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Disclaimer
A Review of Key Legislative and Policy Initiatives to Prepare Singapore’s Construction Industry for Climate Change Adaptation

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Abstract

Emission of greenhouse gases (GHGs) by the energy and construction sectors is one of the main human induced causes of climate change. Thus, most legislative and policy initiatives taken by countries to deal with climate change are likely to have a significant impact on the energy and construction sectors. For example the use of new and environmentally friendly technologies and construction processes could result in cost increases, affecting the up-front investment cost. Although many initiatives have been taken to mitigate climate change by controlling the emission of GHGs from the construction, not much attention has been paid to developing adaptation initiatives in the construction sector. Thus, this paper briefly examines the international framework for dealing with climate change and the key national legislations and policies of the United States, Australia and Singapore for adapting to irreversible adverse impacts of climate change. The aim is to compare the initiatives taken in these three countries and identify their strengths and weaknesses. The paper argues that the relevant mechanism introduced in all three countries are insufficient to deal with the adverse impacts of climate change as their main focus is on mitigation of climate change and not adaptation to climate change. Further, the paper argues that the most rigorous mitigation efforts of current might not be able to prevent climate changes in the near future; hence, adaptation to climate change should become an integral part of the planning process, especially in the construction sector.

Keywords: Greenhouse gases, Climate change, Adaptation, Construction industry, Legislative and policy initiatives
1. Introduction

There is overwhelming scientific consensus that since pre-industrial times, increasing emissions of greenhouse gases (GHGs) have led to a marked increase in atmospheric GHG concentrations (IPCC, 2007) causing global warming. Of the human induced causes of climate change, the energy sector is responsible for about ¾ of the carbon dioxide emissions in the world (IPCC, 2001). The construction industry is said to be not too far behind.

According to the American Institute of Architects (AIA, 2000), the biggest source of emissions and energy consumption both in the U.S. and around the globe is said to be the construction industry. According to a briefing note prepared for the International Investors Group on Climate Change (Kruse, 2004), the cement sector alone is said to account for 5% of global man-made CO$_2$ emissions. Further, mining and manufacturing of raw materials used in construction and the transportation of heavy building materials are said to be contributing significantly to climate change. In the circumstances, it is not difficult to argue that the construction industry is one of the major industries responsible for high levels of GHG emissions causing climate change.

The current initiatives to deal with climate change in most countries are focused primarily on mitigation, with initiatives to adapt to changing conditions taking a back seat. This is not a good sign as the mitigation initiatives would help us sustain the world for the future communities, the present communities need to build resilience to irreversible adverse impacts of climate change (Gunawansa, 2010). Construction industry has the potential to deal with mitigation as well as adaptation as the later is an issue that cannot be neglected given that the adverse effects of year and years of GHG emissions in the past cannot be undone with current mitigation efforts.

The following sections of this paper are organised as follows: section 2 highlights the need for legislative and policy initiatives for climate change adaptation. Sections 3 examines the adaptation initiatives in Singapore, while section 4 makes recommendations for further measures. Section 5 concludes.

2. The need for legislative and policy initiatives for climate change adaptation

2.1 What is adaptation?

In its 4th Assessment report, IPCC defines adaptation as “adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities” (IPCC, 2007). Whilst mitigation of climate change by reducing the current levels of greenhouse gases will help future generations, adaptation initiatives are necessary to prepare the current generation for changing and unavoidable climatic conditions.
According to a new report titled “In Search of Shelter”, the product of a collaboration between the United Nations University (UNU), the US-based NGO, CARE, and New York’s Columbia University, the areas which will be worst affected are the world’s great river deltas (largely situated in Asia), due to glacial melt; desert-dwellers in Africa subject to drought; islanders subject to rising sea levels (namely, low-lying islands in the Indian and Pacific Oceans); and the interior and coast of Mexico and the Caribbean (Warner, et. al., 2009). According to the same source, a mere one meter rise in sea levels could displace approximately 23.5 million people along the Ganges, Brahmaputra, Irrawaddy, Salween, Mekong, Yangtze and Yellow rivers. A two meter rise could uproot 14 million people on the Mekong alone and swamp much of its farmlands. In the circumstances, there is no doubt that initiatives at the multilateral level as well as regional and local levels should be taken to deal with adaptation.

Weather related impacts such as hurricanes, flooding, and coastal erosion would encourage the use of new building techniques and materials to withstand adverse weather conditions. Such events would also influence the choice of site for construction projects. Thus, the challenge of responding to climate change offers the construction industry the opportunity to be innovative and inventive with construction designs and building standards to reduce the impact on climate change by the industry.

### 2.2 International consensus on adaptation

Kyoto protocol\(^1\) is the only multilateral agreement we have to date which spells out the responsibilities of the states to deal with climate change. This protocol however has not introduced a very effective mechanism for dealing with the problem as only a handful of countries which have been listed in Annex 1 to the protocol have binding obligations for reducing the emission of GHGs. Annex 1 countries that have to meet emission reduction targets under the Kyoto Protocol during the commitment period of 2008 to 2012\(^2\). The Kyoto protocol could be criticized for having only a limited life span and also for having binding obligations by the Annex 1 countries.

Further, as far as adaptation is concerned, the Kyoto protocol has not established any effective mechanism, although it requires countries to formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change and measures to facilitate adequate adaptation to climate change\(^3\). Furthermore, although the Kyoto protocol provides for transfer of technology and investment in projects that contribute to sustainable development in developing countries under the Clean Development Mechanism\(^4\), one of the three mechanisms introduced to deal with global climate change\(^5\), and has established an adaptation fund to finance concrete adaptation projects and programmes in developing countries\(^6\).

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1. The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change (UNFCC). It sets binding targets for 37 industrialized countries and the European community for reducing GHG emissions. These amount to an average of 5 percent against 1990 levels over the five-year period 2008-2012.
2. Article 3 of the protocol.
3. Article 10(b).
4. Article 12 of protocol.
5. The other two mechanisms are: (1) Joint Implementation (Article 6) and (2) Emission Trading (Article 17).
6. Article 12 (8).
these two mechanisms are also ineffective as the former does not monitor fair distribution of CDM projects among the developing countries and the later not specifically quantitative funding commitments by the countries.

Despite the lack of effective multilateral consensus on the responsibility of each state to deal with climate change at present, since the Earth Summit of 1992, many nations have been working towards reducing the emission of GHGs at the national level. Some of these initiatives take the form of specific legislation aimed at imposing penalties and taxation to force people and industries to adapt climate friendly behavioral patterns and to promote sustainable development. There are also voluntary industrial standards that have been introduced.

As far as the construction industry is concerned, the recent initiatives to deal with climate change have focused attention on the environmental performance of buildings and construction activity, particularly emissions from buildings. Thus, the focus of these initiatives is on mitigation. Given that there is no scientific evidence which claims that climate change could be completely reversed, there is a need to anticipate and deal with the consequences of a changing climate, while at the same time working to achieve long term reductions in GHG emissions. In the circumstances, we need is a two-pronged system of initiatives, namely:

1. Initiatives to mitigate climate change by reduction of GHG emissions;

2. Initiatives at adaptation to climate change impacts.

The initiatives that fall under the first category above are clearly visible in most countries. However, as far as the second is concerned, very little has been done. Lack of knowledge on the measures to be taken and lack of coordination and support among nations, could be identified as the key reasons, as not every country in the world has the technical and financial capacity to deal with adaptation to climate change. Thus, developed countries should take the lead in the efforts to promote initiatives aimed at adaptation to climate change and help the countries that are most vulnerable to changing climate conditions by providing them with financial, technical and management support to put effective adaptation mechanisms in place.

3. Adaptation initiatives in Singapore

3.1 National strategy on climate change

Having ratified the Kyoto Protocol in April 2006, Singapore has made a voluntary commitment to reduce its carbon intensity by 25% from 1990 levels by the year 2012. According to the Singapore Ministry of Environment and Water Resources (MEWR), in fact, the country had achieved a 22% reduction in 2004 (MEWR, 2008). Further, according to figures from the National Environment Agency (NEA, 2006/2007), Singapore’s carbon intensity was at 0.28 kilotonnes per SGD million in
1990. That figure has declined to 0.21 in 2005, representing a 25% reduction. Thus, it could be said that Singapore is well on track to meet its reduction goals by 2012.

According to the Singapore National Climate Change Strategy (NCCS), the country is committed towards addressing climate change in an environmentally sustainable manner that is compatible with its economic growth (MEWR, 2008). The NCCS provides that in developing it, the country adopted the following guiding principles:

- Climate change action must be environmentally sustainable and compatible with the country’s economic growth.

- Climate change action needs individual, corporate and government effort, as meeting the challenge of climate change cannot be solely a government initiative. Thus, in addition to bringing together representatives from various government agencies, industry representatives, academia, and non-governmental organizations under the National Climate Change Committee (NCCC) for collective efforts on climate change, citizens should be motivated to join national effort and take actions in their daily lives, whether at work, at play, or at home, to become more energy efficient and choose cleaner fuels.

- As climate change actions cover many sectors of the economy and society, the National Climate Change Strategy be developed through a consultative, multi-stakeholder approach, taking into consideration the views of stakeholders and the public at large.

The NCCS aims to meet the national carbon intensity target through actions in five key sectors mentioned above, namely, power generation, manufacturing, transport, buildings and households.

According to NCCS, energy use in buildings made up 16% of Singapore’s energy demand in 2004. Given Singapore’s tropical climate, the need for air-conditioning forms a large part of the electrical demand. Rising temperatures would increase the demand for cooling. Thus, in order to promote buildings designed to encourage greater use of natural light and ventilation, and with proper insulation that ensures less energy is used to cool down buildings, the Building Construction Authority (BCA) of Singapore has established minimum energy efficiency standards under the Building Control Regulations that focus on heat transfer\(^7\). The regulations also require air-conditioning equipment and lighting to comply with minimum efficiency standards prescribed in the Singapore Code of Practice for Energy Efficiency Standard for Building Services and Equipment (2006)\(^8\).

To encourage best practices beyond what are specified in the standard building codes, two building labelling schemes have been introduced by BCA. The first of these schemes is the Green Mark Scheme (GMS), introduced in January 2005. It rates the environmental friendliness of a building

\(^7\) Building Control Regulations 2003.
\(^8\) SS 530 : 2006.
based on a point scoring approach. Depending on the score, the rating is categorized in four levels, namely, Platinum, Gold Plus, Gold and Certified. It enables the benchmarking of the building's environmental performance and allows comparison between buildings. According to BCA, the GMS is a benchmarking scheme which aims to achieve a sustainable built environment by incorporating best practices in environmental design and construction, and the adoption of green building technologies (BCA, 2007).

Under the GMS, with effect from 15 April 2008, it was made a mandatory requirement to obtain at least the minimum rating (“certified” rating) for following types of buildings:

- All new building works with gross floor area of 2000 m² or more;
- Additions or extensions to existing buildings which involve increasing gross floor area of the existing buildings by 2000 m² or more;
- Building works which involve major retrofitting to existing buildings with existing gross floor area of 2000 m² or more.

The second is the Energy Smart Labelling Scheme developed by the Energy Sustainability Unit of National University of Singapore (NUS) and the National NEA, which was launched in December 2005. It is the first energy efficient building labelling scheme in Asia. The “Energy Smart” labelling is given to the top 25% most energy-efficient buildings that also demonstrate good indoor environmental quality. It recognizes developers and owners who design and maintain efficient buildings and is also a benchmarking scheme, where building owners can compare the energy efficiency of their buildings against a national benchmark. It is a pre-requisite for an existing commercial building to achieve the Energy Smart label in order to win the Platinum Award, the highest award, under the GMS.

In addition to the above, some of the other mechanisms that have been put in place include:

- Building Energy Efficiency Master Plan (BEEMP), formulated by the BCA. It details the various initiatives taken by the BCA to fulfil a number of recommendations made by the Inter-Agency Committee on Energy Efficiency (IACCE), which comprises senior officers from various government agencies (which was formed in 1998), on strategic directions to improve the energy efficiency of the buildings, industries and transport sectors. Carrying out energy audits of selected buildings, review and update of energy standards, introduction of energy efficiency indices and performance benchmarks and the introduction of performance contracting (also known as 'third party financing' or 'contract energy management, this is a means of raising money for investments in energy efficiency that is based on future savings) are among the key recommendations made by the IACCE which are to be implemented under the BEEMP.

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9 The Building Control (Environmental Sustainability) Regulations 2008.
• Energy Efficiency Improvement Assistance Scheme, a co-funding scheme administered by the NEA to incentivize companies in the manufacturing and building sectors to carry out detailed studies on their energy consumption and identify potential areas for energy efficiency improvement (NEA, 2002).

• Green Building Masterplan to encourage more developers and owners of property to go green. Under this scheme S$20 million was set aside for three years, 2008 – 2010, for a new scheme called the Green Mark Incentive Scheme to provide monetary incentives for going green. Further, it is said that a further S$50 million has been set aside to intensify research and development efforts in green building technologies and energy efficiency for buildings (MND, 2007).

In summary, the vast majority of the above policies are aimed at mitigating the effects of climate change.

### 3.2 Singapore’s adaptation strategies

In the NCSS the NEA has identified the following seven potential impacts of climate change (MEWR, 2008): increased flooding, coastal land loss, water resource scarcity, public health impact from resurgence of diseases, heat stress, increased energy demand and impacts on biodiversity (NCSS, 2008). Of the adaptation policies to address these impacts, those which are directly relevant to the construction industry are briefly discussed below.

In early 1970s, many areas in Singapore were prone to flooding during the monsoon months. During the last 30 years, the Public Utilities Board (PUB) has been implementing infrastructure policies to reduce flood-prone areas. The result is the reduction of the flood prone area from 3200 ha in the 1970s to about 124 ha in 2006. According to NCCS, the aim is to further reduce the area to less than 66 ha by 2011. This is expected to help ameliorate inland flooding incurred by either sea-level rises (that may make it more difficult for rainwater to drain back into the sea) or storm surges at the shoreline caused by strong winds blowing inward from the sea.

Singapore has a relatively flat coastline and being land-strapped means that the coasts of Singapore are well-utilized for a range of purposes, including recreational facilities and residential buildings. According to NCCS, currently, about 70% to 80% of Singapore’s coastal areas are protected by hard wall or stone embankments; the remaining 20% to 30% are either natural areas such as beaches and mangroves. It is believed that sea level rise of up to 59 cm can result in some coastal erosion and land loss in Singapore. Thus, the NEA and MEWR are looking into ways to strengthen and protect vulnerable regions.

Singapore has been successful in facing up to its limited water resources with a series of integrated water policies. Rising global temperatures may result in changes in rainfall patterns and thus reduce the amount of water captured and stored in reservoirs. According to NCCS, diversification of its
water sources, a key component of Singapore’s current water policy, will be helpful in tackling the likely rainfall reduction due to climate change. Specifically, Singapore has been successful, and is improving, in the recycling of used water to produce water that is safe enough to consume (also known as NEWater); it is also developing desalination.

NCCS notes that increase in global temperature will have profound effect on Singapore, which is a tropical island. For example, extreme heat might result in the increase of air-condition usage in the island. Thus, it notes that innovative measures are needed to reduce or change the use of air-conditioners in buildings and facilities, as they are one of the most energy-intensive mechanical systems utilized in cities. One way is to ensure that renewable energy resources are used to power the utilities; another approach is to increase the energy efficiency of these mechanical systems, either through a change in the design of the technology or improvement in the operation and maintenance of the systems. In recent years, Singapore has also begun to explore more extensive use of passive methods to reduce the heat island effect and the need to use mechanical ventilation systems. An example is the deployment of urban greenery in the city and modification of building layouts and designs to reduce the cooling load of buildings (for example, through the use of building materials with better thermal properties and lighter-coloured building surfaces).

Singapore’s public health and medical policies have always addressed the control of tropical vector-borne diseases, particularly dengue fever. Dengue patterns are affected by many factors, including climate. According to NCCS, NEA is currently studying the link between climatic factors such as temperature, humidity and rainfall with dengue cases. Further, the government has put in place a comprehensive mosquito surveillance, control and enforcement system, which includes a review of building designs to reduce potential breeding habitats, including forbidding the use of roof gutters in new buildings except in special circumstances.

### 3.3 Singapore’s sustainable development blueprint

In February 2008 the Singapore Government set up an Inter-Ministerial Committee on Sustainable Development (IMCSD) to formulate a clear national framework and strategy for Singapore’s sustainable development in the context of the emerging domestic and global challenges. The committee was co-chaired by the Minister for National Development and the Minister for the Environment and Water Resources and consisted of three other ministers in charge of the subjects of Finance, Transport, and Trade and Industry respectively (MEWR, 2009). In April 2009 the IMCSD released the Sustainable Singapore blueprint report, “A Lively and Liveable Singapore: Strategies for Sustainable Growth” (Singapore Blueprint). The strategies in the report were based on the rationale of “The Singapore Way”, which is described as follows (MEWR, 2009A):

“For Singapore, sustainable development means achieving both a more dynamic economy and a better quality living environment, for Singaporeans now and in the future.
We need the economy to grow. This creates jobs, raises our standard of living, and yields the resources that we need to safeguard our environment. But we must grow in a sustainable way, or else a high GDP per capita will be achieved at the expense of our overall quality of life, and cannot be maintained over the longer term. Protecting our environment safeguards a high standard of public health for our people, and makes our city attractive to Singaporeans and foreigners alike.”

The IMCSD details several key goals and initiatives for the period from now until 2030 to improve resource efficiency and enhance Singapore’s urban environment. Some of the key initiatives that are of particular relevance to the construction industry and the built environment are listed below:

- Reduction of the energy intensity (per dollar GDP) by 35% from 2005 levels by 2030;
- Targeting 80% of the existing building stock (by GFA) to achieve at least Green Mark Certified rating (minimum level of energy efficiency) by 2030;
- Introduction of Solar technology at 30 public housing precincts nationwide as a Pilot Project;
- The Housing Development Board (HDB) to reduce energy use of common areas of public housing by 20% to 30% and build more eco-friendly HDB housing;
- Providing 0.8ha of park land per 1,000 persons by 2030;
- Implementation of a S$100 million Green Mark Incentive Scheme for existing buildings to undergo energy efficiency retrofitting;
- Introduction of a Green Mark GFA Incentive Scheme for new buildings that can attain Green Mark GoldPlus and Platinum rating;
- Incorporation of Green Mark GoldPlus and Platinum requirements will be as part of land sales requirements; and
- Improve air quality by reducing ambient PM 2.5 (fine particles) levels to an annual mean of 12µg/m3 and capping ambient SO2 (sulphur dioxide) levels at an annual mean of 15µg/m3.

All of the above initiatives and goals and the others set by the Singapore Blueprint are commendable as effective and efficient means by which a country with hardly any natural resources is trying to incorporate concepts of sustainability into its development and nation building policy architecture. However, being a small tropical island with a very limited land mass, Singapore should take more measured to build up resilience to adverse impacts of climate change.
4. Recommendations

Mitigation and adaptation are not alternatives and both need to be pursued actively and in parallel. Mitigation is essential and adaptation is inevitable (UNFCCC, 2006). Mitigation is essential because, without firm action now, future generations could be confronted with climate change on a scale so overwhelming that adaptation might no longer be feasible. But mitigation will not be enough on its own. This is because even if current efforts to reduce GHG emissions are successful, some adaptation will be inevitable since climate change occurs only after a long time-lag. Just like the current global warming is the consequence of emissions decades ago, the process will continue. Thus, even the most rigorous mitigation efforts of current might not be able to prevent climate changes in future.

