

IVESTIGATING THE ROOT-CAUSE OF LEGAL DISPUTES OVER DEFECTIVE CONSTRUCTION

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Abstract

Construction industry is of critical significance to the development of Australia regarding economic and social aspect, contributing one of the largest portions to Australia's GDP and providing residential building, infrastructure and functional facilities to the operation of the cities as well as job opportunities to the country. Construction disputes are common trait of this industry causing detrimental consequences to the construction projects leading to financial loss and delays in construction projects. Although there is a considerable amount of research and knowledge contributing to the study of dispute causation, legal disputes remain prevailing and hinder the process of construction, especially from the cost perspective. In order to improve our understanding of the causation factors underlying the legal disputes this research was conducted by examining the details of recent legal cases in NSW. Our objective was to determine the extent of the impact of insufficient work-front instruction including missing specifications on occurrence of defective construction work. As a result, this research discusses that poor workmanship as a major causation factor is a direct derivative of vague job description. The observation that patent defects readily identifiable by inspection were a common source of dispute supports our hypothesis that ambiguity of the task provides tradespersons the opportunity to deliver a sub-standard job. Professional ethics and technical skills of the tradies have been discussed to have a moderating effect. Clear and precise specifications are inevitable if disputes are to be reduced.

Keywords

Construction defect, Information flow, Legal dispute, Poor workmanship

Introduction

The construction industry is a pillar industry of Australia's economic development. According to the Australian Bureau of Statistics (ABS 2015), the construction industry accounted for 7.8% of Australia's Gross Domestic Product (GDP) in 2014-15 financial year with the direct output of \$204.5 billion. Meanwhile, the development of the construction industry would also support the upstream and downstream industries such as the manufacturing industry which provides the construction materials to the construction activities. Likewise, the real estate industry and the financial industry would also grow as the management of properties and the financial service such property mortgages would be required after the completion of the construction works.

Disputes caused by various reasons produce significant consequences including hindering the development of the construction industry (Chan and Suen 2005). It is common to have conflicts in the projects and conflicts would turn into disputes if not managed appropriately. Actually it is not odd to construction professionals that construction disputes are inevitable especially in the complex

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construction projects (Cheung and Yiu, 2006). The consequences of construction disputes include troubling progress of the project, deteriorating the relationship between contractors and the project owners, and leading to the overruns of budget and time (Iyer et al., 2008). In terms of cost of construction disputes, Love et al. (2010) stated that the direct cost of construction disputes could account for the contract value ranging from 0.5% to 5%, and the indirect cost would be in form of loss of productivity, stress from disputes, damage to reputation and loss of future work. Assuming the direct rework cost is equal to the direct cost of dispute, which means the cost associated with the disputes would account for, to some extent, 10% of the total contract value.

Love (2012) stated that it has been widely accepted that the defective work and changes of scope are the main causes of construction disputes. A construction defect is generally defined as a deflection in the design and workmanship which would result in failure of a component part of a building and causes damage to persons or property (Gashi, 2018). The defect in the construction industry could be caused by the design defect and the construction defect. The design defect is the result of a design professional's failure to reduce accurate and complete project design which is categorised as the design omission and the design error (Gashi, 2018). Additionally, construction defect includes latent and patent defect (Gashi, 2018). Latent defect means those unobvious defects that cannot be identified easily even via the comprehensive on-site inspection, whereas patent defects are already known or readily obvious based on reasonable inspection.

Therefore, it is necessary to investigate the causes of the disputes and to develop mitigation solutions to avoid them. Relevant, existing researches mainly focus on the analysis of the primary data, such as the research of Hwang et al. (2014), which uses the questionnaires to obtain the data, and the research of Farrington and Ledbetter (1992), whose data was derived from the interviews. The study of Cheung and Yiu (2006) used a fault tree to examine the causes of construction disputes in Hong Kong. In contrast, this research endeavours to trace disputes in legal cases instead of working with data that has primarily collected about dispute. This empirical study aims at creating insight on the occurrence of construction disputes through the lens of common legal disputes in the construction industry.

