

AN EXPLORATORY STUDY OF PROJECT DISPUTE PATHOGENS

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Abstract

In this paper case law and focus groups from Western Australia are used to explore the underlying pathogens that contribute to disputes so as to provide an ameliorated understanding of their origins in construction. Analysis of the case law findings revealed that the underlying issues that were brought to litigation were to do with points of law, namely 'civil procedure'. A significant number of disputes are thus settled using alternative dispute resolution methods such as adjudication and arbitration and mediation. In addition, litigation proceedings were predominately found to occur between clients and contractors. From the focus groups with a public sector client and contracting organization it was revealed that there was a divergence in terms of the pathogens contributing to disputes. For clients the underlying latent conditions that resulted in a dispute were due to the nature of the task being performed (e.g., failure to detect and correct errors) and those arising from people's deliberate practices (e.g., failure to oblige by contractual requirements). For the contractor focus group the circumstances arising from the situation or environment the project was operating in were identified as the main underlying latent condition for disputes (e.g., unforeseen scope changes). A degree of convergence for estimates of dispute costs was found to occur between the client and contractor group. The direct costs of disputes were estimated to range from 0.5% to 5% of the original contract value depending on the resolution method adopted. While the research has been able to provide the initial building blocks for understanding the underlying pathogens contributing to disputes more research empirical research is required, particularly in terms of determining dispute costs.

Keywords: Case law, dispute, costs, client, contractor, pathogens, Western Australia

INTRODUCTION

Disputes have become an endemic feature of the Australian construction industry even though considerable efforts have been made by professional bodies, and government, particularly through the instigation of royal commissions, to curb their occurrence and improve its overall performance (NWPC and NBCC, 1990; Gyles, 1992; DIST, 1998; Cole, 2002; Blake Waldron and Dawson, 2006). While efforts have been made by construction organizations to improve their performance through the adoption of new work practices, techniques and technologies embedded within concepts such as supply chain management, lean production, and knowledge management, disputes still continue to prevail.

Factors such as scope changes, erroneous documentation, and ambiguous contract conditions continue to be fundamental contributors (Blake Waldron Dawson, 2006). Considering the increasing complexity of construction projects and the turbulent economic environment within which they are being procured, there is a need to obtain an ameliorated understanding of the underlying conditions that contribute to disputes if their impact and incidence is to be reduced. Building upon the systemic review of dispute causes presented in Love *et al.* (2008a), the research in this paper examines case law and uses focus groups to determine the ‘pathogens’ that contribute to disputation.

PATHOGENS

Research undertaken by Love *et al.* (2008b) has revealed that errors and scope changes in projects arise because of inherent pathogens that exist in projects. These are latent conditions that lay dormant within the project system until a problem comes to light. Before the problem becomes apparent, project participants often remain unaware of the impact upon project performance that particular decisions, practices or procedures can have.

Pathogens can arise because of strategic decisions taken by top management or key decision-makers within a project. Such decisions may be mistaken but they need not be. Latent conditions can lay dormant within a system for a considerable period of time and thus become an integral part of everyday work practices. However, once they combine with active failures (which are similar to Deming’s common causes) then the problem that arises and the subsequent consequences may be significant.

Active failures are essentially inappropriate acts committed by people who are in direct contact with a system. Such acts include: slips, lapses, mistakes and procedural violations (Reason, 2000). Active failures are often difficult to foresee and therefore cannot be eliminated by simply reacting to the event that has occurred. Latent conditions, however, can be identified and remedied before an adverse event such as a dispute occurs. Pathogens have been defined by a number of qualities (Busby and Hughes, 2004):

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

According to Busby and Hughes (2004) pathogens can be categorized as:

- *Practice* – arising from people’s deliberate practices;
- *Task* – arising from the nature of the task being performed;
- *Circumstance* – arising from the situation or environment the project was operating in;
- *Organization* – arising from organizational structure or operation;
- *System* – arising from an organizational system;
- *Industry* – arising from the structural property of the industry; and
- *Tool* – arising from the technical characteristic of the tool.