Being a tiny island state, Singapore could be vulnerable to the adverse effects of climate change such as rising sea levels and other weather related risks discussed earlier. Thus, it is important that the Government of Singapore considers the implementation of effective measures aimed at adaptation to climate change. Having a sound economy with an easily manageable land mass and population, Singapore is in an ideal position to take more proactive measures towards adaptation.

Singapore should identify the areas most vulnerable to rising sea levels and other adverse impacts of climate change, and consider initiatives such as relocation of housing and infrastructure such as roads. In addition, initiatives should be taken to help vulnerable industries, communities and ecosystems to address the unavoidable consequences of climate change by equipping their capacity to deal with the adverse impacts.

An important factor to note is that adaptation cannot entirely be left to social or market forces. Essential forms of adaptation will demand that institutions, both public and private, plan their strategies and take action in advance. For example, coastal authorities will have to address sea level rises by building dykes, and appropriate building codes have to be introduced to ensure the resilience of future buildings. Vulnerable areas such as coastal settlements will have to be identified and mandatory construction standards will have to be introduced in relation to construction works in such areas. At the same time, private sector should also be encouraged to develop new and innovative designs that would change the established styles of architecture of buildings and contribute to adaptation to climate change. This may require the introduction of new laws and building codes that go beyond the promotion of voluntary construction standards and current GMS, which is essentially aimed at mitigation of climate change by reducing GHG emissions from buildings.

In addition, the government may have to provide the housing and commercial building sectors with appropriate information and education on adaptation through industry training schemes. Further, there is also a need to support the construction industry through programs of research, development and demonstration, as in a highly competitive construction sector, those engaged in construction may be profit driven, with research and development of sustainable construction methods and materials taking low priority. In this respect, it should be noted that the effective role played by the government institutions such as the NEA and BCA in participating in and promoting research and development of new technologies and industry practices have contributed heavily to Singapore’s success in being
well on track for achieving its Kyoto GHG reduction targets by the deadline of 2012. Similar leadership for adaptation is recommended.

A serious problem that should be taken into consideration is the lack of professional and contractor expertise regarding energy efficient design and construction and those that are aimed at adaptable to changing climate conditions. Further, if there is no accountability for designers to ensure that buildings actually perform as predicted, the measures taken towards achieving the targeted mitigation levels and adaptation standards may be futile. In this connection, Singapore could learn from Australia and consider the implementation of a program like the Climate Change Adaptation Skills for Professionals Program (DEWR, 2007) which provides financial grants to tertiary education and training institutions and professional associations to develop professional development and accreditation programs geared towards architects, engineers, natural resource managers and planners so that a pool of experts with skills to deal with adaptation to climate change could be built up.

5. Conclusions

Climate change is an issue that can be no longer ignored. Countries will have no choice but to reform and restructure their development policies to compliment any initiatives taken to address climate change. With growing global concerns on the sustainability of the built environment, there is increasing pressure for the construction industry to consider the environmental impact of their projects and the need to take into account the importance of climate change and its impact on the built environment.

Singapore has, in its own unique way, designed a suite of legislation and policies to mitigate climate change, although not having to meet any bidding mitigation targets under the Kyoto Protocol. However, the focus on developing adaptation strategies has been weak in comparison to mitigation. Thus, there is an urgent need to develop measures to adapt to changing climate conditions that are likely to be inevitable. As far as the construction industry is concerned, such initiatives are important as the entire lifecycle of buildings could be changed in order to establish a coherent succession of sustainable construction activities that would be in harmony with national policies aimed at reducing GHGs and adapting to climate change.

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Multi-objective Decision Making Model for Construction Dispute Mediation

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Abstract

The construction industry is regarded as one of the most adversarial industries. Mediation as one of the alternative dispute resolution methods has gained acceptance in Hong Kong since its introduction in the 1980s. Mediation is a problem-solving process assisted by a neutral third-party, who tries to help the disputing parties in reaching an agreement. The study of mediation has focused on the identification of successful factors, disputants’ satisfaction, mediation outcomes and tactics. In recent social research, mediation is defined as ‘administration and enforcement of rules or social norms’ for disputants’ conformity. Very little is known, however, about relationship between people’s conformity to social norms for dispute resolution and their actual attitude. This paper reports a study that aims to bridge the gap, by examining what people should do in the mediation. Identifying efficient frontier is found to be the common goal in studies of negotiation analysis, game theory and decision making analysis. In this regard a multiple objective decision making system is employed to propose approximate efficiency frontier which can be used to engender an efficient and fair mediation agreement. The results obtained facilitated the investigation of the optimal solution and the trade-off process between parties.

Keywords: multi-objective decision making, ultimatum game, efficient frontier, construction mediation.
1. Introduction

Conflict and dispute regularly feature in construction industry. The use of alternative dispute resolution (ADR) has gained acceptance in Hong Kong since its introduction in the 1980s. Due to the flexible, cost-effective and non-threatening process, mediation is now an integral part of the dispute settlement provisions in many standard forms of construction contract in Hong Kong. Voluntary mediation has been introduced in the civil procedures rules of the High Court as part of the Civil Justice Reform that come into force on 2nd April 2009. Under the New Practice Direction 31, adverse cost order is used to discourage ‘refusal to mediate’ and ‘failing to attempt to mediate’ (Wall, 2009).

Mediation is negotiation involving two or more parties who are assisted by a neutral third-party, and trying to reach an agreed settlement (Kressel & Pruitt, 1989). Mediation is also a problem-solving and decision making process, where equality, participation, self-determination are involved as well as the interactive parties (Neale and Bazerman, 1992). In recently social and legal research, mediation is defined as ‗administration and enforcement of rules or social norms‘ for disputants‘ conformity (Fuller, 1971; Menkel-Meadow, 2001).

On the subject of mediation, there exists quite a lot of good descriptive literature on the identification of successful factors (Wall, 1993; Marieke, 1996), mediation outcomes and disputants satisfaction (Alberts et al, 2005; Yiu et al, 2006) and mediator tactics (Carnevale et al, 1989; Cheung and Yiu, 2007; Yiu and Cheung, 2007). Very little is known, however, about the relationship between people’s conformity to social norms for dispute resolution and their actual attitude. To bridge the gap, the study examines what people should do in the mediation.

Identifying efficient frontier is found to be the common goal in negotiation analysis, game theory and decision making analysis. Efficient frontier was introduced in economics, refined further in game theory with the development of solution for non zero-sum bargaining problem (Nash, 1950), then reworked in integrative negotiation research (eg. Lax and Sebenius,1986) and in decision making modelling (Teich 1994). In this study a multiple objective decision making system is employed to approximate the efficiency frontier and to simulate the normative behaviour on reaching a settlement with efficient and fair trade-off utility value.

2. Mediation styles and tactics

Mediation can be classified as transformative, facilitative and evaluative. This paper focuses on the first two styles. Compared with other two styles, facilitative mediation is relatively dominant, directive and settlement oriented. Facilitative mediation focuses on economic trade-off and generates mutually-acceptable agreements. Transformative mediation involves empowerment and recognition, which aims at transforming dysfunctional, destructive conflicts to become functional and productive. Generally this means fostering integrative over distributive agreement. Empowerment means empowering parties to define issues and to seek solutions on their own. It helps disputants to ―experience a greater sense of self worth, security, self determination and autonomy‖ (Bush and Folger, 1994, pp.87). Recognition means recognizing the other party’s needs and interests, and better
understanding the other party’s perspective. It exploits the opportunity for parties to acknowledge and respond to each other and enhances relationship. Fuller (1971)’s definition of mediation is confined to the interdependent relationship between the parties. For Fuller, transformative mediation releases the parties from the encumbrances of rules and nourishes or improves the tied-in relationship with mutual respect, trust and understanding. Mediator’s role is to select and implement tactics and strategies for positive intervention. The notion of a staged process came from early labour management research. The mediation styles and corresponding tactics are summarised in table 1. In conclusion, “Tied-in” relationship and “economic trade-off” are the two critical characteristics of mediation (Menkel-Meadow 2001, Ren 2003).

Table 1: Summary of Mediation Styles and Tactics

<table>
<thead>
<tr>
<th>Name</th>
<th>Mediation Style</th>
<th>Tactics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Douglas (1962)</td>
<td></td>
<td>problem identification, alternate solution search, solution selection</td>
</tr>
<tr>
<td>Stevens (1963)</td>
<td></td>
<td>face saving</td>
</tr>
<tr>
<td>Zartman Berman (1982)</td>
<td>diagnosis (needs affirmation, review relationship)</td>
<td>formula (understanding, trade-off and joint solution)</td>
</tr>
<tr>
<td>Kolb (1983)</td>
<td>develop a dialogue, encourage direct communication and joint meetings</td>
<td>substantive issues and concessions</td>
</tr>
<tr>
<td>Druckman (1983)</td>
<td>agenda debate, search for principles</td>
<td>issue definition, concession exchange</td>
</tr>
<tr>
<td>Folberg Taylor (1984)</td>
<td>creating trust and structure</td>
<td>fact-finding and isolation of issues; creation of options and alternatives, negotiation and decision-making</td>
</tr>
<tr>
<td>Fisher Ury (1991)</td>
<td></td>
<td>separate people from the problem, focus on interests, not positions, invent options for mutual gain and insist on using objective criteria</td>
</tr>
<tr>
<td>Moore (2003)</td>
<td>establishing relationship, guide mediation, collect background information, design plan, building trust and cooperation</td>
<td>defining issues and setting agenda, uncovering hidden interests, generate options</td>
</tr>
<tr>
<td></td>
<td></td>
<td>assessment of options, final bargaining, formal settlement</td>
</tr>
</tbody>
</table>
3. Ultimatum game

Based on the two characteristics, a two-party mediated game is developed to illustrate the mechanism of normalising people’s behaviour in generation of a mutually satisfactory agreement.

Mediation involves Party A, Party B and the third Party C (the mediator). Disputes are usually seen to be “real or apparent incompatibility of parties’ needs or interests”. Party A wants to maximize while Party B wants to minimize. Moreover, the parties in mediation are locked in a “bilateral monopoly” relationship. If any party disagrees with the mediation outcome, the mediation will fail and thus any party’s expected interest will be forfeited. Under this “tied-in” relation, an agreement can only be achieved if both parties consent to it, a situation similar to the ultimatum game.

Ultimatum game is often used in economic experiments in which two players interact to decide how to split a sum of money. Player 1 proposes how to divide the sum between the two players, and the Player 2 can either accept or reject this proposal. If the Player 2 rejects, neither player receives anything. If the player 2 accepts, the money is divided according to the proposal.

Theoretically, if Player 1 and Player 2 are rational, Player 2 should accept even the smallest positive offer, since the alternative is getting nothing. Theoretically Player 1 should offer only slightly more than zero to Player 2, and Player 2 should accept it as an improvement on its status quo. However Nowak et al (2000) pointed out that the majority of Player 1s offer are about 40-50% of the total sum, and about half of all Player 2s reject offers below 30%. Bazerman and Neale (1995) found that Player 1s generally offer 30-50% of the sum to Player 2, 20% reject the offer and over half reject those of less than 30%. Player 2 has the power of reject to punish Player 1 for unfairness of distribution, since the opportunity cost of loss is much less than Player 1.

There are several criteria for judging distributive fairness, which are equality, need and equity. Equality principle is based on a simple calculation shows Player 2 should only reject offers that are less than 1/n of the total sum, where n is the number of individuals in the game. This solution has many limits, such as the integer problem. Need principle is “those who need more of a benefit should get more than those who need it less” (Welsh 2006). According to that, the utility is employed in the bargaining situation to measure the value of the non-homogeneous issues. Equity principle is about the distribution of benefits to people’s relative contribution, which means each person’s outcomes are proportional to his or her inputs. Raiffa (2002) proposed a measurement of this “proportion”, which equals to (outcome value-reservation value)/ (maximum value-reservation value). Egalitarian solution is proposed because it is proved that Player 2 is not only motivated by self-interest but also “a strong aversion to being disadvantaged themselves” (Nowak et al 2000, Welsh 2006). It seems that the aversion to being disadvantaged (or “envy principle”) affected the animal species as well. Brosnan and de Waal (2003) reported that high percentages of capuchin monkeys rejected the opportunity to trade rocks for cucumber slices when they saw other monkeys receiving grapes, either in exchange for their rocks or without being required to exchange anything. In this sense egalitarian solution (maxi-min) aims to balance the difference between two parties. In this paper, the distributive fairness is evaluated by the combination of equity solution and egalitarian solution (maxi-min).
Raiffa (1985) and Lax & Sebenius (1986) pointed out that a lot of disputes settled with “the value left on the table”. Disputants focus on creating gains to be shared, but never realize “this small pie” can be enlarged. *Nash Equilibrium* is the famous principle for solving “efficiency” in non-zero-sum two-person bargaining game, which is to maximize the product of the two parties’ utilities when the status quo point is normalized to be zero. Another evaluation called *Utilitarian solution* is to maximize the sum of the two parties’ utilities (Thompson 1990, Raiffa 2002).

In these aspects, fairness and efficiency are the key criteria for an optimal mediation agreement which can be measured by *maxi-min equity solution* and *Nash equilibrium, utilitarian solution* respectively. Welsh (2006) concluded the negotiators’ dilemma either offering too much or rejecting those of economic sense. Nash (1950) proposed the efficient frontier as solutions for collaborative bargaining. In economics, “frontier” is where alternative is worse than what they could achieve through agreement with the other party. In this regard, efficient frontier is the solution path for trade-off bargaining to achieve mutual agreement in mediation (Figure 1).

**Figure 1: Mutual Agreement (Thompson, 1990)**

### 4. Multiple objective decision making model

Based on the conception of the Ultimatum Game, a multiple objective decision making model is proposed to approximate the efficiency frontier. Multi-objective decision making (MODM) accompanied with multi-attribute utility theory (MAUT) and multi-criteria decision making (MCDM) has been widely applied to generate options and identify potential agreements in dispute resolution (Kersten 1997). The approximation of efficient frontier can be traced back to RAMONA system (Teich 1991, 1995), as a constraint proposal method, which is to choose reference points from the line connecting the decision makers’ global optima. Kuula (1998) pointed out the limitation of RAMONA, which would be departed from optimal way when program step size was too long. Another method is by sliding the reference point along an auxiliary constraint plane (Ehtamo et al 1999, pp.1702). Followed with the constraint proposal methods, Keeney and Raiffa (1993, 2002) proposed another method to explore the efficient frontier, which is identification of some points on the efficient frontier by using an auxiliary line. By modifying the slope of auxiliary line, the points which are tangent to the efficient frontier can be determined. Goal programming is the most popular
method for generating optimal agreement, which is based on negotiators’ feasible proposals and the specific decision making criteria. Here is the model:

Denote $i$ as negotiator $i = 1, 2$;
Denote $j$ as issue $j = 1...J$;
Denote $z$ as bargaining range of each issue $z = 1...Z$;
Denote $x_{ijz}$ as input data for contractor and client

Denote $w_j$ as $i$’s weight on issue $j$ where $\sum_j w_j = 1$, for $i = 1, 2$;

Denote $M_{ijz}$ as relative utility value for each reference choice $M_{ijz} = w_j x_{ijz}$;
Denote $F_i$ as feasible maximum value $i = 1, 2$;

Denote $\mu_{ijz}$ as an integer variable, where $\sum_z \mu_{ijz} = 1$, $0 \leq \mu_{ijz} \leq 1$, on issue $j$

Assume the weight $M_{1,ijz}$ by 1 and $M_{2,ijz}$ by $\lambda$, the auxiliary line can be defined as:

$$M_{ijz} + \lambda M_{2,ijz}$$

Where $\lambda = \frac{|M_{ijz} - M_{ijz+1}|}{|M_{ijz} - M_{ijz+1}|} (i = 1)$

$s, (s+1) \in [1,Z]$;

s.t. $Max(M_{1,ijz} + \lambda M_{2,ijz}) \times \mu_{ijz}$, we can get a vector $[M_{1,ijz}, M_{2,ijz}]$, $j = 1...J$, for every $\lambda$, $

\therefore$ The utility value of efficient point on the frontier $[\sum_j M_{1,ijz}, \sum_j M_{2,ijz}]$ in terms of $\lambda$

The optimal agreement is generated based on the three criteria:

Utilitarian solution: $\max \sum_i \sum_j M_{ijz} \times \mu_{ijz}$

Nash Equilibrium: $\max \prod_i \sum_j M_{ijz} \times \mu_{ijz}$

Maxi-min equity solution: $\max \{ \min_j \frac{\sum_j M_{ijz} - R_i}{F_i - R_i} \}$

To demonstrate the proposal approach and generate the results, a hypothesis data case is used here from the paper Construction Negotiation Online (Cheung et al 2004). This is a two-party, two-issue case. “This construction dispute begins with the date of completion, which was 1 Jan 2001 in the contract. But due to the delay of sub-contractor and late Architect Instruction, the completion date shifted from 1 Jan 2001 to 1 Mar 2001. The Issues are Extension of Time (EOT), which Main Contractor argued for 60 days but Architect only granted 40 days, Acceleration Cost (AccCost) which was estimated as $30,000 by Project Manager, as well as Lost and Expenses (L/E).” From their work, the issues, bargaining range and two parties’ input data are listed in table 2, and the reservation value for contractor and client is 20 and 30 respectively. Figure 2 shows 144 possible solutions (6*6*4).
Table 2: Input Data for Contractor and Client $M_{i,j}$

<table>
<thead>
<tr>
<th>Issue</th>
<th>EOT</th>
<th>EOT</th>
<th>EOT</th>
<th>EOT</th>
<th>EOT</th>
<th>EOT</th>
<th>EOT</th>
<th>L/E</th>
<th>L/E</th>
<th>L/E</th>
<th>L/E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
<td>35</td>
<td>36</td>
<td>37</td>
<td>38</td>
<td>39</td>
<td>40</td>
<td>40</td>
<td>6000</td>
<td>6100</td>
<td>6200</td>
<td>6300</td>
</tr>
<tr>
<td>Contractor</td>
<td>0</td>
<td>25</td>
<td>40</td>
<td>50</td>
<td>58</td>
<td>60</td>
<td>60</td>
<td>10</td>
<td>18</td>
<td>24</td>
<td>28</td>
</tr>
<tr>
<td>Client</td>
<td>30</td>
<td>28</td>
<td>24</td>
<td>18</td>
<td>10</td>
<td>0</td>
<td>40</td>
<td>33</td>
<td>25</td>
<td>15</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Issue</th>
<th>AccCost</th>
<th>AccCost</th>
<th>AccCost</th>
<th>AccCost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
<td>10000</td>
<td>11000</td>
<td>12000</td>
<td>13000</td>
</tr>
<tr>
<td>Contractor</td>
<td>0</td>
<td>5</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Client</td>
<td>30</td>
<td>25</td>
<td>15</td>
<td>0</td>
</tr>
</tbody>
</table>

Figure 2: 144 Possible Solutions  
Figure 3: Efficiency Frontier

The points that are satisfied with the auxiliary condition $M_{1,j} + \lambda M_{2,j}$ are listed in Table 3, and by moving the auxiliary line, all the efficient points can be found which constitute the efficient frontier (Figure 3). To determine the both parties’ feasible maximum value $F_i$, here the nonlinear efficiency frontier is approximated as linear segments. Thus the feasible maximum value $F_i$ can be simply estimated as 96 and 98.4 ((25-0)/(100-98)=(25-20)/(x-98)).

In Table 3 the optimal solutions can be generated according to 3 criteria. From *Utilitarian solution* and *Nash Equilibrium*, the point F and G are the maximum choice, which are highlighted in figure 3. To achieve *Maxi-min equity solution*, the smaller values between the two parties are selected to mark bold, and the maximum value among them is the optimal solution such as point E.