Construction Disputes

The causes of construction disputes could be various. Kilian and Gibson (2005) found that there are five factors contributing to the disputes, which are project management procedure, design error, inefficient contracting, site management and bidding miscalculations. Rhys (1994) lists management, culture, communication, design, tendering pressure, economics, contract, skill and law as the reasons behind construction disputes. Kumaraswamy (1997) claimed that the dispute could be divided into five common types including variations caused by the site condition, variations caused by the client changes, variations caused by the design errors, unforeseeable ground conditions and ambiguity of contract documents. Ashworth (2015) classifies causes of disputes from the perspective of key project stakeholders into six categories of general, client-related, consultant-initiated, contractor-produced, and subcontractor-triggered. Adriaanse (2005) stated that the quality of material and level of the skill, delays, variations, increase of cost, and the divergence of the interpretations of the contract provisions are main causes that contribute to construction disputes. Love (2002) stated that it has been widely accepted that the defective work and changes of scope are the main causes of disputes.

The research of Mitropoulos and Howell (2001) examined the development of construction disputes by analysing 24 cases of construction disputes in terms of the situation of the case the amount claimed and settled and the level of resolution. The result indicates that the planning and problem-solving ability are much more significant than the contractual terms on the prevention of complex and high-cost disputes.

Defective Construction Work

According to Barrett (2008) the term 'defect' has been firstly defined over one hundred years ago in a legal case in 1897 to be 'the lack or absence of essential elements to completeness'. In the case, a fence

which supposed to set up between the operator and the machinery was missing, leading it to be defective. Defect is defined as 'the non-fulfilment of a requirement related to an intended or specified use' by the Internal Organization for Standardization (ISO). Similarly, ISO defines 'the failure to fulfil a requirement' by using the word 'non-conformance'. Battikha (2008) stated that the non-conformance would occur when components of the project deviate from the defined requirements in the finished state of the project and lead to the decisions in terms of the acceptance and rectification. Another word that is similar to defect is 'snag'. Sommerville and McCosh (2006) articulated that snags could be defined as the defects absorbed during the process of construction, which means they are corrected before completion of the project. Besides, the word 'post-handover defect' is defined as the defects that remain in the building after the completion and delivery of the building during the liability period, which would range from 12 months to 36 months (Forcada et al. 2012).

There are three main types of construction defects, including the failure of the materials and the work to achieve the acceptance level the failure of the materials and the work to remain the same as the specification and design brief, and the failure to complete the project. As for the completion of the work, it is likely to involve disputes if the construction requirements in terms of the specific quality of the work could not be achieved. The patent defects are the one which could be observable and visible. While for the latent defects, it is hidden and caused by the inadequacy of the materials (McClean 2009).

In common law the obligation of the builders terminates after the completion of the construction work. Therefore, builders are allowed to leave the construction site and are no longer responsible for the future damage to the buildings, except for the damage that is caused before the completion of the work. Meanwhile the builders are allowed to terminate the insurance for the building after the completion. However, the builders should be responsible for the compensation for all the patent and latent defects that might be detected afterward. Because the defects might not emerge instantly but would be identified subsequently. These could also be related to a period called defects liability period. The period could range from 6 months to 12 months according to the contracts starting immediately after the building is completed by the builders. Besides, the liability period would be restart if any defects are identified during the original liability period. However, the total time span of the liability period should not exceed 2 years unless there is specific requirement stated in the contract (Barrett, 2009).

Methodology

This research implemented a qualitative approach through extraction of dispute data hidden in the legal case reports. The Australian legal databases, including Lexis Advance, Westlaw AU and Australian Legal Information Institute, was used to search for construction dispute cases related to the defective construction work over a twenty-year period starting from 1999 to 2019 in New South Wales. The research team has looked into 100 cases related to disputes in the construction industry concerned with defective construction work with a technical perspective in order to ascertain the root causes of the defective works behind the disputes.

Content analysis was deployed to analyse the data obtained from the law cases. The information in the cases was extracted and categorised with the description of the case situation and categorisation of the causes. The keywords 'defect' and 'construction' were used to identify cases, and each case was then examined in detail to determine the causation of the defective construction work. The disputes concerned with industrial, commercial and engineering construction projects were inspected.

The causes of the defect in the case study were laid into five categories, which are defective workmanship, communication issue lack of skill, contract issue, and external factor, to define the cause of the defective works in each dispute. Meanwhile, the type of the defect in the disputes was also divided into 3 different kinds namely the patent defect, latent defect, and the design error.

