

# **Consequences of Unforeseen Rework on Australian Construction Projects**

-

## **A case study approach**

A Thesis

Submitted in partial fulfilment of the requirements for the award of

Master of Philosophy of the University of Newcastle

by

**John Smolders**

Submitted in December 2015

## **Statement of originality**

The thesis contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to this copy of my thesis, when deposited in the University Library, being made available for loan and photocopying subject to the provisions of the Copyright Act 1968.

Signed-John Smolders

Dated.....14<sup>th</sup> December 2015

# Table of Contents

STATEMENT OF ORIGINALITY .....	2
TABLE OF CONTENTS.....	3
LIST OF TABLES .....	8
LIST OF FIGURES.....	9
ABBREVIATIONS.....	10
ABSTRACT.....	12
PERSONAL REFLECTION .....	13
DISCLOSURE .....	13
1. INTRODUCTION .....	14
2. LITERATURE REVIEW.....	19
2.1 INTRODUCTION – LITERATURE REVIEW.....	19
2.2 REWORK DEFINITIONS.....	20
2.3 COSTS AND REWORK .....	22
2.4 INTERNATIONAL EXPERIENCES .....	23
2.5 CULTURAL IMPACT OF TRADE UNIONS.....	26
2.5.1 Trade union control and strength .....	28
2.5.2 Politics and Construction.....	30
2.5.3 Key Points – Construction-related unions.....	31
2.5.4 Questions – How do construction-related unions’ activities impact on.....	31
2.5.5 Summary-Unions .....	31
2.6 GOVERNMENT INQUIRIES. ....	32
2.6.1 The Winneke and Gyles Royal Commissions into Union activities- 1982-1992.....	33
2.6.2 The Campbell Inquiry investigating Quality of Buildings-2002 .....	35
2.6.2.1 Building Code of Australia.....	40
2.6.3 Impact of the Campbell Report .....	42
2.6.4 The Cole Royal Commission-2003.....	44
2.6.5 Collins Inquiry of Construction Insolvency-2012.....	47
2.6.6 Hanger Royal Commission into the Home Insulation Program 2013.....	49
2.6.7 Heydon <u>Royal Commission into Trade Union Governance and Corruption. 2014</u> .....	51
2.6.8 Elliott Inquiry into Skills Shortage in NSW. 2014 .....	53
24.1.2 Key Points – Government Inquiries .....	56

24.1.3	<i>Questions – Government Inquiries.....</i>	57
24.2	GOVERNMENT POLICIES.....	58
24.2.1	<i>Evidenced Based Policy.....</i>	59
24.2.2	<i>The Need for Regulatory Change.....</i>	61
24.3	QUALITY ASSURANCE .....	63
24.3.1	<i>Key Points-Quality assurance.....</i>	66
24.3.2	<i>Questions Quality Assurance .....</i>	66
24.3.3	<i>Summary Quality Assurance.....</i>	66
24.4	SUB-CONTRACTORS .....	67
24.4.1	<i>Key Points-Sub-contractors.....</i>	69
24.4.2	<i>Questions – Sub-contractors.....</i>	70
24.4.3	<i>Summary-Sub-Contractors.....</i>	70
24.5	DESIGN DOCUMENTATION.....	70
24.5.1	<i>Key points- Design Documentation .....</i>	73
24.5.2	<i>Questions – Design Documentation.....</i>	74
24.5.3	<i>Summary-Design Documentation.....</i>	74
24.6	PROFESSIONALISM .....	74
24.6.1	<i>Definition .....</i>	75
24.6.2	<i>Architects.....</i>	76
24.6.3	<i>The emergence of the residential builder and sub-contractor.....</i>	76
24.6.4	<i>Construction education.....</i>	76
24.6.5	<i>Home Building Amendment Act 2014.....</i>	77
24.6.6	<i>The need for ‘professional’ builders.....</i>	78
24.6.7	<i>Industry Associations and Institutions .....</i>	80
24.6.8	<i>The Chartered Builder.....</i>	81
24.6.9	<i>Key points-Professionalism. ....</i>	82
24.6.10	<i>Key Questions-Professionalism. ....</i>	82
24.6.11	<i>Summary – Professionalism.....</i>	82
24.7	CERTIFICATION AND REGULATION.....	83
24.7.1	<i>Types of Builders.....</i>	84
24.7.2	<i>Certification-the Process and Concerns.....</i>	85
24.7.3	<i>Key Points – Certification and Regulation .....</i>	90
24.7.4	<i>Questions – Certification and Regulation.....</i>	90
24.7.5	<i>Summary-Certification and Regulation.....</i>	90
24.8	SUMMARY – CHAPTER 2 .....	91
24.8.1	<i>Culture.....</i>	91

24.8.2	<i>Quality</i> .....	92
24.8.3	<i>Professionalism</i> .....	92
24.8.4	<i>Skilling</i> .....	92
24.8.5	<i>Documentation</i> .....	93
24.8.6	<i>Regulation</i> .....	93
<b>3.</b>	<b>RESEARCH DESIGN AND METHODOLOGY .....</b>	<b>95</b>
3.1	INTRODUCTION-RESEARCH METHODOLOGY .....	95
3.2	BACKGROUND .....	96
3.3	QUESTIONS FROM LITERATURE.....	97
3.4	RESEARCH QUESTION .....	99
3.5	AIMS AND OBJECTIVES .....	99
3.6	CHOOSING AN APPROPRIATE DATA COLLECTION METHOD.....	100
3.6.1	<i>Mixed Method Research</i> .....	101
3.6.2	<i>Triangulation</i> .....	102
3.7	THE USE OF A CASE STUDY PERSPECTIVE.....	104
3.7.1	<i>Stakeholder Selection</i> .....	105
3.8	CHALLENGES OF DATA COLLECTION .....	107
3.9	DATA COLLECTION .....	108
3.9.1	<i>Stakeholders</i> .....	109
3.9.2	<i>Quantitative data</i> .....	110
3.9.3	<i>Qualitative data</i> .....	110
3.9.4	<i>Semi-Structured Interview</i> .....	110
3.10	SUMMARY – CHAPTER 3 .....	113
<b>4.</b>	<b>CASE STUDY-DATA .....</b>	<b>114</b>
4.1	INTRODUCTION – CASE STUDY DATA.....	114
4.2	BACKGROUND TO CASE STUDY 1.....	115
4.2.1	<i>Project Structure - CS1</i> .....	120
4.3	BACKGROUND TO CASE STUDY 2.....	123
4.4	QUANTITATIVE DATA RECEIVED.....	123
4.4.1	<i>The Yes-No questions</i> .....	123
4.4.2	<i>Results for CS1</i> .....	124
4.4.3	<i>The Likert style questions</i> .....	125
4.4.4	<i>Results for CS2</i> .....	126
4.5	QUANTITATIVE FINDINGS.....	129
4.5.1	<i>General Response Question</i> .....	130

4.5.2	<i>Summary of Quantitative findings</i> .....	132
4.6	DISCUSSION OF QUALITATIVE FINDINGS. ....	135
4.6.1	<i>Professionalism</i> .....	135
4.6.2	<i>Skills Shortage</i> .....	139
4.6.3	<i>Documentation</i> .....	146
4.6.4	<i>Regulations</i> .....	149
	<i>Summary – Chapter 4</i> .....	150
<b>5.</b>	<b>DATA ANALYSIS</b> .....	<b>151</b>
5.1	INTRODUCTION – DATA ANALYSIS .....	151
5.2	COMPARISON OF GOVERNMENT INQUIRIES WITH CS1 AND CS2.....	152
5.3	ISSUES WITH THE CURRENT REGULATORY SYSTEM. ....	156
5.4	INDUSTRY RESPONSE .....	159
5.5	LEGISLATION.....	160
5.6	GENERAL OVERVIEW OF RESIDENTIAL CONSTRUCTION IN NSW.....	167
5.7	DOCUMENTATION REQUIREMENTS .....	171
<b>6.</b>	<b>CONCLUSION AND RECOMMENDATION</b> .....	<b>176</b>
24.9	INTRODUCTION – CONCLUSION AND RECOMMENDATION.....	176
24.10	ACHIEVING THE RESEARCH OBJECTIVES .....	178
6.2.1	<i>Professionalism</i> .....	179
6.2.2	<i>Documentation</i> .....	181
6.2.3	<i>Quality</i> . ....	183
6.3	HOW HAVE THESE OBJECTIVES SATISFIED THE AIMS OF THIS STUDY?.....	185
6.3	FINAL CONCLUSION .....	189
6.4	RECOMMENDATIONS .....	189
6.5	POTENTIAL VALUE AND SIGNIFICANCE.....	190
6.6	LIMITATIONS OF THE STUDY.....	190
6.7	FINAL POST SCRIPT .....	191
6.8	PREVENTATIVE MEASURES .....	192
	<b>APPENDIX 1 - ROYAL COMMISSIONS AND INQUIRIES</b> .....	<b>193</b>
	<b>APPENDIX 2 - RECOMMENDATIONS FROM THE CAMPBELL INQUIRY</b> .....	<b>194</b>
	<b>APPENDIX 3 - INTERVIEWEES</b> .....	<b>197</b>
	<b>APPENDIX 4 – SURVEY OUTCOMES</b> .....	<b>198</b>
	<b>APPENDIX 5 - INVITATION TO PARTICIPATE IN A SURVEY</b> .....	<b>200</b>

<b>APPENDIX 6 - CONSENT FORM .....</b>	<b>202</b>
<b>APPENDIX 7 - INTERVIEW QUESTIONS .....</b>	<b>203</b>
<b>APPENDIX 8 - GLOSSARY .....</b>	<b>208</b>
<b>APPENDIX 9 - ETHICS APPROVAL.....</b>	<b>211</b>
<b>7. BIBLIOGRAPHY.....</b>	<b>212</b>

# List of Tables

TABLE 1 - DEFINITIONS OF REWORK	20
TABLE 2 - DIRECT AND INDIRECT REWORK COSTS PER PROJECT TYPE. (LOVE, 2002) P. 27	22
TABLE 3 - GOV. INQUIRIES (PARLIAMENT OF AUST., 2014) AND (NSW PARLIAMENT, N.D.)	33
TABLE 4 - KEY CONCERNS RAISED BY CAMPBELL. (NSW GOVERNMENT, 2002)	35
TABLE 5 - CAMPBELL INQUIRY RECOMMENDATIONS	38
TABLE 6 - REGULATORY REFORM RESPONSE-CAMPBELL INQUIRY	39
TABLE 7 - TWELVE IMPACTS OF THE CAMPBELL REPORT (NSW GOVERNMENT, 2002).	43
TABLE 8 - COLE REPORT FINDINGS (COLE, 2003A)	46
TABLE 9 - ELLIOTT INQUIRY FINDINGS	56
TABLE 10 - SUMMARY OF PROFESSIONAL REQUIREMENTS.	78
TABLE 11 - BUILDER COMPARISONS	85
TABLE 12 - MANDATORY INSPECTIONS CLASS 1-10 BUILDINGS (NSW GOVT., 2014B)	88
TABLE 13 - MANDATORY INSPECTIONS CLASS 2,3 & 4 BUILDINGS. (NSW GOVT., 2014B)	89
TABLE 14 - RESEARCH AIMS AND OBJECTIVES	100
TABLE 15 - STAKEHOLDERS INVOLVED IN THE CASE STUDIES.	109
TABLE 16 - CASE STUDY PRELIMINARY FINDINGS	129
TABLE 17 - CAUSE OF REWORK CS1 AND CS2	131
TABLE 18 - COMPARING CASE STUDY FINDINGS AND GOVERNMENT INQUIRIES.	132
TABLE 19 - PROPOSED REFORMS (SMOLDERS ET AL, 2013) AND EVIDENCE ON CASE STUDIES.	156
TABLE 20 - CONCLUSIONS	188



# List of Figures

FIGURE 1 - CAUSE AND EFFECT DIAGRAM (FAYEK ET AL., 2003,18) .....	21
FIGURE 3 - EUREKA FLAG (AUSFLAG, 2015) .....	27
FIGURE 4 - AVERAGE REAL WAGE INDEX FOR DEVELOPED G20 COUNTRIES, 2007-13 (ILO, 2014)....	29
FIGURE 5 - THE REGULATORY SYSTEM IN NSW (CAMPBELL, 2002-PAGE 6) .....	39
FIGURE 6 - MBA ADVERTISEMENT .....	47
FIGURE 7 - HOME INSULATION PROGRAM (ANAO, 2014B).....	50
FIGURE 8 - BAU IS HURTING CONSTRUCTION .....	59
FIGURE 9 - THREE LENSES OF KNOWLEDGE AND EVIDENCE (HEAD, 2007,6) .....	60
FIGURE 10 - EVIDENCE-BASED POLICY DEVELOPMENT 11. ....	60
FIGURE 11 - BUILDING REGULATION & CERTIFICATION PROCESS (LAMBERT, 2015) 33. ....	62
FIGURE 12 - ENGINEERING FEES NSW (LOWE AND CARTLEDGE, 2012, 6).....	72
FIGURE 13 - BUILDING CERTIFICATION PROCESS (LAMBERT, 2015).....	86
FIGURE 14 - GOVERNMENT POLICIES OVERARCHING THEMES.....	98
FIGURE 15 - QUESTION INTERRELATIONSHIP.....	98
FIGURE 16 - THREE MAJOR RESEARCH PARADIGMS (JOHNSON ET AL., 2007B,124) .....	102
FIGURE 17 - TRIANGULATED INTER-RELATIONSHIP. ....	103
FIGURE 18 - INDUCTION AND DEDUCTION. (LOVE ET AL., 2002,296).....	106
FIGURE 19 - SUMMARISED LITERATURE REVIEW QUESTIONS AND THEMES.....	111
FIGURE 20 - NVIVO SOFTWARE INDICATING DATA AND THEMES.....	113
FIGURE 21 - ARRIVAL OF THE FIRST MODULE (SOURCE: JOHN SMOLDERS).....	115
FIGURE 22 - INTERIOR VIEW OF MODULES-PICTURES (SOURCE: JOHN SMOLDERS).....	116
FIGURE 24 - ALUMINIUM FORMWORK SYSTEM-PICTURES (SOURCE: JOHN SMOLDERS) .....	118
FIGURE 27 - ORGANISATIONAL STRUCTURE OF BUILDER 2 .....	121
FIGURE 28 - SITE ORGANISATION DURING RECTIFICATION WORKS.....	122
FIGURE 29 - CS1 YES AND NO RESPONSE .....	124
FIGURE 30 - CS1 LIKERT RESPONSE FINDINGS .....	126
FIGURE 31 - CS2 YES AND NO RESPONSE .....	127
FIGURE 32 - CS2 LIKERT RESPONSE FINDINGS. ....	128
FIGURE 33 - CAUSATION OF REWORK CS1 .....	131
FIGURE 34 - CAUSATION OF REWORK CS2.....	131
FIGURE 35 - CS1 - RATINGS OF THE RESEARCH AREAS .....	134
FIGURE 36 - RECOMMENDATIONS MADE TO GOVERNMENT. (SMOLDERS ET AL., 2013A,4).....	159
FIGURE 37 - DOCUMENTATION TIMELINE- CS1 (SOURCE: PERSONAL RECORDS).....	171
FIGURE 38 - REWORK + REGULATIONS.....	192
FIGURE 39 - CAMPBELL INQUIRY RECOMMENDATION.....	196

## Abbreviations

ABC	Australian Broadcasting Commission
ABCC	Australian Building Construction Commission.
ABS	Australian Bureau of Statistics
AIB	Australian Institute of Building
ALP	Australian Labour Party
AMP	Australian Mutual Provident Society
ASC&J	Australian Society of Carpenters & Joiners
BCA	Building Code of Australia
BCI	Building Construction Industry
BLF	Builders Labourers Federation.
BPB	Building Professionals Board
BWIU	Building Workers Industrial Union
C'wth	Commonwealth
CC	Construction Certificate
CEO	Chief Executive Officer
CFMEU	Construction Forestry Mining Engineers Union
CPA	Communist Party of Australia
CPD	Continuing Practising Development
DA	Development Application
DLP	Democratic Labour Party
EBA	Enterprise Bargaining Agreement
EP&A	Environmental Planning & Assessment Act
FEDFA	Federated Engine Drivers & Firemen's Association
FIFO	Fly in fly out
FWA	Fair Work Australia
FWA	Fair Work Australia
FWB&C	Fair Work Building & Construction
GFC	Global Financial Crisis
HSC	Higher School Certificate
MBA	Master Builders Association
MMC	Modern Methods of Construction
NOLA	National Occupation Licencing Authority.
NSW	New South Wales

NZ	New Zealand
OFT	Office of Fair Trading
OHS	Occupational Health & Safety
OSM	Off Site Manufacture
PCA	Principal Certifying Authority
QC	Queens Council
RC	Royal Commission
RDA	Regional Development Australia
RPL	Recognised Prior Learning
RTO	Registered Training Organisation
S&T	Standards & Tolerances
SEPP65	State Environmental Planning Policy No 65
SEPP	State Environment Planning Policy
TAFE	Technical & Further Education
VBC	Victorian Building Commission
WC	WorkCover

## Abstract

Rework is a phenomenon that has crept into the building construction industry and gained the interest of many academics. Rework is typically a product of faulty construction outcomes arising from a number of causes including shortcomings in professional management, design documentation and job site cultural environment resulting from ethnic differences and / or trades union involvement. The opportunity for this study arose after two similar projects were deemed distressed by their financiers and both required substantial rebuilding. These projects had a common thread of being constructed by Chinese builders, one from Hong Kong (CS1), the other (CS2) from the Peoples Republic of China. Both came under pressure from the Construction Forestry Mining Engineers Union (CFMEU), the union representing construction workers. It was initially thought that cultural ethnic differences combined with the CFMEU's influence on both projects were the catalysts for rework. However, subsequent investigation indicated that the regulatory environment allowed construction to continue unabated. The intention of this study was to unpack possible causations, collect them into themes and then gather data to answer the primary research question of why the two buildings were seemingly allowed to be constructed unchecked. A mixed method research methodology (MMR) was adopted for the data collection and triangulation principles for the data analysis. MMR was suited for this study as the quantitative results provided an overview of rework causation whilst the qualitative findings swayed the pendulum away from cultural causation to regulatory causation. Triangulation provided a threefold perspective from literature, external consultants and those physically working on the projects. This study is unique as it examined two straightforward high-rise buildings with similar attributes that were allowed to progress to a stage of distress. The study identified questionable construction methods, particularly on one project, whilst both projects underwent major removal and replacement of services. The initial premise of this study was the belief that both projects became distressed due to the ethnological cultural differences of both builders' management practices compared to the local 'home grown' methods of construction commonly adopted by the remainder of the workforce. It became evident that culture did play a minor role contributing to rework but the central pillar was something quite different as detailed in this study. Reluctance by Government to adopt regulatory changes suggested by Royal Commissions and Inquiries have created gaps within the regulatory environment allowing non-compliant works to be carried out unchecked and thus creating rework.

## Personal Reflection

I commenced this study after completing in excess of 40 years in construction. During that period I undertook various short courses that were of personal interest as well as those that helped me with my business activities. At no time did I consider a higher degree, let alone in construction. As a result of a chance meeting with my thesis supervisor, who was visiting my site for his own research project, the prospect of further education became a consideration for me.

I am now in my fifth year at university lecturing part time whilst still maintaining my project management interest within industry. This close relationship with the university has prompted me to undertake two higher degree courses, one in research (MPhil) and the other a Masters in Project Management. This part of the journey is now nearing completion as I reflect back a number of key people who have assisted me on my way.

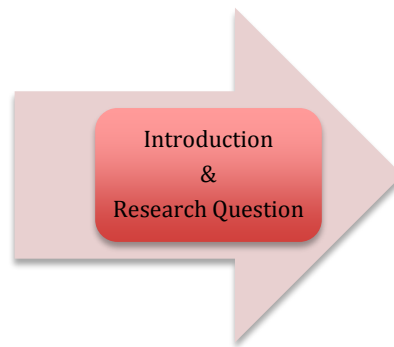
- A very understanding family.
- Two supervisors, A/Professor Willy Sher and Professor Tony Williams who have become more than just friends. The understanding, counsel, advice, teaching and mentoring they have given me is more than anyone could expect or ask for.
- My learned colleagues at the University of Newcastle.
- My colleagues within the Australian Institute of Building and the Master Builders Association.

From a mature age student perspective, the task of learning academic writing does not come easily, especially when one has been subjected to years of adversarial communiqués on construction projects. Perhaps that was one of the greater challenges to overcome. The other challenge is to put to one side self-opinionated subjectivity and let the data do the talking. One thing that I have learnt is that the more sound the data collected, the more reliable is the result.

## Disclosure

The reason for selecting this research topic is my close and personal association with a distressed project I was appointed to manage to completion. The project was a major high profile one that underwent considerable rework and all concerned during this process could not fathom the sheer extent and cost required to rectify faulty workmanship. My close association with this project has afforded me access to all the key stakeholders associated with the project. To this I have added my own personal records gathered during my term on the project.

# 1. Introduction



The construction industry and NSW State Government are both seeking solutions to the vexing issue of quality control delivery of buildings. Other States in the Commonwealth of Australia are also faced with the dilemma of rework and are seeking solutions via industry reform and legislation.

Construction projects are notorious for delays and cost overruns. Flyvbjerg, Holm and Buhl (2002) have concluded that a number of factors contribute to cost and time blowouts on projects. Their conclusions are based on a study across 20 nations in five continents and include:

- The costs of 90% of infrastructure projects are underestimated.
- Rail projects are 45% higher than estimated.
- Tunnels and bridges are 35% higher than estimated.
- Cost underestimation is more pronounced in developing nations.
- Cost underestimation has not decreased over the past 70 years.
- Cost underestimation cannot be explained by error. It appears to be a result of misrepresentation.
- Transportation infrastructure projects do not appear to be more prone to underestimation than other types of large projects. (Flyvbjerg et al., 2002)

Love, Davis, Chevis and Edwards (2011) identified some Australian examples which have contributed to this poor reputation: Perth to Mandurah Rail Link (Western Australia), Southern Cross Railway Station (Melbourne Victoria) and Cross City Tunnel (Sydney NSW). Whilst it is understandable that such high profile projects attract public scrutiny, there is also a concern about smaller projects as highlighted by Collins (NSW Government and Collins QC, 2012). This report aligns with another by Easthope, Randolph and Judd (2012) that highlights that 80% of residential buildings in NSW were defective on completion (Easthope et al., 2012). One finding

of this report was a significant concern for building projects in the range of \$20 million to \$50 million. These projects have been reported by Easthope et al, (2012) as requiring substantial rework to make them habitable.

The presence of such defects is because of concern about a rapidly expanding residential apartment property market (ACIF, 2014). This sector is becoming attractive as an alternative to the traditional “quarter acre block” that Australians aspire to (Van Den Broeke et al., 2014). The quarter acre block is an expression used when town planning in Sydney changed in the early twentieth century as housing transitioned from an English terrace design to a Californian Bungalow (Clare, 1985). As Sydney changed in those early years, Government was progressive and as a result the Sydney suburbs of Daceyville and Haberfield have been world heritage listed as examples of this type of town planning. Compared to today, land at the turn of twentieth century in Sydney was plentiful and the Sydney population was relatively low. The current demand for real estate in the Sydney area has been driven up by the demand for residential properties and the means to fulfil this demand is by way of vertical apartment buildings (Van Den Broeke et al., 2014). This increased demand will place further pressure on the construction industry and regulators.

Other related issues pertaining to rework, causes of cost and time overruns, as well as poor quality, have resulted in governments commissioning several investigations into the construction industry including the Gyles Royal Commission (Gyles, 1992), which focused on industrial relations (O’Niel, 2003), the Royal Commission conducted by the Hon. Terrence Cole in 2003 (Cole, 2003a) and the inquiry on insolvency conducted by Collins (NSW Government and Collins QC, 2012). The terms of reference for these investigations included insolvency, trade union activities, corruption and “sham contracting”. However, all of these investigations only served to highlight concerns. With the election of the Liberal Government in 2013, Prime Minister Tony Abbott, announced yet another Royal Commission into trade unions, particularly the Construction, Forestry, Mining and Engineering union (CFMEU) (Liberal Party, 2014). Currently, the NSW government is reviewing legislation to curb the rising cost of defective work to property owners in particular in the residential sector of medium to high density dwellings (NSW Government and Collins QC, 2012). Regardless of the size of project, it appears that the reasons for rework have common elements, including poor management practices, financial vulnerabilities, political intervention or cultural misunderstandings. Chong (2010) states that there are “\$50 billion worth of distressed assets trapped in – and yet to work through – the banking system”. In the same article Chong states, “Michael Holm, executive chairman of

Balmain Corporation, a leading originator and manager of commercial property loans, ‘guestimates’ that Australia’s banking system has \$50bn – and possibly up to \$100bn in distressed assets to be dealt with.” This is based on industry sources indicating that costs associated with the distressed property market were only starting to filter through the process of mortgagee and receiver’s sales at the time of publication. The impact of these comments has been exacerbated by media coverage in a period of financial turmoil that has become known in Australia known as the Global Financial Crisis. In Newcastle, NSW alone there have been a number of developments that have fallen into this category. For example, Sky Central, Charlestown, has suffered extensive financial distress as reported by McCarthy (2009) and Kirkwood (2008). In this regard, McCarthy (2009a) highlighted a series of issues including substandard plumbing and electrical installations, failure to pay sub-contractors, employment of illegal workers as well as considerable time overruns. In addition, the local media has also identified a number of other distressed developments in central Newcastle and the Hunter vineyards.

Evidence suggests that remediation of distressed projects (such as those mentioned above) has developed into a buoyant sector of the construction industry. In the context of this study, distressed projects are those that become financially distressed. Control of such projects is then transferred to the financier of the project.

It was in response McCarthy’s exposure of distressed projects that the study, reported in this thesis, was initiated and was guided by the following research question:

**HOW IS IT POSSIBLE FOR PROJECTS TO BE ALLOWED TO PROGRESS TO A  
POINT OF NEARING COMPLETION WHILST CONTAINING NUMEROUS DEFECTS  
THAT WILL REQUIRE RECTIFICATION/REWORK?**

The purpose of the study is to identify the reasons why this practice has been allowed to continue un-checked. It investigates the history of the construction industry spanning 50 years. It also examines the current legislation and work practices that have been adopted to identify answers to a number of questions set out in later in this document. This study also investigates the work practices adopted on construction sites, the regulatory frameworks currently controlling the quality of construction works, as well as the remediation processes that may be required when a project has reached practical completion. The study documents the factors contributing to construction projects becoming distressed (Appendix 8). It establishes the scope of the problem as highlighted by the concerns of industry and government. It has identified reasons for the



prevalence of distressed projects in Australia. The study also explores the issue of excessive costs associated with the remediation of a specific construction project. Furthermore, this study has sought out past industry and government practices for the purpose of contextualisation and exploring some of the background to the issues. It has specifically identified references to rework and defective work to determine if past recommendations made by industry and government have been adopted or not.

It should be noted that the case studies referred to in this study were coincidentally constructed by off-shore Chinese builders. This is a relatively new phenomenon in Australia but growing non-the-less, particularly in NSW where apartment construction is proliferating. This study focuses primarily within this sector because Government and owners are increasingly concerned with the final built quality being of poor standard. NSW is the only State in Australia where a specific licence to construct above 3 storeys is not required. This has led to foreign owned companies taking advantage of this loophole and constructing apartments employing questionably qualified developers (who purport to be builders).

The primary focus of this study is to establish why building activities were allowed to proceed. Specifically excluded is an exploration of cultural differences in construction management practices in different countries. Practices like ‘lean construction’ and ‘collaborative relationships’ were not in evidence during the initial construction period but were exercised during the early rectification stages of CS1.

Mixed method principles, focussing on qualitative research have been adapted and applied to this study. Semi-structured interviews were conducted on a major case study alongside a similar project of equal size and cost. The interview data were analysed and triangulated with results obtained from three key sources, literature, on-site personnel and off-site personnel.

This thesis has six key chapters and follows the sequence graphically displayed below.



1– Introduction and outline of the study.

2- Literature Review.

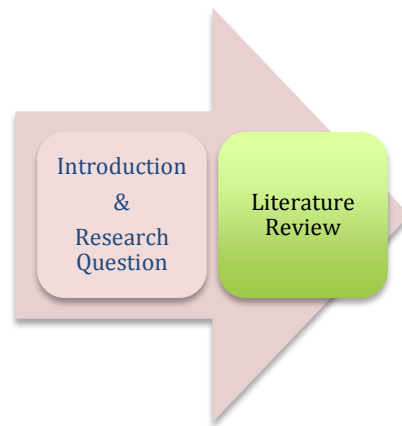
3- Research methodology.

4- Case Study Data

5- Data Analysis..

6- Conclusion & Recommendations.

## 2. Literature Review



### 2.1 Introduction – Literature Review

The Australian Bureau of Statistics' (ABS) report for 2014 indicated that residential construction, comprising single dwellings and high-density apartment buildings, makes up 4.9% of the GDP or \$75.2 billion. The Building Construction Industry (BCI) is also ranked as the highest contributor to the number of start-up companies (335,329) for 2014 yet ranked in the top ten for insolvencies at 1802 or .54% (Hansard, 2015, 01-Monash,pg 6). According to the Housing Industry Association (HIA), the residential construction industry is primarily made up of small businesses as opposed to the commercial and civil construction sector (Hansard, 2015,07). This chapter highlights the causes of rework within the BCI.

In NSW, confidence in fixed property as an investment vehicle is regularly compromised by media reports of poor workmanship, delayed completion times and defects. Not only does this constrain the construction sector, it wastes resources. The reasons for this unsatisfactory situation are diverse and include the culture of the construction industry, and a lack of skills in management and workmanship.

This literature review focuses on understanding the current situation and its precursors as well as the initiatives required to remedy these challenges. Government investigations, industry reports and academic literature as well as media sources have been consulted. This chapter commences with definitions of the term 'rework', followed by published research findings on rework, trade union involvement and government inquiries. The inquiries focus on a number of Royal Commissions as they have affected the construction industry as well as the level of acceptance and adoption of the recommendations. Construction and **certification** processes are also

examined and in particular the use of the Building Code of Australia (BCA), **legislation, sub-contractors, professionalism** and **documentation** used within the construction industry. Another consideration is the impact of the **quality** of delivery resulting from a possible lack in quality of design resulting in rework.

## 2.2 Rework Definitions

Rework can have a number of interpretations depending on the context the term is used in. Love and Edwards describe rework as an “unnecessary effort of redoing” (Love and Edwards, 2004). Others echo their observations with an interest in rework as shown in Table 1.

Authors	Definition
(Oxford University Press, 2014)	make changes to (something), especially in order to make it more up to date
(Love, Smith, & Li, 1999)	“Rework” is the term used when recently completed work on a building project has to be redone.
(Rogge et al., 2001)	activities in the field that have to be done more than once in the field or activities which remove work previously installed as part of the project
(Hwang et al., 2009)	non-conformance with requirements

**Table 1 - Definitions of Rework**

Rework may emanate from design flaws, management practices, safety breaches and/or carelessness. Rework is of particular interest to this study as recent and on-going research has demonstrated that rework has been a major cost contributor to project cost over-runs (Love, Mandal, & Li, 1999), (Burati, Farrington &, Ledbetter, 1992). Furthermore, the quality of design as a contributing factor to rework was identified by (Love, Edwards, & Smith, 2006). However it should be noted, rework, if caused by client design changes, is commonly referred to as a variation and is not considered as rework according to Fayek (Fayek, Dissanayake & Capero, 2003).

A number of studies support Fayek’s findings, with reasons offered as to why building projects have become distressed and require rework. For example, Love (1998) identified a lack of quality in workmanship as a major contributor to rework. Chan and Kumaraswamy (2008) surveyed a large number of public and private commercial builders in Hong Kong and identified four main strategies to offset rework. They are:

1. strong (site) management teams,
2. comprehensive survey of the ground conditions on site,
3. communication between all participants with roles clearly defined and

4. minimisation of variations.

Love and Edwards (2004) identified client changes, value management, ineffective use of IT and design scope freezing as four significant predictors of rework.

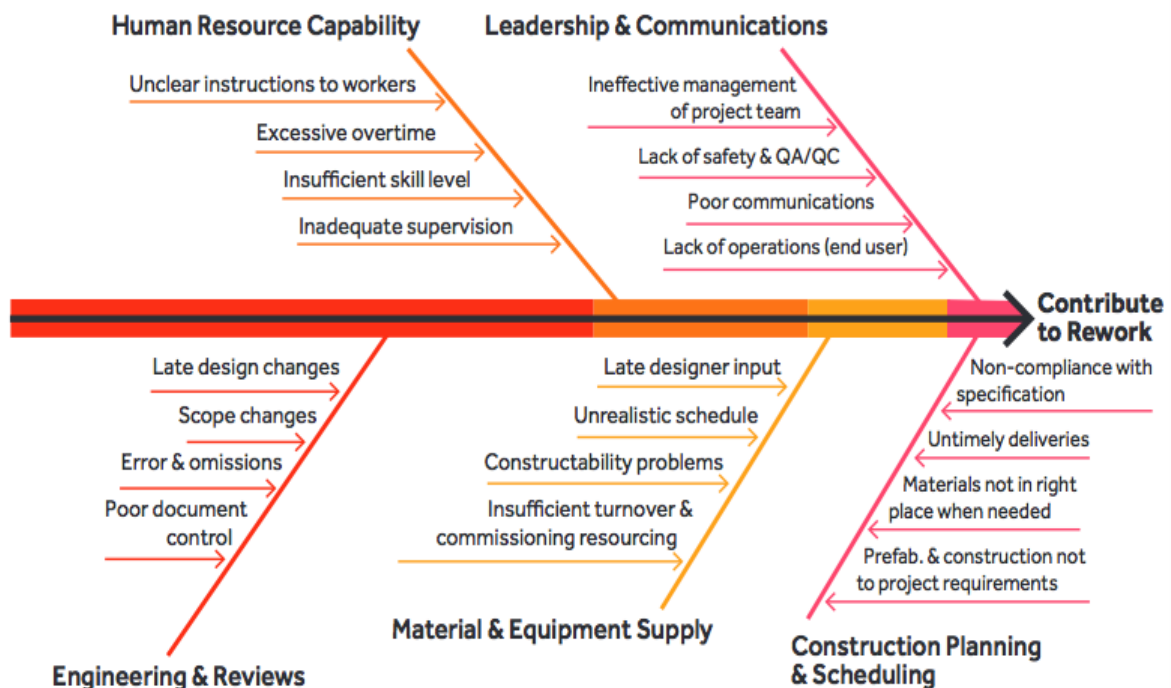


Figure 1 - Cause and Effect Diagram (Fayek et al., 2003,18)

This study explores the categories of rework identified by Fayek in Figure 1. The selected subset headings below extracted from Figure 1 are relevant to this study as they align with the research questions later documented in Appendix 7. In addition, Fayek's findings can be classified in themes. These themes are discussed throughout this thesis and are identified below in **bold text**.

1. Human resource capability **(Skilling)**
  - Skilling and supervision.
2. Leadership and Communications **(Professionalism)**
  - Site management practice
  - Quality control and assurance
3. Engineering and reviews **(Documentation)**
  - Documentation quality and control
  - Design changes

4. Material and equipment supply **(Quality)**
  - Use of pre-fabricated components
  
5. Construction planning and scheduling. **(Regulation & Culture)**
  - Non compliance
  - Building Code of Australia
  - Time management

## 2.3 Costs and Rework

Rework adds significant additional costs to a project. Love (2002), in his study of 161 construction projects in Australia concluded that regardless of project type and procurement method, the mean direct and indirect rework costs were 6.44% and 5.62% respectively (Table 2). Love also noted the influence of the organisations' managerial practices in learning and quality together with project management strategies for reducing rework costs. Love's study delved into quality control and management practices to identify if a combination of practices led but failed to link to a single contributory factor. Love found *"the analysis revealed no significant differences between cost and schedule growth on projects sampled"*

Project Type	N	Direct Rework Costs					Indirect Rework Costs				
		Mean	Standard Deviation	Standard Error	Minimum	Maximum	Mean	Standard Deviation	Standard Error	Minimum	Maximum
New build	90	6.10	7.18	0.75	0.10	35.00	5.69	7.70	0.81	0.00	50.00
Refurbishment/ Renovation	43	7.29	9.73	1.48	0.50	50.00	5.60	6.43	0.98	0.00	30.00
Fit-out	14	7.78	7.70	2.06	1.00	30.00	6.10	7.90	2.11	0.00	30.00
New build/refurbish	11	4.95	4.67	1.41	0.50	15.00	5.81	5.92	1.78	0.00	20.00
Combination of all	3	3.33	1.52	0.88	2.00	5.00	0.66	0.57	0.33	0.00	1.00
<b>TOTAL</b>	<b>161</b>	<b>6.44</b>	<b>7.78</b>	<b>0.61</b>	<b>0.10</b>	<b>50.00</b>	<b>5.62</b>	<b>7.18</b>	<b>0.56</b>	<b>0.00</b>	<b>50.00</b>

**Table 2 - Direct and Indirect Rework Costs per Project Type. (Love, 2002) p. 27**

Love (2003) emphasised that rework can result from a number of contributors and may include cost, time, quality, management practices and client involvement. Could the cultural nature of the construction industry give rise to rework?

Culture in the workplace can include ethnic differences, managerial practices as well as the involvement of trades unions. The Australian construction industry has developed from the influences of the migrant traditional builder intakes of the 1950's, 60's and 70's as well as

politically motivated trades unions (Elder, 2007). Elder (2007) graphically describes the impact unions have had during 1950's up till 1979, an impact that is still felt today.

The following section examines the early history and impact of trade union involvement on construction sites. The cultural significance is well defined by Crosby, a passionate unionist and author, he describes those across the divide as being 'enemies', "*...if we are to create unions that can survive in the environment being crafted for us by our enemies*" (Crosby, 2005,ix). These comments were made in the face of the then Howard Liberal government's stance on creating a control mechanism to curb union disruptions.

## 2.4 International Experiences

The renowned international architect, Frank Gehry's recent comment that "98% of what gets built today is \$#@t" (Dezeen, 2014) sets the tone for construction within an international context. A number of international studies on rework have been undertaken over the years with similar findings. For example, Chan, Mohan and Kumaraswamy (1969) surveyed 83 **Hong Kong** Construction projects and categorised their findings in the eight distinct groups listed below.

1. Project-related factors, covering project characteristics, variations, and communication, decision-making and ground conditions.
2. Client-related factors, including characteristics, financing, variations and payments to contractors.
3. Design Team-related factors, including experience of the team, design complexity and mistakes in documentation.
4. Contractor-related factors, including project type experience, site management, use of sub-contractors and financing.
5. Material-related factors, including shortages, changes of materials, procurement programing and Off Site Manufacture (OSM).
6. Labour-related factors, including shortages, skilling, motivation and productivity.
7. Plant & Equipment-related factors, including shortages, efficiency, breakdowns and selection.
8. External factors, including time for approvals, environmental concerns and restrictions.

In another study, Chan et al, concluded that the predominant factors that caused rework were a combination of poor site management practices and supervision compounded by extensive delays in decision-making processes as well as poor control of variations and documentation (Chan and Kumaraswamy, 2002). Similar findings by Razek, Bassioni and Mobarak (2008) in Egypt pinpointed financing of projects from failure of payment by client to contractor followed by contractor to sub-contractor, design changes and poor management practices. These were inevitably followed by disputes between clients and contractors with each blaming each other (Abd El-Razek et al., 2008). Similarly, in Malaysia inefficiencies in financial arrangements, management, labour, design and variations have been identified as causes of rework (Shariffah et al., 2014). These findings were strengthened further by independent studies undertaken by Burati, Love and Fayek (1992), discussed in Section 2.2. Identifying the causes of rework is one thing, finding a solution is another question.

Marosszeky, Thomas, Khalid, Davis and McGeorge (2002) studied the option of empowerment over enforcement as means to quell rework in construction. This means a better solution in curbing rework is not by furthering government regulations but rather by improving the process of construction by competent participants. Marosszeky et al, also determined construction planning or scheduling is by no means an accurate tool stating that *“less than 70% of tasks are completed in the week that they are planned”*(Marosszeky et al., 2002,2). This highlights that planning is not a production control but rather a project control. The significant difference between production and project control is that project site conditions are vastly different to process industries (production) as may be the case in off-site manufacture (OSM) discussed later within this thesis.

Quality is the operative paradigm in the mitigation of rework. In particular quality of management structures, design documentation, procurement processes, materials and skilled workers.



An approach that leads to quality outcomes is that of 'lean' thinking. Its central tenet is to achieve *defective free* products (Marosszeky et al., 2002,4) as exemplified by Toyota rivalling General Motors as automobile producers (Womack et al., 2007). Defect free construction can also apply to construction activities without radical change to management systems, procurement



and design options. Lean construction (LC) has been adopted across the international sphere. For example, a Canadian company, PCL Construction have embraced lean thinking in the following five key activities

Specify Value	what is important to the customer
Identify the Value Stream	all activities required for the build
Create Flow	adopting a process without idle time
Scheduling-Pull	scheduling the end result to client's expectations by Pull rather than Push, a more traditional concept.
Continuous Improvement	occurs when Flow and Pull merge towards completion

(PCL, 2016)

A company's mantra in adopting a lean process is to have a thorough understanding of their client's needs. In return structure these needs into deliverables thereby reducing rework.

For example, in the United Kingdom, the Bourton Group utilise 'Lean & Six Sigma' (Sigma, 2016) software within their organisation. "Lean Six Sigma projects comprise aspects of Lean's waste elimination and the Six Sigma focus on reducing **defects**, based on critical to quality (CTQ) characteristics" (Sigma, 2016). The pyramid illustrated in Figure 2 represents the software training. Recipients who accomplish certain levels are awarded belts, a system similar to Judo.

Kim and Park on the other hand say that whilst USA construction companies are keen to adopt Lean strategies to achieve better outcomes, the results have been rather "*nebulous*" (Kim and Park, 2006). Similarly, in Malaysia, Mohd,Aini,Nor and Mardhiah (2013) identified seven barriers between local construction companies and LC. They are

1. Managerial aspects
2. Technical aspects
3. Human attitude aspects
4. Aspects of the process of LC
5. Educational aspects
6. Government aspects and
7. Financial aspects (n.d.).

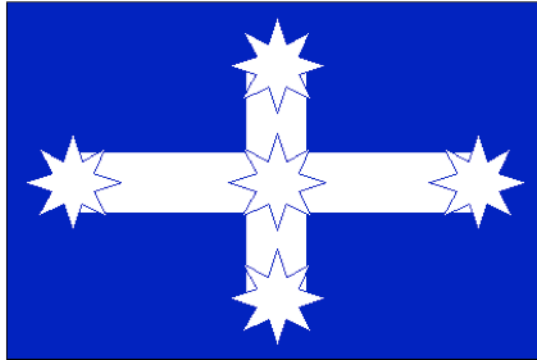
It may be concluded that LC outcomes are very similar to the findings of Chan et al in their study of Hong Builders and rework. Construction companies of sufficient size around the world embrace new methodologies and processes to reduce rework to overcome the primary element of human behaviour for LC to succeed.

From the aforementioned studies it may be argued that LC is not suited for projects that are constructed using traditional methods. But rather within a combination of traditional and OSM in the guise of a Modern Method of Construction (MMC) discussed later within this thesis.

International experiences of rework reflect similar outcomes revealed by LC. Rework is a phenomenon when systems may not be adhered to nor implemented with one of the cause roots identified as being human error.

## **2.5 Cultural Impact of Trade Unions**

The trade union movement began in Victoria with the successful campaign for the eight hour day in 1856 just after the uprisings at the Eureka Stockade. This was during a time when working hours were between 12 and 16 hours a day and the conditions in Australia were very hot compared with those in England. It was during this time that the stonemasons led a protest march through Melbourne bringing with them all the neighbouring building workers to solidify what would have been their first industrial settlement and the beginning of industrial relations (Unions NSW, n.d.). Subsequent to their success, the movement was granted a parcel of land in Melbourne and the world's first Trades Hall was erected. The Eureka Stockade of 1854 (Ausflag, n.d.) was not directly associated with the emergence of the union movement or the eight hour day. It did however have similar parallels to the early struggles of the building workers of the 1850's. The legacy of the Eureka Stockade is the flag pictured in Figure 2 and symbolises the Union's struggles. It has become the standard for the Builders Labourers Federation (BLF) and subsequently the Construction, Forestry, Mining, Engineering Union (CFMEU).



**Figure 3 - Eureka Flag (Ausflag, 2015)**

NSW has had a number of construction-related unions over the years representing all construction allied trades (Unions NSW, n.d.). With the passage of time and dwindling membership numbers, many have either ceased to exist or have merged and consolidated into single unions. Since the deregistration of the Builders Labourers Federation (BLF), the Building Workers Industrial Union of Australia (BWIU-Aus) expanded their membership by absorbing members of BLF, the crane drivers represented by the Federated Engine Drivers and Firemens Association (FEDFA) and as a result of the Cole Royal Commission (2003) formed a new union known as the Construction Forestry Mining Engineering Union (CFMEU). One of the key differences between the CFMEU and large construction companies is its political ideology. When the Communist Party of Australia (CPA) collapsed after the death of Joseph Stalin and the USSR's invasion of Hungary, the CPA denounced the Soviet Union and this created a split in the CPA in NSW. The NSW branch of the BWIU established the Socialist Party of Australia and remained supportive of the Soviet Union. Elder (2007), notes that McDonald (NSW-BWIU) said the following over the split, *"...also about serious differences in industrial tactics. These industrial differences were to surface in a big way in the 1970's"* (Elder, 2007, page 160) These words became reality for the construction industry with a concerted attack on building sites by these unions to this day.

The union movement has played an integral part in forming the culture of the construction industry in Australia today. The Cole Royal Commission recommended the establishment of one singular Union to engage with the construction industry. The CFMEU was formed to capture existing building unions like the BLF and BWIU in addition to other associated unions encompassing forestry, mining and engineering workers. This move was to improve industrial harmony on site as well as to improve the union's image (CFMEU-Nat, 2014).

Early chapters of these trade unions saw the BWIU largely as a Leninist political group with Maoist leanings (CFMEU-Vic, 2014). They were active in amalgamating a number of other unions, including, the BLF (after deregistration) and the Amalgamated Society of Carpenters and Joiners (ASC&J). However, after a number of incidents the ASC&J broke away from the BWIU and supported the conservative Democratic Labor Party (DLP). The BWIU's political interest (and not necessarily their member's interest) gave rise to unprecedented industrial unrest in the early 1970's due to Australia's involvement in Vietnam. The same period saw a marked change in union organisation and structure. Union representatives became more educated and what was once a voluntary organisation of likeminded members (true believers) became a political force having access to more funds. This change was also helped by the Australian Labour Party (ALP) when it came into power in the early 1980's

Chandler recounts this period saying,

*During the 1970's and 1980's the mayhem wreaked by the Builders Labourers Federation, the Federated Engine Driver's and Fireman's Association (Crane Drivers) and the Plumbers Union set up an industry culture where every disruption found its way into an industrial dispute based construction claim. It was easy to roll over to unions by turning to clients and pressing for a direction as to whether the client wanted their project on time or if they were up for a lengthy delay. Most clients did not have the stomach for it and ended up giving tacit approval for a deal and paying. There was no clear line of sight to cause then, and there isn't now.*

These days the CFMEU has taken over the turf once occupied by their earlier counterparts. (Chandler, 2015)

### **2.5.1 Trade union control and strength**

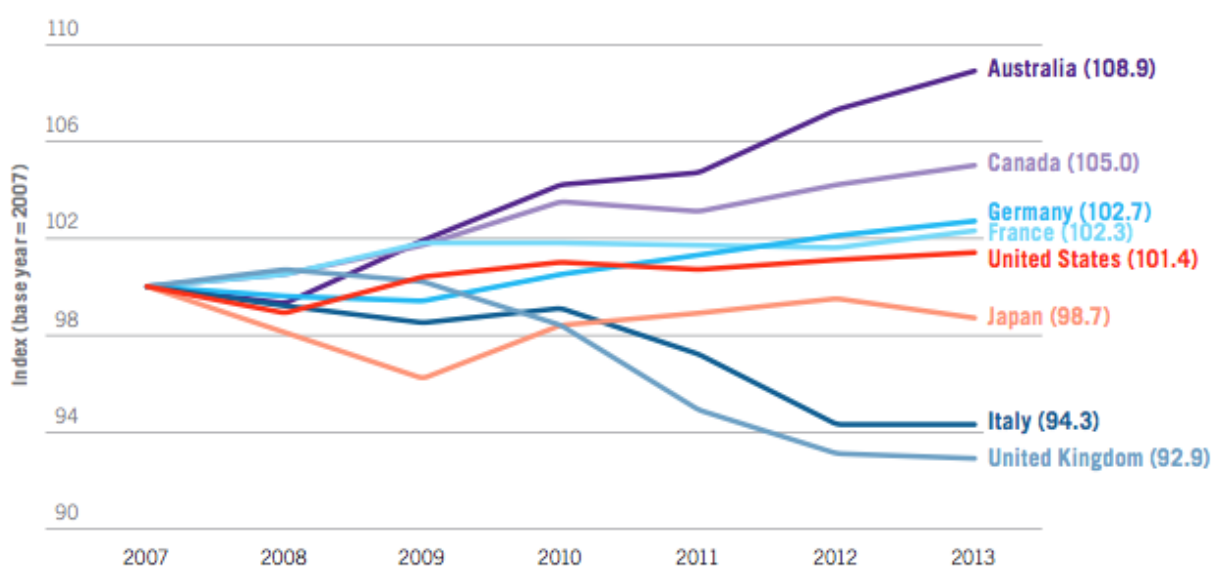
The 1980's was a period of growth, prosperity and national pride for Australia. The New Parliament House was constructed, (Fed. Government, 2014), Westmead Hospital (a ground breaking health facility) was opened and the revitalisation of Darling Harbour in Sydney was about to commence (Ferguson, 1979). In 1984, the then Premier of NSW, Neville Wran, announced the revitalisation of Darling Harbour, an area occupied by wharves and rail sidings as a facility for the people of Sydney in time for the Nation's 1988 Bi-Centenary celebrations (Feneley, 2014). The project was substantial as it included a National Maritime Museum, a shopping mall known as 'Harbourside', a convention centre, exhibitions halls, and an amusement park within an entertainment precinct. The overall management of the site was awarded to Leighton Contractors who in turn awarded separate contracts for the delivery of the buildings to different builders. What made this site unique was that, for the first time, the

CFMEU became an integral part of the site structure, having their own union compound onsite, housing all of the building trade unions associated with the project. It became evident at the Gyles Royal Commission (Gyles, 1992) into productivity that the cost of union intervention considerably raised the cost of construction but did not contribute to quality delivery. Gyles (Gyles, 2014) reported that the Sydney Convention Centre at Darling Harbour (covering an area of 32,000 m<sup>2</sup>) cost NSW tax payers \$195 million whilst a similar building in Austin USA (with a larger floor area 37,000m<sup>2</sup>) cost \$58 million. Gyles went further saying,

*The evidence showed that industrial anarchy was rampant. Restrictive work practices and demands for concessions in relation to pay and other conditions with little or no regard for awards or industrial law were negotiated with major building contractors and then ruthlessly imposed upon subcontractors and smaller contractors with the BWIU acting as enforcer. Boycotts, including secondary boycotts, were rife, with no action from the then Trade Practices Commission (nothing much seems to have changed in that respect (Gyles, 2014,1).*

Giles' comment is of concern considering it was made in 2014.

The continual push by unions to drive up wages has placed Australia at the top of the International Labour Organisation's list as having the highest wage index for developed G20 countries (Figure 4). The effect the increasing cost of construction and the lack of skilled tradespeople willing to work for wages rather than on contract has resulted in many builders risking the employment of semi-skilled or itinerant workers on Australian 457 Visa permits. The potential impact on the BCI is the use of unskilled workers to offset costs and impending rework.



Source: ILO Global Wage Database. Data accessible at: [www.ilo.org/gwr-figures](http://www.ilo.org/gwr-figures)

**Figure 4 - Average Real Wage Index for Developed G20 Countries, 2007-13 (ILO, 2014)**

## 2.5.2 Politics and Construction.

To curb these spiralling costs and industrial unrest, Cole was commissioned, by the Liberal party government to conduct a Royal Commission to investigate trade union activities specifically to improve productivity. Following the Cole Royal Commission, the Australian Building Construction Commission (ABCC) was established to curb union disruption on building sites as these disruptions were having a severe impact on the Australian economy and investors were seeking other avenues to grow their wealth (Cole, 2008). This was subsequently changed to the Fair Work Building & Construction (FWB&C) by the Labour Government when they came into office, amending the legislation to favour the union movement (FWB&C, 2014). According Hanssen:

*It will be worse under Labor, the unions support the Labor Government, of course, and their expectation of the Labor Government is they're going to back the unions. It's a natural expectation (ACCI, 2009, 81).*

The result of freeing up this industrial legislation provided a platform for union activity on all building sites not seen since prior to the Cole Royal Commission. A recent example of cultural behaviours has been the Grocon dispute where the CFMEU were fined \$1.25 million. Wallace says,

*The fines against the CFMEU, handed down today by Justice Anthony Cavanough in the Supreme Court in Melbourne, constitute some of the heaviest penalties levied against a union (Wallace, 2014,1).*

These practices were common prior to the Cole Commission and the industry braced itself for a “return to the bad old days of lawlessness” when Labor gained federal control and introduced the Fair Work Act in 2009 (Patty, 2014a).

The difficulty for the construction industry was the CFMEU’s strong support for and from the Labour government. In particular, Labour dispensed with the Australian Building and Construction Commission and replaced it with Fair Work Australia, an authority with views sympathetic to unions. Employment Minister Eric Abetz said, *"The construction industry has had an unfortunate history of corruption, illegality, thuggery and standover tactics,"* (Drill et al., 2014). This difficulty is compounded by a Senate with leftist leanings and a tendency to support submissions favouring unions (Hansard-2543, 2012).

### 2.5.3 Key Points – Construction-related unions

- K-01. are embedded into the Australian construction landscape and are here to stay.
- K-02. have been described as corrupt, bullying in nature and seeking control.
- K-03. have contributed to the rise of costs in construction.
- K-04. seek to control Work Health and Safety (WHS) and site conditions.
- K-05. are threatened by foreign workers entering Australia via 457Visas.

### 2.5.4 Questions – How do construction-related unions' activities impact on

1. rework?
2. skilling and quality?
3. workplace health and safety?

### 2.5.5 Summary-Unions

It is widely accepted that trade unions play a vital role representing their members. They lobby for their members to receive appropriate financial reward and ensure high standard workplace conditions are maintained in a safe and equitable way. This may be the case for a number of unions representing different occupations. The unions representing construction workers also undertake these tasks but the manner in which they operate to secure their end goal is questionable as evidenced by recent findings by the Heydon Royal Commission (Heydon, 2014a). The unions struggle for better economic and social outcomes can be viewed through two separate lenses. Comparing past and present CFMEU State Secretaries to Jimmy Hoffa of the Teamsters union in the USA (Russell, 2001), mainstream media portrayed Hoffa as a gangster yet his efforts resulted in the American working class being better off than their parents. The US experience has also been demonstrated in NSW through the struggles of the CFMEU and other Unions gaining similar conditions for their worker members thereby improving their livelihoods. Governments have paid appreciable sums of money to investigate union corruption as well as illegal practices by the construction industry via the ABCC and the Royal Commissions and Inquiries (Robinson, 2002). It may be said by those sympathetic to the Union's ethos of equality may be a righteous belief yet on the other side of the spectrum from an employer's viewpoint, there is only a certain amount of cash available for a project to make it viable and be in the position to employ those who are in the Union.

Fundamentally these differences are **cultural** and political in nature. Unionists fundamentally believe in the principles of equality, fairness and justice (Crosby, 2005,8). Whilst these aspirations cannot be denied, the question cost need to be considered. The unions have improved

the social standing of their workers, working conditions on site and improvements to health and safety. At the same time, they have hindered entrepreneurialism, caused builders to go bankrupt and created a culture of fear and intimidation. They are difficult to regulate. However, unions are here to stay and the industry has to negotiate a satisfactory balance between all parties. Ultimately the question has to be raised whether or not unions contribute to rework in the context of this study.

Intimidating conduct by the building unions has led to a number of government inquiries as described in the next section.

## **2.6 Government Inquiries.**

Over the decades, government inquiries have been instigated in response to the concerns of regulators, consumers and industry regarding building practices and delivery within NSW (Gyles, 2014). NSW has had a number of Royal Commissions and Inquiries into building practices concerning, quality, certification, licensing, insolvency and industrial actions. The findings from these Commissions have delivered several similar recommendations. However, government has not adopted all of them. This section considers these inquiries and the areas of concern they have identified.

The polarising nature of the BCI can be seen through a number of lenses, with each lens clearly focusing on a different end goal. It is understandably difficult to make decisions that benefit all stakeholders participating in the construction industry.

It could be said, not since the Royal Commission of the General Post Office in Sydney in 1939 has the building and construction industry functioned without controversy. It may be argued that the systems that were adopted before 1970 for the approval, delivery and quality of buildings functioned well and without controversy. However, since the early 1980's, public and government confidence in the industry to deliver quality buildings waned in the mid 1980's. The traditional role of architects as designers and supervisors began to fade (Gray and Hughes, 2009), regulations did not reflect current trends, quality assurance regimes were tried but not embraced, and skilling of workers and industrial action began to plague the industry (Elder, 2007).

NSW has seen a number of inquiries by State and Federal politicians having a direct impact on the construction industry. The Royal Commissions and Inquiries directly impacting on this study are listed in Table 3. A more detailed schedule can be found in Appendix 1.