In Table 3, it can be found that *Maxi-min equity solution* is an effective way for measuring and balancing the difference between parties. It also shows the power change within the parties, and usually the optimal solution takes place at these points, such as point F. Moreover, it is found that when the solutions are efficient (point F and G), usually they also have advantage in the fairness distribution.
Table 3: Set of Points on the Efficient Frontier

<table>
<thead>
<tr>
<th></th>
<th>EOT</th>
<th>L/E</th>
<th>AccCost</th>
<th>Contractor Utility</th>
<th>Client Utility</th>
<th>Utilitarian solution</th>
<th>Nash Equilibrium</th>
<th>Maxi-min equity solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>36</td>
<td>6000</td>
<td>10000</td>
<td>20</td>
<td>98.4</td>
<td>118.4</td>
<td>1968</td>
<td>0</td>
</tr>
<tr>
<td>B</td>
<td>36</td>
<td>6100</td>
<td>10000</td>
<td>35</td>
<td>96</td>
<td>131</td>
<td>3360</td>
<td>0.197</td>
</tr>
<tr>
<td>C</td>
<td>37</td>
<td>6100</td>
<td>10000</td>
<td>50</td>
<td>92</td>
<td>142</td>
<td>4600</td>
<td>0.395</td>
</tr>
<tr>
<td>D</td>
<td>38</td>
<td>6100</td>
<td>10000</td>
<td>60</td>
<td>86</td>
<td>146</td>
<td>5160</td>
<td>0.526</td>
</tr>
<tr>
<td>E</td>
<td>38</td>
<td>6200</td>
<td>10000</td>
<td>68</td>
<td>81</td>
<td>149</td>
<td>5508</td>
<td>0.631</td>
</tr>
<tr>
<td>F</td>
<td>38</td>
<td>6200</td>
<td>11000</td>
<td>73</td>
<td>76</td>
<td>149</td>
<td>5548</td>
<td>0.697</td>
</tr>
<tr>
<td>G</td>
<td>39</td>
<td>6200</td>
<td>10000</td>
<td>76</td>
<td>73</td>
<td>149</td>
<td>5548</td>
<td>0.737</td>
</tr>
<tr>
<td>H</td>
<td>39</td>
<td>6200</td>
<td>11000</td>
<td>81</td>
<td>68</td>
<td>149</td>
<td>5508</td>
<td>0.802</td>
</tr>
<tr>
<td>I</td>
<td>39</td>
<td>6300</td>
<td>11000</td>
<td>87</td>
<td>60</td>
<td>147</td>
<td>5220</td>
<td>0.881</td>
</tr>
<tr>
<td>J</td>
<td>39</td>
<td>6400</td>
<td>11000</td>
<td>91</td>
<td>50</td>
<td>141</td>
<td>4550</td>
<td>0.934</td>
</tr>
<tr>
<td>K</td>
<td>39</td>
<td>6400</td>
<td>12000</td>
<td>94</td>
<td>40</td>
<td>134</td>
<td>3760</td>
<td>0.973</td>
</tr>
<tr>
<td>L</td>
<td>40</td>
<td>6400</td>
<td>12000</td>
<td>96</td>
<td>30</td>
<td>126</td>
<td>2880</td>
<td>1</td>
</tr>
</tbody>
</table>

Utilitarian solution = Max.(Contractor Utility + Client Utility);
Nash Equilibrium = Max.(Contractor Utility * Client Utility);
Maxi-min equity solution = Max.(min((Contractor Utility-20)/(96-20), (Client Utility-30)/(98.4-20)));

The multi-objective decision making system is not only facilitated as generation of optimal solution, but also a mediator, who helps people to do effective trade-offs during the mediation bargaining scenarios and thus normalize disputants’ behaviour for dispute resolution. In this approach, the mediation proposed to begin with the most preferred points. In this case, client begins with point A and contractor with point L respectively. If both parties follow the mediator’s suggested solution path (shown in Figure 3), they could coincide with point F in an easy way. In the every bargaining scenario, the mediator would choose a direction so that the loss can be the minimum for one party and benefit maximum for the other party. For example from A to B, the contractor loosed the budget from 6000 to 6100, only with 2.4 utility in loss, but the contractor increase by 15 utility from that. Meanwhile, the mediator also persuaded the contractor to cut down EOT arguments, which can realize his benefits from client and also improve client’s position in mediation. In this way moving along the efficient frontier, both parties could choose their most preferred points for improvement till convergence.
5. Future research

This paper is discussing what people should do in mediation, and as a preparation for examining the relationship between the behaviour outcome and risk preference. Since the utility value/function of the model largely depends on the people’s risk preference which involving risk aversion (loss aversion), risk lover, risk neutral, or combination of the above.

6. Conclusion

In recent social research, mediation is defined as ‘administration and enforcement of rules or social norms’ for disputants' conformity. While previous researches on construction mediation focused on identification of successful factors, disputants’ satisfaction, mediation outcomes and tactics, very little about relationship between people’s conformity to social norms for dispute resolution and their actual attitude. To bridge the gap, this study is focused on what people should do at the mediation. Multiple objective decision making model is simulated as the mediator in helping negotiators to achieve a mutual satisfactory mediation settlement with efficiency and fairness. This paper facilitated as an experiment on examining the interrelationship between the outcomes and people’s preferences in the second part of the research.

Acknowledgement

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Dispute Resolution in U.S. Commercial Construction: A Practical Approach

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Abstract

The commercial construction industry has steadily increased in complexity over the last few decades. Construction contracts have become extremely complex in their language, often making interpretation very difficult. While construction contracts often contain anticipatory language for unanticipated occurrences, not all eventualities can be prepared for. Consequently, disputes are inevitable in the construction process. The construction industry thrives on building lasting relationships, so it is absolutely critical that disputes are handled appropriately and expeditiously. If disputes are not dealt with expediency, the project itself can be delayed, leading to claims, which could ultimately destroy professional relationships. Dispute resolution, if handled properly, can have a major impact on the success of a project. Dispute resolution mechanisms should be decided upon at the time the parties enter into the contract. These are important decisions for construction participants to make. Fortunately, there are a number of options the parties can utilize in dispute resolution including: litigation, arbitration, negotiation, mediation, and dispute review boards. Recent changes in the 2007 American Institute of Architects (AIA) construction contract documents reveal a potential changing attitude towards dispute resolution. The purpose of this study will be to provide a preliminary look into which dispute resolution methods are most effective for commercial contractors. This study will look at the various dispute resolution practices used in the commercial construction industry and attempt to determine which methods offer the best solution. Data will be obtained from attorneys, construction executives (general contractors and subcontractors), and project managers in order to gain the broadest perspective on the issue. By doing so, the study will be able to present excellent supportive data for the most desired resolution outcome.

Keywords: disputes, dispute resolution, arbitration, mediation, contracts
1. Introduction

The commercial construction industry has steadily increased in complexity over the last few decades (Cheung, 1999). Construction contracts have become extremely complex in their language, often making interpretation very difficult. While it is true that construction contracts often contain anticipatory language for unforeseen occurrences, not all eventualities can be prepared for. Consequently, disputes are inevitable in the construction process (Cheung, 1999). The construction industry thrives on building lasting relationships, so it is absolutely critical that disputes are handled appropriately and expeditiously. Dispute resolution, if handled properly, can have a major impact on the success of a project, as each party involved is able to stay focused on the actual construction of the project itself (Essex, 1996).

Dispute resolution mechanisms are an important decision for construction participants to make. Dispute resolution proceedings can be costly and exhaust a tremendous amount of resources (Cheung et al., 2002). Subsequently, the construction industry has begun to look for the best possible solution in settling disputes. The uniqueness of every construction project demands that every aspect of resolving potential disputes be examined thoroughly to determine which method is the most applicable. Fortunately, dispute resolution as a whole offers many different options to choose from including: litigation, arbitration, negotiation, mediation, and dispute review boards (Essex, 1996).

All parties involved with commercial construction contracts should make an effort to use prevention techniques prior to construction in order to minimize the impact of disputes that may arise. Dispute prevention techniques include an understanding of pre-construction risk mitigation by all parties including: contractors, owners, designers and subcontractors (Cheung, 1999). However, despite all of the pre-construction efforts, it is likely that disputes will arise during the construction process. Once a dispute arises, the construction industry has vacillated over the most effective means of resolving the dispute. The private commercial construction sector has most recently favored mediation and arbitration as means for resolving the dispute. This is reflected in the most popular construction contract document forms; mainly those promoted by the American Institute of Architects (AIA). However, in the latest version of the AIA documents (2007) a significant change has occurred whereby mediation and arbitration is no longer the default mechanism for resolving disputes. Our research is aimed at looking at how the industry views dispute resolution mechanisms and if, indeed, there are changing attitudes in this arena.

2. Background / literature review

Negotiation is almost always the first step in dispute resolution. However, when negotiation fails, other methods are quickly imposed. The use of litigation has historically been the favored option for resolving one's dispute and is often looked upon as the traditional method. However, as a consequence of the enormous cost and resource drain that litigation requires, the United States construction industry began looking to alternative measures to deal with disputes. Alternative dispute resolution, or ADR, has been proven to be a highly effective alternative to litigation since the mid-
1970’s even though it was not widely adopted in the construction industry until the mid-1980’s (Weidner, 2006). ADR refers to any means of dispute resolution that takes place outside of a court room (ADR, 2008). ADR is often thought of as a means of resolving disputes more efficiently and also can assist the parties in understanding the issues between them more clearly, minimizing the adversarial atmosphere that can be created in the midst of a dispute (Essex, 1996).

The application of dispute resolution practices in the commercial construction industry will vary depending on the project in question. Past research indicates that the resolution of potential conflicts between contractors, owners, designers, and subcontractors has several conclusions. Primarily, the dispute resolution discussions focus on: (a) when to resolve disputes (Cheung, 1999; Groton, 1991; Cheung et al., 2002), (b) what type of dispute resolution is appropriate (Groton, 1991; Widiss, 1979; Moffitt & Bordone, 2005; Tarlow, 2008), (c) what has worked and not worked in the past (Korn & Pallas, 2007; Hinchey & Schor, 2002; Keil, 1999; Widiss, 1979), and (d) what forms dispute resolution may take in the future (Essex, 1996; Groton, 1991; Kane, 1992).

The American Institute of Architects’ (AIA) construction contract documents are widely used throughout commercial construction. Dispute resolution has been a concern expressed in the past from owners, architects, and contractors (Gibbs, 2007). Up until the latest version of the AIA documents were issued in 2007, the architect was identified as the initial arbiter of claims. This posed a number of problems and potential areas of conflict. Owners don’t want their architects making decisions against them and contractors often believe that architects cannot act impartially when they are being paid by the owner. In addition, architects are reluctant to make decisions that may affect their own liability. This often resulted in the Architect being placed in a “Catch 22” scenario; i.e., simply being caught in the middle. As a result, the latest revisions to the AIA documents have allowed for several changes to their contract documents as related to dispute resolution.

The AIA101-2007 and AIA201-2007 (Owner-General Contractor Agreement and General Conditions to the Contract, respectively) family of documents advocate the concept of a third party neutral as the Initial Decision Maker (IDM). The third party neutral is agreed upon by the parties at the time of contracting and if a third party neutral is not named, the architect takes on the role of IDM. Another important revision in the 2007 documents, as related to dispute resolution, is the freedom to choose between arbitration and litigation. This is often referred to as the “check box” system; and if neither option is selected the default option becomes litigation. As a reflection of the success of mediation in assisting the parties in resolving their disputes, the 2007 documents maintain mediation as the first step in dispute resolution, as did the 1997 documents (Gibbs, 2007).

Some industry professionals believe that there is a tendency to resolve monetary disputes after construction is complete (Groton, 1991). This idea stems from the belief that the cost would be greater to everybody in the long term, if project resources were reallocated to dispute resolution during the construction process. The problem with this belief is that uncertainty about the outcome of the project is increased, creating an adversarial relationship. However, the truth is that the vast majority of industry professionals advocate prompt resolution to construction disputes as soon as they arise (Cheung et al., 2002). These construction leaders recognize the value added in dealing with
disputes expeditiously. Research suggests that early dispute resolution practices will help contractors, owners, designers, and subcontractors maintain and preserve their business relationships.

Mediation remains a popular method of dispute resolution. However, in order for mediation to be effective all parties must be willing to listen and try to work things out amicably. Many of the contracts today stipulate that parties must try mediation prior to arbitration or litigation (Tarlow, 2008). The problem with this is that some disputes may already be to the point where a binding resolution may be the only way to resolve the dispute. Alternatively, mediation has proven to be an excellent dispute resolution option if all parties have the right attitude regarding the desirability of resolving the dispute (Tarlow, 2008). Unfortunately, since mediation is non-binding, it may fail to produce a resolution and parties may have to look to binding resolutions, such as arbitration and litigation. Historically, contractors have looked at arbitration as a favored mechanism under the guise that it is an expeditious, efficient, and economical solution. One distinct difference between arbitration and litigation that is critically important is that arbitration is agreement based and not always provided with standards, as is litigation (Widiss, 1979).

The true benefit of litigation is that legal principles and the right to appeal are what uphold the standards, making litigation an attractive option since previous court rulings provide a solid foundation for future proceedings (Widiss, 1979). Commercial contractors must look for the dispute resolution practice that is most likely to resolve the conflict as economically as possible. Contractors can start the selection process by asking three simple questions: what are the goals of the processes, what aspects of the dispute in question make it resolvable using one practice over another, and what contributions might each practice make to overcoming problems that would prevent an effective resolution from coming to fruition (Moffitt & Bordone, 2005).

Architects and contractors are both under increased pressure today from owners to design and build projects quickly. This pressure only increases the likelihood that disputes will arise. Mediation often proves to be a successful mechanism for resolving disputes quickly but is dependent upon having a mediator that is proactive. A mediator must ask the tough questions so that there is no doubt as to where the proceeding is heading. If a mediator fails to be proactive, then the probability of a successful outcome is diminished (Korn & Pallas, 2007). Mediation, however, may not be the best method to use when parties are trying to resolve a case that deals with a distinct issue of law. Hinchey and Schor contend that litigation establishes a legacy from which attorneys may advise their clients. Furthermore, contractors who build large projects with enormous amounts of money at risk, usually spend a tremendous amount of time in pre-construction negotiation in order to mitigate their risks. These contractors may not be willing to give up their interpretation of these negotiations to a mediator or arbitrator, who is not legally bound to adhere to the terms of the agreement (Hinchey & Schor, 2002).

Whichever dispute resolution method is selected should aim to resolve the dispute as efficiently and effectively as possible. All professionals involved in a construction project typically only have two resources that they can contribute to a construction process: time and talent. Consequently, if the wrong method for dispute resolution is chosen, these two resources may be siphoned away from the
project which would open the door for project failure, and the development of an adversarial environment (Keil, 1999).

As the commercial construction industry continues to advance in technology and complexity, the need for advanced dispute resolution mechanisms will increase. One emerging concept finding favor in some segments of the industry is dispute review boards. These boards allow a pre-selected panel, normally consisting of three independent parties, to advise disputing parties on a resolution solution specifically tailored to their dispute (Essex, 1996). The review board is often engaged at the outset of the contract and makes a commitment to meet as necessary during the construction process to handle any disputes in a timely fashion. Some commercial contractors are finding this method to be extremely effective. It is designed to keep the panel abreast of all ongoing construction proceedings so that they may offer immediate advice should a dispute arise. This method may also be helpful, particularly for contractors and subcontractors, since field occurrences are difficult and costly to recreate. Research has shown that dispute review boards also help to minimize actual disputes from arising in the first place. This finding is directly attributable to the real-time project knowledge that the panel members possess (Kane, 1992). As project complexity increases dispute resolution may also move towards hybrid forms in the future.

3. Methodology

The purpose of this study is to look at various dispute resolution practices used in the commercial construction industry and to ascertain which methods offer the best solution. Data was obtained from owners, attorneys, construction executives, and senior project managers in order to gain the broadest perspective on the issue. By focusing on the aforementioned parties for direct information, the study was able to present supportive data to determine which methods offer the best solution for the commercial construction industry.

Data was gathered from industry professionals using a qualitative research approach. Qualitative research can be defined as subjective, and is often structured into two categories of research: exploratory and attitudinal (Coles & Naoum, 1998). The purpose of exploratory research is to understand a situation, look for alternatives, and to propose new ideas (Zikmund, 1997). Exploratory research was used as construction professionals were interviewed regarding their opinions on dispute resolution practices. Attitudinal research was used to evaluate the opinion, view, or perception of an individual, towards a certain object (Coles & Naoum, 1998). The interviews provided substantive information as to the current views associated with dispute resolution in order to provide the reader with contemporary information regarding practices that are best suited for resolving commercial construction disputes.

4. Data analysis and results

The data compiled was analyzed using the qualitative approach of triangulation. The data obtained from the interviews was interpreted using a three step process. First, the data was analyzed
separately according to professional position to ensure that all data has been properly catalogued. Second, the data was compared using the triangulation method, and extensions thereof, to look for commonalities between the various professionals interviewed. The triangulation method is used to integrate data from multiple sources (Univ. of California; Triangulation, 2008). The goal of triangulation is to find recurring themes that are prevalent throughout the interviews. Extensions of the triangulation method were also used to further develop a rich understanding of dispute resolution. For example, the theory of complementarity was used with the construction executives and attorneys as they were both asked questions that are unique, in the sense that they are overlapping as well as different (Gaber & Gaber, 2007). The goal of using the complementarity approach is to understand the difference in thinking between business owners and the attorneys who represent their interests. In addition to using the complementarity approach, the researcher used an additional method of triangulation with the senior project managers known as expansion (Gaber & Gaber, 2007). The expansion method was used to extend the range of conceptual understanding by asking questions that target different components of the same framework of questioning. Although the questions are different in their own right, the underlying concepts are similar to those asked the executives and the attorneys. The expansion process allows the researcher to gain a deeper understanding of the affects that the dispute resolution process has regarding various construction professionals.

These methods are of particular importance to this data analysis, since the individuals interviewed were asked a variety of questions. The variety of questioning will ensure that potential biases are reduced, by allowing industry leaders to answer the questions in a manner that corresponds to their professional capacity. Consequently, the triangulation method will serve as a filter, allowing the professionals to provide the reader with a strong interpretation of dispute resolution opinion, relative to their role in commercial construction.

Initially data was coded a priori using themes and keywords derived from the interview questions (Gibbs & Taylor, 2006). The a priori codes were used to label the questions asked. In addition, for analysis purposes, the questions were categorized by which participant was asked the question. The ultimate goal of this research is to provide construction professionals with an informed outlook of dispute resolution methods.

Twenty seven questions were used to explore the attitudes of the parties involved with the process. Initially a simple question with an expected outcome was asked and all of the participants agreed that negotiation was the most non-adversarial method of resolving a dispute. All participants agreed that dispute resolution methods made a significant impact on operations with the exception of a single subcontractor.

Next, the parties were asked about the root cause of most disputes. Money and communication breakdowns were factors that result in disputes entering an impasse from which the parties would seek outside assistance from their attorneys.

The next series of questions were aimed at the contracting parties and their interaction with attorneys. General contractors were much more willing to seek attorney involvement than were subcontractors.
Questions were then asked about the importance of having dispute resolution methods contractually defined prior to construction. In a related question, the parties were also asked about the differences in the 1997 and 2007 versions of the AIA documents. The contractors interviewed had not yet been personally involved with the 2007 documents. However, the majority of parties agreed that dispute resolution methods should be defined in the contract and that the Architect should not be the Initial Decision Maker.

