back of retentions cripples the cash flow of contractors. The retentions are more than the profit margin so contractors are borrowing money to finance a job then waiting up to 12 months for the final payment. In the meantime the contractor has had to pay interest on his overdraft which results in a negative cash flow and net loss on the job	I2, I11, I4
SC14	Main zeal as an example, say no more. Main contractors forget to pay on time, find an excuse not to pay.	I2, I13
SC15	I believe that retentions if kept should be held in trust accounts and not used to fund further projects or costs.	I12
SC16	It is regulated by the main contractor or principal. If retentions were a viable option they would be held in a protected trust. The retention figure is generally more than the profit on the project so is not sustainable.	I12
SC17	We as subcontractors are funding the head contractor with no guarantee of payment	I11
SC18	Finance costs to the supplier. If the client goes belly up what chance do you have of getting the retention paid?	I3
SC19	The major problem with retentions is that most players no not understand the implications of it on cash flow and project margins so over all it drives down returns to contractors to unsustainable levels. There is also no assurance that at the end of the retention period there will be any funds available from the client to meet the retention payment or that they are still in business.	I10
SC20	Used as interest free overdraft by main contractors. According to the formula used, bearing in mind the main contractor these days may not be the contractor with the contractor with the greatest amount of work. The total retentions being held by the main contractor can and often is greater than the total retentions held by the client. This gives interest free money for use by the directors of the main contractor for whatever purpose they se fit. If the company fails for whatever reason and the directors have chosen to continue with unrealistic fees etc. there appears to be very little effort by either receivers or the courts to recover monies taken by directors in a mode which would be best defined as NOT Acting in the interests of the company.	I7, I11
SC21	Main contractors retaining owed monies well after the main contractor has been released from contract, and longer than maintenance period of contract	I2
SC22	It effects the cash flow of most sub-contractors and cannot be relied on to be paid when due. Retentions cannot be counted as profit on a contract due to the fact it in unsecured. It appears the main contractor on a large contract has any money at risk with the client in retentions as the sub-contractors cover the total amount.	I4, I12, I13
SC23	The main problem is that the retention money is not secured (i.e. in trust account) but is used by main contractors to cash-flow	I12

	there next project.	
SC24	There is no means to ring-fence money collected as retentions to ensure they are used only for the purpose they were retained, the money appears to end up as working capital for the head contractor.	I12
SC25	The main contractor going into receivership	I3
SC26	1. Market is now much more competitive than it was when retentions were first applied (Liens retention Act) and the retained amount is often more cash flow than the contract profitability. 2. Money is deducted via a builder out of sync with that deducted by the client from the builder. This allows the builder to get considerable positive cash flow which has a number of on-going serious issues.	I7
SC27	I have once had to wait for 3 years for retention payment, not because my work had any faults or was substandard, the client was using contractor and subcontractor retentions to fund another building project.	I2, I13
SC28	It is used to fund projects and delays payments to small businesses who cannot afford it. It is used by the main contractor almost as an extra discount.	I11
SC29	Retention money is deducted from approved payments for the purpose of performance and warranty. It is not held in trust or protected in any way but is simply used by main contractors as business as usual money. The current scaled system ensures the cash held by the main contractor on a subcontractor always exceeds the amount being held on it. When a main contractor behaves badly this retention money is used to prop it up until default occurs. Any money left goes into the hands of the receiver. It is no longer acceptable to have this money used in this manner. Some form of protection is required or a simple bonding system should be used. The problem is that as for the ""pay when paid"" clause this choice can only happen with government assistance and an amendment to the CCA. Many main contractors agree but few are willing to act.	I11, I12, I7, I3
SC30	If the main contractor stops trading then retentions monies due to subcontractors are ""lost	I3
SC31	The problem is the retention money held by the client / developer and in some cases also the main contractor is not secured. Look at Main zeal Construction as an excellent example. Also, MOST developers and main contractors use the sub contractor's retention money for their own benefit such as interest free loans, financing their next project. In short the culture around retention money held by developers and main contractors is extremely undisciplined and of real and extreme concern to thousands of suppliers and contractors / sub contractors put at continued risk.	I12,I11
SC32	The present rate of 10 per cent is too high for small /short time contract suppliers and would be more equitable if reduced to 5 per cent or negotiable within this range.	Not coded

SC33	There is no guarantee that the money is available when due for payment and will contractor will pass the money on to sub contractors and is the money set aside or used to cover up companies cashflow problems	I12
SC34	It is not secure. Repayment can be held until work of other subcontractors is complete. The start date is project Practical Completion, not from date of subcontract completion. Some Contractors have to be repeatedly harassed to release retentions, and can hold payment for no good reason.	I12, I2
SC35	Main Contractors appear to use whatever means to NOT pay the sub-contractors the retention, when it is due. Main Contractors blame clients for not paying them, so in turn the Main Contractor cannot pay the sub-contractor (i.e. paid when paid), which is illegal.	I1, I2
SC36	Sub-contractors undertake the work and incur the cost of delivering the work yet do not have full access to the monies owed, which impacts on the sub-contractors cash-flow. In the likes of a main contractor going under/receivership/liquidation these outstanding retention monies are not paid, yet the sub-contractor has carried out the work so should be the first party paid out in any issues arising from main contractor difficulties.	I4, I3
SC37	They are the most stupid things. Products and service require produce statement and guarantees so what actually is the purpose of retentions. Often a subcontractor will remedy or complete his works but the main contractor still holds his retentions because of some other stupid reason (often his own negligence and slowness to respond).	I2
SC38	Because retentions are applied on a sliding scale basis it results in main contractors having less held on them than they hold on subbies. They traditionally use this as interest free working capital which gets tied up in their businesses. When the client finally releases the defects liability money it puts the contractor into negative cash flow. He is unable to release to subbies as he would go into overdraft. Multiply this scenario by say 10 projects and you can see how quickly the contractor can get into trouble. They must not be allowed to continue this practice.	I7, I11
SC40	As the use of retentions become a funding source for the head contractor, the customer gains little security and the subcontractor is at risk of losing out.	I11
SC41	The majority of contractors need to be chased if we as subcontractors are to get retentions paid out. It is an onerous task to follow up, gain a retention release date, chase the main contractor for its payment. Our retention date is tied to the practical completion date. This may not be agreed by the client for any number of reasons outside our control. We are currently waiting on the first retention release on a major supermarket, no fault of ours but the main contractor has not got his, we do not get ours, then we wait twelve months for the balance. Our work was done without fault and the shop opened last October !	I1, I6