Date	Name	Jurisdiction	Investigator
1981-1982	Royal Commission into the activities of the Australian Building Construction Employees' and Builders Labourers' Federation	Vic	Winneke
1992	Royal Commission into the productivity in the Building Industry in NSW	NSW	Gyles
2002	Joint Select Committee on Quality of Buildings	NSW	Campbell
2003	<u>Royal Commission into the Building and Construction Industry</u>	Federal	Cole
2012	Inquiry into the Construction Industry Insolvency in NSW	NSW	Collins
2013	<u>Royal Commission into the Home Insulation Program</u>	Federal	Hanger
2014	<u>Royal Commission into Trade Union Governance and Corruption</u>	Federal	Heydon
2014	Skills shortages in NSW	NSW	Legislative Assembly

**Table 3 - Gov. Inquiries (Parliament of Aust., 2014) and (NSW Parliament, n.d.)**

### **2.6.1 The Winneke and Gyles Royal Commissions into Union activities- 1982-1992**

These Royal Commissions were in response to illegal activities within the construction industry. Norm Gallagher, union boss of the now deregistered Builders Labourers Federation (BLF) was the first prominent construction union official found to be corrupt in 1981 (Hedley, 2015). This led to a series of Royal Commissions into the construction Industry. The BLF had a strong presence along the eastern seaboard of Australia and they influenced major construction sites with intimidation with compensation paid to union officials (Gyles, 2014). This was the catalyst for the then Prime Minister of Australian, Malcolm Fraser, to commission Winneke to chair an investigation into the building industry (Robinson, 2002). Norm Gallagher was found guilty of receiving secret commissions in the form of two houses and one apartment and sentenced to four month's jail.

The net outcome of the Winneke Royal Commission was to establish

*punitive measures to bring the industry under control” as well as “a programme set up within a corporatist framework”(Thompson and Tracy, 1993,67). These measures resulted “in legislative amendments requiring donations to be authorised and the prevention of officials gaining material interests or loans (Aust Government, 2014,1253).*

Following the Winneke Royal Commission in 1992, Nick Greiner, Premier of NSW commissioned Roger Gyles to conduct a Royal Commission into productivity in the Building Industry in NSW. Contrary to industry expectations and possibly due to a narrow window of inquiry, Gyles stated that he *"found no systemic corruption by unions, and criminality in the building industry was driven by some of the biggest construction companies, their subcontractors and managers"* (Gyles, 1992). Gyles was referring to the collusive practice by builders to secure Government tenders (Ray, Hornibrook and Skitmore, 1999).

Both of these Royal Commissions illustrate the difficult environment the construction industry has been facing over a number of years and the actions by construction unions. It can be argued that the CFMEU has improved working conditions on site. It can also be argued that international companies have brought with them their work practices and have also improved working conditions on site. For example, Mainline Constructions, an American company, also brought with them a civilised approach to site office accommodation not before seen on constructions sites. This included air conditioned, carpeted offices complete with office equipment and a receptionist. Prior to Mainline's arrival, a builder's office consisted of no more than an uninsulated tin shed housing an office for the site foreman whilst at the same time doubling up as a lunchroom and tool lockup. Despite the positive initiatives by Mainline to improve workplace conditions, the union was not satisfied. As has been reported,

*Building those office peaks sent Mainline Construction into liquidation in the early 1970s. While the directors blamed the militant and at times corrupt Builders' Laborers' Federation, its old boss Norm Gallagher replied uncharitably: "It couldn't have happened to a greater pack of prize bastards"* (Robinson, 2002,1).

#### **2.6.1.1 Summary: Winneke and Gyles Royal Commissions**

The Winneke Royal Commission was granted a modest sum of \$1million to investigate Norm Gallagher and the Builders Labourers Federation. Gallagher was found to be guilty and sentenced to four months in jail.

The Gyles Royal Commission was granted \$25million to expose collusive tendering practices and industrial law-breaking by unions which resulted in a task force to police the industry (Robinson, 2002).

## 2.6.2 The Campbell Inquiry investigating Quality of Buildings-2002

Bob Carr, Labour premier of NSW instigated a number of reforms. One of these reforms was based on the government's concern of building quality. Members of the building industry then pressured the NSW Government to establish a Joint Select Committee in 2002 focusing on the quality of buildings. Chaired by David Campbell, MP, the primary objective of the enquiry was to determine

*“whether there are enough checks and balances existing to ensure consumers are guaranteed that their new homes are safe, properly certified, and built to satisfactory standards”* (NSW Government, 2002, page 1).

It is worth noting that the building industry had already undergone significant change with the introduction of builder licencing in the early 1970's and the introduction of national standards for building known as the Building Code of Australia (BCA) (ABCB, 2013). Campbell (NSW Government, 2002) acknowledged the industry was not delivering work that met the expectations of the general public and his inquiry sought answers to the following seven key areas of concern:

No.	Topic	Concern
1	Building Quality and Home Building Process	Is the building industry delivering a quality product?
2	Builder Licencing and Regulation of Building Practitioners	Is the licencing system robust?
3	Building Codes and Standards	Can the building codes be improved?
4	Consumer Advice and Information	How can the public be fully informed?
5	Planning Certification and Council Issues	Is the certification process adequate?
6	Dispute Management	Can the dispute resolution system be improved?
7	Strata Schemes	What is the impact of change on strata schemes?

**Table 4 - Key concerns raised by Campbell. (NSW Government, 2002)**

The thrust of the Campbell Inquiry was to determine generally the quality of buildings. The investigation therefore delved into various checks and balances to achieve quality outcomes by way of certification and compliance processes. They also investigated the redrafting of the BCA using plain English (NSW Government, 2002). This entailed a detailed study of the Environmental Planning and Assessment Act 1979 that had been in operation until 1998; querying if any changes were necessary to tighten certification, qualifications and experience of certifiers and if sufficient regulatory power was in place to deal with non-compliant buildings. A working committee established by Campbell, examined minimum standards, in particular areas of waterproofing, and sound and thermal insulation. In addition to examining the licencing

scheme for tradesmen and builders, particular emphasis was focused on qualification, experience and conduct of building practitioners and their specific roles within the regulatory environment, dispute resolution and the effects this may have on the Home Warranty Insurance Scheme. The Committee's objectives were to assist industry and the general public in the following areas:

- Consolidate building regulatory functions within government.
- Increase accountability by industry.
- Improve consumer awareness and industry education.
- Streamline planning and certification processes.

Of note were the primary objectives and resulting recommendations of the Committee for the establishment of a "Home Building Compliance Commission". The central pillar of having a singular authority known as a Commission was to bring together the various authorities having interests and regulatory control of the BCI. The notion of a centralised "Building Commission" still echoes within Government circles and industry associations alike but unlike other States, NSW still functions under two Ministries, the Office of Fair Trading (who manage builder and trade licensing) and the Department of Planning via their responsible body, the Building Professional's Board (BPB) (who manage certifiers).

The Committee also recommended the creation of a Principal Certifying Authority (PCA) as the entity responsible for inspecting buildings to assess compliance with the BCA. They recommended that owners rather than builders engage PCAs. This recommendation was accepted. However, this occurred prior to the State Environmental Planning Policy No. 65 (SEPP65), an instrument that sets out the quality requirements for residential flat developments (NSW Government, 2011). The implications of this mean that developers are recognised as owners and hence may choose their own PCA. This is an area of concern for the present government.

Following the Campbell Report, the Department of Planning conducted a number of stakeholder meetings to determine acceptance of the recommendations of the report (Dept. of Planning NSW Govt., 2003). The Committee tabled 55 recommendations (**Appendix 2**) but the government did not accept all of them. Out of the 55 recommendations:

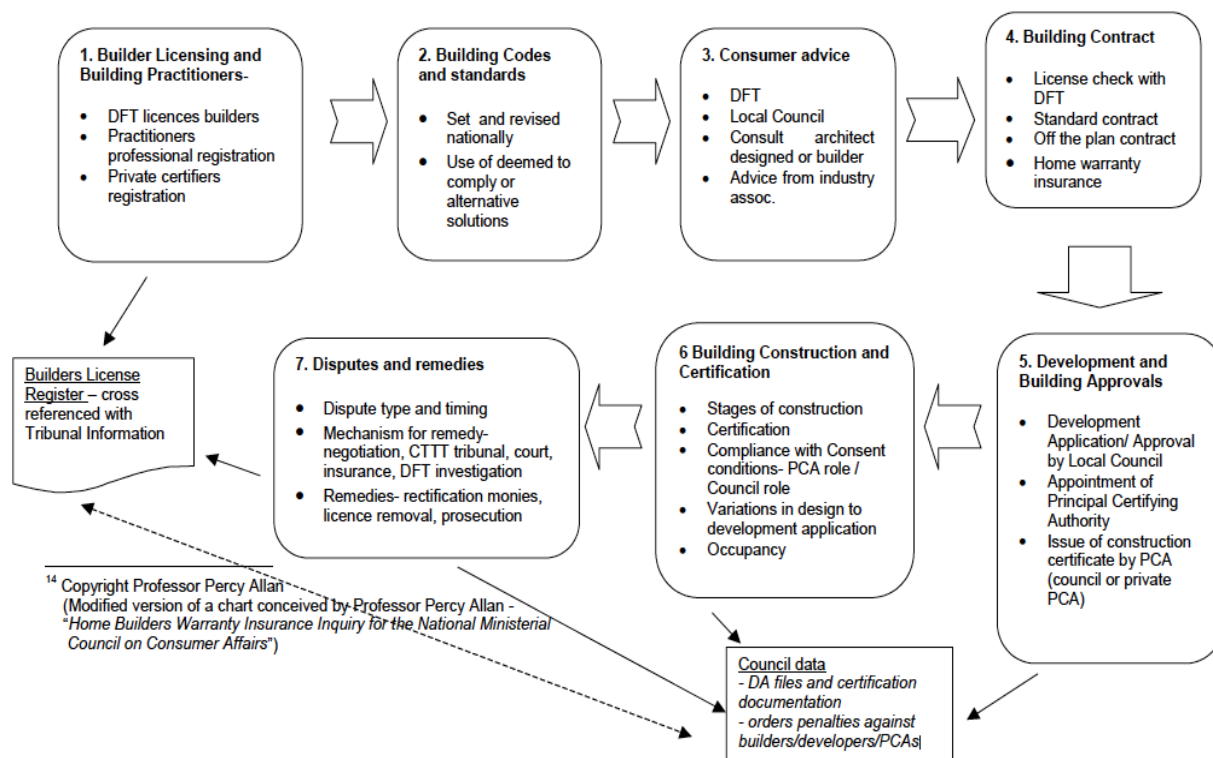
- 17 were accepted,
- 10 were not accepted,
- 4 were partially accepted and
- 4 are not relevant to this study.

The 10 recommendations that were not accepted are of particular interest to this study as they reflect the same concerns government agencies are currently investigating. These are illustrated in Table 5.

No	Recommendation	Current Impact
1	Establish a Home Building Compliance Commission	Other Commonwealth States have merged regulators under one single entity of a Building Commission. In NSW there are two ministries who control and manage building regulations thereby confusing the general public as to whom is responsible for compliance. The MBA, the industries voice in matters relating to government intervention says, <i>Master Builders advocates that an Independent Building Commission is a deserving response to the industry's contribution to the State economy. This Commission will draw together the current fragmented approach of various departments and Government agencies to deliver efficiencies and eliminate current duplication.</i> (MBA, 2006)
2	Performance audit of the commission	Not applicable because a Commission was not established.
5	Building Licence categories for low, medium & high-rise buildings.	Non-licensing of medium and high-rise builders has led to poor professional practice, insolvencies and poor quality. (NSW Government and Collins QC, 2012)
6	Assess effectiveness of current licensing.	The Gold License scheme (OFT's attempt to accredit licence holders as quality builders) has not translated as an effective tool to achieve quality. (Parker, 2007)
7	Implement Continuous Practicing Development CPD especially on BCA.	CPD was initially trailed but subsequently repealed. This will degrade the profession as trade based practitioners do not gravitate towards formalised continual training. (MBA, 2014a).
11	Investigate implementation of regulatory control of building standards in the non-residential sector.	Non-residential construction is now scrutinised in the same manner as residential work to ensure compliance with the BCA and Environmental Planning and Assessment Act.
16	To create a separate commission to establish industry skills programs.	The Government has not created a Commission to implement a skills program. The resultant has been an RTO system and privatization of the government TAFE system not providing the required skill outcomes. (Bagshaw, 2015)PM
19	BCA should be made readily available.	Only recently has the BCA been made freely available. Fourteen years has lapsed since this recommendation was made and the majority of the building industry is still not familiar with the BCA. (ABCB, 2014a)
30	Introduce a rating system for consumers to choose a builder.	A contentious suggestion which most likely would have been rejected by industry. (MBA, 2005)
33	PCA to be appointed by owner and if the owner is a developer, the PCA is to be closely monitored.	This recommendation has been an absolute failure as evidenced by the disciplinary actions against certifiers by the BPB.(Maltabarow, 2013a)3)

**Table 5 - Campbell Inquiry Recommendations**

These rejected or overlooked recommendations came under renewed review by subsequent inquiries and Royal Commissions (O'Niel, 2003).



**Figure 5 - The Regulatory System in NSW (Campbell, 2002-page 6)**

A graphic of the regulatory environment prior to Campbell's recommendations is shown in Figure 5. The current system is generally unchanged, apart from the variations outlined below (Note that the numbering of the paragraphs below corresponds with Figure 5).

	Areas of possible regulatory change	Results from recommendations
1	Builders Licensing and Practitioners.	Prior to the Campbell Inquiry the Department of Fair Trading (now OFT) regulated builders and certifiers. Subsequently the Building Professionals Board was established under a different Ministry.
2	Building Codes and Standards.	No change.
3	Consumer Advice	No change.
4	Building Contract.	No change however according to Dwyer, there is too much reliance by State Governments on using the Home Warranty Insurance (HWI) scheme as a means of satisfying consumer disquiet. The HWI has become ineffectual and regarded as not being an insurance policy (Dwyer, 2014a).
5	Development and Building Approvals.	No change
6	Building Construction and Certification	No change
7	Disputes and Remedies	The OFT are currently reassessing (Parker, 2007,14).

**Table 6 - Regulatory Reform Response-Campbell Inquiry**

### **2.6.2.1 Building Code of Australia**

According to Dempster, the BCA is a large complex document setting out codes and standards for construction (Dempster, 2014). It does not stipulate tolerances against a quality benchmark apart from relying on AS's.

As part of Labour's economic reform and de-regulation, the Hawk and Keating governments of 1983 and 1986 introduced the Building Code of Australia (Bartizan, 2012). The completed document was then introduced in 1990 and became law. Replacing the previous Ordinance 71, the BCA became known as a 'performance based' document meaning if the prescriptive method outline in Vol. 2 of the BCA was not satisfied, Vol. 1 allowed for 'Alternate Solutions' to be adopted. The complex structure of the BCA was also a concern for the Campbell Inquiry. The BCA sets out the minimum standards required for building work. Incorporating all of the requirements of Australian Standards and statutory requirements of different States into one nationally accepted document caused these concerns. The Australian Building Codes Board was reestablished with members from Government and industry. It is responsible for its content. At the time the Campbell inquiry began, the BCA had been in operation for only a short period of time. The BCA is amended annually, requiring an annual subscription in excess of \$400.00, placing it out of reach for those that are required to adhere to it. Only recently (2014) has the BCA been made freely available on-line but hard copy versions still requires payment (ABCB, 2014b). This availability was long overdue, as the Committee recognised in 2002 that the BCA was a difficult reference book to interpret and that the cost of the book placed it out of reach for many practitioners.

Standards and Tolerances (S&T) is a publication drafted by the Victorian Building Commission (VBC) in 2002 to benchmark quality standards for construction. For example, the placement of bricks and concrete was clearly defined in terms of their positioning within the horizontal and/or vertical planes (Victorian Government, 2007). The VBC needed to differentiate regulatory compliance against quality using a common trade term, 'workman like manner'. However, the expression may have lost its original meaning, possibly due to the perceived acceptance of lower quality as a result of poor skills. The expression has now been amended in the NSW Home Building Act Amendment 2014 to reflect 'fit for purpose'. The Office of Fair Trading (OFT) in NSW has also adopted the S&T. The BCA does not refer to the Standards and Tolerances publication as the BCA's function is not concerned with quality but with buildings being 'fit for purpose'. The S&T document is a guide and has no legal power within NSW, in the same manner as the 'Guide to the BCA' (Lovegrove, 2014), a publication produced by the ABCB to



assist readers to interpret the BCA, is not accepted as a defence in courts of law (Gutsa, 2014). However, the judiciary interprets the BCA as absolute when defining parameters prescribed within the code. Ultimately, the Committee's recommendation for incorporating Standards and Tolerances into the BCA has not been adopted. This anomaly has made it difficult for consumers who perceive the BCA to be the basis of quality. In contrast to manufacturing, where standards and tolerances are regarded as the norm, the construction process is the assembling on site a vast quantity of components using labour (skilled or otherwise) machinery and product. The resultant may be within a quality spectrum from high to low depending on a number of factors. These could be the calibre of the labour force, the quality of the materials and the methods used. All three factors have to align at an equal level to achieve a quality outcome. The BCA attempts to regulate design as well as quality via its specification and referencing to Australian Standards. However, it does not prescribe the skills required to undertake the said work.

The general public's perception is that the BCA governs quality and the certifier who assesses building work in accordance with the BCA is also undertaking a quality inspection. This has not been the case nor was it the intent of the legislation. The BCA has not been widely read by industry largely due to its costly subscription and opaque language. Furthermore, industry cannot rely on an individual's self-interpretation of the BCA's meanings, when a matter pertaining to the BCA is before the courts, the legal interpretation is held.

To emphasise this point, these fine lines of interpretation can also be used in a developer's favour as was the case of a tragic fire in 2012, at the Euro Terraces in Bankstown when one inhabitant lost her life. This fire could have been easily prevented had sprinklers been fitted inside the building. The BCA stipulates for any building above 25 meters, sprinklers must be installed as the fire brigade's equipment cannot reach above that height. The Euro Terraces building was 24.92 meters in height, just 80mm short of the regulation and therefore absolved from having a fire sprinkler system fitted (Philips, 2013).

Interpreting the BCA has given rise to a new profession, the BCA Consultant, a practitioner who has an understanding of the BCA but is not necessarily accredited as a PCA. Without proper interpretation, disputes and poor quality of delivery is inevitable (Banks, 2004,22) (Grennan, 2010).

### 2.6.3 Impact of the Campbell Report

The impact of the Campbell Report relevant to this study is as follows:

Ref. No.	Recommendations made by Campbell.	Enacted	Themes and Ramifications to the BCI
1	Building Licence categories for low, medium and high-rise buildings.	No	Professionalism. Unqualified builders permitted to construct multi-storey buildings, potential rework.
2	Assess effectiveness of current licensing.	No	Professionalism and Quality. There is no checking of builder's quality or performance, potential rework.
3	Implement CPD especially on BCA.	No	Skills. A number of builders have no understanding of the BCA and therefore giving rise to potential rework.
4	Investigate financial soundness of builders	Yes	Professionalism and Skills. This was only acknowledged for licensed domestic builders, not builders who construct more than three storeys. Again in the absence of sound financial control, shortcomings may give rise rework.
5	Vigorous investigation unit be established.	Yes	Quality. Only applicable to low rise residential work. Without an external and independent audit, defects may be overlooked and create an environment for rework.
6	Investigate implementation of regulatory control of building standards in the non-residential sector.	No	Quality. The BCA is sole document for building standards and does not prescribe quality. Poor quality construction often will result rework.
7	Implement powers to deal with offences by builders and certifiers.	Yes	Quality. Even though this recommendation has been enacted, few builders in the high-rise sector have been disciplined. Some certifiers have been disciplined via the BPB. If these offences relate to faulty workmanship, the resultant is rework.
8	Commission to establish industry skills programs.	No	Skills. Skill shortages are of major concern. There is a strong tendency by industry to use foreign workers on 457 Visas albeit without a satisfactory skill set. Poor delivery may require rework.
9	Commission to target high risk specialist areas for training to reduce the incidence of defective waterproofing, tiling and concrete in consultation with industry.	Partly	Skills and Quality. OFT recognize the problem with high-risk trades. Industry conducts skilling of waterproofing contractors but has not curbed the incidence of defects (Howe, n.d.). Waterproofing is still a major concern for owners' corporations on many completed projects. A main area of rework in the BCI.

10	BCA should be made readily available.	No	Skills, Quality, Professionalism & Regulations. Had the BCA been freely available the issues of compliance on major projects may have been significantly reduced. Better education and understanding by all participants of the rules and regulations will reduce compliance rework.
11	Mandatory Critical Inspections: 1.Prior to placing a footing; 2.On completion of the framework; 3.Prior to placing a reinforced concrete structure; 4.On completion of waterproofing activity; and 5.On completion of building work.	Yes	Quality. Five critical inspections are totally inadequate for a multi-storey building. The absence of proper and timely inspections or audits is a recipe for rework.
12	Site inspections conducted by PCA.	Yes	Quality. As per comments above.

**Table 7 - Twelve impacts of the Cambell Report (NSW Government, 2002).**

The Campbell Inquiry resulted in 12 direct contributions to rework (Table 7) from a total of 55 recommendations (i.e. 22%). In particular, these omissions have a direct impact in areas pertaining to **professionalism** in licencing and financial viability of a contractor, **skills, quality and regulations**.

### **2.6.3.1 Summary-Campbell Inquiry**

The Campbell Inquiry was a direct result of consumer disquiet about **quality** and **regulatory** control of building work. The result was ineffectual and the NSW construction industry is currently lobbying the current government for the introduction of a centralised building Commission encompassing all relevant bureaucracies under the control of one Ministry (Smolders et al., 2013b). The publicly perceived ambiguity between the two principal Government departments, namely the Department of Planning (incorporating the Building Professionals Board (BPB)) and the Office of Fair Trading (OFT) has caused confusion over responsible parties when a dispute arises. The lack of competencies in education and training within the construction industry and the ability for un-licenced or un-qualified builders to erect multi-storey buildings alongside certifiers of whom only 20% have been deemed qualified (Maltabarow, 2013a) has caused distrust between builders and certifiers as well as a lack of confidence by the public (Department of Planning, 2013 page 189). Another concern raised by the Campbell Inquiry was the BCA in terms of its cost, language, lack of use and knowledge of it by industry.

## 2.6.4 The Cole Royal Commission-2003

The Cole Royal Commission (Cole, 2003b) was established by Prime Minister Howard's Liberal Government to review the conduct and practices in the building and construction industry to ascertain why a major contributor to the Gross Domestic Product of Australia was compromised by rising wage costs and poor productivity. Cultural and structural reform was seen as paramount if Australia was to maintain economic growth at the time. Cole reported widespread disregard of law, unwillingness by contractors to seek legal recourse and trade unions wanting to control the building delivery process. Cole identified 26 major concerns requiring reform, all of which have implications for this study as listed in Table 6.

	<b>Findings</b>	<b>Commentary as to why these findings have had an impact on industry</b>
1	Widespread disregard of, or breach of, the enterprise bargaining provisions of the Workplace Relations Act 1996 (C'wth).	The CFMEU has a strong presence on building sites. The union pressures builders to increase the number of workers on site when not required and in particular to coerce builders to accept nominees from the union to be engaged on site. This has come to light again in the current Heyden Royal Commission (Heydon, 2014b)PM.
2	Widespread disregard of, or breach of, the freedom of association provisions of the Workplace Relations Act 1996 (C'wth).	A fundamental work right for a worker is their freedom of association and their personal right to join or not to join a union (Killoran, 2014)AM. The union sees this differently as they insist and at times enforce workers to join their respective union that is contrary to law.
3	Widespread departure from standards of occupational health and safety;	The construction industry has generally embraced safety on site as a primary function for all who are active on site.
4	Widespread requirement by head contractors for subcontractors to have union-endorsed Enterprise Bargaining Agreements (EBAs) before being permitted to commence work on major projects in State capital central business districts and major regional centres.	Major projects like Barangaroo, Olympic Park, Darling Harbour are managed by a large head contractor, (also known as a Tier 1 company) who in turn awards smaller head contracts to smaller contractors who in turn award contracts to sub-contractors. Conditions that are established at the very beginning of a project (and may be politically motivated) are pressured onto the smaller contractors who have to abide by the terms of the original agreement. This can lead to excessive site on-costs and allowed that are not normally exercised outside of a particular project. The current Heyden Royal Commission has exposed a number of these "on costs" and has been found to be illegal and a means by which unions increase their own financial base (Insurance News, 2004).
5	Widespread requirement for employees of subcontractors to become members of unions in association with their employer obtaining a union-endorsed enterprise bargaining agreement.	A strong CFMEU presence on site makes the running of a project extremely difficult. The Cole Royal Commission gave the industry some leeway from the control of the unions. However with the Rudd/Gillard Labor Government, the unions were granted more power via the "Fair Work Australia" Act thereby actions prior to the Cole Commission are again present on sites across Australia.
6	Widespread requirement to employ union-nominated persons in critical positions on building projects.	Crane drivers and safety officers are often the union representative on site. The crane driver in particular as he can stop the project at a moment's notice.

7	Widespread disregard of the terms of enterprise bargaining agreements once entered into.	Enterprise bargaining does not stop at the beginning of a project. There is constant pressure by unions to re-negotiate the terms after an EBA has been agreed. Resulting in further industrial unrest on the job site.
8	Widespread application of, and surrender to, inappropriate industrial pressure.	Building companies have succumbed to inappropriate industrial pressures at times either due to naivety of the site management or a commercial decision to keep the project moving forward.
9	Widespread use of occupational health and safety as an industrial tool.	False claims of safety breaches.
10	Widespread making of, and the receipt of, inappropriate payments.	Currently being investigated before the Heyden Royal Commission (Schneiders, 2014)AM.
11	Unlawful strikes and threats of unlawful strikes.	Spot strikes and stoppages.
12	Threatening and intimidatory conduct.	Random unannounced site visits by different unions
13	Disregard of contractual obligations.	Unions by their very industrial actions on projects jeopardise contracts between builder and sub-contractor as well as builder and client therefore threatening the livelihoods of either builder, sub-contractor or even client.
14	Disregard of National and State codes of practice.	Not all contractors are aware of a National or State Codes of Practice as not all are members of industrial or professional associations.
15	Disregard of, or breach of, the strike pay provisions of the Workplace Relations Act 1996 (C'wth).	It is not uncommon for workers to be paid whilst on strike in order to achieve industrial peace on site yet this practice is illegal.
16	Disregard of, or breach of, the right of entry provisions of the Workplace Relations Act1996 (C'wth).	The ABCC has laid down specific requirements for union entry onto building sites. However, as identified by Heyden, Union representatives still disregard the rule of law and intimidate site staff to gain entry onto building sites (Blaxendale, 2014)AM.
17	Disregard of Australian Industrial Relations Commission (AIRC) and court orders.	The union has blatantly disregarded court orders made against them (Duncley, 2014)AM.
18	Disregard by senior union officials of unlawful or inappropriate acts by inferior union officials.	Senior union officials have maintained a blind eye on their organisers on site who practice 'old-style bullying and intimidation', (this) must come to an end' Grocon spokesperson (Duncley, 2014)AM.
19	Reluctance of employers to use legal remedies available to them.	Employers are reluctant to take on unions as they simply do not have the financial backing. An exception was Daniel Grollo from Grocon who took the CFMEU to court at a great cost to himself but eventually succeeded. (ABC News, 2014)AM
20	Absence of adequate security of payment for subcontractors.	Security of Payments legislation has now been passed by Government and practiced by Industry.
21	Avoidance and evasion of taxation obligations.	Sham contracting is becoming more prevalent on sites (ABCC, 2011)AM as it has been discovered that the use of sham contracting can involve the cash economy thereby no tax is deducted.

22	Inflexibility in workplace arrangements.	First man on, last man off rule. This rule was established by the CFMEU. By it's inflexibility, it allows contractors with no skill set to bid for jobs and, if unsuccessful, allows them to remain on site, paid whilst someone else does the intended job - resulting in poor workmanship and overpayment for work done.
23	Endeavours by unions, particularly the Construction, Forestry, Mining and Energy Union (CFMEU), to regulate the industry.	The CFMEU has an agenda to control all building sites! Recently Boral's CEO Mike Kane addressed the Heyden RC saying, <i>"... the CFMEU wanted to control all the big construction sites in Melbourne's CBD and Boral was just "roadkill" in the union's war with Grocon.</i> <i>The CFMEU punished Boral by heavying its customers to stop buying its concrete products, which has forced it out of Melbourne. Boral's stand has cost it an estimated \$8 million thus far.</i> <i>"This is a criminal conspiracy to interfere in the marketplace," Kane told the royal commission.</i> <i>"It's blackmail; it's blackmail by any other definition that I've ever heard of and it's been effective" (Devine, 2014).</i>
24	Disregard of the rule of law.	The whole thrust of the Heyden Royal Commission is to expose unlawful behaviour by unions.

**Table 8 - Cole Report Findings (Cole, 2003a)**

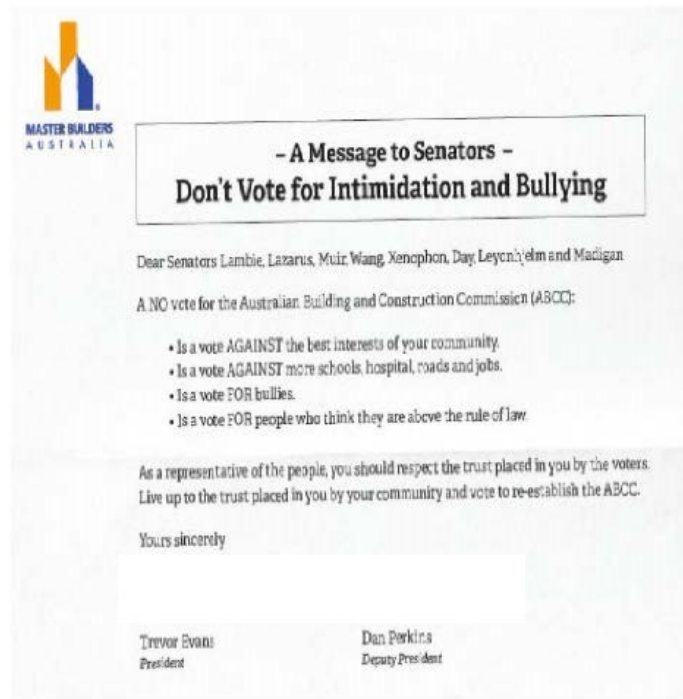
#### **2.6.4.1 Summary-Cole Royal Commission**

Cole found a conflict of **cultures** between unions and contractors that required change and policing. He recommended the establishment of the ABCC in an attempt to regulate union activities thereby improving productivity on construction sites. The ABCC is a Commonwealth authority, and the current federal government is seeking to reinstate it. However, the Senate is blocking any amendments to have the ABCC re-instated. In an advertisement in local newspapers (Heaton, 2015a), the MBA has expanded their campaign to re-instate the ABCC (Figure 6). The MBA's Chief Executive Officer Wilhelm Harnisch has been quoted as saying,

*A vote for the ABCC is a vote for more and affordable schools, hospitals, childcare centres, aged care facilities and roads. Voting against will give the construction union free rein to continue their industrial thuggery to the cost of all Australians.*

Harnisch further states,

*All the industry is asking for is that the Senate crossbench stand up for the rights of the community and not give in to the union thugs and bullies (Heaton, 2015a).*



**Figure 6 - MBA advertisement**

Cole's creation of the ABCC has increased productivity and lowered costs. Political intervention by the previous Labour Government saw the ABCC rebadged into Fair Work Australia resulting in increased union activity that has further threatened not only building companies like Grocon but manufacturing companies like Boral as well (Booker, 2014).

### **2.6.5 Collins Inquiry of Construction Insolvency-2012**

The construction industry has experienced considerable change over the past three decades. Building has become more process driven and off site manufacture (OSM) has evolved to what may be considered as the norm (Hamson and Brandon, 2004). Politically, government departments that regulate and oversee construction works have also made considerable adjustments to keep abreast of changes in the built environment. Significant skills shortages within the construction industry has led to the use of foreign workers under the 457 Visa scheme. Political groups and trades unions have criticised this scheme as it precludes local workers from job opportunities. All sectors of industry, not only the construction industry, employ workers via this scheme. Unions are concerned that these 457 Visa workers are paid below the specified industrial agreed wage rates. The unions have campaigned under the banner of "Sham Contracting" whereby sub-contractors have replaced pay as you go (PAYG) employees and bypassed unionism on construction sites (ABCC, 2011).

The Collins report “Inquiry into the Construction Industry Insolvency in NSW” provided findings (Wilkinson, 2013) which summarised below:

- 1 Monies paid to the principal contractor are forwarded to their sub-contractors.
- 2 Monies received by contractors leaked to five destinations outside of the project pyramid.

They are:

- Paying off a trail of other debts
- Paying off a bank overdraft.
- Purchasing property.
- Discretionary expenditure of a personal nature.
- Collateral development activity engaged in by the builders.

A positive result of the Collins Inquiry of 2012 has been the creation of a new trust retention scheme. The Minister for NSW Fair Trading, Mr Mason-Cox MP announced via a media release the following,

*Through our reforms NSW will become the first state to protect payments for subcontractors by requiring construction companies to hold retention money in a trust fund.... Head contractors will be responsible for holding retention money in their own accounts, and NSW Fair Trading will be checking audit reports that require head contractors to show they are keeping trust accounts as required. This will end the widespread industry practice of using subcontractors’ trust money for the head contractor’s working capital purposes. At the end of the day, this money belongs to subcontractors and it’s about time it was protected as such. This principle underpins the proposed retention trust scheme and is widely supported by industry (Mason-Cox, 2014).*

This reform may be a positive step by Government for the BCI. However, this initiative is only applicable for projects with a contract value in excess of \$20 million, leaving a large proportion of the sector unchanged.



### 2.6.5.1 Summary, Collins Inquiry

Collins highlighted the diminished **Professionalism, Culture and Documentation** on construction sites as well as capabilities and expertise, saying

*... more significant changes in culture are possible than by attempts to strongly regulate the industry. An example of an appropriate driver might be when an industry rating scheme was established to rate capability, professionalism, risk, expertise and experience. If the rating system was used by the insurance and financial services industries to differentiate premiums and the cost of funds, as well as government to award work then there would be a strong driver for organisations to improve their performance (Collins QC, 2012,261).*

The report also discussed declining standards in project **documentation** as Collins states:

*There is also the resource entitled “Getting it Right the First Time: a plan to reverse declining standards in project design documentation within the building construction industry” put together by Engineers Australia (Collins QC, 2012, 130).*

Following the Collins Inquiry, but not related to it, was the Hanger Royal Commission. This examined the ill-fated home insulation program highlighting WHS regulations and lack of skilling in the workplace.

### 2.6.6 Hanger Royal Commission into the Home Insulation Program 2013.

The Global Financial Crisis (GFC) of 2008 was a period of considerable disquiet around the developed world. Governments sought ways to curb the effects of the GFC within their own particular countries by stimulating or at the very least maintaining steady economic growth (Berg, 2014). In Australia the Rudd-Gillard Government followed other international countries and embarked on a national roof insulation roll out plan (ANAO, 2014a). The scheme attempted to create and stimulate employment whilst at the same time educating the general public about the importance of thermal insulation. Installing roof insulation at a subsidised cost of \$1,600 per home reduced the use of fossil fuels needed to produce energy for heating and cooling homes (ANAO, 2014b).

The system was flawed from the start. In the rush to have the insulation program implemented a number of problems occurred including the deaths of three young inexperienced installers (Tiffen, 2010). Negative press exposure pressured a newly elected government into setting up a Royal Commission. In his summation, the Commissioner identified a number of shortcomings

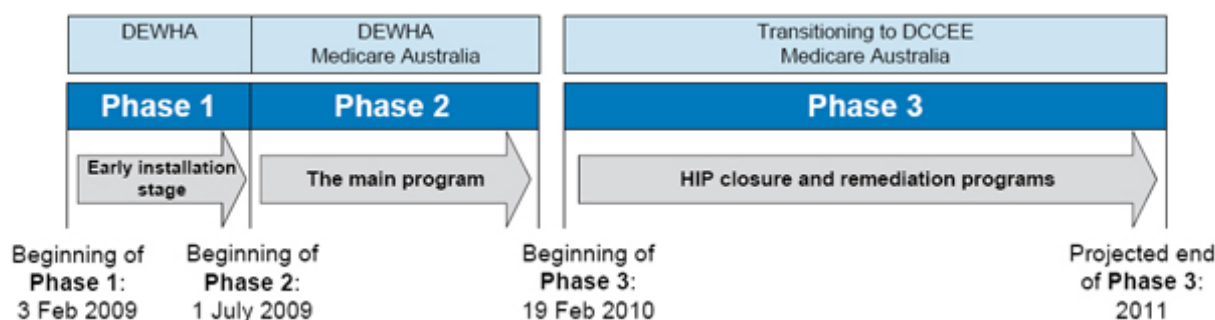
(Hanger, 2014). Of particular concern was the Australian Government's absolving itself of workplace health and safety risk by transferring the responsibility for the safety of workers to the States and Territories. The Commissioner found that approach to be erroneous in law. Hanger says, (Hanger, 2014, 229, 238, )

*The question is whether it was appropriate for the Australian Government to effectively create a market for work and encourage unskilled people to work in that market, but not ensure that there was a safety net that would protect such workers from the risk of injury at the hands of contractors or employers who did not observe their common law and statutory obligations. To rely on the State and Territory regimes to police their respective workplace health and safety laws seems to me to have been misguided, as those regimes are largely reactive (Hanger, 2014, 33).*

Furthermore, the States and Territories in taking instruction from the Australian Government were ill prepared in law via their own State regulation to cope with the influx of inexperienced installers entering the insulation market. What was found to be of greater concern was that the Australian Government was made aware of the 'likelihood' (sic) of risks to installers (Hanger, 2014 page 238). Compounding these risks, the States and Territories were faced with a large-scale program they were not prepared for. They had insufficient knowledge of the specific area of a full scale insulation program roll-out.

The Commissioner tabled the following three key findings:

1. The Australian Government failed to take responsibility of the program and transferred that responsibility to the States and Territories who were not prepared for it.
2. The Australian Government made no attempt to ascertain the regulatory framework of the States and Territories to deal with risks to personal safety and property.
3. The Australian Government wrongly regarded itself as justified in leaving the States and Territories responsible for OHS.



**Figure 7 - Home Insulation Program (ANAO, 2014b)**

The reference to Medicare in **Figure 7** is due to Medicare's administration of the Home Insulation Program on behalf of the Government.

The relevance of these findings to this study is the assumption and belief by Government that there are sufficient checks and balances by way of regulation or a Code of Conduct for the nation to engage on a large-scale project like the insulation programme. With reference to **Figure 7**, it was evident that Phase 3 included a remediation stage (which was far greater than Phase 1 and 2 combined), indicating the likelihood of poor delivery methods, which imply poor management practices, quality and a lapse in government regulation. This leads to the question of whether this belief by government is mirrored by the construction industry assuming the system currently in operation is functioning adequately (Tiffen, 2010). This may give rise to inadequacies in the current system allowing unskilled, unsafe and phoenix operators to take advantage of the opportunities presented to them.

#### **2.6.6.1 Summary Hanger Royal Commission**

The Hanger royal commission exposed serious breaches of WHS regulation requirements and auditing. It also highlighted the importance of training, whether on the job or at institutions prior to working on site. This RC highlighted breaches in **Professionalism, Culture and Quality**.

#### **2.6.7 Heydon Royal Commission into Trade Union Governance and Corruption. 2014**

The Royal Commission headed by Justice Heydon (Heydon, 2014b), sitting at the time of writing, has commenced examining all aspects of union involvement and the use of “slush funds” (see definition Appendix 8) and if they were used for political or personal gain by union members. Former leader Michael Williamson of the Health Services Union has been jailed for 7.5 years for corruption (McClymont, 2014) alongside former Labor MP Craig Thompson who was sentenced for 12 months for defrauding the Health Services Union of more than \$24,000.00. This Royal Commission also had an ex-Prime Minister defending questions relating to union corruption and internal governance. Responding to questioning, Ms Gillard said, “slush funds did not pay for her home renovations” (Chettle, 2014).

The CFMEU is currently under intense scrutiny of the Royal Commission, particularly in NSW and Victoria (Patty, 2014b). The CFMEU has been found to have links with motor-cycle gangs with the intent of creating malice within the construction industry (Olding, 2014).

Speculation about possible outcomes of this Royal Commission will post-date this study's completion. After many complaints and concerns by industry and governments, the need for an inquiry was evident. The construction industry faces many challenges and union involvement has been a major concern for industry as it has a direct effect on productivity, quality and cost impact for the built environment.

#### **2.6.7.1 Summary Heydon Royal Commission**

In summary, the Heydon RC is still in progress, though two initial reports (Heydon, 2014a) were presented to the Governor on Dec 15<sup>th</sup> 2014. The initial findings have found criminal conduct or 'wilful defiance of the law' by union officials and that fraud charges ought to be made against a number of them. The union's standard response is that the RC is undermining workers' wages and conditions as stated by Dave Noonan, CFMEU National secretary at a recent media event:

*Like previous royal commissions, the Heydon commission is politically motivated to produce outcomes to justify the introduction of anti union laws: This is clear from the prejudiced and biased findings of the royal commission that reflect the ideological bent of the Abbott government and their hatred of unions (Booker, 2014,1).*

In response, the Master Builders Association said the following

*Today the royal commission into union governance and corruption will hand down its interim report. It will almost certainly find links between organised crime and union activity. What the report will not even mention is that the most violently corrupt union in Australia receives ample support inside Federal Parliament, from both the Labor Party and the Greens.*

*The politician who has done more to defend the honour of the Construction, Forestry, Mining and Energy Union, a union which, in part, exists to protect the rights of workers but also, in part, operates outside the law, is Labor senator Doug Cameron (MBA, 2014b,1).*

It is evident the **cultural** disconnect between the CFMEU and the construction industry may remain for a considerable time and that possibilities for a harmonious working relationship between the two organisations remain only as a possibility for the future.

### 2.6.8 Elliott Inquiry into Skills Shortage in NSW. 2014

The inquiry into skills shortages (Elliott, 2014) is a direct result of the perceived absence of skilled workers available to fill the demand in a number of industries including the construction industry. The terms of reference of this inquiry was to identify gaps and areas of need within trades, professions and communities as well as to identify strategies to offset skills shortages. It was initially thought that the mining industry was absorbing all of the available skilled personnel by offering greater incentives than local councils and private operators could muster. The inquiry did not see this as a concern but the mining industry was seen to have had an advantage over other industries due to their capacity to offer higher wages. However, under the current economic outlook for commodities this is no longer the case as recent reports have indicated unemployment figures for NSW coal mining has “*fallen below 20,000 for the first time since 2010*” (Hagemann, 2015).

The effects of a skills shortage are evident in many industries, including hospitality and aviation with either the influx of foreign workers or work being moved to other countries. However, the construction industry has seen a significant change since the migration boom of the 1950's. One of the inquiry members, the Member for Clarence had this to say at the inquiry:

*One of the areas that concerned me a little bit in regard to your skilled migrant labour force that is under-employed or unemployed is that they will clearly lack experience in Australia, which is a difficult thing to achieve if no one wants to employ you. But the other thing is, and apart from having your qualifications recognised, **understanding regulations**. That is a huge issue. We are tied up in so much bureaucracy in this country that it is very difficult for someone coming from another country with qualifications and experience in another country to try to do the same thing. It is a big ask. But the starting point, in my opinion is how desperate regions are to bring in migrant labour* (Elliott, 2014,30).

These comments identify issues that are central to what is perceived as having significant implications for the construction industry. The Member for Clarence mentioned “*understanding regulations*” (Elliott, 2014,30) because of the disconnect that exists between migrant workers and the codes of this country. The reality of these comments and Australia's reliance on foreign workers is not new. When Australia federated in 1901 one of the first Acts passed was the Immigration Restriction Act (1901) (MMA, 2004). This Act would be regarded today as xenophobic, racist and discriminatory as the Act only provided settlement within Australia from Britain or Northern Europe. However, World War 2 changed sentiment in Australia as the

country required rebuilding and manpower was short, attracting a steady flow of European migrants to Australia. This influx was assisted by the then Chifley Government to embark on the ambitious Snowy Mountains Hydro-Electric Scheme. One hundred thousand people worked on that project and 121 lost their lives during construction. Due the complexity and size of the project, new Work Health and Safety issues were tried and it was said at the time,

*Safer and cheaper construction techniques were created and the project set new standards in occupational health and safety (NSW Migrant Heritage Centre, 2011, building the 'Snowy').*

As well as setting new safety standards, the Snowy Mountains Hydro-Electric Scheme was also instrumental in defining Australia's culture that all men are equal, as the flowing quote illustrates:

*Following initial problems between Polish and German workers at East Camp in Cooma, all nationalities were mixed in together and this erased nationalistic tensions. At Wambook, Walter Hartwig, the German engineer who recruited most of the tradesmen there, was called in to settle a conflict between Germans and Poles. He brought the two groups together and spelt it out in straight terms. **We are all new Australians... This is an honourable title which is not to be abused. The nonsense of Europe has no place here** (NSW Migrant Heritage Centre, 2011, building the 'Snowy').*

The success of the Snowy scheme attracted many ethnic groups specialising in particular trades e.g. Italian migrants were renowned for their skill in concrete structures evidenced by the likes of major companies, Grollo (Grollo Group, 2014), DeMartin and Gasparini and A&G Formwork (A&G, 2014) and English migrants, who were renowned for their masonry skills. The unions, and in particular the Amalgamated Society of Carpenters and Joiners (who were considered as a moderate union without any leftish ideology) played a pivotal role in assessing the trade credentials of migrants before they were allowed to join that union. Membership effectively gave them a 'ticket' to practice in this country. As Evans explains,

*From the H R Nicholls Society's point of view the most important thing on the building sites is the notice prominently displayed at the site entrance. Usually bearing the building company's logo they proclaim 'No Ticket---No Start'. These notices constitute a triumphant assertion of trade union power and privilege (Evans, 1989,vol16).*

Today Australia is truly multicultural and migration has not ceased. What has ceased is the basic skills assessment for workers entering the construction industry. TAFE NSW has been tasked to up-skill workers wanting to participate in the construction industry and these also include new migrants contributing to the National need (TAFE, 2015). Federal government has also allowed

a number of Registered Training Organisations (RTO) to assist with the education process and these organisations include industry bodies such as the Master Builders Association (Yu and Oliver, 2015).

The MBA of NSW has recently argued that the use of migrant workers on 457 Visas has not been abused, contrary to the views of Labour politicians. These politicians, who have ties with trades unions (White and Johnston, 2015), have made statements to say the 457 Visas have been abused by industry (CFMEU, 2014). On the other hand, Wilhem Harnish, CEO of the MBA Australia, has made the following statement...

*There is only a small number documented cases where rogue employers have been caught abusing 457 visas, which shows the current system is working. Simply citing anecdotal cases of alleged abuses does not prove the current system is failing. "Master Builders calls for a rational discussion between government and industry rather than Government making decisions on the run (MBA, 2014c).*

The Elliott enquiry ultimately made 22 recommendations from their 6 findings as per Table 9.

	<b>Findings</b>	<b>Recommendations</b>
1	Current skills shortage is not caused by mining.	<b>3</b> Skills auditing across all Govt. agencies. <b>4</b> Establishment of regional research centres.
2	Skilled migration is welcomed by all stakeholders.	<b>5</b> Commonwealth Government to align migration with skill shortages. <b>6</b> Regional Development Australia (RDA) to adopt information sharing amongst all States. <b>7</b> RDA to be more regionally responsive. <b>8</b> Granting of student working visas. <b>9</b> Work experience programs for migrant workers. <b>10</b> Adoption of an International Apprenticeship scheme.
3	Regional training is an effective way to retain skilled people in regional areas.	No recommendation was made
4	TAFE is the backbone of vocational training and requires appropriate financial assistance.	<b>11</b> Work readiness program for school leavers. <b>12</b> Mathematics ought to be compulsory for HSC students. <b>13</b> Revue of work ready subjects for schools. <b>14</b> Programs to assist students towards work readiness goals. <b>15</b> Revue careers advice given at schools. <b>16</b> Regionally based training to be maximised. <b>17</b> Marketing trade apprenticeships to improve attractiveness. <b>18</b> Provide incentives for apprentices to complete training. <b>19</b> Assist regional employers and apprentices. <b>20</b> Competency based apprenticeship training. <b>21</b> Recognised Prior Learning (RPL) to be given advanced standing for university entrance. <b>22</b> TAFE to develop a formal mentoring program. <b>23</b> Business succession planning and skills transfer from retired

		workers.
5	Communities that embrace new residents and market their regions commercial and cultural strengths are reporting success.	No recommendation was made.
6	Changes to the Regional Relocation Grant are consistent with the need to attract workers.	<b>24</b> To provide greater cultural and social support to skilled migrants relocating to regional areas.

**Table 9 - Elliott Inquiry Findings**

#### **24.1.1.1 Summary-Elliott Inquiry**

The Elliott inquiry stemmed from public concern that the mining industry was attracting and employing a large proportion of Australia's workforce by enticing workers with attractive salaries and the adventure of working in remote parts of the country. This phenomenon created a new industry, one that caters for 'Fly-In, Fly-Out' workers. These workers commute from across the country rotationally working then returning home for an agreed period of time. This became a concern for local councils who could not attract plant operators as they could not match the salaries given by mining companies. This concern was echoed by the construction industry that also requires plant operators, riggers and labourers. Elliot's findings did not confirm the public concern that mining was "*the sole cause of skill shortages*" (Elliott, 2014,x). It did, however, recognise the need for skilled migration, and settling them into regional areas. It also recognised and recommended the importance that schools and TAFE played in educating and promoting apprenticeship-based trade skills.

#### **24.1.2 Key Points – Government Inquiries**

The key points raised by Government Inquiries have been categorised in various themes. These are depicted in bold text below and are discussed further throughout this thesis.

- K-01.     **Culture**, (Winneke, Gyles, Cole and Heydon Inquiries)
- Building trade unions have been ordered to restructure and conform to law.
  - The ABCC was established to oversee workplace reform.
  - The ABCC has been politically replaced by Fair Work Australia.
- K-02.     **Professionalism** (Gyles, Collins and Hanger Inquiries)



- Security of Payments Act was introduced throughout Australia to protect sub-contractors.
  - Insolvencies within the construction industry is concerning.
  - Improvement of the licensing system.
  - Industry to adopt an ethical Code of Conduct.
- K-03.     **Quality** (Campbell and Hanger Inquiries)
- Compliance regulations were enshrined into the BCA.
  - Standards and Tolerances pertaining to quality have been overlooked.
  - The need for proper training and WHS compliance on the work site.
- K-04.     **Regulation** (Campbell Inquiry and NSW Home Building Amendment Act)
- Licencing for commercial builders and works above three storeys have been overlooked in NSW.
- K-05.     **Skilling** (Elliott and Hanger Inquiries)
- Wide spread use of unskilled labour and poor quality outcomes.
  - The 457visa scheme may be subject to abuse.
  - Skills shortage in NSW remains a concern for Industry and Government alike.
  - Education is the key to promote quality.
- K-06.     **Documentation** (Collins Inquiry)
- K-01.     Improvement and accountability by those who prepare the documentation so that they are adequate for construction purposes.

### 24.1.3 Questions – Government Inquiries

- Q-01.     **Culture:** Has the presence of the trade union involvement affected productivity?
- Q-02.     **Professionalism:** Has the industry lost a sense of professionalism?
- Q-03.     **Quality:** Can quality be regulated by auditing?
- Q-04.     **Regulation:** Should all builders be licenced?
- Q-05.     **Skilling:** How will the BCI cope with changing employment trends?
- Q-06.     **Documentation:** Is documentation adequate for construction?

## 24.2 Government Policies

*One thing you hope for, with politicians, is that they won't make the same mistake over and over again. (Goldacre, 2014,174)*

The ultimate goal of having Royal Commissions and Inquiries is to uncover facts and understandings of past events to effect change through evidenced-based policies. What is evident from the aforementioned inquiries is the reluctance by government of either political persuasion to enact a number of recommendations into policies. The Oxford dictionary defines policy as “*a course or principle of action adopted or proposed by an organisation or individual*” (Oxford University Press, 2014). It goes further to say “*a set of ideas or a plan of what to do in particular situations that has been agreed officially by a group of people, a business organisation, a government, or political party*”. Foxell and Cooper say

*The built environment represents a significant part of any nation's wealth, culturally as well as financially, and needs to be cared for, updated and expanded if that value is to be maintained and harnessed. As a result, built environment policies will always form a significant part of any government's plan of action across its many spheres of interest, including industrial, energy and cultural policy areas, but also in social, employment, environmental, health and education sectors (Foxell and Cooper, 2015,400).*

Mumford, a self-confessed public servant has a similar viewpoint when he states,

*I take a pragmatic approach: regulatory regimes are deemed to fail when the promises that were initially made when the regime was put in place are not met and, as a consequence, Parliament decides there are sufficient grounds to replace the existing regime with a new one*

In effect, Mumford directly attributes the ‘leaky building crisis’ (Mumford, 2011,7) in New Zealand as a direct result of poor policy adopted by the NZ Government. It may be argued that NSW may have been facing similar issues to those experienced in New Zealand. At a presentation for NSW Government's Trade and Investment branch, Chandler used the word ‘systemic’ when describing policy decisions in NSW as indicated on Figure 8 (Chandler, 2014).

## BAU IS HURTING CONSTRUCTION

- The quality of constructed work is mixed with non-conforming work either overlooked or compromised,
- Systemic weaknesses in the process of building certification, and
- Construction's failure to foster a domestic off-site industry as a specific response to improving productivity and innovation.

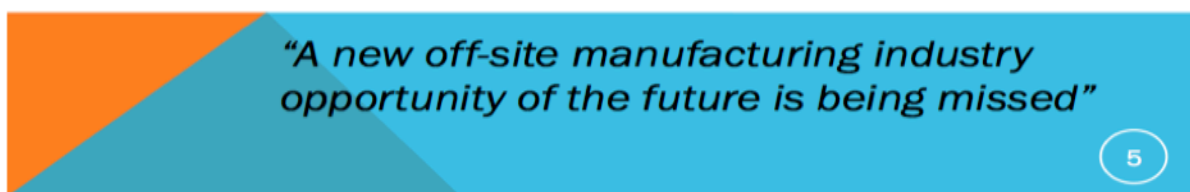
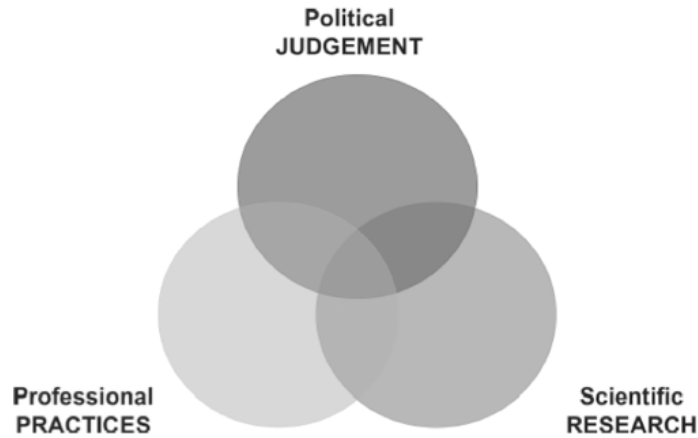


Figure 8 - BAU is hurting construction

Chandler's presentation was centred on the use off-site manufacture (OSM) to improve productivity. OSM is often termed 'Off Shore Manufacture' as a considerable amount of material being used today has been sourced overseas. Chandler uses terms like "*quality, non-conforming, overlooked and compromised*" in Figure 8 to highlight factors he argues contribute to a systemic weakness of building certification processes. Compounding this is the concern expressed by some members of the public about the manner in which policies are adopted. Michel, responding to Government actions regarding a proposed development, stated that volunteers (the local community) are the losers whilst bureaucrats remain the same even after departmental name changes, consultants are deadpan and politicians are evasive (Michel, 2015). It could be argued that policy makers should curb politically motivated policy and replace these with evidence-based policy as a transparent way of consulting relevant stakeholders and treating all submissions fairly.

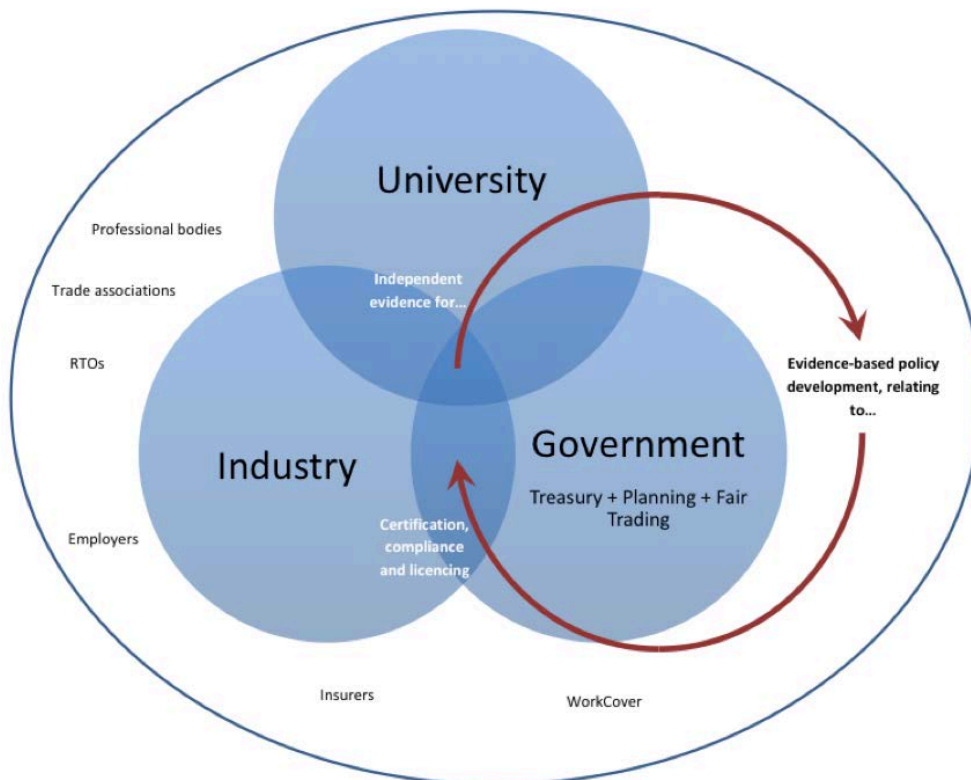
### 24.2.1 Evidenced Based Policy

Head presents three lenses through which policy may be viewed (Figure 9). These are the government's or bureaucratic reactionary response to a dilemma (political know-how), the professional bodies (practical and professional field expertise) that may be affected by policy change and the academic rigour (rigorous and systemic research) of collating evidence.