A series of questions were asked to explore the attitudes of the respondents to the services of the American Arbitration Association (AAA) or other arbitration facilitators. Also explored in this line of questioning is whether there is a preference for a single arbitrator or a panel of arbitrators. To further explore arbitration, participants were questioned about the lack of appeal in arbitration. The majority of the respondents favored arbitration over litigation and had a preference for a single arbitrator, unless the particular situation dictated a panel. No preference, one way of the other (i.e., positive or negative) was evident as it related to the AAA or any other arbitration facilitator. A number of the respondents stated that their experience was generally a joint administration of the arbitration proceedings by the parties; i.e., using no formal entity or association as a facilitator. General contractors and subcontractors had mixed responses about arbitration’s lack of appeal while attorneys stated that there should be no concern since the parties interested in a right to appeal should favor litigation in the first place.

Questions were asked to determine if the participants felt that mediation was an effective form of dispute resolution. There was some concern among all parties interviewed that since mediation is not binding it is often not taken as seriously by all parties and some may try to play the system. However, a great majority of the respondents stated that mediation was effective in resolving disputes. Attorneys stated that the success of mediation is, to a large degree, dependent upon the skill of the mediator. A mediator who takes charge of the proceedings and acts in a forceful manner is much more likely to end with a settlement than one that is more passive. In addition, the attorneys offered that parties often appear to have a preconception regarding the likelihood of a settlement being reached prior to the mediation. Parties that go in with a positive attitude that the dispute will be resolved during the mediation are much more likely to succeed than those going in without a positive approach. Furthermore, some of the respondents indicated that mediation was treated simply as a precursor to arbitration or litigation.

The attorneys unanimously agreed that litigation offered more legal challenges than alternative methods. They stated that litigation could be very complex and time consuming, and that judges and juries often had limited construction knowledge. Attorneys also reported that most executives were knowledgeable about dispute resolution methods and the distinctions between the alternatives; but that it really depended upon the specifics of the project and the dispute as to which method was most appropriate. All of the attorneys interviewed felt that dispute resolution methods were making positive improvements, but they went on to say that mediation, arbitration, and litigation were here to stay. Attorneys pointed out that advances were being made in dispute review boards. They opined that while many in the industry believe that dispute review boards were appropriate only for federal projects they are seen more frequently in private commercial construction than just a few years ago.
The attorneys also stated that some are experimenting with hybrid forms of dispute resolution such as a mediation-arbitration hybrid.

Attorneys were also questioned about the changes in the most recent version of the AIA documents (2007). All of the attorneys agreed that the change in the consolidation clause was important. The 1997 AIA forms require disputes involving the architect to be held at a hearing separate and apart from other parties; i.e., that claims against architects cannot be consolidated with claims against other parties. To illustrate, an owner has a potential dispute that involves both the architect and the general contractor. The owner would be required to have two hearings in order to resolve this matter under AIA 1997. Many owners and contractors were frustrated with this clause and were threatening to discontinue use the AIA contract documents altogether if it was not modified. The change is reflected in the 2007 AIA documents in that their no longer is the “no consolidation” clause.

Most of the attorneys stated that it was too early to adequately assess the changes in the dispute resolution clauses from the 1997 to 2007 AIA documents. That we are still at least a couple of years away from being able to see if the “check box” system and the default provision for litigation will have any effect on how the parties handle disputes.

Project managers were also questioned and all reported that when a dispute arose on one of their projects they were intimately involved in dispute resolution process. They also reported that there was a heightened degree of tension on a project during the course of the dispute resolution. The project managers also reported that they had worked with IDMs other than an architect and these always turned out to be independent construction managers. They also reported that they were personally involved with the data collection process during disputes and this required a significant amount of their time.

5. Conclusion

Not surprisingly, the research results indicate that all parties prefer to settle disputes by negotiating. All agreed that maintaining relationships and keeping dispute resolution costs to a minimum are very important factors in how they conduct business and that negotiating a settlement is the best way to accomplish this goal. Mediation is seen as an effective form of dispute resolution by all of the general contractors and attorneys. However, subcontractors offered different opinions on the matter with some preferring mediation while others found it futile since it is non-binding.

All parties essentially agreed that litigation is the worst form of dispute resolution mechanism. However, an interesting part of this research is the attorneys’ attitude towards dispute resolution. Attorneys have similar opinions to the construction executives, in that they believe that the quicker disputes can be resolved, the better for everyone; but they take a legalistic approach towards the subject, essentially stating that any dispute resolution if fine as long as the parties have the freedom to choose during the time the contract is negotiated.
There may not be one definitive dispute resolution method that is best suited for all situations, but the research clearly indicates that negotiating disputes and dealing with them quickly is the best course of action. More research will be available in the coming years once the latest versions of the AIA documents become more widely used. It will be interesting to see if the new AIA contractual language (e.g., check box system) leads to a decrease in arbitration and an increase in litigation. The attorneys also agree that advancements are being made in dispute resolution methods with the dispute resolution boards and some attempts at hybrid systems. However, they also point out that mediation, negotiation, and litigation practices were here to stay. The research clearly indicates that disputes will always be prevalent in commercial construction, and they must be resolved as quickly as possible to preserve professional relationships and the perpetuity of the commercial construction business.

References


Appendix A

Interview questions posed to the different professionals interviewed.

Construction Executive Questions (General Contractors and Subcontractors):

1. What types of dispute resolution methods do you feel are most non-adversarial, and are best suited for relationship preservation?

2. When choosing a dispute resolution option, what factors are you most concerned with in terms of the impact on operations? (Do you decide or do you rely on advice from your attorney; do you use different methods for different clients; do you use different methods for different types of work)?

3. Is there one method that stands out among construction executives (or for your company) as the best all around?

4. When do you consider a dispute at an impasse and solicit outside assistance?

5. What individual is responsible for dealing with the attorneys?

6. How important is it that dispute resolution options be contractually defined prior to construction?

7. Do you like the change from 1997 to 2007 AIA Docs re dispute resolution? (i.e., Initial Decision Maker not having to be the Architect, and the new “check box” option in the 2007 version to allow for arbitration or litigation, should mediation attempts fail.)

8. If you do like the check box option in the 2007 version, why?

9. How would you choose the Initial Decision Maker? What is important to you when making this decision?

10. Have you used AAA’s arbitration services before, or any other facilitator?

11. If no to question 10, have you been involved in deciding who will be the arbitrator with the other party involved? In other words, were both sides able to work together in picking their arbitrator?

12. In arbitration, do you favor a single arbitrator or a panel of arbitrators (i.e., 3)?

13. Is the lack of appeal in arbitration a concern?

14. Do your contracts require mediation prior to arbitration (according to the 1997 AIA version)?

15. Since mediation is non-binding, do you feel that it is effective? Do you feel that the environment offered by mediation is non-adversarial and conducive to an amicable solution?

Questions for Attorneys:

1. How important is it that dispute resolution options be contractually defined prior to construction?
2. What options present the most legal challenges for an adequate resolution?

3. How knowledgeable are construction executives about dispute resolution as a whole?

4. What does the future of the construction industry look like in terms of dispute resolution advancement?

5. Do you like the change from 1997 to 2007 AIA Docs re dispute resolution? (i.e., Initial Decision Maker not having to be the Architect, and the new “check box” option in the 2007 version to allow for arbitration or litigation, should mediation attempts fail).

6. What are your thoughts in regards to the Initial Decision Maker not having to be the Architect?

7. Why did the architects agree to being “consolidated” with other parties in construction related disputes in the 2007 version of the AIA documents?

8. If you do like the check box option in the 2007 version, why?

9. In arbitration, do you favor a single arbitrator or a panel of arbitrators (i.e., 3)?

10. Is the lack of appeal in arbitration a concern?

11. Do you feel that contractual consistency is important between the different parties in construction? (i.e., between Owners and GC’s and GC’s and Subcontractors).

12. Since mediation is non-binding, do you feel that the odds of a successful resolution are worth the effort, or do you believe that arbitration or litigation offer a better solution all around for construction related disputes?

**Questions for Senior Project Managers:**

1. How involved are you with dispute resolution?

2. Where do you see the biggest impact of a selected dispute resolution option in terms of worker productivity? Is there a negative impact on the jobsite as a whole? (i.e., attitude, schedule concerns, etc.). Do superintendents express the significance of these issues to you?

3. Can you sense a heightened degree of tension on a project if a particular dispute resolution option is in use? Can you elaborate on any experiences that you may have had?

4. What are your thoughts in regards to the Initial Decision Maker not having to be the Architect?

5. Have you had to deal with an IDM other than the Architect?

6. What type of information are you responsible for collecting when disputes arise?

7. How does the data gathering process impact your productivity, in terms of your day to day professional responsibilities?
8. Do you find it difficult to get other parties to be helpful in data gathering once a dispute arises? Do you sense an attitude shift in the professional relationships with subs, owner, etc. once a dispute is ongoing?

9. Have you ever personally been involved in an actual mediation, arbitration, or litigation proceeding? (i.e., had to testify or participate directly).

10. If yes to number nine, what resolution method have you found to be the most productive and palatable for all parties involved?
Technical Building Regulations in EU Countries: 
A Comparison of their Organization and Formulation

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Abstract

The purpose of this paper is to compare technical building regulations in European Union (EU) countries. Three research questions are addressed: what are the main differences and similarities? what are the main types of organization and formulation? what are the main trends and developments? The following tasks were carried out in order to provide an answer to these questions: preparing a questionnaire and obtaining answers from experts of EU countries, collecting and analysing main building regulations, and comparing results. The results are that, in the majority of the EU countries, central authorities are involved in setting technical building regulations, however the involvement of regional and local authorities varies. Technical building regulations can be set in one main document, a coordinated group of documents or separated legal documents. The formulation adopted for most subjects is performance based, combined with functional or prescriptive requirements for specific subjects. Only in England and Wales have technical building regulations a pure functional formulation. Few countries have official documents with deemed to satisfy solutions. The building regulations include the main subjects (i.e. safety, health, practicability and energy saving), but several countries have no requirements on environmental protection. In the majority of the EU countries, direct references to specific standards are made, but standards are not accessible free of charge. There is not a pattern in the way that building regulations apply to construction works in existing buildings. The main conclusions drawn from the study were that there are five main types of organization and formulation of technical building regulations in the EU countries, as follows: 1) one document with functional requirements and a coordinated group of documents with deemed to satisfy solutions; 2) one document with performance requirements; 3) one document with prescriptive requirements and new performance regulations on specific subjects; 4) a set of coordinated documents with performance requirements; and, 5) separated legal documents mainly with performance requirements combined with some prescriptive requirements. Although there are exceptions, a regional distribution was observed in the countries that adopt each type.

Keywords: technical building regulations, comparative study, European Union
1. Introduction

In every European country, there is a building regulatory system encompassing the building regulations and the building control system. Building regulations set minimum quality requirements to ensure that buildings are safe, healthy, energy-efficient and accessible to everyone who lives and works in and around them. Building control aims to guarantee the application and enforcement of these minimum requirements.

The purpose and the subjects covered by the building regulations are identical in European Union (EU) countries. However, there are many differences between countries regarding who sets the building regulations, how the technical building regulations are organized and formulated, what is the role of national standards and how building regulations apply to existing buildings.

Studying the organization and formulation of the technical building regulations is important for three main reasons. Differences among the technical building regulations of EU countries represent a barrier to the freedom of movement of services in the construction industry. In recent years several EU countries have moved to shorter objective based technical buildings regulations, but the extent and form how each country implemented reforms varies. The Construction Products Directive and the EN Eurocodes lead to some harmonization of the technical building regulations of the EU countries.

The purpose of the paper is to compare technical building regulations in EU countries. The three research questions addressed are as follows: what are the main differences and similarities? what are the main types of organization and formulation of technical building regulations? what are the main trends and developments?

The following section explains the research methodology and section 3 presents the results of the comparative analysis. Section 4 describes and discusses the conclusions of the comparison.

2. Methodology

The research presented in this paper was conducted as part of a European comparative research project currently underway at OTB Research Institute for Housing, Urban and Mobility Studies (Meijer and Visscher, 2008). The project aims to describe and compare the building regulation system in 34 European countries. The main subjects addressed are as follows: the organization and formulation of technical building regulations, the tasks and responsibilities of actors involved in building control, the technical and administrative aspects of the building permit procedure and the quality demands imposed on building control bodies.

The analytical framework of the research project was build upon previous studies about the building regulations in Europe (Meijer, Visscher and Sheridan, 2002). The development of the research project was divided into two phases. In the first phase, the aim was to describe the building regulation system. National experts in each country received questionnaires about their building regulatory
systems. Based on information obtained from the questionnaire and the analysis of major legal documents, a monograph was written for each country. In the second phase of the project, the aim was to compare the building regulation systems of the European countries in order to identify trends and developments.

This paper presents results from the second phase of the research project. The focus is on the technical building regulations. The basis of the analysis is restricted to the 27 countries of the European Union. Due to the federal structures of Austria, Germany and Belgium, analyses of each of these countries focuses on a single province or region. With regard to the United Kingdom, information was collected for England and Wales.

Within the second phase of the research project, the tasks and responsibilities assigned to public and private parties that enforce the building control systems in EU countries have already been compared. The results were presented in a previous paper (Pedro, Meijer and Visscher, 2009).

The conclusions presented in this paper are not definitive, as the necessary information has not yet been gathered and validated for all countries.

3. Comparative analysis

3.1 Regulatory framework

In almost all EU countries, there is a building act that provides the legal framework for legislation concerning the content and implementation of building regulations (Table 1). The building act usually includes: main requirements for construction works; procedures for design, building and operation of construction works; competences of national and local authorities; and, tasks and responsibilities of persons participating in construction. The following are exceptions to the rule:

1) In Austria there is no building regulatory law established on a central level.

2) In Belgium, France and Portugal there is not a national law that directs the technical building regulations.

In some EU countries the Building Act is joined with the Planning Act and also sets the main goals and rules for the land-use and spatial planning (e.g. Bulgaria, Czech Republic, Finland, Germany and Sweden).
3.2 Responsibility

In half of the EU countries, the technical building regulations are laid down by the federal or national authorities and there are no regional or local building regulations (Table 2). In these countries technical building regulations are uniform throughout the whole country. Due to their particular administrative divisions or legal traditions, in the other half of EU countries the responsibility to lay down the building regulations is divided differently. The following distributions of responsibilities were identified:

1) Central authorities set a model of technical building regulations that is adapted by regional authorities (e.g. Germany).

2) Regional authorities set the technical building regulations with functional requirements and refer to the central guidelines for technical requirements (e.g. Austria).

3) Central, regional and local of authority legislate over different requirements and types of buildings (e.g. Belgium).

4) Central authorities set the technical building regulations for some requirements (e.g. energy performance of buildings), and local authorities set building regulations for different requirements (e.g. Luxemburg).

5) Central authorities set technical building regulations, and regional and local authorities also set additional building regulations subordinated to national ones (e.g. Italy).

6) National authorities set technical building regulations, and regional authorities also set additional building regulations subordinated to national ones (e.g. Slovakia, and Spain).

7) National authorities set technical building regulations, and local authorities also set additional building regulations subordinated to national ones (e.g. Finland, Latvia, Lithuania, Portugal).

8) The regional authorities set technical building regulations (e.g. United Kingdom).

Building regulations set by different local authorities of one country are usually similar even if there is no model. Subordinated building regulations must comply with requirements set at a higher level and usually include additional or more demanding requirements.
Table 2: Who sets the technical building regulations?

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3.3 Organization

There is no dominant approach to the organization of the technical building regulations in the EU countries (Table 3). Three main types of organization were identified:

1) One main document sets the technical requirements and sub-regulations may supplement with technical details some subjects of the main document.

2) Technical building regulations are set in a coordinated group of documents, usually organized by technical requirement and in some requirements a differentiation is made between types of buildings.

3) Separated legal documents contain technical building regulations for specific requirements and/or types of buildings.

In England and Wales, functional requirements are set in one document and deemed to satisfy solutions are organized in a coordinated group of documents. In Austria, each regional authority lays down functional requirements in one document that refers to a group of documents with technical requirements set at central level.

Attending to the complexity of technical buildings regulations set in separated documents, in several countries different solutions were adopted to assist identifying the applicable requirements:

1) In France, the regulations concerning a certain subject are combined in codes. A code contains all regulations, recent amendments and changes, jurisprudence, etc., but not the whole contents of these documents. The main texts will be found in the codes, but not all the technical details. Codes are updated by changes to the individual laws, decrees and implementing orders of which they are composed.

2) In Portugal, by law a ministerial order must be published every year with a list of the legal provisions to be observed when developing building designs and executing constructions.

3) In Slovenia, a web application was developed by the central authorities to assist in identifying the relevant requirements.
In the last 10 to 15 years, the developments in the organization of the technical building regulations were towards the centralization of the technical building regulations into fewer legal documents (Table 4). This reduction aimed mainly at simplifying the building regulations. However, in some countries there was decentralization mainly due to the approval of new regulations for requirements or types of buildings that were not previously covered and, the approval of building regulations by regional and local authorities. In many countries there were no developments in this respect.

### Table 4: What were the developments in the organization of technical building regulations in the last 10 to 15 years?

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### 3.4 Formulation

The formulation of the requirements in the technical building regulations can be classified in three categories:

1) Functional – requirements define the main objectives, but there is no determination method, no performance level, and no reference to solutions or materials.

2) Performance – requirements express the level of performance in quantitative terms and define the determination method.
3) Prescriptive – requirements lay down a specific design or construction solutions.

In most EU countries, there is an inconsistency in the formulation of the technical requirements for different subjects. The formulation of the requirements is mainly performance based combined with functional or prescriptive requirements (Table 5). The following situations were identified:

1) Technical building regulations have a pure functional formulation (e.g. England and Wales).

2) Technical building regulations adopt a performance formulation, with the exception of some requirements that are prescriptive (e.g. Czech Republic, Denmark, Germany, Finland, Ireland, The Netherlands, Romania, Spain and Sweden). The requirements with a prescriptive formulation usually concern dimensions (e.g. heights, distances, floor area).

3) Technical building regulations adopt a formulation that combines performance and prescriptive requirements. Recent technical building regulations are usually performance-based, but existing ones still adopt a prescriptive formulation (e.g. Austria, Belgium, Bulgaria, France, Italy, Latvia and Portugal).

4) Technical building regulations are mainly prescriptive, but some new regulations (e.g. energy performance of buildings) adopt a performance formulation (Cyprus, Luxembourg and Malta).

5) Technical building regulations include functional, performance and prescriptive requirements for different subjects (e.g. Lithuania and Slovenia).

In Austria, regional authorities lay down provisions that are purely functional requirements. Subsequently the technical requirements are established in a group of guidelines set at a central level. These technical requirements are predominantly formulated in a prescriptive way but some requirements are performance-based.

**Table 5: How are the technical building regulations formulated?**

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<tr>
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<th>Prescriptive</th>
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</table>

In the majority of EU countries there are no official documents with deemed to satisfy solutions (Table 6). However the following exceptions were identified:

1) In Czech Republic, France, Slovakia, Slovenia, England and Wales there are official documents that intended to provide guidance to the application of the technical building regulations. These
documents elaborate the requirements, discuss the underlying issues, and describe strategies that can be used to comply with the requirements. However, there may be alternative ways of achieving compliance, thus there is no obligation to adopt any particular solution contained in these documents. In England and Wales, the approved documents (i.e. official documents with deemed to satisfy solutions) are particularly relevant, since the technical building regulations have a pure functional formulation. In fact, if it is preferred to meet the relevant requirement of the building regulations in some other way than the one presented in the approved documents there has to be a demonstration that the alternative complies with the functional requirements of the regulations.