Discussion of Findings

This study successfully identified 100 dispute cases which are related to the defective construction works. It was noticed that the cause of the defective works, in some of the cases, had not been mentioned in the case record. In these instances, the parties merely to ask for the judgment to decide the party who should take the responsibility to the cost of the rectification. Therefore, the cause of the defect in those cases was unable to be identified and hence those cases were categorized into 'unknown' and were removed from the analysis of defect causes.

The result, including the causes of defects and the types of defect are shown in Figure 1 and 2. It is remarkable that the defective workmanship accounts for approximately 77% of the causes of defect in the disputes. The lack of skill and contract issue contribute around one-fifth of the defects, accounting for 11% and 8% individually. The remaining 4% of the defects are equally caused by the communication and external factor. As for the types of the defect, it is obvious that three-quarter of the defects are patent defect with approximately one-fifth of the defects are latent defect. The design error only accounts for a small portion of the defects with 6%.

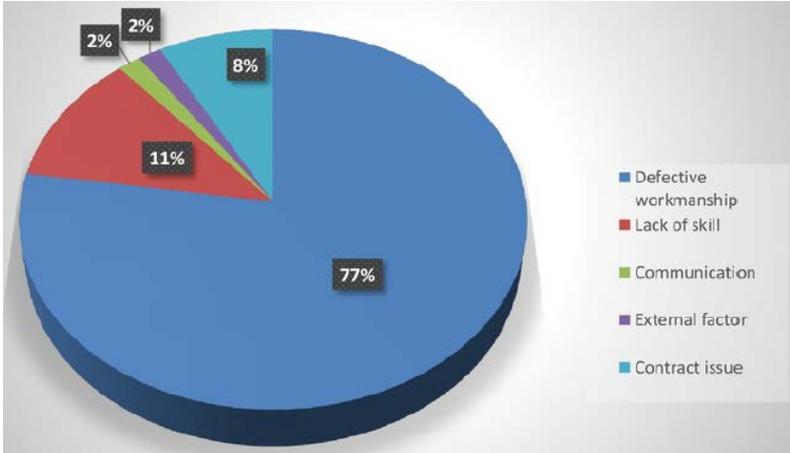


Figure 1: Causes of defect

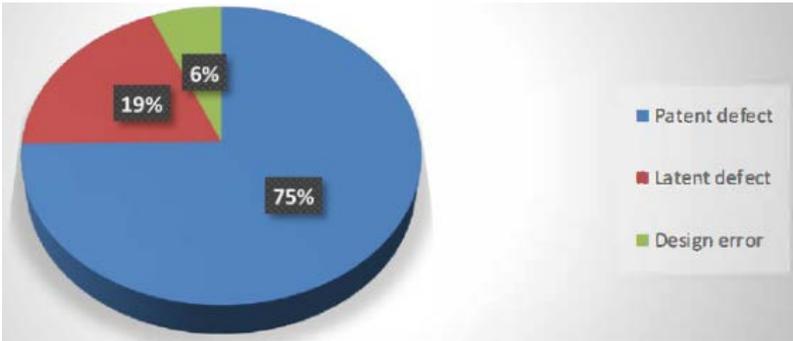


Figure 2: Types of defect

During the data collection process it was noted that a sizable number of cases were concerning licencing and registration issues, disciplinary proceedings, and qualification issues, which involved construction companies or builders and the authorities such as the Building Professionals Board and the NSW Fair Trading. The other types of the dispute cases are employment disputes which usually involve companies and employee's superannuation, worker's compensation and the long service leave.

According to the result of the research the defective workmanship is the biggest contributor to the defective construction works and the patent defect is the major type of the defective construction works.

Hence it is of great significance to project managers to reconsider the trade of between cheaper labour and the higher risk of defective works. The fact that majority of the defects were patent capable of being discovered by reasonable inspection, demonstrates the important role of effective supervision and inspection. Project management team is advised to take regular inspections seriously in order to detect the defects and to avoid disputes.

Factors such as building classification, size of the structure, use of performance solutions, experience of design and building team, and climate conditions have been considered to evaluate the risk associated with inspection of construction works. This study identified issues as simple of missing movement joints resulting litigation. Or, in regard to design, the mismatch between client's need and what has been designed. In two cases for example, a pavement was designed and built that was not adequate for the kind of machinery the client planned to drive on the pavement. Improper classification of foundation material resulting in insufficient load bearing capacity or cracks in building elements due to reactive soil is another incident that could be avoided by more effective inspection.