**Figure 9 - Three Lenses of Knowledge and Evidence (Head, 2007,6).**

This model may be refined specifically for NSW as demonstrated in Figure 10 emphasising the dual role of universities working in tandem with industry to resolve key policy issues for final deliberation by government. By doing so, all relevant stakeholders in NSW would have an opportunity to make submissions, and universities would have a role in analysing and reporting to government of their findings.



**Figure 10 - Evidence-based policy development 11.**

Head continues that “*the rise of ‘evidence-based’ orientation within government agencies*” is “*consistent with the public sector’s increased interest in efficiency and effectiveness*” (Head, 2007,2). This suggests that bureaucrats and the public service could favour the adaptation of evidence-based policy in line with industry and academia as illustrated in Figure 10.

### **24.2.2 The Need for Regulatory Change**

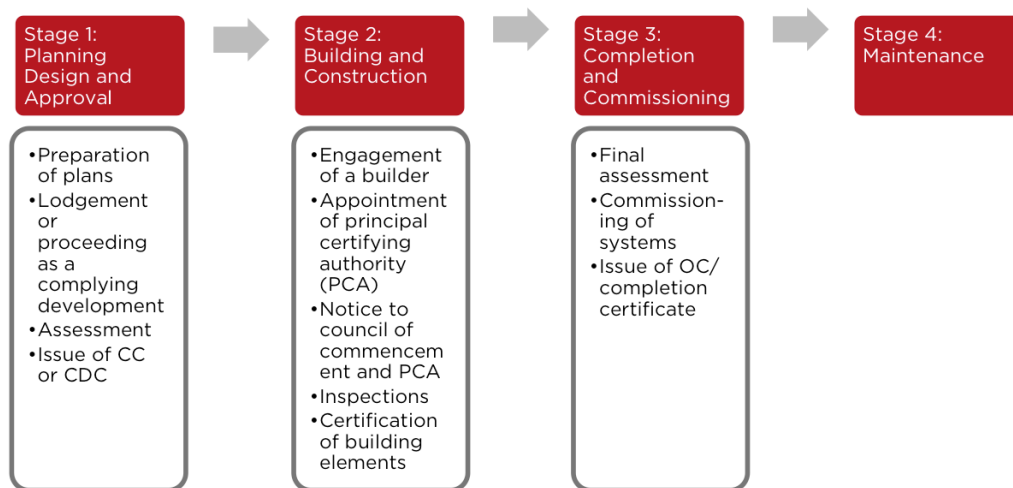
Government inquiries have focused on policy development and implementation within the BCI nation-wide yet gaps are still appearing state-wide. Recent reporting by home owner Steven Balfour publically stated “*The system of administration governing the Victorian building industry is not working and there is urgent need for reform from the top down*” (Johanson, 2015). In NSW, the BPB has released a discussion paper by former Treasury Secretary Michael Lambert acknowledging concerns within the BCI to “*examine certification and its application in the wider building industry*” (BPB-NSW Gov., 2015).

This document identifies the following needs:

1. To assess the validity and efficacy of the current Act
2. To examine building and subdivision certification and its application in the wider building industry
3. To make recommendations for reform.

Lambert identified the following four groups for further investigation

- Governance structure of building regulation and certification. The current governance system is fragmented as it has a number of bureaucratic agencies working independently for one another leaving the community and industry confused. The recommendation is to consolidate these entities under one governing structure, possibly a commission, as is the case in other States.
- Use of e-technology to improve access to information, processing of transactions and management of systems. Standardisation of forms and processes on-line demonstrated in Figure 11.



**Figure 11 - Building Regulation & Certification Process (Lambert, 2015) 33.**

- Supply, accreditation, accountability and oversight of certifiers. Production of a practice guide wherein the inspection process can be defined and apportioned to correct professional bodies appropriately trained to undertake these required inspections. Improvement in the availability of education and accreditation thereby providing a career pathway for certifiers.
- Resourcing and funding arrangements for the building regulation and certification system. The system is currently funded by the taxpayer and is not functioning effectively. A recommendation is to charge a levy at Development Application (DA) stage and have the public subscribe to the certification process.

At the time of writing, Lambert, via the BPB has been addressing these issues at public forums seeking input from stakeholders and identifying aspects of the regulatory system that may diminish its effectiveness (Lambert, 2015).

#### **24.2.2.1 Summary – The Need for Regulatory Change**

It is evident that the building regulatory system is in need of reform. The BPB has recognised this and is currently gathering stakeholder feedback to effect changes. The results will not be known by the time this thesis is submitted. Any improvements to the current system could only be advantageous for the BCI.

## 24.3 Quality Assurance

The BCA as discussed in section 2.6.2.1 is a national document to achieve four primary goals,

- *provide a rigorously tested rationale for regulation;*
- *net benefits to society greater than costs;*
- *regulation should be no more restrictive than necessary for the public interest;*
- *no regulatory or non-regulatory alternative that would generate higher net benefits (ABCB, 2013,8).*

There is no reference to quality. Its main objective is compliance to a minimum standard. Unlike its counterpart used in the United Kingdom, BS 8000, this document is voluminous in size and does encompass quality, as illustrated below

*BS 8000 is a series of standards describing the execution of works for a range of construction activities. They are issued to fill a gap in the authoritative information that is available to those specifying and assisting in the description of processes to ensure better construction **quality**. The various parts of BS 8000 draw content from, and relate to, other relevant British Standards and codes (BSI, 2015,1).*

The tools available for quality delivery are the S&T guide or the use of Natspec (Natspec, 2015) but the use of these documents is not mandatory.

The Project Management Institute's (PMI) guide 'A Guide to the Project Management Book of Knowledge' (PMBOK) (Project Management Institute, 2013, 556) defines Quality as "*The degree to which a set of inherent characteristics fulfils requirements*". The guide further defines a quality control plan and a quality management system in each case highlighting the structures, frameworks, policies, procedures and resources required to maintain a quality standard during the course of construction. To adhere to a quality standard, ISO 9001-2008 Quality Management System (SAI-Global, 2014) was implemented to define work sequences to reduce the incidence of rework. By implementing this system, an organisation will have,

A Quality Control System

Regular audits of the system

Implement effective measures for correction and prevention

Management reviews and

Maintaining the system updated.

Love and Irani's (2003) comment about quality costing information systems associated with rework as follows "...rework...(is) often considered as a quality failure" (Love and Irani, 2003,659). This statement highlights the need for a quality control system to be adopted. The adoption of ISO9000 was a product of a fundamental shift that started in the mid 1980's. The control of a project slowly moved away from architects to builders. Government contracts would only be let to contractors who had a quality assurance scheme in place and were audited by a recognised external body. However, over time only the major Tier 1 and 2 companies could retain this system. Tier 1 companies include multinational construction companies like Leighton and Lend Lease, whilst Tier 2 companies may be regarded as national companies. These companies have the size and cash flow required to maintain QA and other systems in place so that they are in the position to tender for large institutional and government contracts. Tier 3 companies are usually smaller building firms undertaking contracts in the vicinity of \$1-\$20m and do not have a large office support base. They are generally unable to maintain systems normally required for larger projects (Patterson Building Group, 2012). This issue of poor QA systems still remains within the industry today and is of particular concern to purchasers of apartments as opposed to commercial buildings (Smolders, Whittaker, Bulmer & Sher, 2013a).

The residential construction sector has been the subject of a number of inquiries as previously discussed (in particular the Campbell Inquiry). To alleviate some of the concerns raised by government and industry alike, consistent lobbying by the Master Builders Association and the Australian Institute of Building have continued since the introduction of licencing during the 1960's. With the proliferation of apartments initiated by developers, in particular in the greater western area of Sydney, the public's negative perception of built quality has been supported by government inquiries. Government findings clearly indicate that the residential apartment market lacks quality and scrutiny by the authorities.

In the report "Governing the Compact City", (Easthope et al., 2012), UNSW highlighted fifteen general defects. The first three key areas of concern were

1. 42% of defects emanating from internal water leaks,
2. 42% of defects emanating from cracking of internal walls,
3. 40% of defects emanating from water penetration from outside of buildings.

The remainder stemming from faulty services, finishes, balustrading, noise and equipment (Easthope et al., 2012).



The report identifies four key stumbling blocks that Owners Corporations (OC) experience when arranging for defects to be remedied. They are:

1. Whether the developer/builder is in control of the scheme,
2. Whether or not the builder is operating,
3. Whether the OC are awaiting a claim or
4. Whether legal actions are yet to be finalised.

Over the past ten years the number of inexperienced developers has proliferated (Manning, 2004). It would seem that there are few barriers to entering the property development market. One reason for this increase in NSW is that there is no government legislation requiring builders undertaking high-rise or commercial construction to be licensed, with the exception of apartment buildings (Department of Fair Trading, n.d.).

Real estate agents are inundated with properties they cannot sell for reasons of defective work or non-compliant works. Furthermore banks are imposing more pre-sale constraints on developers prior to releasing funds (Alex, 2011). Builders with little or no industry experience are entering the market place in the belief that they can make substantial profits (Manning, 2004). However, the skills required to successfully undertake major projects are simply not available (Franklin Matthew, 2010). The decline in apprenticeship numbers has increased the challenges site managers face to deliver quality products.

Quality delivery requires more than up-skilled trades. It also requires good supervision. Project delivery has evolved with builders changing their role from being an active participant to one of management. Builders, particularly in the medium to high residential market, generally have QA auditing systems in place (Watpac, 2015) but this does not seem to be case for many other builders as highlighted by Easthope (2012). With subtle changes over time, it could be said that builders of today have lost some of the traditional skill sets required for quality delivery and inspection and that there has been an over reliance on certifiers to ensure this outcome. Certification is not quality inspection. Therefore, the role of the PCA comes into question as it is their responsibility only to ensure compliance with the consent given at the DA stage. They also need to ensure that the work undertaken is in accordance with the BCA the Environmental Planning and Assessment Act (NSW Govt., 2011) and the relevant documentation for the project. The PCA, by law, is required to collate certificates from builders who in turn collate same from sub-contractors to state that all work completed and installed by that sub-contractor complies with AS and the BCA. If the sub-contractor is not available to comply, the principal

contractor or the builder may complete the form on the sub-contractor's behalf except for specialist service trades like electrical, hydraulics, mechanical (MVAC) and fire. This is not a satisfactory system as it allows for defective work to slip through the system either intentionally or unintentionally.

#### **24.3.1 Key Points-Quality assurance**

- K-01. ISO 9001 introduced as a means to audit quality standards.
- K-02. ISO 9001 has been adopted by larger companies for major projects. i.e. government contracts.
- K-03. Smaller companies cannot afford to maintain ISO9001 protocols.
- K-04. Rework can be considered as a quality failure.
- K-05. Larger companies are able to adopt QA practice, whereas smaller companies could find it more challenging.
- K-06. Supervision plays a key role in quality outcomes.
- K-07. Certification practices require auditing.

#### **24.3.2 Questions Quality Assurance**

- Q-01. Was rework a result from the lack of quality assurance auditing?

#### **24.3.3 Summary Quality Assurance**

The purchasers of new homes or investment properties expect to receive a quality product. How they are assured that this will be the case is an issue. The public perception is that certifiers not only verify that construction work complies with regulations; they inspect the quality of construction work as well. This is to some degree correct but when a certifier's task of compliance control (not quality) is tested in court, magistrates and judges may not have a full understanding of construction methodology. In such cases they rely solely on the documentation provided to them. They attach considerable importance to the BCA, with the result that the question of quality and regulation becomes clouded by subjectivity. There is no regulatory instrument that defines quality in construction apart from the S&T guide. Therefore, quality, especially the interpretation of delivering an acceptable standard of work, ultimately becomes a standard adopted by contractors who have in place a system whereby they can independently audit their quality of work via a known standard, ISO9000. The concern however is when work has been undertaken by unskilled workers and certified by those who do not have the skill set or professional acumen to be able to assess QA.

## 24.4 Sub-Contractors

A contributing factor to quality assurance has been the emergence of sub-contractors. Building delivery has changed dramatically over the past 30 years. The well-established builders of the past often employed core trades of carpenters, joiners and bricklayers. The industry then (post WW2) had a healthy apprenticeship system in place. With the change of delivery practices to project management systems introduced in the 70's and 80's, greater reliance was placed on sub-contractors as opposed to the traditional 'old school' builder. As Chivers states,

*They are 'old school'. Old school means anything from an earlier era and it's looked upon with high regard or respect. These days it seems almost old fashioned to be able to pick up the phone and speak directly to your builder - the bloke who makes the decisions - especially when you are dealing with medium to large project home builders. There's usually layer upon layer of management levels to sift through before getting the information you need. With one large multinational builder I've dealt with, it took them two months to get the paperwork into their systems before we saw any start on the site. (Chivers, 2015,1)*

Sub-Contracting was a direct result to 'corporate engineered structural changes' according to Mayhew and Quinlan. This system was introduced as a means to outsource labour flexibility thereby delivering outputs to customers more cheaply. They say,

*Output-based payment encourages quicker completion times. Products may be delivered to customers more cheaply and quickly... although there may be adverse effects on quality. (Mayhew and Quinlan, 1997,192)*

Marosszeky also recognised this change in the mid 90's, when he stated, "Since consultant fees were deregulated more than 15 years ago, design consultants have been operating in a superficial, price-based market" (Marosszeky, 1996,1). This superficial price-based market has been recognised as a product of the proliferation of sub-contracting practices due to competition and in particular the residential housing market. Marosszeky argues that QA has evaporated, saying,

*The fundamental change of the last decade (1980's) has been the recognition that service providers at the corporate and individual levels must unambiguously be responsible for delivering quality services. This is a change from the previous regime of supervision by the client and within the supplier organisation (the builder). (Marosszeky, 1996,1).*

These insights paint a striking resemblance to the issues faced by industry today,

- **Professionalism** - The building process has changed from insular on-site implementation, supervision and management to specialist off-site management practices.
- **Documentation** - Fully documented plans and specifications have been reduced to documentation targeted for compliance rather than construction.
- **Quality** - An over reliance by sub-contractors and lack of supervisory skill sets have led to poor QA standards compounded by a questionable certification process.

Marosszeky' concluding comments on government, that the "*Policy arm and government client organisations must work together*", still holds firm today. Industry groups and associations continue to lobby government for change.

With the emergence of sub-contractors came the loss of the 'Clerk of Works' (CoW). A CoW can be described as a person with a trade background who completed a CoW course from a technical college (pre-cursor to TAFE). A CoW was regarded as the eyes and ears of the architect or client who at the time was responsible for the **quality** delivery of a building. A CoW had discretionary powers when it came to quality of works. One of their primary roles was to give notice to a builder if defective work was identified. If that work was not rectified, the CoW would block payment to the contractor until such time the work was fully completed to a satisfactory standard. These standards were **fully documented** on the plans and specifications for the project. A glimpse into the life of the CoW can be derived from a thesis written by Russell, who states,

*After 2 years in the drawing office I was posted to the large project for New Abattoirs at Homebush Bay, as assistant to Mr. J. Parle the Architect supervising the work, Roy Mandleson was the Clerk of Works. We had a 2 room site office and walked to the site from Flemington Station each day - a distance of about a couple of miles. My duties were the preparation of construction details under Mr. Parle's guidance; the preparation of monthly quantities for assessing the progress payments; and certain supervision duties as assistance to the Clerk of Works. These 2 years on site gave me a wider experience than would normally be the case. (Russell, 1980,238)*

Some countries like Britain still retain the services of a CoW (UK Government., 2012) whilst in Australia and in particular NSW the CoW is almost a forgotten profession. The notion of utilising CoWs on site has been raised with Government (Smolders et al., 2013a) but without a perceived reaction. Thereby a greater reliance has been placed on subcontractors to deliver an expected quality output.

The lack of construction skill sets has created a concern for quality delivery and is not unique to Australia especially in the area of subcontract bricklayers. Recent reports from the UK suggest migrant workers are receiving considerable pay-packets. Quirk says,

*Manpower, a UK recruitment agency, said Portuguese bricklayers were earning £1,000 a week owing to a lack of skilled British tradespeople. The job would normally attract wages of £500 a week. (Quirke, 2014).*

Recent reports have emerged of similar concerns being faced by industry in NSW. Keene **notes that**

*BRICKIES are earning up to \$6000 to work a four-day week because of a critical skilled labour shortage that is threatening the Australian dream of owning a brick home. (Keene, 2015).*

According to the Australian Brick & Block-laying Training Foundation Ltd, housing commencements have increased by 18% over 2013-14 whilst apprentice numbers have been the lowest for ten years. Furthermore 44% of bricklayers were over the age of 40 and 23% were over the age of 50 (ABBTF, 2013). The current skills shortage and the shortage of bricklaying sub-contractors has compounded by an ongoing dispute between Boral, a major brick supplier and the CFMEU (Binsted, 2014). This dispute may have influenced Boral to cease manufacturing bricks and to merge operations with CSR (the corporate identity of the previously known Colonial Sugar Refinery), giving CSR greater influence over the market and reducing competition (Boral/CSR, 2014).

#### **24.4.1 Key Points-Sub-contractors**

The following are the key points derived from this section,

- K-01. Since the mid 1980's the numbers of sub-contractors have increased.
- K-02. Not all sub-contractors are fully accredited nor have they sufficient skilling.
- K-03. The creation of the sub-contract system was price driven.
- K-04. The demise of the CoW who audited **quality** has left a gap for quality management.
- K-05. Sub-Contractors currently self-certify their work.
- K-06. The construction industry places a greater reliance on Sub-contractors (**professionalism**).
- K-07. Quality has shifted from the CoW to self-certification (**regulation**) by sub-contractors yet quality is not assessed.

### **24.4.2 Questions – Sub-contractors**

- Q-01. Does sub-contracting contribute to rework?
- Q-02. Does poor on site supervision contribute to rework?

### **24.4.3 Summary-Sub-Contractors**

Construction delivery has changed significantly over past decades and greater emphasis and reliance has been placed on sub-contractors. To document quality on construction projects, sub-contractors are required to certify their own work in accordance with the BCA and Australian Standards. The certificates received from sub-contractors fulfil the requirement for the “Occupancy Certificate” that is required at the end of a project. Should these certificates not be forthcoming, developers face the risk of not having the project certified and being liable for major rework (Love and Edwards, 2004). The perceived belief that sub-contractors are competent to certify their own work is of some concern but when compounded by poor site management skills, the potential for rework is heightened.

In addition to industrial concerns facing industry the following section will investigate the depth of detail provided in documentation.

## **24.5 Design Documentation**

Design has not been a concern of the Royal Commissions. The White Paper entitled ‘Building works constructed without approved plans’ (Department of Planning, 2013) highlighted the contribution of documentation to rework. Tilly has researched design documentation extensively and says

*...poor design and documentation quality has been identified as being a major factor in reducing the overall performance and efficiency of construction projects as well as being directly responsible for projects running over budget (Tilley, 2005,283).*

Tilly further argues that responsibility for documentation not only lies with designers. Deficiencies in project management have had a negative impact on the construction process as well. Furthermore, he argues the importance of relationship building as a ‘prerequisite’ to being able to direct others to reach a project’s objectives and suggests the use of the following seven key attributes:

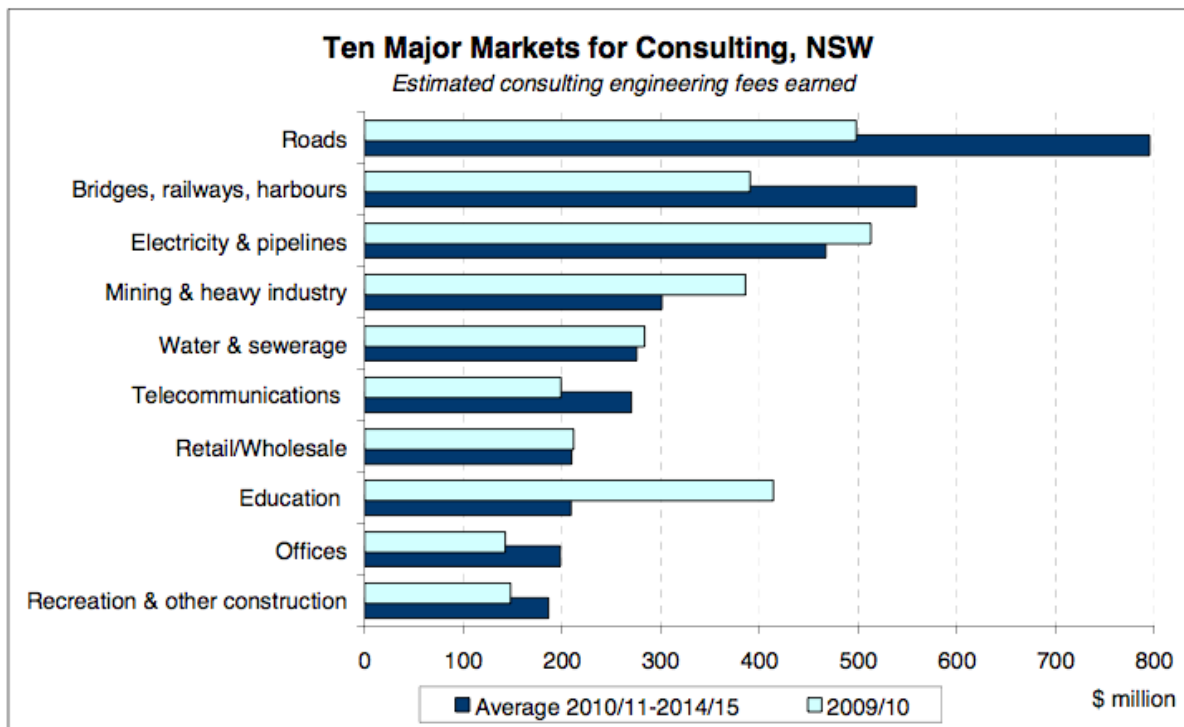
- Collaboration – jointly working together
- Cooperation – willingness to achieve a common goal
- Commitment – motivation and dedication
- Coordination – negotiate a satisfactory outcome
- Certainty – for the goal to be achieved
- Communication – two-way exchange of thoughts and information
- Trust – integrity and reliability. (Tilley, 2005,290)

Hughes and Gray have a different view arguing architects had a full supervisory role to play over projects. This was the case in the past but that has now changed. They say,

*The traditional role of the architect has changed from project leader and manager to leader of the design team. This has led to considerable ambiguity about the leadership of the project as a whole, particularly where roles and responsibilities have not been clearly defined from the outset* (Gray and Hughes, 2009,1).

This particular phenomenon started around 1985 and has turned into a new procurement model known as design and construct (D&C). Bulmer, in his response to construction reform in 2013, stated that 80% of construction projects are now D&C. This has effectively transferred the risk of construction delivery to builders and not architects, as was the case pre 1985 (Bulmer, 2013). Multi-disciplined engineering consultancy companies like GHD and Aurecon have emerged to following in the footsteps of Arup. These organisations also provide architectural services in addition to their engineering services. Based on turnover, both GHD (GHD, 2015) and Aurecon (Aurecon, 2015) are two of the largest architectural practices in Australia currently. Major construction companies are also hiring more architects than traditional architectural firms. The reason is risk management. Builders and contractors are accustomed to taking the full risk for the delivery of their projects including the design content (Chandler, 2015). The NSW Government has acknowledged “*that there are no requirements about who can prepare building design plans apart from residential flat buildings under SEPP65*” (Montoya, 2013,28). Citing poor remuneration, architects have been reluctant to provide fully detailed documentation, providing sufficient information for DA and CC purposes. This practice has resulted in a lack of skill by architects to detail their projects in a manner that addresses buildability outcomes that assist construction processes. Major builders today are required to rework schematic designs using ‘value engineering’ processes to make projects buildable at a reasonable cost. Consult Australia, a member of the Australian Sustainable Built Environment Council (ASBEC), the

Australian Construction Industry Forum (ACIF), the Australian Chamber of Commerce and Industry (ACCI) and the Australian Services Roundtable (ASR), in their report tabled to government in 2012 made some interesting observations and recommendations. They projected fees for engineering consultancy alone for the last four categories (Figure 12) to be around \$800 million dollars. It is noteworthy that they are also very concerned of a skills shortage and document quality (Lowe and Cartledge, 2012).



**Figure 12 - Engineering fees NSW (Lowe and Cartledge, 2012, 6)**

Engineers Australia also commissioned a report focusing on document quality in 2005. In their report “Getting it Right the First Time” they stated that poor documentation contributed an additional 10-15% to construction costs. They added that the annual cost of poor documentation is estimated to be around \$12 billion per year across Australia (Engineers Aust., 2005). However, Love et al came to a different conclusion...

*No significant correlations were identified between design team practices and rework. However, it was also revealed that there was a significant correlation between schedule growth and ‘lack of manpower to complete the required tasks’ (P. Love et al., 2006,247)*



In 2002, the Premier of NSW Bob Carr, criticised the quality of the **design** of residential flat buildings constructed under the State Planning Instrument SEPP No 65 (Maher, 2002). SEPP65 contained the following objective,

*‘A development application for residential flat development will be required to be accompanied by a design verification from a registered architect (referred to in the Regulation as a qualified designer) verifying that the qualified designer designed, or directed the design, of the development and that the design quality principles of SEPP 65 are achieved’ (NSW Govt, 2002)*

The term Qualified Designers was included above as a ‘Grandfather’ clause to allow those currently engaged as building designers to seek appropriate qualifications. Carr’s comments eventually led to the enactment of the Architects Act 2003 No 83. This Act was a direct result of the proliferation of apartment buildings being developed without the input of qualified designers. The Architects Registration Board (ARB) was established and a person could only use the term Architect if that person was accredited by the ARB. The intent of this change was to raise the quality in design (NSW Govt., 2003).

The disharmony between designers and architects has not yet been resolved. Recent attempts by the AIA to promote their members has “*incurred the wrath of building designers*” (Howe, 2015). The AIA has embarked on an advertising campaign as reported by Howe

*One of the campaign advertisements denigrates the qualifications of building designers relative to architects by implying that their level of expertise is akin to that of an untrained layperson Howe states “You talk to someone with the degree and the years of experience to bring it to life,” reads one campaign advertisement. “An architect. Not a design, draughtsman, or your sister’s husband’s brother who’s hand on a computer.” And “You wouldn’t ask a hairdresser about heart surgery,” reads another. “So when it comes to renovating, ask an architect” (Howe, 2015).*

AIA’s attempt to seek greater recognition for their architect members is understandable.

#### **24.5.1 Key points- Design Documentation**

- K-01. Good documentation minimises rework.
- K-02. Architects are losing their market share for the design of domestic structures.
- K-03. Government has attempted to improve design by legislation.
- K-04. Architects are expensive and have been replaced by building designers.

K-05. Documentation seems inadequate.

### **24.5.2 Questions – Design Documentation.**

Q-01. Is the current level of documentation adequate for construction?

Q-02. What can consultants do on site to curb rework?

### **24.5.3 Summary-Design Documentation**

It is evident that good documentation prior to commencing construction leads to good outcomes. Literature has revealed, regardless of industry type, that complete and accurate documentation offsets potential rework. Government has recognised this concept, as indicated by the White Paper (Department of Planning, 2013) and Premier Carr legislating the Architect Act and introducing State Environmental Planning Policy No 65 (SEPP 65) legislation. Yet, according to the Building Designers Association, 90% of town house and villa developments have been designed by non-architects whilst only 3% of domestic housing has been designed by architects due to their perceived high cost (BDA, 2002,4). Regardless whether building designers or architects have been contracted to deliver design documentation, the desired outcome should be a complete and fully detailed design set minimising the potential for misinterpretation, variations and rework.

## **24.6 Professionalism**

The BCI has evolved over time and is still evolving. Participants within this industry have a multitude of roles ranging from the trades to management. The term “I am a builder” is an expression often used to describe either tradespeople or managers. Are these ‘builders’ professional?’ is a relevant question. Are all ‘builders’ professional? For example, architects’ roles are well defined, legislated and supported by a professional institution bestowing their members a sense of professionalism. This section explores the meaning of the word ‘professional’, it’s colloquial usage, education as a pathway to professionalism and institutions that support and promote respective professions.

The term ‘professional’ is widely and loosely used. Social scientists are still debating the validity of the usage of the term ‘professional’ as Watson states,

*Social scientists are themselves members of an occupation that makes claims to expertise and which deals in knowledge. And social scientists are inevitably aware of the*

*advantages that the label “professional” gives to occupations that establish their mastery of socially sensitive or “special” kinds of knowledge. Could it be that social scientists, as wise members of an occupational group with an ambiguous social status, want to keep the idea of a special kind of occupation, the profession, clearly on the agenda? Is it a comforting notion to hold onto in the face of occupational insecurity? (Watson, 2003,104).*

Therefore, what is professionalism?

### **24.6.1 Definition**

The Oxford Dictionary describes professionalism as “*one having the competence or skill of a professional thereby delivering an output of quality and efficiency*”. Freidson defines professionalism as an exclusive right to perform a certain kind of work function (Freidson, n.d.). Watson on the other hand, describes the ‘slippery’ (sic) nature of how the terms profession and professional is used, saying

*The word “professional” is used to cover a potentially bewildering variety of things. Sometimes, we hear people use it to indicate that someone is being paid for carrying out a certain kind of activity, as opposed to doing it for pleasure. We might comment on a musician friend, “Her singing has improved enormously since she went professional.” In the business sphere, the word “professional” is often used to refer to someone being employed to manage someone else’s enterprise, as opposed to running one on their own account (Watson, 2003,95).*

Watson further describes the emerging practices of the 1980’s and 90’s when speaking of management as a profession that “*made no difference to the attractiveness of the concept of professionalism*” (Watson, 2003,98). This could be said about the building profession in NSW. Whilst the terms ‘professional carpenter’ or ‘professional builder’ are often used, are these people really professional? Reed and Anthony observe the term ‘professional’ is “*a rhetorical device and ideological resource to legitimate the claims various expert groups and their representative groups make on society’s material and cultural base*” (Reed and Anthony, 1992,596). They question the claims of, for example, carpenters and builders to simply call themselves professional by publically promoting themselves as such without regard to a professional code of conduct, practice or ethics.

### **24.6.2 Architects**

Premier Carr, when he introduced the *Architects Act*, attempted to have one group of experts to be deemed 'professional' by way of enshrining their vocation in law. Architects are, under law, professional but has that helped their profession or simply allowed them to charge more for their services? Many see their work threatened and executed by others (building designers) who may have architectural training but who are not recognised by the Board of Architects. Architects who are recognised by the Board of Architects have been peer reviewed, are academically qualified, practice CPD and have the required insurance. Carpenters and builders are not subjected these requirements. However, they are still deemed to be professional in the eyes of the public.

### **24.6.3 The emergence of the residential builder and sub-contractor.**

Public perceptions have evolved, and so has the BCI. The residential building industry has changed over the past 50 years as a result of economic and technical changes. Traditionally a builder would have his own team of tradesmen including carpenters and bricklayers. The builder traditionally had their own joinery shop and owned the plant they used on site. Post WW2 saw a major change in residential building as prefabrication and low cost 'fibro' homes were built en masse to cater for the influx of immigrants coming to Australia (Elder 2007). Brick veneer construction began to overtake full brick and 'fibro' homes and the 'project home' success story began in Australia. With the rise of 'project home' builders, a shift away from employing direct tradesmen to sub-contracting emerged. Sub-contracting allowed builders to engage tradesmen by paying for their services on a piecework basis and gradually, over time the concept of 'project home' sub-contracting replaced the system of direct employment by larger constructions companies to the point that it is regarded as the 'norm'. Perhaps the sub-contractor is undergoing a similar identity profile as the builder in terms of professionalism. Studies on sub-contractor partnering with contractors suggest that long term partnering arrangements between sub-contractors and contractors are more beneficial than seeking a wide scope of suppliers (Errasti et al., 2007,256).

### **24.6.4 Construction education.**

The training of builders has also significantly changed over the past few decades. Those wanting to become builders post WW2 were traditionally carpenters or bricklayers. Training was extensive and thorough, entailing an indentured apprenticeship of 5 years and education at a technical college. Topics included architectural drafting, structural design and calculations,

regulatory requirements, technical knowledge, estimating and quantity as well as land surveying and practical sessions of different trades (Freyne 2010). In later years, construction education became recognised as a university degree. In addition to the established traditional universities, the original training ground for construction trades in NSW, the Sydney Technical College, expanded their campus to include a university. This change allowed students who completed their certificate entry into a university degree course thereby gaining recognition through the professional standing of institutions like the AIB and others. According to Freyne

*From the 1970s the footprint of the Sydney Technical College (STC) shrank considerably, as it ceded space to the now-separate Institute of Technology, which in 1988 achieved university status and became the University of Technology, Sydney (Freyne 2010)*

Education has played a significant role in the construction industry. In 1988, the entire education portfolio was restructured by the State Minister for education, Terry Metherell MP who introduced the Education Reform Act in 1990 (Metherell 1988). As a consequence, the centralised and highly respected TAFE system was abolished and ultimately TAFE lost its authority as a Government department (Freyne 2010). The new emergence of Registered Training Organisations (RTO's) run by private operators began delivering training and vocational education (MBA, 2015). The National Centre for Vocational Education Research's (NCVER) report on TAFE and its operations has concluded that there is little difference between TAFE and RTO's in student outcomes and employment prospects (NCVER, 2012). With all these initiatives and changes within the education system the industry is still struggling with a skills shortage and trades are still working on site without proper qualification and skills.

#### **24.6.5 Home Building Amendment Act 2014**

The watering down of the Home Building Act 1989 (NSW CA, 2015) has not assisted concerns about the lack of trained tradespeople. According to Shadow Minister Mihailuk, *"people will no longer be required to hold a license for building and general trade work (especially painting) if the value of the work is less than \$5,000"* (Mahailuk, 2015). According to Minister Mason-Cox's statement, these 'red tape' reductions bring NSW in line with other States (Allen, 2015).

The public outcry resulting from these changes to the Home Building Amendment Act (HBAA) (NSW Govt., 2014a) again highlights concerns by building owners who are at odds with consultants. Owners Corporation Network executive officer, Karen Stiles (OCN, 2015) stated, *"Right now, I could not in good conscience recommend buying into a new building,"* whilst

Stephen Albin from the Urban Development Institute had a different viewpoint stating "*Defects are unavoidable, they'll always happen but these laws will help put more integrity into the system and cut down on major defects by empowering qualified tradespeople*" (Powell 2015).

#### 24.6.6 The need for ‘professional’ builders.

Table 10 illustrates the difference between licenced builders and other participants in the BCI. All bar the licensed builder have representation by professional institutions, are required to have a tertiary level educational qualification and are required to undertake CPD. It seems strange that responsibility for constructing a building, its quality and functioning is left to an individual with limited education and no further requirement to keep up-to-date.

	<b>Accreditation Registration</b>	<b>Min Term of Professional Experience</b>	<b>Tertiary Qualification</b>	<b>Continuing Professional Development (CPD)</b>	<b>Professional Institutes</b>
<b>Architect</b>	Legislative requirement	Requirement	Requirement University	Requirement	AIA
<b>Building Certifier</b>	Legislative requirement	Requirement	Requirement University / TAFE	Requirement	AIBS
<b>Engineer</b>	Self and co-regulation requirement. Legislative requirement only in QLD.	Requirement	Requirement University	Requirement	EA
<b>Licensed Builder</b>	OFT manage the process for granting licenses.	There a mandatory period of experience before a license can be obtained.	Mandatory to have a min. tertiary qualification (Cert IV) in Building to obtain a licence. TAFE / RTO	Not required.	MBA and HIA
<b>Chartered Builder</b>	AIB manages registration process via the NBPR.	Requirement	Requirement University / TAFE	Requirement	AIB and CIOB

**Table 10 - Summary of Professional Requirements.**

It may be inferred from Table 10 that a licensed builder is not a professional compared to other stakeholders, as there is no requirement for a degree, registration with an institute and CPD. However, the general public views them as professionals, be they either a tradesperson or a licensed builder.

The concept of professionalism within the BCI appears to be lacking. The following disparities within the current regulatory system has been identified by Smolders (Smolders et al., 2013b)

- Commercial builders in NSW have no requirement for licencing and the recommendation by industry is that they should be licenced.
- The current mandatory inspection by certifiers is inadequate and it does not address quality as perceived by the general public.
- Certifiers are not required and in some cases are unable to recommend solutions to resolve noncompliant situations.
- A licenced builder does not necessarily adhere to or is required to adhere to a professional code of ethics unless they are members of a professional body.
- Developers are considered and perceived to be builders but in reality the two professions are very different.
- Some twenty years ago, a ‘clerk of works’ carried out building inspections; an architect who had full supervisory control over a project appointed this person, but this system has disappeared and left a void, especially in the delivery of quality.

The current state within NSW of allowing unaccredited builders to erect buildings under the State Environment Planning Policy No.65 (Sepp65) has caused considerable concern for the industry as a whole. Stopgap measures have been put into place with the emergence of ‘Building Consultants’, a quasi group of trade background practitioners purporting to be professional and advising clients (home owners) about remediation and restitution. These “professionals” do not contribute to learning or to the advancement of the profession by way of proper accreditation or assessment. The primary consideration seems to be that these consultants are licenced as a builder (only required for domestic dwellings under three storeys) by the Office of Fair Trading and have professional indemnity insurance. These consultants trade in the lucrative area of SEPP65 built apartments in conjunction with teams of lawyers known within the trade as ‘ambulance chasers’ (Hurley, 2013). These lawyers engage property inspection firms to create a defects schedule to obtain compensation. It must be stressed that there is a tendency to place all builders in that same basket, or as Dwyer puts it, *“While there are many good and responsible builders in our industry, it is unfortunate we only hear about the building disasters and there are far too many of them.”* (Dwyer, 2014b)

On the whole, reputable builders who have delivered very good products over the years have represented industry. There are builders who regularly tender and construct high-density

residential apartments for clients who are developers and on the whole, these builders have a quality assurance program in place that guarantees high standards. These builders then follow through by providing their client with a maintenance regime and a building manual. However these builders are also in decline due to low margins, competition in the market place and threats of litigation by ‘ambulance chasers’ (Smolders et al., 2013a,7).

In contrast, new players are entering the market place without the necessary experience. Developers construct residential apartments outside the usual constraints of fixed cost, time, quality and warranty that are placed on builders (Dwyer, 2014b).

#### **24.6.7 Industry Associations and Institutions**

Membership of building-related bodies is available to a number of differing groups. The Master Builders Association (MBA) pre-1985 was the eminent body who endorsed their members by peer review and accreditation to ensure their members could use the prefix ‘Master Builder’ (Elder 2007). This membership requirement has been relaxed and replaced by requirements to have a sound financial record, payment of membership fees and a NSW builder’s licence. The Housing Industry Association (HIA), originally established by builders to secure access to supplies (Elder 2007), is now a body representing the entire building industry including suppliers. The HIA does not accredit their members’ qualifications. The Australian Institute of Building (AIB), founded in 1951, is the only Australian body representing the construction industry who accredit their members based on a peer review and academic qualifications (Smolders et al., 2013). The AIB is the manager for the National Building Professional’s Registry (NBPR) and the only Australian body who can accredit professional standing in broad areas of expertise in the fields of construction and building (AIB 1997).

Professional institutions, as opposed to trade organisations (MBA & HIA), have to highlight “professional Builders” or “Chartered Builders”. Corporate members of the Australian Institute of Building (AIB) and its international cousin the Chartered Institute of Building (CIOB), have obtained the required years of experience, undergone a professional interview by their peers to assess their competencies and are awarded the status of Chartered Building Professional (CBP) or simply “Chartered Builder” (CB).

The AIB is the peak body in Australia (incorporated by Royal Charter in 1969) representing building and construction professionals, responsible for accrediting Universities throughout Australia and maintaining professional CPD programs for their members. It is also the only institute representing professional builders at government level in Australia. The AIB was



granted a Royal Charter in 1969, which was incorporated into the Commonwealth Government Gazette as being the sole professional body in Australia to accredit the building profession. The Charter states

*On 7 October 1969 a Royal Charter ("the Charter") was granted to the Australian Institute of Building ("the Institute")-the sole chartered institution representing this nation's professional practitioners both within Australia and abroad, of all the various disciplines of the Building Profession: Construction and Project Management; Quantity Surveying and Building Economics; Building Surveying and Certification; Property and Facilities Management; Housing; Building Services; Kindred Sciences and Technologies; Construction Law and Arbitration.*

Below is an extract of the AIB's truncated history giving an analogy of the difference between trade and professional bodies.

*As a consequence, if we were to use a medical analogy, if the Master Builders Association (MBA), the Housing Industry Association (HIA) and the Australian Constructors Association (ACA) are akin to the Australian Medical Association (AMA)– then the Australian Institute Building would be akin to the Royal Australian College of General Practitioners (RACGP) –i.e. deliberately out of the lime light, with legal obligations to serve the community imposed by its Royal Charter (Smolders et al., 2013b).*

#### **24.6.8 The Chartered Builder**

Both the AIB and CIOB recognise members through accreditation and peer review processes. They include 'Chartered' within their title. This term is internationally recognised to signify that the holder has been assessed and is deemed to be competent to act in a professional manner. In the BCI this concept is long overdue. In an attempt to improve quality, professionalism, skilling and regulatory control, the AIB has embarked on a campaign to inform the authorities of the benefits a Chartered Builder could bring to the industry. In a submission to the NSW Government in 2013, the AIB made the following recommendations to attract professional recognition for its members

- The Chartered Builder Program (CBP) can provide independent certification of an entire project by utilising demonstrated skills and expertise gained across a broad range

of unique project circumstances. This certification ensures that a project is delivered in full compliance with both the agreed specification and design intent.

- In a submission to the NSW Government it was envisaged that the senior project manager would be a CBP as well as a licensee holder and will charge his subordinate supervisors to warrant compliance of works via a strict quality assurance program on site. The project manager will sign off on the works on completion and present the final certificate to the Principal Certifying Authority (PCA) along with the building manual.
- On small lower density projects, the builder can engage a qualified CBP who is a practicing building consultant to sign off on the works as required.
- For domestic construction, the AIB recommended for all CBP's to have an A4 certification standing so that they can do the entire inspection for compliance as well as quality. Existing certifiers who have the necessary construction expertise can obtain a CBP qualification subject to the usual process. (Bulmer, 2013)

At the time of writing, government has been considering some of these recommendations. Acceptance /acknowledgment of the term Chartered Builder may yet become reality.

#### **24.6.9 Key points-Professionalism.**

- K-01. The term 'profession' is not clearly defined and is liberally used.
- K-02. The BCI has evolved over time to become 'professional'.
- K-03. The BCI is still in need of reform.

#### **24.6.10 Key Questions-Professionalism.**

- Q-01. Should sections of the BCI be formally recognised as 'professional'?
- Q-02. Could professionally recognised builders ensure compliance and quality?

#### **24.6.11 Summary – Professionalism**

Social scientists continue to debate the validity of the term professional. For the BCI, it is a term that, when fully adopted by industry and bureaucrats alike, can make a significant difference to practitioners within the BCI and the general public who benefit from their expertise.

The BCI appears unbalanced when the risks taken by builders are compared with consultants long being recognised as professionals. These consultants absolve their responsibilities contractually onto builders. Why do builders accept these terms of engagement? The answer could be the relative ease with which a builder obtains a license to be able to practice.

Registered architects on the other hand have achieved their ‘status’ by being granted professional status through the Board of Architects. They are able to call themselves ‘Architects’ exclusively; a person not registered cannot use the title legally. However, by that very instrument, their status as a ‘professional’ may have hampered their job opportunities which in turn has possibly resulted in poor design documentation being produced by designers who may not be fully qualified. Introducing legislation that renders sectors of the construction industry ‘professional’ may have unforeseen and detrimental consequences. There have been many examples of poor workmanship and quality in buildings demonstrating a need for professionally qualified people to ensure building delivery has not only met regulatory requirements but also quality standards, thereby reducing rework.

## **24.7 Certification and Regulation.**

Prime Minister Gough Whitlam stated:

*There are still buildings occupied which the Romans built, and it's perfectly safe to go into them..." Just because some of the techniques are the same, people think that anybody can build a house. In fact we have got to recognise that building is a particularly skilled occupation, and people who are in elected positions – State Governments, Local Governments in particular – ought to realise that...building regulations and codes have to be up to date (Whitlam, 1973).*

This extract came from the opening of the first “project” housing estate built in Sydney. Whitlam, in the company of heads of State and Local Governments stated, “*I mentioned many heads here, but it all comes back to this-we have got to co-operate*”. Whitlam’s statement simply expressed his view for the building construction industry that, to be viable, all stakeholders have to cooperate with one another.

Unfortunately, the co-operation mentioned by Whitlam has not been adopted across the entire BCI. Non-compliant work has been part of the BCI for a considerable time and more recently highlighted by the media (Munro, 2010). In response to these concerns, the AIB suggest non-compliant building work is most likely carried out by either disreputable, unskilled builders and / or developers (Smolders et al., 2013b). Table 11 is an extract from information contained in the AIB’s response to the Department of Planning’s White Paper titles ‘A New Planning System for NSW’. This White Paper is an attempt by Government to reform the BCI.

### 24.7.1 Types of Builders

There is considerable confusion amongst people when the term builder is used. The same could be said when regulators address issues that affect builders. Builders are not all the same nor should they be treated in the same way. Some builders specialise in small residential alterations and additions, some build bespoke homes whilst others may be ‘project’ style homebuilders. Other builders apply their trade in the commercial market from small projects to high-rise work. Building regulations have been written in a generic way to generalise builders as a single entity. According to the MBA, the building landscape is made of the following

5	Top Tier Contractor	National/International companies.
6	Mid Tier Contractor	National/State based companies.
7	Third Tier Contractor	State/regional based companies
8	Fit out/Refurbishment Contractor	State/regional based companies.
9	Residential Contractor	Regional based contractors.
10	Project Home Builder	State/regional based contractors (MBA, 2012)

In the medium to high-rise residential sector there are a number of builders who are all very different. These include: smaller residential contractors working on one or two projects and tendering for new work, small residential developers and builders constructing one or two medium density projects and finally larger builders capable of tendering for large projects (as distinct to large developers /builders who construct their own buildings). Relevant to this study is the definition of a Builder, Developer or a Chartered Builder as well as an understanding their roles and responsibilities within the building process. Appendix 8 defines these professions along with other industry stakeholders. Below is an example of difference between developers, licensed builders and chartered builders set against the regulatory framework. The primary difference between builders could be due to professional ethics and a code of conduct that is expected from a chartered builder but not necessarily from the others.

<b>Stakeholder Position.</b>	<b>Building Professional Board</b>	<b>Developers</b>	<b>Licensed Builders</b>	<b>Chartered Builders</b>
Robust Compliance	yes	some	some	yes
Qualified Practitioners		some	some	yes
Tailored Inspections		some	some	yes
Consistent Consent Conditions	yes			
Delineation between Building and planning decisions	yes			
Building Manual		some	some	yes
Support for certifiers and review panels	yes			yes
Online regulation, certification portal	yes			
Building Audits	yes			yes

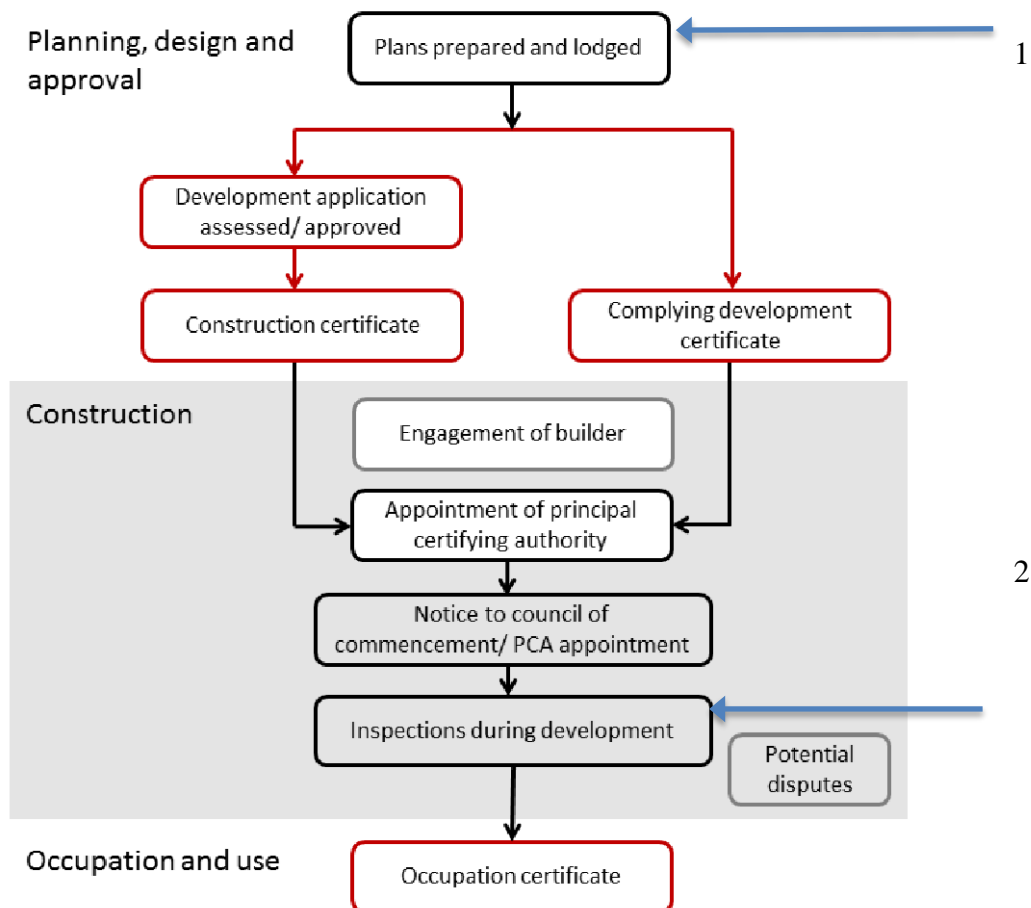
**Table 11 - Builder comparisons**

Table 11 highlights the difference between a ‘professional’ builder (Chartered) as opposed to a licensed builder or developer. Regulators and the general public seem unaware of these differences.

The following section explore the certification process and those responsible for compliance. It also examines recent moves by authorities to address concerns about non-compliant work, a contributor to rework.

### **24.7.2 Certification-the Process and Concerns.**

As indicated in Figure 13, certification is the process of having an independent review of building work traditionally carried out by local councils. Since the 1990’s it has been transferred to private certifiers as a result of national competition reforms (Lambert, 2015). Figure 13 illustrates the certification process in NSW. The study, reported here, focused on the initial planning stages of document approval (1) and the inspection regime (2) during and after the project has been completed.



**Figure 13 - Building Certification Process (Lambert, 2015).**

The Building Professional's Board (BPB) is an entity within the Department of Planning NSW. In 2013 the BPB published a White Paper titled 'A new Planning System for NSW' (Department of Planning, 2013). Of particular interest for this study is Chapter 8 of the White paper which highlights three key issues, namely:

1. Building defects.
2. Buildings not complying with the approved plans.
3. Lack of a building manual particularly within the residential market.

It should be noted that these concerns are not necessarily associated with every residential building constructed in NSW nor is it applicable to every building company in NSW (NSW Government, 2013). In their submission on the White Paper, the Fire Protection Association Australia (FPAA) expressed the concerns by their members about current failings, stating

*“Many FPA Australia members have expressed concern over a long period of time regarding the range of bureaucratic issues that prevent them from achieving safe,*

*compliant outcomes efficiently and economically. Accordingly, it is the position of FPA Australia that progress of these reforms is critical.” (Fire Protection Association of Aust., 2013)*

The NSW Government’s engagement with industry and the community (Maltabarow, 2013a) illustrates its awareness of the problems that have arisen from poor building practices. Maltabarow states, *“Much of the building control delivery chain is opaque to consumers and tends to focus on regulatory outcomes which only indirectly touch on the interests of consumers” (Maltabarow, 2013a)*. Maltabarow was referring to building outcomes in the eyes of consumers (i.e. quality, sustainability, safety and amenity). Adding further weight to his comments he says,

*“Each stage of the progression from specifying requirements, to seeking consent, engaging a builder, appointing a certifier, supervising construction, to occupation should be clearly explained and understood” (Maltabarow, 2013a).*

The public perception is that certifiers are the quality control experts generally employed by their local council. It is likely that the general public is not aware that certifiers assess projects to be in accordance with the Building Code of Australia and not with any quality standard. To counteract further defective works, the NSW Government via the Department of Planning and the Department of Fair Trading, is currently reviewing all of their current regulations.

One of the concerns of the NSW government is the experience, or possibly the lack of experience, of some certifiers. The government is also concerned about the legislation certifiers must comply with in order to facilitate certification. Key operational statistics published by the BPB (Maltabarow, 2013a) demonstrate the current position as well as the financial pressures the BPB faces. Maltabarow notes that

- Approximately 500 private certifiers are accredited by the Board, along with 900 Council certifiers.
- Private Certifiers issued an estimated 12,000 complying development certificates with a value of \$1.7 Billion (70% of all certificates issued by value); and around 24,000 construction certificates (about 50% of the total of 48,000).
- 103 complaints were received against accredited certifiers, within the annual range over the last five years. About half of those received were from Councils, with the balance roughly split between owners and neighbours.

- Of those, 30 were proven and accreditation was removed in 2 cases. Over the last five years, a total of 7 have had their accreditation removed.
- The BPB does not monitor actions taken against certifiers in the Courts (Maltabarow, 2013a).

The issues raised by Maltabarow, above, clearly indicate inadequacies within the regulatory framework surrounding certification. The BCI faces major concerns when having their works inspected and certified. There are at present far too few certifiers in the field, and those that are practicing are facing difficulties from either a lack of skill or experience as evidenced by the complaints and disciplinary actions taken. Maltabarow, in an attempt to deflect these concerns, suggested better **quality** in building, when he states, *“Getting builders to get things right in the first instance would seem to be a better approach than over-reliance on the checking process.”* (Maltabarow, 2013a). These comments may be true but for the tens of thousands builders practicing in NSW the paradigm shift towards self-certification to “get things right in the first place” may be a far greater exercise than improving the numbers and quality of certifiers. For example, a domestic cottage requires 6 mandatory inspections compared to a medium to high-density apartment building, which requires a minimum of 3 as indicated in Table 12 and Table 13. These tables illustrate the required inspections in accordance with the NSW Environmental Planning and Assessment Regulation 2000-Reg part 162A,

In the case of class 1 or 10 building, the PCA must inspect the following:

	<b>Mandatory Inspections Class 1 &amp; 10 Buildings</b>
1	After excavation for, and prior to the placement of, any footings.
2	Prior to pouring any in-situ reinforced concrete building element.
3	Prior to covering of the framework for any floor, wall, roof or other building element.
4	Prior to covering waterproofing in any wet areas.
5	Prior to covering any stormwater drainage connections.
6	After the building work has been completed and prior to any occupation certificate being issued in relation to the building.

**Table 12 - Mandatory Inspections Class 1-10 buildings (NSW Govt., 2014b)**

However, in the case of class 2, 3 or 4 buildings the following mandatory inspections are

	<b>Mandatory Inspections Class 2,3 &amp; 4 Buildings.</b>
1	Prior to covering of waterproofing in any wet areas, for a minimum of 10% of rooms with wet areas within a building.
2	Prior to covering any stormwater drainage connections.
3	after the building work has been completed and prior to any occupation certificate being issued in relation to the building



required:

**Table 13 - Mandatory Inspections Class 2,3 & 4 Buildings. (NSW Govt., 2014b)**

As indicated above, certifiers undertake six mandatory inspections during the course of small residential construction whilst larger residential buildings in excess of three storeys require only three mandatory inspections. In an attempt to improve the standards of certification in NSW the BPB was established to oversee a number of improvements. With the impending rise of multi medium to high density apartment dwellings being constructed in the foreseeable future in NSW (ACIF, 2013), the BPB, in collaboration with the University of Newcastle (UoN) (Maund, Sher, Smolders, n.d.) developed a proactive approach to seek out and encourage more professionals to the certification industry. Certifiers in the past have generally been employed by local councils. One of the aims of the BPB is to encourage more private firms to act as Principal Certifying Authorities. To achieve this, the BPB and UoN are collaborating to develop an evaluation instrument that will assist:

- 6 Certifiers seeking to upgrade to a higher level of accreditation but who do not have a recognised qualification (Maltabarow, 2013a) and/or are unable to obtain the practical experience relevant to progression; and
- 7 Associated professionals who, although not accredited, wish to become a certifier but lack the recognised qualifications and/or experience.

The efforts of both parties is to evaluate the new instrument thus encouraging more qualified practitioners into this specific industry. This work is being undertaken to improve the standards of competence within the certification industry thus giving the construction industry as well as the ultimate consumer safeguards that the work being delivered is to an acceptable standard. (Maund et al., n.d.)

The evidence presented above has identified concerns within the certification framework that ultimately affects the BCI. This may be the result of a lack of certifiers in the field unable to thoroughly assess compliance with regulations, or regulations that are not explicit. Regardless, it may seem to be a contributor to rework as faulty construction may be overlooked or not be visible at the time of inspection. The BPB is aware of these concerns and as a result of the publication of the Dept. of Planning's White Paper, resulting in key reforms being considered (Maltabarow, 2013a) with a clear outcome to increase the number of certifiers in the field. Maltabarow 2013 further states that the securing of appropriate outcomes hinges upon a unilateral framework to be established between the administrations of Planning and

Infrastructure, Fair Trading and Local Government to ensure a coordinated approach with clear responsibilities and assignments.

The comments made by Maltabarow has been welcomed by industry (Maltabarow, 2013b), but government has not as yet acted on these recommendations.

### **24.7.3 Key Points – Certification and Regulation**

- K-01. Approximately 20% of certifiers are qualified.
- K-02. Certifiers do not inspect quality of building work.
- K-03. Certifiers lack practical building knowledge and are unable by law to advise on how to remedy any non-complaint issues they have identified.
- K-04. A Centralised Building Authority is needed in NSW.
- K-05. Certifiers have transitioned from public service to private practice.
- K-06. Better auditing required of the BCI by the regulators.
- K-07. Poor design documentation currently being accepted for DA's and CC's.