2) In Denmark, Finland and Sweden the building regulations comprise mandatory performance requirements and guidelines for their implementation. Guidelines are not mandatory and may contain: examples of provisions satisfying requirements; sketches, explanations and comments to aid interpreting the requirements; and references to standards, instructions and other material which provides more detailed information.

3) In Spain, there are technical documents, recognized by the authorities, which are not mandatory but contain complementary information to the technical building regulations. These documents include: technical guides for design, quantification, maintenance and conservation procedures; evaluation methods and computer programs; comments about application of Building Code; and, other documents that assist in the application of the Building Code.

Table 6: Are there official documents with deemed to satisfy solutions?

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In the last 10 to 15 years, there was a general trend towards performance-based requirements in most of the EU countries (Table 7). Only in United Kingdom there was an increase of functional requirements. In some countries there were no developments.
Table 7: What were the developments in the organization of the technical building regulations in the last 10 to 15 years?

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3.5 Subjects included in technical building regulations

In most EU countries all main requirements are included in the technical building regulations (Table 8). The requirements on the building and plot are usually set or complemented at a local level. The requirements on safety, health, practicability (e.g. dimensions of rooms, ceiling height, accessibility, number of shower/basin/toilets) and energy saving are mainly set at a central level. Several countries have no requirements on environmental protection.
Table 8: What are the subjects included in the technical building regulations?

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Table 9: In which way are national standards referred to?

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3.7 Regulations for existing buildings

In more than half of the EU countries there are no specific technical building regulations for existing buildings (Table 10). When there are building regulations for existing buildings, they usually apply to a particular scope (e.g. reconversion of illegal urban areas) or concern specific requirements (e.g. upgrade of technical equipments).

Construction works in existing buildings are treated differently by the general technical building regulations of the EU countries. The following two main approaches were identified:

1) General building regulations apply to all construction works, but for existing buildings relaxations of the provisions are possible (e.g. Austria, Cyprus, France, Latvia and The Netherlands).

2) General building regulations apply to new buildings (e.g. Ireland, Portugal, Slovenia, England and Wales), and to reconstruction, extension, extensive renovation or change in use of existing buildings. Small renovations and maintenance works are usually excluded from complying with building regulations for new buildings. In these situations it is not necessary to raise the standard, only to avoid making it worse.

The general technical building regulations of some EU countries include specifications that apply specifically to existing buildings (e.g. Belgium, Denmark, France, Luxembourg, Malta, The Netherlands, Portugal and Sweden). These specifications are usually less restrictive provisions.

The building regulations for existing buildings can be used passively or actively. Passively, if the building has to comply with the regulations when construction works are carried out. Actively, if the authorities can summon the owner to carry out quality improvement of buildings that do not comply with the building regulations.
Table 10: Are there technical building regulations specific for existing buildings?

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4. Conclusions and discussion

Main differences and similarities between EU countries regarding technical building regulations

In the majority of the EU countries there is a building act that provides the legal framework for legislation concerning the content and implementation of building regulations. Central authorities are involved in setting technical building regulations. The building regulations include the main subjects (i.e. safety, health, practicability and energy saving). The formulation of the requirements is performance based, combined with functional or prescriptive requirements for some subjects. There is a common pattern of verification by reference to specific national standards, but standards are not accessible free of charge.

However there are several differences regarding the organization and formulation of technical building regulations. The involvement of regional and local authorities in setting technical building regulations varies. Technical building regulations can be set in one main document, a coordinated group of documents or separated legal documents. Some countries have official documents with deemed to satisfy solutions. There is not a pattern in the way that building regulations apply to construction works in existing buildings. England and Wales adopt pure functional formulation of the technical building regulations.

Main types of organization and formulation of technical building regulations in EU countries

Five main types of organization and formulation of technical building regulations were identified:

1) One document with functional requirements and a coordinated group of documents with deemed to satisfy solutions (e.g. England and Wales).
2) One document with performance requirements (e.g. Denmark, Finland, Netherlands, Spain and Sweden).
3) One main document with prescriptive requirements and new performance regulations on specific subjects (e.g. Cyprus, Luxembourg and Malta).
4) Set of coordinated documents with performance requirements (Austria, Czech Republic, Germany, Ireland and Latvia).

5) Separated legal documents with performance requirements combined with prescriptive requirements for some subjects (e.g. Belgium, Bulgaria, France, Italy, Portugal, Romania, Slovakia and Slovenia).

Although there are exceptions, a regional distribution can be observed in the countries that adopt each type: Scandinavian countries in type 2), small countries in type 3); central Europe countries in type 4), southern Europe countries in type 5). England and Wales stands alone in type 1).

**Trends and developments in technical building regulations of the EU countries**

In the last 10 to 15 years, the dominant trend in the organization and formulation of technical building regulations was their centralization into fewer legal documents and the increase of performance-based requirements. However, in many countries there were no developments or, contrary to the general trend, there was decentralization mainly due to the approval of regulations on new requirements.

**Lessons to be learned from the technical building regulations of the EU countries**

In an overall analysis, many differences were identified in the organization and formulation of the technical building regulations of the EU countries. These differences constitute a barrier to the free circulation of people and services. Additional uniformity among building regulations would contribute to the establishment and functioning of a single market for services in the construction industry, in which architects, developers and builders are no longer limited to working in national markets.

**References**


Alternative Dispute Resolution in the Malaysian Construction Industry

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Abstract

In Malaysia, ADR is seen as an alternative to litigation in resolving contractual disputes as it is perceived to be cost saving, more private and able to avoid ill-will or animosity as it sometimes does, in litigation. In the Malaysian construction industry, the present practice of ADR is focused mainly on arbitration. However, with the revised standard forms for construction contract, proposals for the Mediation Act and the Adjudication and Payment Act, there is a strong indication that ADR will be a common feature in resolving construction disputes in Malaysia. This paper intends to highlight the application of ADR in construction contracts with reference to three main standard forms contract, which are referred to in Malaysia: the PWD 203A (2007 edition), the PAM 2006 and the CIDB Standard Form of Contract for Building Works 2000. The main objective of this paper is to analyze existing provisions in the three standard form contracts and to evaluate their significance in resolving disputes between parties of construction contracts.

Keywords: alternative dispute resolution, construction industry, Malaysia
1. Background of the construction industry in Malaysia

1.1 Introduction

The Malaysian construction industry constitutes an important element of the Malaysian economy. This industry generates wealth and improves the quality of life of the people through the provision of social and economic infrastructure like schools, hospital, houses, roads, airports, ports, bridges, dams etc. (CIDB, 2008). The industry has generated some 800,000 jobs opportunities and creates a multiplier effect to industries such as manufacturing, financing and professional services. Thus, it acts as a catalyst for and has multiplier effects to the economy (CIDB, 2007).

Although it accounts for only 2.5% of the gross domestic product (GDP) in 2007, BERNAMA (2009) reported that the construction industry is expected to grow to 3.5% in 2009 despite the economic slowdown. The construction industry in other parts of the world has also provided ample opportunities for Malaysian contractors to flourish. Since 1986 a total of 386 overseas projects valued at RM22 billion have been completed. Furthermore, with the current trend, CIDB (2007) envisaged that the long term sustainability intended by the implementation of the Malaysian Construction Industry Master Plan will result in the construction industry contributing 5% to the country’s GDP by 2015.

1.2 The construction industry master plan (CIMP)

The Malaysian construction industry is fast growing and in light of this, it is vital that the industry works towards strengthening its foundation to face present and future challenges in the global arena. This concern prompted a roundtable discussion to be held in 2003 and 2004 which identified and recommended priorities and directions to improve the future of the Malaysian construction industry. The outcome was to entrust the Malaysian Construction Industry Development Board (CIDB), an arm of the Malaysian government set up through legislation, to coordinate the various measures recommended by the roundtable (CIDB, 2007).

Subsequently CIDB proceeded to establish ten working groups. The proposals were consolidated and further enhanced by the working groups into a ten-year strategic roadmap for the Malaysian construction industry, known as the Construction Industry Master Plan (CIMP) ranging from the period 2006-2015 (CIDB, 2007).

In 2007, the CIMP received approval by the cabinet committee for Investment and Infrastructure. This strategic roadmap is intended to develop the Malaysian construction industry into a sector that is world-class, innovative and knowledgeable global social provider. It is also intended to ensure that the construction industry is well positioned to support the nation’s overall economic growth and to meet various challenges (CIDB, 2007).
The mindset of the human capital that drives the industry must be revolutionised to accept the
dynamic of the transformation process that would be brought about by the CIMP. It is believed that
the CIMP will trigger a paradigm shift in the Malaysian construction industry, having firstly arrested
some the prevalent weaknesses currently prevalent in the construction community (CIDB, 2007).

In order to achieve the overall strategic direction, amongst others, the CIMP has charted seven
strategic thrusts. The second thrust which is relevant to the discussion in this paper involves
strengthening the construction industry image. The CIMP mentions that the resolution of disputes
within the construction industry needs to be speedy and economical. In relation to this, one of the
recommendations in the aforementioned thrust is to introduce a “Construction Industry Payment and
Adjudication Act” to resolve disputes.

2. Construction disputes

The construction industry is known for its conflict, with its characteristics mix of complex
contractual relationships, huge sums of money at stake, highly complex projects and remorseless time
pressure, as much as its spectacular construction and civil engineering projects (Holtham et al., 1999;
Mackie et al., 2000). It also has a reputation as a tough and aggressive world in which the weakest
and even at times some of the strongest will go the wall (Mackie et al., 2000). Disputes result not
only from destructive or unhealthy conflict, but also when claims are not amicably settled
(Kumaraswamy, 1998). Hence, a construction project is considered by many a dispute waiting to
happen (Patterson & Seabolt, 2001).

Construction disputes itself, typically comprises both technical and legal dimensions, the former
being the dominant issue in disputes. For this reason, litigation may not be the most appropriate
forum for dealing with these types of disputes (Cheung, 2006). The dissatisfaction with the
traditional dispute resolution mechanisms which can no longer successfully cope with the growing
needs and challenges of the present construction environment has invoked the industry to look
towards other alternative methods (Pêna-Mora et al., 2003). Alternative dispute resolution (ADR) is
a generic description used to identify a wide range of resolution process that aims to resolve disputes
speedily and cost efficiently (Cheung, 2006).

Disputes within the construction industry are inevitably related to time, money and quality. Disputes
that are not resolved promptly, in all probability, would incur a considerable escalation in expenses
which are hard or impossible to quantify. According to Cheung (2006) the visible expenses
anticipated include the legal representatives, expert witnesses, and the cost of the dispute resolution
proceedings itself. Amongst the less visible costs would be the company resources assigned to the
dispute and lost business opportunities, while the intangible costs are identified as detriment to good
working relationships and potential value lost due to inefficient dispute resolution process.
3. Alternative dispute resolution

Over the last few decades the perceived shortcomings of litigation and also arbitration have resulted in attempts to find other quick means to resolve construction disputes. Mackie et al. (2000) observe that ADR was first developed in the United States in early 1980s as a result of dissatisfaction with the delays, costs and inadequacies of the litigation process. However, it only began to receive consideration in the late 1980s and early 1990s. Since then, its development as a process to resolve civil disputes relatively inexpensive and quickly has gained momentum and is now widely practiced in the construction industries in many countries, especially in Canada, United Kingdom and Australia (Mackie et al., 2000; Holtham et al., 1999). The acronym ADR has also been defined as Additional Dispute Resolution and Assisted Dispute Resolution. With time, it also stands for Appropriate Dispute Resolution and Amicable Dispute Resolution to reflect these desired outcomes (Mackie et al., 2000; Cheung, 2006).

The realisation of ADR as a process that complements both litigation and arbitration has meant that the processes are constantly expanding to include new techniques which offer no limits to the types of dispute resolution processes that can be utilised. The main attraction of ADR is often the consensual process, but this also means that it will not be successful unless the parties each have a genuine desire to reach a settlement (Holtham et al., 1999). Even though the most common ADR methods do not provide assurance of a resolution, in practice most of these methods lead to a final settlement (Mackie et al., 2000). The key to a settlement process is that the parties and those assisting in the process understand and agree to the same process.

The reasons for resorting to ADR include time savings, less costly discovery, more effective case management, confidentiality, and facilitation of early, direct communication and understanding among the parties of the essential issues on each side of the dispute, preservation of ongoing party relations, savings in trial expenses, and providing qualified neutral experts to hear complex matters (Treacy, 1995). Traditionally, arbitration being the forum sought in the construction industry (Battersby, 2003).

The ADR processes differ in their formality and placement of decision-making power. Some methods are non-binding and allow the parties to have control at all times over the outcome of the dispute, participate in the development of an agreeable settlement in the presence of a neutral third party and withdraw from the process at any point. (Péna-Mora et al., 2003). Other methods may become binding where all powers lies with the neutral third party which is mandatory and have a formal structure that require strict adherence to the rules and implementation (Uff, 2005a).

ADR methods include arbitration, mediation, conciliation, early neutral evaluation, expert determination and mini trial as well as other hybrid methods such as med-arbitration and dispute adjudication/review board. Brown and Marriot (1999) have identified eighteen main dispute resolution methods ranging from processes which offer the least control, which is litigation, to those that offer the greatest control, that is, negotiation.
Although there is no one exclusive ADR for the construction industry, apart from arbitration, which is the most widely form of alternative dispute resolution mechanism in the construction industry, other spectrums of ADR include negotiation, mediation, and conciliation as well as other hybrid methods such as med-arbitration, adjudication, mini-trial, expert determination or appraisal, court-annexed ADR and dispute review board. The array of dispute resolution methods has advantages and disadvantages and despite having similar objectives, the processes involved are significantly different from one method to the other (Battersby, 2003). In relation to this, Kumaraswamy (1998) views that there is a need for advice to tailor an appropriate mechanism to resolve a given dispute in a particular circumstance, as it may result in an unresolved dispute. Moreover, due to the divergence in construction disputes, the right process should be adapted to the type of problem so as to provide a solution that suits the varied nature and size of dispute in issue, with the object of saving time and costs (Mackie et al., 2000 and Battersby, 2003).

Arbitration is generally seen as a more flexible procedure than litigation but this may be so in theory but not in practice (Holtham et al., 1999). The poor image of arbitration is attributable to its temptation to imitate traditional court procedure (Jones, 2006). In arbitration, the parties have the opportunity to choose an arbitrator with relevant expertise, but non-lawyers see the process as having been hijacked by lawyers who have imposed litigation style practice on what was originally tended to be quick and simple means of resolving disputes (Holtham et al., 1999). Amongst the advantages of arbitration is the privacy and confidentiality afforded to the parties. The parties also have the freedom to determine an arbitrator or appropriate appointing body to ensure that he or she has relevant expertise and experience. They are free to choose their own rules, with great procedural and substantive flexibility, but the flexibility of the process can create uncertainty among the parties (Holtham et al., 1999). There are very limited grounds of appeal against an arbitration award. Hence, depending on the circumstances of a dispute, Battersby (2003) views that arbitration can be very quick and cost effective as a means of resolving dispute. On the other hand, it can also be very time consuming, cumbersome, expensive and adversarial which contributed to it earning the name litigation in the private sector.

Litigation and arbitration are about winning and losing, while mediation creates a non-adversarial condition in order to reach a win-win solution. The mediator functions to assist the parties in dispute to generate options and foster an understanding of their respective positions and to manage emotions (Battersby, 2003). Although the mediator controls the process, he/she does not impose any resolution or opinion on the merits of the case, promoting a win/win situation, leaving the parties themselves to control the outcome (Mistelis, 2001). In England, a mediator is also known as conciliator and the term is used interchangeably (Battersby, 2003).

The process of mediation is flexible, private and confidential with the legal rights of the parties protected when no agreement has been reached (Mistelis, 2001). Its concept is a totally different

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1 Sections 15(5) and 18(10) of the Malaysian Arbitration Act 2005.
2 See the judgment in *Northern Regional Health Authority v Derek Crouch Construction Company Limited* [1984] 1 QB 644,at 70 where Sir John Donaldson MR stated that “Arbitration is usually no more and no less than litigation in the private sector.”
process from arbitration in all respects saves only for the parties’ agreement to utilise the process as an alternative to litigation and the objective of privacy (Battersby, 2003). It is non-binding and involves a neutral third party that does not make decisions. It is contended that mediation and adjudication is included in a contract not as a replacement for arbitration but only as a means of avoiding arbitration (Battersby, 2003). Mediation is faster and more cost effective than arbitration. It also avoids the risk of win-loss situation. When goodwill exists between the parties, mediation being non-adversarial helps to promote amicable settlements and preserves business relationships. The parties to mediation retain control over their positions and can walk away from mediation or take time to reconsider the situation (Battersby, 2003).

Although mediation of construction disputes highly resembles other mediation, Patterson and Seabolt (2001) highlight some peculiarities which merit consideration. Normally a mediator chosen to deal with a construction dispute is likely to possess substantial knowledge and experience in the construction industry, thus saving time and expenses for the parties. As construction disputes are document-sensitive, the mediator will most probably be called upon to facilitate the amicable exchange of documents. The mediator may require a longer time for presentations from and caucuses with parties as it may involve multiple parties and complex issues. The mediator may also be required to render advisory opinion on matters if the parties agree to this approach.

Meanwhile, in adjudication, the adjudicator acts as a third neutral party who is appointed to resolve a dispute within a certain time limit. The decision of the adjudicator is binding but not necessarily final as it could later be reviewed by either arbitration, court proceedings or by settlement agreement between the parties. In large international contracts, adjudication is usually referred to as dispute adjudication board or dispute review board which may consists of one or more adjudicators (Natkunasingam & Sabaratnam, 1998). In the UK, certain standard forms of contract have encouraged adjudication as an alternative dispute resolution earlier on, but its scope has now been greatly extended by an underpinning Act that provides that any party to a contract is entitled to adjudication.

4. ADR in Malaysian construction contracts

Notwithstanding the wide adoption of ADR within the construction industry, the geographical differences attributed to cultural factors, maturity of the industry and prevalent legal systems in force influences the use of ADR practices. Furthermore, participation in ADR techniques remains largely voluntary, and the legal implication arising from them remain uncharted (Cheung, 2006).

In Malaysia, the most common alternative dispute resolution methods incorporated in Malaysian construction contracts are arbitration and mediation (Lim and Xavier, 2002). At present, Malaysia is seeking for an efficient and economical dispensation of justice and a more suitable dispute resolution technique to deal with current and future challenges in the construction industry. In line with the Malaysian CIMP, CIDB is advocating statutory adjudication as a suitable dispute resolution in the construction industry.
There are various standard forms of construction contract, which the parties can refer, adopt or incorporate in Malaysia. For the public sector, the main reference is normally the PWD 203 form, whilst for the private sector; the PAM standard form contract and the CIDB Building Works contract. For the purpose of this article, discussion on the contractual terms relating to ADR shall be made to the latest version of these three forms; the PWD 203 A (Rev. 2007), the PAM (Rev.2006) and the CIDB Building Works 2000 Edition.

### 4.1 Arbitration

While the court is the main forum for resolution of construction dispute, arbitration is a well established part of the construction industry (Natunasingam and Sabaratnam, 1998; Oon, 2003). In Malaysia, arbitration is governed by the Arbitration Act 2005, which repeals and replaces the Arbitration Act 1952. It is applicable to all arbitration proceedings commencing after 15 March 2006. This much awaited Act has addressed some of the perceived and actual failures of the arbitration process in the previous Act (Premaraj, 2007). It is based on the United Nations Commission International Trade Law (UNCITRAL) Model Law on International Commercial Arbitration (“the Model Law”) which member states are free to modify for use in their domestic arbitral regime (Rajoo & Davidson, 2007). 63 countries worldwide have adopted this model, including the common law state of New Zealand, which the Malaysian Act structure closely resembles (Rajoo & Davidson, 2007).