Conclusion

Although there is a considerable amount of research and knowledge contributing to the study of dispute causation, legal disputes remain prevailing and hinder the process of construction, especially regarding the crucial costs. In order to improve the understanding of the causation factors underlying the legal disputes, this research was conducted. As a result, this research has identified that the defective workmanship as responsible for the majority of the defective construction works and the patent defect, which is detectable by reasonable inspection, accounts for a large portion of the type of the defective works.

This study provided project management team an insight of legal disputes initiated by defective work and recommended careful selection of the labour force as an immediate solution. Regular inspection and more comprehensive supervision of the construction process are also discussed to complement more rigorous recruitment. With the defective works being avoided, the potential disputes and the following economic loss could be significantly reduced.

References

- Aslnoorth A 2012, *Contractual procedures in the construction industry*, 6th ed Harlow, England.
- Adriaanse, J 2005, *Construction contract law: the essentials*, Basingstoke, Palgrave Macmillan.
- Australian Bureau of Statistics 2015 Australian National Accounts: National Income Expenditure and Product, viewed 20 September 2018 <http://www.abs.gov.au/AUSSTATS/abs@.nsf/ProductsbyCatalogue/52AF_A5FD696482C_ACA25_768D0021E2C7?OpenDocument>.
- Barrett, K 2008, *Defective construction work*, Chichester, West Sussex, UK.
- Barrett K 2009. *Defective construction work: and the project team*, John Wiley & Sons.
- Battikha, M 2008, 'Reasoning mechanism for construction nonconformance root-cause analysis', *Journal of Construction Engineering and Management*, vol. 134, no. 4, pp. 280-288.
- Chan, E.H.W. & Suen H.C.H. 2005, 'Dispute resolution management for international construction projects in China', *Management Decision*, vol. 43, no. 4, pp. 589-602.
- Cheung, S & Yiu, T 2006. 'Are Construction Disputes Inevitable?', *IEEE Transactions on Engineering Management*, vol. 53, no. 3, pp. 456-470.
- Farrington J & Ledbetter W 1992 'Causes of quality deviations in design and construction', *Journal of Construction Engineering and Management*, vol. 118 no. 1, pp. 34-49.
- Forcada, N, Macarulla, M, Fuertes, A, Casals, M, Gangoellis, M & Roca, X 2012, 'Influence of building type on post-handover defects in housing' *Journal of Performance of Constructed Facilities*, vol. 26 no. 4, pp. 43.

- Gashi, E 2018 'Management of defective works in infrastructure projects' *International Review of Applied Sciences and Engineering*, vol. 9, no. 1, pp. 73-80.
- Hang B, Zhao, X & Goh, K 2014, 'Investigating the client-related rework in building projects: The case of Singapore', *International Journal of Project Management*, vol. 32, no. 4 pp. 698-708.
- Iyer, K.C., Chaphalkar, N.B. & Joshi, G.A. 2008, 'Understanding time delay disputes in construction contracts', *International Journal of Project Management*, vol, 26, no. 2 pp. 174-184.
- Kilian, J & Gibson G 2005, 'Construction Litigation for the U.S. Naval Facilities Engineering Command, 1982-2002', *Journal of Construction Engineering and Management*, vol. 131, no. 9, pp. 945-952.
- Kumaraswamy M 1997 'Conflicts, claims and disputes in construction', *Engineering, Construction and Architectural Management*, vol. 4, no. 2, pp. 95-111.
- Love, P 2002, 'Influence of project type and procurement method on rework costs in building construction projects', *Journal of Construction Engineering and Management*, vol. 128, no. 1, pp. 18-29.
- Love P Davis, P, Ellis J & Cheung S, 2010, 'Dispute causation: Identification of pathogenic influences in construction', *Engineering, Construction and Architectural Management*, vol. 17, no. 4, pp. 404-423.
- Mclean, S 2009, 'Defective Construction Work', *Journal of Building Appraisal*, vol. 4, no. 3 p. 2
- Mitropoulos P & Howell, G 2001, 'A Model for Understanding Preventing, and Resolving Project Disputes' *Journal of Construction Engineering and Management*, vol. 127, no. 3, pp. 223-23.
- Rhys, J 1994, 'How constructive is construction law?', *Construction Law*, vol. 10 no. 1, pp. 28-38
- Sommerville, J & Mccosh, J 2006, 'Defects in new homes: an analysis of data on 1,696 new UK houses', *Structural Survey*, vol. 24 no. 1, pp. 6-21.