### **24.7.4 Questions – Certification and Regulation**

- Q-01. Are building inspections adequate to counteract rework?
- Q-02. Is design documentation in accordance with regulations and BCA?
- Q-03. Is the builder sufficiently competent to build the type of project?

### **24.7.5 Summary-Certification and Regulation**

This section has provided insights into an industry that is reliant on certification as a means of developing basic trust in the built environment. Within that system is a bureaucracy responsible for regulating an inspection regime that operates in a systemic fashion with skilled practitioners. The BPB has recognised the need for reform. The number of certifiers has waned, disciplinary actions are high, possibly caused by grandfather clauses that have allowed individuals with insufficient skills to be elevated above their capabilities.

The BPB is currently looking at accreditation, skills and increasing practitioner participation whilst at the same time examining possible improvements by having encouraging the BCI to be more proactive. At the time of writing, there has been no resolution but it would seem Government has recognised flaws within the certification process that create a pathway for rework.

## 24.8 Summary – Chapter 2

This chapter has identified six themes with a direct impact on rework. The viewpoints of different stakeholders have provided an insight into the complexities that make the construction industry adversarial in nature and influenced by political intervention. The industry is challenged by skills shortages, industrial unrest and productivity demands in the new world order of 'Globalisation', i.e. "operating on an international scale" (Oxford University Press, 2013).

Below are the six themes. Where some themes interact with others they are highlighted in **Bold**.

### 24.8.1 Culture

An anthropological study of humans may establish why there is a cultural difference between participants within the construction environment that results in an adversarial context. This adversarial context is a form of culture within the BCI. The cultural change is from direct employment being the regarded as the norm to the new norm of engaging sub-contractors by builders. The union has not been in favour of this system as in some cases builders force workers into 'sham' contracts where they ought to have been directly employed. An adversarial culture can also arise as a result of pressures from contract administration between sub-contractors and builders as well as builders and clients. On the 'shop floor' or the site, unions exert their influence in an attempt to seek better conditions that may or may not be justified.

The trade unions have represented workers who traditionally were engaged within a 'master-servant' relationship with their employers. Over time this relationship has been tested with the introduction of sub-contracting. Sub-contracting has prompted a different relationship and has now become a commercial arrangement between two commercially astute organisations. With this transition, unions are seeking to gain control over construction sites by various means in an attempt to remain viable and relevant. In doing so, they have caused disruptions to major projects resulting in delays and increased costs. There have also been incidences of vandalism on construction projects by union sympathisers giving rise to rework. Government inquiries have been commissioned to resolve differences but these processes have been deemed political. Attempts by governments of different political persuasions have resulted in polarised viewpoints between the construction industry and the unions. The threat of a skills shortage is intertwined within this landscape and has given rise to imported labour via the 456 Visa program. The unions see this as threat to their members in contrast to employers who see this as a way to by-

pass union intervention to reduce costs. These uncertainties have given rise to another concern and that is the quality and management of construction projects.

### **24.8.2 Quality**

The construction industry has changed over the last three to four decades. The one critical result has been the removal of the ‘Clerk of Works’. The CoW had the responsibility to ensure the building process met not only regulatory compliance requirements but also quality standards that were reflected in a full set of **Documentation**. This process has been tinkered with over the years. Some contractors adopted ISO9000 compliance standards whilst others simply marketed themselves as ‘good’ builders. However, with the introduction of the BCA, quality was not addressed. Certifiers are unable to assess or advise due to a regulatory loophole for those with insufficient skilling.

### **24.8.3 Professionalism**

Professionalism covers numerous aspects of the construction process from initial design **Documentation, Skilling** of trades personnel, sub-contractors and site administration.

The traditional training ground for builders has been an apprenticeship in bricklaying or carpentry alongside education via a tertiary course at a government run institution like a technical college or TAFE. On receipt of their trade qualifications, these ‘tradie’s’ or journeymen were issued a licence and usually commenced their career on a small domestic project before venturing onto larger commercial projects. In contrast, in present times, opportunists (some being developers) seek out a licence as quickly as possible via RTO’s and commence constructing large mid-sized apartment buildings without the full necessary skillsets, proper education or peer review by an industry body. The BCI has flagged this practice as concerning and this has been echoed by industry bodies such as the MBA and the AIB. Government has partially addressed these concerns. The industry is in need of more professionally trained, recognised and accredited builders. Although there are individuals and companies currently fulfilling this role, government has been slow in recognition. Maltabarow has expressed a wish for better building outcomes, but this will difficult to accomplish with the current status quo of builder licensing.

### **24.8.4 Skilling**

Government has recognised potential skills shortages within the construction industry and has allowed 457 Visas to be used to attract overseas workers. Unions on the other hand, argue that industry is more preoccupied with excluding union labour in an attempt to get ‘cheap’ labour.

The CFMEU is also concerned about the use of ‘sham contracting’ whereby an employer has a commercial agreement with a worker or workers to undertake ‘piecework’ as a subcontractor. The CFMEU has the view that this has been orchestrated to bypass worker benefits such as sick and holiday pay.

NSW (and Australia) is facing a skills shortage. Based on the economic principle of supply and demand, the cost of labour will escalate unless more workers become available. In the interim, government is aware of this concern yet slow to respond. The skills shortage affects all participants within the BCI, be they trades or management. Industry can contribute more to offset this shortage by engaging more apprentices, cadets and the like but has been reluctant due to lack of support from government. The concerns facing the BCI include the proliferation of unskilled workers and managers delivering projects together with the possibility of having works certified by unskilled certifiers.

#### **24.8.5 Documentation**

The design of construction projects has also changed over the past few decades. In the times of a CoW, architects were responsible for the overall control and delivery of a quality product. The Carr government introduced the ‘Architect Act’ in an attempt to curb questionably designed apartment buildings being erected. The training of architects has also changed over the years and there is currently greater emphasis on design rather than buildability. At a time, architectural practices were fully staffed with draftsmen. Currently new practices use CAD or BIM with technicians / architects thereby drastically reducing the cost of design **Documentation** in labour terms but not necessarily in hardware and software. Notwithstanding these advances the industry still suffers from incomplete documentation sufficient only to address the requirements for a DA or a CC. Engineers Australia has been proactive and vocal in seeking greater reliance on documentation complete with sign off after the work has been completed by the responsible entity be it the architect or the engineer.

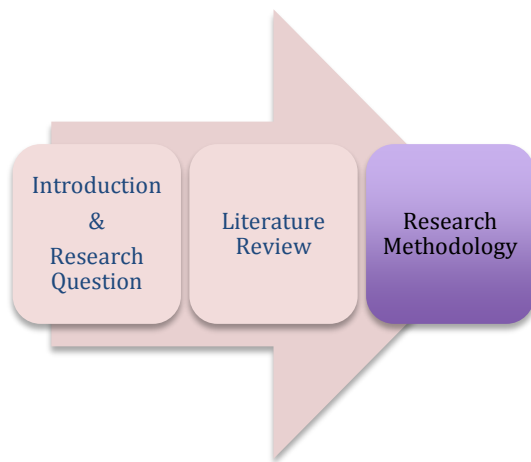
#### **24.8.6 Regulation**

At the time of writing, a number of recommendations emanating from the Campbell Inquiry (Table 7) have not been enacted by government. However, discussions have been taken place between stakeholders and government to re address some of these omissions. The MBA, AIB and other industry groups have strong views that some of these recommendations ought to be adopted to improve quality output. In particular, the licensing of builders who intend to build in excess of three stories should be licensed as in all other states of the commonwealth as originally

proposed by a National Licensing Authority. The certification profession is under stress due to the litigious nature of this profession. Fewer candidates are taking up the profession and furthermore, of the 1300 registered certifiers, only 20+% of these have appropriate qualifications. It is likely that this state of affairs causes disputes due to requirements of the BCA being misinterpreted. A recent positive move by the Government is to make the BCA freely available online in an attempt for wider coverage, acceptance and compliance.

This literature review has exposed six distinct themes that have been proven to cause rework. Literature has also shown areas of policy and regulations within the BCI via the various Royal Commissions and Federal or State inquiries. The following chapter outlines methods that have been adopted to seek out additional data. These new data will be aligned with the findings from literature to identify possible answers to the research question.

### 3. Research Design and Methodology



#### 3.1 Introduction-Research Methodology

This chapter commences with a recap of the themes as discussed in Chapter 2. These themes relate to one another through the common thread of regulation. The chapter continues with a collation of questions that surfaced from the literature review. To address these questions, a suitable research method had to be identified and this is explored next. After reviewing quantitative and qualitative alternatives it became apparent that both methods had elements that suited the study. A mixed method research (MMR) approach was selected for this study and is described next. Quantitative findings would present a quick graphical snapshot of possible outcomes whilst the qualitative findings could uncover possible undertones that may not have been present from the quantitative results. Following this recap, is a discussion on ‘using the right method’ to capture the remaining data. The following section discusses the work of Love, Holt and Li (Love et al., 2002) Nichols (Nichols, 2009) in combining MMR and Triangulation.

The use of a case study by others has also been explored and evaluated and this proved to be a suitable means of seeking ‘real life’ experiential feedback for comparison against the findings from literature. In addition, these findings also supported the original intent coming from site experience to do this study. The selection of participants was critical to this study. In order to have a balanced viewpoint, triangulation was adopted for analysing data. Triangulation required an even number of participants from offsite as well as those with onsite experience with a case study. This study was fortunate to engage with senior members of the project thereby providing valuable professional viewpoints. Interviews were conducted over a number of months as it

proved difficult to conduct interviews at a convenient location and time suitable for all concerned.

The research gap is again brought into focus followed by the aims and objectives of this study to ascertain a link to the causation of rework. The themes that were presented in the previous chapter will again be refined to a lesser number by combining themes with a common thread. Ultimately the study will focus on three threads overshadowed by the fourth overriding thread, **regulation**.

The remaining section of this chapter outlines the process of data collection, initially focusing on the challenges then methods. Due to potential legal ramifications and the delicate nature of the project, doing a survey would not bring out any real causation but it would present a clear direction. Therefore, the opted choice was a semi-structured interview that allowed participants to answer a set group of questions as well as an opportunity to speak freely. It was through this practice that **regulation** became more apparent.

## 3.2 Background

Chapter 2 of this Thesis has identified six themes describing the causes of rework. Of particular interest were the findings from Government Inquiries, the impact of trades unions and the effect these have had on safety, skills shortages and management practices. These **themes were condensed** as follows.

- **Professionalism** has been linked with Sub-Contractors and Culture.
- **Quality** has been linked with Skilling.
- **Documentation** is unchanged.

Overarching these three themes is

**Regulation**                      **certification** has shared the same theme.

Literature has shown that government policies have had an overarching influence over these four themes as demonstrated Figure 14.



### 3.3 Questions from Literature

Literature identified the following questions. Within these questions, themes have been added in **BOLD** to demonstrate their relationship with the specific question.

Questions – **Professionalism**-Union impact, Sub Contractors and Culture.

- Q-01. Does union activity impact on rework?
- Q-02. Could union intervention on site result in better **Skilling and Quality**?
- Q-03. Does WHS have an impact on rework?
- Q-04. Does sub-contracting contribute to rework?
- Q-05. Does poor on-site supervision contribute to rework?
- Q-06. Should sectors of the BCI be formally recognised as ‘professional’?
- Q-07. Could professionally recognised builders be utilised to implement compliance and quality?

Questions – **Government Inquiries**

- Q-08. **Culture**. Has the presence of trade unions hampered productivity?
- Q-09. **Professionalism**. Has the industry lost a sense of professionalism?
- Q-10. **Quality**. Can quality be regulated by auditing?
- Q-11. **Regulation**. Should all builders be licenced?
- Q-12. **Skilling**. How will the BCI cope with changing employment trends?
- Q-13. **Documentation**. Is documentation adequate for construction?

Question – **Quality & Skilling**

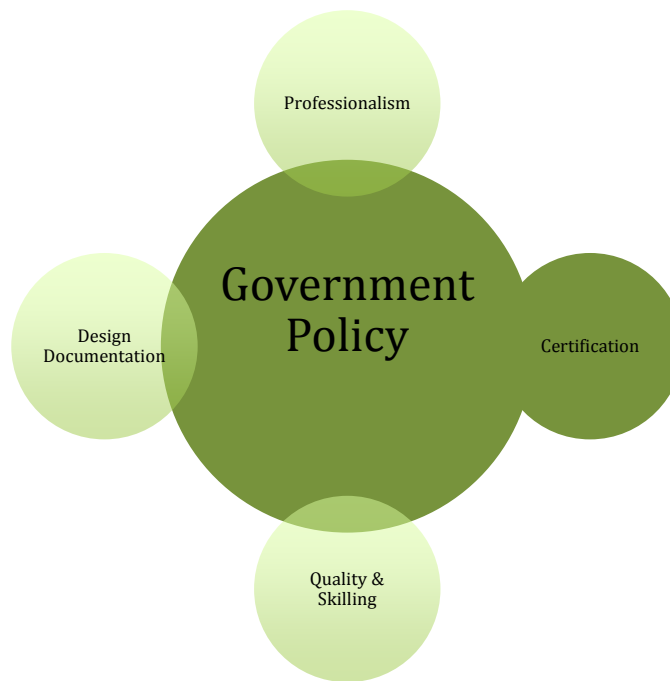
- Q-14. Does rework result from the lack of quality assurance auditing?

Questions – **Design Documentation**.

- Q-15. Is the current level of documentation adequate for construction?
- Q-16. What can consultants do on site to curb rework?

Questions – Certification & **Regulation**.

- Q-17. Are building inspections adequate to counteract rework?
- Q-18. In general, is design documentation in accordance with regulations and BCA?
- Q-19. Are builders sufficiently competent to build the type of project?



**Figure 14 - Government Policies overarching Themes.**



**Figure 15 - Question Interrelationship.**

Figure 15 demonstrates the relationship of themes to government policy. Each theme has been influenced by governmental regulatory framework. Figure 15 shows a similar pattern with added questions raised from the literature review, also relating to government policy.

The aforementioned questions on page 92 provide a backdrop to the remainder of this study. The themes highlighted above interface with the research aims and objectives to answer the research question. An appropriate research methodology has to be selected carefully as discussed in the next section.

### 3.4 Research question

How is it possible for projects to be allowed to progress to near completion whilst containing numerous defects that require rectification / rework? This question has been refined to accommodate the interrelationship between themes and government policy. Categorising the questions listed above into themes (Figure 15) allows **policy** to be identified as a possible contributor to rework. Therefore, the research question for this study has been expanded as follows,

**Is there a systemic failure within the current regulatory framework in project delivery giving rise to rework?**

### 3.5 Aims and Objectives

The aims of this study are listed in Table 14. They set out to determine if rework is the result of a systemic failure caused by a lack of Professionalism, inadequacy of Documentation or simply through poor Quality delivery. These aims are encompassed within the questions raised in the previous section.

The objectives of this study uncover gaps in management practices, design processes (documentation) and / or monitoring of regulatory compliance and built quality.

Table 14 outlines these aims and objectives. The generic premise of questions directed towards stakeholders was to determine whether the project was built **professionally** utilising standard building practices adopted by industry at large, and if so, was the **documentation** adequate for the delivery and for a **quality** outcome?

o Themes	Research Aims	Research Objectives
<b>Professionalism</b>		
	To determine the extent systemic failures of existing building delivery exist due to lack of professionalism.	Investigate and define the current roles of building professionals. Acknowledge the gaps in management practices.

<b>Documentation</b>		
	To examine the reliance placed on design documentation.	To identify the design process and possible contribution to rework. To identify the adequacy of design documentation.
<b>Quality</b>		
	To explore industry practices to identify improvements to curtail the rise of rework.	To identify the roles and responsibilities of professionals within the BCI. To identify the effectiveness of auditing the construction process. To identify compliance and built quality.

**Table 14 - Research Aims and Objectives**

This research sought to identify the gaps within these three areas of significance. Information was gathered from a number of key focus areas of stakeholders having a unique relationship with the case study in question as described in the following sections.

### **3.6 Choosing an Appropriate Data Collection Method.**

CM research has been dominated by two distinct approaches; interpretivist and positivist (Love et al., 2002,295), Combining these approaches is known as empiricism as Love explains,

*“Empiricism refers to a set of philosophical beliefs formed around the idea that experience rather than reason is the source of robust knowledge of the world (Moric, 1980)”* (Love et al., 2002,295).

Love elaborates that empiricism has come to mean,

*“the practice of investigating nature of the world using practical or experiential methods, rather than by applying or developing theories, or assuming guiding principles (sic)”* (Nichols, 2009,528).

The broad spectrum of stakeholders illustrated in Figure 17 was expected to yield different personal opinions that would provide such a nuanced and informed narrative. These opinions were obtained via a semi-structured interview as described in Appendix 7.

### 3.6.1 Mixed Method Research

Love (2002) refers to the ‘reality of construction’ when adopting a methodology for CM research. The underlining reason is that there have been persuasive arguments for and against the use of Mixed Method Research (MMR). Ultimately Love draws the following conclusion:

*If CM researchers are to effectively solve the problems that industry faces then they need to adopt a robust research methodology that is able take into account both ontological and epistemological viewpoints. This is so that we can better understand phenomena that influence organizational and project performance in construction (Love et al., 2002,302).*

In line with Love’s findings combined with the complexity of CM research when dealing with justifiable beliefs and human nature (epistemological and ontological), the author adopted MMR as the appropriate vehicle to gather data to address his aims and objectives.

Johnson, Onwuegbuzie and Turner (2007a) summarised this pragmatic approach of MMR when they say,

*Mixed methods research is, generally speaking, an approach to knowledge (theory and practice) that attempts to consider multiple viewpoints, perspectives, positions, and standpoints (always including the standpoints of qualitative and quantitative research (Johnson et al., 2007a).*

Therefore, utilizing MMR and Triangulation, data was analysed using combined qualitative research methods to encompass data from literature and interviews as well as quantitative data to illustrate findings. The volume of quantitative data was modest, and the research methodology can hence be viewed as predominately qualitative centric as defined by Johnson and displayed in Figure 16,

*Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration (p. 124)(Johnson et al., 2007b)*

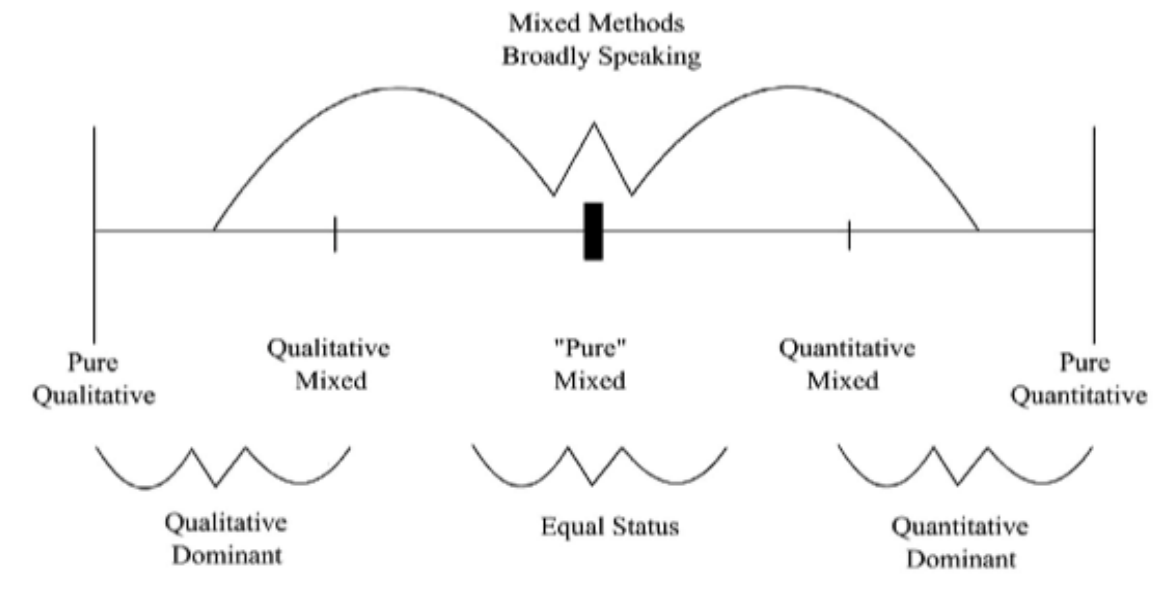


Figure 16 - Three Major Research Paradigms (Johnson et al., 2007b,124)

To effectively use MMR and to address the key points and questions highlighted in the previous chapter, triangulation was adopted as an appropriate methodology on the basis of having access to differing viewpoints and literature. The literature that initially informed this study was then supplemented with in depth data to ascertain the actual causes of rework. According to Silverman,

*By having a cumulative view of data drawn from different contexts, we may, as in trigonometry, be able to **triangulate** the ‘true’ state of affairs by examining where the different data intersect* (Silverman, 2010, 133).

MMR was adopted to correlate literature with interview data. This data was strategically collected from differing perspectives to gain a balanced, unbiased overall view. Considerable research has been undertaken by the likes of Creswell and Clark (2010), Johnson and Onwuegbuzie, ( 2004), Turner (Johnson et al., 2007a) and Feilding (Fielding, 2010) into MMR in recent years. The merits of adopting MMR align with the case study.

### 3.6.2 Triangulation

Love’s argues that triangulation,

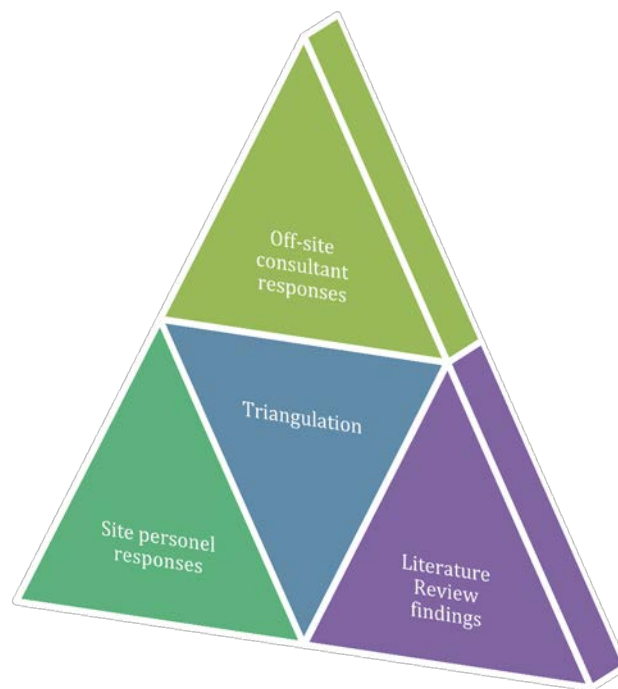
*“... involves the use of multiple research methods and/or measures of a phenomenon, in order to overcome problems of bias and validity (Black, 1993)”* (Love et al., 2002,299).

Triangulation provided the perspectives of different participant cohorts. Two distinct cohorts provided two very distinct viewpoints. The onsite personnel presented their ‘lived experience’ in

contrast to the consultants who were not necessarily influenced by daily onsite activities. The consultants provided holistic objective views rather than the subjective views presented by the onsite workers.

The data were collected as follows,

- Q-01. Interviews were conducted with site personnel directly employed by the builder on the case study projects to access their “lived experiences” (otherwise known as phenomenological hermeneutic approach).
- Q-02. Interviews were also conducted with the consultants engaged on the case studies. These consultants brought a differing viewpoint as they only engaged with the projects at varying intervals during construction. These consultants included the architect, quantity surveyor and/or certifier.
- Q-03. Government policy, White Paper, Royal Commissions and periodic documents were analysed.



**Figure 17 - Triangulated inter-relationship.**

(Note: Interpreting Figure 17, the internal lines indicate the bond between the three perspectives coming together by triangulation.)

### 3.7 The use of a Case Study Perspective.

A case study approach was selected to test the questions listed in Section 3.3. According to Flyvbjerg, “...if you choose to do a case study you are not so much making a methodological choice as a choice of what is to be studied” (Flyvbjerg, 2011). Flyvbjerg acknowledges useless definitions that can be attributed to case studies when he states the Merriam-Webster and the Penguin Dictionary of Sociology use the term “intensive” implying more detail and completeness to an “individual unit”. An article by Flyvbjerg and further defined by Stake (1996) describes a case study as “*functioning specific or bounded system*”.

This study has focussed on two buildings of similar size and cost; Case Study 1 (CS1) and Case Study 2 (CS2). Both were in close geographical proximity to one another. CS1 was the primary subject for this study whilst CS2 demonstrates that the unusual circumstances of CS1 were not unique.

This study focused on the findings from literature and two case studies. One of these case studies was criticised in the media for the length of time it took to reach completion (SCICLUNA, 2008) thereby creating a subjective landscape of viewpoints and opinions. The use of a case study allows researchers to ascertain findings between the boundaries of phenomena and context when set amongst multiple sources. According to Yin, case study research is,

*“an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used”* (Yin, 2003).

Supporting Yin’s comment, Love and Edwards (2004) argue that a case study can provide an analytical outcome rather than a statistical outcome. They say,

*“A case study is exploratory in nature, based on interviews and relies heavily on verbal reports and unobtrusive observation as primary data sources.”* (Love and Edwards, 2004)

Utilising triangulation (Figure 17) to offset any potential bias participants may have had, the findings from this study reflect the ‘lived experiences’ of individual stakeholders.

The three themes in Table 14 were further investigated to ascertain whether or not culture and / or the regulatory environment had an impact on rework.



1. Professionalism - Qualitative data were collected from literature, compared and contrasted with the experiences of stakeholders associated with the case studies.
2. Quality - Data from literature and case studies were collected to identify the quality measures adopted by industry and if these measures were adopted on the case studies.
3. Documentation - Data from literature were compared with the experiences of stakeholders associated with the case studies.

These data identified the root causes of rework and captured commentary relating to Professionalism, Documentation and Quality. The reasons why the case study projects were allowed to progress emerged from these findings. The causes related, inter alia, the culture of professional wrongdoings or poor regulatory practice. According to Loosemore and Andonakis (2007),

*In Australia, the subcontracting industry is also characterised by a high degree of **cultural** diversity and there is evidence that many simply cannot understand the meaning of **regulations** and simple workplace instructions and signage, even when written in plain English (Loosemore and Andonakis, 2007,1).*

It is thus important to emphasise that the construction industry is rife with cultural issues. These may be apparent from the ethnic background of the workforce, trade union intervention and /or the interrelationships between stakeholders.

### **3.7.1 Stakeholder Selection**

Ethics approval for this study was obtained on the 12<sup>th</sup> September 2012 (Approval number H-2012-0254, Appendix 9). Stakeholders in key roles associated with the case studies were then contacted via email. Details are provided in Appendix 5 - Invitation and Appendix 6 - Consent Form. All requests included an information sheet (invitation) and an acceptance form for interviewees to sign and return. Upon receipt of these acceptances, a further request was made with the stakeholder by email or phone if they knew another person associated with either case study wishing to be interviewed. Upon final collation of the interviewees accepting the invitation, dates and times were negotiated for a 'face to face' interview. The only exception was a builder who resided in China who provided a written response to the semi-structured interview questions. To achieve the unbiased outcome discussed in the previous section, stakeholders were selected to represent the two distinct viewpoints as depicted in Figure 17. These stakeholders were specifically selected due to their involvement being external to the project or being

involved directly on-site. Their respective and differing viewpoints represent the contrasting viewpoints required of a case study.

However, it is not always possible to totally remove the bias as verbal responses could present bias as well as fact. According to Grant and Giddings, “...well established schools of thought concentrate around four discreet ways of viewing reality: positivism, interpretivism, radical/critical, and post modern/post structural” (Grant and Giddings, 2002, 1). Out of these four options, the two most appropriate for this study are interpretivism and positivism as Nichols further explains,

*Interpretivism tries to understand what it is to be human. It is associated with a phenomenological tradition that seeks to understand experience through the eyes of the person experiencing it (Van Manen, 1990). It is the oldest and most well-established of the qualitative traditions, and the one that has gained the most traction in health care, particularly in nursing and occupational therapy. Interpretivists view the objectivity of the world as a subjectively lived phenomenon (Nichols, 2009,530).*

Love describes positivism as “emphasis on facts as distinct from values and meanings” (Love et al., 2002,296). A correlation of the two can be seen in Figure 18.

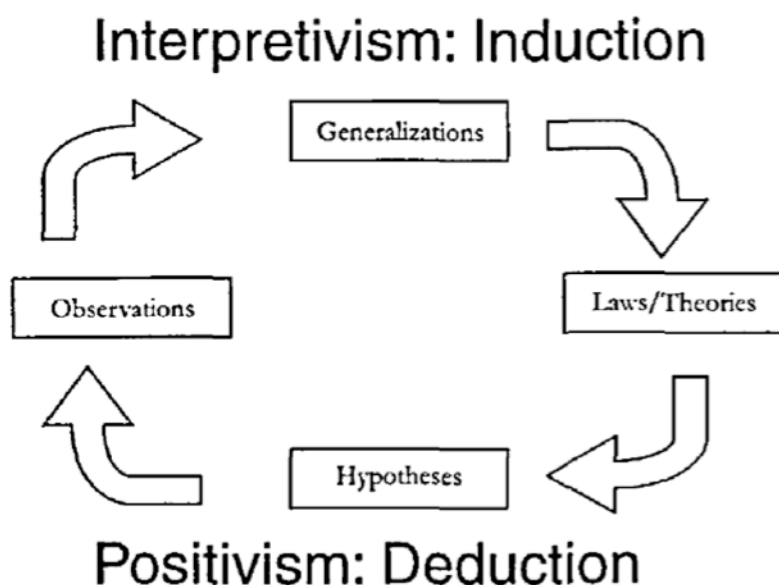


Figure 18 - Induction and deduction. (Love et al., 2002,296)

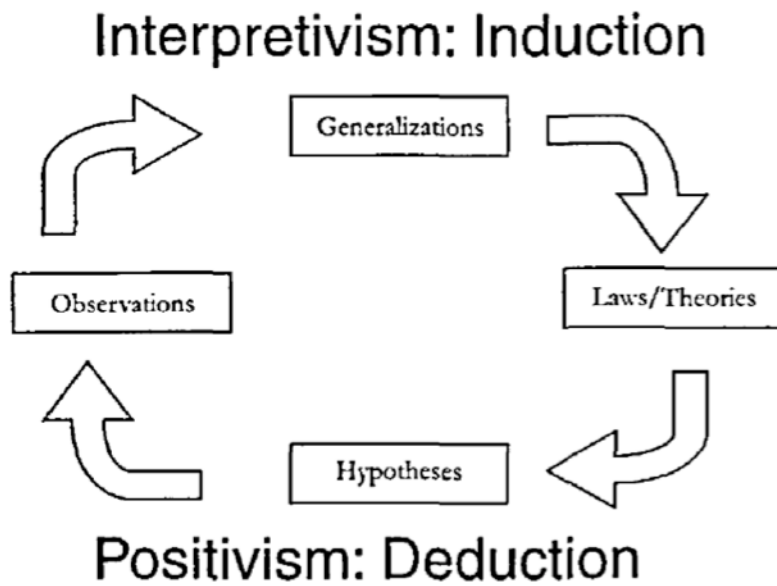


Figure 18 may be summed up by saying “we believe what we see”. This study explores differing viewpoints from stakeholders who have actually witnessed the construction activity applicable to this study. Their combined views together with findings from literature reveal the causes of systemic issues that gave rise to rework and thereby provide answers to the research questions.

### 3.8 Challenges of data collection

One of the challenges of data collection is the adversarial culture of the construction industry. This culture could be seen as advantageous as it is possible that opposing viewpoints may surface. On the other hand, the credibility of the findings may be enhanced where the views of different participants align. Mc George and London note that the “...*industry has perhaps the unenviable reputation of being highly adversarial, and as a result of this, is paradoxically a leader of in (sic) both dispute occurrences and dispute systems (Gropton, 2005; Keil, 1999; Michael, 1998)*” (McGeorge et al., 2007). Research participants may have been subjected to adversarial environments and may thus present strong viewpoints. These may have been influenced by dealings with workers with different cultural beliefs, overseas workers or by being subjected (feeling inadequate or superior) to foreign management systems. Golding and Murdock describe this as, “... *how it is that the gross injustices and inequalities of contemporary capitalism come to be understood as natural, inevitable and – crucially – as legitimate by those who benefit least from them*” (Murdock and Golding, 1977).

Gill explains that Murdock and Golding investigated the power of the “*media to explore its role in promulgating ideologies that served to sustain and justify relations of domination*” (Gill, 2008). Therefore, the importance of seeking data that is factually correct without undue influence of subjectivity is paramount. Nicholls describes these limitations when he states

*the key tenets of quantitative research – objectivity, value-neutrality, detachment, rationalism, and logical reasoning – work well when we exclude people’s subjectivity from the equation, but, when a person’s experiences, interconnections with others, or social and cultural systems in which they live, breathe, work, love and play demand attention, quantitative research has some profound limitations (Nichols, 2009,528).*

The very essence of seeking personal viewpoints from those directly engaged on site against those who have a consultative connection with the project could yield either opposing or similar viewpoints. In particular, it should be noted the response and viewpoint given by the union representative gave an interesting insight of the project.

### 3.9 Data collection

Specific questions were asked of stakeholders associated with CS1 and CS2. Their answers provided the primary data which were categorised into the three primary themes of **professionalism, quality** and **documentation**. These results form the basis of this study. The expected behavioural outcomes ought to have an emphasis on ethnological qualitative gathering of information as described by Nichols in the previous section. The data collected from building professionals and stakeholders differed from person to person. A series of open interviews took place which elicited issues that may not have been apparent from a visual on-site inspection (Creswell and Clark, 2010).

The results of the investigation uncovered a number of opinions from stakeholders. Johnson, Onwuegbuzie and Turner state:

*“Mixed methods research is, generally speaking, an approach to knowledge (theory and practice) that attempts to consider multiple viewpoints, perspectives, positions, and standpoints (always including the standpoints of qualitative and quantitative research” (Johnson et al., 2007a).*

The multiple viewpoints of participants were obtained by means of structured interviews. Participants were drawn from a range of disciplines within the building industry, including those associated with construction of the project be it from a worker's perspective or from the perspective of management, the client, financiers, consultants and / or the architect.

Initial quantitative results have been represented as graphs to provide an overview. Qualitative data has been used to support more detailed information which were analysed using Nvivo software to ascertain the causes of rework on the case studies.

MMR exploited the following principles defined by Tashakkori and Creswell:

*“mixed method research is defined as research in which the investigator collects and analyses data, integrates the findings and draws inferences using both qualitative and quantitative approaches or methods in a single study or a program of inquiry”*  
(Tashakkori and Creswell, 2007).

The quantitative and qualitative data were expected to support the findings from literature and uncover the underlying factors that contribute to rework.

### 3.9.1 Stakeholders

In addition to the literature review, two distinct perspectives of the project were harvested to triangulate data. Twelve people accepted the invitation to be interviewed. Six of those represented had worked on-site and the other six represented off-site staff. Table 15 shows the stakeholders and their respective involvement in the case studies.

No.	On-Site	Off-Site	Profession
1		<input type="checkbox"/>	Certifier-BCA Consultant
2	<input type="checkbox"/>		Sub-Contractor-Fire services
3		<input type="checkbox"/>	Architect-Prepared initial concept plan and DA Submission.
4	<input type="checkbox"/>		Builder – Builder No 2 now based in China.
5		<input type="checkbox"/>	Client – Developer
6	<input type="checkbox"/>		Site Clerk - Administration
7		<input type="checkbox"/>	Quantity Surveyor- Cost Planner on behalf of the financier.
8		<input type="checkbox"/>	Building professional
9		<input type="checkbox"/>	Superintendent-Overseer on behalf of financier.
10	<input type="checkbox"/>		Union Rep-workers representative.
11	<input type="checkbox"/>		Contracts Administrator-rework.
12	<input type="checkbox"/>		Development Manager-Pre DA.

**Table 15 - Stakeholders involved in the case studies.**

### **3.9.2 Quantitative data**

Literature identified three key areas of interest for this study (i.e. professionalism, quality and documentation). Quantitative data were collected and analysed to explore the extent to which these three areas applied to the case studies. This collection process was designed within the semi-structured interview utilising a yes-no response and a graded response adopting a Likert scale. The objective for gathering quantitative responses was to seek out which of the three key areas featured more prominently than others.

### **3.9.3 Qualitative data**

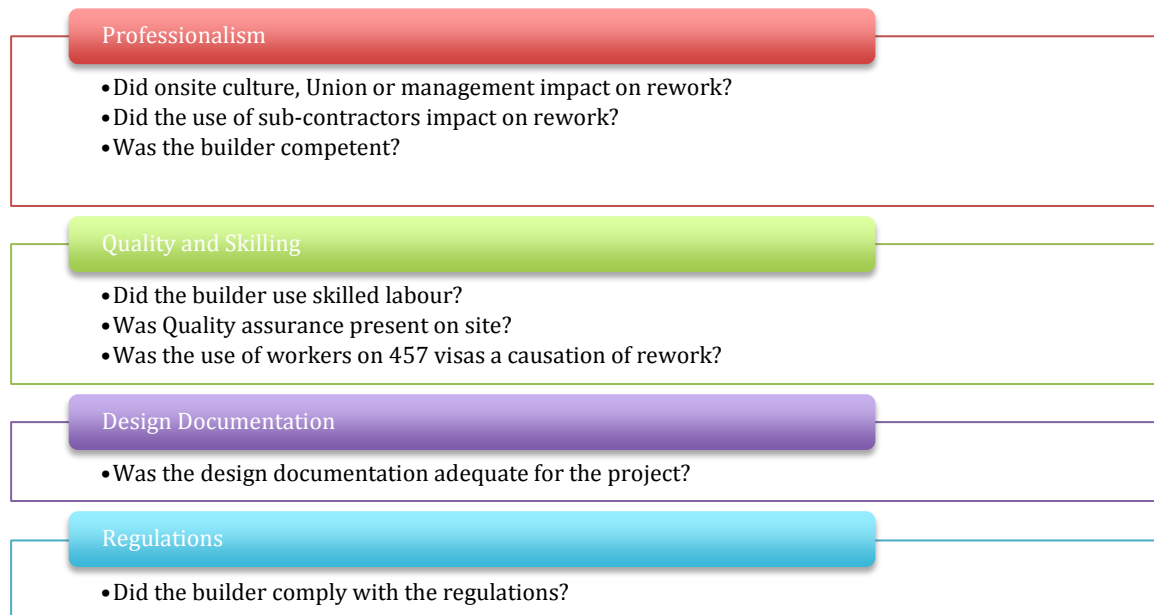
To complete the triangulation of the case study research, selected stakeholders were interviewed. According to Wisker:

*...to 'triangulate' i.e. to back up one set of findings from one method of data collection underpinned by one methodology, with another very different method underpinned by another methodology - for example, you might give out a questionnaire (normally quantitative) to gather statistical data about responses, and then back this up and research in more depth by interviewing (normally qualitative) selected members of your questionnaire sample (Wisker, 2007, Ch8).*

The study gained significant insights into the causes of rework on the case studies. Participants spoke freely of their personal experiences whilst being directed within a set framework of questions.

### **3.9.4 Semi-Structured Interview**

Semi-structured interviews were used to collect qualitative data. These were used to obtain data relevant to the questions listed in Section 3.3. The relationship between these questions and the themes shown in Section 3.2 are provided in Figure 15. The data so obtained has been summarised under the four theme headings in Figure 19.



**Figure 19 - Summarised Literature Review Questions and Themes**

Case study was deemed distressed. In seeking answers to the themes mentioned previously and questions that materialised from literature, the study utilised a phenomenological hermeneutic approach, and according to Sher, has been popularised in some domains as “lived experience studies” (Sher, 2014,80). Therefore, seeking responses from the selected stakeholders who have had a direct exposure to the case study in question will render that “lived experience” viewpoint.

Thirty-three questions were presented to stakeholders. These required a yes/no answer or a graded response on a Likert scale. They were also given the opportunity to speak freely on selected questions. The questionnaire encompassed the following:

#### Management:

Contractor’s organisational structure.

Cost and time to complete the project.

Working conditions including Workplace Health and Safety.

Management and on-site labour skills.

Relationships between client, sub-contractors and on-site labour.

Working with cultural differences.

#### Documentation:

Consultants involvement on site.

Quality of documentation.

Adequacy of documentation.

#### Quality:

Quality assurance measures.

Quality of work delivered.

#### Culture:

Specific questions were also asked about culture. The initial goal was to prove the cultural differences in management playing a significant role in CS1. Impartiality was crucial, as the interviewee was not to be prompted or to be persuaded in any specific direction.

#### Regulations:

No direct questions were asked about regulations, legislation or certification. At the outset of this study, it was thought that cultural differences created an environment for the case studies to become distressed. It was only during the course of interviews that regulations emerged as a possible contributor.

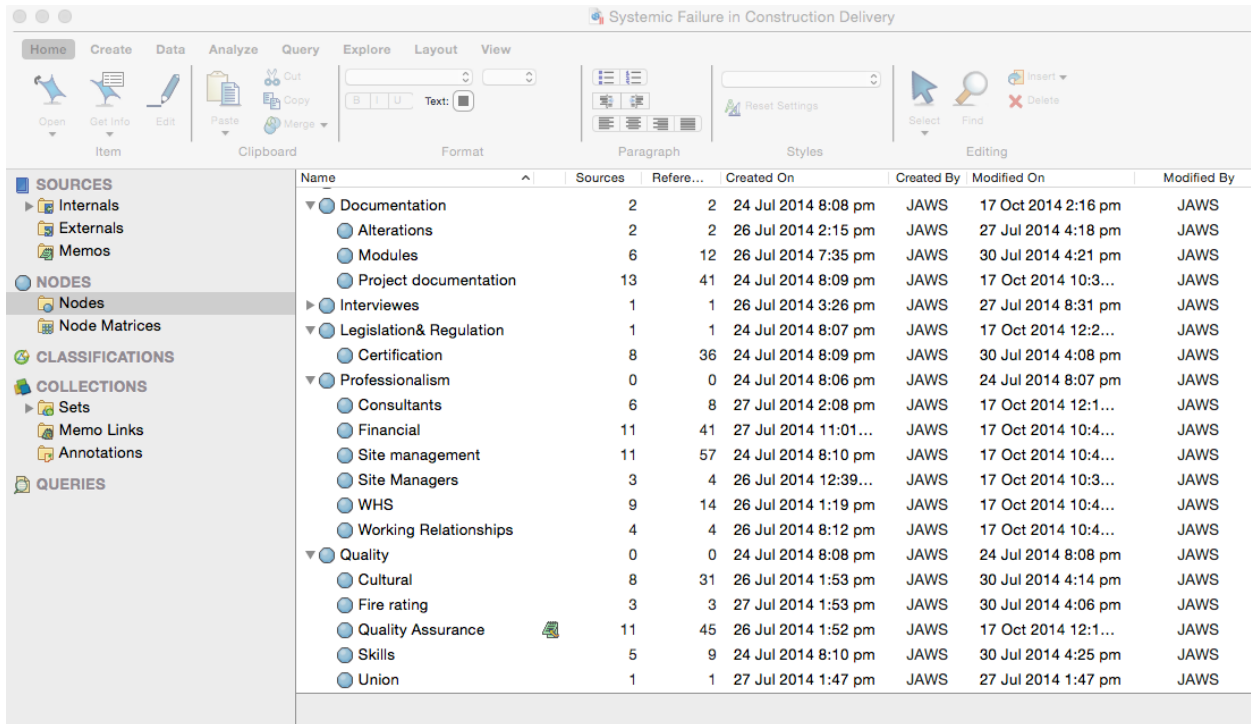
Following each quantitative question, participants were given the opportunity to speak freely on the topic being questioned.

The final capstone question was to ascertain stakeholders' overall opinion of the case study's causation of rework.

The interviews were audio recorded, transcribed and analysed using Nvivo software.



According to the QSR website, NVivo is a platform for analysing all forms of unstructured data by using a powerful search engine for interrogation, resulting in findings by way of subtle connections between stored data. (QSR International., 2015)



The screenshot shows the NVivo software interface with the title 'Systemic Failure in Construction Delivery'. The left sidebar contains a tree view with categories: SOURCES (Internals, Externals, Memos), NODES (Nodes, Node Matrices), CLASSIFICATIONS, COLLECTIONS (Sets, Memo Links, Annotations), and QUERIES. The main area displays a table of themes and their associated data.

Name	Sources	Refere...	Created On	Created By	Modified On	Modified By
Documentation	2	2	24 Jul 2014 8:08 pm	JAWS	17 Oct 2014 2:16 pm	JAWS
Alterations	2	2	26 Jul 2014 2:15 pm	JAWS	27 Jul 2014 4:18 pm	JAWS
Modules	6	12	26 Jul 2014 7:35 pm	JAWS	30 Jul 2014 4:21 pm	JAWS
Project documentation	13	41	24 Jul 2014 8:09 pm	JAWS	17 Oct 2014 10:3...	JAWS
Interviews	1	1	26 Jul 2014 3:26 pm	JAWS	27 Jul 2014 8:31 pm	JAWS
Legislation & Regulation	1	1	24 Jul 2014 8:07 pm	JAWS	17 Oct 2014 12:2...	JAWS
Certification	8	36	24 Jul 2014 8:09 pm	JAWS	30 Jul 2014 4:08 pm	JAWS
Professionalism	0	0	24 Jul 2014 8:06 pm	JAWS	24 Jul 2014 8:07 pm	JAWS
Consultants	6	8	27 Jul 2014 2:08 pm	JAWS	17 Oct 2014 12:1...	JAWS
Financial	11	41	27 Jul 2014 11:01...	JAWS	17 Oct 2014 10:4...	JAWS
Site management	11	57	24 Jul 2014 8:10 pm	JAWS	17 Oct 2014 10:4...	JAWS
Site Managers	3	4	26 Jul 2014 12:39...	JAWS	17 Oct 2014 10:3...	JAWS
WHS	9	14	26 Jul 2014 1:19 pm	JAWS	17 Oct 2014 10:4...	JAWS
Working Relationships	4	4	26 Jul 2014 8:12 pm	JAWS	17 Oct 2014 10:4...	JAWS
Quality	0	0	24 Jul 2014 8:08 pm	JAWS	24 Jul 2014 8:08 pm	JAWS
Cultural	8	31	26 Jul 2014 1:53 pm	JAWS	30 Jul 2014 4:14 pm	JAWS
Fire rating	3	3	27 Jul 2014 1:53 pm	JAWS	30 Jul 2014 4:06 pm	JAWS
Quality Assurance	11	45	26 Jul 2014 1:52 pm	JAWS	17 Oct 2014 12:1...	JAWS
Skills	5	9	24 Jul 2014 8:10 pm	JAWS	30 Jul 2014 4:25 pm	JAWS
Union	1	1	27 Jul 2014 1:47 pm	JAWS	27 Jul 2014 1:47 pm	JAWS

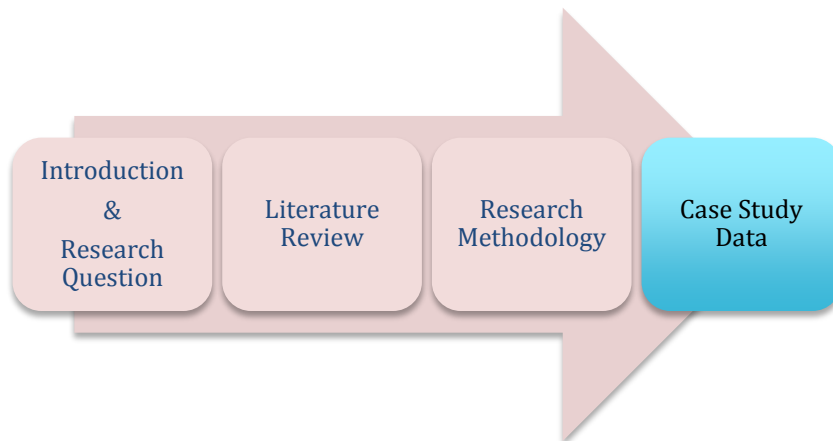
Figure 20 - NVivo software indicating data and themes.

### 3.10 Summary – Chapter 3

An analysis of relevant literature has allowed a number of themes to be explored. These made it possible to identify the causes of rework within a case study environment.

MMR was the preferred option because of its quantitative outcomes giving a snapshot of potential causations. Qualitative responses from a semi-structured interview could uncover possible latent viewpoints that may expose underlining issues leaning towards answering the research question. Triangulation was the preferred tool for analysing the data collected using NVivo software.

## 4. Case Study-Data



### 4.1 Introduction – Case Study Data

This chapter provides a detailed background of CS1 and to a lesser degree CS2. The data collected from the stakeholders associated with these case studies are presented here. The findings of each case study are compared with each other and with relevant literature. It should be noted that the author played a significant role in the remediation process of CS1 and therefore had good access to stakeholders. Fortuitously, some of these stakeholders were also associated with CS2. In addition, both projects were constructed by Chinese construction companies. The builder for CS1 was Hong Kong based whilst the builder for CS2 came from the Peoples Republic of China. It was very evident when the author became involved with CS1 that the practices adopted by these Chinese builders were very different in management style experienced in Australia. However, the delivery mechanism adopted by both builders were quite similar. Both projects relied heavily upon their own use of labour, both companies had a substantial on site labour force imported from China using the 457Visa pathway and in both instances the working relationships between workers and management could be described as confronting at times when observed by the author. The intention of the 457Visa program is to allow the importation of skilled workers into Australia to offset the shortage of trades. This was not the case for either project as ample resources were available when I undertook the remediation process. Only a relatively small number of these imported workers could be regarded as competent. The skilled workers were assisted by numerous unskilled workers in all areas of construction but in particular the erection of the concrete structure, formwork and reinforcement.

## 4.2 Background to Case Study 1

Case study 1 (CS1) contains the hallmarks of the initial findings in the literature review (Chapter 2). CS1 presents the size, structure and management issues identified as being of concern to several organisations, including Owners Corporation Networks (Easthope et al., 2012).

Briefly, CS1 involved a development application was lodged to the local City Council for a mixed development for retail and hotel development on 14th December 2000. Subsequently, tenders were let to find a suitable builder to execute the works in accordance with the documentation prepared by the initial local project architect. On the 30th March 2005, a building contract was let for the re-design and construction of the project to Builder 1. Within months, Builder 1 sold their interests to a foreign company (Builder 2) who intended to establish themselves in Australia to grow their core business of exporting building products from overseas to their subsidiary companies in Australia.

The project was fully documented at the initial contract stage. To facilitate the use of building components from overseas, Builder 2 elected to alter the design and incorporate modular cubicles for bathrooms, kitchens and laundries.



**Figure 21 - Arrival of the first Module (Source: John Smolders)**

In the initial project design, the floor slabs were not intended to be level. To accommodate the modules and allow for free movement on the floor, the project was redesigned to level all the slabs. In addition, set downs had to be provided so that the finished floor levels of the modules lined up with the surrounding floor level. This later became the source of problems that required entire floors to be re-topped.



**Figure 22 - Interior view of Modules-pictures (Source: John Smolders)**

After demolition and earthworks, work on the concrete structure began. Little effort was made to counteract ground water from entering the lower levels of the building. The design changes noted above caused the structure to be built below the water table, subsequently causing water ingress.





Level 2 as shown on Figure 23. Builder 2 subsequently adopted a modular aluminium formwork system (designed by Builder2) and manufactured overseas.



**Figure 24 - Aluminium Formwork system-pictures (Source: John Smolders)**

The system appeared to work well in its initial clean state. However, after some use, concrete slurry began to build up on the sides of the formwork modules, distorting the concrete surface. The result of the continual use of this formwork caused major deflections to columns, stair wells, lift shaft, door openings and external façades. These deflections resulted in the misalignment and positioning of reinforcement steel, and caused on-going concerns. A significant amount of time and cost was incurred to rectify these structural distortions. Scaffolding had to remain around the structure for longer than was originally programed. The entire structure had to be solid plastered after scrabbling (Figure 25) and a heavy textured paint was used to assist with smoothing out the remaining deflections.



**Figure 25-Realigning Wall to be Vertical (Source: John Smolders)**

Cubicles began to arrive on site in March 2007. A climbing landing platform was established centrally in the building to receive delivery of the modules. The modules were not protected from the elements and significant damage arose during transportation and exposure to weather.

The builder engaged few supervisory staff. They engaged a large contingent of unskilled foreign workers on 457 visas which resulted in few Australian trades working on site.

The plumbing contractor was responsible for the re-design and installation of water reticulation and

drainage. Late in January 2008 it was revealed that neither the contractor nor the plumber had lodged an application to the Water Authority to assess the hydraulics design. This oversight caused significant delay and resulted in considerable costs as the drainage system had to be removed and completely redesigned (Figure 26). This process took eight months to complete due



**Figure 26 - Hydraulic Rework (Source: John Smolders)**

to the reluctance of local hydraulic engineers to provide a new design and engage with the project. The rectification included breaking through existing walls to gain access to the pipework, requiring extensive rework in plastering and painting. As a consequence, other service contractors (including electrical, sprinkler, mechanical, fire protection and air conditioning) were scrutinised and subsequently replaced together with their works when inferior and sub-standard work practices became apparent. All of

these service contractors relied on a design and construct contract with Builder 2. Unfortunately, these designs were not forthcoming from Builder 2 who allowed these works to continue on site. This resulted in total disharmony between the trades and made coordination a very difficult task.

The windows and sliding doors were designed and manufactured overseas and installed by the builder's directly employed workers. The client was advised that these windows were of the same style used successfully overseas and that the design was based on the "fish bowl" system whereby the window is fully sealed. However, the windows had no provision for expelling water to the outside of the building as is common with curtain walling systems based on the 'fish bowl' principle (Failure Mechanisms in Building Construction - Google Books, n.d.); these windows and doors were not supplied with a sub-sill that would have normally provided drainage to the exterior.

Finishing trades began on site early 2008. The Gyprock contractor's contract described the works as 'all the walls and ceilings except for the bathrooms and kitchens' (which were part of the modules). The omission of this work caused concern as the modules did not meet Building Code of Australia (BCA) standards, requiring considerable rework. A specialist site engineer was employed to investigate solutions whilst working alongside the re-appointed initial local architect, engineers, suppliers and a BCA consultant. No documentation or design was

forthcoming from Builder 2 to demonstrate the integration of services, sound proofing of service ductwork, and fire rating between tenancies and ceiling soffits. The rectification works exceeded \$15m over the original tender price of \$24m.

Apart from the building defects described above, issues relating to non-payment of subcontractors and payment of debts associated with other projects created financial stress. This resulted in accounts and wages not being paid, causing industrial disputes, and unsafe work practices.

Builder 2 subsequently went into receivership and left the country. The financier took control of all financial disbursements incurred on site and the project was completed under the management of the financier's appointed superintendent.

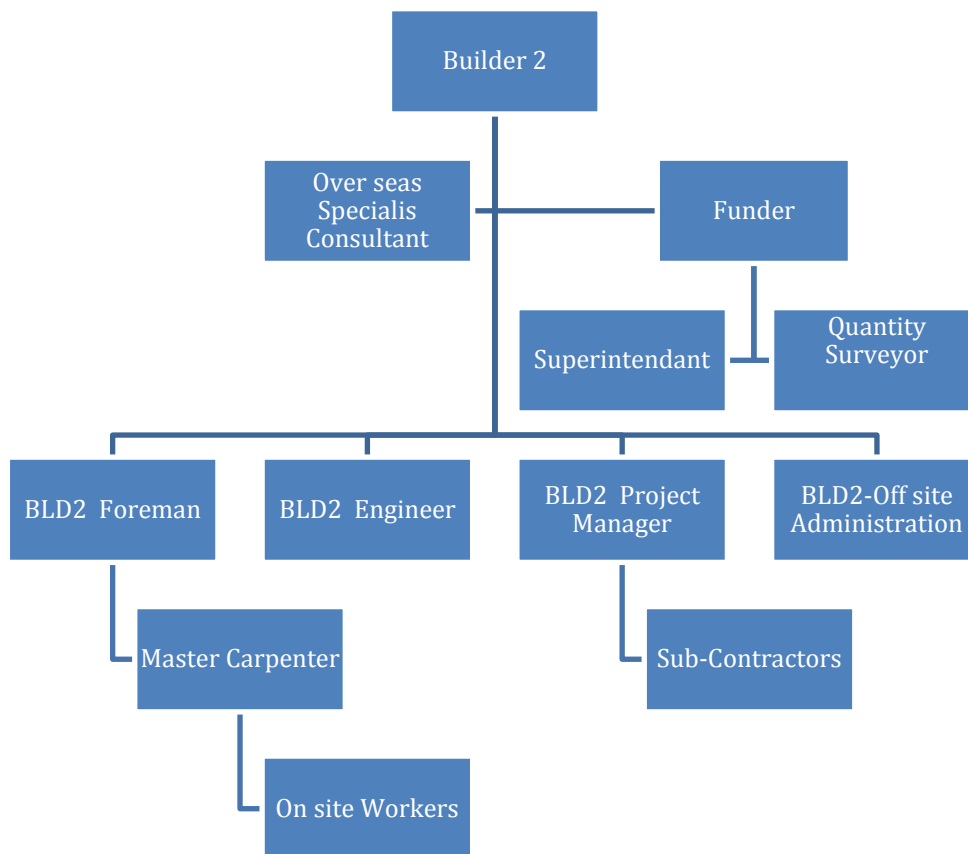
CS1 has all of the attributes described in literature, refer to Table 14.

#### **4.2.1 Project Structure - CS1.**

CS1 went through three distinct phases of construction

- Phase 1, Builder 1 commenced works using local consultants and locally prepared documentation with an able site team.
- Phase2, Builder 2 altered the design to utilise their modules, substantially reducing local involvement and site staff.
- Phase 3, included rectification of the project after direct involvement by the client.