The Malaysian courts have been actively involved in dealing with challenges in arbitration. In *Menang Development (M) Sdn Bhd v Pembinaan K& H Sdn Bhd & Anor*, the plaintiff were house developers who appointed the defendant as a contractor for their project. The plaintiff challenged the architect certificate and applied for appointment of an arbitrator. The High Court held that challenge of the architect certificate was not bona fide but nevertheless, the plaintiff were not prevented from having the alleged defects and related claims to be arbitrated on as it is their contractual right.

In *Usahasama SPNB –LTAT Sdn Bhd v Borneo Synergy (M) Sdn Bhd*, the plaintiff appointed a company, PPHM as its main contractor. The defendant was the subcontractor of PPHM. In the course of performance of the work, PPHM purported to withdraw from the main contract and recommended for the piling work to be continued by the defendant. Subsequently, a deed of assignment was signed between the plaintiff and defendant and acknowledged by the plaintiff. Later a dispute arose between the plaintiff and defendant relating to payment for the work done. The defendant issued an arbitration notice pursuant to clause 54 of the main contract. The Kuala Lumpur Regional Centre for Arbitration (KLRCA) appointed an arbitrator who later exercised his discretion and passed an award in favour of the defendant. The plaintiff took a court action contending that the appointment of the arbitrator is not valid and to set aside the award.

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3 [1993] 3 CLJ 41.
4 [2009] 7 CLJ 779
The court held that there was a clear intention between the parties that they are bound by separate contract, which was based on terms of the main contract when PPHM withdrew from the main contract. Evidence showed that the plaintiff and defendant had conducted themselves as if terms of the main contract bind upon their relationship. Owing to the fact that there existed a contract between the plaintiff and defendant based on terms of the main contract, it follows that clause 54 of the P.W.D, which was a part of the main contract was a term of the contract between the plaintiff and the defendant. As such, the arbitrator has discretion to decide on the arbitration proceedings.

In the latest version of the standard forms, clauses on arbitration are found in clause 65 of PWD 203A (Rev. 2007), clause 34 of PAM 2006 and clause 47 of CIDB Building Works 2000 Edition. In all these standard forms, it could be seen that arbitration is adopted as the final form of dispute resolution and has produced a de facto universality of arbitration as the normal method of settling disputes (Rajoo, 2008). Some of the various issues on disputes that have been referred to arbitration have been identified by Rajoo (2008) as follows:

- Termination of the contract due to failure by contractor/sub-contractor to proceed diligently and competently on site, or the contractor/sub-contractor ceased working, or repudiation of contract by employer.
- Non-payment of variation claims, progress payment claims, extension of time claims, liquidated and ascertained charges against contractor/sub-contractor, validity of final account and certificate.
- Changes in design, defective materials, poor quality of workmanship, delay and extension of time due to local authorities’ requirements, and negligence and nuisance.

4.2 Mediation

Although the modern or formal mediation is yet to mark in the dispute resolution process in Malaysia, the promotion of mediation in a number of industries have demonstrated that mediation is increasingly advancing into the society (Natunasingam & Sabaratnam, 1998 and Lim, 2004). In the construction industry, although mediation is relatively new, it is gaining recognition which is evidenced by the incorporation of mediation terms as a first tier of dispute resolution in a number of the Malaysian construction contracts (Lim & Xavier, 2002 and Ismail et al., 2009). Parties to a construction contract are encouraged to attempt to settle their disputes amicably by mediation prior to referral to other dispute resolution prescribed in the contract. In the standard forms contracts, the mediation terms were first introduced in clause 35 of the PAM 1998. It was gradually introduced in

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5 Clause 65. See Appendix A.
6 Clause 34. See Appendix B.
7 Clause 47. See Appendix C.
clause 47.2 of the CIDB Standard Form of Contract for Building Works 2000 Edition\(^8\) and in clause 35 of the latest PAM 2006.\(^9\) There is no meditation clause in the PWD forms.

A research conducted on five major Malaysian agencies that have provided dispute resolution services between 2000 and 2008, demonstrates that mediation cases are very low compared to arbitration cases. In one agency, less than 1% of mediation cases was on construction, while in another agency, none of its more than 500 cases came before a mediator (Ismail et al., 2009). Another research to establish how construction disputes are conceived by practicing quantity surveyors in Malaysia showed that 23.1% and 21.4% of disputes were settled through negotiation and contractual adjudication respectively (Mohd Isa et al., 2009). The study also reveals the following reasons on why mediation was not widely used within the Malaysian construction industry:

- Most problems can be resolved through direct-negotiation with the disputants without any involvement from others. The involvement of a third party can make disputes become more complicated or even worse
- Not widely known in Malaysia since it is a new approach
- Not exposed to any mediation procedure since no major disputes have yet arisen which need settlement through mediation
- Differential in value of work if substantial will be added or omitted progressively and this must be agreed by both parties
- The main contractor will offer alternative works or projects as replacement if the sub-contractor suffers losses
- Not agreed or initiated by both parties
- Unaware

It is suggested that the future of mediation in this country lies in the promotion of the benefits of mediation and the availability of structured mediation training to ensure that mediation skills are properly acquired (Natkunasingan & Sabaratnam, 1998). It is hoped that the much-awaited judicial reforms in Malaysia which includes the proposal to set up a mediation system under a Mediation Act which would not only require parties to mediate prior to filing in court, but also assist in clearing the backlog of civil cases. It was agreed that a court-mandated mediation system should be set-up, as mediation did not work well if it is outside the court system (Zaman, 2009).

### 4.3 Adjudication

Adjudication is regarded as the nearest process to arbitration.\(^10\) It is similar to arbitration in that it is a judicial process in which the adjudicator determines the parties’ respective rights and obligations

\(^8\) Clauses 47.2 and 47.3 of CIDB Standard Form of Building Contract (2000 Edition). See Appendix C
\(^9\) Clause 35. See Appendix B.
under the contract on the basis of evidence presented by the parties (Battersby, 2003). The principal advantage of adjudication over arbitration is that it is much simpler as it is intended to be a quick process similar to mediation, and relatively cheap. In contrast with mediation, adjudication results in a decision which is temporarily binding until finally determined by litigation, arbitration or settlement agreement between the parties. Adjudication is not a condition precedent to arbitration or court. It is statutorily enabled which entitles a party to exercise their rights to invoke adjudication; otherwise the parties may opt for other dispute resolution.

In summary, adjudication can be described as a procedure of referring a dispute to a third neutral party, an adjudicator, who must be appointed within seven days. Once a dispute has been referred to the adjudicator, the adjudicator must act impartially and may take the initiative to ascertain the facts and the law. The adjudicator must fulfil his/her obligation to reach a decision within twenty-eight days of referral and may extend the period of making decision by up to fourteen days with the consent of the referring party or any further extension agreed by the parties. This process aims is to determine a dispute on a temporary basis to enable work to proceed unimpeded and with less likelihood of serious injustice being caused (Cottam, 1998). Even if the decision is not accepted by one of the parties, the parties are obliged to implement the adjudicator’s decision. The decision is binding unless and until the dispute is finally resolved by legal proceeding, arbitration, settlement agreement or both parties accept the decision as finally determining the dispute.

In the UK, under the Housing Grants, Construction and Regeneration (HGCR) Act 1996 statutory adjudication was introduced as a procedure to resolve disputes in the construction industry. The legislation is an attempt to provide a “quick-fix” solution based on the assumption that the construction industry is willing to accept “rough justice” at the adjudication stage during the currency of the project, provided that serious challenges are brought through arbitration or litigation only after practical completion (Chan et al., 2005).

In Malaysia, the use of adjudication to resolve disputes is rare (Natunasingam & Sabaratnam, 1998). In the PAM (Rev. 2006) adjudication and arbitration are put under the same clause.11

The latest development relating to adjudication is the CIDB initiative with the backup of the construction industry which has recommended statutory adjudication through the proposed Construction Industry Payment and Adjudication Act (CIPAA). Besides providing a speedy dispute resolution mechanism for the construction industry, the other key features of the proposed CIPAA are to outlaw the practice of pay-when paid and conditional payment, to facilitate regular and timely payment, and provide security and remedies for the recovery of payment (CIDB, 2008).

Briefly, the basic adjudication procedures prescribed by the proposed CIPAA is outline as follows:

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11 Clause 35. See Appendix B
When a dispute arises the claimant to the dispute initiates the proceedings by serving a notice of adjudication on the respondent. Upon the service of the notice, the claimant may agree with the respondent on an adjudicator. The party can only agree to an adjudicator after a dispute has arisen. If the agreed adjudicator is not an accredited adjudicator, the claimant shall write and obtain authorisation of the Adjudication Control Authority (ACA) before requesting the agreed person to act as adjudicator. If the ACA do not authorise the agreed person to act as adjudicator, or if the parties fail to agree on an adjudicator, the claimant shall write to the ACA to nominate an adjudicator. In both of the above situations, the ACA shall respond in writing within seven working days from the receipt of the claimant’s application.

The agreed or nominated adjudicator shall within three working days from the written request of the claimant to act as adjudicator serve a written notice stating that he/she is willing and able to act as adjudicator. The notice shall also state the proposed terms of appointment and fees (if it differs from those published in the regulations), contain a declaration that there is no conflict of interest, and contain any disclosure that may prejudice the adjudicator.

Upon service of the above notice, the agreed or nominated adjudicator may hold a preliminary meeting with the parties to acquaint with the dispute and afford an opportunity to the parties to resolve the dispute amicably.

The agreed or nominated adjudicator shall within five working days from the service of the above notice serve on the parties a written notice of acceptance of appointment. This notice confirms the appointment of the adjudicator based on the terms of appointment and fees. The adjudicator may direct the parties to contribute and deposit in equal share a reasonable portion of the fees as security to be deposited with the ACA.

The claimant shall serve on the adjudicator and the respondent the adjudication claim and supporting documentations within 10 working days (or any further time agreed by the parties: 12

Section 12(1) of the proposed Construction Industry Payment and Adjudication Act (CIPAA) stipulates that a party to a construction contract has the right at any time to refer to adjudication any dispute or disputes arising under or in connection with the construction contract including withholding of certificate and non payment of payment claim made under the Act. Section 12(2) provides that the right to refer is not jeopardised even if the dispute is the subject of proceedings in court, arbitration or other dispute resolution process.

Section 14(2) stipulates that the notice of adjudication shall state the nature and a brief description of the dispute or disputes, state the remedy sought and state that it is made under the Act.

Section 14(1) of the proposed CIPAA.

Section 15(1) of the proposed CIPAA.

Section 15(4) of the proposed CIPAA.

Section 2 of the proposed CIPAA specifies that an Adjudication Control Authority means the body prescribed by the Minister to administer adjudication for the purposes of the Act.

Sections 15(2) and (3) of the proposed CIPAA.

Sections 15(2) and (3) of the proposed CIPAA.

Section 17(1) of the proposed CIPAA.

Section 17(3) of the proposed CIPAA.

Section 17(4) of the proposed CIPAA.

Ibid.

Section 31(3) of the proposed CIPAA.
or which the adjudicator may reasonably allow) from the receipt of the notice of acceptance of appointment of adjudicator.\textsuperscript{25}

- The respondent shall serve on the adjudicator and the claimant a written adjudication response\textsuperscript{26} within ten working days from the receipt of the adjudication claim (or any further time agreed by the parties or which the adjudicator may reasonably allow).\textsuperscript{27}

- The claimant shall serve on the adjudicator and the respondent a written reply within five working days from the receipt of the adjudication response.\textsuperscript{28}

- The adjudicator is empowered to establish the procedure including limiting the submission, require further submissions and set deadlines for submission of documents from by the parties.\textsuperscript{29} The adjudicator may use own specialist knowledge, appoint independent experts with the consent of the parties, call for meetings and conduct any hearing, carry out inspection of the site, work, material or goods relating to the dispute including opening up of work done.\textsuperscript{30} He/she may also open up, review and revise any certificate, decision, instruction, opinion or valuation or the parties or contract administrator, and decide on any matter although no certificate has been issued in respect of the matter.\textsuperscript{31} The adjudicator is also empowered to inquisitorially take the initiative in ascertaining the facts and the law required for the decision, issue such directions as may be necessary, order the interrogatories to be answered, and order that any evidence to be given on oath or affirmation.\textsuperscript{32}

- After taking into consideration all matters found by and brought before the adjudicator in the proceedings, the adjudicator shall decide the dispute within forty two working days from the service of the adjudication response, or reply to the adjudication response (if any), or from the time prescribed for the service of the adjudication response if none has been served, or such further time as agreed by the parties.\textsuperscript{33}

- The decision shall be in writing, containing reasons unless dispense with by the parties.\textsuperscript{34} The adjudicator shall determine the adjudicated amount (if any) to be paid by one party to the other, the date on which it is to be paid, and other matters in dispute on rights and obligations of the parties.\textsuperscript{35} The adjudicator is also empowered to award financing costs and interest.\textsuperscript{36} The adjudicator may require full payment of the fees and expenses to be deposited with the ACA before releasing the decision to the parties.\textsuperscript{37}

\textsuperscript{25} Section 18 of the proposed CIPAA.
\textsuperscript{26} Section 19(2) provides that the adjudication response shall answer the adjudication and may include cross claim and supporting documents by the respondent provided the cross claim was included in the payment response where the claimant has previously served a payment claim under the Act.
\textsuperscript{27} Section 19(1) of the proposed CIPAA.
\textsuperscript{28} Section 19(4) of the proposed CIPAA.
\textsuperscript{29} Sections 24(a) to (c) of the proposed CIPAA.
\textsuperscript{30} Sections 24(d) to (h) of the proposed CIPAA.
\textsuperscript{31} Sections 24(m) and (n) of the proposed CIPAA.
\textsuperscript{32} Sections 24(i) to (l) of the proposed CIPAA.
\textsuperscript{33} Sections 26(1) and (2) of the proposed CIPAA.
\textsuperscript{34} Section 26(3) of the proposed CIPAA.
\textsuperscript{35} Section 26(4) of the proposed CIPAA.
\textsuperscript{36} Section 24(o) of the proposed CIPAA.
\textsuperscript{37} Section 31(d) of the proposed CIPAA.
• If a party is dissatisfied with the decision of the adjudicator, the aggrieved party may within seven working days from the receipt of the adjudication decision make a written application accompanied with other relevant documents, to the ACA with a copy to the other party for a review of the adjudication decision.\textsuperscript{38}

• The party applying for a review shall with the application, deposit with the ACA the adjudication review fee and the adjudicated amount (if any) payable to the party as ordered in the adjudication decision, as stakeholder pending the determination of the adjudication review.\textsuperscript{39}

• The ACA shall appoint a panel of three adjudicators within seven working days from the receipt of the application for review of the adjudication decision and the payment of the adjudication review fee and the adjudicated amount (if applicable) and notify the parties of the appointment in writing.\textsuperscript{40}

• The review adjudicators are provided the same powers as that of the original adjudicator. They may confirm, set aside or vary the adjudication decision as they consider appropriate.\textsuperscript{41}

• The review adjudicators shall determine the review within fourteen working days from the appointment by the ACA or such further time as agreed to by the parties.\textsuperscript{42} The determination shall be decided by a majority decision.\textsuperscript{43}

• The adjudication decision or the adjudication review determination is binding unless set aside by the High Court,\textsuperscript{44} the subject matter of the decision is settled by agreement between the parties, or the dispute is finally decided by arbitration or the court.\textsuperscript{45}

• If a party refuses to pay the adjudicated amount, the unpaid party may apply to the court to enforce the adjudication as a court judgment,\textsuperscript{46} suspend performance or reduce the rate of performance,\textsuperscript{47} or make a written request to the principal to pay the outstanding adjudicated amount.\textsuperscript{48}

Under the proposed CIPAA, adjudication is not a condition precedent to arbitration, litigation, or other dispute resolution mechanism. It is an entitlement which is statutorily provided in the event a party wishes to invoke adjudication. Once adjudication is initiated, the other party is drawn into it (CIDB, 2008). However, the parties are not prevented from resorting to another dispute resolution process, regardless of whether or not the proceedings take place concurrently with the adjudication.

\textsuperscript{38} Sections 27(1) and (2) of the proposed CIPAA.
\textsuperscript{39} Section 27(3) of the proposed CIPAA.
\textsuperscript{40} Section 27(4) of the proposed CIPAA.
\textsuperscript{41} Sections 28(2) and (3) of the proposed CIPAA.
\textsuperscript{42} Section 28(1) of the proposed CIPAA.
\textsuperscript{43} Section 28(3) of the proposed CIPAA.
\textsuperscript{44} Section 34 of the proposed CIPAA provides that the aggrieved party may apply to the High Court to set aside the decision if the decision was improperly procured through fraud, bribery, denial of natural justice, or the adjudicator acted in excess of jurisdiction.
\textsuperscript{45} Section 13(4) of the proposed CIPAA.
\textsuperscript{46} Section 36(1) of the proposed CIPAA.
\textsuperscript{47} Section 37(1) of the proposed CIPAA.
\textsuperscript{48} Section 38(1) of the proposed CIPAA.
proceedings. Other dispute resolution mechanisms can co-exist, and complement each other. Similar to the Malaysian Arbitration Act 2005, the proposed Act is also strongly influenced by the New Zealand Construction Contracts Act 2002. At present, this proposed Act is awaiting approval to be tabled before the Malaysian Parliament.

The proposed CIPAA is not without disapproval and Ameer Ali (2007) dealt with several of the concerns. One of the point of interest raised by the Malaysian Bar was that the proposed Act would exclude certain competent professionals from being selected as adjudicators. In relation to this, it was clarified that there was no attempt in the proposed Act to exclude or include any particular group of professionals from either representing the parties or to be selected as adjudicators. The Bar also questioned whether payments and claims were really an issue as there was no empirical evidence to support that there cash flow problem in the industry. In answer to this, the regular surveys conducted by the Master Builders Association Malaysia and also a survey carried out by University of Malaya has confirmed the existence of the issue. Another concern is the possibility of statutory adjudication leading to a reduction in construction arbitration. If this occurs, then it should be better for the construction industry since parties could move on to complete their projects.

Other points that were raised included the possibility of „ambush” where the claimant can spend a long time preparing their case while only allowing the respondent a limited time to respond (SCL, 2008). The other aspect is whether adjudication is suitable for complex issues in dispute especially if it is further substantiated with massive documentation, which an adjudicator have to decide within a restricted time. Another concern is on the availability of suitable competent adjudicators who are able to determine the dispute within the prescribed time frame (Premaraj, undated).

5. Observation

Malaysia without doubt needs to head towards reforming the applicable laws as well as exploring efficient and economical ways to dispense justice in the construction industries. At present, the Malaysian government has undertaken several reform measures to improve the arbitration process (AGC, 2008). The measures include amendments to the Arbitration Act 2005 as well as upgrading the role of the KLRCA ((Lim, 2009). The courts in Malaysia have acknowledged the importance of ADR, particularly mediation. Pursuant to this, a Mediation Act is also reported to be in the pipeline which is proposed to provide for a court mandated mediation system that would help clear the backlog of civil cases (BERNAMA, 2008). There is yet to be a proposed model available for public viewing. The introduction of the statutory adjudication in Malaysia through the proposed CIPAA is also seen to be an innovative step for Malaysia. When both the proposed Mediation Act and CIPAA come into force, it would be of interest to gauge the approach of the construction industry participants towards these Acts. The Malaysian Bar Council has also undertaken an initiative to improve construction litigation by proposing to set up a specialised construction court modelled after the Technology and Construction Court (TCC) of the UK (Lim, 2009). This court would provide expertise, efficient system and affordable justice that are able to deal with all construction cases

49 Section 13(1) of the proposed CIPAA.
commenced in court as well as appeals and applications arising from arbitration and the imminent adjudication. With all the initiatives and proposals by respective agencies, there is a high possibility that soon ADR shall be a common feature/method in resolving construction disputes in Malaysia.