SC42	1. We have found that most of the time the onus is on us to claim these retentions at the end of the defects liability period, as opposed to the main contractor releasing them in accordance with the agreed subcontract. This can prove extremely difficult 12 months after completion (being the usual DLP) as the contractor who engaged us is not interested in revisiting an old project, then finds faults or reasons to not pay the full amount, and/or blames the client for not releasing their retentions on the project. (Am currently trying to get payment for $30,000 +GST in retentions on one project that was due to be released last September). 2. The money held from not paying the retentions is not allocated to a specific account, or held in trust anywhere, to ensure that it is then available to subcontractors who worked on that project and have met all contractual obligations. 3. Not enough regulation around retentions in the industry - differing rates and means of administering between different companies and project to project; no clear situations as to when you can and we you can't hold retentions (i.e. frequently have retentions held off work carried out under purchase order rather than subcontract that shouldn't be held; as landscapers we generally have a maintenance period for any new work to ensure the plants are maintained correctly and avoid defects yet this is not always excepted and retentions are still held - of course the plants will die if they're not maintained - or they also keep a retention off the maintenance)	I1, I2, I6, I9
SC43	The money typically represents all or nearly all the profit in a job. The money is absorbed into the Main Contractors coffers, when it should be held in an interest bearing 3rd party trust account. Warranties are standard practice, as are Producer Statements. It is a historical practice retained for the benefit of the Main Contractors only. It is always a struggle to get retentions released, as the Contractors have no incentive to do so of their own accord, meaning we have to chase and harass to get paid.	I12, I2, I6
SC44	The money being held is in one parties hands and they can use it to finance the next project thus endangering the subcontractors money/ wellbeing.	I11
SC45	Too often, it is a real struggle getting retentions released by main contractors, and we have no way of knowing if these have been released by the client. Some trades do not accept any retention while others accept them as a norm. There is also a big difference between different main contractors with ease of release of especially final release which can be 18 months after practical completion.	I6, I9

SC46	1.) Contractors use retentions to fund their working capital - developers use a sliding scale on contractors to hold retentions, often with a cap. The contractor then applies the same sliding scale of retentions to subbies - result - the contractor may have only a couple of hundred K held as retentions by the main contractor, but then as a total they hold a couple of million on subbies because the same sliding scale if applied to far lesser sums - result - subbies fund the contractor to the tune of a couple of mill. per job. 2.) Part of signing onto contracts is the need to sign a Continuity Agreement before any payment claims are paid - this is to ensure the developer benefits from all subbie obligations irrespective of whether or not the main contractor is still around. Issue, as in the case of Mainzeal, developer gets full benefit of all warranty obligations but subbies remain unpaid - subbies should have the right to walk away in such cases where payment obligations are not met - remembering developers are part of the reason as to why some firms fail - they are often the parties that are screwing everybody down forcing behaviours such as Mainzeal's. 3.) Retentions are often held on small firms who struggle to follow through on process 12 months down the track - and contractors bank on this. Such subbies not only struggle to follow these debts, 12 months after the event they find they may still have to re-enter into more final account negotiations - contractors use the ""we can spend time rehashing stuff but we have more resource than you"" - this inevitably means some subbbies walk away from their retentions - exactly what some contractors want to happen. 4.) Contractors rarely voluntarily pay retentions - they wait until they are followed up. This is unethical given that it is highly likely they have more often than not received retentions held on them well in advance of when they release retentions.	I6, I7, I11, I13
SC47	The major problem is lack of security to ensure the return of retentions once all contractual obligations are complete. Additionally, if the Client or Contractor holding retentions is placed in receivership/ liquidation the retentions are not a secured debt.	I3, I12
SC48	As has been evidenced many times with the demise of main contractors, it ends up with the sub-contractors funding the loss despite having done nothing wrong. We end up effectively paying the banks so they can take no loss despite them being the primary assessor of risk in deciding to fund main contractors. Secondly the main contractors are extremely poor at paying this money out. The sub-contractor has no leverage over the main contractor to extract this payment and they hold it for months. Finally Contractors are upping the level of retentions to fund their cash flow.	I3, I6, I11
SC49	Retentions are held over work completed by the sub contractor, and should at that stage be treated as funds owing to the sub contractor. From this point the sub contractor should be treated as	I12

	a secured creditor for the amount owing. the retentions should be held in a trust account and not been paid to the maincontractors accounts.	
SC51	Our retentions are held by main contractors, we struggle to get retentions paid at defects liability completion time, generally it takes us 3 - 6 months to get our money back.	I6, I13
SC52	Head Contractors hold a greater total value than they should against subcontractors' versus what is held against them by the client. There should be a sliding scale on the held value and variable release dates tied to attached risk of each trade. Although in my experience, many subcontractors do not manage their retention risk very well either, so they certainly do not help themselves in this regard. Both the head contractor and subcontractor can do better managing, agreeing these risks.	I6,I7
SC53	Security of retentions for sub-contractors should the main contractor go into liquidation Retentions should be held in a Trust account for the specific job and not be controlled by the main contractor	I12
SC55	Retentions should be held by a third party who shall pay the sub contractor interest on retention money at the end of the retention period and be instrumental in dispute between Main and sub-contractor. All retention money owed to the sub contractor if the collapse of the main contractor does not allow the work to be completed, should be repaid. Resumption of the work taken up by another main contractor would require similar retentions to be paid for all or part of the sub contract works regardless of it being the original or new sub contractor.	I12
SC56	Because of the use of a sliding scale of retentions the main contractor is cash flow positive on the contract from the first payment through to the final release of defect retention. The main contractor uses the positive cash flow as working capital; this can disguise the actual financial position of both the contract and the main contractors business. As in the Mainzeal situation the positive cash flow from multiple contracts can be used to service huge amounts of debt that directors may allow to build up until a final reckoning comes. If the situation becomes critical the directors are tempted to go out and win contracts at any price, in order to tap in to a new source of positive cash flow. This has the effect of distorting the market at the expense of well-run companies. This impacts throughout the industry.	I7, I11,
SC57	Margins on jobs are already very very tight, sometimes less than the retentions. In this regard, there is a lot of pressure put on sub contractors.	I4
SC58	Retentions can cause cash flow problems and extra finance requirements for the sub-contractor.	I4