Before causal inferences about disputes can be made it is necessary to initially determine the latent conditions that contribute to their occurrence.

RESEARCH APPROACH

In line with previous studies Australian case law was initially reviewed (e.g., Watts and Scrivener, 1992) to ascertain the reasons as to why a dispute was in place. This enabled the key issues that contribute to disputes to be identified. Focus groups were then used to explore ‘how’ and ‘why’ disputes emerged between parties.

Case Law

The LexisNexis® database was used to search for disputes cases over a ten year period from 1998 until 2007 in Western Australia. The parameters “building” and “construction” disputes were used to identify cases and each one was then examined in detail to determine the dispute causation. Only disputes that pertained to commercial, industrial, engineering construction projects were examined in this research, which numbered approximately 200 in total. Domestic building disputes were excluded from the search. Cases were also examined to obtain an estimate of the costs that been incurred by parties. It was revealed that the costs of disputes were not published in the public domain and so where possible reference to the costs associated with adjudications were made. For example, adjudications from ‘The Building and Construction Payments Agency Payments Agency’ that were made available within the public domain were used to ascertain why payment was not forthcoming to a party.

Focus Groups

Focus groups were used to elicit viewpoints and examine the perceived causes and costs of disputes. Unlike conducting multiple individual interviews, participants in the focus group can listen to and comment on each other’s original responses, discussing their perceptions and ideas with each other in an often enjoyable and comfortable shared environment (Patton 2002). The feedback obtained from focus

group is also deemed to be more specific, animated and meaningful than the feedback from individually completed interviews and questionnaires (Patton 2002).

Reid and Ellis (2007) argue that there is no definitive meaning of a dispute and the existence of which is a subjective issue requiring a common-sense approach that relies on the facts, the law and policy considerations. Thus, for the purposes of this research the following *operational definition* was used for a dispute:

“When parties cannot resolve an issue relevant to the performance of the project in a proactive, timely and mutually acceptable manner, and each party forms an entrenched and contrary opinion with respect to that issue that requires resolution”.

The focus group was used to obtain initial information relating to the views and opinions of participants about the causes and costs of disputes in a non-threatening environment. As a common method of selecting participants for focus groups, convenience sampling was used. Participants from a public sector client and contracting organization who had been involved with several disputes were invited to participate in the research.

Ideally focus groups should contain between 6 and 12 participants (Stewart and Shamdasani, 1990); for both groups 6 people were present. While the focus group progressed, participants were given freedom to discuss issues, listen to fellow participants, provide reflective comment and arrive at a shared understanding of collective experiences regarding the causes of disputes. Whilst working with the group the facilitator appeared to be ‘genuinely naïve’ and avoided leading questions so as to allow corroboration to naturally occur. The nature of the questions raised allowed for avenues of interest to be pursued without introducing bias in the response. Notes were taken during the interview to support the digital recording to maintain validity. The duration of each focus group was approximately two hours.

Data Analysis

Content analysis was used as the analysis technique of data that was obtained from the focus groups. In its simplest form this technique is the extraction and categorization of information from documents. Inferences from the data can only be drawn of the relationship with what the data means can be maintained between their institutional, societal and cultural contexts (Krippendorff, 1980). For the case law this was undertaken manually because the researchers were not able to store the data in an electronic format. The text derived from the focus groups was analyzed using QSR Nvivo (which is a version of NUD*IST and combines the efficient management of Non-numerical Unstructured Data with powerful processes of Indexing and Theorizing) and enabled the development of themes to be identified.

One advantage of such software is that it enables additional data sources and journal notes to be incorporated into the analysis. The development and re-assessment of themes as analysis progresses accords with the calls for avoiding confining data to pre-determined sets of categories (Silverman, 2001). Kvale (1996) suggests that *ad hoc* methods for generating meaning enable the researcher access to ‘a variety of common-sense approaches to interview text using an interplay of techniques such as noting patterns, seeing plausibility, making comparisons etc’ (p.204).