References


BERNAMA (2009) Speech by Second Minister of Finance, Datuk Ahmad Husni Hanadzlah on 10 Nov during the Sidang Kemuncak Pembinaan Malaysia Kedua 2009, 10 November.


Appendix A

PWD (203 A) 2007

65. ARBITRATION

65.1 If any dispute or difference shall arise between the Government and the Contractor out of or in connection with the contract, then parties shall refer such matter, dispute or difference to the officer named in Appendix for a decision.

65.2 The officer named in Appendix's decision shall be in writing and shall subject to clause 65.4 hereof, be binding on the Parties until the completion of the Works and shall forthwith be given effect to by the Contractor who shall proceed with the Works with all due diligence whether or not notice of dissatisfaction is given by him.

65.3 If the Parties-

(a) Fails to receive a decision from the officer named in the Appendix within forty-five (45) days after being requested to do so; or

(b) Is dissatisfied with any decision of the officer named in the Appendix,

then such dispute or difference shall be referred to arbitration within forty-five (45) days to an arbitrator to be agreed between the Parties and failing such agreement, to be appointed by the Director of the Regional Centre for arbitration in Kuala Lumpur on the application of either Party hereto. Such arbitration shall be heard at the Kuala Lumpur Regional Centre for Arbitration and shall be conducted in accordance with the rules for arbitration of the Kuala Lumpur Regional Centre for Arbitration using the facilities and the system available at the Centre.

65.4 Such reference, except on any difference or dispute under clause 52 hereof shall not be
commenced until after the completion or alleged completion of the Works or determination or alleged determination of the Contractor's employment under this Contract, or abandonment of the Works, unless with the written consent of the Government and the Contractor.

65.5 In the event that such consent has been obtained in accordance with clause 65.4, the reference of any matter, dispute or difference to arbitration pursuant to this clause and/or the continuance of any arbitration proceedings consequent thereto shall in no way operate as a waiver of the obligations of the parties to perform their respective obligations under this Contract.

65.6 In any arbitration proceedings conducted pursuant to clause 65.3, the Parties may make any counter claim in relation to any dispute or difference arising from the Contract.

65.7 Upon every or any such reference the costs of such incidental to the reference and award shall be in the discretion of the Arbitrator who may determine the amount thereof, or direct the amount to be taxed as between solicitor and client or as between party and party, and shall direct by whom and to whom and in what manner the same be borne, award and paid.

65.8 The award of the Arbitrator shall be final and binding on the Parties.

65.9 In the event of the death of the arbitrator or his unwillingness or inability to act, then the Government and the Contractor upon agreement shall appoint another person to act as the arbitrator, and in the event the Government and the Contractor fail to agree on the appointment Of an arbitrator, an arbitrator shall be appointed by the Director of the Regional Centre for Arbitration in Kuala Lumpur.

65.10 In this clause, "reference" shall be deemed to be reference to arbitration within the meaning of the Arbitration Act 2005.

65.11 The arbitration shall be governed by the Arbitration Act 2005 and the laws of Malaysia.

Appendix B

PAM 2006

30.0 Certificates and Payment

30.1 ...

30.4 The Employer shall be entitled to set-off all cost incurred and loss and expense where it is expressly provided under Clauses 2.4, 4.4, 5.1, 6.5(e), 6.7, 14.4, 15.3(b), 15.3(c), 15.4, 15.5, 19.5 and 20.A.3. No set-off under this clause may be made unless:

30.4(a) the Architect or Quantity Surveyor (on behalf of the Employer) has submitted to the Contractor complete details of their assessment of such set-off; and

30.4(b) the Employer or the Architect on his behalf has given the Contractor a written notice delivered by hand or by registered post, specifying his intention to set-off the amount and the grounds on which such set-off is made. Unless expressly stated elsewhere, such written notice shall be given not later than twenty eight (28) Days before any set-off is deducted from any payment by the Employer.

Any set-off by the Employer shall be recoverable from the Contractor as a debt or from any monies due
or to become due to the Contractor under the Contract and/or from the Performance Bond.

If the Contractor after receipt of the written notice from the Employer or the Architect on his behalf, disputes the amount of set-off, the Contractor shall within twenty one (21) Days or receipt of such written notice, send to the Employer delivered by hand or by registered post a statement setting out the reasons and particulars for such disagreement. If the parties are unable to agree on the amount of set-off within a further twenty one (21) Days after the receipt of the Contractor’s response, either party may refer the dispute to adjudication under Clause 34.1. The Employer shall not be entitled to exercise any set-off unless the amount has been agreed by the Contractor or the adjudicator has issued his decision.

30.5 …

34.0 Adjudication And Arbitration

34.1 Reference to adjudication is a condition precedent to arbitration for disputes under Clause 30.4. The parties by written agreement are free to refer any other disputes to adjudication. Any dispute under Clause 30.4 after the date of Practical Completion shall be referred to arbitration under Clause 34.5.

34.2 Where a party requires a dispute or difference under Clause 34.1 to be referred to adjudication, such disputes or differences shall be referred to an adjudicator to be agreed between the parties. If after the expiration of twenty one (21) Days from the date of the written notice to concur on the appointment of the adjudicator, there is a failure to agree on the appointment, the party initiating the adjudication shall apply to the President of Pertubuhan Akitek Malaysia to appoint an adjudicator, and such adjudicator so appointed shall be deemed to be appointed with the agreement and consent of the parties to the Contract.

34.3 Upon appointment, the adjudicator shall initiate the adjudication in accordance with the current edition of the PAM Adjudication Rules or any modification or revision to such rules.

34.4 If a party disputes the adjudicator's decision, he shall nevertheless be bound by the adjudicator's decision until Practical Completion but shall give a written notice to the other party to refer the dispute which was the subject of the adjudication to arbitration within six (6) Weeks from the date of the adjudicator's decision. The adjudicator's decision shall be final and binding on the parties if the dispute on the adjudicator's decision is not referred to arbitration within the stipulated time. The parties may settle any dispute with the adjudicator's decision by written agreement between the parties or by arbitration under Clause 34.5.

34.5 In the event that any dispute or difference arises between the Employer and Contractor, either during the progress or after completion or abandonment of the Works regarding:

34.5(a) any matter of whatsoever nature arising under or in connection with the Contract;

34.5(b) any matter left by the Contract to the discretion of the Architect;

34.5(c) the withholding by the Architect of any certificate to which the Contractor may claim to be entitled to;
34.5(d) the rights and liabilities of the parties under Clause 25.0, 26.0, 31.0 or 32.0; or

34.5(e) the unreasonable withholding of consent or agreement by the Employer or Contractor,

then such disputes or differences shall be referred to arbitration.

34.6 Upon the disputes or differences having arisen then:

34.6(a) any party may serve written notice on the other party that such disputes or differences shall be referred to an arbitrator to be agreed between the parties; and

34.6(b) if after the expiration of twenty one (21) Days from the date of the written notice to concur on the appointment of the arbitrator, there is a failure to agree on the appointment, the party initiating the arbitration shall apply to the President of Pertubuhan Akitek Malaysia to appoint an arbitrator, and such arbitrator so appointed shall be deemed to be appointed with the agreement and consent of the parties to the Contract.

34.7 Upon appointment, the arbitrator shall initiate the arbitration proceedings in accordance with the provisions of the Arbitration Act 2005 or any statutory modification or re-enactment to the Act and the PAM Arbitration Rules or any modification or revision to such rules.

34.8 The arbitrator shall without prejudice to the generality of his powers, have power:

34.8(a) to rectify the Contract so that it accurately reflects the true agreement made by the Employer and Contractor;

34.8(b) to direct such measurements and/or valuations as may in his opinion be desirable in order to determine the rights of the parties;

34.8(c) to ascertain and award any sum, which ought to have been the subject of or included in any certificate;

34.8(d) to open up, review and revise any certificate, opinion, decision, requirement, or notice;

34.8(e) to determine all matters in dispute submitted to him in the same manner as if no such certificate, opinion, decision, requirement or notice had been given;

34.8(f) to award interest from such dates at such rates and with such rests as he thinks fit

34.8(f)(i) on the whole or part of any amount awarded by him in respect of any period up to the date of the award;
34.8(f)(ii) on the whole or part of any amount claimed in the arbitration and outstanding at the commencement of the arbitral proceedings but paid before the award was made, in respect of any period up to the date of payment; and

34.8(g) to award interest from the date of the award (or any later date) until payment, at such rates and with such rests as he thinks fit on the outstanding amount of any award.

34.9 Where any dispute arises between the Employer and Contractor and the dispute relates to the works of a Nominated Sub-Contractor and arises out of or is connected with the same dispute between the Contractor and such Nominated Sub-Contractor, the Employer and Contractor shall use their best endeavour to appoint the same arbitrator to hear the dispute under Clause 293 of the PAM Sub-Contract 2006.

34.10 Unless with the written agreement of the Employer and Contractor, such arbitration proceedings shall not commence until after Practical Completion or alleged Practical Completion of the Works or determination or alleged determination of the Contractor's employment under the Contract or abandonment of the Works except on:

34.10(a) the question of whether or not me issuance of an instruction is empowered by these Conditions;

34.10(b) any dispute or difference under Clauses 31.0 and 32.0;

34.10(c) whether or not a certificate has been improperly withheld or not in accordance with these Conditions; or

34.10(d) whether or not a payment to which the Contractor may claim to be entitled has been properly withheld in accordance with these Conditions.

34.11 The award of such arbitrator shall be final and binding on the parties.

35.0 Mediation

35.1 Notwithstanding Clause 34.0 of these Conditions, upon the written agreement of both the Employer and Contractor, the parties may refer any dispute for mediation. If the parties fail to agree on a mediator after twenty one (21) Days from the date of the written agreement to refer the dispute to mediation, any party can apply to the President of Pertubuhan Akitek Malaysia to appoint a mediator. Upon appointment, the mediator shall initiate the mediation in accordance with the PAM Mediation Rules or any modification or revision to such rules.

35.2 Prior reference of the dispute to mediation under Clause 35.1 shall not be a condition precedent for its reference to adjudication or arbitration by either the Contractor or the Employer, nor shall any of their rights to refer the dispute to adjudication or arbitration under Clause 34.0 of these Conditions be in any way prejudiced or affected by this clause.
Appendix C

CIDB Standard Form of Contract for Building Works 2000

47 SETTLEMENT OF DISPUTES

47.1 Reference to the Superintending Officer

(a) Subject to Clause 43.2 and Clause 47.4, if a dispute or difference of whatsoever kind shall arise between the Employer or the Superintending Officer and the Contractor in connection with or arising out of the Contract or, whether during the execution of the Works or after their completion and whether before or after any determination of the Contractor's employment, including any dispute or difference as to any opinion, instruction, determination, decision, certificate or valuation of the Superintending Officer, it shall in the first place be referred by either party to the Superintending Officer for his decision. Such reference shall state that it is made pursuant to this Clause 47.1 and a copy shall be sent to the other party to the Contract.

(b) No later than the expiry of 30 Days after the date upon which the Superintending Officer has received such reference, the Superintending Officer shall give his decision in writing to the Employer and to the Contractor which shall be final and binding on the parties to the Contract unless, as hereinafter provided, either party requires that the decision should be referred to mediation under Clause 47.2.

(c) Unless the Contract has already been repudiated or the employment of the Contractor determined or the execution of the Works completed, the Contractor shall, in case of any reference, continue to proceed with the Works in accordance with his obligations under the Contract and the Contractor and the Employer shall give effect forthwith to every decision of the Superintending Officer unless and until the same shall be revised by mediation under Clause 47.2 or an arbitrator under Clause 47.3 (or as may be otherwise ordered by a tribunal of competent jurisdiction).

47.2 Reference to Mediation

(a) If the Superintending Officer fails to give his decision by the expiry of the 30-Day period following the date on which the Superintending Officer received the reference to him of any dispute or difference, or if either party be dissatisfied with any decision of the Superintending Officer pursuant to Clause 47.1 (such dissatisfaction shall be deemed a dispute), then the Employer or the Contractor may within a further 90 Days after the expiration of the said 30 Day period or 90 Days after receiving the Superintending Officer's decision, as the case may be, give notice to the other party with a copy to the Superintending Officer of his intention to refer the dispute or difference to mediation (hereinafter referred to as the "Request for Mediation").

(b) Upon service of a Request for Mediation the dispute or difference shall be subjected to mediation between the parties in accordance with the CIDB Mediation Rules. Provided however if the Request for Mediation is served after the expiration of the 90 Day time limit stipulated by sub-clause 47.2(a) the recipient shall not be obliged to participate in a mediation and the mediation shall not proceed further without the recipient's written consent.

(c) Upon the dispute or difference being resolved in mediation, such resolution shall be recorded in a settlement agreement and the parties shall give effect to this agreement accordingly. A copy of the
settlement agreement shall be given to Superintending Officer who shall take notice of the same and where applicable give effect to the terms of the settlement agreement in discharging his duties and authorities under the Contract.

(d) It shall be a condition precedent to the commencement of arbitration proceedings under Clause 47.3 that the issues arising in the dispute or difference shall have been the subject of a reference to mediation in accordance with Clause 47.2. If the parties fail to achieve any settlement at the mediation then upon the termination of the mediation pursuant to the CIDB Mediation Rules, either party may refer the dispute or difference to arbitration and the final decision of an arbitrator under Clause 47.3.

47.3 Reference to Arbitration

(a) Subject to sub-clause 47.2(c), the Employer or the Contractor may within 14 Days after the termination of the mediation, give notice to the other party with a copy to the Superintending Officer of his intention to refer the dispute or difference to arbitration (hereinafter referred to as the "Notice of Arbitration") and the final decision of an arbitrator. The arbitrator may be agreed upon by the parties and where the parties fail to agree within 14 Days of the Notice of Arbitration then either party may request the Appointer of Arbitrator named in the Appendix to appoint an arbitrator.

(b) Subject to Clause 47.4, arbitration proceedings shall not, without the other party's consent in writing, be initiated before the Date of Practical Completion of the Works or alleged Date of Practical Completion (or if there is more than one such Date of Practical Completion, the latest) or the determination or alleged determination of the Contractor's employment under the Contract except on the question of:

(i) whether or not the issue of an instruction is empowered by the Contract; or

(ii) whether or not a payment has been improperly withheld; or

(iii) whether a payment is not in accordance with the Contract; or

(iv) whether either party has withheld or delayed consent where such consent is not to be unreasonably withheld or delayed.

(c) The Notice of Arbitration under this Clause 47.3 shall be deemed to be a submission to arbitration within the meaning of the Arbitration Act 1952 or any amendment or re-enactment of the said Act.

(d) The arbitrator shall have power to –

(i) open up, review and revise any certificate, opinion, decision, requisition or notice; and

(ii) determine all matters in dispute which shall be submitted to him, and of which notice shall have been given in accordance with sub-clause 47.3(a) in the same manner as if no such certificate, opinion, decision, requisition or notice had been given; and

(iii) award damages including interest or financing charges for the period before and after the date of the award at such rate as he may in his discretion consider to be appropriate.
(e) Upon every or any such reference the costs incidental to the arbitration and award shall be the discretion of the arbitrator who may determine the amount of costs, or direct the amount to be taxed as between solicitor and client or as between party and party, and shall direct by whom and to whom and in what manner the same shall be borne and paid.

(f) The award of the arbitrator shall be final and binding on the parties.

(g) In the event of:

   (i) death of the arbitrator; or

   (ii) refusal or incapability of the arbitrator to act; or

   (iii) removal of the arbitrator by the court or by mutual agreement of the parties;

the parties shall mutually agree on a replacement. If the parties fail to agree on a replacement within 14 Days of any of the said events then either party may request the Appointer of Arbitrator named in the Appendix to appoint such replacement.

(h) The place of arbitration shall be in the place named in the Appendix.

47.4 Settlement of Dispute in the Event of Determination

Notwithstanding Clause 47.1, if the dispute or difference concerns the determination of the employment of the Contractor or the termination, repudiation or abandonment of the Contract by either party, such dispute or difference shall not be referred to the Superintending Officer for decision pursuant to Clause 47.1 but shall be referred to mediation and if not so resolved pursuant to Clause 47.2 then to arbitration in accordance with Clause 47.3.
General Framework for Risk-Managed Performance-Based Building (RM-PBB)

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Abstract

Building actors must ensure compliance with laws and regulations, while providing building end-users with products that conform to what is established within contractual agreements. These building actors also face the increasing need to deliver highly aggregated and easily communicable information (e.g., quality and/or performance labels) as well as risk-related information for financial and insurance institutions to use in lending decisions, in the first case, or calculating insurance premiums, in the latter. While some countries are looking to reduce the issues addressed in building regulations in face of an ever-increasing global market place, there is the need to strengthen the capacity for responsibility of the various actors and market participants. For this reason, it is essential that adequate decision supportive information is available. Aiming at this goal, many research efforts and official initiatives have contributed with more or less sophisticated frameworks that are being used both in regulatory and non-regulatory environments. Existing initiatives include performance-based model codes (Nordic, IRCC and Performance System models) and standards (Systems Approach, ASTM WBFS, ISO 15928 series) as well as standardized management systems and guidelines (ISO 9001, ISO 14001, ILO-OSH 2001, ISO 10006, ISO 31000) and their infrastructure of support (ISO 19011, ISO 17021). This paper endeavours the conciliation of these existing initiatives into a single proposal for the building sector – a General framework for Risk-Managed Performance-Based Building (RM-PBB). This new proposal has the potential to address the full spectrum of building quality/performance/risk and links four converging markets: housing, property, construction, insurance and financing. This paper describes the background of this general framework and its seven interrelated basic elements: i) strategic management; ii) information modelling; iii) technical specification; iv) technical evaluation; v) technical control; vi) technical reporting and; vii) technical auditing.

Keywords: construction management, building, risk, performance, quality
1. Introduction

The management of a building project includes planning, organizing, monitoring, controlling and reporting of all aspects related to the project (including conformance against requirements and the constraints of time, cost and resources), as well as the motivation of all those involved in the achievement of the project objectives (adapted from ISO 10006).

Management models and frameworks may facilitate the complex task of consistently incorporating the wide range of objectives that must be addressed throughout all activities of a building project. They also facilitate communication amongst stakeholders. For this reason, several management models and frameworks have been developed. This paper presents some of the most prominent.

For example, quality management systems (based on ISO 9001, ISO 9004 or ISO 10006), environmental management systems (based on ISO 14001), occupational safety and health management systems (based on ILO-OSH 2001), and risk management guidelines (based on ISO 31000 and ISO 10006) are increasingly accepted by building practitioners (see standardized management systems and guidelines in figure 1).

Figure 1: Background of Risk-Managed Performance Based-Building (RM-PBB)

Moreover, organizations implementing management systems often seek independent demonstration (certification and/or recognition) that such systems manage the aspects relevant to its activities in line with its policy. The credibility of any demonstration initiatives is highly dependent on an adequate
infrastructure supporting such management systems (see figure 1). Thus, one must also take into consideration existing international guidelines for management systems auditing (ISO 19011) as well as the requirements for bodies providing audit and certification of management systems (ISO/IEC 17021).

Seemingly, models and frameworks originated from the performance-based building (PBB) concept (see figure 1) are more and more relevant for the building subsector. These include performance-based model codes and standards, such as the NKB Nordic Model (NKB, 1978), the IRCC eighth-tiered model (Meacham, 2004b), the CIB TG 37 Performance System Model (CIB, 2004), the NBS Systems Approach (Hattis, et al., 2001), the ASTM Standards on Whole Building Functionality and Serviceability (ASTM, 2000) and the ISO 15928 series for the description of performance of houses (ISO/PAS 22539).