SC60	The whole thing is designed around providing cash flow for builders; most builders don't understand services trades sothey use the retentions for a funding and be as a stick to hit builders when they don't understand what is going on. We don't need retentions as we have already signed a legally binding bloody contract which says we must fix defects within a certain timeframe or we could be penalised by a variety of different means - so why bloody hold back money? I blame it on fletchers for lobbying the government and moving the goalposts so that the builders came out on top at the expense of the services trades (MEPF)	I11
SC61	In the electrical industry we cover warranties with the supply of a certificate of compliance and signing of contracts which covers our workmanship and in particular a minimum of one year warranty on the parts we supply. We also have to supply a declaration of conformity on all items we install.	Not coded
SC62	The only issue we have encountered with the retention practice is being paid the outstanding retention amounts by companies which may be struggling with cash flow. The payments can sometimes be delayed through no fault of ours.	I2, I13
SC63	The retention monies held on sub contractors far outweighs the value of retention monies held on the main contractor so the main contractor in effect is cash positive in this regard. The retention monies are held as unsecured funds by the main contractor so are at risk if there is a financial collapse. These monies are not in dispute and have been rightfully and contractually earned by the sub-contractor and is usually a large part of any profit that the job might hold.	I7, I12
SC64	They are used as cashflow for builders.	I11
SC65	Main contractors use the retention system to fund their projects ""Interest free"". This becomes apparent when companies such as Mainzeal collapse and the retention moneys are lost. Also often retentions are continued to be held against contractors who have fulfilled all their obligations due to other sub-contractors or the main contractor having fallen behind.	I2, I11, I3
SC66	The retentions need to be held by an independent body.	I12
SC67	the money is held & used by the builder for his own gain and not held in trust for the person who is owed the money	I11
SC68	Main contractor hold retention as we sub contractors have no control as to where this money is held ,if used to finance other projects or life style.	I11
SC69	As contracting is an extremely competitive industry the holding of retentions for 12 months strongly affects contractors cashflow and their ability to be profitable.	I4

SC70	The market is so tight,that we barley have 10% margin in the job! To then forfeit it as retention is unacceptable as a subbie. It makes our cash-flow out of wack and the main contractor holds it against us and in the end pays what he likes and we have to accept his summary of retention payment against ours. He can decide that we need to cover part expense of some issue on site and we have to agree otherwise we don't get our retention. We have to have it for cash flow so we just accept the reduced amount. I have never had my retention held back because i have not fulfilled my contract or refuse to rectify issues. It is just a great way for main contractors to get cash flow. I know of large contractors who can build a spec house in twelve months on retentions money that they have not released!	I4, I11
SC71	Retentions are too high for what they are. At 5% of the total they would have the same effect but not cripple the contractors.	I14
SC72	Non-payment of the retentions when they are due. Also construction company's client doesn't hold retentions.	I13
SC73	Retentions don't always get paid	I13
SC74	How long the retention is held and by whom	
SC75	If the main contractor goes broke the subcontractors loose their retentions.	I3
SC76	Money should be held by a third party, so builder is as keen as everyone else to sort out any problems and get payment. At present it normally costs builder when he pays out retentions .	I12
SC77	Retentions are often delayed past the 12 month date due to a single fault/subcontractor.	I2
SC78	The main contractors are using subcontractor's money to finance their own companies. We very very seldom get retentions paid out on time, and sometimes not at all. When investigating with the principle we usually find that the retentions had been paid in full and on time to the main contractor! The holding of retentions for 3 months would be understandable and acceptable but the non-payment for 18 months is not. We pay tax and GST on the full invoiced amount which includes tax on the 10% retentions that we don't get paid for up to 18 months. If the main contractor goes under then all the retentions are lost.	I2, I3, I11, I13
SC79	Retentions are cheap funding for main contractors and puts the small subbies in a difficult position	I1
SC80	Not secured in the event of a receivership. Open to manipulation by unscrupulous contractors. Sub trades at the mercy of the contractor. Prohibitive cost to chase small debts so some retention never followed up. Lack of independence in the process.	I3, I6, I11
SC81	As a sub-contractor I have been hit four times now and if this keeps up a lot of our solid companies will simply disappear for two reasons Can't afford to stay in business or have just had a guts full of being ripped off. The consumer starts paying as well as subs will probably start and build in a contingency.	Not coded

SC82	Payment and sign off. Some projects can sometimes require substantial follow for sign off - ie we've installed an alarm system to standard and it is functioning correctly but the painter hasn't finished painting and this can hold up our payment. Payment dates are often missed and requires debtor follow up.	I2, I6
SC83	The cost to small business is huge as they end up funding contractors. One contractor owed me $5000 for a period of 5 years. As I keep undertaking the work retention's keep accumulating in the end because they had continually owed me money for so long and were poor performers as the main contractors in getting remedial work completed I stopped being their service provider unless retention's were excluded from the contract. I now do not undertake retention's for any contracts and am now therefore out of the commercial market.	I11,
SC84	The amount held by the main contractor, in most cases, far exceeds the value of maintenance or defect items. The amount held for the duration held can be the difference between a healthy or poor cash flow for the company involved.	I7, I4
SC85	This is being abused. I have had retentions held from my company and there has never been an issue with my work and then they are not paid out at the appropriate time and then I have to chase the money.	I6, I13
SC87	As a subcontractor "bottom feeder" our company has been through the effects of 2 other local building company collapses over the past few years and each time it has been retentions and progress claims that we have lost out on. We are all unsecured and vulnerable to the way our clients run their business. Furthermore we are still abused by main contractors in respect to getting payment of retentions on time in spite of following all the procedures of the construction contracts act. This is especially the case in a small region like Taranaki where if we don't like the rules the main contractors play by we may not get another job with them!! The main contractors still apply the pay when paid policy in respect to retentions and quite often it is not our fault when the retentions are held back. A typical scenario is that a project has been finished and a remedial list issued. We will attend to our items ASAP to ensure retention release is not delayed but another subcontractor may not complete his items or the main contractor might have moved their focus onto another project and if they have good cash flow they may not put a priority on following up on the subcontractors responsible thus delaying the release from the principle for all contractors involved. This system is extremely unfair and has penalised our company on numerous occasions causing us to use and pay interest on overdraft facilities etc. In addition to this the retentions value is typically the margin in our job as the industry is very tight in our sector and we struggle to get more than 10% margin on project work. The government want to improve the economy and one way they can do that is buy changing policy to	I1, I2, I3,