Using Nvivo enabled the researchers to develop an organic approach to coding as it enabled triggers or categories of interest in the text to be coded and used to keep track of emerging and developing ideas (Kvale, 1996). These codings can be modified, integrated or migrated as the analysis progresses and the generation of reports, using Boolean search, facilitates the recognition of conflicts and contradictions.

RESEARCH FINDINGS

An examination of Australian case law provided limited insights into the nature and extent of the disputes. Most cases (75%) were employment case disputes involving construction companies and employees’ superannuation, long service leave, and workers compensation. Tables 1 and 2 provide examples of construction dispute cases from Western Australia. It was found that the remaining cases (25%) that proceeded to litigation involved ‘Civil Procedure’ matters or focused on the meaning and interpretation of contractual terms.

< Table 1. Civil procedural matters: Examples of litigation cases from WA >

< Table 2. Dispute examples: Interpretation and health and safety >

The cases identified did not provide an indication to the cause of the initial dispute, as they dealt with matters of law that arose during disputation process. It would appear that most construction disputes are actually settled before litigation proceedings become advanced or an outcome is reported in the public domain. It is suggested most parties eschew litigation because of the resourcing and emotional effort required to reach a resolution. The examination of the case law clearly indicates that a majority of disputes that arise in construction are actually resolved using alternative dispute resolution processes. Disputes that arise due non-payment are dealt with under the ‘Security of Payment Legislation’ and the use of adjudication (Table 3).

< Table 3. Adjudication decisions made under the ‘Queensland Security of Payment Legislation’ in 2008 >

A request for adjudication of a payment claim may arise because a payment claim is rejected, is disputed, not paid in full, or security of retention monies not returned by the due date under the contract. Only data on the 'Security of Payments' and adjudication statistics were readily available from the 'Building and Construction Industry Payments Agency (Queensland). Here the typical causes of non-payment were found to be related to quality issues (e.g., poor workmanship, and defective work), change of scope, ambiguity of contract terms, and incomplete contract documentation. In Queensland, 75% of claims for non-payment arose from subcontractors, 13% from contractors, 7% from consultants, and 7% from suppliers. Interestingly, it was observed that litigation occurs mainly between contractors, their client and unions. No litigation cases were identified that involved consultants and subcontractors.

Divergence: Client and Contractor Perceptions of Dispute Causation

The client and contractor focus groups revealed insights about their experiences with disputes in projects. The client focus group comprised of a project director, and five project managers. For the contractor, a state manager, two operations managers, a construction manager, a project manager were in attendance. The focus groups provided an open forum to discuss what the causes of disputes were and how they could be avoided. Initially, participants within the client and contractor groups were reluctant to express their views and experiences as to the causes of disputes with respect to specific examples. It was perceived that the presence of senior managers hindered interviewees from 'speaking freely' because of the commercial sensitivity that may have been associated with a dispute that the organization had or was currently involved with. With this mind, the dialogue switched from the specific to generic causes, consequences, costs and avoidance strategies of disputes.

Table 4 identifies the perceived causes of disputes noted by the client and contractor groups. The pathogens contributing to the cause of the dispute are also identified. In many instances several pathogens are identified as contributing to the cause of the dispute. For example, in the case of poor planning and resourcing by contractors and consultants *practice* and *circumstance* are identified as being contributing pathogens.

< Table 4. Client and contractor perceived dispute causes and avoidance >

The client group suggested that the prevailing skills shortage was a problematic issue for consultants and contractors and this was affecting their ability to deliver services within specified time frames. Furthermore, it was suggested that the design documentation process evolved in ad hoc manner and as a result it was often incomplete for the purposes of tendering. Similarly, it was perceived that contractors frequently were not able to respond to changing conditions as their planning efforts

were deemed to be reactive rather being proactive. It was stated by a client project manager that:

“Contractors don’t seem to plan for changes; I mean even the smallest change. There is no contingency and a slightest change means that they claim for an extension of time or for delay and disruption because they are reactive. We don’t take this nonsense from them”.