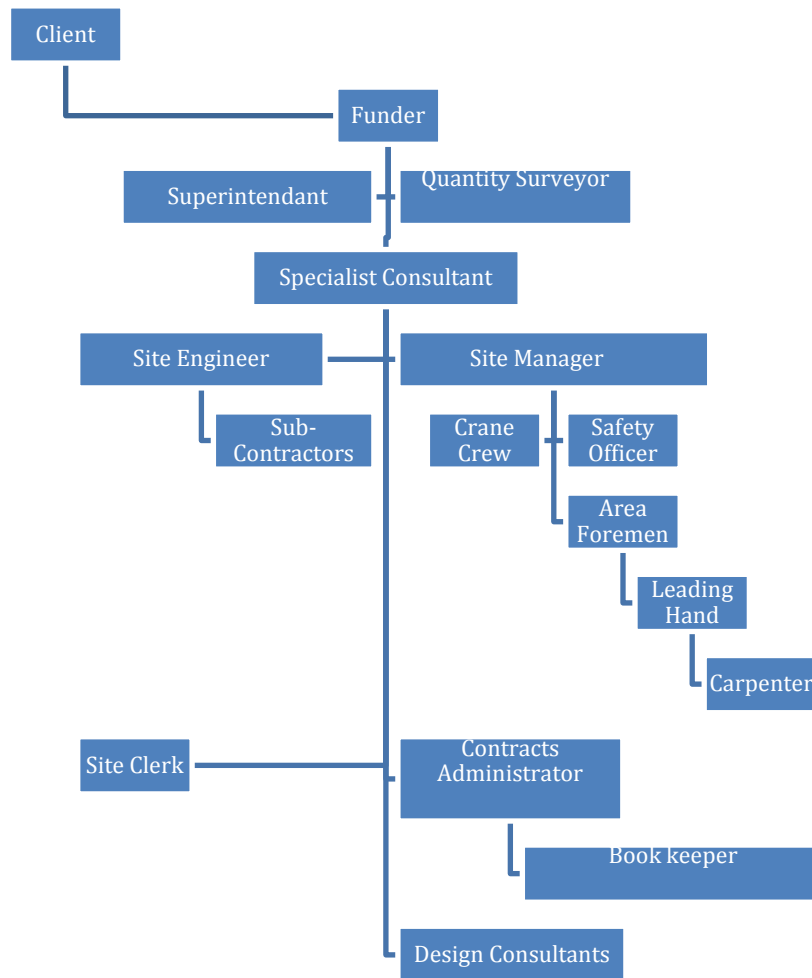
**Figure 27 - Organisational Structure of Builder 2**

It should be noted the management structure of Builder 2 on site was also unusual as it was minimal in terms of site supervision and office administration. The team was headed by Builder 2's project manager who had an onsite engineer assisting with design changes by continually creating sketches for communicating these to the workers, in lieu of a completed set of architectural and structural drawings. All instructions and other administrative documents were in Chinese.

The Chinese project manager and the Chinese engineer spent very little time on site. They argued that it was culturally inappropriate to have dialogue with the site workers. Any carriage of instruction from senior management to the workers was exchanged via their site Foreman. The 'Foreman' was the person who stood between senior management and the workers, directing their labour with the assistance of a 'Master Carpenter'. This multi-skilled person was able to train their unskilled workers directly on site. The site crew varied in number from time to time, but during the construction phase, up to 45 men were employed. These covered the various

trades of: formwork, steel fixing, concrete, carpenters and general labourers who were on site seven days a week from sunrise to sunset.

The second phase of the project, undertaking rectification works, was reorganised using local tradesmen and site managers. They adopted standard construction methodologies and conformance to the BCA. Figure 28 illustrates the management structure on site during rectification works.



**Figure 28 - Site organisation during rectification works.**

The rectification phase saw an entirely different on-site structure. A specialist consultant project manager (the author) was appointed to oversee the completion of the project with the assistance of onsite administration staff including a site engineer, contracts administrator, book-keeper and safety officers, see Figure 28.

### **4.3 Background to Case Study 2**

Case Study 2 (CS2), had two stages. Firstly, a builder/developer and secondly, a builder was appointed by the financier to complete the project. This project was a multi-storey building within 5 kilometres to CS1. The building comprised basement car parking, retail space on the ground and first floor with residential accommodation on the upper floors. The building was constructed at the same time as CS1 and suffered extensive time delays as reported in the local press (McCarthy, 2010) Both CS1 and CS2 were built by Chinese builders. The buildings were similar in size and budget. Due to adverse media coverage relating to this project, only three parties were willing to be interviewed.

A project structure was not available for CS2.

### **4.4 Quantitative Data Received.**

Ten participants undertook the semi-structured interview as described in the previous chapter under the heading 3.9.4 Semi-Structured Interview. Whilst all ten were associated with CS1, three of these participants completed the same interview for CS2. The participants' responses for both case studies were recorded using a Yes-No answer and a Likert scale of poor, fair and good. Both responses have been illustrated in graphical form below.

#### **4.4.1 The Yes-No questions.**

The following 'Yes-No' supplementary questions were used to ascertain a quick snap shot of possible causations to rework. A full list of questions is available in Appendix 7 - Interview Questions.

The questions asked were,

- Q12 Did the contractor use their own labour extensively on site?
- Q13 In your opinion did the contractor's on-site staff and workers have adequate experience to undertake their work?
- Q23 Was the client actively involved with the running of the project?
- Q24 Was the client slow in making decisions?
- Q25 Were there difficulties with payments from client to the contractor?
- Q29 Did the consultants regularly visit the project?
- Q31 Was there a quality assurance system in place?

#### 4.4.2 Results for CS1

A summary of responses to these questions for CS1 is provided in Figure 29. CS2 has been detailed separately under the heading Results for CS2 below and demonstrated in Figure 31. Due to graphical restrictions some of the questions have been truncated but have been listed above.

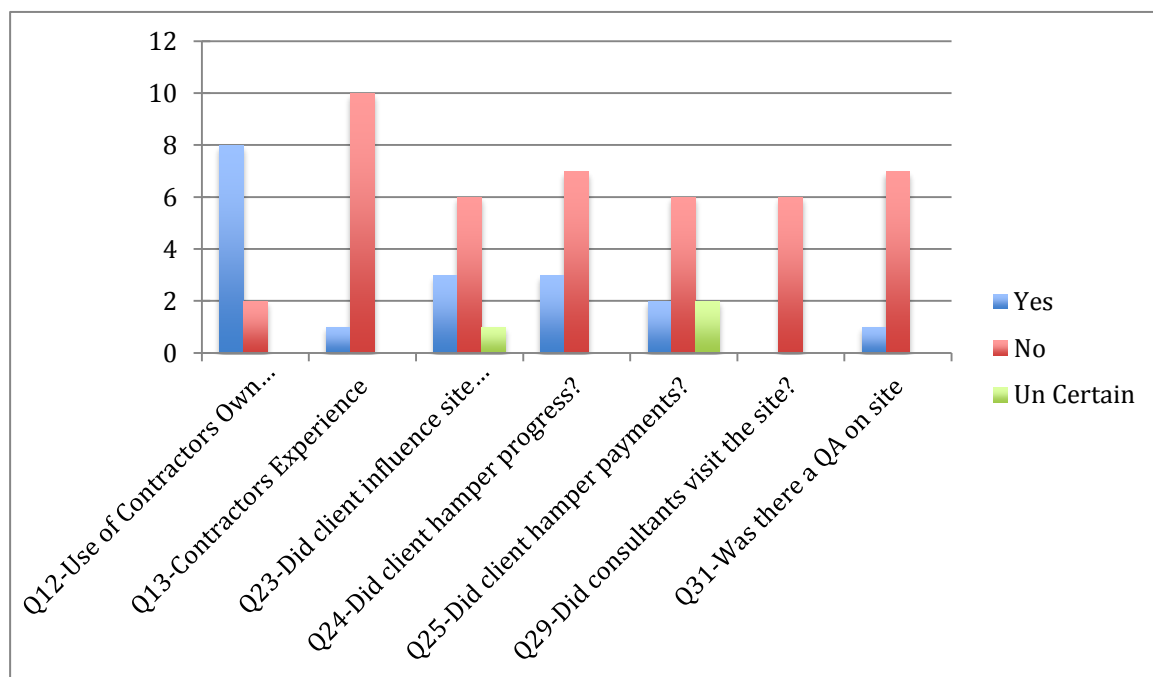


Figure 29 - CS1 Yes and No response

Figure 29 identified the following key results

- Q12- 8/10 confirmed direct labour was used on site.
- Q13-10/10 confirmed the contractor was in-experienced.
- Q23- 6/10 confirmed client's influence did not hamper site management.
- Q24- 7/10 confirmed client involvement hampered the project.
- Q25- 6/10 expressed no payment difficulties from the client.
- Q29- 6/10 could not confirm the presence of consultants on site.
- Q31- 7/10 confirmed that there was no quality assurance on site.

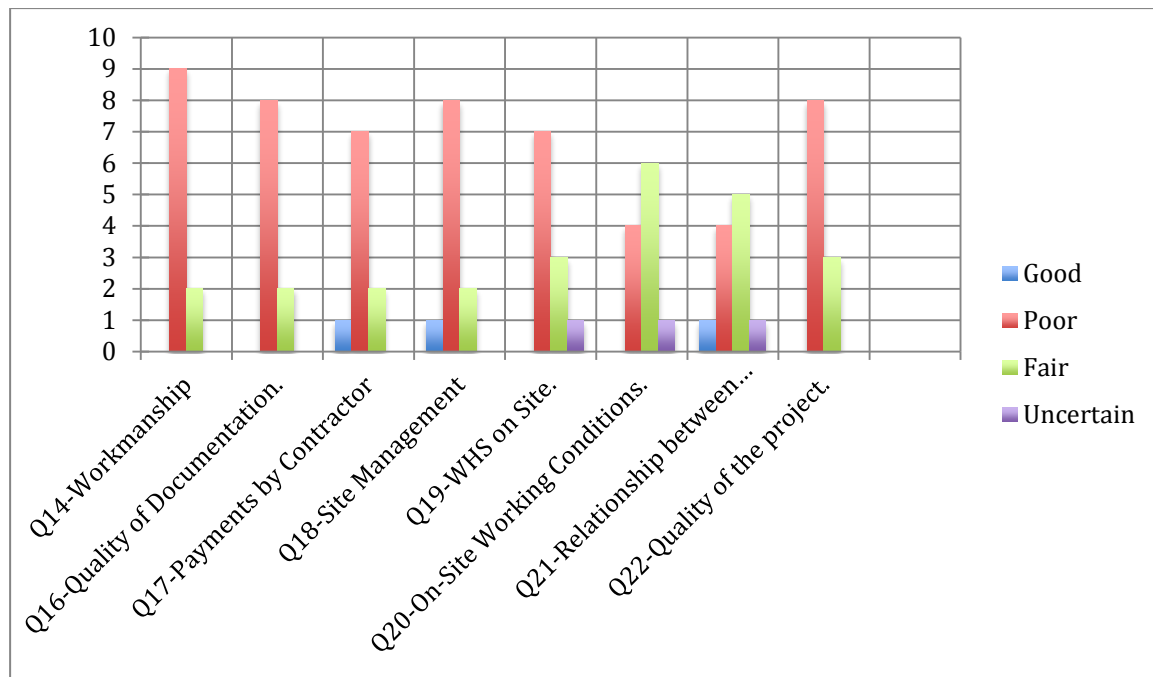
Please note, Q 1 to Q11 were generic descriptive questions of the project. As for Q 24 and Q25, the client became active on site after the project was deemed to be distressed thereby affecting the responses received in relation to the clients influence on site affecting management.

The quantitative Yes-No responses for CS1 confirmed that inexperience within management and their use of their own labour was a detriment to the project. The client's involvement hampered the project but to what extent is explored in the qualitative findings. Finally, participants confirmed that the consultants were not involved in day-to-day decisions. Site personnel were forced to rely on the initial documentation provided to them. This was compounded by the lack of any evident QA procedures.

#### **4.4.3 The Likert style questions.**

A more detailed view was obtained by using the Likert system and the following questions were asked.

- Q14 How would you rate the on-site workers to quality assurance?
- Q16 Was the on-site construction documentation adequate?
- Q17 In your opinion, did the contractor administer payments and wages in a timely manner?
- Q18 How would you rate the site management?
- Q19 How would you rate occupational, health and safety on site?
- Q20 How would you rate working conditions on site?
- Q21 How would you rate working relationships between sub-contractors and the contractor?
- Q22 How would you rate quality of workmanship?



**Figure 30 - CS1 Likert response findings**

Figure 30 can be interpreted as follows,

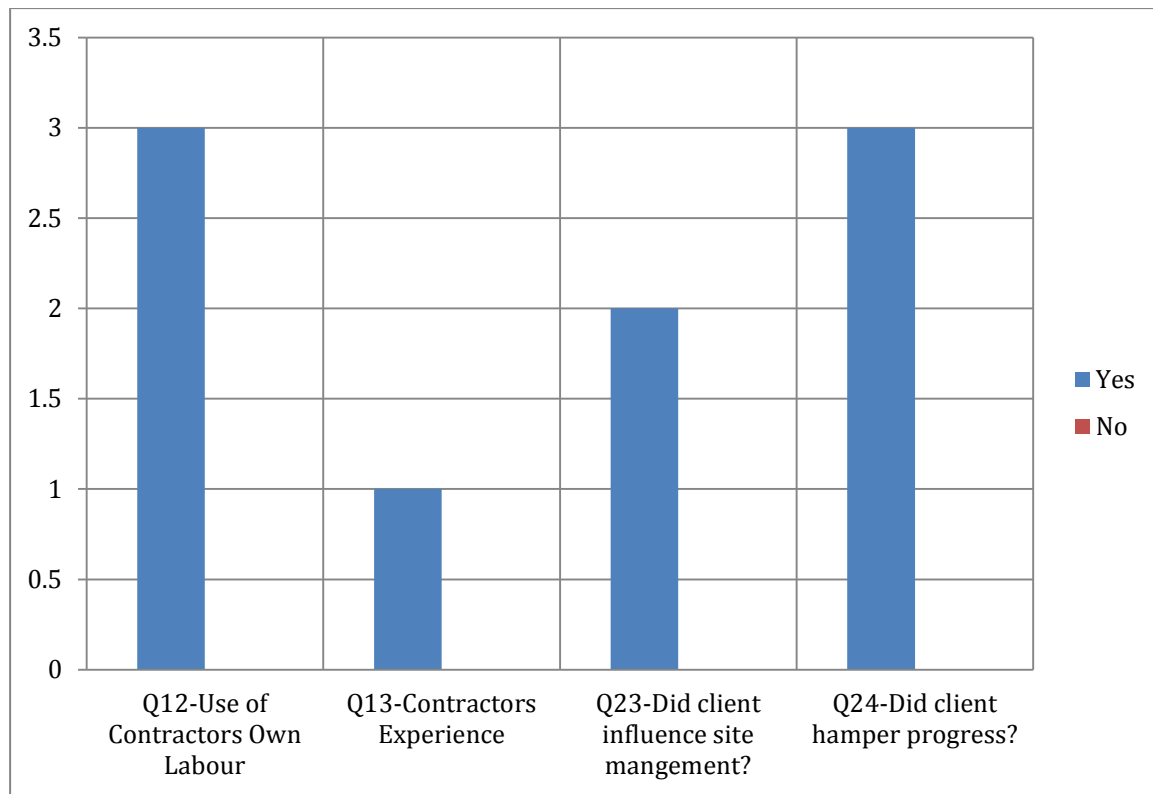
1. Q14-9/9 -rated Workmanship as poor..
2. Q16-8/9 -rated Documentation as poor.
3. Q17-7/9 -rated Payments by contractor as poor.
4. Q18-8/9 -rated Site Management as poor.
5. Q19-7/9 -rated WHS on site as poor.
6. Q20-5/9 -rated Working conditions as fair whilst 4/9 rate it poor.
7. Q21-5/9 -rated Relationship as fair whilst 4/9 rated it as poor.
8. Q22-8/9 -rated The overall quality of the project as poor.

The responses returned a similar result as for the Yes-No questions. Overwhelmingly workmanship, site management, WHS and working relationships were seen to contribute to **professional** failings, poor **quality** and poor **documentation**.

The significance of these findings corroborated the findings of literature, strengthening the question, why was this project allowed to continue?

#### **4.4.4 Results for CS2**

This project, similarly managed by Chinese personnel, demonstrated a different management structure to CS1. The client of CS2 was actively involved and had direct control with the project's management team as opposed to CS1.



**Figure 31 - CS2 Yes and No response**

CS2 identified the following,

Q12-3/3 participants confirmed the use of the contractor's own labour on site.

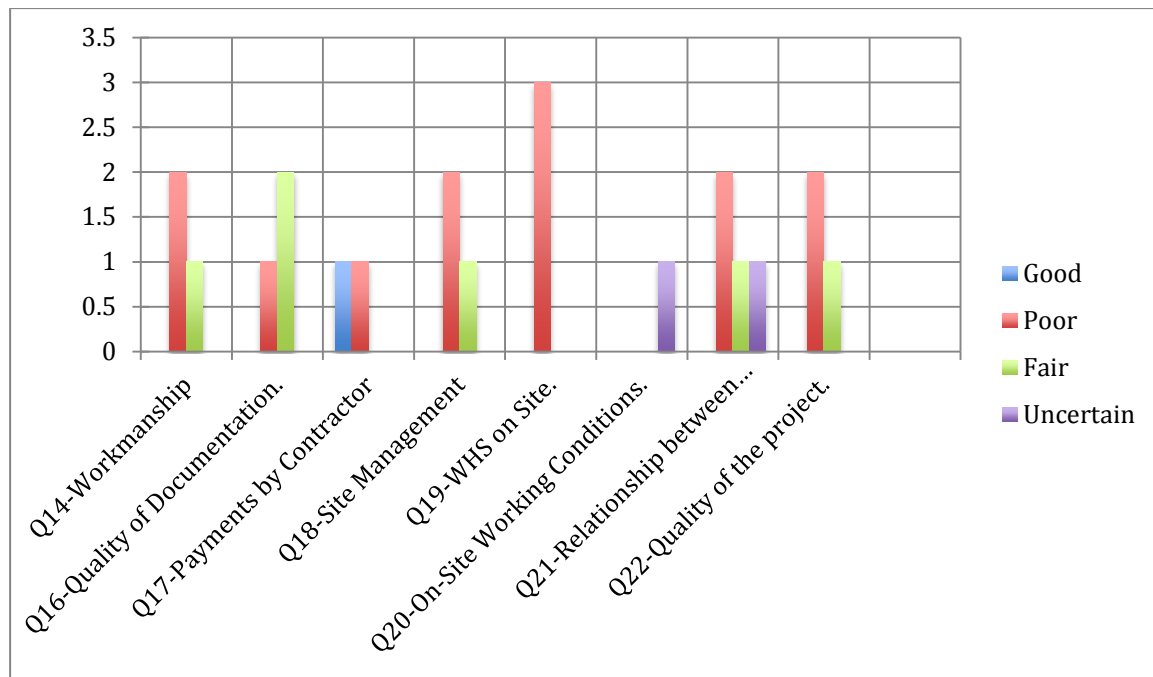
Q13-1/3 participants believed the contractor was experienced.

Q23-2/3 participants felt that the client influenced site management.

Q24-3/3 participants believed the client hampered progress on site.

Participants commenting on CS2 confirmed the use of the contractor's own labour on site. Insufficient data was collected to confirm or otherwise the contractors experience. They confirm the client's direct involvement in managing the site.

The Likert findings for CS2 (Figure 32) provide a strong indication of poor quality delivery as was the case in CS1. Again the graphics does not allow to fully inserting the questions.



**Figure 32 - CS2 Likert response findings.**

Figure 32 depicts the results from the yes/no survey for CS2,

9. Q14-2/3 -rated Workmanship as poor.
10. Q16-2/3 -rated Documentation as fair.
11. Q17-1/3 -rated payments by contractor as poor the remainder had no comment.
12. Q18-2/2 -rated Site Management as poor.
13. Q19-3/3 -rated WHS on site as poor.
14. Q20-0/3 –no rating available for working conditions.
15. Q21-2/3 -rated Relationship as poor whilst 1/3 rated it as fair.
16. Q22-2/3 -rated the overall quality of the project as poor whilst 1/3 suggested fair.

CS2 was higher than CS1 whereas CS1 gave an overwhelming response of poor, CS2 suggested some areas were deemed fair, in particular Documentation.



## 4.5 Quantitative Findings

Results from questions formatted as Yes-No or Likert has identified similar flaws in both case studies during the course of the construction process comparing with literature.

<b>Literature Causation of rework</b>	<b>Case Study 1 &amp; 2 Findings</b>
Poor design documentation and control	Yes
Poor management skills i.e. Site management	Yes
Lack of financial skills i.e. On-site financial control Budget estimating	Yes
Poor workmanship i.e. Lack of QA	Yes
Cultural differences i.e. Communication and language barriers.	Yes
Poor regulatory building control i.e. Non Compliance	Yes

**Table 16 - Case Study Preliminary Findings**

As demonstrated above, the findings from the quantitative questions aligned with the literature review indicating poor outcomes for two projects chosen for this study in terms of cost, time and quality. It could be said that these outcomes came as a direct result for a number of reasons. Both builders on CS1 and CS2 demonstrated a building management practice that was at odds with standard building practice as conducted in Australia. Documentation was not approved for construction as CS1 did not have a Construction Certificate. In an attempt to maintain progress on site, the contractor prepared diagrammatic sketches which were used to communicate to the site team to explain engineering and architectural details as and when required. Poor management and design documentation led to poor quality. This was exacerbated by language barriers and the use of unskilled workers. In relationship to the themes of this study, the findings were as follows:

- Professionalism- Inability to adapt to Australian culture and management styles.
- Documentation- Inability to maintain document control as well as complying to Australian Standards.
- Quality- Inability to deliver a quality product acceptable to Australian Standards.

In addition, to substantiate parallel findings from CS1 and literature, another element surfaced from the interviews, specifically, **Legislation**, in particular an inability to design and construct in accordance with Australian Standards.

Therefore, four factors were identified which strongly align with the findings from the literature and the case studies. These findings reinforce the question, why was rework still occurring and where were the checks and balances that ought to exist to curb the phenomena? It occurred that neither the builder, consultants nor authorities identified the problems on site until it was too late. Subsequent intervention to curb any further incidence of rework came at a considerable cost to the project.

CS1 was not an extraordinary and unique example of a distressed building. The second case study (CS2) was identified to demonstrate that major multi-million dollar rework projects are not unusual. Though not done to the same depth as CS1, CS2 explored the views of some of the stakeholders who were willing to be interviewed.

There was a strong correlation of outcomes between these two case studies. The major differences were the involvement of the client, sourcing of materials and the standard of documentation and site management. Therefore, as a capstone to the interview, a final generic quantitative question was raised to identify causation.

#### **4.5.1 General Response Question.**

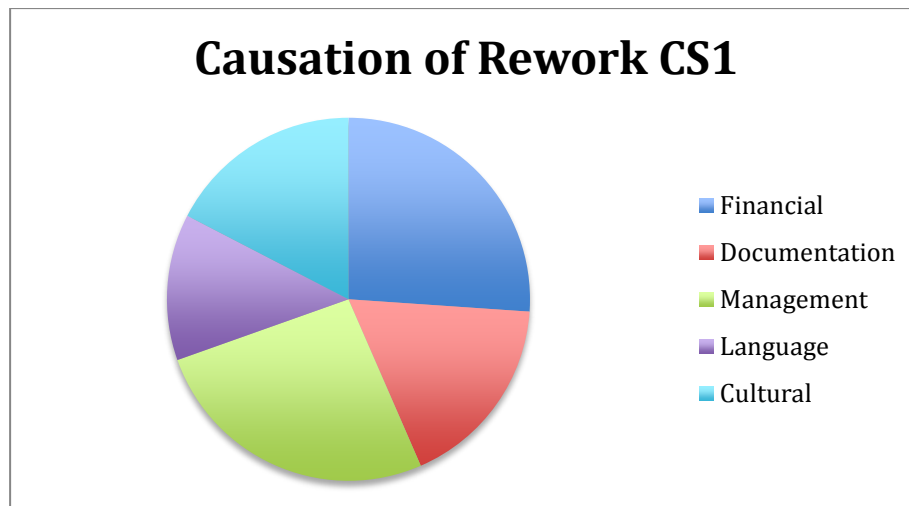
The final question was designed to seek out hidden agendas from participants. It consisted of a tick box answer designed to seek out a single contributory factor and the participants were encouraged to speak freely. The question is shown below:

***Q32-In your opinion, what factors contributed to rework on this project?***

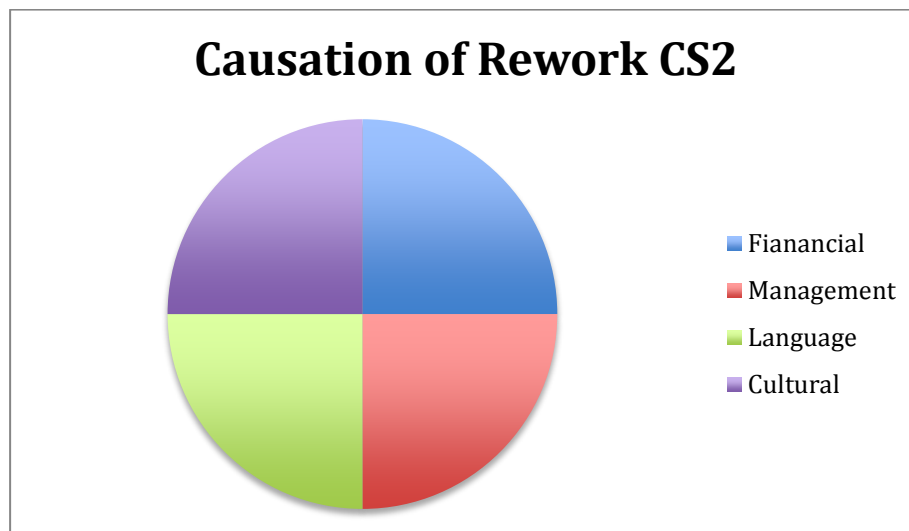
The question comprised the following tick box options:

- K-01. Financial difficulties
- K-02. Poor documentation of plans and specification.
- K-03. Poor management systems.
- K-04. Language difficulties.
- K-05. Cultural differences
- K-06. Other.

Figure 33 and Figure 34 graphically represent the findings of this question for CS1 and CS2. It is interesting to note a similar outcome for both projects.



**Figure 33 - Causation of Rework CS1**



**Figure 34 - Causation of Rework CS2**

Table 17 provides a unified viewpoint of both case studies representing similar themes for all categories except for documentation. It was revealed during the interviews that design documentation for CS1 was initially prepared in Australia but later revised in China, whereas all of the documentation for CS2 was produced in Australia.

Cause of rework	CS1	CS2
Financial	20%	25%
Documentation	20%	
Management	20%	25%
Language	20%	25%
Cultural	20%	25%

**Table 17 - Cause of Rework CS1 and CS2**

### 4.5.2 Summary of Quantitative findings

The combined themes from the case studies and government inquiries are shown in Table 16. It is noteworthy that government authorities were aware of the problems experienced by industry as these were identified as causes of concern in the inquiries also shown in Table 18.

Cause of rework	Case Study Issues	Government Inquiries
Financial	Payment difficulties Financial mismanagement	Collins Inquiry, 2012 Insolvency
Documentation	Insufficient inspections. Non-Compliance.	White Paper, NSW Government, 2013. Certification Gyles RC 1992. Standardising & BCA
Management	Site management skills. Union intervention WHS non-compliance	Cole RC, 2003 Hanger RC, 2013.
Language	Onsite communication difficulties with staff and workers and their ability to interpret the BCA and legislation	Campbell, 2002, Non-English speaking workers. (NSW Government, 2002,75)
Culture	457 Visa and union intervention.	Skills Shortage NSW 2014.

**Table 18 - Comparing Case Study findings and Government Inquiries.**

Evidence of **Quality** Assurance was not evident in either case study as the majority of participants were critical of the standard of workmanship and the quality on the project overall.

Disregard for building **regulations** (BCA) was particularly evident on CS1. As documentation was prepared overseas, it did not comply with Australian codes and the builder failed to achieve a construction certificate (CC) prior to construction. CS2 presented no findings regarding **documentation**. Evidence from the interviews showed that CS1 lacked onsite interaction with design consultants thereby contributing to rework.

**Professionalism** with regards to financial management for both projects was strained due to lack of funds available to pay sub-contractors. The projects recovered when the financier took control of funds for both projects and cleared outstanding debts. McCarthy (2009a), an investigative journalist, took considerable interest in both projects and produced numerous reports dealing with matters of parallel interest with this study. In one of these reports, the funder was reported to have taken financial control of the project. Kevin Foley, bank spokesman, said:

*We're not doing it out of the goodness of our heart. We think it's in the best interests of the community, the developer and the bank that the project is completed. That's why we're paying the people on the site (McCarthy, 2009a).*

McCarthy further reported the local Federal Member of Parliament as saying the following when questioned over financial dealings with one of the case studies:

*With amounts approaching \$100 million suspected to be in question, and 38 of the 125 companies in the XXX<sup>1</sup> group suspected of being involved, the ATO's pursuit of XXX for GST fraud and taxation non-compliance is critical (McCarthy, 2009b).*

The site management issues uncovered were similar for both projects. There was a lack of understanding of the BCA and WHS rules. In addition, the use of foreign labour on 457 Visas created an environment for union intervention as well as interest by the Dept. of Immigration. McCarthy reported the following:

*I just arrived one day and they said I didn't have a contract with them any more and another tiler was doing the work," Mr Kim said. Illegal workers were found tiling, laying bricks and labouring at Charlestown yesterday, Mr Logan said. Mr Ferguson (General Secretary of the CFMEU) said "... illegal workers were taking the jobs of Australians. Because of activities like this, young people can't get apprenticeships (McCarthy, 2009c).*

WorkCover, the safety authority for NSW, also kept a keen eye on the case study projects as Kirkwood reported,

*The WorkCover Authority has shut the apartment redevelopment after workers were found on the asbestos contaminated site without safety gear. WorkCover spokesman, John Kirby said Sydney developer had been issued with a \$1500 infringement notice (Kirkwood, 2005).*

**Culture** and language - it was evident from interviews, suggested that working relations with site workers was amicable. However, that relationship did not translate well with sub-contractors who were owed a substantial amount of money by both contractors. A major concern expressed by those interviewed regarding the use of foreign workers, was their lack of **skills** and disregard for WHS rules making communication difficult. As Kirkwood reported;

---

<sup>1</sup>XXX has been used in instances where personal names have been used in the article.

*WorkCover said the organisation had responded to a range of complaints about XXX sites over the past 18 months. The spokesman said more than 50 "improve work method" notices had been issued to three sites: (Project 1), the former (Project 2) apartment block and an apartment block in XYZ Street, Newcastle (Kirkwood, 2008).*

The client for each case study played a significantly different role. With CS1, the client had little involvement with the builder. The client did engage with the project directly when Builder 2 was incapable of completing the project. For CS2, the interviews indicated that the client and the builder were interrelated by corporate structure. Both projects exhibited poor site management. Similarly, relationships on site with others were rated as fair for both projects. Workplace health and safety on both projects were also rated as poor. Questions relating to either builder's experience were overwhelmingly responded to in a negative manner for CS1. Builder for CS2, received a positive response when questioned about experience.

Figure 35 illustrates quality as one of the primary concerns followed by documentation and professionalism. These figures come directly from the Yes-No and Likert response from CS1, the numerical data used in this graph can be viewed in Appendix 4 – Survey Outcomes . Regulation stands alone at this moment because no direct questions were asked at the time of the interviews as it was not envisaged that regulations or lack of may have been a contributing factor to rework.

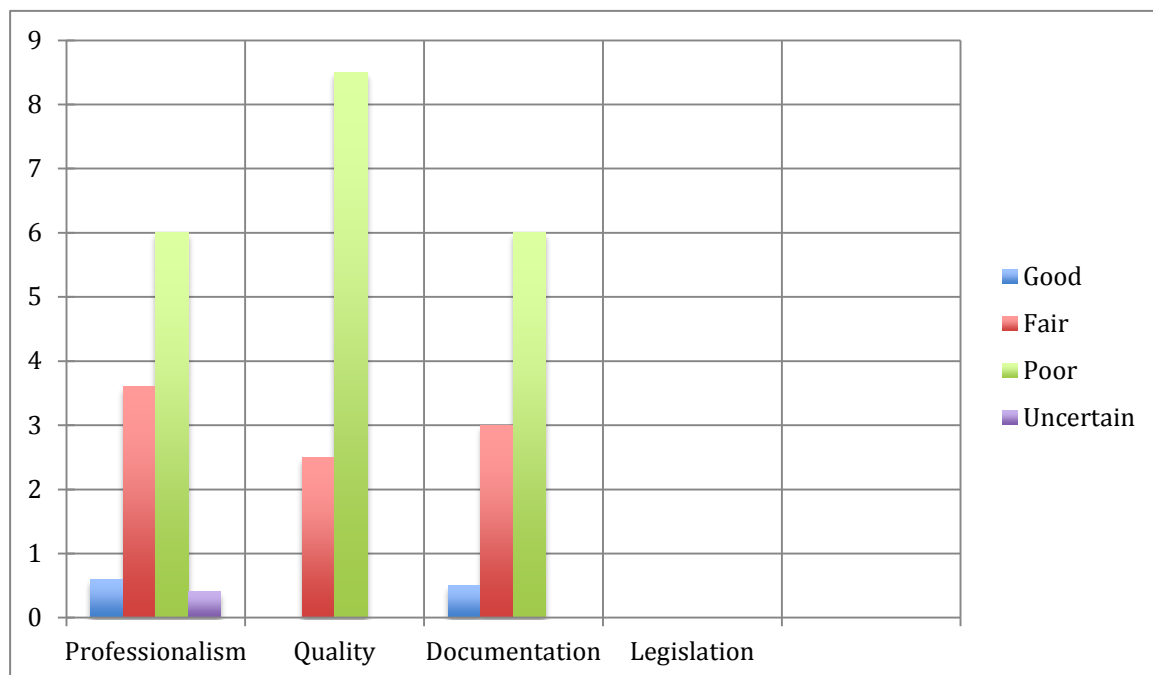


Figure 35 - CS1 - Ratings of the research areas

## 4.6 Discussion of Qualitative Findings.

This section discusses the four primary themes of this study, **Professionalism**, **Quality (skills)**, **Documentation** and **Regulation**. Stakeholders' comments, obtained during the interviews, were used to ascertain any standout gaps and possible causes contributing to rework. Questions that are aligned with the above themes have been included herein. These questions have been derived from literature and used to design the semi structured interview questions.

### 4.6.1 Professionalism.

A recap below of the Questions taken from Figure 19, pertaining to Professionalism.

- Did onsite culture, union or management impact on rework?
- Did the use of sub-contractors impact on rework?
- Was the builder competent?

The site management practices adopted on CS1 and CS2 were foreign to the local region. The management structures followed building and management practices used abroad and were quite different to the management practices and styles adopted locally. All internal communication was in Chinese. However, when dealing with sub-contractors, the language spoken was English. Onsite staff remuneration was bonus-based, creating a large incentive for a small site team to maintain control over expenditure. However, this caused division amongst the Australian workers. Love and Edwards commented on similar findings on one of their case studies, uncovering a trait that resonated very closely with CS1 as discussed below:

*The client's project manager's lack of consultation with occupiers caused a degree of disharmony within the client organization, as different by stakeholder agendas by stake-holder were being pursued. This disharmony was directed at the contractor, who was perceived to be the culprit for cutting costs and not building the facility to their requirements. However, the offender in this instance was the client's project manager who was confronted with a difficult dichotomy, that is, by having to satisfy occupiers' requirements while simultaneously reduce project costs (Love and Edwards, 2004).*

For CS1, Builder 2's PM also had difficulty in completing the project in a manner satisfactory to his superiors abroad as indicated by his superior's responses in the semi-structured interview. At the same time, the PM was being placed under pressure by the client's PM who was seeking a timely completion and quality result as indicated by his statement in the interview:

*It was an overseas chap who had come to Australia and although he was endeavouring to do his best he wasn't up to the mark and we found later on that he was being deceptive with regards to work practices.*

In order to gather this data from CS1, interviewees were questioned about their personal viewpoint of the site management practices adopted by Builder 2. Respondent 10 (a union representative) offered the following observation of management when he visited the site:

*It was hard to tell, because there was always a bunch of people in the office, but nobody really seemed to know what they were doing and you couldn't really find out who they were. There was (sic) a couple of guys who obviously felt themselves fairly important and bossed people around, but I wasn't really sure of their capacity. You could never really find out for sure who was who. But they had some local assistants, a couple of guys that basically were labourers and mostly inexperienced. But however during the course of the job they probably saved their buns, because these guys had a lot of experience by the end of the job, because they had to learn it real quick. There were people that were in those positions, but they just were constantly incompetent. So even though they were there in the normal working day, you would try to probably bypass them and go for the guys who were the labourers on the job if you wanted to get any information about anything, or get something put across, because they conveniently didn't understand English, or conveniently couldn't understand our laws or the way they worked. So there was a project manager, I believe, and there was someone who did the accounts, but they all just seemed mostly terrified. Every time I went there, all they wanted to do was get me out of the place (Union rep.)*

This respondent's snapshot of working conditions on site describes a viewpoint of management being "out of touch" with their workforce and makes a strong argument about the inexperience of management.

The following responses were obtained from the site clerk:

*Too simple to blame cultural, it was more arrogance from the project manager who wouldn't listen to advice from people who knew more than him. I believe it was more arrogance from the project manager (Site Clerk)*

The site clerk's viewpoint above provides another perspective about cultural attitudes and perceived arrogance of the project manager, whereas the contracts administrator cited the following response when questioned about site management:

*There were structures in place, but they weren't in a system that I would, typically - you would, typically, see in a site office. Obviously, there were site foremen. There was a safety officer. They had key people in key roles, sort of fulfilling their roles. In terms of site management I think it was very disorganised. It was, essentially, one person sitting there. The new team were trying to extract information from them. We couldn't track anything. It was*



*very hard to establish what had happened and what hadn't happened. The filing system was all over the place. The drawings were all over the place. Drawings were out of date. The drawings weren't in - services drawings didn't reflect current architectural drawings. It was very poor. If there was a good system in place it was hidden from us, and it would have been in Chinese (CA)*

An external viewpoint was sought from a senior development manager who had worked on the project prior to the ground breaking. He said,

*They are both residential projects, conversion to residential from another use. Unless you have experienced residential project teams and different from commercial and industrial buildings and so on, at least you have people with that specific experience. You don't understand how long it takes and how to do it (Development Mgr.)*

The numerical result from the interviews rating the site management of CS1 returned a result of Good = 1, Fair = 2, Poor = 8. Two out three participants for CS2 rated CS2 as being Poor. (Appendix 4)

Having ascertained site management was at best regarded as poor, the question had to be raised as to how the sub-contractors managed to achieve progress and how they related to the principal contractor. Responses from interviewees included

*“Volatile. That's the only way I could describe it. There was always arguments (sic) relating to payments. There was always sub-contractors (sic) stopping work because they didn't have the right staff, they had the wrong materials. They were bringing a lot of stuff in from overseas and the guys weren't used to working with it. A lot of doubt about whether it was suitable. They were working with people who were being wrong and when people - when you're hiring people that are being paid cash in hand or not being paid proper wages you're really dealing in a cesspool of people who - they're not bad people, but you're only going to get what you pay for. Inexperience or reliability. So a lot of the sub-contractors probably had a lot of reliability problems with the employees, because the employees didn't like the way they were treated on the job, so they'd just go to a better job (Union Rep)*

The development manager's viewpoint on subcontractors was as follows,

*Well, I think deteriorating, mainly fair, at best, I would think. There were a number of subbies that I spoke to who had problems with the job and with the contract*

Delving deeper into the project, the question was asked how they felt Work Health and Safety (WHS) was addressed on site,

*Disregarded. Occupational health and safety? I don't think they read the book. I don't think they would have known what it was, maybe because they were used to the Hong Kong rules (Client)*

*Poor. Had to be continually reminded about doing requirements. Unions were called in on several occasions by some of the workers and they were given notice under the Work Cover Authority Act to perform or the job would be shut down. On more than one occasion that's what's happening. They were, I understand, fined for poor practices and not complying with the guidelines (Project Mgr.)*

*There wasn't any. There really wasn't any management of occupational health and safety. They didn't have - they just didn't have a clue and they have a blatant disregard for our laws and didn't respect them, because their answer would be, in China we didn't have to do it this way and we find that our system is better. So after a lot of pushing and shoving they were getting rudimentary stuff there, but it didn't matter whether they had the paperwork there, they didn't comply with it ever (Union Rep.)*

*There were structures in place, but they weren't in a system that I would, typically - you would, typically, see in a site office. Obviously, there were site foremen. There was a safety officer. They had key people in key roles, sort of fulfilling their roles (Contracts Administrator)*

Appendix 4 provides details from participants who were asked to rate work practices on site relating to WHS. Seven participants chose 'poor', whilst three returned a comment of 'fair'.

The impact of using sub-contractors also came into question whilst interviewing participants. Sub-contractors were predominately selected on price whilst their experience was taken for granted. The net result for either project was poor and defective quality of workmanship compounded by defective materials supplied by the builder in CS1. The practices of engaging unskilled sub-contractors as demonstrated in CS1 could have wider implications for industry if it is allowed to spread. Have these sub-contractors been adequately tested specifically on their capabilities or have they simply provided information to a government department sufficient for them to obtain a licence? In comparison to England's certification system, sub-contractors have the capability of self-certifying their works because their ability to do so has been peer assessed by their guild.

#### **4.5.1.1 Summary – Professionalism.**

These case studies demonstrate considerable onsite disharmony between workers and management due to a lack of managerial skills and an unawareness of safe working practices by both workers and management. Although CS2 fared better than CS1 for delivery techniques,

both projects suffered considerable rework due their lack of understanding of local construction practices and culture. Even though the CFMEU had considerable input into both projects, they made little contribution to reducing the amount of rework. However, their intervention did promote a safer environment for workers.

Therefore, to answer the three questions at the beginning of this section:

- Did onsite culture, union or management impact on rework?
  - Yes it did.
- Did the use of sub-contractors impact on rework?
  - Yes it did.
- Was the builder competent?
  - Yes. The builder was competent but lacked local knowledge of practice and regulations. Skills Shortage and Quality.

Recap of questions derived from Figure 19, Skills Shortage and Quality.

- Did the builder use skilled labour?
- Was Quality assurance present on site?
- Was the use of workers on 457 visas a causation of rework?

## **4.6.2 Skills Shortage**

### **4.6.2.1 Part 1-Skills Shortage**

Perceived skills shortages for both case studies may have been fortuitous. Contractors on both sites imported their own labour from China. However, the level of skills possessed by these workers was questionable. Workers were employed via a labour hire company (associated with the builder) and were on 457 Visas. The unions have branded this practice as Sham Contracting, meaning that employers hiring workers as employees but pay for their services as though they are sub-contractors. Workers on site were exploited through low wages and long hours. This practice is contrary to the aims of the 457 visa program, as the imported workers were not sufficiently skilled.

In an attempt to address the continuing skills shortage, a recent report by the Committee on Economic Development in NSW chaired by David Elliott, MP in March 2014, has within its terms of reference, the following points:

- Identifying gaps in skill shortages; and
- Identifying strategies for government to assist in addressing skill shortages.

The committee identified a number of concerns including:

*The Committee's recommendations cover the gamut of skill shortages, branching into secondary education, technical and tertiary training, measurement and auditing, marketing, and migration. By recommending changes to the ways secondary students are educated, the recognition of prior learning for the technically qualified seeking entry to university, and changes to the way skill shortages are measured and addressed at the regional, state and national levels, the Committee hopes to see that skills are acquired, applied, measured and planned for more effectively, and benefits flow for individuals, professions, businesses and communities (Elliott, 2014)*

Some the concerns identified above are applicable to the construction sector. Secondary education, technical and tertiary training are of concern to the construction industry today. Historically, an apprentice in the building industry would be indentured to a builder for at least five years. Currently a candidate needs only a certificate III course at TAFE or a Recognised Training Organization (RTO) and within 16 months walks away with a certificate as a tradesman or journeyman.

Professional institutions accredit universities but are powerless to influence TAFE colleges and RTO's. Vocational education has become an industry in itself. The current graduates from these training institutions lack a considerable skill-set, compared to the tradesmen of days gone by. According to Bitá:

*The federal government's regulator, the Australian Skills Quality Authority, sanctioned 297 RTOs last financial year — cancelling registration for 25 colleges and suspending 49 others. ASQA deputy chief commissioner Dianne Orr says she is "concerned about the integrity of qualifications offered by some RTOs.*

*The public and industry need to have confidence in the qualifications that are being issued, and that the people holding those qualifications have the competencies, she says. We are concerned about the integrity of the vocational education system. We don't want it to be devalued by some of the practices of the providers (Bitá, 2014,1).*

The lack of adequate trade skills within the construction industry has led to companies seeking employees from outside Australia by use of the 457 Visa scheme, as recognised by the Elliot report (Elliott, 2014). The 457 Visa system has been in operation for some time and some groups like the CFMEU believe the system is flawed and used only for economic gain. Others like the MBA believe the system is working, although they acknowledge some abuse (MBA, 2014c).

Compounding the skills shortage is another problem related to sub-contracting. The CFMEU has labelled this practice as 'Sham Contracting'. Sham contracting has been widely debated, disputed and contested for some considerable time. The Fair Work Building Commission's inquiry into Sham Contracting was released in 2011. The term 'sham' has been described in Australian Courts in a case between *Sharrment Pty Ltd v Official Trustee in Bankruptcy*, and his Honour, Justice Brereton stated in paragraph 29:

*A "sham" is therefore, for the purposes of Australian law, something that is intended to be mistaken for something else or that is not really what it purports to be. It is a spurious imitation, a counterfeit, a disguise or a false front. It is not genuine or true, but something made in Imitation of something else or made to appear to be something which it is not. It is something which is false or deceptive (Brereton, 2014).*

The MBA deny the extent of sham contracting as reported by media. According to Harnisch:

*The fact that a number of workers may be misclassified is different to the deliberate and pernicious manipulation of people to force them to become contractors: that is the nature of a sham. Master Builders does not support that practice. But the finding that up to 13% of contractors may be misclassified is not evidence that endemic sham arrangements are in place (Harnisch, 2012).*

Smolders (2011), in his response to the sham contracting inquiry, held a different view based on his personal experiences working with a foreign company,

*Australia has not addressed the issue of allowing foreign companies to establish themselves well. The 457 visa has been abused and a number of these companies create more harm than good in their endeavour to maximise their profits for their overseas counterparts. It would be appropriate for these companies to be affiliated with a known reputable Australian company of equal size for a period of time before they are given a license to build or develop (Smolders, 2011).*

Labour issues were also unique to CS1. The union representative frequenting the site found conditions challenging, as it was managed in a manner that contradicted normal site management practices. When a respondent questioned about site labour and management said:

*They used some of their own labour. It was very hard to keep track of them. They were a very difficult company to deal with. We had to learn ways of tricking them to find out who was on site by following people home from work, taking car rego numbers, ambushing the site from different directions so that people couldn't leave the site without us being able to work out who was there. But I'd say they probably had a percentage of people - it was totally unknown to us the total percentage of people that were working under dubious contracts day and night. There was also some locals employed, who were - had various positions over the job, which I believe was mostly as decoys. There was also a lot of contract let out to fringe type of contractors that might have been - not been able to get contracts with other building companies.*

These comments were echoed by the project's contracts administrator, who said:

*From my understanding, they did a majority of the structure work, so the concreting formwork. They also did a majority of the partitioning. There were at least two, to my knowledge, when I got there, were of Chinese origin. It was hard to establish if they were sham contractors of the head contractor or if they were contractors in their own right.*

In addition, the project's Quantity Surveyor stated:

*I think the main problem with this particular project did come from the Chinese management. They [sought] inexperienced workers that they could pay cheaply rather than getting in professionals, the inferior products that they brought over from China certainly made a difference, because a lot of them had to be replaced at great costs. Generally, they were very difficult to work with overall.*

After evaluating the above comments and the quantitative response in Figure 35, there was an overwhelming disapproval of site management practices with 8 out of 10 participants stating 'poor'.

Compounding the problem of rework and poor construction standards is the issue of declining numbers of apprentices. Apprenticeships are slowly becoming obsolete, as reported by Bleby (2014) who states,

*Builders have responded sharply to a recent fall in trade apprenticeship numbers, saying higher wage rates kicking in this year will only worsen the number of apprentices coming through, further constraining the supply of skilled workers (Bleby, 2014).*

Skills shortages have been with industry for some time now. The reasons are wide ranging and vary from the ability of attracting more young people to enter university as well as a trade, low wages during the initial training period as an apprentice and the reluctance of builders to commit to hiring an apprentice for four years with substantial on-costs for training, workers

compensation insurance and payroll tax (MBA, 2006). The MBA has raised these issues in the Home Builders 2007 review (MBA, 2006) with the government, but the government is reluctant (CFMEU, 2011) to ease the pressure of payroll tax and insurance to ease the burden of employing apprentices. The result is fewer trained apprenticeships and more reliance on unskilled workers, be they local or from overseas. It is likely that the latter solutions have culminated and contributed to the drop of competent tradespeople experienced today. In turn, this new phenomenon faced by the construction industry may have an impact in the foreseeable future in the areas of procurement, industrial relations and project delivery.

Political intervention and union influence on construction sites may have its benefits for their members but at the same time could be very damaging to their own industry:

*'Unionised workers represent almost 20 per cent of the Australian workforce yet hold disproportionate political influence (Dorling and McKenzie, 2010).*

This quote from US State Department cables intercepted Wikileaks. They say further:

*Right-wing unions" wield considerable influence among Australia's senior ministers" and cultivate "a robust stable" of MPs "they are able to turn to in private discussions". The national secretary of the Health Services Union, Kathy Jackson, privately said "she and other union secretaries wield at least as much influence as junior state ministers by controlling who is elected to Parliament (Dorling and McKenzie, 2010)*

In the same article, the CFMEU was not seen favourably by the ALP

*The CFMEU utilises a much more public and antagonistic form of lobbying. This characteristic has led Julia Gillard and other ALP officials to publicly distance themselves from the CFMEU.*

The union movement recently celebrated past achievements and there is no denying their members and officials have benefitted from their actions. The eight-hour day was a considerable victory for the union. This is in contrast with escalating site costs making Australia one of the most expensive countries in the world for construction. Arguably, unions use safety as a means to gain access to sites and intimidate site staff. The CFMEU has a major task ahead to reform and be seen as a responsible organisation. The unions' political persuasiveness has been a product of their membership numbers and used effectively to gain control both here and abroad:

*The National Union of Workers tells US officials that the key to gaining influence is the ability to effectively marshal union membership to support ALP candidates. (Dorling and McKenzie, 2010)*

#### **4.6.2.2 Part 2-Quality Assurance (QA)**

The generally accepted meaning of QA in the construction industry is ‘fit for purpose’ (Wikipedia, 2015a) and achieving a set of standards which are either compatible with the design documentation and specification or an approved sample (existing model or built product). These all need to be in accordance with the contract and in particular the Principal’s Project Requirement (PPR) (Qld Govt, 2014) and the National Construction Code / BCA (NCC) (ABCB, 2013).

CS1 demonstrated it was no exception to this rule. The builder predominately used their own labour on 457 visas. These workers were ‘trained’ on the job by a company ‘foreman’ who issued work orders to these workers. The question of quality did not concern the builder as they focussed on building a structure that met the objectives of the contract documentation. However, this documentation did not include a specification for quality control, nor were there any perceived quality audits in place to ensure quality.

To counter any further quality issues as evidenced in CS1 it could be suggested that QA ought to be added to outcomes under Codes of Practice using the two guides prepared by Standards Australia and the Dept. of Fair Trading. These documents were introduced in Victoria as part of their reformation of the building industry and used in NSW. These documents also provide a platform for QA together with a regular quality check and comparison against design intent and specifications throughout construction. These inspections apply to all buildings under construction. (Munro, 2010)

*The BCA does not address quality but rather compliance. S&T sets a benchmark in an attempt to bring about quality but the only real mechanism is a properly constructed specification. In the past, architects provided full design documentation including a detailed specification managed by a Clerk of Works (CoW). The CS1 client expected quality and was not given this. When questioned, the client from CS1 stated the following, “I think the Chinese quality of work was very sloppy (Client)*

Government has been reticent to legislate for quality. The Campbell report (Campbell, 2002) focused on regulatory reform of licencing and certification in an attempt to improve quality but in practice, these reforms only covered statutory obligations in accordance with the BCA and did not actually address quality. Their belief was that the marketplace would define acceptable standards of quality. That may be true for a select group of building practitioners who pride themselves in their accomplished work.



A shift in policy occurred when Government allowed individuals to build their own home. They were called ‘owner builders’. Legislation was relaxed at that time but has since been tightened up by the *Home Building Amendment Act*. With this shift came the phenomena of ‘do it yourself’ (DIY) market that has been well marketed in media outlets. Perhaps this phenomenon has led to the number of self-qualified trades people entering the construction industry with untested skill sets as demonstrated on CS1 and 2. Quality can be overly subjective in interpretation that would make legislation difficult.

It is recognised in the Design/Build market sector that significant and robust procedures are in place. Unfortunately, that is not the case across the entire construction sector as evidenced on both case studies.

Another possible contributory factor to poor QA standards is the role of sub-contractors. There is a regulatory requirement for sub-contractors to certify their works in accordance with a development approval certificate. These certificates form the basis of the “Occupancy Certificate” that is required at the end of Construction process. Should these certificates not be forthcoming, developers face the risk of not having their project certified and being liable for major rework (Determinants of rework in building construction projects.pdf, n.d.). Meeting the requirements of the NSW certification process can be arduous and difficult, depending whether or not a local council or a private certifier is engaged. Plans are normally submitted to the local authorities that assess the documentation and grant a development approval. Subsequent to this a ‘Principal Certifying Authority’ is appointed by a client to be the local council or a Principle Private Certifier (PCA). Major participants within the BCI tend to favor private certifiers as they tend to administer the documentation in a timely manner. Clients then submit their revised DA documentation for the purpose of a ‘Construction Certificate’ and it is these documents that the final ‘Occupancy Certificate’ will be relied upon.

#### **4.6.2.3     *Summary – Part 1 Skills Shortage and Part 2 Quality***

Both case studies used imported workers on 457 Visas and were raided by Immigration officials who believed that there were illegal workers on site. As it turned out, only one person was ultimately detained for overstaying his work Visa. Sham contracting may have been adopted on both sites but no evidence was found to substantiate that this had occurred. The use of foreign labour on site may have been purely cultural as management and workers all spoke and communicated in their own language and the workers understood their employer’s methods of building. The difficulty with this concept being practiced outside of their own country is that no

one on either site was aware of the rules and regulations of NSW and in particular, the BCA. Local contractors found it difficult to work with the imported labour and there was miscommunication between the two parties.

Both case studies fall under the category of residential medium-high rise construction and this particular sector of the BCI has been hampered by a number of factors including,

- A lack of proficient building practices.
- A lack of skilled trades people and lack of apprentices.
- Flawed certification and regulation system.
- Lack of Quality assurance auditing.

The problem facing the BCI is that, building trades are not regarded as 'sexy', due to the onsite nature of hard physical work and a dirty environment. Industry and Government have recognised this dilemma. As mentioned in the Elliott Inquiry (Elliott, 2014), one of the key platforms to increase school leavers numbers of apprenticeships is by undertaking a careful marketing program targeting. The other impediment has been the shift by the building industry from directly employing trades to using sub-contractors. The other concern industry has experienced is the casual nature of the industry. Employers have worn the cost of payroll tax, workers' compensation and other on-costs in order to maintain their apprentice numbers however in reality it is more economical to use sub-contractors.

Over-riding the four factors mentioned above is the reliance on design documentation. These documents are used to secure development consent, a construction certificate and ultimately to be used for construction purposes but they should also be relied upon for Quality control.

### **4.6.3 Documentation**

Recap of question derived from Figure 19, Documentation.

- Was the documentation adequate for the project?

CS1 could be regarded as a good example of what happens when the documentation is not to any set standard. CS1 began with a full set of documentation designed and documented in Australia by Australian architects and engineers. These drawings were subsequently used to obtain a DA for the project. The project began on a sound footing with Builder 1 who intended to complete the project as expected in this country. Unfortunately for the developer, Builder 1 sold their incomplete project to another Chinese builder who had little knowledge of construction practices in Australia. Therefore, with only initial approval for ground works and low level construction,

the Builder 2 continued to construct the building to level 9 without a CC or council approval. There was no specification annexed to CS1's documentation to identify quality.

The shift from local architects to overseas designers (as with CS1) may have contributed to inadequate documentation and poor design standards. Therefore, a question needs to be asked as to why this shift occurred?

One of the arguments presented by local architects is that the client is not prepared to pay for a full set of documentation but rather sufficient documentation to satisfy the Regulator's requirements. Architects may also transfer responsibility of documenting quality assurance measures to the client or the builder. The BCI, on the other hand, argues that architects in the past have charged 10% of the project value for a full service, plus any further costs incurred by them as a result of having to use consultants such as engineers. The BCI has seen these costs as untenable for the project's bottom line and have shifted their procurement model more towards D&C. Nowadays, large projects are predominately design and construct and the total design fee, including all consultants sits at a low 5% of the contract value.

The use of overseas design firms on CS1 has been fraught with concern due to the designer's lack of understanding of the BCA and other compliance issues.

Builders have taken up the responsibility of design by directly employing or engaging their design consultants as a means of risk minimisation. They are accordingly covered by professional indemnity insurance and this allows them full flexibility for value management for the client and value engineering to reduce time and cost in delivery.

Fayek's discussion on design in his report to the Construction Owners Association of Alberta (COAA) refers to their Construction Industry Institute (CII) defining rework as, "*activities in the field that have to be done more than once in the field or activities which remove work previously installed as part of the project*" (Fayek et al., 2003,190).

In New South Wales, we can compare the COAA with our own Owners Corporation and the CII with the Australian Institute of Building. The statement by Fayek applies here in NSW and in particular with the case studies Fayek emphasises, "*any error or omission in the design documents can effect the construction process*" (Fayek et al., 2003,193).