	improve security of lower tier subcontractors and cash flow by changing the way this legislation works.	
SC88	Subcontractor has no control over when these retentions are released. E.g. 50% released on practical completion yet very rarely does this occur. Main contractor uses our money to cash flow their business.	I3, I11
SC89	Sometimes time period too long and maybe too high percentage	I13, I14
SC90	Retentions can cause a cash flow problem and extra costs if borrowing is required to cover the cash flow shortage.	I4
SC91	Funds with held and even lost should the main contractor becomes bankrupt.	I3
SC92	If there is a fault(not of my making) my retentions are still held 18months I have had to wait no fault of my own.	I2
SC93	The contractor has retentions held at 10% for the first 200,000. There after it progressively goes down, where his average can be as low as 3%. Hence when things go wrong, the subcontractor holds a greater part of the debt i.e. 10% retentions, also he has to wait much to long for the release of retentions.	I7, I13
SC94	The retentions kept 10% or 5% is sometimes the only profit the subcontractor gets and has to wait up to 6 months.	I14, I13
SC95	To get paid the retentions as a subbie we have to: Plead, ring, complain and keep diary notes , find the QS responsible who has left the said completed job to get anyone to discuss outstanding money,12 months after the job ends no one wants to talk to you, yet it's our money they are withholding it should paid with interest it should be held by independent bond holder (govt. or other)	I6, I12
SC96	Retention's seem to be a negotiable item at the end of a contract. QS's will find reasons that have no validation to not pay retentions. Construction companies seem to struggle with retentions on their books. Alliance Constructions reasons for receivership was outstanding retention to sub contractors.	I6, I2
SC97	It is being used to finance main contractors and not being used for the reasons it was set up for.	I11
SC98	Retentions in theory serve the purpose of insuring a client against poor/incomplete workmanship. Retention money belongs to the subcontractor because it has already been earned and should be unconditional upon the completion of the project/contract. That money should not be available for a client to use in their cash flow, and should definitely not be available as a source of 0% financing at the expense of the subcontractor.	I11

SC99	The smaller subcontractor, at the bottom of the contract environment, is suffering significant financial hardship when the profit for the work is tied up. The risk absorbed at this level is disproportionate to the value added to the contract performance which is insignificant. The project works are completed to the point of practical completion before the payment claims are met. The delay in processing claims and achieving practical completion certification, which is frequently not issued at all, blurs the timeline to which retentions are then applied. The 12 month retention period can end up being months beyond the actual completion of works date and therefore retentions end up being withheld for considerably longer than can be justified. The management, lack of control, accountability and frequently viability of main contractors makes the retentions process close to a farce.	I4, I13
SC100	The holding of retentions punishes those subcontractors who are reputable and honest. Usually these subcontractors have been in the construction industry for some time and have established their pricing to enable them to make a living income. The main contractor takes the retentions and then uses that money to run their business i.e. an interest free loan from the sub-contractors. It must be realised that the retention money belongs to the sub contractor and not the main contractor. Retention money is being held in trust by the main contractor. Any retentions held must be deposited in a trust account the same as lawyers and real estate agents. Honest main contractors should not have a problem with this.	I11, I12
SC101	It is used for the wrong reason it is set out for i.e. casflow for main contractors & clients more so than security.	I11, I12
SC102	Retentions favour the client/contractor whereas bank guarantees/performance bonds provide a more equitable solution.	Not coded
SC104	Retention is money held back by the client from Subcontractors. It is hard to shallow why when a major contractor uses these funds to finance its company, or in the event of insolvency, why will secured creditors have the right for these monies than subcontractors , by rights, should be solely entitled to get these monies.	I11, I12
SC105	It's cash flow for the main contractor, and is not used or secured for the subbies for when the retention period is complete. The subbies have to fight and argue to get it out of the main contractor. The main contractor has already spent it and they make it difficult for the subbie to get.	I11, I 6

SC106	There are a number of issues 1) If the main contractor goes into receivership the sub contractors do not get paid their retention money even if they have met their obligations. Retention release can take more than 12 months after completion of a project and a main contractors financial position can change very rapidly in that time especially if they are operating as detailed in issue 2. 2) A main contractor will have a maximum retention held on him by the client. This may be only up to a maximum of $200,000 but the main contractor will hold a 10% of retention on all subcontractors. This gives the main contractor good positive cash flow which they may use to pay previous debt, finance new projects, buy flash cars or take high dividends for that year. It all comes unstuck when the main contractor has a very quiet patch or has a number of bad projects. It catches up on them eventually. 3) As a subcontractor you may honour obligations but if the main contractor or one of his other sub contractors does not this often means your payment will be delayed even though your company has fulfilled its obligations.	I2, I3, I7, I11
SC107	For us it is that retentions are held when we are supplying nothing but hire equipment & services - no product, and these retentions are often held until practical completion when we are usually one of the earlier subs on the site.	I2
SC108	Main contractors use them as a source of free finance which is the subbies money. When the main contractor falls over Mainzeal all that money which isn't there's is lost!!!	I11, I3
SC109	As a demolition contractor we do not install or build a product that requires a guarantee, once our job is done the material is gone. We are on nearly 100% of the jobs the first contractor to complete the works but then have to wait until the end of the build contract plus any guarantee period which could be more than two years after our completion of works to get our retentions.	I2
SC110	Generally retentions are most of the profit margin for contractors depending on what industry you are in Why does it have to be 10% why not 2 or 3 % that would then be more than adequate for the client and reasonable for the contractor, this would also expose the real reason by client /head contractor for holding the amount of 10%	I14

Appendix C-3

The costs and benefits of retentions

ID	Costs and Benefits
CL1	One key value in the use of retentions is the reduced time lost by the Principal in the event that the contractor fails to perform / complete / remedy defects. The processes of arbitration or adjudication are time-consuming, costly and result is long delays to the completion of the works - a delay that is often not recoverable under the contract. It means that the Principal cen get on and complete / remedy - while the argument is carrying on. If the Principal is wrong then they will be required to compensate for that error.
CL3	Unfortunately the poor performing contractors drag down the reliable high performers who perhaps don't need retentions held.
CL4	Clients pay for the cost of finance in the end. This is however a cost worth paying for the protection/drivers which retentions provide. Poor financial managment and wholesale default by clients causes failures of contractors.
CO3	Retentions should be no issue if payment processes under the contracts act 2002 are followed
CO9	We have seen retentions work well, but the clients we have (ie, the Owners), and the contracts we use, protect both the Owner and the Contractor well (I'm not sure about the contractor / subcontractor relationship). However, I have noted Owners taking advantage of the Construction Contracts Act to withhold monies unreasonably, and causing grief. We don't undertake work with developers, and I would understand this to be a different world based around the use of other people's money. Ultimately, retentions gets performance for the Owner, and if the owner is paying for it through slightly higher prices, then that it far less distasteful than having an incomplete or poor quality project.
CO13	The primary benefit is to the Principal in incentivising the clearance of the snag/fault list.
CO24	Contracts operating without retentions cause greater scrutiny of the work completed to date. As a consequence work containing any defect is excluded form payment. Effectively payments reflect REWARD for work well done vs work done poorly. Retentions create lazy quality assessments and mask poor quality work amongst good quality work and delay the incentive for corrective action. Good subcontractors wait for their money while bad subcontractors delay good performance until money is due. Retentions encourage the latter. An industry without retentions will expose poor quality work as it happens and expose poor payment practice when the quality of the work is not in question.