In this instance, a genuine claim could be made but the client perceives it to be a small change when in fact such a change could delay a project’s completion date. The stern stance taken by the client could be viewed as being provocative and thus may lead to conflict emerging.

Incomplete documentation and opportunistic behavior on the contractor’s behalf were deemed to be in congruence with one another. The contributing latent conditions were identified as the *task*, *practice*, and *system*. Here errors can occur because design audits reviews, and verifications are not undertaken, or employees do not have the skill and experience to document. Errors contained within the contract documentation can lay the foundation for opportunistic behavior from the contractor to make a claim for something that they may have already taken into account during the tendering process. For example, it was stated:

“At the moment contractors are doing very well. Margins are high, I believe in the region of 15%. When the market changes you watch, they’ll look for any error or mistake within the contract documents so they can increase their margin through claims. There are several contractors who have a reputation for being claim merchants. I know one firm who flooded the client with claims in the hope to get a few extra dollars”.

In contrast to the perceptions of the client group, the contractors’ views as to dispute causes are extremely dissimilar. More emphasis is placed on the *circumstance* arising from the situation or environment the project operates in than on the *task*, *practice* and *organization* suggested by the client group. Competitive tendering was identified as a dispute cause because price was deemed to be the primary selection factor for contractors. This resulted in a member of the contractor focus group stating:

“Your reputation is an issue, its sensitive particularly when you’re in the business of trying to establish and maintain relationships. We try so hard to develop relationships with our clients, though we feel we are constantly screwed on price, especially when we tender for projects”.

As a result of the contractor’s tender price for works being typically reduced their reaction to such a scenario appeared to be premeditated as it was stated:

“We have entitlements under a contract and when they are taken away from us then we stand up for ourselves. We just want what is fair and reasonable – we’re not opportunistic. There are two types of claim opportunistic and needs based. Opportunistic claims are when you fight like a dog because essentially you’re in a loss position and you want the most you can out of it. Most of our disputes are on a needs basis and not opportunistic”.

The *circumstances* that arise in a project are predominately driven by clients who have limited knowledge of market conditions and innovation and who place too much emphasis on cost rather than ‘value for money’.

The client and contractor group unanimously agreed that disputes were non-value adding and could cause considerable emotional and financial heartache for organizations involved. A plethora of activities that could be implemented in projects to reduce the incidence of disputes were propagated (Table 2). Those activities identified should form an integral of part work practices and project procurement. For example, design reviews, verifications would reduce the incidence of errors in documents, a fully developed scope would reduce the likelihood of scope changes, and standard forms of contract would eliminate misinterpretation. Interestingly, a dichotomy appears between the client and contractor in terms of their view on what procurement method to use to reduce disputes: traditional compared to non-traditional procurement (constructability is integral to these methods). There is a greater propensity for projects being procured using traditional forms to experience disputes than those procured using non-traditional methods (Cheung and Yiu, 2006).

Congruence: Client and Contractor Perceptions of Dispute Costs

The client and contractor agreed that the costs of resolving disputes were significant, particularly when litigation proceedings commenced. The General Manager for the contractor stated:

“Both parties feel the pain of a dispute when it ends up in the court room. It’s a very emotional experience and the costs can be unbelievable. There is only one winner, the lawyers. We try to avoid them at all costs”.