There appears to be a consensus within literature according to Fayek. Rounce, in his study for the reduction of waste in design following the 1990 UK recession places the importance of good administration and management practices as a means of reducing rework in construction

(Rounce, 1998). The initial findings from CS1 indicated a consensus formulating an opinion of poor site management practices that are in line with literature and furthermore were reinforced by the interviewees when questioned about design. One respondent, an architect, made the following observation,

*Yes, in that (building was designed externally) - and I meant the architects in China. They were pretty nice group of people, but nonetheless they were very clearly instructed by the builder as to what was to happen, how things were to be put together. So at the end of the day they just did as they were told (Architect).*

Another stakeholder gave a similar response to the design process adopted for CS1 and his comments were as follows:

*They were hopeless. They didn't read Australian design rules and in my opinion [the quantity surveyor] should never have paid them because there was a million dollars in architectural fees and design fees and it all had to be redone using Australian engineers. They might have been adequate to do in China but they didn't meet Australian regulations.*

As it is evident from the comment above, a substantial amount of money was transacted for the delivery of the documentation. There was a belief that the design may have been produced in Australia but in reality, the documentation was produced in China and did not conform to Australian Standards. As further vindicated by another stakeholder:

*Poor documentation of plans and certifications? Definitely. When it came to finalising the building, the documentation just wasn't there so the engineers had to get it re-done. The plans stayed the same. The certifications, once again, poor management, that's the reason they went broke.*

Poor documentation on-site translated to poor quality of work on site, including difficulty for the PCA to certify the executed works, as identified in the following respondent's view on documentation:

*Totally inadequate(documentation). There was no resolution between what was in the building and what was called up in the BCA and Australian standards. There was no - to the best of my knowledge - no working drawings showing how the interface was going to occur between the existing structure and the imported wet areas that they flat packed or didn't flat pack or put in - manufactured in China, brought to Australia, whack them in the building. There was no co-ordination done between how that was going to happen and how it was going to comply in terms of services and fire rating.*

Love et al (2006) expressed the notion of paying higher fees to achieve better quality in documentation

*It has been suggested that a major cause of rework relates to the quality of contract documentation that is produced by design consultants and that higher fees paid to consultants would result in improved contract documentation quality (Peter Love et al., 2006)*

This notion may be correct except for CS1 when it was stated BL2 was paid \$1m for the documentation. However, the documentation received was certainly not up to any standard acceptable in Australia.

#### **4.6.3.1 Summary Documentation**

CS1 commenced with a full set of complying documentation for the project. When the building project was sold to another builder, the method of project delivery was altered to utilize modules imported from overseas. Considerable changes were made to the design of the building and these modifications were planned and drawn overseas with little regard to Australian regulatory standards. As a result, CS1 was allowed to be constructed using these amended drawings without consultation and submission of these revised documents to local authorities for compliance purposes known as a Construction Certificate (CC).

The result was a building constructed contrary to the BCA and without any QA. There was no evidence that this occurred on CS2.

#### **4.6.4 Regulations**

Recap of question derived from Figure 19, Regulations.

- Did the builder comply with the regulations?

It is apparent builder 2 of CS1 had little knowledge or had blatant disregard for compliance regulations. The previous themes of quality and documentation included numerous mentions of breaches in work place practices, employment and documentation. The phenomena only highlighted the research question as to why the builder was allowed to continue. In a response to the final question of the questionnaire, the BCA consultant had this to say:

*Well the first problem I came across was that there was definitely a language problem. A lot of the people on site were Chinese people and didn't seem to be able to work in English. Other people, other factors which became a major issue were the use of incorrect materials, imported from China, which didn't have the appropriate certification or accreditation from CSIRO. A good example of that is plaster board, which .... I think the majority of that had to be cleared out again. All of the fire doors were imported from China and every one of the fire doors and jambs was pulled out and replaced with Australian standard doors. So they were two of the main things, cost issues as well. A lot*

*of the other problems involved the drilling of, drilling through floors and walls to service connections and then changing with the fire service collars. All the units, they were pre-assembled as kitchen and bathrooms were delivered as a package and steel framed, steel framed modular enclosure. These were then put in position and found a lot of the holes that had been drilled weren't in the right position, so they had to redrill the service connection and try and fill in the old holes with fire rated material (Certifier).*

Adding to these comments are recent reports by sections of the industry that the practices mentioned above are still prevalent today. Engineers Australia's Multi-discipline Committee recently held a public conference in Sydney. An extract from that meeting was captured by Heaton, he states:

*An Engineers Australia Multi-disciplinary Committee report released on June 24 claimed the state had Australia's 'worst building certification system' and warned that a major fire in a high rise Sydney apartment was inevitable because the building control system was so poor.*

*According to that report, fire engineers talk of common problems, including fire separation between apartments, fire gaps not being installed correctly, fire dampers that prevent the spread of smoke often not being installed correctly and electrical installations not being done correctly (Heaton, 2015b).*

Perhaps what may be more concerning is Heaton's opening remarks of the same article referenced above:

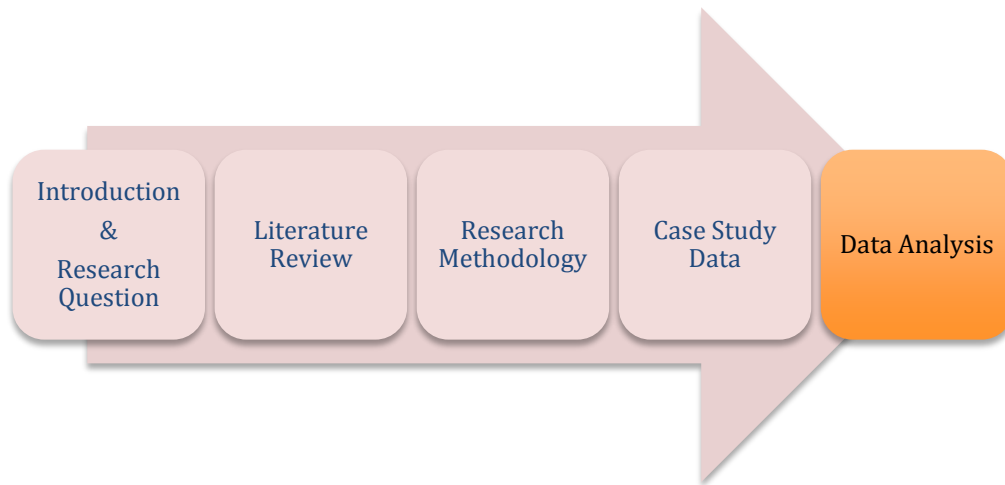
*As New South Wales reviews its building certification and regulation regime, concern within the state's building industry is growing that an overly lax regime is leading to defective buildings and allowing people to 'get away with murder' (Heaton, 2015b).*

A more extensive discussion on this topic is provided in Chapter 5.

## **Summary – Chapter 4.**

This chapter centred on generic questions extracted and placed into themes. The result was a demonstration of two builders controlling two separate projects. Both builders succumbed to receivership leaving in their wake a substantial amount of rework that was not only costly but resulted in personal losses to many project stakeholders. This research has explored the reasons why these projects and in particular CS1 was allowed to continue to reach nine storeys in height until intervention was sought. The following chapter analyses the findings from these case studies and compares these findings using triangulation comparing literature, onsite and offsite experiences to identify failings that have allowed these case studies to be advanced unchecked.

## 5. Data Analysis



### 5.1 Introduction – Data Analysis

Triangulation was adopted to validate the data collected from the case studies. The structure adopted to highlight comparisons between literature, onsite and offsite findings is by initially describing the literature findings and then adding commentary from interviews highlighting each respondent as **Onsite** or **Offsite** compared with **Literature** in **bold** print, finishing with a concluding statement. Particular focus has been on CS1 as it is rich in data addressing the various themes throughout this study.

As depicted in Table 18, the data collected from CS1 and CS2 point strongly towards inadequacies raised by government inquiries. This chapter unpacks the regulatory framework currently surrounding the BCI. It begins with a recap of the various government inquiries, followed by the reaction to these inquiries by industry. The effect of these inquiries on the possible minimisation of rework, particularly on the subject case studies is then described. Legislation is also reviewed with a particular emphasis on the residential (SEPP65) sector under which the two case studies were regulated.

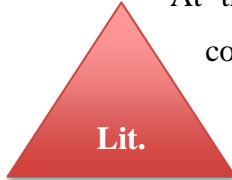
Evidence from the stakeholders associated with CS1 has confirmed the three project specific causes of rework aligning with literature; **professionalism**, **documentation** and **quality**. Cultural differences also played a role in the three causes.

Therefore, “**Why was a building allowed to be substantially constructed without hindrance and succumb to major rework before the project was completed?**”

CS1 was without doubt a troubled project, but to say that CS1 was unique would be unfounded. CS2 bore remarkable similarities to CS1. However, it is not suggested that these projects are the norm but are rather a representation of endemic issues that have allowed the projects to be constructed.

Successive governments (both Liberal and Labour) have commissioned inquiries, Royal Commissions and the like to gain insight into construction processes and alter current ways of working. Their repeated recommendations (Table 16) have had little effect as evidenced by the case studies. This lack of change has had far reaching consequences for the BCI. In the context of this study, how did Government efforts to curb defective work create an environment for contractors to deliver sub-standard work? This is explored in the following sections.

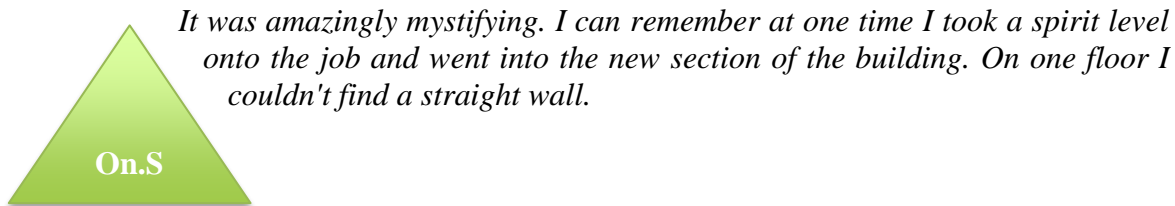
## 5.2 Comparison of Government Inquiries with CS1 and CS2.

 At the time of the Cole Royal Commission into Unions, CS1 was about to commence during a period of industrial unrest and substantial industrial control by unions. The contractor for the project was of foreign origin and not a member of an industrial trade organisation like the Master Builders Association (MBA) with the result that they were not familiar with local practices, regulations etc. Therefore, the project (CS1) was on shaky ground from the very start. An outcome of the Cole Royal Commission was the introduction of the Australian Building and Construction Commission (Wikipedia, 2015b). The commission was established as a control mechanism to ensure industrial harmony and equity amongst all stakeholders. The ABCC was very successful, in reducing the working days lost from 136,000 in 1996 to 15,000 in 2006 (Cole, 2008,10). Productivity also increased by 9.4% within the same period (Cole, 2008,10). The ABCC also had a direct impact on CS1 in curbing industrial unrest caused by union officials. The influence of the union substantially impacted on the quality and construction time delivery of both case studies, whilst the positive effect of ABCC's intervention became evident on CS1 at the latter stages of construction.

**Campbell's Royal Commission** focused on **Quality**. Amendments were made to legislation and the BCA was amended for easier comprehension. The BCA has been an obstacle as much as reference for better construction methods. It cost in excess of \$400 per year for a current edition thereby unaffordable for many practitioners. The on-line version of the BCA has been freely made available on the 1<sup>st</sup> December 2014 (ABCC, 2014). However regardless of cost and



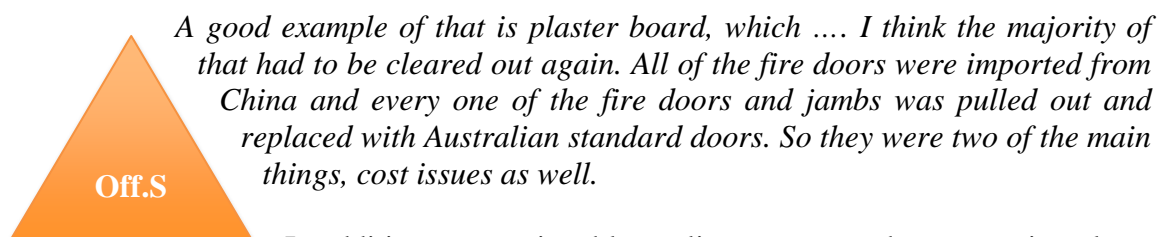
availability, any attempt to affect quality by way of certification was seemingly lost on CS1. An **Onsite** worker responded unfavourably regarding CS1. He highlighted the poor quality of ‘cubicles’ (modules) imported from China to be used as bathrooms and kitchens as follows “Generally, the cubicles that come from China weren't of the quality that we were told that they would be. The general work from the Chinese workers was sloppy, because they weren't experienced in what they were doing”. In a similar response, another **Onsite** stakeholder on CS1 had the following comments to make:



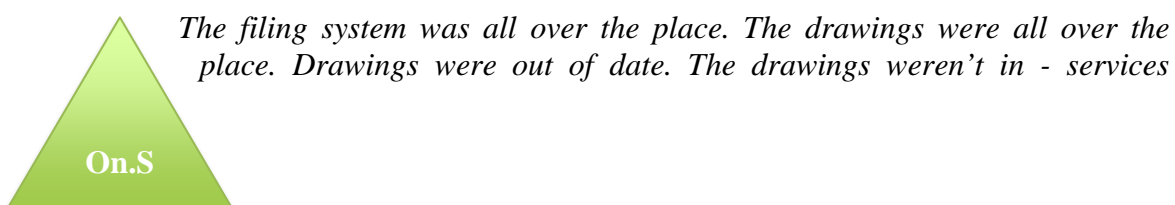
Similarly, another **Onsite** worker said

*I know some things weren't done the right way. I know on the plumbing side - I was involved a little bit on the plumbing side with these units that were coming in. There was pipe work that wasn't clipped properly. There was some hot and colds that were back to front. There was tap-ware that was supposed to fit, but the actual pipe work that was coming out of the walls weren't to the correct spacing's, where I thought there could have been alternative solutions used besides demolition - just destroying these units to make this tap-ware work.*

The **Offsite** certifier confirmed the concerns expressed by the onsite workers when he made the following observation:



In addition to questionable quality outcomes, documentation also came into question. ‘Buildsurv’ state, “Part D2.16 of the BCA has always been difficult to interpret” (Buildsurv, 2015). This comment has been shared by industry and was one of the reasons the BCA was made free, prescriptive measures are difficult to interpret. This was the case with CS1. Architectural and engineering documents produced overseas for CS1 were not fully compliant with BCA standards. The construction that followed was understandably not compliant either. One **Onsite** worker had this to say regarding documentation for CS1:



*drawings didn't reflect current architectural drawings. It was very poor. If there was a good system in place it was hidden from us, and it would have been in Chinese.*

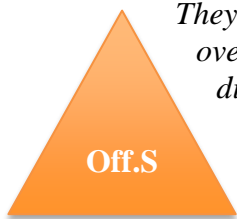
This may have been as a result of the original project architect's negotiations with the builder.

The original architect (**Offsite**) had this to say:



*I was interviewed by XXX, and they asked me for a fee proposal to alter the drawing to suit some changes they wanted to make in terms of design, for whatever reason. Essentially they just said to me that I was too expensive, and that they would use their own resources to make the changes to the documentation that they needed. So I was out of the picture.*

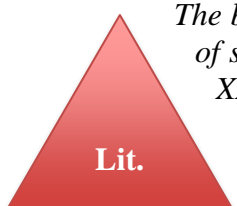
The **offsite** superintendent had these comments to make regarding documentation:



*They gave us information which was based on design drawings from overseas which had to be certified by Australian consultants in various disciplines. We never saw the final design documentation because they were forever changing. So the design documentation that never really concluded as it should have been in the first three months after they started construction.*

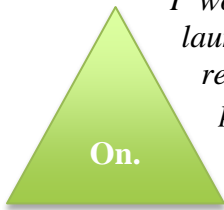
CS2 did not have these issues as their documents were produced in Australia.

**The Collins inquiry** into construction insolvency highlighted corporate behaviour that threatened the livelihood of subcontractors and suppliers. This was particularly evident on CS2 where it was widely published in the media that funds that were meant for the project were directed elsewhere. Bank spokesperson Kevin Foley had this to say when interviewed by McCarthy:



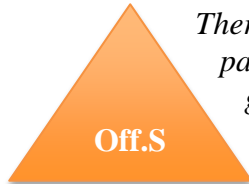
*The bank is the major lender behind (CS2), which has had a troubled history of stoppages because of non-payment to subcontractors and the collapse of XXX companies including YYY earlier this year (McCarthy, 2009a).*

Stakeholders associated with CS1 also expressed concerns about monies being channelled offshore and not being utilised to pay subcontractors and suppliers. An **Onsite** worker interviewed said:



*I would say there's a lot of greed there and a lot of, maybe, money laundering or fancy bookkeeping or something. Someone did well. As a result, the project suffered significantly because those funds weren't being put into the project, where they were meant to be putting into the project.*

Likewise, the developer (**Offsite**) for CS1 had these comments to make:



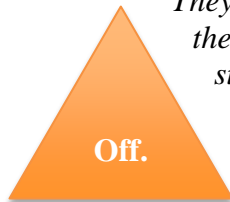
*There were no financial difficulties in that XXX (builder) got their bills payed. However, it's subsequently been found out that the money didn't go to paying the subbies, it was used for other purposes.*



**The Elliott investigation** into skills shortages also highlighted concern for the lack of skills available. This situation has paved the way for contractors to use the 457 Visa option of allowing foreign workers into the country.

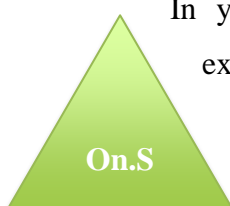
The effects of the 'skills shortage' was evident on CS1 as expressed by the following participants

Developer (**Offsite**) had this to day:



*They used a number of 457 visa itinerant workers. The labourers themselves were Chinese but they didn't come from Hong Kong, we started with qualified, competent people and they all left and they were replaced with maybe qualified people in their own country, but they didn't understand language and they didn't understand the Australian way of building, so they were unqualified...*

The **Onsite** response from one of the stakeholders was the following:



In your opinion, did the contractor's onsite staff and workers have adequate experience to undertake their work?

*Interviewee: "No, I don't believe so".*

Several aspects raised in the Campbell, Collins and Elliot inquiries were evident on CS1. These included Quality, BCA interpretation, 457 Visa, documentation and non-payment of sub-contractors. These were witnessed by onsite and offsite stakeholders and align with literature at the beginning of this section.

### 5.3 Issues with the Current Regulatory System.

Over the past few years the NSW has become aware of the problems that have arisen from poor building practices. To counteract further defective works, the NSW Government, via the Department of Planning and the Department of Fair Trading are currently reviewing all of their current regulations. The NSW Government Department of Planning's White Paper (in particular Chapter 8) highlights three key issues:

1. Building defects.
2. Buildings not complying with the approved plans.
3. Lack of a building manual particularly within the residential market. (Department of Planning, 2013)

Apart from the building manual, items 1 and 2 above were present in both case studies.

The Australian Institute of Building's submission in response to the White Paper identified a number of key areas of reform that could address the shortcomings uncovered by government inquiries (Smolders et al., 2013). They are tabled below and compared with both case studies.

<b>Shortcomings</b>	<b>CS1</b>	<b>CS2</b>
The ingress of water.	Yes, ongoing concern.	Not Known
Focus on quality of buildings	Yes, evidenced.	Yes, evidenced.
Building certifiers to actively intervene to stop building work that are non-compliant.	Had this occurred, the amount of rework would have been reduced.	Had this occurred, the amount of rework would have been reduced.
Building manuals to be included into regulation.	Not applicable	Not applicable
Commercial builders to be licensed.	Special licensing for high-rise buildings is one way to ensure the builders are capable.	Special licensing for high-rise buildings is one way to ensure the builders are capable.
Certifiers ought to explain why a building component is non-compliant.	This would speed up rectification for defective works.	This would speed up rectification for defective works.
Licensed builders to adhere to a code of ethics.	A Code of Ethics was not evident on CS1.	A Code of Ethics was not evident on CS2.
Distinction between builders and developers to be defined.	Not relevant.	Relevant.

**Table 19 - Proposed reforms (Smolders et al, 2013) and evidence on case studies.**

Another issue focused on by the submission is the experience or lack of experience of certifiers on projects of this size. Key operational statistics published by the BPB (Maltabarow, 2013a)

demonstrate the current difficulties experienced by the certification industry. In relation to both case studies it is not difficult to understand the following key points raised by Maltabarow. Some extracts are as follows:

- **Approximately 500 private certifiers are accredited by the Board, along with 900 Council certifiers.** Comparing these number of certifiers in the field to the quantum of work demonstrated below requiring certification, the prospect multiple inspections becomes an issue.
- **Private Certifiers issued an estimated 12,000 complying development certificates with a value of \$1.7 Billion (70% of all certificates issued by value); and around 24,000 construction certificates (about 50% of the total of 48,000).** These figures highlight the workload spread across a small number of certifiers and may be the reason insufficient inspections were carried out on CS1.
- **103 complaints were received against accredited certifiers.** 103 complaints for 1400 certifiers is a large percentage of dissatisfied customers (Maltabarow, 2013a).

In summation, there are not enough certifiers to cater for the growing demand and the number of certifiers being penalised by the Board is indicative of either their lack of skill or that they are simply not working to a code of practice. Maltabarow states *“Getting builders to get things right in the first instance would seem to be a better approach than over-reliance on the checking process”*. This raises the question of whether the certifier on CS1 was competent for the task, or was the process adopted a **failure in the system?**

As mentioned in Table 12 and Table 13, according to NSW legislation (NSW Govt., 2014b), certifiers have six mandatory inspections to undertake during the course of construction for domestic works and only three for large residential and commercial works. This small numbers of inspections is not sustainable as indicated by the review process currently underway by the Lambert report into certification (Lambert, 2015). In an attempt to improve the standards of certification in NSW, the BPB was established to oversee a number of improvements to certification. With the impending rise of medium to high density apartment dwellings being constructed in the foreseeable future in NSW (ACIF, 2013), the BPB has identified a proactive approach to seek out and encourage more professionals to the certification industry. Certifiers in the past have generally been part of local councils and one of the aims of the BPB is to

encourage more private firms to act as Principle Certifying Authorities. In order to achieve this outcome, the BPB has been focusing on:

- Certifiers seeking to upgrade to a higher level of accreditation but who do not have a recognised qualification and/or are unable to obtain the practical experience relevant to progression; and
- Associated professionals who, although not accredited, wish to become a certifier but lack the recognised qualifications and/or experience.

Their efforts are to encourage more qualified practitioners into this specific industry. This work is being undertaken to improve the standards of competence within the certification industry thus giving the construction industry as well as the ultimate consumer safeguards that the work being delivered is to an acceptable standard.

Maltabarow identified a number of key reforms to be targeted, including:

- Support for expert panels charged with defining scope of certification, Council boundaries and regulatory impact of Chapter 8 of the White Paper.
- Expanded compliance activities, including more effective audits; investigations; assessment of a “demerit” system and peer review to support better practice.
- An assessment of the ability of the accreditation scheme to meet the strategic directions of the White Paper and development of changes as required.
- A program to acquire relevant operating information, including data required to support group insurance arrangements.
- Development of initiatives to improve communications with stakeholders.
- Secretariat to operate as an independent unit (other than for administrative support), responsible to directions by the statutory Building Professionals Board and directly accountable the Minister.
- Examine options for expanding the range of building professionals who should be accredited as certifiers (Maltabarow, 2013a).

Maltabarow further states that securing of appropriate outcomes hinges upon a unilateral framework to be established between the administrations of Planning and Infrastructure, Fair Trading and Local Government to ensure a coordinated approach with clear responsibilities and assignments. A better streamlined certification process would have identified instances of non-

compliance on both case studies and contributed to a better quality outcome with minimal rework.

## 5.4 Industry Response

Responding to two recent government investigations (The Department of Planning White Paper (NSW Government, 2013) and the Office of Fair Trading's Home Building Amendment Act) (NSW Govt., 2014a) the Australian Institute of Building (Department of Planning, 2013) identified a number of key areas of reform that could address the shortcomings uncovered (Smolders et al., 2013). In relation to CS1, the following recommendations could have averted rework. They include:

No.	Recommendation	Impact on Case Study 1
1	Focus on quality of buildings.	The contractor did not have a Quality Assurance plan for the project and the resultant was rework.
2	Building certifiers to actively intervene to stop building work that are non-compliant.	The Case Study was allowed to continue unchecked for too long, work was non-compliant and rework could have been averted had the certifier intervened.
3	Training be provided to lift the skills of building certifiers to recognise non- Compliance.	Certifiers ought to have sufficient building process knowledge to identify critical issues found on site and recommend solutions to avert rework.
4	Building manuals to be included into regulation.	Mandatory building manuals <sup>2</sup> will assist with the closure stage of the project to the benefit of the owner's corporation.
5	Recommendation that commercial builders be licenced.	Had there been a licensing regime for commercial builders for the case study, rework may have been averted.
6	Certifiers ought to explain why a building is non-compliant	In the context of this case study, the contractor had little knowledge of the legislative requirements for the project. The certifier did not offer any assistance to recommend methods to rectify the non-compliant work as they were powerless to do so under the Act.
7	Licensed builders to adhere to a code of ethics.	Had either project a commercial 'licensed' or accredited builder, a code of ethics may have been adopted and averted rework.
8	Inspections for building quality be conducted by appropriately qualified persons.	Refer to comments in 3 above.

Figure 36 - Recommendations made to Government. (Smolders et al., 2013a,4)

<sup>2</sup> Building Manual, a collection of project specific data for the benefit of the project's owner.

The emphasis by the AIB in its recommendations to Government is that actions are required in the areas of **Quality**, **Regulations** (certification) and **Professionalism** by way of expanding license requirements for large projects.

Item 6 in Figure 36 relates to the role of the certifier not being able to recommend solutions to rectify breaches of the BCA. This issue did hamper both builders' abilities to address the certifier's concerns. In effect, the causes of rework were left unchecked.

The MBA's response to the Home Building Amendment Act 2014 was to say, "*These legislative changes are the culmination of a long period of lobbying by Master Builders and will introduce measures which provide greater clarity and balance to the legislation*". Whilst this may be so, the changes have not fully addressed the issues raised by various Royal Commissions and Inquiries apart from stamping out 'phoenix contracting'. It could be argued that some of the changes have exacerbated the situation rather than improving it. For example, the value of projects requiring a licence was raised from \$1000 to \$5000. In this instance, a homeowner can get their house painted by an unqualified person that could potentially lead to further concern.

## 5.5 Legislation

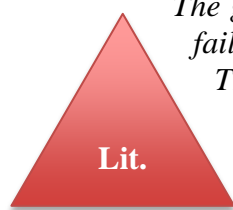
The current system of licencing in NSW has been in existence since the early 1970's. It was introduced in response to a longstanding demand and lobbying by the Master Builders Association (MBA/NSW) to the NSW Government in the early 1960's (Elder, 2007) to curtail the emergence of incompetent builders, known at the time as "cowboy builders".

With the introduction of the BCA, the regulatory regime was amended to tighten fire, egress and disability access provisions, as well bringing building standards up to date with new technology ("ABCB - BCA 1988 & 1990 Archives," n.d.).

According to Elder (2007), the construction industry in NSW is adversarial in nature. Anecdotally, a common expression used by many builders is that "*it is hard enough to find a job, then to build it and make any money from it*". The average margin a builder makes from a project is in the vicinity of 1.5%, as opposed to a developer who seeks a higher margin of 30% (AIB, 2012). The disparity between builders' and developers' profit margins is substantial and tempts those who have the capital to fund such developments to strive for even larger profit margins (NSW Government and Collins QC, 2012). This is an area of concern, as traditionally builders do not make substantial profits. The construction industry has a tradition of competitive tendering and the market has been strained by builders (NSW Government & Collins QC,



2012,8) who are inclined to take commercial risks to secure new projects. As highlighted by Cole in his report:

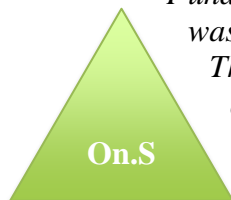


*The greatest threat to your future success in the construction industry is a failure to understand risk). Participants usually have a low capital base. The use of other people's capital and assets for project delivery is high. Competition for projects is intense. The profit margin to turnover ratio is comparatively low when compared to other industries with more fixed capital structures. Because the construction of each project is unique, involving a new location, new designs, new personnel, new equipment, new construction conditions, and uncertain weather, the risks involved in a project and it's successful delivery are high. Risk is the constant feature of the whole project. And so you must understand it in all its manifestations (Cole, 2008).*

These findings have also been found in the recent Collins report on builder liquidations (NSW Government and Collins QC, 2012). His report "Inquiry into the Construction Industry Insolvency in NSW" (Wilkinson, 2013) provided the following findings, based on two strong pillars:

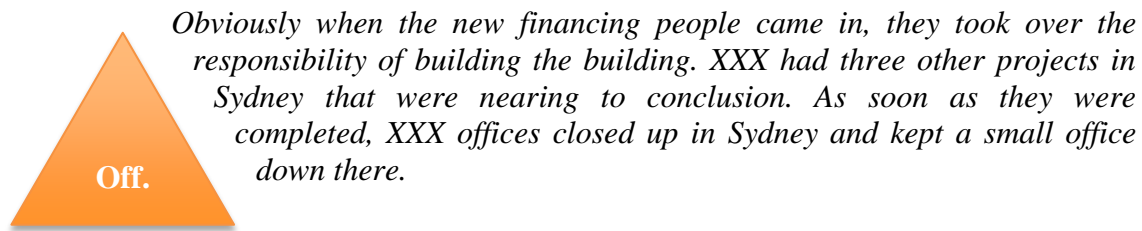
1. Monies paid to the principal contractor are forwarded to their sub-contractors.
2. Monies received by contractors leaked to five destinations outside of the project pyramid. They are:
  1. Paying off a trail of other debts
  2. Paying off a bank overdraft.
  3. Purchasing property.
  4. Discretionary expenditure of a personal nature.
  5. Collateral development activity engaged in by the builders.

The CS1 builders fell within Collin's findings as evidenced by the **Onsite** contracts administer:



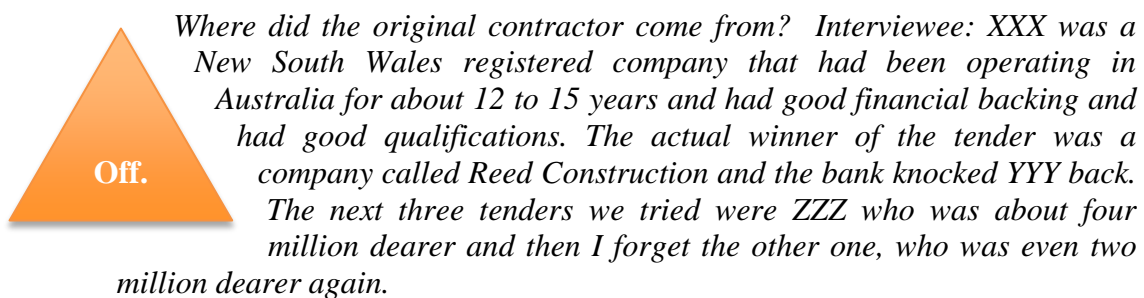
*I understand that the first progress payment the head contractor received was one and a half million, and they hadn't actually done any work. Therefore, they had a big pot of money to get that project moving, up and running and rolling. I would say there's a lot of greed there and a lot of, maybe, money laundering or fancy bookkeeping or something. Someone did well. As a result, the project suffered. Significantly, because those funds weren't being put into the project, where they were meant to be putting into the project. There was no correlation between progress claims and work complete on site. So that's one issue.*

The clients (**Offsite**) view of financial management was as follows:



The taking of risk by builders to secure construction contracts is not new. Federal and state governments are concerned with the negative impacts of these risk-taking practices. They have contributed to numerous liquidations including those of the case studies reported here and have had a negative impact on both federal and state economies. Ingra (2014) identified a number of factors that contribute to these insolvencies and his concerns align with those of Collins (2012). In particular, Ingra (2014) states that the cause of distress begins at the very beginning of a project, during the tender stage. Contractors are compelled to submit tenders with extremely low profit margins and they, in turn, request their sub-contractors to do the same. Ultimately both the contractors and the sub-contractors reach a point where they cannot continue with a project due to their low margins (Collins 2012). Eventually either one or both succumb into receivership (Australian Financial Review on 15<sup>th</sup> November 2012). Collins notes that this results in a “...bidding war for the shrinking pool of work which leaves scarcely any profit margin” (NSW Government & Collins QC, 2012,8).

CS1 was subjected to this situation as described by the client (**Offsite**) as below



All three companies, mentioned above, have since gone into receivership and are no longer operating. They have since become subjects of interest of the Collins inquiry (Collins QC, 2012) into insolvency.

The original architect (**Offsite**) for the project had this to say on the tender process of CS1:

*I started 10, 12 years ago with [XXX], who had purchased a building and the site next door, enabling the extra tower to be built. We took it through development approval with XXX. We fully documented the building for construction with XXX. He then went out and sought prices from builders,*

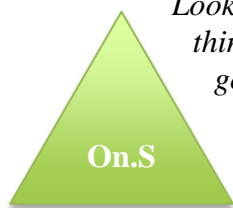
*which proved to be extremely difficult for him to actually get a price that was going to match his expectations.*

The quantity surveyor (**Offsite**) had this interpretation of the tender selection process:

*I believe the project was tendered on a typical lump sum project tendering arrangement and I have a feeling that XXX the tenderer, who became the contractor, put forward this alternative methodology to offer some - I think some reasonable savings for the client and instead it's ultimately caused the project's demise.*

It should be noted from these interviews, CS1 had three distinct building phases. The first phase was by an Australian/Chinese building company (Bld1) who sold their interests to Bld 2 of Chinese origin. Phase 2, Bld2 continued with the project until placed into liquidation and then phase 3, the project was under management via instructions from the financier when the project was deemed a 'distressed project'.

One stakeholder, who can be regarded as having an **Onsite** viewpoint, was the original development manager for CS1. His observations about the early stages (phase 1) of the project were as follows:



*Look, with any conversion there are always going to be unknowns and I think probably the contractor hadn't appreciated the effort that was going to be needed bring it to a satisfactory conclusion, effort to design and construct that one. So I think they were just relying on the documents to provide all the answers. I think that's probably where it unwound. The building had been derelict for 20 years or something like that and that meant [unclear] huge BCA issues, structural issues. You had a building that is basically on - footings on sand and then you are putting a new building on piles beside it and differential - that will never work. I don't know - there were problems, practical problems later in the piece because a lot of risk elements in the project. They [can't] appreciate it. By all the parties, maybe not, by the consultants as well as the contractor.*

Overriding the competitive culture is the regulatory and licensing system in NSW ("NSW Planning Act and Regulation notes 2000 – 2004,"). The present study is confined to the current NSW regulations and licensing regime and falls under its auspices.

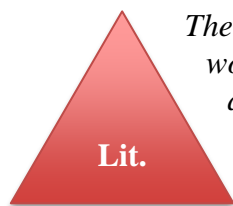
The concerns of national licencing had a profound impact on the case studies. The BCI has been vocal in addressing the 'builders licence' system in NSW especially for the SEPP65 projects. No special licences for builders building over three storeys are mandated in NSW. Builders who are licenced for small domestic dwellings are allowed to construct medium to high rise apartments without the need for the mandatory insurance obligations imposed on small builders. CS1 had a

‘consultant licenced builder’ engaged offsite to the project, for the sole purpose of satisfying regulatory requirements. The licensed builder did not supervise construction until very late in the project when defects were being discovered and the new management system was put in place.

National licensing would have brought NSW in line with the rest of Australia with a special licence for medium to highrise encompassing SEPP65 type buildings. There was no evidence to indicate the professional background of the license holder responsible for CS2.

The issues facing NSW are similar in all other states in Australia. Every state is represented on a council known as the Council of Australian Government (COAG). COAG’s task is currently to engage and deliver a seamless national economy via regulatory reform (Council of Australian Governments, 2013).

In September 2012, COAG was entrusted to seek and agree upon regulatory reform via a new National body known as the National Occupational Licensing Authority (NOLA) (Crouch, 2013). According to NOLA’s web site:

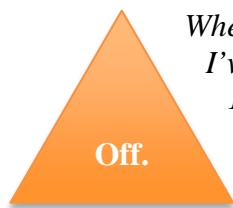


*The COAG announcement of December 2013 indicates that states will work with the Council for the Australian Federation (CAF) to develop alternate options to national licencing (National Occupational Licensing Authority,2013).*

The construction industry was very supportive of national licensing (Maroya, 2012) as it was industry that continually lobbied government for standardization of licencing and codes across the country. Unfortunately NOLA was abandoned by COAG, in late 2013 leaving industry in a state of uncertainty (NOLA, 2013). This abandonment of NOLA has created a vacuum in NSW, as there is no mandated quality control for buildings in excess of three storeys. It should be noted that quality control differs from certification in NSW. **No mandatory quality inspections are conducted on projects over three storeys** in height during the construction phase. A minimum of 3 critical inspections are carried out for compliance purposes only as regulated by the Building Professionals Board, these inspections are administered by the Principal Certifying Authority (PCA) authorised to do the inspections for that project. There was little evidence of any inspection on CS1 prior to the project undergoing new management. The PCA has full discretion of the inspections required and these could have been conducted for foundation work, waterproofing, framing and final occupancy. On the other hand **small domestic projects require between five and six critical inspections**. It is perplexing why legislation requires only

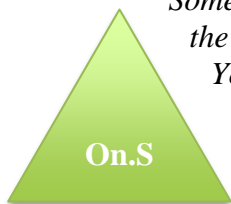
three mandatory inspections for a major building under construction. Registered certifiers, who may either be in private practice or employed by a local council, undertake these inspections. However, the inspections only certify that a project has been built in accordance with the approved Development Consent approval and the Building Code of Australia – **they do not assess the quality of construction.**

No known inspections were carried on CS1 out until the project was deemed distressed and taken over under a new management scheme. The certifier's representative (**Offsite**) on initially examining the project had this to say:



*When I first became involved, the workmanship was possibly the worst I've ever seen. Which is why my involvement stretched over about 10 or 11 months to check that the replacement of the work they were doing had been done.*

CS2 had similar issues as CS1. The following description was given by the (**Onsite**) Union representative on the project:



*Some of the contractors were up to speed and quite good contractors. But the finishing off of the jobs - so the finishing trades were very below par. Your key trades, formworking and stuff like that, fairly good. Even in some cases the electrical, but not in all. On one of the jobs they got the whole place plumbed up and done - the entire electrical system done not to code. At the end, when the bank took over the job, they had to pull the whole lot out, which meant taking all the Gyprock walls out, ripping out the plumbing, ripping out all of the electrical, and starting all over again, because nothing had been certified.*

These comments reflect what occurred on CS1. Both case studies demonstrate an absolute lack of quality by way of auditing or by a lack of a skill in recognising the requirements for assessment or appreciating a quality outcome.

The certification system in NSW and other states is in an unsettled state (ACT Government, 2013). The Building Professionals Board (BPB), a department attached to the NSW Government Department of Planning, is aware of the difficulties facing the building industry, with poor quality construction being widespread. During the years 2012 and 2013 the BPB consulted industry (via road shows and round table discussions) and recently prepared a White Paper (Department of Planning, 2013). This White Paper focuses on two specific areas, with the bulk dealing with planning issues. Only one chapter is dedicated to improving certification of projects (Chapter 8). The BPB has identified only a small number of registered certifiers as qualified and

this has caused concern amongst regulators and industry alike. Maltabarow highlights that there are approximately 1500 certifiers in NSW of which 500 are private and 1000 are council employees (Maltabarow, 2013a). Furthermore, Maltabarow states that private certifiers have to maintain Professional Indemnity insurance (PI) whilst council are not required to do so. In addition, private certifiers may be liable for any unforeseen defects for ten years after issuing a Final Occupation Certificate whilst council staff are not subjected to this risk (Building Professionals Board, n.d.). This places private certifiers in a precarious position, especially if the contractor responsible for constructing a building was a developer or a phoenix<sup>3</sup> company. On the other hand, licensed builders are required to guarantee structures for seven years (Fair Trading, n.d.). This is a protective measure to ensure that clients and consumers receive a quality built product or, as in the case of the case studies, a well-built structure.

Both case studies succumbed to phoenix style builders as both builders have left Australia. The ramifications for stakeholders of both case studies are:

1. No insurance cover via the Home Owners Warranty Scheme (recently given a name change of Home Building Compensation Fund Nov. 2015) (Sicorp, 2015) to cover defective works.
2. No builder to sue for defective works.
3. Difficult to obtain legal recourse from consultants
4. Certifiers are the 'last man standing' with a Professional Indemnity policy and can therefore be sued.

Newly amended legislation has assisted homeowners who have recently purchased apartments. However, this does not apply to those who have succumbed to these phoenix builders. These people have little protection compared to purchasers of single dwellings as the government has the view that apartment owners use the legal system as opposed to single dwelling home owners use the mediation services by Fair Trading.

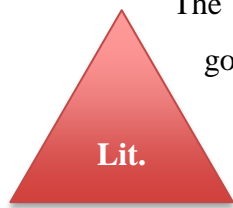
The construction industry has experienced considerable change over the past three decades. Building has become more process driven and off site manufacture (OSM) has evolved to a stage that may be considered to be the norm (Hamson and Brandon, 2004). Politically, government departments that regulate and oversee construction works have also made considerable

---

<sup>3</sup> A phoenix company is a company established solely to facilitate one project and which then ceases to trade with the directors being unable to be traced.

adjustments to keep pace with changes in the built environment. Significant skills shortages within the construction industry has led to the use of foreign workers under the 457 Visa scheme. Political groups and trades unions have criticised this scheme as it precludes local workers from job opportunities. Trades unions have campaigned under the banner of “Sham Contracting” whereby sub-contractors have replaced pay as you go (PAYG) employees and by-passing unionism on construction sites (ABCC, 2011).

## 5.6 General Overview of Residential Construction in NSW.



The residential construction market has been subject to a number of inquiries by government. Lobbying by the Master Builders Association and the Australian Institute of Building during the 1960's to stamp out “cowboy builders resulted in the licencing of builders. With the proliferation of apartments currently being constructed by developers the perception of the general public is that these products lack quality and scrutiny by the authorities (Smolders et al., 2013a,11).

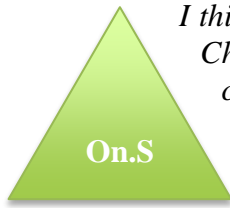
In a report prepared by UNSW on behalf of Government “Governing the Compact City”, the UNSW highlighted fifteen general building defects. The first three key areas of concern were:

1. 42% emanating from internal water leaks,
2. 42% from cracking of internal walls,
3. 40% from water penetration emanating from outside.

The remainder stemming from faulty services, finishes, balustrading, noise and equipment being the major concerns of strata owners. (Easthope et al., 2012)

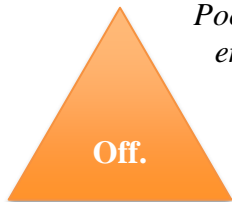
These defects were apparent in the case studies. One of the **onsite** stakeholders for CS1 was actively involved after the project was completed and occupants had moved in. He said:





*I think the main problem with this particular project did come from the Chinese management. They [sought] inexperienced workers that they could pay cheaply rather than getting in professionals, the inferior products that they brought over from China certainly made a difference, because a lot of them had to be replaced at great costs.*

An **offsite** stakeholder had a similar viewpoint when he stated,

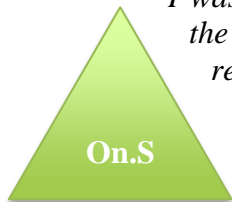


*Poor workmanship or non-compliant workmanship in the mechanical engineering areas, in the plumbing area, the fire services.*

These comments affirm that CS1 fell within the same pattern as Easthope's 2012 research which identified four key stumbling blocks that Owners Corporations (OC) experience when arranging for defects to be remedied. They are:

1. Whether the developer/builder is in control of the scheme.
2. The builder is no longer operating.
3. The OC are awaiting a claim.
4. Legal actions are yet to be finalised.

Again, an **Onsite** stakeholder on CS1 had this to say in relation to the above:



*I was asked to finalise the final occupancy certificate documentation for the building, which was for the tower, a change of use and also for the restaurant. Since I was requested to undertake that work, there's been more changes to that building, when it was taken into administration, which has created further difficulties because people who were involved prior to the administration now don't want to be involved and are very reluctant to provide certification.*

This situation left the owner's corporation for CS1 in a vexing situation of owning an apartment in a building that had not been granted an OC. It also leaves them in a difficult situation of seeking recovery for latent defective work.

Various authors have identified reasons why building projects have become distressed. For example, Love (1998) identified lack of quality in workmanship as a major contributor to rework. Chan and Kumaraswamy (2008) surveyed a large number of public and private commercial builders in Hong Kong and identified four main strategies to offset rework. They are:



- Strong (site) management teams.
- Comprehensive survey of the ground conditions on site.
- Communication between all participants with roles clearly defined.
- Minimisation of variations. (Chan and Kumaraswamy, 1998).

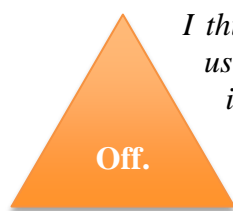
Love and Edwards (2004) identified client changes, value management, ineffective use of IT and design scope freezing as four significant predictors of rework (Love and Edwards, 2004). These observations resonate with CS1 and CS2.

Over the past ten years there has been a proliferation of inexperienced developers in Australia (Manning, 2004), It would seem that there are few barriers to entering the property development market. One reason for the increase in NSW is that there is **no government legislation requiring the licensing of builders undertaking high-rise or commercial construction** (Department of Fairtrading, n.d.).

Real estate agents are inundated with properties they cannot sell due to faulty works, and banks are imposing more pre-sale constraints on developers prior to the release of funding (Alex, 2011). Builders with little or no industry experience are entering the market place in the belief that they can make substantial profits (Manning, 2004).

The skills required to successfully undertake major projects are simply not available in NSW (Franklin Matthew, 2010). The decline in apprenticeship numbers has placed more emphasis on to site managers to deliver a quality product.

The Quantity Surveyor for CS1 had this to say on skilling:

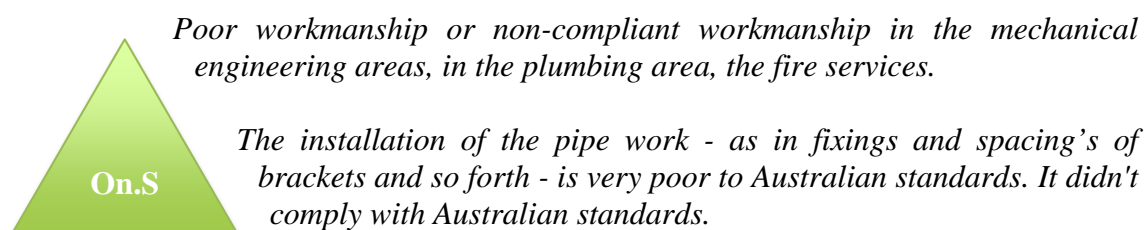


*I think there may have been a gross misunderstanding of some systems use, construction methodologies. There were some new systems brought in that I don't think the contractor had a lot of skills with and a lot of experience with and I don't think a lot of the consultants did as well, particularly pertaining to tying all that together in a way that would achieve certification.*

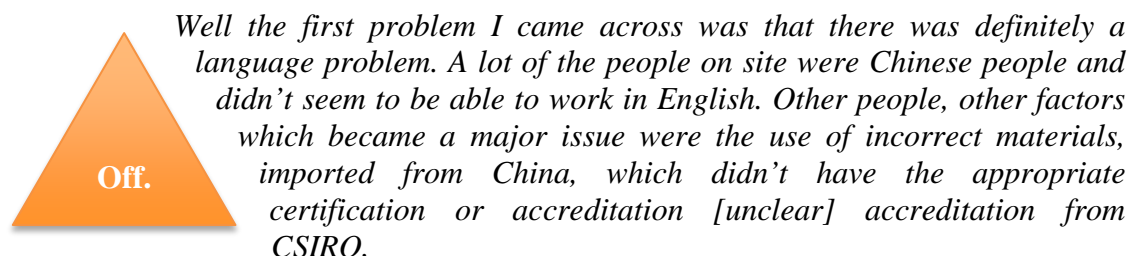
Another possible factor contributing to rework is the role of sub-contractors. Sub-contractors are required to certify their work in accordance with the BCA and Australian Standards (Environment Planning and Assessment Act 1979)(NSW Govt., 2014b). These certificates from sub-contractors fulfil the requirement for an “Occupancy Certificate” that is required at the end of construction. Should these certificates not be forthcoming, developers faces the risk of not having a project certified and being liable for major rework (Love and Edwards, 2004).

However, there is no guarantee that a sub-contractor has the skill to complete such certificates, or even accredited to do so as there is no requirement. Previously, tradesmen were offered the opportunity to sit for an additional course after their trade certificate via TAFE known then as the 'Building Foreman & Clerk of Works' course. This course has long ceased to exist however it did provide those who graduated the ability to assess and certify work on the field. In England, trades are linked to a guild who in turn ensure the trades are competent to carry out their work as well as to certify their work (City & Guilds Group, 2015).

There was considerable non-compliant and defective work on CS1, as shown by these observations of **Onsite** staff:



Similar responses were forthcoming from offsite observations.



*Because what happened is that the builder used a wall system that was unproven in this country. He used a window system that was unproven in this country. They did plumbing plumbing systems that weren't tested in this country.*

It became very evident that reliance of certification from sub-contractors posed a considerable issue for CS1 and ultimately all of the sub-contractors employed by Builder 2 on CS1 had their contracts terminated due to defective work they had been party to. They were subsequently replaced by local competent sub-contractors who had the ability to rectify the work and issue a compliance certificate.

## 5.7 Documentation Requirements

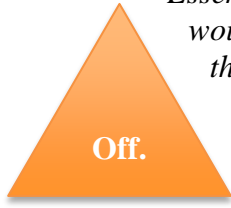
CS1 had ample time during which relevant design documentation could be prepared. As reported in the local media, documentation for CS1 began on the 14<sup>th</sup> December 2000 when it was successfully granted a development application from Newcastle City Council (Kirkwood, 2000). To achieve compliant documentation for a Construction Certificate (CC), the architect appointed specialist consultants to finalise documentation as shown in Figure 37

Heritage	Jan 2001
Restaurant/parking	Feb 2001
Acoustic	Mar 2001
Terrace design	July 2001
Archaeological	Oct 2001
Hazardous Material	Dec 2001
Mechanical	July 2002
Electrical	July 2002
Soil	July 2002
Air Conditioning	Sept 2003
Dilapidation	Dec 2003
Mine Subsidence	Dec 2003

**Figure 37 - Documentation Timeline- CS1 (Source: personal records)**

It was not until 2005 that a contract was awarded to the first builder (Bld1) (as previously discussed in section 4.2. The successful builder factored in his tender the use of modular components, necessitating redesign of the structure to allow ease of movement as well as utilization of modules.

The initial design was prepared by a local architect and then sent to China to be re-drafted to allow for the inclusion of modular pods. Interviewing the original architect, he recounted the time as follows



*Essentially they just said to me that I was too expensive, and that they would use their own resources to make the changes to the documentation that they needed. So I was out of the picture.*

The architect continued by recounting how the client re-engaged him to go to China to view the production of the modules to ascertain that they were being manufactured in a satisfactory manner. He said:

*.... the decisions he made then, to pre-make the bathrooms and the kitchens in China, and (the client) asked me to go over there and have a look at how they were doing it, and to check out whether or not it was being done in a satisfactory manner. Which I did. But they took no notice of me, in China.*

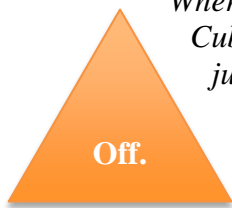
The BCA consultant also had concerns regarding manufacturing of the modules. He said:

*Because of the cost implications, they, I think, were looking to save a lot of money on these completed bathrooms and kitchens, ready assembled and cheaper than those they can provide from Australia.*

More concerning was the certification of these modules; again the BCA consultant stated:

*... problem caused by these cubicles (modules). A lot of the problems were the fact that some of these modules were actually finished and it's very difficult to certify these, they placed these modules into different units, difficult to ensure fire rating ...*

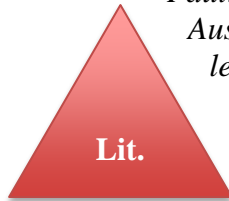
There was a common thread amongst participants when questioned about quality and their own personal belief of the causes of rework as another interviewee suggests:



*Where do you start and where do you finish? When – even things like the Cubicles that they put down in these units was all over the place. It was just a shocker. The installation of the services, we'd spend endless hours trying to work out how to get the pipe from the electrical conduit into the building, because they hadn't left sufficient space or sufficient numbers of vertical risers. Then they hadn't understood that they need to be fire dampened, or fire preparation. Vertically and horizontally through the building. So we had to work our [freckle] off to try and get a solution to those problems after they'd arisen. They just – trying to rework the building once work's been done it is extremely difficult. They – obviously when the water got into the building, they had to rework cupboards and floor conditions in those areas. The installation of the wall tiles was not a top notch job, so that had to be redone. So we had X coming in [unclear]. The window didn't keep water out. We asked the question, where was the [sub-sills]? Oh we don't need sub-sills. So we thought without sub-sills the windows leak. So all the reworking and the repacking of all those windows. They decided at some point that they would bring the balustrades for the balconies*

*from China. They turned up and they were painted steel. It only took a matter of two weeks before the rust started to show through. The rail had to be replaced with aluminium, as was specified, and as the contract required. [Laughs]. It just goes on and on. **All the work that had to be done in terms of certification.** Putting in stairs that complied and trying to get theirs exempted because they didn't comply. Accommodating the pump station which had all been documented before, but they completely ignored the pump station documentation."* (Architect, **Offsite**)

The use of un-vetted materials from China contributed significantly to the detriment of the project. Parliamentary Secretary to the Minister for Industry, Bob Baldwin said recently,



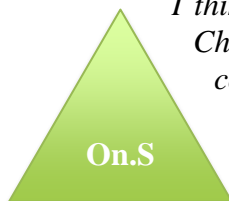
*Faulty construction products and materials are a serious problem in Australia which is putting families and lives at risk as well as putting legitimate and compliant product suppliers at an unfair disadvantage (Heaton, 2014).*

The practice of importing inferior products into Australia is not new. The ramifications of faulty electrical wiring not complying with Australian Standards, as-well-as non-compliant hot and cold PVC and copper piping has been overlooked by the Government for some considerable time. In this context, Heaton notes that the:

*Housing Industry Association (HIA) building spokesperson Kristin Brookfield said, a lack of coordination and **oversight amongst regulatory authorities** was contributing to the problem and adding that consumers should never be left in a position of having to decide for themselves whether individual products are adequate and safe. That task, she said, should rest with manufacturers, suppliers and importers.*

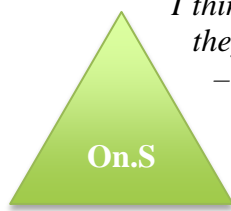
*This is an increasing problem for the whole building industry, and no one wants to see a **significant or catastrophic failure occur**,” she said. “It’s time that all levels of government worked together to seriously address the issue (Heaton, 2014).*

With a cost blowout in excess of \$20m in CS1 and CS2 the words used “significant or catastrophic failure” by the HIA could certainly be expanded to include issues that were raised on both case studies. Again a quote from another **Onsite** respondent on this topic as they say:



*I think the main problem with this particular project did come from the Chinese management. They [sought] inexperienced workers that they could pay cheaply rather than getting in professionals, the inferior products that they brought over from China certainly made a difference, **because a lot of them had to be replaced at great costs**. Generally, they were very difficult to work with overall (Site Clerk).*

This was confirmed by another **Onsite** interviewee who said:



*I think if they were building a building in Hong Kong they'd know what they're doing. Building a building here, they didn't. I think they took it – they thought they could make – take the situation to their advantage; i.e. they could have a windfall, they could make a lot of money out of this. I don't think their intention was to ever build a quality product. I think their intention was to make as much money as they could and totally rip the guts out of XXX, really. I don't think they had any good intentions at all because they shammed that job up in every way possible, from the subcontracting to their mates, to setting up labour hire companies that they actually owned and paying the guys – the Chinese guys – the minimum wage, to over-claiming on progress claims; claiming a million and a half bucks for something that's, probably, worth 250,000; making product in China and importing it here. So they're making it with cheaper materials, making it with cheap labour. I think it could be reverse racism or something. I don't know what you'd call it, but we'll take these silly Aussies for a ride. We can outsmart them. They might have their nice BCA and their nice Australian standards and they might talk to each other in a civil manner, but we'll just play sneaky buggers (Contracts Administrator-**Onsite**).*

Not until a new management team was appointed was it realised that the builder was constructing the building despite the fact that they did not have a complying set of CC documents (a mandatory regulatory condition).

When it became evident to the new management team that the project had serious issues in regards to Building Code Standards, a BCA consultant was appointed to comb through the structure to uncover any physical and potential latent defects and non-compliance issues. When interviewed, the BCA consultant said

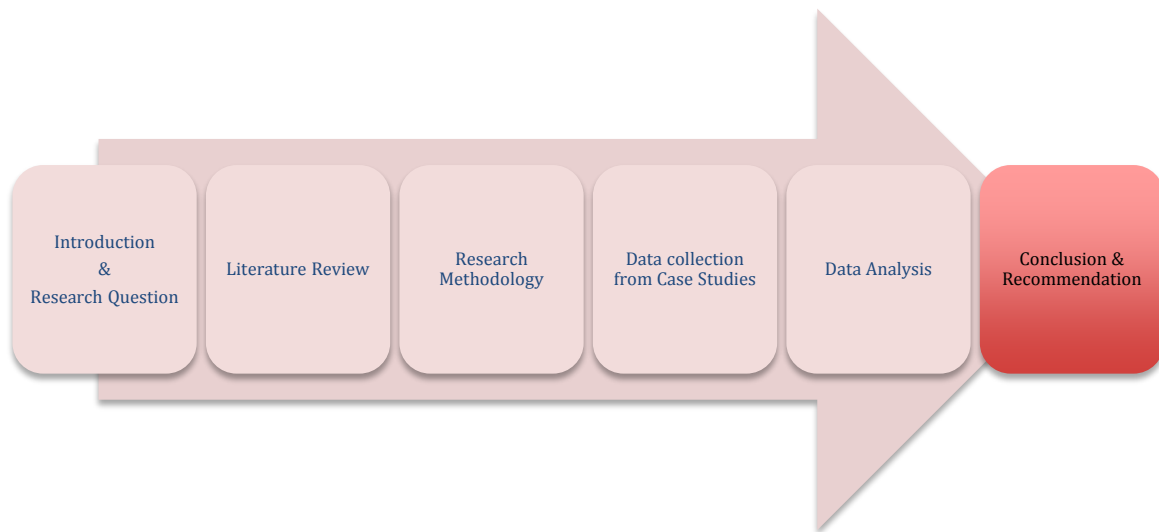


*When I first became involved the workmanship was possibly the worst I've ever seen. Which is why my involvement stretched over about 10 or 11 months to check that the replacement of the work they were doing had been done (BCA Consultant).*

The combination of faulty documentation, lack of skilling leading towards poor quality outcomes, poor management practices and defective work all contributed to both case studies needing rework on a major scale.