CO26	Contracts operating without retentions cause greater scrutiny of the work completed to date. As a consequence work containing any defect is excluded form payment. Effectively payments reflect REWARD for work well done vs work done poorly. Retentions create lazy quality assessments and mask poor quality work amongst good quality work and delay the incentive for corrective action. Good subcontractors wait for their money while bad subcontractors delay good performance until money is due. Retentions encourage the latter. An industry without retentions will expose poor quality work as it happens and expose poor payment practice when the quality of the work is not in question.
C16	As commented before, Procurement by way of lowest cost selection process is the problem. retentions are fine and a good way of ensuring performance. Contractor and subcontractor ignorance in terms of the contracts they enter into is an issue and requires education.
C17	Retentions do not encourage performance, performance shouldn't be an issue if you are dealing with professional trades people NOT rouges and cowboys which the trades are generally personified as.
C23	As commented before, Procurement by way of lowest cost selection process is the problem. retentions are fine and a good way of ensuring performance. Contractor and subcontractor ignorance in terms of the contracts they enter into is an issue and requires education.
C24	Retention benefited mostly the client/owner not the contractor/sub contractor.
SC1	Retentions are NOT the problem, SECURITY OF PAYMENT IS which is why they should be in a TRUST ACCOUNT to discourage builders bad payment habits. [Of all my client list I would count no more than the fingers on 1 hand that do Not fall into this catagory]
SC2	Contractors and subcontractors DO NOT build in the price of retentions into their bid price. It is market cycles that drive pricing. Contractors accept onerous one sided conditions and risks willingly for at least half the business cycle. During booms is the time to make money because you sure won't on average during the regular downturns. Normally most MCs are reasoanbly honorable about releasing retentions, problems come from difficulties in achieving PC and DL completion, and when subs provide MCs with excessively positive cashflow. Mis-management not retentions cause failures, also being to large driven by booms because growth intensifies competitive intensity yet too many out grow long term smoothed demand, each cycle.
SC6	Hurts cash flow, O/D with bank to overcome
SC9	Retentions cause small businesses to fail or never make a profit.
SC11	Costs for administration, tracking and collection etc
SC13	The retentions are more than the profit margin so contractors are borrowing money to finance a job then waiting up to 12 months for the final payment. In the mean time the contractor has had to pay interest on his overdraft which results in a negative cash flow and net loss on the job
SC16	Retentions are a relic of legacy and there are contempory models that work for all parties
SC19	The aims of retentions can and should be achived by a system that shares the risk equally between, Client, Contractor & Sub Contractor. The present system and it abuse by contractors ensures the financial load is always born by

	the sub contractors.
SC20	I believe the retention pracice causes more failures of sub contractors than contractors. This is because the formula often used can result in the main contractor not bearing the burden of retentions at all.
SC23	retention only increase financial failures in sub contractors NOT main contractors as they normally cash flow positive on retentions
SC24	Increased administration costs both in recovering and issueing retention money
SC26	Contractors are often trading insolvement well before liquidation if they had to take into account the value of retention held by them from subcontractors. it tends to mask per performing builders as they can survive for a much longer period on subcontractors held cashflow. It is also a disencentive for builders to release retnetions as it is a cashflow penalty for them and retentions are held much longer or maintenance not completed to prevent money being paid out.
SC28	I retentions were not held by the main contractor then those with constrained cashflow would need to either seek funding from elsewhere or close. This may actually be beneficial for a professional and healthly industry longer term.
SC35	Retention should be a flat rate across the project or a fixed figure, not a reducing rate on the value of the project
SC40	the use of retentions places and extends doubt over ownership over materials supplied
SC42	little to no consideration is given to profit when the main contractor asks you to revise your price to help them win the job. we were recently awarded a contract in excess of $800,000 where the main contractor wanted to keep a 10% retention which would have wiped out most (if not all) of our profit for this job as it was won in a competitive tender market and our price was adjusted accordingly. a project of this value should be administered with 'sliding scale' retentions, eg 10% on first $200,000, then 5% on next $800,000, dropping down to 2.5% after that (standard master builders practice)
SC43	I cannot think of a single benefit to a subcontractor who is forced to pay retentions. It cannot be costed into a contract as the Tender process does not specify if retentions are payable or not. It is an absolute rort on the part of Main Contractors who use it as a source of free funding.
SC46	1.) Building in price of retentions - hard to do this in a recessionary environment - bottom line is that eveyone is pricing rock bottom, and failure of retention money to flow will result in further failure because businesses are not fully accounting for retention holding costs - remember margins are down from a few years back in an environment where retentions are being held for longer. 2.) Increases failures - it also hides prospective failures - it is quite likely Mainzeal would have failed a lot earlier if they did not have retentions to assist their cashflow - therefore there would probably have been a lesser industry hit.
SC48	Increases the amount of poor payment in the industry which flows right through to suppliers.

SC49	cashflow has always been a problem in the building industrie first 10% retentions then having to pay our suppliers in full and low margins makes for high cost . in my view the retentions are holding us back from spending on new equipment and employing more staff
SC55	Retentions are at a cost to sub contractors possibly borrowing retention money and putting themselves at risk if arriving at this very situation of total company collapse.
SC60	in tough economic times (like now!) margins are often less than the retention being held putting huge pressure on ashflow, and if the builder falls over during the 12 month defects period then hey ho, you are in big trouble
SC95	the cost of chasing outstanding retentions is high for the subbie with no guarantee of payment
SC98	The system is wholly unfair until the system is changed. The money belongs to the sub-contractor because they have already earned it. The funds must be kept secure, earning interest and risk free for the sub-contractor in order for the practice to be fair.
SC106	Retentions are fine and work as long as they are used as intended and they are not spent on supporting the main contractor.

Appendix C-4

Alternatives (changes to the current practice)

ID	Changes to the current practice
CL1	1. Bonds in lieu of retentions have been used - but also impact the contractor's cash-flow and/or ability to undertake multiple contracts where the surety requires backing by way of cash deposits and/or capital (asset) guarantees. I don't consider these to be better. They may be equivalent if in the form of ""on-demand"" bonds. 2. Some contractors fail to claim repayment of retentions, not because they are unfamiliar with their rights under the contract, but simply because they fail to have systems to keep track of outstanding monies. Any principal who deliberately withholds repayment of retentions - citing some failure when none exists - will do so, citing some other false reason in the absence of retentions. Retentions are not the problem.
CL2	The way retentions are held for public sector work should be different to private sector work. Private sector work should be retained independent. No change required for public sector work.
CL4	An alternative is a Bond instead of retentions. Consideration to retention levels should be more project specific and take into account the actual likely cost of default.
CL13	if have to have retentions leave separate account , not part of main contractor become a secured creditor like staff salaries
CO2	I am aware of an alternative of getting a bond in lieu of retentions, but amongst colleagues and the profession (architects), this is not considered as the same degree of surety, and possibly more work to obtain. I would support the idea of a secure deposit system - but there are questions of cost and risk with this option too.
CO4	The change required is to the understanding of NZS3910.
CO5	Consider the present system is satisfactory
CO6	Sub-Contractors are unprotected but not necessarily related to retentions
CO7	As previous, educate, ensure transparency within the contract works, and hold retentions differently.
CO8	Certainly, by the way you are questioning the matter; it would appear, from your perspective anyway, there is a need for changes. What they are - I have no idea.