The determination of dispute costs was an area that was considered problematic for participants in the focus groups. No systematic method for determining the cost of disputes was in place within their respective organizations. The total dispute cost, excluding the actual claim cost, can be expressed as:

$$\text{Total Dispute Cost} = \sum_1^i C_i \text{ direct} + \sum_1^j C_j \text{ indirect}$$

Direct costs include fees and expenses paid to lawyers, paralegals, accountants, claims consultants, and other experts. Indirect costs are salaries and the associated overhead of in-house lawyers, company managers, and other employees involved in processing the dispute. Hidden costs are inefficiencies, delays, loss of quality to the project, and the cost of strained business relationships among the various parties. It was suggested by a member of the contractor's organization that the direct cost of a dispute incurred accounted for approximately 5% of the project's original contract value.

Estimates of dispute costs provided from participants from both groups ranged from 0.5% to 5% of project's contract value. The estimate of 5% provided by the contractor was considered to be a major dispute and accordingly warranted resolution through litigation. Other indirect costs identified by participants included lost productivity, stress and fatigue, loss of future work, reduced profit, and tarnished reputation. Love (2002) revealed that the indirect cost of rework could be as much as six times the cost of rectification. It is widely accepted that defective work and scope changes are primary causes of rework and disputes. Assuming the associated costs of litigation could be as high as 5% of contract value and the indirect costs have a multiplier of six, then disputes could in some circumstances account for 30% of a contract's value.

Considering the forecast of construction and engineering activity for 2008 and 2009 is projected to be in excess of \$82 billion then the total cost of disputes could range anywhere from \$2.73 billion to \$27 billion to the economy. These indicative costs assume that every project would incur disputes, which is not necessarily the case. However the figure does provide a degree of magnitude of the problem at hand. Bristow and Vassilopoulos (1995) revealed that litigation fees are often more costly than the claim being sought. In the United States, for example, it has been estimated that in excess of US\$5 billion a year is spent on construction litigation and such expenditure is expected to increase annually by 10% (DeSai, 1997; Michel, 1998). This figure excludes the 95% of disputes that are settled before trial (Stipanowich, 2004).

CONCLUSION

While a considerable amount of knowledge has been accumulated about dispute causation, they continue to prevail and disharmonize the process of construction with considerable cost. In obtaining an improved understanding about the underlying contributing factors case law and focus groups were undertaken. The case law revealed that the underlying issues that were brought to litigation were to do with points of law, namely 'civil procedure'. A significant number of disputes are thus settled using alternative dispute resolution methods such as adjudication, arbitration,

mediation and negotiation. In addition, litigation proceedings were predominately found to occur between clients and contractors.

Two focus groups with a public sector client and a contracting organization were then undertaken. The focus groups enabled participants to present their experiences with the causes and costs of disputes. There was a significant difference in opinion as to causes of disputes. For clients it was perceived the underlying latent conditions that resulted in a dispute were predominately due to the nature of the task being performed (e.g., failure to detect and correct errors) and those arising from people's deliberate practices (e.g., failure to oblige by contractual requirements). The causes identified by the public sector client included were poor workmanship and defects, opportunistic behavior of contractors, incomplete/erroneous documentation, and poor planning and resources of consultants and contractors. For the contractor focus group the circumstances arising from the situation or environment the project was operating in was identified as the main underlying latent condition for disputes (e.g., unforeseen scope changes). There was however found to be a degree of convergence for estimates of dispute costs. The direct costs of disputes were estimated to range from 0.5% to 5% of the original contract value depending on the resolution method adopted.

While the research has been able to provide the initial building blocks for understanding the underlying pathogens contributing to disputes more empirical research is required before conclusive findings can be made, particularly in terms of determining dispute costs. However, some limitations to the research presented should be acknowledged. First, the inconsistent definitions of 'dispute' between studies make research findings difficult to compare and generalize with other studies. Focus groups were only undertaken with clients and contracting groups as they were identified as the main parties of a dispute during the analysis of litigation cases within Western Australia. Input from consultants, may provide a more balanced perspective as to the perceived causes and costs of disputes.