The rework experienced on CS1 and CS2 could have been avoided from the very onset of each project. Numerous Government Royal Commissions, Inquiries and Reports have mentioned all of the themes contributing to rework on both of these projects.

## 6. Conclusion and Recommendation



### 24.9 Introduction – Conclusion and Recommendation

The findings of the study, reported in this thesis, have established that good governance and policy is not a science but rather a result of political influence. Initial observations of CS1 revealed a myriad of issues not normally expected when a project undergoes a management change when 75% complete. Initial thoughts were directed towards the cultural nature and management practices of the builder. The documentation was incomplete; there was no specification and no coordination of consultants' drawings and services. Of more concern, the builder was constructing a building without a Construction Certificate! In addition, there were financial implications. Financial control of the project was managed off-site at the builder's remote head office and access to these records was not possible as the client's representative or as a researcher. Ultimately, a 'cost-to-complete' exercise was commissioned, based on the current information at hand. This did not include latent conditions. The 'cost-to-complete-budget became a 'moving goal post', orchestrated by discoveries of faulty and non-compliant works. Site conditions were abhorrent, staff morale was low, sub-contractors had not been paid for some considerable time; all contributing to an unsettled environment on site. The trade union, recognised the new management structure were willing to foster a collaborative approach to



complete the project. This was assisted by the union bringing harmony to the site in exchange for the payment of outstanding wage claims, albeit at an unbudgeted financial cost to the project.

At the commencement of this study the writer had a firm belief that allowing foreign contractors to build on our shores would result in rework on a major scale. **This assertion was wrong!**

The Gyles, Campbell and Cole Royal Commissions between 1992 and 2003 made recommendations in an attempt to improve compliance, quality, productivity and culture (professionalism) within the BCI. These Royal Commissions preceded CS1 and CS2. Ironically, The Collins Royal Commission into Construction Insolvency was conducted after CS1 and CS2 were completed and echoed the sentiments of their findings of Phoenix operators, sham contracting, security of payments and poor or fraudulent account practices.

Why were these two separate contractors, on two distinctly different projects, allowed to continue without any interruption? It would appear that insufficient checks and balances were in place from a number of sources but in particular the lack of a Construction Certificate, no commercial license, unskilled workers, self-certification by unskilled trades and lack of protection for sub-contractors. All of these could have been avoided had Government heeded the findings of the various Royal Commissions and Inquiries. Ultimately both builders managed to construct their projects within an environment that allowed their actions to continue unchecked. How many projects have been completed in this manner and what latent defects do they contain?

## 24.10 Achieving the Research Objectives

The resultant of this study has identified three primary themes (professionalism, documentation and quality) that created a pathway for rework on the case studies. Below is a copy of Table 14 (shown in Section 24.10) containing the aims and objectives of the study set against these three themes. Following this table, a breakdown of the case study findings is examined.

Themes	Research Aims	Research Objectives
<b>Professionalism</b>		
	To determine the extent systemic failures of existing building delivery exist due to lack of professionalism.	Investigate and define the current roles of building professionals. Acknowledge the gaps in management practices.
<b>Documentation</b>		
	To examine the reliance placed on design documentation.	To identify the design process and possible contribution to rework. To identify the adequacy of design documentation.
<b>Quality</b>		
	To explore industry practices to identify improvements to curtail the rise of rework.	To identify the roles and responsibilities of professionals within the BCI. To identify the effectiveness of auditing the construction process. To identify compliance and built quality.

Copy of Table 14- Research Aims and Objectives

Table 14 has identified the three key themes of professionalism, documentation and Quality.

**6.2.1 Professionalism**

*The objective as defined in Table 14.*

*Investigate and define the current roles of building professionals, acknowledge the gaps in management practices.*

Professionalism by definition is interpretively lost through social culture. The building professional could mean a labourer, tradesperson or manager. A licenced builder has been deemed to be a ‘Master Builder’ by industry organisations yet obtaining a licence for residential construction in NSW is relatively straightforward. The other ‘professionals’ within industry include architects, engineers and quantity surveyors. but what about the myriad of roles within the builder’s realm? Could site mangers, estimators, procurement managers, development managers, project managers and project directors be regarded as professionals? These individuals are often responsible for major works that are far more complex than the works undertaken by their ‘professional’ trade counterparts. Society in general, as well as federal and state governments, are seemingly unaware of building ‘professionals’ and these individuals are frequently overlooked. A number of ‘professional’ organisations representing these professionals (including the AIB, AIQS and AIBS) have all attempted to affect change in this area, but have received a lukewarm response from government. With the new changes to regulations currently being investigated by government, the possibility of a centralised building commission and representation and acceptance of Chartered Builders in a defined role of quality and inspection may become reality.

On both projects, the builders came under considerable criticism from participants. This may have resulted from cultural differences and a poor understanding of building delivery in Australia. However, both builders failed to recognise the importance of compliance whether wilfully or by sheer ignorance. Both builders were harshly criticised by participants regarding their site management obligations especially in the area of WHS. Notwithstanding this, WorkCover and the trade union seemed powerless to influence them. The main issue with both builders was their licensing. This is the only mechanism regulators can use to allow builders to operate. Unfortunately, NSW does not have a separate licence for buildings over 3

storeys and regulators rely on a domestic builder's licence for any residential building over 3 stories. There is no distinction between a domestic licence and a commercial (high rise) licence in NSW.

The case studies identified the importance of professionalism and working within a code of conduct. These characteristics were not visible, nor were they reported by any of the participants.

The role of the builder or construction manager is becoming more complex as the industry progresses and it is timely for the profession of building to be recognised.

Legislation can assist by the introduction of licencing for those operating in the mid to high-rise development sector.

**In conclusion,** professional behaviour and attitude is a perception in the minds of people and by definition can vary from person to person. Nevertheless, professional behaviours have consequences. These are generally perceived to be acceptable behaviours within the confines of their said vocation. In Australian construction, senior management roles are generally undertaken by personnel who have had on-the-job training to a level that has been empowered and assessed by their peers to undertake their next managerial task, initially under supervision. This system still applies today within traditional construction organisations. What has occurred is a phenomenon within the Sepp65 midrise apartment sector. This involves opportunities for unqualified individuals to undertake roles of authority on these projects. This is concerning. As evidenced in the case studies, overseas site management practices were at odds with mainstream construction practices in Australia. This may not be of significant concern as other US and European companies have established themselves in Australia successfully. However, the evidence demonstrated in these case studies is that some companies have not been able to adjust to the Australian regulatory and work practice framework. Numerous Royal Commissions, Inquiries and the like have proposed reforms to improve the BCI industry. For example, this study has shown the omission of an 'open' builder's licence in NSW to be one such instance that has led to unprofessional behaviour on construction processes. The requirement to hold a builder's licence in NSW is barely sufficient for the applicant to be able to construct a stand-alone dwelling, let alone a nine storey building.

### 6.2.2 Documentation

*The objective as defined in Table 14.*

*To identify the design process and possible contribution to rework. To identify the adequacy of design documentation.*

Carr, in his attempt to define the Sydney skyline with well-designed structures by introducing the Architects Act, was a positive step to improve design and documentation. However, the role of the architect has diminished over time along with the quality and quantity of sufficient documentation for construction purposes. Builders have traditionally been the risk takers when it comes to building, yet they are prepared to accept sub-standard documentation for the execution of the works. It is a builder's belief when the architect provides too much detail and documentation, the delivery process could be scrutinised more than if those details are left to the builder to decide. Recent moves by the BPB, via the Lambert discussion paper, highlight the need for streamlining the DA/CC process so that it becomes standardised throughout the State at every council level. Improvements to documentation and the possible mandatory insertion of a specification, albeit "Natspec" to affect a better quality outcome would be a benefit.

CS1 suffered considerably due to poor documentation whilst CS2 fared much better as illustrated in Figure 30 and Figure 31 probably due to the documents being prepared locally. Document management for CS1 was reported as being very poor creating difficulties for staff and contractors to effectively deliver the project. Participants from CS2 did not report any issues relating to documentation.

According to the participants interviewed, CS2 had a better start as their documentation was prepared locally thereby controlling coordination by having some interaction between their consultants. CS1 on the other hand, were given a full set of documentation produced locally but decided to alter the design abroad, to suit their purposes. In the process control of coordination was lost as well the maintenance of an up-to-date document register. The checking process conducted by the PCA whilst assessing the CC application would have picked that up and requested up dated information. This would be case with CS2 but not with CS1 as the builder continued building using unapproved design documents.

Legislation was absent when a major building was being constructed and reached a height of 9 storeys without any interference by certifiers acting on behalf of the regulators. This situation would not have occurred, had sufficient mandatory inspections taken place, including someone checking documentation against approvals. Whatever the reason, a gap within the regulatory environment allowed CS1 to progress the way it did.

The independent inquiry by Lambert may address these flaws but, in line with previous inquiries and Royal Commissions, it is not clear whether Lambert's recommendations will find their way into legislation.

**In conclusion**, the preparation of design documentation and supervision of compliance on construction projects have changed over recent times. The role of the architect has diminished and a greater emphasis has been placed on certifiers to ensure projects are built in accordance with the documentation as opposed to the role traditionally undertaken by the architect. The process begins with examination of design documents to ensure they comply with the relevant acts and standards. The certifiers then inspect the work. The compelling argument is the low number of inspections. With the current minimum mandatory requirements for inspections, how could a certifier reasonably be able to assess a project to any depth? Furthermore, there has been a perception by the general public that these inspections also cover quality as well as compliance. This has placed certifiers in a difficult position. NSW is currently facing an apartment boom yet the numbers of certifiers have not increased proportionally. Certifiers have not had the same training as architects or builders in the finer points of quality, regardless if this is their role. The certifiers act on behalf of the regulator; they assess construction drawings and ensure construction is in accordance with the drawings. CS1 was found to have constructed the building to level 9 without any approval from the regulators prior to the issue of a CC. Regardless of how this happened, it did and one could ask where were the checks and balances that would have placed a stop work notice on the project? CS1 also had the design documentation redrafted overseas with questionable references to Australian Standards, in particular fire separation. The project continued unchecked and major rework was required to correct numerous breaches of legislation; this may not have occurred had the due process taken place. These issues have not been raised by past Royal Commissions or Inquiries but rather have come under focus by the relinquishment of duty for certification by Councils to down size their certification roles, thereby placing greater reliance on private certification practices. Montalbaro expressed his concerns about the availability of

certifiers to fulfil these requirements. The media has exposed certifiers that have overlooked fire breaches and exposed lives. Within this backdrop, Lambert is currently reviewing the role of certifiers and it is hoped by industry that a common sense approach will be adopted to improve this sector of the BCI. Professional design process and adequacy of documentation should be regarded as fundamental to a delivery process. Disregard to this process can only lead to more examples as demonstrated in CS1.

### **6.2.3 Quality.**

*The objective as defined in Table 14.*

- 1. To identify the roles and responsibilities of professionals within the BCI.*
- 2. To identify the effectiveness of auditing the construction process.*
- 3. To identify compliance and built quality.*

The independent inquiry by Lambert is currently reviewing a number of aspects concerning certification including documentary requirements for DA and CC purposes. Part of this review is to ascertain the requirement for the insertion of a standard formatted specification similar to the Natspec system, as a tool to monitor quality. It should also be noted the current mandatory inspections for multi-unit developments over three storeys only require no more than the 3-4 as specified and only cover compliance and not quality.

The interpretation of quality has become more subjective over the years as a result of lowering skill sets within the trades. Consumers also fall victim with their willing to accept work that does not fall within the old terms of ‘workman like manner’, that term has now been changed to ‘fit for purpose’. The same could be said for the trades and installers, as the construction environment continually changes due to market pressures, skill availabilities and education opportunities. The days when the ‘clerk of works’ assessed a project for quality has long gone. But what has replaced the CoW? Industry has tinkered with QA via ISO9000 or alternatively clever marketing. The issue of quality expectations is still a matter of concern for industry and government alike and a solution may be yet some time away.

Both case studies suffered badly from poor quality delivery. This was due to a number of causes including skilling, material imports and lapsed supervision. Whatever the cause, the counter act poor quality, a self-imposed quality management system is the only means available in today’s market unless the client engages a representative or superintendent to act

as a CoW's to improve quality.

Both case study builders used imported (457Visa) labour to execute as much as possible in lieu of using locally based sub-contractors. The reasons for their use of imported labour were multiple and they included cultural, ease of managing control and financial benefit.

As a result, both projects had numerous examples of work that was carried out by unskilled workers. CS1 had examples of defective plumbing whilst CS2 had defective electrical works. Both of these trades are mandatorily licensed by the authorities yet in both cases works undertaken had to be removed and replaced by competent trades. The use of 457Visas by either case study builder caused considerable concern for authorities, unions and workers on site. These visa holders did not have any significant skill base that could not have been sourced locally and they further put at risk other workers on site by their non-conformance to WHS procedures.

Whatever the builder's motivation was, the resultant work was carried out contrary to the EP&A Act and the BCA but most of all, lacked quality requiring significant rework.

Further hindering the delivery of a quality product/project was material choices. Although CS2 did not disclose examples of non-compliant materials used on the project, CS1 had numerous instances. Participants mentioned windows and doors, balustrading, fire services, 'Gyprock' walling, fire doors and ceramics to name a few. A great deal of these materials had to be removed and replaced by locally sourced goods that had adequate certification assurances that the products met Australian Standards. The modules that were adopted for CS1 seemed like a progressive move by Bld1 at the time but these modules also proved problematic when the various components were found not to meet local standards for certification.

**In conclusion,** Quality assurance remains a vexing question for industry and government alike. The notion that material supplied to a project meets all of the requirements prescribed by law cannot be assumed. Australia is moving rapidly towards a Global economy and is no longer isolated from the rest of the world. Imports of international products and labour are becoming more prevalent. In addition to material quality lies labour quality. The removal of government involvement from the TAFE system and the proliferation of RTOs providing courses to the BCI has had mixed results. The prospect of rewinding the wheel with builders directly employing trades and apprentices is fast becoming not a viable option. However,



within the small medium enterprises (SME) sector this may still be current to a small degree. The country is facing a skills crisis within a booming construction period. The question remains as to how youth skills are developed as opposed to importing skilled workers via 457 Visas. Australia is not alone in dealing with this dilemma. The now international use of sub-contractors has contributed significantly to the decline of apprenticeships and a new direction for training is urgently required.

### 6.3 How have these objectives satisfied the aims of this study?

Table 20 below demonstrates the connection between rework and government organisations. Both builders managed to construct their projects despite regulatory requirements. One could describe this conclusion as the ‘perfect storm’, providing the opportunity for these builders, and possibly others, with the ability to construct within NSW un-vetted and unopposed under the current legislation.

A snapshot of the role by regulators and comparing with the results from both case studies can be seen on Table 20 below illustrating the regulator’s role as per the themes and objectives discussed within this thesis.

Aims	CS1	CS2	Regulator	Impact
<b>Professionalism</b>				<b>To determine the extent systemic failures of existing building delivery exist due to lack of professionalism.</b>
Unlicensed work	Yes	Yes	OFT	Builders have a responsibility for using licenced trades, in particular plumbing and electrical. Both case studies have uncovered this was not the case. Evidence by Kirkwood, has publically highlighted this concern. Audit checks of trades by regulators (Building Police) can prevent the use of unlicensed trades thereby preventing unlawful work resulting in rework.
Builder’s Competency  A case for an Open Category License.	Poor	Fair	OFT	The data obtained from both case studies indicated a poor rating for the competencies of the builder on CS1 whilst the builder on CS2 fared better. The opportunity for CS1’s builder to construct the project could have been thwarted at the very outset had the builder an appropriate licence for the works to be

				<p>undertaken. Currently, the OFT only issue licences for residential work within NSW. The emphasis has been to address consumer concern particularly regarding single dwelling construction. OFT do not manage complaints associated with highrise (Sepp65) apartment buildings as these complaints are usually settled privately using the court system thereby alleviating any concern for licence reform by OFT.</p> <p>Industry bodies disagree and are seeking to have open licencing introduced, as has been the case in other States and a key reform for NOLA.</p>
<b>Documentation</b>				<p><b>To identify the design process and possible contribution to rework.</b></p> <p><b>To identify the adequacy of design documentation.</b></p>
Document Sourcing	Abroad	Locally	PCA	<p>The quality of design documentation reflects the quality of the building. To achieve this quality, documentation has to comply with all of the regulations imposed by Federal, State and Local jurisdictions as well as containing sufficient detail for the builder to construct. The documentation for CS1 was amended overseas with little regard for local standards whilst CS2 had their documentation produced locally. The net result from the data extracted from the case studies indicated poor documentation on CS1 resulted in considerable rework whilst CS2 did not.</p> <p>This phenomena for CS1 could have been averted had a CC application been made by CS1 and assessed by a PCA for compliance, rework could have averted.</p>
Construction Certificate	No	Yes	PCA Council	<p>By law, a CC is required before work commences on site.</p> <p>Why CS1 was constructed to L9 without a CC is unknown. Why CS1 managed to build a structure to L9 is also a valid question but not subject to this study.</p> <p>Both the PCA and Council have a responsibility to monitor unlawful works under their control yet in the instance of CS1 no intervention took place. Ideally, either the PCA or Council could have placed a stop work notice on CS1 and have prevented unlawful work thereby preventing subsequent rework.</p>
Design Documentation	Poor	Fair	PCA	<p>Had due process occurred for CS1 by way of a CC supported by a comprehensive set of documentation, rework could have been avoided.</p> <p>As evidenced by this research, the documentation supplied by the builder for CS1</p>

				was not suitable for a CC nor for construction. This situation eventuated in the appointment of the original 'local' architect to redesign and submit a new set of design documentation for CC purposes as well as a means for effecting rectification – rework.
<b>Quality</b>				<b>To explore industry practices to identify improvements to curtail the rise of rework.</b>
Non-Compliant work	Yes	Yes	PCA	Both projects were subjected to rework due to poor quality delivery. The reasons identified were cultural, poor skills and unprofessional delivery practice. Another contributor is the low number of mandatory or statutory inspections by the PCA thereby creating an environment for noncompliant works to be built and in time potentially covered over to a point of not being visible for inspection. These defects will become latent defects and may not be subject to rectification by the builder unless detected within the specified time frame. These hidden defects can be averted by improved auditing systems and increasing the number of mandatory inspections for high rise buildings thereby averting any potential rework.
WHS	Yes	Yes	Work Cover	Work Cover plays a crucial role by identifying safety concern on work sites and by providing advice and training. CS1 and CS2 had the benefit of Work Cover actively engaging with both builders to assist with safe work practices. Unfortunately, the efforts by Work Cover to improve safety on site was seen by both builders as a hindrance rather than a benefit according to those interviewed. The reasons as to why the builders took that viewpoint can only be speculated but one reason identified was language barriers making enforcement very difficult.
Unskilled labour	Yes	Yes	Dept. of Immigration	The BCI is facing an unknown future caused by the lack of skilled workers. Traditionally builders employed their own trades accompanied by apprentices, that has now become a past trend and the take up rate for apprenticeships have declined over the years. In response to this newly created vacuum, Government has assisted by the introduction of the 457 Visa scheme allowing skilled trades to imported and employed on the basis that local skills are not available. Both projects used imported labour on 457 Visas. Evidence indicated these workers came with a limited skill set yet were able to enter the country. This is contrary to the

				<p>requirements set by Government. Furthermore, it was proven that these workers were not required due to rectification undertaken by local trades.</p> <p>The unskilled workers imported by both builders significantly contributed to rework on both projects.</p>
Non-Compliant goods.	Yes	Not Known	OFT PCA Customs	<p>A large proportion of components used on CS1 emanated from China. The exact source from within China was difficult to determine as numerous components were difficult to certify. A considerable quantity of this material was eventually disposed from the site and replaced by locally sourced items adding further costs to rework.</p>
Quality Delivery	No	No	Required	<p>Quality delivery is becoming a major concern yet regulators are not venturing into this space. Both builders have been criticised for poor quality workmanship. Campbell's Royal Commission raised this concern yet there has been no attempt by Government to address this concern. The PCA is responsible only for compliance, not for quality therefore leaving the responsibility to the builder who in return ought to have an internal auditing or quality assurance measures in place.</p> <p>Both builders did not have any QA system in place as evidenced by the interviewees.</p> <p>The reasons for poor quality delivery by either builder can be described as any one of the abovementioned causations of rework.</p>

**Table 20 - Conclusions**

## 6.3 Final Conclusion

Having unpacked the various objectives mentioned above in Table 20, the role of the regulator plays a significant part in the prevention of rework by administering timely inspections and audit processes.

Dissecting and analysing data from the stakeholders associated with the two case studies and then comparing their statements against literature has aided the answer to the research question as to why a building could progress to a point of nearing completion whilst containing numerous defects... the answer leans heavily towards gaps or failings within legislation.

After the expiration of numerous Royal Commissions and Inquiries as well as new ones that are still continuing today, findings and outcomes seem to be overlooked yet simply to resurface at another inquiry. Perhaps this is due to the barn-door nature of these inquiries or the recommendations have been put to one side for political purposes.

## 6.4 Recommendations

As a result, from this research, there appear to be a number of misinterpreted beliefs within the general public and within government. Government has been seen to be reactionary and have viewed the industry as a single entity sharing the same issues. This belief is fundamentally flawed. Concerns for cottage builders are different to the concerns of high-rise commercial builders for example; the indicators of BCI company failures may not necessarily be evident across the entire BCI. Recognition of professionals operating within the BCI and acceptance of their capabilities could bring benefits for the entire industry and general public alike. Therefore, to dot point some of these recommendations,

- More mandatory inspections required during construction.
- Clearer roles and responsibilities in regards to building regulation and certification, including better access to information, preferably on-line.
- Defining the three distinct layers or strata's within the BCI, i.e. housing, mid-rise and high-rise construction and regulate as appropriate for each.
- Recognise builders who have been peer reviewed and accredited at a higher level of education and training as Chartered Builders.
- Establish an inspectorate or an audit unit to randomly audit construction for compliance and quality.

- Mandate specifications within documentation at CC level to improve documentation and quality.
- License builders undertaking all works above 3 storeys.
- Introduce Home Owners Warranty Insurance for residential buildings above 3 storeys.
- Establish a single building commission to bring together all of the government departments currently fragmented and having influence over the BCI thereby streamlining compliance.
- Provide and mandate additional educational requirements for those delegated and responsible to sign a certificate of compliance issued to the PCA.

## **6.5 Potential Value and Significance**

The motivation of this study was from a number of major projects in regional NSW that became distressed for a number of reasons. Initial research has highlighted this experience is replicated elsewhere. The findings from this study will provide a greater understanding of some of the shortcomings found in the construction industry and thereby inform industry of the negative impact of distressed projects.

## **6.6 Limitations of the Study**

The focus of this research has been confined to NSW only even though the Council of Australian Government are keen on unifying legislation across the country via a national code, the reality is that political manoeuvring has ceased any possibility of this as indicated by the collapse of the National Licencing Scheme.

The NSW government has been seeking a solution to the influx of defective and distressed projects with the establishment of various round-table and industry discussion panels. Stemming from these discussions is the recognition of a cultural change within industry and a desire for Government to reduce their “red tape” by making industry more accountable for quality delivery of Buildings. The three arms of the NSW Government, Treasury, Planning and fair Trading have recognised the importance of collaboration but are short of saying NSW requires a centralised “Building Commission” as is the case in Victoria and Queensland.

## 6.7 Final Post Script

As a researcher, to be vindicated is always refreshing. With the conclusion of the Royal Commission (post submission of this Thesis) into Trade Unions, Brian Seidler, ED of the MBA had this to say,

*“It is interesting to observe that our industry has had experienced 3 Royal Commissions over the last 3 decades – all resulting in similar recommendations. The unfortunate and recurring theme however, is that Governments are unable to achieve outcomes that the industry is crying out for” (MBA, 2016,page 8).*

## 6.8 Preventative Measures

The topic of rework in construction has been a growing phenomenon, a concern for industry, government and the end user. Academics have studied various components of causation yet the problem of rework still remains. This study has uncovered various themes attributing to rework and linked them with literature in an attempt seek means of understanding and possible prevention. Figure 38 presents a graphical self-explanatory illustration of regulatory influence and the prevention of rework. The diagram can be implemented for each of the themes discussed commencing with planning and finalising by amending legislation.

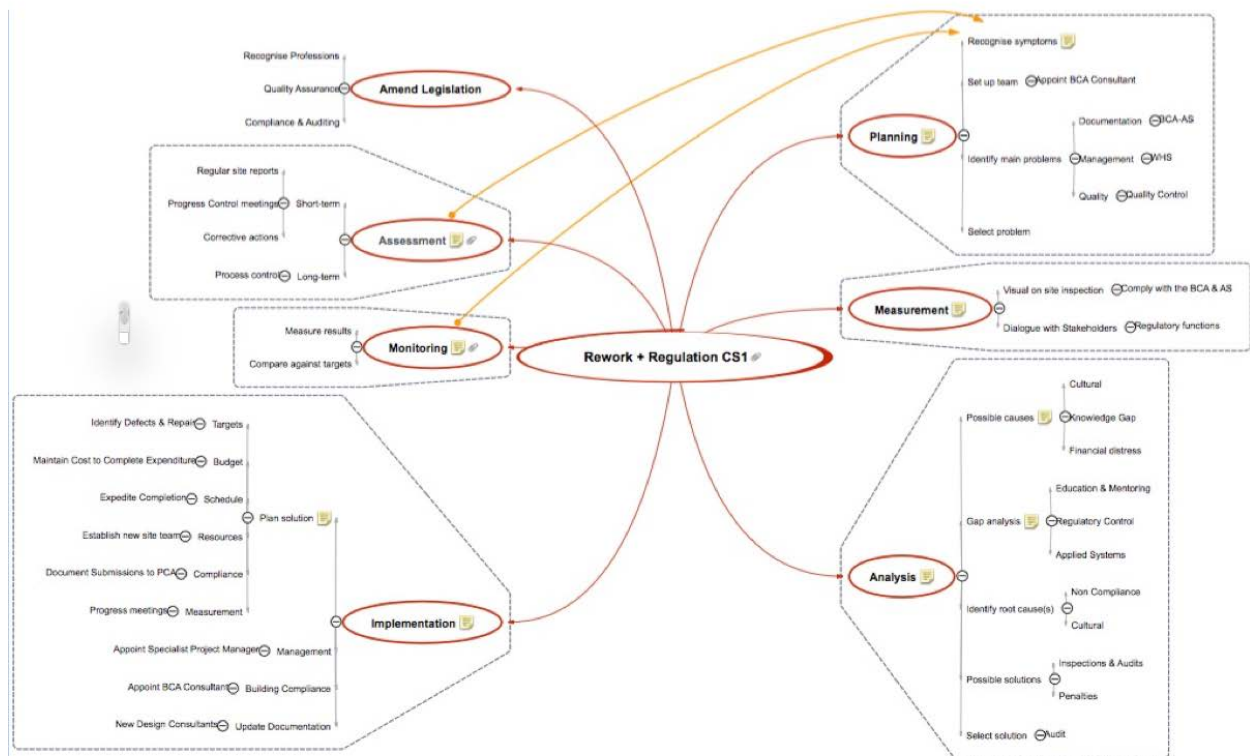


Figure 38 - Rework + Regulations

A more detailed discussion on prevention has been identified as a topic for further research and a PhD.



## Appendix 1 - Royal Commissions and Inquiries.

Date	Name	Jurisdiction	Chair
1939	Royal Commission regarding the contract for the erection of additions to the General Post Office, Sydney	NSW	Maxwell
1981-1982	Royal Commission into the activities of the Australian Building Construction Employees' and Builders Labourers' Federation	Vic	Winneke
1992	Royal Commission into the productivity in the Building Industry in NSW	NSW	Gyles
1990	Public sector tendering and contracting in NSW - Capital works tendering and contracting: management options	NSW	NA
1991	Public sector tendering and contracting in NSW: Capital works tendering and contracting, Volume A	NSW	NA
1992	Coastal planning and management in NSW: The process for the future, Volume 2	NSW	Standing Committee
1998	Security of payment for the New South Wales building industry	NSW	Joint Standing
2000	Report on the Environmental Planning and Assessment (Savings and Transitional) Amendment (Olympic Co-ordination Authority) Regulation 1999	NSW	Joint Statutory
2002	Home Building Amendment (Insurance) Act 2002	NSW	Standing
2004	The approval process relating to the Designer Outlets Centre on Orange Grove Road, Liverpool	NSW	Standing
2006	Cross City Tunnel, First report	NSW	Joint Select
2006	The Cross City Tunnel and Public Private Partnerships, Second report	NSW	Joint Select
2006	Lane Cove Tunnel, Third report	NSW	Joint Select
2007	Inquiry into the operations of the Home Building Service	NSW	Standing Parker
2009-2010	Badgery's Creek land dealings and planning decisions: First report, Second report	NSW	Standing
2013	Cogeneration and Trigeneration in NSW	NSW	Legislative Assembly
2013	<u>Royal Commission into the Home Insulation Program</u>	Federal	Hanger
2014	Skills shortages in NSW	NSW	Legislative Assembly
2014	<u>Royal Commission into Trade Union Governance and Corruption</u>	Federal	Heydon

## Appendix 2 - Recommendations from the Campbell Inquiry

No	Recommendation	Accepted	Current Impact
1	Establish a Home Building Compliance Commission	No	Dysfunction between OFT and BPB
2	Performance audit of the commission	No	Not applicable
3	Establish a funded Home Building Advice & Advocacy Centre	Yes	Alternate dispute resolution (ADR) is currently being reviewed.
4	Information exchange protocols to be developed between agencies.	Not Known <sup>4</sup>	
5	Building Licence categories for low, medium & high-rise buildings.	No	Non-licensing of medium and high-rise builders has led to poor professional practice, insolvencies and poor quality.
6	Assess effectiveness of current licensing.	No	The Gold License scheme has not translated as an effective tool to achieve quality.
7	Implement CPD especially on BCA.	No	CPD was initially trailed but subsequently repealed. This will degrade professionalism.
8	Investigate financial soundness of builders	Yes	OFT determines financial competency for domestic licensing but have no authority on commercial builders. This eventually gave rise to the Collins Report on Insolvency.
9	Revise licensee penalties for breeches.	Yes	Government's only means to curb breeches has been by penalties, this is not the best outcome.
10	Vigorous investigation unit be established.	Yes	I have no feedback regarding the effectiveness of this investigation unit.
11	Investigate implementation of regulatory control of building standards in the non-residential sector.	No	Sole reliance on the BCA.
12	Expand licensing and establish one body to manage builders and certifiers.	In Part	The intent of this recommendation was for a singular authority and to professionalize builders, the resultant was the establishment of the BPB under a different Ministry.
13	Implement powers to deal with offences by builders and certifiers.	Yes	As per 'Maltabarow's' report, a number of certifiers have already been disciplined.
14	Commissions ability to undertake complaints based on auditing.	Partly	Auditing of builders has not eventuated whilst auditing of certifiers have.
15	Make available builders history on-line.	Yes	OFT has made available complete license history of all builders.
16	Commission to establish industry skills programs.	No	OFT has not created a Commission nor are they active in promoting skills and training programs.

<sup>4</sup> Where I have mentioned 'Not Known' is because these issues are Government internal policies.

17	Commission to target high risk specialist areas for training to reduce the incidence of defective waterproofing, tiling and concrete in consultation with industry.	In Part	OFT recognize the problem with high-risk trades. Industry conducts skilling of waterproofing contractors however it has not curbed the incidence of defects.(Howe, n.d.)
18	BCA to be drafted in “Plain English”	Yes	BCA may have been drafted in plain English but due to it’s annual cost and misinterpretation the BCA has been slow on the uptake by builders.
19	BCA should be made readily available.	No	Only until recently has the BCA been made freely available, 14 years has lapsed since the recommendation was made.
20	Consumer Protection Booklet to be made available.	Yes	This book is available on-line.
21-28	Amendments to the BCA	Yes	Recommendations were directed to the Building Codes Board and have been generally accepted.
29	Pertains to the operation of the Advocacy Centre.	Yes	No comment.
30	Introduce a rating system for consumers to choose a builder.	No	A contentious suggestion.
31	Introduce a “Guide to choosing a PCA”.	Yes	Adopted by the BPB.
32	Commission regulate the contents of building contracts.	Partly	Contracts are produced by industry however Government has regulated various aspects.
33	PCA to be appointed by owner and if the owner is a developer, the PCA is to be closely monitored.	No	This recommendation has been an absolute failure as evidenced by the disciplinary actions against certifiers by the BPB.(Maltabarow, 2013a)
34	Clarification of certifiers role within legislation.	Yes	Clear understanding of the differing functions of certifiers.
35	Mandatory Critical Inspections <ul style="list-style-type: none"> <li>• prior to placing a footing;</li> <li>• on completion of the framework;</li> <li>• prior to placing a reinforced concrete structure;</li> <li>• on completion of waterproofing activity; and</li> <li>• on completion of building work.</li> </ul>	Yes	Five critical inspections are inadequate for a multi-storey building.
36	Site inspections conducted by PCA.	Yes	Legislation dictates PCA to do site inspections however with the shortage of PCAs amendments may be made to allow future inspections to be carried out by Qualified Building Inspectors.
37	Site notification by PCA	Yes	
38	Complaint handling by the Commission.	Yes	Complaints against certifiers are now conducted by the BPB.
39	Review of Complying Development	Yes	CDCs are managed by the BPB.

	Consent regime.		
40-47	Various provisions pertaining the administration of certification.	Not applicable	No comment
48-51	Dispute resolution recommendations.	Not applicable	No comment
52-55	Strata issue recommendations.	Not applicable.	No comment

**Figure 39 - Campbell Inquiry Recommendation**

## Appendix 3 - Interviewees

No	Profession
1	Certifier
2	Sub-Contractor
3	Architect
4	Builder
5	Client
6	Site Clerk
7	QS
8	Builder
9	Project Manager
10	Union Rep
11	Contracts Administrator
12	Development Manager

## Appendix 4 – Survey Outcomes

### Case Study 1

An example of 11 responses to the survey.

Use of own labour extensively on site?	Yes = 8, No = 2-mean = 6
Was there adequate experience?	Yes = 1, No = 10- mean = 9

#### Professionalism

Were payments made in a timely manner?	Good = 1, Fair = 2, Poor = 7, mean = 4
Rate the site management?	Good = 1, Fair = 2, Poor = 8, mean = 5
Rate work practices (OH&S) on site?	Fair = 3, Poor=7, Uncertain=1, mean = 4
Rate working conditions on site?	Fair = 6, Poor = 4, Uncertain = 1, mean= 2
Rate working relations on site?	Good=1, Fair = 5, Poor=4, Uc=1,mean= 2
Summary result	Good=3/5=.6, Fair=18/5=3.6,Poor=30/5=6,
UC=2/5=.4	

#### Quality

Rate overall quality of works?	Fair = 3, Poor = 8, mean=-5
Rate Quality of work?	Fair = 2, Poor = 9 –mean = 7
Summary result	Fair=5/2=2.5, Poor=17/2=8.5

Client's involvement in running the job?	Yes = 3, No = 6, Uc = 1, mean=-3
Did clients decisions hamper the project?	Yes = 3, No = 7,mean= 4
Difficulties with payments by client?	Yes=2, No=6, Uc=2, mean= 4

#### Documentation

Was the documentation adequate?	Yes=1, No=1, Fair =2, Poor = 8 mean = 6
Were design consultants local or OS?	Majority of participants said Both.
If yes, from what discipline?	Arch, St Eng, Elect Eng, Hyd Eng and Fire.
How would you rate documentation?	Yes=1, Good=1, Fair=4, Poor=4.mean= 6
Did the consultants regularly visit the site?	No=6,mean=-6
Summary result	Good=1/2=.5, Fair=6/2=3, Poor=12/2=6

If yes, who?

Was there a QA in place?	Yes=1, No=7, mean= 6
Your opinion-Causation of rework?	Financial=6, Documentation = 4, Management 6 Language 3 Cultural 4.

## Case Study 2

Survey outcomes for Case Study 2.

An example of 3 responses to the survey.

Use of own labour extensively on site?	Yes = 3, No = 0 (3)
Was there adequate experience?	Yes = 1, Uncertain=1 (1)
Rate Quality of work?	Fair = 1, Poor = 2 (-1)
Was the documentation adequate?	Fair = 2, Poor = 1 (1)
Were payments made in a timely manner?	Good = 1, Poor = 1 (0)
Rate the site management?	Fair = 1, Poor = 2 (-1)
Rate work practices (OH&S) on site?	Poor = 3 (-3)
Rate working conditions on site?	Fair = 6, Poor = 4, Uncertain = 1 (2)
Rate working relations on site?	Fair = 1, Poor=2 (-1)
Rate overall quality of works?	Fair = 1, Poor = 2 (-1)
Client's involvement in running the job?	Yes = 2, Uc = 1 (2)
Did client's decisions hamper the project?	Yes = 3, (3)
Difficulties with payments by client?	Yes=1, Uc=1 (1)
Were design consultants local or OS?	Local
If yes, from what discipline?	Arch, St Eng, Elect Eng, Hyd Eng and Fire.
How would you rate documentation?	Fair=2 (2)
Did the consultants regularly visit the site?	Yes=1 (1)
If yes, who?	All
Was there a QA in place?	No=2, Uncertain =1 (-2)
Your opinion-Causation of rework?	Financial=1, Management 1 Language 1 Cultural 1

# Appendix 5 - Invitation to participate in a survey.

Willy Sher  
School of Architecture and Built Environment  
University of Newcastle  
University Drive, Callaghan  
NSW 2308  
[Willy.sher@newcastle.edu.au](mailto:Willy.sher@newcastle.edu.au)

10<sup>th</sup> June 2012

## **Exploring the impacts of rework on new building projects and there implications to certification.**

Sher, Willy David; John Smolders

### **Invitation**

We are conducting research to explore the impact of certification on distressed projects.

### **Why is the research being done?**

Construction is currently in a difficult cycle with a number of contractors facing financial hardships and financial institutions taking possession of distressed projects. The resultant of these reposessions is that sub contractors associated with the project have not been fully paid and are reluctant to sign off on their incomplete works. In many instances a new contractor is appointed to complete the project and that same contractor is faced with the dilemma of securing certificates in accordance with the DA conditions.

The **aim** of this study is to establish key indicators that will assist in ascertaining whether or not it is financially viable to remediate a distressed project to a stage of achieving a Final Occupancy Certificate.

There are two parts to this research, firstly we will be seeking an informal discussion with parties that have had first hand experience with distressed projects and secondly we will be compiling a structured survey that will be widely distributed within industry.

### **What choice do you have?**

Participation in this research is entirely voluntary, should you decide to assist, that will be very helpful however if you decide at a later date to withdraw, we will ensure that all references made by yourself is withdrawn from the study.

### **What will be expected of me?**

Mr John Smolders will be interviewing you in a casual manner. He will engage you in conversation about your specific knowledge of the project. Please note that this interview will be recorded so that a transcript can be made for further evaluation.

### **What are the risks and benefits?**

By participating in this research you will be contributing to the understanding of the implications of certification of distressed projects. It is not anticipated that participation in the research would present any appreciable risks to you. There are no identifiable direct benefits to individual participants. However, the findings of this research could benefit the industry to better manage distressed construction projects.

### **How will your privacy be protected?**

All data gathered through the Interview will be treated with the strictest confidence. All identifiable features (i.e. names of individuals and projects) will be removed and codes will be assigned. Participants will be provided the opportunity, upon request to review, edit, or erase the recordings or transcripts of the interviews. Only the research team will have access to personally identifiable data collected. All information will be stored in password protected computer files. Once the project is complete the information will be stored for five years in the Principal



Investigator's office in a locked cabinet and then destroyed according to University of Newcastle procedures.

**How will the information collected be used?**

The data will be used within a range of publications such as journals, international conferences and in a thesis to be submitted by John Smolders. Participants will not be identified in any reports arising from the project. The participants will be offered a summary of the results. If you would like to receive a summary of the results of the research, please register your request in the 'Consent Form' or by contacting Mr Willy Sher on the phone number or email address below.

**What do you need to do to participate?**

Please read this Information Statement and be sure you understand its contents before you consent to participate. If there is anything you do not understand, or you have questions, contact the researcher. Should you choose to participate in this study, please complete the attached 'Consent Form' and e-mail or post it to Mr Willy Sher. The research team will then contact you to arrange a time convenient to you for the interview.

Please keep this information sheet.

***Further information***

If you would like further information please contact Mr Willy Sher or John Smolders, on the phone number or email address below.

Thank you for considering this invitation.

**The Research Team**

Willy Sher  
Chief Investigator  
[Willy.Sher@newcastle.edu.au](mailto:Willy.Sher@newcastle.edu.au)  
T+61 2 4921 5792  
F+61 2 4921 6913

John Smolders  
Student Researcher  
[John.Smoldersi@newcastle.edu.au](mailto:John.Smoldersi@newcastle.edu.au)  
M +0412 257192  
F+61 2 4921 6913

# Appendix 6 - Consent Form

Willy Sher  
School of Architecture and Built Environment  
University of Newcastle  
University Drive, Callaghan  
NSW 2308  
[Willy.sher@newcastle.edu.au](mailto:Willy.sher@newcastle.edu.au)

10<sup>th</sup> June 2012

Consent Form for the Research Project  
**Exploring the impacts of rework on new building projects  
and there implications to certification.**  
Sher, Willy David; John Smolders

I agree to participate in the above research project and give my consent freely.  
I understand that the project will be conducted as described in the Information Statement, a copy of which I have retained.  
I understand I can withdraw from the project at any time and do not have to give any reason for withdrawing.  
I consent to participate in both phases of the interviews involved in this research and have it recorded.  
I understand that my personal information will remain confidential to the researchers.  
I have had the opportunity to have questions answered to my satisfaction.

Please fill and sign the space below and return this form to the address provided in the right hand corner above

**Print Name:** \_\_\_\_\_

**Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

*Please feel free to contact any of the under-listed for clarification, if any*

**The Research Team**

Willy Sher  
Chief Investigator [Willy.Sher@newcastle.edu.au](mailto:Willy.Sher@newcastle.edu.au)  
T+61 2 4921 5792  
F+61 2 4921 6913

John Smolders  
Student Researcher  
[John.Smoldersi@newcastle.edu.au](mailto:John.Smoldersi@newcastle.edu.au)  
M +0412 257192

# Appendix 7 - Interview Questions

Willy Sher  
School of Architecture and Built Environment  
University of Newcastle  
University Drive, Callaghan  
NSW 2308  
[Willy.sher@newcastle.edu.au](mailto:Willy.sher@newcastle.edu.au)

June 2012

Interview for the Research Project  
**Exploring the impacts of rework on new building projects  
and there implications to certification.**  
Sher, Willy David; John Smolders

## Welcome and Instruction

Thank-you for agreeing to participate in this interview. While your views are highly valued, your identity will not be disclosed to anyone outside the research team. We are interested in your collective experiences and attitudes, not those of particular individuals. I am going to ask you some questions about your experiences of a particular project that may form the basis of a case study. You can ask me to repeat a question if you need to but apart from that I will be contributing as little as possible.

Our particular focus of interest is certification of the works by others who have been brought onto the project to complete various components of the project.

Furthermore, I am going to record your interview, so please speak clearly and remember that the recorder will not pick up actions such as nodding etc.

I will now tell you about the topics. I will then get you to introduce yourselves and check the recorder to make sure it is recording your voice. You will be given the opportunity to review, edit and erase your contribution on the resulting transcripts. Pseudonyms of all participants and researchers involved will be used on the transcripts so participants are not identifiable.

## Overview of Topic

(Overview of topic and check that everything has been understood)

This interview is aimed at gaining an understanding of your experiences on a particular project that has been subjected to 'rework' and certification.

(Introduction)

(Play back tape to ensure that all voices are audible and recorded).

## Project details.

Where is the project located?

---

Can you briefly describe the project?

---

What was your involvement with the project?

---

Was the contractor on the selected project the head contractor or a sub-contractor?

☐-Head Contractor

☐-Sub-Contractor

If the contractor was a sub-contractor, what was the trade?

---

What was the original contract value?

---

What was the final cost of the project/work completed by the contractor in local currency?

---

What was the original contract time to complete the project/works in months?

---

What was the actual time to complete the project/works in months?

---

What is the building ultimately used for?

---

Contractor's place of origin?

---

Did the contractor use their own labour extensively on site?

☐-Yes

☐-No

In your opinion, did the contractor's on-site staff and workers have adequate experience to undertake their work?

☐-Yes

☐-No

How would you rate the on-site workers to quality assurance?

☐-good

☐-Fair

☐-Poor

☐-Uncertain

Number of key site management personnel engaged by the contractor?

☐☐☐☐

Was the on site construction documentation adequate?

☐-good

☐-Fair

☐-Poor

☐-Uncertain

In your opinion, did the contractor administer payments and wages in a timely manner?

☐-good

☐-Fair

☐-Poor

☐-Uncertain

How would you rate the site management?

☐-good

☐-Fair

☐-Poor

☐-Uncertain

How would you rate occupational, health and safety on site?

☐-good

☐-Fair

☐-Poor

☐-Uncertain

How would you rate working conditions on site?

☐-good

☐-Fair

☐-Poor

☐-Uncertain

How would you rate working relationships between sub-contractors and the contractor?

☐-good

☐-Fair

☐-Poor

☐-Uncertain

How would you rate quality of workmanship?

☐-good

☐-Fair

☐-Poor

☐-Uncertain

### **Clients Involvement**

Was the client actively involved with the running of the project?

☐-Yes

☐-No

☐-Uncertain

Was the client slow in making decisions?

☐-Yes

☐-No

☐-Uncertain

Were there difficulties with payments from client to the contractor?

☐-Yes

☐-No

☐-Uncertain

### **Consultants**

Were any of the consultants from abroad?

☐-Yes  
☐-Uncertain

☐-No

If yes, from what discipline?

☐-Architectural  
☐-Structural Engineer  
☐-Electrical Engineer  
☐-Hydraulic Engineer  
☐-Fire Services Engineer  
☐-Other

---

How would you rate the documentation prepared by these consultants?

☐-good  
☐-Poor

☐-Fair  
☐-Not Applicable

Did the consultants regularly visit the project?

☐-Yes  
☐-Not Applicable

☐-No

If yes, from what discipline?

☐-Architectural  
☐-Structural Engineer  
☐-Electrical Engineer  
☐-Hydraulic Engineer  
☐-Fire Services Engineer  
☐-Other \_\_\_\_\_

Was there a quality assurance system in place?

☐-Yes  
☐-Uncertain

☐-No

#### **Causation of Rework**

**In your opinion, what factors contributed to rework on the project?**

**(Please tick one or more boxes)**

☐-Financial difficulties  
☐-Poor documentation of plans and specifications.  
☐-Poor management systems.  
☐-Language difficulties  
☐-Cultural differences  
☐-Other

Please fill and sign the space below if you so desire and return this form to the address provided in the right hand corner above

**Print Name:** \_\_\_\_\_

**Role on site:** \_\_\_\_\_ **Date:** \_\_\_\_\_

*Please feel free to contact any of the under-listed for clarification, if any*

**The Research Team**

*Willy Sher*

*Chief Investigator [Willy.Sher@newcastle.edu.au](mailto:Willy.Sher@newcastle.edu.au)*

*T + 61 2 4921 5792*

*F +61 2 4921 6913*

*John Smolders*

*Researcher*

*[John.Smolders@newcastle.edu.au](mailto:John.Smolders@newcastle.edu.au)*

*M + 0412 257192*

*F + 61 2 4921 6913*

## **Appendix 8 - Glossary**

These definitions have been scripted for inclusion for a submission made to Government by the AIB in an attempt to explain the differing roles of stakeholders in the construction industry.

### **Head Building Contractor**

That firm or individual who is contracted to complete a building project (be it a new build, extension, alteration or renovation) and who is licensed as such as required under State legislation; and/or who selects and engages, or employs licensed Trade Contractors; and/or employs licensed Tradespeople.

Taking vicarious liability for their performance in the delivery of the works.

### **Trade Contractor**

A licensed firm or a licensed individual who is (sub)contracted by the Head Building Contractor, or contracted directly by the Client, to perform select trade works for which they are specifically licensed.

### **Head Contractor's Construction Manager**

That individual engaged or employed by the Head Building Contractor to run the construction site and who takes day-to-day responsibility for the safety of the site and construction of the works.

### **Head Contractor's Project Manager**

That individual engaged or employed by the Head Building Contractor who takes overall responsibility for the delivery of the project in terms of the contracted quality, time and cost requirements, and in terms of the statutory requirements of safety and employment.

### **Project Manager**

That individual engaged or employed by the Self Build Developer who takes overall responsibility for the delivery of the project in terms of the contracted quality, time and cost requirements, and in terms of the statutory requirements of safety and employment and to coordinate various Trade Contractors directly engaged and/or employed by a Developer Client.



### **Developer -Client**

That individual or firm who which are not owner occupiers of single dwellings which are the subject of the works, which engages the Head Contractor to build the works, and takes responsibility that the end products fit for purpose and complies with all Statutory, Development, and National Construction Code (BCA and relevant Australian Standards) requirements in order to permit the project to assume it's end use.

### **Self Build Developer**

That individual or firm, who dos not notify the consent authority that a specific Head Building Contractor has been appointed orwhich engages or employees a Project Manager in lieu of a Head Building Contractor and as a consequence assumes the responsibilities of both the Head Building Contractor and the Developer Client above.

### **Chartered Builders-Chartered Building Professionals**

Those individuals who have taken responsibility for the delivery - its quality and compliance with development consent and the like (depending upon the jurisdiction) the BCA and all relevant Acts, Codes and Standards –of the projects which are major and/or significant works.

As a consequence Chartered Builders are required to have: a greater breadth and more intimate construction knowledge; an equally considerable management and financial expertise; and safety and leadership skills –than registrants in any other category on the National Building Professionals Register -as they are responsible for the quality of the project and its physical delivery within its financial, quality, and legal (including time and safety) parameters. (Smolders et al., 2013b) pp.13

### **Documentation**

Any reference in this document referring to documentation is to be read as design documentation rather than administrative documentation unless specifically mentioned.

### **Distressed**

A term used by industry practitioners to identify projects that have insufficient funds. These include to complete a project or simply unable to be completed.

## **Culture**

Culture in the work place can include ethnic differences, managerial practices as well as Union involvement.

## **Slush Funds**

A reserve of money used for illicit purposes, especially political bribery.(Oxford University Press, 2014)

## **457Visas**

A working classified visa issued by the Commonwealth of Australia to overseas workers required for their specific tasks and abilities not readily available in Australia for a particular project.

# Appendix 9 - Ethics Approval

HUMAN RESEARCH ETHICS COMMITTEE



## Notification of Expedited Approval

---

To Chief Investigator or Project Supervisor:	<b>Associate Professor Willy Sher</b>
Cc Co-investigators / Research Students:	<b>Mr John Smolders</b>
Re Protocol:	<b>Remediate or demolish – an investigation into the cost overruns of construction projects due to unforeseen rework</b>
Date:	<b>12-Sep-2012</b>
Reference No:	<b>H-2012-0254</b>
Date of Initial Approval:	<b>12-Sep-2012</b>

---

Thank you for your **Response to Conditional Approval (minor amendments)** submission to the Human Research Ethics Committee (HREC) seeking approval in relation to the above protocol.

Your submission was considered under **Expedited** review by the Ethics Administrator.

I am pleased to advise that the decision on your submission is **Approved** effective **12-Sep-2012**.

**For noting:** As per our previous letter, please ensure that you add the University of Newcastle complaints statement to the foot of the Participant Information Statement prior to distribution. The wording of the complaints statement can be found on the 'Participant Information Statement – Sample Content' document, available at:  
<http://www.newcastle.edu.au/research/research-services/human-ethics/application-procedures/forms-and-guidelines.html>

In approving this protocol, the Human Research Ethics Committee (HREC) is of the opinion that the project complies with the provisions contained in the National Statement on Ethical Conduct in Human Research, 2007, and the requirements within this University relating to human research.

Approval will remain valid subject to the submission, and satisfactory assessment, of annual progress reports. *If the approval of an External HREC has been "noted" the approval period is as determined by that HREC.*

The full Committee will be asked to ratify this decision at its next scheduled meeting. A formal *Certificate of Approval* will be available upon request. Your approval number is **H-2012-0254**.

## 7. BIBLIOGRAPHY

- ABBTF, 2013. ABBTF Annual Report [WWW Document]. URL <http://www.abbtbf.com.au/wp-content/uploads/2014/10/ABBTF-Annual-Report-2013-2014-Email-FINAL.pdf>
- ABC News, 2014. CFMEU fined \$1.25m over Grocon protests in Melbourne - ABC News (Australian Broadcasting Corporation) [WWW Document]. URL <http://www.abc.net.au/news/2014-03-31/cfmeu-fined-1-25-million-over-grocon-protests-union-melbourne/5355976> (accessed 9.18.14).
- ABCB, 2014a. Annual Business Plan ABCB 2014-15 [WWW Document]. Australian Building Codes Boards/media files. URL <http://www.abcb.gov.au/~media/Files/Download%20Documents/ABCB%20docs/2014-15%20Business%20Plan.pdf>
- ABCB, 2014b. Free National Construction Code [WWW Document]. Australian Building Codes Boards/media files. URL [www.abcb.gov.au/~media/Files/Download%20Documents/About%20the%20NCC/Free-NCC-Online-Public-FAQs.ashx](http://www.abcb.gov.au/~media/Files/Download%20Documents/About%20the%20NCC/Free-NCC-Online-Public-FAQs.ashx)
- ABCB, 2013. National Construction Code Series-Building Code of Australia - Class 1 and Class 10 Buildings. Australian Building Codes Board.
- ABCB - BCA 1988 & 1990 Archives [WWW Document], n.d. URL <http://www.abcb.gov.au/en/ncc-products/ncc-archives/bca1988and1990-archives> (accessed 3.5.14).
- ABCC, 2014. ABCB - The next installment in Building Regulatory Reform [WWW Document]. URL <http://www.abcb.gov.au/about-the-national-construction-code/The%20next%20instalment%20in%20Building%20Regulatory%20Reform.aspx> (accessed 9.15.15).
- ABCC, 2011. NSW Government Response to the ABCC inquiry into Sham Contracting. [WWW Document]. Fair Work Building Commission. URL <http://fwbc.gov.au/sites/default/files/NSW%20Government%20Response.pdf>
- Abd El-Razek, M.E., Bassioni, H.A., Mobarak, A.M., 2008. Causes of Delay in Building Construction Projects in Egypt. *Journal of Construction Engineering & Management* 134, 831–841. doi:10.1061/(ASCE)0733-9364(2008)134:11(831)
- ACCI, 2009. Submission to Senate Standing Committee On Education, Employment And Workplace Relations [WWW Document]. Parliament of Australia. URL <http://www.aph.gov.au/DocumentStore.ashx?id=b100237d-bbc4-498b-b325-eba6f671e8f5>
- ACIF, 2014. Australian Construction Industry Forum - ACIF Forecasts for Residential Building [WWW Document]. URL <http://www.acif.com.au/forecasts/summary/highlights-for-residential-building> (accessed 3.25.14).
- ACIF, 2013. Australian Construction Industry Forum - Latest Summary [WWW Document]. URL <http://www.acif.com.au/forecasts/summary> (accessed 3.7.14).
- ACT Government, 2013. Regulation of design and inspection practitioners in the construction industry-Discussion paper [WWW Document]. ACT Government-Environment and

- Planning Directorate-Planning. URL [http://www.actpla.act.gov.au/\\_\\_data/assets/pdf\\_file/0006/37635/Regulation\\_of\\_design\\_and\\_inspection\\_practitioners\\_in\\_the\\_construction\\_industry\\_-\\_Discussion\\_paper.pdf](http://www.actpla.act.gov.au/__data/assets/pdf_file/0006/37635/Regulation_of_design_and_inspection_practitioners_in_the_construction_industry_-_Discussion_paper.pdf)
- A&G, 2014. A&G Formworkers [WWW Document]. URL <http://www.formworkers.com.au/page1.htm> (accessed 12.19.14).
- AIB, 2012. Australian Institute of Building Submission to the Inquiry into Construction Industry Insolvency in NSW – Discussion and Issues Paper [WWW Document]. Australian Institute of Building/Submissions. URL <http://www.aib.org.au/your-institute/submissions/>
- Alex, T., 2011. Bankers still not keen to lend big | Courier Mail [WWW Document]. URL <http://www.couriermail.com.au/ipad/bankers-still-not-keen-to-lend-big/story-fn6ck2gb-1226052095539> (accessed 8.21.11).
- ANAO, 2014a. Home Insulation Program [WWW Document]. URL <http://www.anao.gov.au/Publications/Audit-Reports/2010-2011/Home-Insulation-Program/Audit-brochure> (accessed 12.28.14).
- ANAO, 2014b. Audit brochure-Home Insulation Program. [WWW Document]. URL <http://www.anao.gov.au/Publications/Audit-Reports/2010-2011/Home-Insulation-Program/Audit-brochure> (accessed 9.4.14).
- Aurecon, 2015. Building design [WWW Document]. URL <http://www.aurecongroup.com/en/expertise/design/building-design.aspx> (accessed 6.17.15).
- Ausflag, n.d. AusFlag: Eureka Flag [WWW Document]. URL <http://www.ausflag.com.au/eureka.asp> (accessed 12.26.14).
- Aust Government, 2014. Submission to the trade union Royal Commission. Part 19-1 [WWW Document]. URL <http://www.tradeunionroyalcommission.gov.au/Submissions/Documents/SubmissionPart19-1.pdf>
- Bagshaw, E., 2015. Dodgy NSW private colleges to be investigated by federal regulator [WWW Document]. URL <http://www.smh.com.au/nsw/dodgy-nsw-private-colleges-to-be-investigated-by-federal-regulator-20150226-13nfpi.html> (accessed 3.9.15).
- Banks, G.-C., 2004. Reform of Building Regulation [WWW Document]. URL [http://www.pc.gov.au/\\_\\_data/assets/pdf\\_file/0016/16009/building.pdf](http://www.pc.gov.au/__data/assets/pdf_file/0016/16009/building.pdf)
- Bartizan, P., 2012. Building regulations and the Bankstown fire - World Socialist Web Site [WWW Document]. URL <https://www.wsws.org/en/articles/2012/10/buil-o18.html> (accessed 6.15.15).
- BDA, 2002. BDA NSW CHAPTER SEPP 65 REVIEW SUBMISSION – Feb 2012 [WWW Document]. URL [http://www.planning.nsw.gov.au/Portals/0/sepp65/submissions/Building\\_Designers\\_Association\\_NSW\\_120223.pdf](http://www.planning.nsw.gov.au/Portals/0/sepp65/submissions/Building_Designers_Association_NSW_120223.pdf)
- Berg, C., 2014. The cold calculations of the GFC stimulus - The Drum (Australian Broadcasting Corporation) [WWW Document]. URL <http://www.abc.net.au/news/2014-08-26/berg-the-cold-calculations-of-the-gfc-stimulus/5696150> (accessed 12.15.14).