CO9	It wouldn't seem unreasonable for either all projects to have retentions paid into an independent holding system. Other systems which involve the bureaucracy of further parties would add cost and expense to a system which is currently reasonably straightforward.
CO10	It is a recognised standard industry practice to hold retentions, and legal and practical issues are well understood by reputable operators.
CO11	The retention sums should be paid into a holding account as the job proceeds with a mutual release procedure for both client and contractor.
CO12	Use a trust account to ensure funds are available in the event of insolvency possibly have the funds held by an independent 3rd party
CO13	In the case of contractor default, provision for a subbie to access principal held retentions subject to clearance of faults/snags of the subbie.
CO15	Obviously some change is needed to ensure subcontractors are protected.
CO20	I do not experience problems
CO21	(i) Enforce a system of retentions to be kept in a trust account. (ii) Ensure a speedy dispute resolution method such as adjudication resolves any disputes regarding retention whether its misuse or delay in the release of retention.
CO24	Retentions are abused by main contractors. The Construction Contracts Act is ineffective in resolving these due to the long timeframes that retentions are held. If current retention systems are to remain the Construction Contracts Act needs to be changed to provide a form of security such that retentions are lost when a Payer goes into liquidation.
CO25	To ensure the reasons for retentions are met, the retentions should be held in a joint (Principal/Contractor) interest-bearing account and released to suit performance-based conditions.
CO26	Retentions are abused by main contractors. The Construction Contracts Act is ineffective in resolving these due to the long timeframes that retentions are held. If current retention systems are to remain the Construction Contracts Act needs to be changed to provide a form of security such that retentions are lost when a Payer goes into liquidation.
CO27	To ensure the reasons for retentions are met, the retentions should be held in a joint (Principal/Contractor) interest-bearing account and released to suit performance-based conditions.
CO29	Retentions should be abolished and replaced by a bonding system. Ownership of the bond can be established to safeguard security of ownership questions. The Client is in control of the bond, not the main contractor. therefore there is more pressure on the Main Contractor to get performance and maintenance issues resolved satisfactorily.
C2	Bonds work much better

C3	We frequently are able to use the NZS 3910 Bond in Lieu option. This places higher hurdles on a mischievous Principal (or Engineer to Contract) to try and gain retentions funds. It also means that there is no temporary underpayment for work correctly performed. Perhaps there should be a default payment or charge for slow payment of retentions? Much the same as interest chargeable on slow progress payments. While the presumption of most conditions of contract and subcontract agreements is that there is equal ""power"" between the parties the reality is that the Principal has the money and the power. Perhaps the answer is that contractors/subcontractors can avail themselves of something like the Personal Properties Security Register (Companies Office). And by so doing they go to the top of the heap for recoveries should the Principal fall over. Any such security interest would be recoverable by a charging order from the District Court - it would need to be linked to the asset being constructed so that Principals or receivers could not transfer ownership until any residual obligations are resolved.
C4	Primarily to the security of the retentions withheld, but potentially to retention structure or form of security.
C5	It currently disadvantages the subcontracting community and has advantages. performance bonds
C6	Performance bonds
C7	Retentions work as long as outstanding retentions are paid in full and on time. Probably a Bond instead of retentions would be a better idea. The cost of raising a bond is far less than the interest incurred over the time of outstanding retentions. This still gives the client some measure of protection.
C8	Bond in lieu of retentions, and/ or a reduced %age helps in retention.
C9	Most of the obvious alternatives have been captured in this survey. The fundamental objective is to have a system that is fair to both parties. Client wants to ensure if there are any defects, they will be rectified and the funds are available. The contractor needs to have the confidence that the 'contingency' for carrying out these works are put aside but on completion of the defects liability period, he will recover the money. It really comes down to a form of insurance that addresses the outcomes for both parties, which is where a performance bond is perfect and fair.
C10	Allowing contractors performance & maintenance bonds as a right rather than at the client choosing
C11	Puts too much pressure on cash flow and the ability to pay creditors. Bonds seem a good system.
C12	Bonds, guarantees, etc
C13	This system of retentions is obviously being abused and is open to abuse from clients,consultants and main contractors depending on how various situations arise. It is the tail end user who gets left holding that can due to a lack of security over any retention fund. I prefer the system of a retention holding account held in trust by a law firm, accountants or bank with a fair distribution of any interest monies shared upon the release of contractual obligations. The cost of administration could be by a scale of fees that is automatically added to the contract or as part of the consultants terms of employment and needs to be

	enforced by law for all building contracts.
C14	Security of payment of retentions is required. Bond in lieu of retentions should be acceptable practice.
C15	Retentions should be held in trust by a third party
C16	Retentions are a simple system, bonds, trusts, etc. are quite complex to set up and monitor. You need to consider the complexity of construction projects and the number of parties involved in projects, setting up subcontracts is involved enough having bonds etc. would introduce another layer of cost in administration, I am sure subcontractors do not fully understand how bonds work and the costs and the asset surety that would be required.
C17	Abolish retentions, introduce professionalism across the trades, have the client pay a % up front to cover start of the project so the trades aren't funding the project and have the trades furnish a QA warranty or workmanship guarantee (which most of them have anyway, along with indemnity insurances) for work completed and introduce a better project management structure for the trades to operate under. Project Management should be mandatory on any project to mitigate the risks to all parties of failure.
C20	We do not use retention payments. Instead we use the practice of prewire charge of 50% of the job. If the customer is new and unknown, sometimes we ask for a deposit up front especially if there are goods which are needed that are not usually stocked in wholesalers, therefore carrying a restocking charge if not used or needed should customer either change his mind or not pay up.
C21	All retention monies should be held in a Retention fund administered by the government. Paid out as the contract stipulates. This will eliminate risk to contractors and sub-contractors alike. Also obviate Client using contractors' retention s to fund developments. Contractors will also be able to earn some interest on the monies.
C22	Subcontractors and Main Contractors need better protection going forward. In simple it is the client wanting the work undertaken so why should the contractor suffer and have to fund their projects.
C23	Retentions are a simple system, bonds, trusts, etc. are quite complex to set up and monitor. You need to consider the complexity of construction projects and the number of parties involved in projects, setting up subcontracts is involved enough having bonds etc. would introduce another layer of cost in administration, I'm am sure subcontractors do not fully understand how bonds work and the costs and the asset surety that would be required.
C24	Retention better to depend on the risk and nature of work rather than general application.
C30	It is not required. It's just blackmail (period)