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Table 1. Civil procedural matters: Examples of litigation cases from WA

Point of Law	Case
Discovery of Documents	<ul style="list-style-type: none"> • Leighton Contractors Pty Ltd v Public Transport Authority of Western Australia (No 5) — Supreme Court, WA — Le Miere J — 8 Oct 2007 [2007] WASC 233, BC200708582, • Leighton Contractors Pty Ltd v Public Transport Authority of Western Australia — Supreme Court, WA — Le Miere J — 28 Jun 2007 [2007] WASC 143, BC200704989 • Leighton Contractors Pty Ltd v Public Transport Authority of Western Australia — Supreme Court, WA — Le Miere J — 22 Mar 2007 [2007] WASC 65, BC200701962 • Leighton Contractors Pty Ltd v Public Transport Authority of Western Australia — Supreme Court, WA — Le Miere J — 13 Feb 2007 [2007] WASC 32, BC200700565
Privilege	<ul style="list-style-type: none"> • Public Transport Authority of Western Australia v Leighton Contractors Pty Ltd — Supreme Court, WA, Court of Appeal — Steytler P, McLure and Miller JJA — 18 Jul 2007 [2007] WASCA 151, BC200705603
Application for Interlocutory Injunction	<ul style="list-style-type: none"> • Leighton Contractors Pty Ltd v Construction, Forestry, Mining and Energy Union — Supreme Court, WA — Le Miere J — 24 Feb 2006 [2006] WASC 39, BC200601158
Unlawful Industrial Action <i>Interlocutory Injunction</i>	<ul style="list-style-type: none"> • Leighton Contractors Pty Ltd v Construction, Forestry, Mining and Energy Union — Supreme Court, WA — Le Miere J — 20 Jul 2006 [2006] WASC 144, BC200605662
Injunctions	<ul style="list-style-type: none"> • Leighton Contractors Pty Ltd v Construction, Forestry, Mining and Energy Union — Supreme Court, WA — Le Miere J — 3 Mar 2006 [2006] WASC 47, BC200601349 • Construction, Forestry, Mining and Energy Union; Ex parte Leighton Contractors Pty Ltd — Supreme Court, WA — Roberts-Smith J — 16 Nov 2004 [2004] WASC 250, BC200407846
Court Application	<ul style="list-style-type: none"> • Leighton Holdings Ltd v HIH Casual & General Insurance Ltd — Supreme Court, WA — Master Sanderson — 13 Feb 2001 [2001] WASC 34, BC200100241
Arbitration Clauses	<ul style="list-style-type: none"> • WMC Resources Ltd v Leighton Contractors Pty Ltd — Supreme Court, WA, Full Court — Kennedy, Ipp and White JJ — 7 May 1999 [1999] WASCA 10, BC9902536,

Table 2. Dispute examples: Interpretation and health and safety

Point of Law	Case
<p>Contractual</p> <p><i>Interpretation of Contractual Terms</i></p>	<ul style="list-style-type: none"> • WMC Resources Ltd v Leighton Contractors Pty Ltd — Supreme Court, WA, Full Court — Kennedy, Ipp and White JJ — 7 May 1999 [1999] WASCA 10, BC9902536, • WMC Resources Ltd v Leighton Contractors Pty Ltd — Supreme Court, WA — Anderson J — 10 Sep 1998 ARB15/98, BC9804601, • WMC Resources Ltd v Leighton Contractors Pty Ltd - BC9902536 • WMC Resources Ltd v Leighton Contractors Pty Ltd - BC9804601
<p>Occupational Health and Safety</p>	<ul style="list-style-type: none"> • Leighton Contractors Pty Ltd v Ridge — Supreme Court, WA — Miller J — 23 Nov 1998 980650, BC9806256, • Leighton Contractors Pty Ltd v Simon Luigi John Ridge - BC9806256

Table 3. Adjudication decisions made under the 'Queensland Security of Payment Legislation' in 2008