- Binsted, T., 2014. ACCC approves Boral-CSR brick-making merger [WWW Document]. URL <http://www.smh.com.au/business/accc-approves-boralcsr-brickmaking-merger-20141218-129o7d.html> (accessed 3.22.15).
- Bitá, N., 2014. When “qualified” is no guarantee of competence | The Australian [WWW Document]. The Australian. URL <http://www.theaustralian.com.au/opinion/when-qualified-is-no-guarantee-of-competence/story-e6frg6zo-1227049474270> (accessed 6.30.15).
- Blaxendale, R., 2014. Grocon accuses CFMEU of intimidating building workers | The Australian [WWW Document]. URL <http://www.theaustralian.com.au/news/nation/grocon-accuses-cfmeu-of-intimidating-building-workers/story-e6frg6nf-1227024400428> (accessed 9.18.14).
- Bleby, M., 2014. Higher wage rates will hit trade apprenticeships, says building industry [WWW Document]. URL [http://www.afr.com/p/business/property/higher\\_wage\\_rates\\_will\\_hit\\_trade\\_4wWO4BLqhBA4PXigxTknKI](http://www.afr.com/p/business/property/higher_wage_rates_will_hit_trade_4wWO4BLqhBA4PXigxTknKI) (accessed 2.27.14).
- Booker, C., 2014. Royal commission takes aim at CFMEU, recommends charges against senior officials [WWW Document]. URL <http://www.theage.com.au/victoria/royal-commission-takes-aim-at-cfmeu-recommends-charges-against-senior-officials-20141219-12awyp.html> (accessed 12.30.14).
- Boral/CSR, 2014. Press Release Boral CSR JV [WWW Document]. URL <http://www.boral.com.au/Images/common/pdfs/141218-ASX-Release-Boral-CSR-Bricks-JV-including-ACCC-release.pdf>
- BPB-NSW Gov., 2015. Building Professionals Act Review | Building Professionals Board [WWW Document]. URL <http://bpb.nsw.gov.au/building-professionals-act-review> (accessed 6.3.15).
- Brereton, J., 2014. In the Matter of ICS Real Estate Pty Ltd (in liquidation); and In the Matter of Independent Contractor Services (Aust) Pty Ltd (in liquidation) [WWW Document]. URL <http://www.lexisnexis.com.au/aus/search/search.aspx?q=ICS%20Real%20Estate>
- Bsi, 2015. BS 8000-0:2014 Workmanship on construction sites. Introduction and general principles [WWW Document]. URL <http://shop.bsigroup.com/ProductDetail/?pid=000000000030275705> (accessed 6.18.15).
- Building Professionals Board, n.d. For non-council certifiers and accredited bodies corporate [WWW Document]. URL <http://www.bpb.nsw.gov.au/page/for-non-council-certifiers/> (accessed 3.5.14).
- Buildsurv, 2015. Building Code of Australia 2015 update [WWW Document]. BuildSurv. URL <http://www.buildsurv.com.au/news/2015/4/17/building-code-of-australia-2015-update> (accessed 9.15.15).
- Bulmer, C., 2013. AIB Supports Planning Reforms – and now for Construction Reforms! [WWW Document].
- Burati Jr J L, Farrington J, Ledbetter, WB, 1992. Causes of Quality Deviations in Design and Construction | Browse - Journal of Construction Engineering and Management [WWW Document]. URL <zotero://attachment/769/> (accessed 9.12.11).

- Campbell, D., 2002. Joint Select Committee on the Quality of Buildings. [WWW Document]. URL [https://www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/ceb0c4be044a64d4ca256cf4000ace2d/\\$FILE/Report%20upon%20the%20Quality%20of%20Buildings%20V2.pdf](https://www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/ceb0c4be044a64d4ca256cf4000ace2d/$FILE/Report%20upon%20the%20Quality%20of%20Buildings%20V2.pdf)
- CFMEU, 2014. Massive rise in regional unemployment prompts call for Victorian Government to support 457 Visa crackdown | CFMEU National [WWW Document]. URL <http://www.cfmeu.asn.au/news/massive-rise-in-regional-unemployment-prompts-call-for-victorian-government-to-support-457-visa> (accessed 11.26.15).
- CFMEU, 2011. Race to the Bottom. THE PROBLEM OF SHAM CONTRACTING IN THE AUSTRALIAN CONSTRUCTION INDUSTRY [WWW Document]. URL <http://www.tradeunionroyalcommission.gov.au/Hearings/Documents/2015/Evidence18June2015/V1-Tab016.pdf>
- CFMEU-Nat, 2014. Our Proud Past | CFMEU National [WWW Document]. URL <http://www.cfmeu.asn.au/your-union/our-proud-past> (accessed 10.25.14).
- CFMEU-Vic, 2014. Our Proud Past | CFMEU Victoria [WWW Document]. URL <http://www.cfmeuvic.com.au/your-union/our-proud-past> (accessed 10.26.14).
- Chan, D., Kumaraswamy, M., 2002. Compressing construction durations: lessons learned from Hong Kong building projects. *International Journal of Project Management* 20, 23–35. doi:16/S0263-7863(00)00032-6
- Chan, D., WM, Kumaraswamy, M., M., 1998. A comparative study of causes of time overruns in Hong Kong construction projects. *International Journal of Project Management* 15, 55–63.
- Chandler, D., 2015. Are calls for governments to share project risk a bit far fetched when coming from Lend Lease? | David Chandler OAM | LinkedIn [WWW Document]. URL <http://www.linkedin.com/pulse/calls-governments-share-project-risk-bit-far-fetched-chandler-oam?trk=prof-post> (accessed 6.17.15).
- Chandler, D., 2014. PreFabNZ. Presented at the Meeting with Trade and Investment-NSW Govt., Sydney-NSW Government.
- Chettle, N., 2014. Trade unions royal commission: Julia Gillard says slush fund did not pay for her home renovations - ABC News (Australian Broadcasting Corporation) [WWW Document]. URL <http://www.abc.net.au/news/2014-09-10/gillard-former-prime-minister-royal-commission-trade-unions/5732582> (accessed 12.15.14).
- Chivers, J., 2015. My “Old School” Builder [WWW Document]. Your Mortgage. URL <http://www.yourmortgage.com.au/article/my-old-school-builder-190050.aspx> (accessed 6.17.15).
- City & Guilds Group, 2015. City & Guilds [WWW Document]. URL <http://www.cityandguilds.com/qualifications-and-apprenticeships/construction#fil=uk> (accessed 9.16.15).
- Clare, J., 1985. The Californian Bungalow in Australia. *Historic Environment* 1, 19–39.
- Cole, T., 2008. Understanding Risk - The building industry in the 21st century. *AIB Construct* 9–13.

- Cole, T., 2003a. Royal Commission into the Building and Construction Industry [WWW Document]. URL <http://www.royalcombc.gov.au/> (accessed 3.29.14).
- Cole, T., 2003b. Final Report of the Royal Commission into the Building and Construction Industry Hearings – New South Wales Part 2.
- Collins QC, B., 2012. Inquiry into The Construction Industry Insolvency in NSW [WWW Document]. URL <http://www.finance.nsw.gov.au/sites/default/files/pdfs/IICII-final-report.pdf>
- Council of Australian Governments, 2013. Seamless National Economy: Final report on performance.
- Creswell, J.W., Clark, V.L.P., 2010. Designing and Conducting Mixed Methods Research. SAGE.
- Crosby, M., 2005. Power at Work: Rebuilding the Australian Union Movement - Michael Crosby - Google Books.
- Crouch, E., 2013. NOLA-Annual Report 2012-2013 [WWW Document]. Open Gov NSW. URL <https://www.opengov.nsw.gov.au/publications/13747>
- Dempster, G., 2014. ABC of the BCA - Building Certification [WWW Document]. The Oil Stone. URL <http://theoilstone.com.au/abc-of-the-bca-makes-the-bca-as-simple-as-123/> (accessed 7.19.15).
- Department of Fairtrading, N.G., n.d. Building - NSW Fair Trading [WWW Document]. URL [http://www.fairtrading.nsw.gov.au/Tradespeople/Home\\_building\\_licensing/Licence\\_classes\\_and\\_qualifications/Building.html](http://www.fairtrading.nsw.gov.au/Tradespeople/Home_building_licensing/Licence_classes_and_qualifications/Building.html) (accessed 8.21.11).
- Department of Planning, 2013. A New Planning System for NSW, White Paper. NSW Government, Department of Planning, Sydney.
- Dept. of Planning NSW Govt., 2003. Q. & A. on development assessment and certification [WWW Document]. URL [http://www.planning.nsw.gov.au/planningsystem/pdf/QOCQ\\_Afinal231203.pdf](http://www.planning.nsw.gov.au/planningsystem/pdf/QOCQ_Afinal231203.pdf)
- Devine, M., 2014. Boral boss shames construction industry with news of CFMEU thuggery | Herald Sun [WWW Document]. URL <http://www.heraldsun.com.au/news/opinion/boral-boss-shames-construction-industry-with-news-of-cfmeu-thuggery/story-fni0ffsx-1226986846917> (accessed 12.29.14).
- Dezeen, 2014. “98% of what gets built today is \$#@t” says Frank Gehry [WWW Document]. Dezeen. URL <http://www.dezeen.com/2014/10/24/98-percent-of-architecture-is-bad-says-frank-gehry-middle-finger/> (accessed 7.20.16).
- Dorling, P., McKenzie, N., 2010. Unionists boast of backroom power [WWW Document]. URL <http://www.smh.com.au/technology/technology-news/unionists-boast-of-backroom-power-20101208-18pwj.html> (accessed 1.1.15).
- Drill, S., Fife-Yeomans, J., Ainsworth, M., APP, 2014. Labor leader Daniel Andrews under pressure as kickback allegations claim senior CFMEU scalp | Herald Sun [WWW Document]. URL <http://www.heraldsun.com.au/news/law-order/labor-leader-daniel-andrews-under-pressure-as-kickback-allegations-claim-senior-cfmeu-scalp/story-fni0fee2-1226811620548> (accessed 12.14.14).



- Duncley, M., 2014. Clean out the CFMEU, says Simon Crean [WWW Document]. Australian Financial Review. URL <http://www.afr.com/news/policy/industrial-relations/clean-out-the-cfmeu-says-simon-crean-20140330-ix9oq>
- Dwyer, P., 2014a. Latest News | Builders Collective of Australia | Developing a better Australian Building and Construction Industry [WWW Document]. URL <http://www.builderscollective.org.au/latest-news/> (accessed 9.13.14).
- Dwyer, P., 2014b. Opportunity Lost as the Wider Building Industry Suffers [WWW Document]. Soursable Industry News and analysis. URL <http://sourceable.net/opportunity-lost-as-the-wider-building-industry-suffers/> (accessed 10.15.14).
- Easthope, H., Randolph, B., Judd, S., 2012. Governing the Compact City [WWW Document]. URL [http://www.be.unsw.edu.au/sites/default/files/upload/research/centres/cf/newsarchive/2011/Governing\\_the\\_Compact\\_City\\_FINAL\\_REPORT.pdf](http://www.be.unsw.edu.au/sites/default/files/upload/research/centres/cf/newsarchive/2011/Governing_the_Compact_City_FINAL_REPORT.pdf)
- Elder, J., 2007. The History of the Master Builders Association of NSW: The First Hundred Years [WWW Document]. URL <http://ses.library.usyd.edu.au/handle/2123/1936> (accessed 3.5.14).
- Elliott, D., Chair, 2014. Skill Shortages in NSW [WWW Document]. URL [http://www.parliament.nsw.gov.au/Prod/Parlment/committee.nsf/0/ef8a635be9f5b23bca257ca7000ee0fc/\\$FILE/Report%20No%202%2055%20-%20Skill%20shortages%20in%20NSW.pdf](http://www.parliament.nsw.gov.au/Prod/Parlment/committee.nsf/0/ef8a635be9f5b23bca257ca7000ee0fc/$FILE/Report%20No%202%2055%20-%20Skill%20shortages%20in%20NSW.pdf)
- Engineers Aust., 2005. Report-Getting it Right the First Time [WWW Document]. URL <http://codebim.com/wp-content/uploads/2013/06/Getting-It-Right-The-First-Time.pdf>
- Errasti, A., Beach, R., Oyarbide, A., Santos, J., 2007. A process for developing partnerships with subcontractors in the construction industry: An empirical study. *International Journal of Project Management* 25, 250–256.
- Evans, N., 1989. H.R. Nicholls Society: No Ticket, No Start---No More!: Introduction [WWW Document]. URL <http://archive.hrnicholls.com.au/archives/vol6/vol6-intro.php> (accessed 6.16.15).
- Failure Mechanisms in Building Construction - Google Books [WWW Document], n.d. URL <http://books.google.com.au/books?id=3OIUo-Po8x4C&pg=PA40&lpg=PA40&dq=Curtain+walling-Fish+bowl+system&source=bl&ots=uowVmzQqi8&sig=vO1NlmjoVZkIR9H0zyD4FKBxfMA&hl=en&sa=X&ei=ul34UfCQIMSfiQLwvoCYBA&ved=0CEAQ6AEwAw#v=onepage&q=Curtain%20walling-Fish%20bowl%20system&f=false> (accessed 7.31.13).
- Fair Trading, n.d. Home building licensing - NSW Fair Trading [WWW Document]. URL [http://www.fairtrading.nsw.gov.au/ftw/Tradespeople/Home\\_building\\_licensing.page?](http://www.fairtrading.nsw.gov.au/ftw/Tradespeople/Home_building_licensing.page?) (accessed 3.5.14).
- Fayek, A., Dissanayake, M., Capero, O., 2003. Measuring and Classifying Construction Field Rework: A Pilot Study [WWW Document]. URL <http://coaa.ab.ca/portals/Library/Measuring%20and%20Classifying%20Construction%20Rework%20-%20Final%20Report.pdf>

- Fed. Government, 2014. Engineering Heritage Australia: THE NEW PARLIAMENT HOUSE [WWW Document]. URL <http://www.engineer.org.au/chapter13.html> (accessed 12.14.14).
- Feneley, R., 2014. Neville Wran: Praise, controversy and “Balmain boys don’t cry” quote marked time in office [WWW Document]. URL <http://www.smh.com.au/comment/obituaries/neville-wran-praise-controversy-and-balmain-boys-dont-cry-quote-marked-time-in-office-20140420-zqx46.html> (accessed 12.14.14).
- Ferguson, L.H., 1979. New South Wales Report of the Department of Public Works. [WWW Document]. URL <https://www.opengov.nsw.gov.au/viewer/693d4f61b72b1d9943b61c1646540279.pdf>
- Fielding, N., 2010. Mixed methods research in the real world. *International Journal of Social Research Methodology* 13, 127–138. doi:10.1080/13645570902996186
- Fire Protection Association of Aust., 2013. Submission on NSW White Paper [WWW Document]. Maltabarow report submission. URL <http://bpb.nsw.gov.au/sites/default/files/public/Archive/Maltabarow%20report%20submission%20-%20FPA%20Australia%20-%20Submission%20to%20NSW%20Planning%20System%20Review%20White%20Paper%20Final.pdf>
- Flyvbjerg, B., 2011. Case Study (SSRN Scholarly Paper No. ID 2278194). Social Science Research Network, Rochester, NY.
- Flyvbjerg, B., Holm, M.S., Buhl, S., 2002. Underestimating Costs in Public Works Projects Error or Lie? *APA Journal* Vol.68, 279–295.
- Foxell, S., Cooper, I., 2015. Closing the Policy Gaps. *Building Research & Information* 43, 399–406.
- Franklin Matthew, 2010. Skills shortage to cripple nation building | The Australian [WWW Document]. URL <http://www.theaustralian.com.au/politics/skills-shortage-to-cripple-nation-building/story-e6frgczf-1225851585390> (accessed 8.21.11).
- Freidson, E., n.d. Eliot Freidson’s Contribution to the Sociology of Professions: Discovery Service for Univ of Newcastle [WWW Document]. URL <http://eds.b.ebscohost.com.ezproxy.newcastle.edu.au/eds/detail/detail?sid=d3f0a4ea-8e6b-47c2-b9f0-2d6c9a68dfca%40sessionmgr112&vid=0&hid=120&bdata=JnNpdGU9ZWRzLWxpdmU%3d#db=bth&AN=9706062378> (accessed 12.23.14).
- FWB&C, 2014. Role of the ABCC | Fair Work Building and Construction [WWW Document]. URL <http://www.fwbc.gov.au/role-abcc> (accessed 10.26.14).
- GHD, 2015. Architecture [WWW Document]. URL <http://www.ghd.com/global/services/architecture/> (accessed 6.17.15).
- Gill, R., 2008. Subjectivity - Culture and Subjectivity in Neoliberal and Postfeminist Times [WWW Document]. URL <http://www.palgrave-journals.com/sub/journal/v25/n1/full/sub200828a.html> (accessed 5.9.15).
- Goldacre, B., 2014. I think you will find it is more complicated than that. London: Fourth Estate - Google Search [WWW Document]. URL

- [https://www.google.com.au/search?q=goldacre+B,+2014,+I+think+you+will+find+it+is+more+complicated+than+that.+London:+Fourth+Estate&ie=utf-8&oe=utf-8&gws\\_rd=cr&ei=3zZdVbmmM86B8QXO64CwAw](https://www.google.com.au/search?q=goldacre+B,+2014,+I+think+you+will+find+it+is+more+complicated+than+that.+London:+Fourth+Estate&ie=utf-8&oe=utf-8&gws_rd=cr&ei=3zZdVbmmM86B8QXO64CwAw) (accessed 5.21.15).
- Grant, B., Giddings, L., 2002. Contemporary Nurse-Making sense of methodologies: A paradigm framework for the novice researcher. Taylor and Francis.
- Gray, C., Hughes, W., 2009. Building Design Management. Butterworth-Heinemann, Great Britain.
- Grennan, H., 2010. Stumbling blocks: how to decipher the building code [WWW Document]. URL <http://homes.ninemsn.com.au/houseandgarden/advice/8178775/stumbling-blocks-how-to-decipher-the-building-code> (accessed 9.13.14).
- Grollo Group, 2014. Grollo History [WWW Document]. URL <http://www.grollogroup.com.au/grollo-history/> (accessed 12.19.14).
- Gutsa, J., 2014. BCA Guide - No More than a Guide [WWW Document]. URL <http://sourceable.net/bca-guide-no-more-than-a-guide/> (accessed 4.9.14).
- Gyles, R., 2014. BACK TO THE FUTURE – UNIONS AND THE BUILDING INDUSTRY THEN AND NOW [WWW Document]. URL [https://www.google.com.au/search?q=BACK+TO+THE+FUTURE+%E2%80%93+UNIONS+AND+THE+BUILNDING+INDUSTRY+THEN+AND+NOW&ie=utf-8&oe=utf-8&gws\\_rd=cr&ei=GXRfVvDaGcG50ATbuorQCA](https://www.google.com.au/search?q=BACK+TO+THE+FUTURE+%E2%80%93+UNIONS+AND+THE+BUILNDING+INDUSTRY+THEN+AND+NOW&ie=utf-8&oe=utf-8&gws_rd=cr&ei=GXRfVvDaGcG50ATbuorQCA)
- Gyles, R., 1992. Royal Commission into Productivity in the Building Industry in New South Wales [WWW Document]. URL <http://trove.nla.gov.au/work/22566259?selectedversion=NBD9027404>
- Hagemann, B., 2015. Coal employment fallen in the Hunter [WWW Document]. Australian Mining - online edition. URL <http://www.australianmining.com.au/news/coal-employment-fallen-in-the-hunter> (accessed 6.15.15).
- Hamson, K., Brandon, P., 2004. Construction 2020 - A vision for Australia's Property and Construction Industry | QUT ePrints [WWW Document]. URL <http://eprints.qut.edu.au/40762/> (accessed 8.1.13).
- Hanger, I., 2014. Royal Commission into the Home Insulation Program. [WWW Document]. URL <http://www.homeinsulationroyalcommission.gov.au/Documentation/Documents/ReportoftheRoyalCommissionintotheHomeInsulationProgram.pdf> (accessed 4.9.14).
- Hansard, 2015. Submissions – Parliament of Australia, Insolvency in the Australian construction industry. [WWW Document]. URL [http://www.aph.gov.au/Parliamentary\\_Business/Committees/Senate/Economics/Insolvency\\_construction/Submissions](http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Economics/Insolvency_construction/Submissions) (accessed 4.22.15).
- Hansard-2543, 2012. MINISTER FOR EMPLOYMENT AND WORKPLACE RELATIONS Senate Parliamentary Question [WWW Document]. URL [http://www.aph.gov.au/Parliamentary\\_Business/Committees/Senate/Education\\_Employment\\_and\\_Workplace\\_Relations/Completed\\_inquiries/2010-13/towardstransparency/report/~media/wopapub/senate/committee/eet\\_ctte/completed\\_inquiries/2010-13/towards\\_transparency/report/d01\\_attach2.ashx](http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Education_Employment_and_Workplace_Relations/Completed_inquiries/2010-13/towardstransparency/report/~media/wopapub/senate/committee/eet_ctte/completed_inquiries/2010-13/towards_transparency/report/d01_attach2.ashx) (accessed 12.14.14).

- Harnisch, W., 2012. Sham Contracting - Enforce Current Law | Master Builders Australia [WWW Document]. URL <http://www.masterbuilders.com.au/newsarticles/sham-contracting-enforce-current-law> (accessed 10.16.14).
- Head, B.W., 2007. Three Lenses of Evidence-Based Policy. *The Australian Journal of Public Administration, Research and Evaluation* 67, 1–11. doi:10.1111/j.1467-8500.2007.00564.x
- Heaton, A., 2015a. Builders Ramp up Campaign for Construction Regulator [WWW Document]. URL <http://sourceable.net/master-builders-ramp-up-campaign-for-construction-regulator/#> (accessed 3.21.15).
- Heaton, A., 2015b. Is the NSW Building Professionals Act failing? [WWW Document]. Sourceable. URL <https://sourceable.net/nsw-building-professionals-act-failing/#> (accessed 3.7.17).
- Heaton, A., 2014. Faulty Building Products Flooding Australian Market: Minister [WWW Document]. URL <http://sourceable.net/faulty-building-products-flooding-australian-market-minister/> (accessed 12.3.14).
- Hedley, T., 2015. Norm's cautionary tale [WWW Document]. URL <http://at.theaustralian.com.au/link/7c87073774e26215a2f0e6a72bddd35f?domain=theaustralian.com.au> (accessed 12.9.15).
- Heydon, J.D., Justice, 2014a. Heydon RC into Union Governance and Corruption-Interim Report Vol 1&2 [WWW Document]. URL <https://www.tradeunionroyalcommission.gov.au/reports/Documents/InterimReportVol1.pdf> (accessed 12.30.14).
- Heydon, J.D., Justice, 2014b. Heydon Royal Commission into Trade Union Governance and Corruption [WWW Document]. URL <http://www.tradeunionroyalcommission.gov.au/Pages/default.aspx> (accessed 12.15.14).
- Howe, M., 2015. Building Designers Furious Over Demeaning Architects Campaign [WWW Document]. URL <https://sourceable.net/building-designers-furious-demeaning-architects-campaign/#> (accessed 5.19.15).
- Howe, M., n.d. Leaky Balconies Trigger Rise in Building Litigation [WWW Document]. Sourceable. URL <http://sourceable.net/leaky-balconies-trigger-rise-in-building-litigation/> (accessed 10.18.13).
- Hurley, B., 2013. Radical NSW apartment reforms challenges owners' rights [WWW Document]. URL [http://www.brw.com.au/p/investing/radical\\_nsw\\_apartment\\_reforms\\_challenges\\_WncdYyWmvaCFqhD9cEJAKI](http://www.brw.com.au/p/investing/radical_nsw_apartment_reforms_challenges_WncdYyWmvaCFqhD9cEJAKI) (accessed 10.16.14).
- Hwang, B.-G., Thomas, S., Haas, C., Caldas, C., 2009. Measuring the Impact of Rework on Construction Cost Performance: *Journal of Construction Engineering and Management: (ASCE)* [WWW Document]. URL [http://ascelibrary.org/doi/abs/10.1061/\(ASCE\)0733-9364\(2009\)135%3A3\(187\)](http://ascelibrary.org/doi/abs/10.1061/(ASCE)0733-9364(2009)135%3A3(187)) (accessed 11.5.14).
- Igra, A., 2014. Construction Insolvencies are no Mystery [WWW Document]. URL <http://sourceable.net/construction-insolvencies-are-no-mystery/> (accessed 2.26.14).

- ILO, 2014. Global Wage Report [WWW Document]. URL [http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms\\_324678.pdf](http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_324678.pdf) (accessed 8.12.14).
- Insurance News, 2004. Corruption commission hears of insurance payment to union - Local - Insurance News - insuranceNEWS.com.au [WWW Document]. URL <http://www.insurancenews.com.au/local/corruption-commission-hears-of-insurance-payment-to-union> (accessed 9.18.14).
- Johanson, S., 2015. Regulators, government fail homeowners suffering building problems [WWW Document]. URL <http://www.smh.com.au/business/regulators-government-fail-homeowners-suffering-building-problems-20150602-gheuzm.html> (accessed 6.3.15).
- Johnson, R.B., Onwuegbuzie, A.J., 2004. Mixed Methods Research: A Research Paradigm Whose Time Has Come. *Educational Researcher* 33, 14–26. doi:10.3102/0013189X033007014
- Johnson, R.B., Onwuegbuzie, A.J., Turner, L.A., 2007a. Toward a Definition of Mixed Methods Research. *Journal of Mixed Methods Research* 1, 112–133. doi:10.1177/1558689806298224
- Johnson, R.B., Onwuegbuzie, A.J., Turner, L.A., 2007b. Toward a Definition of Mixed Method Research. *Journal of Mixed Method Research* 1, 112–133.
- Keene, N., 2015. Bricks and moolah for willing workers | dailytelegraph.com.au [WWW Document]. URL <http://www.dailytelegraph.com.au/news/nsw/huge-demand-for-brickies-much-moolah-to-be-had-for-willing-workers/story-fni0cx12-1227245387308> (accessed 3.22.15).
- Killoran, M., 2014. Union thugs threatened: “Sign this or get no work” says boss. *Courier Mail*.
- Kim, D., Park, H.-S., 2006. Innovative construction management method: Assessment of lean construction implementation. *KSCE J Civ Eng* 10, 381–388. doi:10.1007/BF02823976
- Kirkwood, I., 2008. Death threats claim. *Newcastle Herald* 14.
- Kirkwood, I., 2005. Developer fined, site off limits. *Newcastle Herald* 13.
- Kirkwood, I., 2000. City’s tallest building to go ahead. *Central Coast Herald* 3.
- Lambert, M., 2015. Independent Review of the Building Professionals Act 2005 [WWW Document]. URL <http://bpb.nsw.gov.au/sites/default/files/public/Information%20sheets%20%26%20practice%20advice/BP%20Act%20review%20Discussion%20Paper.pdf> (accessed 6.25.15).
- Liberal Party, 2014. Prime Minister - Royal Commission into trade union governance and corruption | Liberal Party of Australia [WWW Document]. URL <https://www.liberal.org.au/latest-news/2014/02/10/prime-minister-royal-commission-trade-union-governance-and-corruption> (accessed 3.29.14).
- Loosemore, M., Andonakis, N., 2007. Barriers to implementing OHS reforms – The experiences of small subcontractors in the Australian Construction Industry [WWW Document]. URL <http://www.sciencedirect.com.ezproxy.newcastle.edu.au/science/article/pii/S0263786307000270> (accessed 12.12.14).
- Love, P., Edwards, D., Smith, J., 2006. Contract Documentation and the Incidence of Rework in Projects. *Architectural Engineering and Design Management*. 1, 247–259.

- Love, P., Edwards, D.J., Smith, J., 2006. Contract Documentation and the Incidence of Rework in Projects. *Architectural Engineering and Design Management*. 1, 247–259.
- Love, P., Holt, G.D., Li, H., 2002. Triangulation in Construction management research. *Engineering, Construction and Architectural Management* 4, 294–303.
- Love, P.E.D., 2002. Influence of Project Type and Procurement Method on Rework Costs in Building Construction Projects. *Journal of Construction Engineering and Management* 18–29.
- Love, P.E.D., Davis, P.R., Chevis, R., Edwards, D.J., 2011. Risk/Reward Compensation Model for Civil Engineering Infrastructure Alliance Projects. *Journal of Construction Engineering and Management* 127136.
- Love, P.E.D., Edwards, D.J., 2004. Determinants of Rework in building Construction. *Engineering Construction and Architectural Management* 11, 259–274.
- Love, P.E.D., Irani, Z., 2003. A project management quality cost information system for the construction industry. *Information & Management* 40, 649–661. doi:16/S0378-7206(02)00094-0
- Love, P.E.D., Mandal, P., Li, H., 1999a. Determining the casual structure of rework influences in construction. *Construction Management and Economics* 17, 505–517.
- Love, P.E.D., Smith, J., Li, H., 1999b. The propagation of rework benchmark metrics for construction. *International Journal of Quality & Reliability Management* 16, 638–658. doi:10.1108/02656719910249829
- Lovegrove, K., 2014. The Legal Status of the Guide to the BCA – Building Practitioners & Building Professionals Beware [WWW Document]. URL <http://www.lslawyers.com.au/elibrary/guide-to-the-bca> (accessed 12.28.14).
- Lowe, A., Cartledge, J., 2012. NSW Professional Services Industry Action Plan – Consult Australia Submission NSW PROFESSIONAL SERVICES INDUSTRY ACTION PLAN.
- Maher, K., 2002. Achieving Better Design Residential Flat Developments in NSW Recommendations prepared by Urban Design Advisory Committee for the Premier of NSW July 2000.
- Maltabarow, G., 2013a. Building Certification and Regulation- Serving a new planning system for NSW. [WWW Document]. URL [http://planspolicies.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=6356](http://planspolicies.planning.nsw.gov.au/index.pl?action=view_job&job_id=6356) (accessed 7.3.14).
- Maltabarow, G., 2013b. BUILDING CERTIFICATION AND REGULATION – SERVING A NEW PLANNING SYSTEM FOR NSW [WWW Document]. URL [https://majorprojects.affinitylive.com/public/4699af15dd6daca40c4a59f1b91f4a86/Maltabarow\\_report.pdf](https://majorprojects.affinitylive.com/public/4699af15dd6daca40c4a59f1b91f4a86/Maltabarow_report.pdf) (accessed 7.21.15).
- Manning, P., 2004. Comment on building and development at the end of a boom. Like now. - Somersoft Property Investment Forums [WWW Document]. URL <http://www.somersoft.com/forums/showthread.php?t=17793> (accessed 8.20.11).
- Marosszeky, M., 1996. Quality Assurance | ArchitectureAU [WWW Document]. URL <http://architectureau.com/articles/quality-assurance/> (accessed 12.9.14).

- Marosszeky, M., Thomas, R., Davis, S., McGeorge, D., 2002. QUALITY MANAGEMENT TOOLS FOR LEAN PRODUCTION - MOVING FROM ENFORCEMENT TO EMPOWERMENT [WWW Document]. IGLC-10.
- Maroya, A., 2012. Submission to the National Occupational Licensing Authority regarding Regulatory Impact Statements for first tranche National Licensing Occupations (Submission on National Licensing Occupations.). Master Builders Association, Canberra.
- Mason-Cox, M., 2014. NSW BUILDING INDUSTRY GETS AUSTRALIA'S FIRST RETENTION TRUST SCHEME [WWW Document]. URL <http://www.aib.org.au/lib/pdf/Media%20Releases/NSW%20building%20industry%20scheme.PDF> (accessed 9.12.14).
- Maund, K., Sher, W., Smolders, J., Naughton, R., n.d. Understanding the Building Certification System: A need for accreditation reform. JCEB, 2 (2) 64–71.
- Mayhew, C., Quinlan, M.G., 1997. Subcontracting and occupational health and safety in the residential building industry. Industrial Relations Journal 28, 192–205.
- MBA, 2016. 2016 MB NSW Magazine Jan - Mar [WWW Document]. Issuu. URL [https://issuu.com/crowtherblaynemediaspecialists/docs/nswmb\\_jan\\_mar\\_16\\_ebook](https://issuu.com/crowtherblaynemediaspecialists/docs/nswmb_jan_mar_16_ebook) (accessed 3.10.16).
- MBA, 2014a. IPART Review of Reforming Licensing in NSW Response to the draft Report by the Master Builders Association of NSW [WWW Document]. URL [http://www.ipart.nsw.gov.au/files/92b4259e-ba11-4ab7-9b35-a35d011379ae/Online\\_Submission\\_-\\_Master\\_Builders\\_Association\\_of\\_NSW\\_-\\_P\\_Meredith\\_-\\_3\\_Jul\\_2014.pdf](http://www.ipart.nsw.gov.au/files/92b4259e-ba11-4ab7-9b35-a35d011379ae/Online_Submission_-_Master_Builders_Association_of_NSW_-_P_Meredith_-_3_Jul_2014.pdf) (accessed 9.18.14).
- MBA, 2014b. Royal Commission interim report released [WWW Document]. URL [http://www.mba.org.au/media\\_room/mbanews/article/?id=456](http://www.mba.org.au/media_room/mbanews/article/?id=456) (accessed 12.30.14).
- MBA, 2014c. 457 Crackdown Misdirected. [WWW Document]. URL <http://www.mbansw.asn.au/Media/Industry-News/457-CRACKDOWN-MISDIRECTED/> (accessed 9.18.14).
- MBA, 2012. Master Builders Salary Survey Guide [WWW Document]. URL [http://www.conduitgroup.com.au/\\_assets/Master%20Builders%20NSW%202012%20Salary%20Survey%20Guide.pdf](http://www.conduitgroup.com.au/_assets/Master%20Builders%20NSW%202012%20Salary%20Survey%20Guide.pdf) (accessed 7.19.15).
- MBA, 2006. MASTER BUILDERS ASSOCIATION OF NSW POLICY PRIORITIES 2006-2007 [WWW Document]. URL <http://www.homebuilders.net.au/MBA-Home-Builders.pdf> (accessed 5.3.14).
- MBA, 2005. MASTER BUILDERS ASSOCIATION OF NSW SUBMISSION REVIEW OF LICENSING IN THE HOME BUILDING INDUSTRY [WWW Document]. URL <http://www.homebuilders.net.au/MBA-Home-Builders-Licensing.pdf> (accessed 9.18.14).
- McCarthy, J., 2010. Hightrade leaves New buyer sought for property. Newcastle Herald 9.
- McCarthy, J., 2009a. ANZ pays subbies. Newcastle Herald 2.
- McCarthy, J., 2009b. Grierson: group made me an offer. Newcastle Herald 5.
- McCarthy, J., 2009c. Raid nets seven illegal workers. Newcastle Herald 5.

- McClymont, K., 2014. Health Services Union Corruption - Google Search [WWW Document]. URL [https://www.google.com.au/search?q=Health+Services+Union+Corruption&ie=utf-8&oe=utf-8&gws\\_rd=cr&ei=eTOOVO-VIai0mwW25IGYCQ](https://www.google.com.au/search?q=Health+Services+Union+Corruption&ie=utf-8&oe=utf-8&gws_rd=cr&ei=eTOOVO-VIai0mwW25IGYCQ) (accessed 12.15.14).
- McGeorge, D., London, K., Love, P., Davis, P., Jeffries, P., Ward, P., Chesworth, B., 2007. Dispute Avoidance and Resolution: A Literature Review.
- Michel, D., 2015. Fix old issues before creating new ones. Northern District Times 31.
- MMA, 2004. Making multicultural Australia | multicultural Hot Words: White Australia Policy [WWW Document]. URL <http://www.multiculturalaustralia.edu.au/hotwords/unpack/White.Australia.Policy> (accessed 6.16.15).
- Montoya, D., 2013. NSW planning reforms: building regulation and certification. briefing paper No9/2013.
- Moric, H., 1980. Challenge to Empiricism. Methuen, London.
- Mumford, P., 2011. "7. Policy Disasters Waiting to Happen: When predictable disasters flow from government decisions" in Future-Proofing the State Managing Risks, Responding to Crises and Building Resilience by Jonathan Boston... | ANU Press [WWW Document]. URL <http://press.anu.edu.au/apps/bookworm/view/Future-Proofing+the+StateManaging+Risks,+Responding+to+Crises+and+Building+Resilience/11051/ch07.xhtml> (accessed 12.1.14).
- Munro, K., 2010. Calls for Certifiers to get house in order. Sydney Morning Herald.
- Murdock, G., Golding, P., 1977. Capitalism, Communication and Class Relations.
- National Occupational Licensing Authority [WWW Document], n.d. URL <http://nola.gov.au/> (accessed 2.27.14).
- Natspec, 2015. Natspec Construction Information [WWW Document]. URL <http://www.natspec.com.au/> (accessed 12.10.15).
- Nichols, D., 2009. Qualitative research: part one -- philosophies: Discovery Service for Univ of Newcastle [WWW Document]. URL <http://eds.a.ebscohost.com.ezproxy.newcastle.edu.au/eds/detail/detail?sid=3873a494-419a-40f7-98f1-6e7750a02b51%40sessionmgr4004&vid=0&hid=4108&bdata=JnNpdGU9ZWRzLWxpdmU%3d#db=ccm&AN=2010443302> (accessed 4.11.15).
- NOLA, 2013. National Occupational Licensing Authority [WWW Document]. URL <http://nola.gov.au/> (accessed 3.5.14).
- NSW CA, 2015. HOME BUILDING ACT 1989 [WWW Document]. URL [http://www5.austlii.edu.au/au/legis/nsw/consol\\_act/hba1989128/](http://www5.austlii.edu.au/au/legis/nsw/consol_act/hba1989128/) (accessed 6.18.15).
- NSW Government, 2013. White Paper, Building Regulation and Certification [WWW Document]. URL <http://www.planning.nsw.gov.au/~media/Files/DPE/Reports/a-new-planning-system-for-nsw-white-paper-2013-04.ashx> (accessed 5.25.13).
- NSW Government, 2011. NSW Legislation SEPP65 Design Quality of Residential Flat Development. [WWW Document]. URL <http://www.legislation.nsw.gov.au/viewtop/inforce/epi%2B530%2B2002%2BFIRST%2B0%2BN/?fullquery=%28%28%28> (accessed 8.23.14).



- NSW Government, 2002. Campbell Report. Report upon the quality of buildings. [WWW Document]. URL [http://www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/CEB0C4BE044A64D4CA256CF4000ACE2D?open&refnavid=CO5\\_2](http://www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/CEB0C4BE044A64D4CA256CF4000ACE2D?open&refnavid=CO5_2) (accessed 5.25.13).
- NSW Government, Collins QC, B., 2012. The Collins Report - Independent Inquiry into Construction Industry Insolvency in NSW [WWW Document]. URL <https://www.finance.nsw.gov.au/news-media/news/independent-inquiry-construction-industry-insolvency> (accessed 5.25.13).
- NSW Govt., 2014a. Home Building Amendment Act 2014 [WWW Document]. URL [http://www.austlii.edu.au/au/legis/nsw/num\\_act/hbaa2014n24235.pdf](http://www.austlii.edu.au/au/legis/nsw/num_act/hbaa2014n24235.pdf) (accessed 12.17.14).
- NSW Govt., 2014b. ENVIRONMENTAL PLANNING AND ASSESSMENT REGULATION 2000 - REG 162A Critical stage inspections required by section 109E (3) (d) [WWW Document]. URL [http://www.austlii.edu.au/au/legis/nsw/consol\\_reg/epaar2000480/s162a.html](http://www.austlii.edu.au/au/legis/nsw/consol_reg/epaar2000480/s162a.html) (accessed 12.16.14).
- NSW Govt., 2011. STATE ENVIRONMENTAL PLANNING POLICY NO 65--DESIGN QUALITY OF RESIDENTIAL FLAT DEVELOPMENT [WWW Document]. URL [http://www.austlii.edu.au/au/legis/nsw/consol\\_reg/seppn65qorfd818/](http://www.austlii.edu.au/au/legis/nsw/consol_reg/seppn65qorfd818/) (accessed 12.10.14).
- NSW Govt., 2003. Architects Act 2003, No 83 [WWW Document]. URL <http://www.architects.nsw.gov.au/download/ARCHITECTS%20ACT%2020034.pdf> (accessed 11.12.14).
- NSW Govt, 2002. 2002 No 525 Published in Gazette No 122 of 26 July 2002, page 5546 Page 1 [12] New South Wales Environmental Planning and Assessment Amendment (SEPP 65) Regulation 2002.
- NSW Migrant Heritage Centre, 2011. Building The “Snowy” | Snowy Mountains Hydro Electric Scheme | NSW Migration Heritage Centre [WWW Document]. URL <http://www.migrationheritage.nsw.gov.au/exhibition/newaustralia/building-the-snowy/> (accessed 12.18.14).
- NSW Parliament, n.d. Inquiries - Current Parliament (2011+) by date - NSW Parliament [WWW Document]. URL <http://www.parliament.nsw.gov.au/prod/parlment/committee.nsf/V3ListInquiries> (accessed 8.24.14).
- NSW Planning Act and Regulation notes (2000 – 2004) [WWW Document], n.d. URL <http://planning.nsw.gov.au/PlanningSystem/Circularsandguidelines/Archives/ActandRegulationnotes20002004/tabid/87/language/en-AU/Default.aspx> (accessed 3.2.12).
- OCN, 2015. Owners Corporation Network [WWW Document]. URL <http://www.ocn.org.au/contact> (accessed 12.10.15).
- Olding, R., 2014. Contract to kill: the story of an alleged \$200,000 hit [WWW Document]. URL <http://www.smh.com.au/national/contract-to-kill-the-story-of-an-alleged-200000-hit-20141027-11ck02.html> (accessed 10.27.14).

- O’Niel, S., 2003. Building Industry Royal Commission: Background, Findings and Recommendations [WWW Document]. URL <http://www.aph.gov.au/binaries/library/pubs/cib/2002-03/03cib30.pdf> (accessed 5.21.14).
- Oxford University Press, 2014. Oxford Dictionary.
- Oxford University Press, 2013. Oxford Thesaurus of English Copyright © 2009, 2013 by Oxford University Press. All rights reserved.
- Parker, R., 2007. Inquiry into the operations of the Home Building Service [WWW Document]. URL [http://www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/26951789c73f28cfca2573b10001b97f/\\$FILE/FINAL%20REPORT.pdf](http://www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/26951789c73f28cfca2573b10001b97f/$FILE/FINAL%20REPORT.pdf) (accessed 9.13.14).
- Parliament of Aust., 2014. Royal Commissions and Commissions of Inquiry – Parliament of Australia [WWW Document]. URL [http://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/Browse\\_by\\_Topic/law/royalcommissions](http://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Browse_by_Topic/law/royalcommissions) (accessed 8.24.14).
- Patterson Building Group, 2012. The difference between tier 1, 2, and 3 building companies [WWW Document]. URL <http://www.patterson-building.com.au/blog/difference-tier-1-2-3-building-companies/> (accessed 12.15.14).
- Patty, A., 2014a. Unions returning to “bad old days of lawlessness”, says Eric Abetz [WWW Document]. URL <http://www.smh.com.au/federal-politics/political-news/unions-returning-to-bad-old-days-of-lawlessness-says-eric-abetz-20140804-10023b.html> (accessed 12.15.14).
- Patty, A., 2014b. CFMEU head Brian Parker’s evidence to royal commission challenged [WWW Document]. URL <http://www.smh.com.au/nsw/cfmeu-head-brian-parkers-evidence-to-royal-commission-challenged-20141024-11b4n6.html> (accessed 10.27.14).
- PCL, 2016. Lean Construction [WWW Document]. PCL Constructors. URL <http://www.pcl.com/services-that-deliver/technology-and-innovation/pages/lean-construction.aspx> (accessed 7.20.16).
- Philips, R., 2013. Bankstown apartment fire survivor tells media how blaze began - World Socialist Web Site [WWW Document]. URL <https://www.wsws.org/en/articles/2013/01/11/ging-j11.html> (accessed 6.15.15).
- Project Management Institute, 2013. A Guide to the Project management Body of Knowledge, 5th ed. Global Standard.
- Qld Govt, 2014. Managing Contractor Conditions Contract [WWW Document]. URL <http://www.hpw.qld.gov.au/SiteCollectionDocuments/ManagingContractorConditionsContract.pdf> (accessed 9.8.15).
- QSR International., 2015. Qualitative Data Analysis Software | Mixed Methods Research | NVivo [WWW Document]. URL [http://www.qsrinternational.com/products\\_nvivo.aspx](http://www.qsrinternational.com/products_nvivo.aspx) (accessed 7.27.15).
- Quirke, J., 2014. GCR - News - UK skills famine sees Portuguese bricklayers earn £1,000 a week [WWW Document]. URL <http://www.globalconreview.com/news/uk-skills-famine-pushes-bricklayers-earning-1000/> (accessed 12.11.14).

- Ray, R., Hornibrook, J., Skitmore, M., 1999. ETHICS IN TENDERING: A SURVEY OF AUSTRALIAN OPINION AND PRACTICE [WWW Document]. URL [http://eprints.qut.edu.au/4418/1/4418\\_1.pdf](http://eprints.qut.edu.au/4418/1/4418_1.pdf) (accessed 8.29.14).
- Reed, M., Anthony, P., 1992. PROFESSIONALIZING MANAGEMENT AND MANAGING PROFESSIONALIZATION: British management in the 1980's [WWW Document]. URL <http://eds.a.ebscohost.com.ezproxy.newcastle.edu.au/eds/pdfviewer/pdfviewer?sid=2e36a1e6-6d3b-4c8b-b88c-023a6aed746b%40sessionmgr4005&vid=1&hid=4105> (accessed 1.1.15).
- Robinson, P., 2002. Commission builds on previous inquiries of similar construction - theage.com.au [WWW Document]. URL <http://www.theage.com.au/articles/2002/05/06/1019441475557.html> (accessed 8.29.14).
- Rogge, D., Coglisier, C., Alaman, H., McCormack, S., 2001. An investigation of field rework in industrial construction. Construction Industry Institute.
- Rounce, G., 1998. Quality, waste and cost considerations in architectural building design management [WWW Document]. URL <http://www.sciencedirect.com/science/article/pii/S0263786397000422> (accessed 11.3.14).
- Russell, J.C., 1980. The Work of the NSW Government Architect's Branch-1958-1973. UNSW, Kensington.
- Russell, T., 2001. Out of the Jungle: Jimmy Hoffa and the Remaking of the American Working Class - Thaddeus Russell - Google Books [WWW Document]. URL [http://books.google.com.au/books?hl=en&lr=&id=a69CD1IRlpYC&oi=fnd&pg=PR9&dq=Teamsters+intimidation+Hoffa&ots=KuOLPQkUkw&sig=Z-PYxTv\\_5DOZkuI\\_\\_uJAPtmP8W0&redir\\_esc=y#v=onepage&q=Teamsters%20intimidation%20Hoffa&f=false](http://books.google.com.au/books?hl=en&lr=&id=a69CD1IRlpYC&oi=fnd&pg=PR9&dq=Teamsters+intimidation+Hoffa&ots=KuOLPQkUkw&sig=Z-PYxTv_5DOZkuI__uJAPtmP8W0&redir_esc=y#v=onepage&q=Teamsters%20intimidation%20Hoffa&f=false) (accessed 3.13.15).
- SAI-Global, 2014. ISO 9001 Quality Management Systems - Audit and Certify [WWW Document]. URL <http://www.saiglobal.com/assurance/quality-business-management/ISO9001.htm> (accessed 12.15.14).
- Schneiders, B., 2014. CFMEU's sweet Coca-Cola deal adds cash to slush fund [WWW Document]. URL <http://www.theage.com.au/victoria/cfmeus-sweet-cocacola-deal-adds-cash-to-slush-fund-20140916-10hl9u.html> (accessed 9.18.14).
- SCICLUNA, S.-K., 2008. Finishing touches; \$30m facelift gives new look to ugliest building. Newcastle Herald 3.
- Shariffah, Z., Mohammad, F., Khairani, A., 2014. Enhancing the Quality of Construction Environment by Minimizing the Cost Variance, in: Procedia - Social and Behavioral Sciences 153 ( 2014 ) 70 – 78 Available Online at [Www.sciencedirect.com](http://www.sciencedirect.com) 1877-0428 © 2014 The Authors. Published by Elsevier Ltd. This Is an Open Access Article under the CC BY-NC-ND License ( [Http://creativecommons.org/licenses/by-nc-nd/3.0/](http://creativecommons.org/licenses/by-nc-nd/3.0/) ). Peer-Review under Responsibility of the Association of Malaysian Environment-Behavior Researchers, AMER (ABRA Malaysia). Doi: 10.1016/j.sbspro.2014.10.042 ScienceDirect AicQoL2014Kota Kinabalu AMER International Conference on Quality of Life. Science Direct, The Pacific Sutera Hotel, Sutera Harbour, Kota Kinabalu, Sabah, Malaysia. doi:10.1016/j.sbspro.2014.10.042

- Sher, W., 2014. Tertiary construction management education: the lived experience of academic staff in Australia. (PhD). The University of Newcastle, Newcastle.
- Sicorp, 2015. Home | NSW Government SICorp [WWW Document]. URL <https://riskinsite.nsw.gov.au/portal/server.pt/community/a%3Bsicorp/236> (accessed 9.16.15).
- Sigma, 2016. Lean Six Sigma. Wikipedia, the free encyclopedia.
- Silverman, D., 2010. Doing Qualitative Research, Third. ed. SAGE.
- Smolders, J., 2011. Response to the ABCC inquiry Sham Contracting [WWW Document]. URL <http://fwbc.gov.au/sites/default/files/John%20Smolders.pdf> (accessed 1.8.13).
- Smolders, J., Sher, W., Bulmer, C., Whittaker, R., 2013a. Submission in Response to the NSW Government White Paper A New Planning System for NSW [WWW Document]. URL <http://www.aib.org.au/lib/pdf/submissions/The%20Australian%20Institute%20of%20Building%20Submission%20to%20the%20NSW%20Planning%20White%20Paper%20FINAL.pdf> (accessed 1.6.13).
- Smolders, J., Whittaker, R., Bulmer, C., Sher, W., 2013b. The Australian Institute of Building Submission in Response to the NSW Government White Paper A New Planning System for NSW [WWW Document]. URL <http://www.aib.org.au/?s=submissions> (accessed 1.6.13).
- TAFE, 2015. Multicultural Education Services - The Northern Sydney Institute - NSI - TAFE NSW [WWW Document]. URL <http://www.nsi.tafensw.edu.au/Services/MulticulturalEducation.aspx> (accessed 6.16.15).
- Tashakkori, A., Creswell, J.W., 2007. Editorial: Exploring the Nature of Research Questions in Mixed Methods Research. *Journal of Mixed Methods Research* 1, 207–211. doi:10.1177/1558689807302814
- Thompson, H., Tracy, J., 1993. The Building and Construction Industry: Retaliation or Reform? - Labour & Industry: a journal of the social and economic relations of work - Volume 5, Issue 1-2 [WWW Document]. URL <http://www.tandfonline.com/doi/abs/10.1080/10301763.1993.10669110> (accessed 6.14.15).
- Tiffen, R., 2010. A mess? A shambles? A disaster? • Inside Story [WWW Document]. URL <http://insidestory.org.au/a-mess-a-shambles-a-disaster> (accessed 12.28.14).
- Tilley, P., 2005. LEAN DESIGN MANAGEMENT—A NEW PARADIGM FOR MANAGING THE DESIGN AND DOCUMENTATION PROCESS TO IMPROVE QUALITY? Proceedings IGLC-13, July 2005, Sydney, Australia 283–295.
- UK Government., 2012. A Better Deal for Public Building [WWW Document]. URL <http://cic.org.uk/newsevents/APPGforEBE-Report.pdf> (accessed 11.25.12).
- Unions NSW, n.d. About Unions NSW - Unions NSW [WWW Document]. URL <http://www.unionsnsw.org.au/about> (accessed 12.26.14).
- Van Den Broeke, L., Sainsbury, M., Silmalis, L., 2014. Fears Chinese investors are pricing first-home buyers out of the market will be investigated by parliament | thetelegraph.com.au [WWW Document]. URL <http://www.dailytelegraph.com.au/news/nsw/fears-chinese->

- investors-are-pricing-firsthome-buyers-out-of-the-market-will-be-investigated-by-parliament/story-fni0cx12-1226855755918 (accessed 3.19.14).
- Victorian Government, 2007. Guide to Standards and Tolerances [WWW Document]. URL [https://www.google.com.au/search?q=Guide+to+Standards+and+Tollerences&ie=utf-8&oe=utf-8&gws\\_rd=cr&ei=c3pfVq-rJYLemAX-4bOgAg](https://www.google.com.au/search?q=Guide+to+Standards+and+Tollerences&ie=utf-8&oe=utf-8&gws_rd=cr&ei=c3pfVq-rJYLemAX-4bOgAg) (accessed 8.23.14).
- Wallace, R., 2014. CFMEU fined \$1.25m over Melbourne Grocon protests | The Australian [WWW Document]. URL <http://www.theaustralian.com.au/news/nation/cfmeu-fined-125m-over-melbourne-grocon-protests/story-e6frg6nf-1226869621624> (accessed 10.26.14).
- Watpac, 2015. Corporate Governance - Watpac Limited [WWW Document]. URL <http://www.watpac.com.au/investor-centre/corporate-governance/> (accessed 6.18.15).
- Watson, A., 2003. Professions and Professionalism: Should We Jump Off the Bandwagon, Better t...: Discovery Service for Univ of Newcastle [WWW Document]. URL <http://eds.b.ebscohost.com.ezproxy.newcastle.edu.au/eds/pdfviewer/pdfviewer?sid=23558bb5-ad4c-4ae6-8f91-77fed8c43a7b%40sessionmgr113&vid=1&hid=120> (accessed 1.1.15).
- White, A., Johnston, M., 2015. Andrews lets CFMEU off the hook [WWW Document]. URL <http://at.heraldsun.com.au/link/d8722947069a32c60409dd4377d74e52?domain=heraldsun.com.au> (accessed 11.26.15).
- Whitlam, G., 1973. MBA Parade of Homes. Master Builder 141–142.
- Wikipedia, 2015a. Quality assurance [WWW Document]. Wikipedia, the free encyclopedia. URL [https://en.wikipedia.org/w/index.php?title=Quality\\_assurance&oldid=671530805](https://en.wikipedia.org/w/index.php?title=Quality_assurance&oldid=671530805) (accessed 8.9.15).
- Wikipedia, 2015b. Office of the Australian Building and Construction Commissioner [WWW Document]. Wikipedia, the free encyclopedia. URL [https://en.wikipedia.org/w/index.php?title=Office\\_of\\_the\\_Australian\\_Building\\_and\\_Construction\\_Commissioner&oldid=669304686](https://en.wikipedia.org/w/index.php?title=Office_of_the_Australian_Building_and_Construction_Commissioner&oldid=669304686) (accessed 8.16.15).
- Wilkinson, J., 2013. Construction Industry in NSW: Background to the Insolvency Inquiry (No. e-brief 04/2013). NSW Parliament.
- Wisker, G., 2007. The Post Graduate Research Handbook [WWW Document]. URL [https://www.google.com.au/search?q=the+postgraduate+research+handbook+by+gina+wisker&ie=utf-8&oe=utf-8&gws\\_rd=cr&ei=uiKSVMKOPMK78gXhw4KgBQ](https://www.google.com.au/search?q=the+postgraduate+research+handbook+by+gina+wisker&ie=utf-8&oe=utf-8&gws_rd=cr&ei=uiKSVMKOPMK78gXhw4KgBQ) (accessed 12.18.14).
- Womack, J.P., Jones, D.T., Roos, D., 2007. The Machine That Changed the World: The Story of Lean Production-- Toyota's Secret Weapon in the Global Car Wars That Is Now Revolutionizing World Industry, Reprint edition. ed. Free Press.
- Yin, R., 2003. Case Study Research: Design and Methods - Robert K. Yin - Google Books [WWW Document]. URL [http://books.google.com.au/books/about/Case\\_Study\\_Research.html?id=BWea\\_9ZGQMwC](http://books.google.com.au/books/about/Case_Study_Research.html?id=BWea_9ZGQMwC) (accessed 11.5.14).
- Yu, S., Oliver, D., 2015. THE CAPTURE OF PUBLIC WEALTH BY THE FOR-PROFIT VET SECTOR [WWW Document]. URL <http://www.aeufederal.org.au/Tafe/WRCAEU2015.pdf> (accessed 9.2.15).

n.d.