C31	If the NZ government upheld consumer protection laws stringently,retentions would not be necessary.Fines could be imposed by a govt. regulated authority as OSH and Dept. of Labour do with non-compliance in safety and accidents.
C34	Yes all retentions should be administered by a third party
SC1	As already stated SECURITY OF PAYMENT i.e. TRUST ACCOUNTS are required
SC3	We would like to see an independently administered fund where retentions are paid into and both parties must satisfy their contractual arrangements before they are released. Interest on monies invested would cover administration costs. This would shield subbies from main contractors failures.
SC4	Remove retentions completely. The competitive pressure within the industry is enough to ensure quality workmanship and professionalism.
SC5	They need secured in an interest earning account with the interest being paid to the sub trade. The money for retentions cannot be classified as money receivable in a receivership. It belongs to the company supplying the goods and service
SC6	Simple, money should be held in trust, the money owed to each sub-contractor to be declared during the course of the project and paid directly to the sub-contractor and NOT via the builder
SC7	If retentions are to continue they must be placed in trust. If a maximum value of retentions held applies then this must also be passed on to the subbies on a pro-rata basis. Head contractors still use a pay when paid basis for releasing retentions - this goes against the CCA but seems to be a very common practice. Performance bonds are a potential replacement system for retentions.
SC8	Sub-contractors have to finance the profit on a project for over a year, forcing up the cost of business. There is no way a main contractor should be allowed to hold more than is held on them nor should they be allowed to use that money other than having it in trust. Either bond or monies held in trust. A simple change to the construction contracts act would sort this out.
SC9	Once the job is complete & defect free you should get all of your money... not have to wait until the warranty period has expired 'just in case' something fails, because the warranty is covered in the contract you signed (faulty workmanship) and the parts are covered by the consumer guarantees act, and the parts warranties etc. (surely?) - I'm talking electrical sub-contractor here.
SC10	Retention payments need to be automated when they fall due. Perhaps clients /main contractors could make full payment to the sub-contractors bank and the bank holds the retentions - and automatically releases them to the sub-contractor when the required period of time expires - or refund them to the payer upon application
SC11	Consistency Easier to administer
SC12	Too much financial risk placed onto the subcontractor.Too much temptation for the builder / owner to go and spend the retention money.
SC13	Completely scrap the retention process

SC14	Sliding scale retentions are good. If retentions are to be used, they are a necessary evil and work only if the monies are released on time. All retentions should be held secure, if this is to be in bonds or a government account, making payment guaranteed no matter.
SC15	Retentions should be sheltered in some way from being exposed to misuse.
SC16	Shared risk is a better option where the sub-contractor or contractor provide a conforming bid at true cost plus agreed margins and contingencies and perform to a guaranteed maximum price. If there is scope creep then they are handled at cost plus agreed margin. If the project comes in under the guaranteed maximum price then both parties share the residual. i.e. If a 1M contract comes in at 900K then both parties have 50K each. It is a win/win and drives efficiencies. Then both parties have a reason to ensure that costs are under control. It takes a contemporary view and both parties have to be able to trust each other. It takes away all the scraps and makes less money for lawyers. It works very well.
SC17	A bond system or secured deposit
SC18	Get rid of them
SC19	Don't know how you would fix it.
SC20	Administration by an independent body comprising reps from all groups. Architect reps client. Contractors represent themselves and then if need be an independent qualified arbitrator.
SC22	A bond system where the subcontractor receives all payment in full as the work progresses but the bond may be used if the sub-contractor fails in his duty as per a contract requirement.
SC23	Yes because it an unfair system to subcontractors as they cash flow main contractors
SC24	The Consumer Guarantees Act should work to cover the issue of warranty and completion of work. Any money held should be in a system of legal trust to ensure it is only accessed for the purpose retained and available to the subcontractor at the end of the retention period.
SC25	All payments need to be handled by a third party which could be done for a very small cost
SC26	Two choices. 1. Bond in lieu of retention. These are still a meaningful mechanism to ensure compliance with the features of retentions. 2. If retentions were proportioned across subcontractors to the same money applicable to builders (for the subcontractors work) it would reduce the overall retention money deducted (at no cash flow cost to the client) and ensure cash flow was available to subcontractors if a builder went into receivership.
SC27	With the tender process in NZ, a contract winning sub-contractor is already cutting his margin to a minimum. The fact that he's losing a percentage from every claim won't encourage him to produce his best work; on the contrary, he'll produce his fastest work. This way the client doesn't receive the best results from anyone.
SC28	The main contractor should bear the risk. If the retention method is used going forward then the monies should be paid into a trust account and not used by the main contractor to fund their business.

SC29	The use of bonding or other forms of cash guarantees by membership organisations. The use of trust accounts to protect the money being used by the main contractor or receiver. A flat scale that removes the cash incentive to the Main Contractor.
SC30	No changes are required - is a cost for subcontractors to carry and would benefit all if a better bond system or similar is put in place. Also should be an accounting rule that main contractors can't use the money in their balance sheets - this should be a relatively easy accounting rule to implement and could be backed up by legislation.
SC31	There should be legislation requiring the retention monies to be held in a Solicitors Trust Account or by another secure method. Thus, preventing that money from being at risk of anything other than its purpose. Denying Developers and main contractor's access to funds that belong to others would encourage better commercial behaviour, solvent balance sheets and less risk to sub-contractors and the wider NZ community through monumental failures of the construction industry developers and main contractors. Alternatively Bank Demand Bonds in lieu of retentions.
SC32	The retention rate could be flexible in range of 5 to 10 % There are some trades doing early work on sites that could be released their money because the work is completed & approved e.g. earthworks , foundations etc.
SC34	Retentions need to be secure
SC35	A retention Bond. Or a pot of money which the Main Contractor / client adds to the project estimate costs.
SC36	I believe that the retentions belong to the people undertaking the work and that they should be the first creditor to be paid out in a collapse of a main contractor, as the failure of a main contractor could put more businesses in jeopardy, especially subbies, if they are not only not paid current claims but retentions as well. Having a 'holding' company/party that holds all retentions and distributes them to the relevant parties would add another layer of administration and cost in the whole delivery cycle, but maybe this would be offset by the small returns investing the retentions would generate in a bank or like where it is secure.
SC37	Yes changes needed, but not sure how.
SC40	Performance bonds through the banking system are a better way of delivering security to the customer
SC41	Retentions if held should commence from the time we reach practical completion of our works and it should not be bound to overall practical completion. Retentions must be paid out on completion of the work and held in trust on behalf of the client/subcontractor. Clear dates need to be in place, maintenance commences? and is complete ?.
SC42	More uniformity more accountability on main contractor more security over money held or just don't have retentions.
SC43	Mainzeal retentions cost me in excess of $50,000. This was profit on completed work. I will not invest that money in my business, distribute any staff bonuses, donate to charity or employ tradesman to renovate my property. The money is out of the food chain. It is unregulated