Project type	Nature	Claim value	Contract value	Adjudication award	Causes of dispute
Commercial – Residential	Concreting	\$32,727		\$32,727	Failure of payment
Commercial – Retail	Plastering	\$11,303		\$11,303	Defective work
Industrial – Power Station		\$2,202,381		\$816,039	Incomplete documentation caused scope changes
Commercial - Residential	Consultancy (Electrical/ HVAC)	\$26,026		\$26,026	Incomplete documentation caused scope changes
Commercial - Residential	Concrete flooring components	\$93,629	\$308,400	\$80,280	Dispute over whether or not payment invoice was received
Administrative - Civic	Supply and install 'Tilt up' concrete panels	\$63,652		\$63,652	Subcontract terminated (unreasonable), weather (safety), defects, poor workmanship
Commercial - Residential	Supply and install the tensioned ground anchors	\$60,408	\$145,000	\$60,408	Change of scope and defective work
Commercial - Residential	Design and construct	\$255,833		\$118,534	Existence of contract; lack of documentation
Commercial - Residential	Supply and installation of joinery	\$555,013	\$1,263,820	\$425,123	Variations, ambiguity of contract, incomplete drawings, workmanship, out of sequence works, excessive overtime, changing critical path, slow response for information
Commercial - Residential	Provision of safety railing to building roofs	\$15,930		\$14,539	Change of scope
Commercial - Retail	Bulk earthworks	\$325,396	\$1,699,222	\$289,406	Variations - unforeseen underground conditions (rock, acid, sediment basin)
Industrial - Warehouse	Manufacture and erection of structural steel	\$42,565		\$37,004	Delays due to shortage of labour, incorrect materials, incorrect drawings, on-site rectification needed.
Commercial - Offices	Installing plasterboard	\$6,898		\$6,898	Defective work and incomplete documentation
Commercial - Offices	Internal ceilings, cornicing.	\$9,243		\$9,243	Defective work

Commercial - Offices	Supply of windows/doors	\$44,000		\$44,000	Change of scope
Commercial - Offices	Supply and install wall sheets and ceiling detail	\$14,095		\$14,095	Damage to site and defective work
Commercial - Subdivision	Civil works and drainage	\$97,608	\$320,097	\$97,608	No evidence tendered for failure to pay
Commercial - Offices	Unknown	\$24,924		\$24,924	Change of scope
Commercial - Residential	Supply and installation of fire doors	\$25,317		\$25,317	Failure to serve payment schedule
Commercial - Offices	Construct and erect steel framework	\$13,183		\$13,183	Failure to install according to plans
Watermain construction	Civil works: application of epoxy coatings	\$88,776		\$88,776	Change of scope
Commercial - Office	Block laying	\$29,914		\$29,404	Defective work, failure to clean up site, delays, cost of repairs, incorrect invoice amounts.
Administrative - Authorities	Civil engineering works	\$114,334		\$11,434	Problems with drawings, variations
Commercial - Residential	Concrete work	\$32,727		\$32,727	No payment schedule served
Unknown	Rental of plant and equipment	\$68,504		\$51,534	Payment claim not validly served, no documents confirming claims
Industrial - Factory	Plumbing works	\$9,089	\$29,277	\$9,089	No reasons given by adjudicator
Commercial - Residential	Plumbing works and hydraulics	\$161,791	\$2,280,000	\$8,456	Incomplete work
Commercial - Residential	Provision of project management services	\$55,886	\$266,750	\$55,886	No reasons given by adjudicator
Residential	Sealing of expansion joints and wet areas	\$3,161		\$3,161	Defective work
Water main	Built pipeline	Unknown		\$11,122,646	Latent conditions (rock) and change of scope
Educational - School	Roofing	\$9,915	\$13,980	\$9,915	Standard of work, variations, cost of variations
Hospital	Linings and ceiling works	\$204,315		\$204,315	Changed scope of works, fitness for purpose, utilization of respondents staff and interest
Commercial - Retail	Unknown	\$39,243		\$39,243	No reasons given, seeks to deduct some labour and plant costs.

Hotel/Motel/Resort	Construction of ceilings & partitions:	\$187,040		\$187,040	Progress payment, defective work
Hotel/Motel/Resort	Landscaping works	\$10,884	\$174,738	\$10,884	Failure to pay on schedule
Industrial - Warehouse	Construction and associated works	\$35,773		\$21,013	Change of scope
Commercial - Residential	Project management	\$40,540		\$40,540	Cost escalation
Commercial - Residential	Building services	\$51,728		\$51,728	Change of scope and defective work
Administrative – Civic	Guttering	\$3,960	\$4,382	\$3,960	Change of scope
Commercial - Retails	General construction	\$807,491		\$189,933	Change of scope
Administrative - Authorities	Supply and installation of shade sails	Unknown	\$77,000	\$8,741	Change of scope
Commercial - Retail	Roofing	\$14,893		\$8,843	Termination of contract, defective work, delays
Commercial - Retail	Refurbishment	\$40,296	\$231,530	\$40,296	Change of scope and defective work
Commercial - Residential	Carpentry	\$11,769		\$11,521	Change of scope and defective work
Commercial - Residential	Construction	\$310,994		\$310,994	Change of scope and defective work
Industrial - Warehouse	Floor sanding	\$10,495		\$9,892	Defective work
Industrial - Warehouse	General construction	\$63,518		\$62,224	Value of work excessive, variation not approved, back-charges, defective work
Commercial - Offices	Installation of anchors and walers	\$550,286		\$550,286	Defective work and cost of rectification
Commercial - Offices	Supply of labor for concrete work	\$66,633		\$34,453	Change of scope
Industrial - Factory	Site clean services and bobcat work	\$3,557		\$3,557	No valid reason given by respondent

Table 4. Client and contractor perceived dispute causes and avoidance

Client	Pathogen	Dispute avoidance	Contractor	Pathogen	Dispute avoidance
<ul style="list-style-type: none"> Poor planning and resourcing by the contractor/consultants Misinterpreting the contract terms and conditions Financial capacity of contractor Poor workmanship and defective work Pricing of scope changes Opportunistic behavior by a contractor Incomplete/erroneous contract documentation Non-payment of work 	<p>(P),(C)</p> <p>(T),(C)</p> <p>(C),(O)</p> <p>(T) (S)</p> <p>(S), (C)</p> <p>(O), (P)</p> <p>(T) (P) (S) (T)</p>	<ul style="list-style-type: none"> Prequalification Traditional lump sum contracts Behavioral assessment of project team members Greater emphasis on planning and documenting project of scope Improved intelligence of market conditions Design reviews and audits Partnering Improved planning of consultants and contractors Security of Payment Legislation 	<ul style="list-style-type: none"> Restricted access to site Uncertainty of project scope Scope changes Letting a contract too early Bespoke contracts Site conditions Poor contract documentation Interpretation of contract clauses Unreasonable expectations of clients e.g., time pressures Transfer of conditions (risk) from the client to contractor/ to the subcontractor Lack of understanding about cost escalation in contracts Competitive tendering Inappropriate procurement method Nominated subcontractors/suppliers 	<p>(C)</p> <p>(C)</p> <p>(T), (C)</p> <p>(C), (S)</p> <p>(C)</p> <p>(T),(P), (S),</p> <p>(P), (C)</p> <p>(I), (C)</p> <p>(I), (CO),(C)</p> <p>(C)</p> <p>(I), (C),(CO)</p> <p>(S),(C),</p> <p>(C), (T), (S)</p>	<ul style="list-style-type: none"> Fully defined scope Proactive claims management Detailed evaluation of site conditions Standard forms of contract Negotiated contracts Greater consideration to procurement method selection Constructability: involvement of contractor earlier in the design process to resolve planning issues that occur on-site

Key: Practice (P), Task (T), Circumstance (C), Convention (CO) Organization (O), System (S), Industry (I), Tool (T)