SC45	In the steel fabrication industry, the practice of withholding retentions is unfairly biased against the smaller subs who are not able to hold any payments back from merchants and minor trades. The whole system needs to be fairer to subtrades.
SC46	Reasons for changes being required are as per above. Protections already in place to ensure defects are remedied: warranty agreements supported by threat of legal action if not upheld. Or rather than use the full legal system, use the mediation approach consistent with payment claims (ensuring fast resolution). Performance guarantees / bonds (issued by banks) - while there is a cost to this at least it is an absolute cost to be priced in. With retentions you are always fighting over the amount being kept, and the timing of receipt.
SC48	Retentions are being used inappropriately for funding main contractors and put a lot of the risk of business failure with the wrong parties. This can wipe out otherwise effective sub-contractors. It is risk we have no control over. Rather than business practice survival becomes one of luck over time. Our work comes very early in the contract and we do not get paid our first amount to all other contractors have done their work.
SC50	Retentions should be held in trust. A practical completion certificate must be issued to subcontractors Retention money cannot be withheld once a practical completion certificate has been issued. Retentions cannot be held/adjusted at Contractors whim.
SC51	Retentions need to be kept in a trust situation similar to when you buy a house and put down a deposit. Thiswould keep the money secure and provide for the money to earn interest over the twelve month period.
SC52	Head contractors and subcontractors should agree between them a fair value and time period for managing retentions on each project, as risks change on every job. Some head contractors project management teams are not very flexible in this, although to be fair some subcontractors aren't either. Many subcontractors tag out of LD's, so held retentions is the only way the builder can have financial security for if programme delays cost them. They then have the ability to pass on some of these costs to whomever is responsible.
SC55	As explained earlier,a third party adjudicator should be part and parcel of major construction anywhere in the world,retain the retention moneys,and be a cost to major development.The adjudicator must be paid;it would be a contractor in its own right.Costs would also be gained from the errant party,sub-contractors or main contractors carry insurance for failure of supplied goods etc.
SC60	Why not use bonds like they used to in the bad old days before fletchers f##ked it up?
SC61	In our industry a certificate of compliance is only handed over once the job is complete
SC62	A third party organisation should be utilised to hold retention monies in a secure manner therefore protecting the contractors and sub-contractors alike.

SC63	The existing system is fundamentally flawed as has been proven by both historical main contractor collapses and the current Mainzeal collapse. It would be fairer to have an agreed bank bond set up at the beginning of a contract that can be accessed by either party under certain criteria if required. Could also look into possibility of insuring the required amount although the on-going costs of this may be limiting.
SC64	Retentions need to be abolished with defects pursued in law or via trade organisations who guarantee members workmanship.
SC65	Retentions should be abolished. Failure to fulfil obligations should result in no further work.
SC66	The money should be held by a third party.
SC68	To be held in trust by an independent body
SC69	A personable guarantee is quite often also required so a bit of a double dip as a guarantee is quite normal.A fairer system would be a personal guarantee to 10% of the contract value for a period not exceeding 12 months would still hold the contractor legally liable without the stranglehold of funds held.
SC73	Payment paid over 12 months
SC75	The retention should be held in trust
SC76	Retentions held and administered by third party , like a tenancy bond system .
SC77	Retentions held in trust and released on time, but trade specific.
SC78	Need to make the retention pay out trade specific i.e. civil works start say a year before anyone else then have to wait a year from practical completion! Trades have their retentions held back because another subbie hasn't done his part. The main contractors are the worst offenders with retention releases so they should definitely not hold the funds.
SC80	Current system is unfair to sub-contractors and open to manipulation and control by a contractor
SC81	Do away with all retentions
SC83	Get rid of them. Shonky contractors run retention's as a way of life, the norm they should be personally accountable, if Mainzeal was run based on a realistic profit it would not have required and utilised money that in reality was never theirs to use. Also large retentions are kept in the bank when they can earning interest when it should be paid out to the sub-contractor. Corporate businesses are leaches of the small contractor
SC85	Get rid of it and use quality sub-contractors.
SC87	Government run escrow account
SC88	Money has to be put into trust type accounts and looked after by an independent body.
SC93	Retentions can be based on the average of the main contract.
SC94	There should be no retentions held.
SC95	Retentions held not by contractor, but independent bond holder
SC96	Retention is seen as a potential margin grab by QS for jobs. Or worse regarded as additional costs for the job. If the money was in a trust type situation held by a third party then the money go to the right people easier once the criteria for release was met.

SC97	Not working as it was designed to work.
SC98	Again - the funds belong to the sub-contractor. They should be risk free and earning interest. At present, they are being used as a 0% financing option by the client. IN the event of liquidation, these funds are unsecured debt???? it's unbelievable.
SC99	An independent control of the retentions held secure. Forcing controls or obligations with regard to the issue of practical completion and level of accountability with regard to the unreasonable or unjustified delay in issuing PC. More objective and independent verification of any claim to withhold retentions or delay release.
SC100	A well written contract protects the main contractor from the default of a sub-contractor. Careful consideration of a tenderers submission taking into account the reputation and proven reliability of the tenderer rather than just the lowest price minimises the risk to the main contractor. As a last resort, should a retention system be retained then the retention money MUST be held in trust and not be available to the retention holder as an interest free loan. This could be by way of all monies being held in a trust account with the appropriate documentation held by both parties. Alternatively Government could set up a body who will hold the retentions. Any interest received would be used to administer the fund.
SC101	Monies retained must be placed in a trust account
SC102	Bank guarantees or performance bonds have proven to be a mutually beneficial alternative and at far less cost.The practice of retentions needs to be abolished.
SC104	Put retentions on a Trust Account
SC105	Secure retention money in a trust, make it safe for the subbie to claim on completion of the retention period.
SC106	Retentions do work but the retention at the end of a project should be held in a trust fund or secured against a bank bond. This would guarantee payment of sub-contractors if they have met their contractual obligations at end of 12 months. At present it is all weighted in the favour of the main contractor.