Existing initiatives that facilitate the management of building projects are typically inspired in business ‘cultures’ such as quality, risk and performance. These business ‘cultures’ are interrelated and, if properly adapted to the particularities of building projects, can be merged into a general framework for Risk-Managed Performance-Based Building (RM-PBB) approach. The discussing on the merging of these three business ‘cultures’ and its relation with the RM-PBB has been presented elsewhere (Almeida, et al., 2010).

2. RM-PBB background

Risk-Managed Performance-Based Building (RM-PBB) is a new general approach proposed for the building sector. The overall goals (and expected results) of this general approach are: i) improving building quality (and reduction of defects); ii) harmonize the interests of various stakeholders (and enhance interaction amongst the housing property, construction, insurance and banking markets); and; create a new business model rooted on the continuous improvement of present practice (without disrupting implemented best practices).

2.1 RM-PBB key principles

The underlying key principles of RM-PBB are: i) end-user (society and individuals) requirements should be the driving force for capturing building related information; ii) all stakeholders should benefit from a communication strategy centred on the delivered building product; iii) building information should be translated and adapted into formats suitable for stakeholders such as banks and insurance companies; iv) stakeholder liability and end-user protection against non-conforming buildings should increase and; v) conformance against technical requirements (audited from an engineering standpoint) should be considered as imperative, regardless of other type of requirements.
2.2 RM-PBB framework design

All the quality-based, performance-based and risk-based initiatives presented above can be used as "inputs" for designing a robust and comprehensive general framework that outlines a RM-PBB approach. This general framework suits all stakeholders – such as authorities, owners, designers, end-users, banks, insurers, rating agencies and auditing bodies – that need to address the full technical spectrum of a building product quality/performance/risk.

The designing process is based on the conciliation of quality, performance and risk based "inputs", namely (see table 1):

i) the merge of existing performance-based models;

ii) the incorporation of risk management concepts (especially risk management processes) and;

iii) the consideration of quality-based management systems and its infrastructure of support.

Table 1: Conciliation of design "inputs" towards a RM-PBB framework form

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<thead>
<tr>
<th>Framework elements (see figure 2)</th>
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<td>NBS Systems Approach</td>
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<td>ISO (9001, 31000, 10006, etc.) quality management processes</td>
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<td>ISO 19011 and ISO/IEC 17021 infrastructure of support</td>
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3. RM-PBB general framework elements

All design "inputs" can be conciliated into a robust and comprehensive form that outlines a RM-PBB general framework. This general framework comprises seven interrelated elements (strategic
management, information modelling, technical specification, technical evaluation, technical control, technical reporting and technical auditing), as shown in Figure 2.

Figure 2: RM-PBB general framework

### 3.1 Strategic management (element 1)

CIB working groups and task forces focusing on the performance-based approach have long concluded that successful implementation of performance-based regulatory systems is beyond code discussion and that additional attention should be paid to issues such as liability, insurance, accreditation, qualifications, dispute resolution and impact on international trade (CIB, 2004; CIB, 1997), education, public policy and support infrastructure such as professional registrations and product approval processes (Bakens, 2005; Tubbs, 2004). Such issues must be considered within ‘strategic management’ in order to ensure successful operation of the remaining elements of the proposed framework. Each country adapting (risk-informed) performance-based codes has developed frameworks, management models and/or schemes accordingly with their own local particularities and culture, hence with varying degrees of sophistication. Several ISO management systems and guidelines include frameworks suitable for managing building projects and these can be used to assist the development of this element. Some important research on these matters have been undertaken (van der Heijden, 2009), but much more research is needed on this area.

Concerning independent demonstration of results, technical auditors (and the auditing bodies that enclose their activity) should be independent third-parties previously submitted to some form of accreditation and/or acceptance by the users regarding the information they provide (i.e. banks, insurers, end-users or their representatives). Hence, there must be an accreditation program, or any other similar program of conformity assessment, for these technical auditors to be submitted against. Despite the fact that the scope of ISO/IEC 17021 is audit and certification of management systems of all types, it is the authors’ belief that this international standard, along with other CASCO standards, can provide valuable guidance towards further development of this element.
3.2 Information modelling (element 2)

The need for harmonization in sorting, organizing and classifying building related information has long been identified. In this regard, there have been several international efforts that resulted in methodologies such as Building Information Model, Building Product Model, Building Object Model, Building System Model or Building Construction Core Model, among others (ISO 22263; Gielingh, 2008; NIBS, 2007; Spekkink, 2005; ISO/PAS 16793; ISO 10303; Tarandi, 2003; ISO 12006-2; ISO/TR 14177; Wix, 1994; Turner, 1988).

_Information modelling’ can be looked at as a convenient building conceptual representation with the specific purpose of supporting _technical specification’, _technical evaluation’ and _technical control’ of a building project. The critical dimensions of information affecting end-users, owners, insurance companies and others, throughout the entire building lifecycle, which are addresses in this element, are: i) performance requirements modelling (defining and decoupling building performance attributes); ii) risk modelling (characterization and organization of risks that may impact end-users, as well as the building product) and; others (e.g. parts modelling, which consists in disaggregating building geometrical and physical parts that must conform against requirements).

3.3 Technical specification (element 3)

_Technical specification’ is the bridge between engineering practice and risk-informed performance-based building (RI-PBB) environments (IRCC, 2008; Meacham, 2007; May, 2007; IRCC & ARUP, 2006; Becker, 2005; Meacham, 2004a; CIB, 2004; Bukowski, 2003) as it conforms a solid link between the qualitative (_information modelling’) and quantitative (_technical evaluation’ and _technical control’) elements of the RM-PBB framework. This element constitutes a communication platform between the authorities (society end-users representatives) and owners (individual end-users representatives) that need to specify their acceptable level of performance and/or risk, on one side, and the design and construction engineers that need to understand the degree of reliability that they must embed in the delivered building product, on the other. This element allows specification of: i) what is low or high performance; what is low or high risk and; what groups/classes of buildings and structures have similar level of performance and/or tolerable risk to society.

3.4 Technical evaluation (element 4)

The quantitative levels of the NKB model can be combined (Lützkendorf, et al., 2006) into an evaluation method (Horvat, 2005). _Technical evaluation’ captures the essence of both the NKB Nordic Model and the NBS Systems Approach and, subsequently, of the frameworks that derived from them (IRCC model, CIB TG37 PSM, the ASTM WBFS and the ISO 15928 series of standards). This element is aligned with RI-PBB frameworks and includes processes that provide guidance throughout the assessment and treatment of the ‘inherent risk’ of a building project (risks that are more difficult to manage, such as natural catastrophes). This element enables the evaluation of “in-service” building performance – e.g. structural safety (ISO 15928-1), structural serviceability (ISO
15928-2); structural durability (ISO 15928-3); fire safety (ISO 15928-4); energy efficiency (ISO 15928-5); etc. (see ISO/PAS 22539) – and the assessment of the correspondent levels of ‘inherent risk’ embedded in the building design.

3.5 Technical control (element 5)

Performance-based frameworks don’t cover the finite probability of ‘failure’ (to meet the specified level of performance or ‘inherent risk’ established as acceptable/tolerable) due to gross human error during the design and construction phases. However, human failure occurring within the internal resources of the building project is a primary concern (Barber, 2005; El-Sayegh, 2008) that must be addressed. This is the scope of ‘technical control’.

This element of the RM-PBB framework comprises a complete risk management system that deals with ‘factors of aggravation of inherent risk’ arising from gross human error. The practical application of ‘technical control’ is dependent on project-specific data. It is thus important that design and construction related organizations concuring towards completion of the building product implement management systems which are capable of capturing such data. This data can then be converted into useful information for other project participants (Ng, et al., 2005), namely the key participants that implement this element of the RM-PBB framework (i.e. technical controllers).

3.6 Technical reporting (element 6)

Because building information has become so complex (Lützkendorf, et al., 2006), ‘technical reporting’ is a part of the RM-PBB framework that guides technical controllers when presenting results and reporting conclusions of their findings to the different interested parties (i.e. end-users, insurance companies, etc.). This element of the RM-PBB framework can be considered as a mean to recording the risk management processes (ISO 31000).

3.7 Technical auditing (element 7)

As mentioned above, the proposed RM-PBB framework might support independent demonstration of results. Therefore, it is imperative to include some sort of reproducible guidance and methodology that internal or external parties (i.e. technical controllers) can follow when implementing procedures aiming at such demonstration of results. ‘Technical auditing’ is the element of the RM-PBB framework that supports this need. The ISO 19011 standard is not exclusively applicable to quality and environmental management systems, provided that special consideration is paid to identifying the competence needed by the audit team members. Hence, the authors suggest that the principles and methodology of this standard may be used as a solid base for technical auditing, managing technical audit programs, conducting technical audits and defining the competence of technical auditors (i.e. technical controllers).
4. Conclusions

The RM-PBB approach takes performance-based building (PBB) instruments such as codes (Nordic, IRCC and Performance System models) and standards (Systems approach, ASTM WBFS, ISO 15928 series) as a starting point, and enhances this existing PBB frameworks by merging them with the risk management concepts and processes (laid down by ISO 31000 and ISO 10006) and standardized management systems and guidelines (ISO 9001, ISO 14000, ILO-OSH 2001, ISO 10006 and ISO 31000), as well as their infrastructure of support (ISO 19011, ISO 17021).

The proposed RM-PBB framework may be useful for several practitioners and interested parties. The authorities may be provided with valuable information on exposure to damage of values such as the environment, property, health or life itself, as well as extraordinary costs associated with probable damages in buildings (this can be used for planning purposes) and with tools to communicate decisions and ensure compliance with its intents. The owners that need to specify their acceptable level of risk and/or performance may be empowered with a robust communication interface that facilitates interactions with the various stakeholders throughout the different phases of the lifecycle of a building project (designers, constructors, property managers, authorities, banks, insurance companies, technical controllers, etc.). The end-users may be presented with a warranty that the delivered product fulfils the negotiated building quality/performance/risk level and precise information that allows comparing alternatives in the building market. The designers may be enabled with performance-based procedures that are easily incorporable into ordinary design and calculation methods. The technical controllers (independent third parties) may benefit from a consistent, explicit and harmonized infrastructure to guide and support their activity (evaluation, control and communication of the quality/performance/risk to be found in a building, constructed asset or facility, or a building product, or a service). Finally, the banks and insurance companies may be able to support their lending decisions, in the first case, or calculating insurance premiums, in the latter, based on adequate risk related information.

The seven interrelated elements of the proposed RM-PBB general framework (strategic management, information modelling, technical specification, technical evaluation, technical control, technical reporting and technical auditing) are presently being developed by a research group at Technical University of Lisbon (IST) towards their practical application on buildings and, particularly, on structural subsystems.

References


Turner, J. (1988). AEC Building Systems Model, ISO TC 1184/SC4/WG1, Document 3.2.2.4


ISO 10303. Industrial automation systems and integration - Product data representation and exchange: ISO


ISO 19011. Guidelines for quality and/or environmental management systems auditing: ISO, 2002


A key global challenge nowadays is to address climate change and reduce greenhouse gas emissions. Climate change is one of the most pressing issues facing Australia today. Improvements to energy and water efficiency of existing building stocks can significantly cut greenhouse gas emissions and reduce utility bills. With increasing recognition that green buildings outperform conventional buildings, much less known about how green building initiatives can be incorporated into upgrading existing housing stocks. In Australia due to population growth and increased in the size of dwellings coupled with the reduction of number of person per household have put an enormous pressure on energy and water consumption. Existing houses represent approximately 98% of residential building stocks and any improvement to these dwellings will have a profound impact on reducing the negative effects of the environment. This paper examines the sustainable upgrading strategies in improving environmental performance of three existing single dwellings. This paper presents an economic analysis of sustainable upgrading using Net Present Value. The results suggest that sustainable upgrading of existing housing stocks is feasible and the scheme will be more attractive if more government financial assistance is provided.

**Keywords:** sustainable upgrading, BASIX, sustainable house
1. Introduction

A key global challenge nowadays is to address climate change and reduce greenhouse gas emissions (Phillips, 2008). The building sector is increasingly aware of the vulnerability of buildings to the sustainability agenda. Of particular concern is the fact that the building sector is responsible for approximately 23% of Australia’s total greenhouse gas (GHG) emissions (CIE, 2007). Building sustainably provides a way to significantly mitigate environmental impact (CIE, 2007). Previous research has concentrated on the sustainability of new buildings and has developed strong business cases for green buildings. Many support the idea that inefficient existing buildings should be demolished to make way for new and more efficient buildings (Boardment et al., 2005). Demolishing existing buildings and replacing them with new ones is largely preferable in many cases since it is often expensive to upgrade and difficult to make them to meet sustainability standards (Boardman et al., 2005). A key foundation of this argument is that GHG emissions of highly efficient new buildings is far lower than the buildings built in the past due to effective use of insulation and modern technology. However, opponents maintain that new buildings consume natural raw materials and energy in the development which could have been saved by reusing existing buildings (Bullen, 2007). In addition the large amount of carbon embodied in existing buildings, the energy required in demolition and disposal of waste, and the energy required for extraction, production, transport and use of new materials are significant factors (Ireland, 2008).

As new construction activity in the market averages less than 2% of the building stock the importance of focusing on maintenance and refurbishment of existing buildings needs to be emphasised (Bullen, 2007; Power, 2008). With the current rate of rebuilding it would take 50 to 100 years to replace the current building stock whilst existing buildings will continue to perform inefficiently and pollute the environment. In support of this, there are growing calls for the upgrading of existing buildings and even to completely stop new construction to limit the wastage of scarce resources (Kohler, 1999). In Australia there is a significant switch from new buildings to the adaptation and rehabilitation of existing structures. The importance of this trend is to extend the useful life of existing buildings that support the key concepts of sustainability by reducing virgin material consumption, transport and embodied energy, and pollution (Ireland, 2008; Power, 2008).

This paper is intended to shed light on energy and water consumption of Australian homes and the development of strategies to improve the environmental performance of existing housing stocks. It summarises the discussions and arguments, and attempts to clarify the direction towards major reductions in water and energy use in homes. The paper aims 1) to gain a deeper understanding on issues related to refurbishment of existing housings as opposed to new build, 2) to review the current situation of sustainable housing in Australia, 3) to assess and compare environmental performance of three properties of similar size but differing ages in New South Wales (NSW), Australia .4) to examine the conversion strategies in improving environmental performance in meeting the minimum BASIX requirements, 5) to present the research result.
2. Environmental performance of residential buildings - refurbishing or demolishing

Building green has become a standard building practice in the construction industry nowadays. Demolishing an inefficient property may seem to be the best way of reducing energy use and to make way for more new buildings as it is often expensive to upgrade and difficult to refurbish existing houses to meet sustainability standards (Boardman et al., 2005). A key foundation of this argument is that greenhouse gas (GHG) emissions of highly efficient new housing can be far lower than the houses built in the past due to effective use of insulation and the latest technology. This is the underlying principle of the 40 percent house argument in advocating the demolition of a total of 3.2 million houses from 2005 to 2050 (Boardman et al., 2005; Power, 2008). Demolishing houses built in the past is considered to be a way to improve environmental efficiency.

With increasing recognition that green buildings outperform conventional buildings in terms of environmental, social and economic aspects, much less is known about how green building initiatives might be incorporated into existing buildings and little work has been done to examine how existing buildings should be maintained and refurbished for sustainability. If the challenges of climate change and reduced GHG emissions are to be successfully tackled, there is enormous potential to maintain and refurbish the existing building stocks in order to make the current built environment more environmentally-friendly and energy efficient (Bromley et al., 2005; Bullen, 2007). The existing building stock has the greatest potential to lower the environmental load of the built environment significantly within the next 20 or 30 years (Bullen, 2007). Recent research suggests that sustainable maintenance and refurbishment of existing buildings use 23% less energy than new construction (Mickaityte et al., 2008). Moe (2007) further suggests that it will take approximately 65 years for a green and energy-efficient building to recover the energy and resources lost in the demolition of an existing building, even if 40% of the building materials from the demolition are recycled. Power (2008) further states that building, demolition and renovation waste make up about one-third of all landfill which is detrimental to the environment. Consequently, sustainable maintaining and refurbishing of existing buildings may be a more practical way to respond to climate change and other negative impacts on the environment.

There have been research into the environmental value of existing housing and results have demonstrated that the maintenance and conservation of existing housing stocks help to achieve environmental gains as these buildings represent a major investment in natural and human resources (SDC, 2006; Ireland, 2008). A research project undertaken by the Empty Homes Agency, UK reveals that refurbishing existing homes can save up to 35 tonnes of CO₂ per property by removing the need for the energy locked into new build materials and construction. The research also reveals that there is not much difference of new built compared with refurbished housing over an operating period of 50 years (Ireland, 2008).

Research undertaken by the UK Government (Cabinet office, 2000) reveals that the energy produced from non-renewable sources consumed in building accounts for about half of the UK’s emissions of
carbon dioxide. Over 90% of non-energy minerals are used to supply the construction industry with materials. However in each year about 70 million tonnes of construction and demolition materials end up as waste in landfill sites. It is questionable whether the decision to undergo demolition is justified for its energy-efficiency, given that the energy performance of renovated homes can improve significantly over time (SDC, 2006; Ireland, 2008). According to Power (2008) upgrading existing housing stocks can both reduce carbon emissions and environmental impacts of new building through implementing basic energy-efficiency improvement measures including insulation, double glazing, damp-proofing and condensing boilers for heating and hot water.

Despite the increasing recognition for sustainable refurbishment of existing housings there is still strong opposition due to economic constraints and the difficulty to match the sustainable performance of a new house. However despite this there is strong evidence that existing housing stocks has the greatest potential to lower the environmental load of the built environment significantly over the next few decades. The time to convert a building as opposed to new build will have an impact and the work to convert a building will take less time than demolition, site clearance and new build, unless extensive structural alterations or repairs are required. According to some research the cost of refurbishing is generally much less than the cost of new construction, since many of the building elements are already constructed (SDC, 2006). The opposition is further intensified due to the lack of reliable data and methodology to undertake life cycle economic, energy and environmental analysis of building elements, materials and equipments for sustainable maintenance and refurbishment of existing buildings. Little work has been done in these areas. Sustainable maintenance and refurbishment of buildings will require identifying building elements/components that may require regular maintenance, repair and scheduled renovation and their related life expectancy to determine the maintenance cycle over the useful life of the building. However there is a shortage of appropriate, relevant and historical information and data that can be used.

3. Residential energy use in Australia

Australia’s total current residential household is expected to increase from 7.4 million in 2001 to 10.8 million dwellings in 2020, an increase of 47% (DEWHA, 2008; ABS, 2009). Population growth and fewer people per household are the driving force behind housing demand. The total residential floor area is expected to rise from 685 million m$^2$ in 1990 to 1682 million m$^2$ by 2020, an increase of 145%. The average size of new dwellings is increasingly rapidly since 1986. It is expected to increase by approximately 280% by 2020 while the number of households is only projected to increase by 177% over the same period (DEWHA, 2008). Therefore the per person residential energy consumption has been a steady but modest increase from 17 GJ per person in 1990 to 20 GJ by 2020, approximately a 20% increase. The increase is partly being driven by a decline in the number of person per household.

Australians are high energy users. Energy consumption was around 5,688 PJ in the 2005-6 and is expected to rise to 6,479 PJ in the 2011-12 year, representing an increase of 14% (Department of Climate Change, 2009). In Australia, about 95% of the energy comes from burning fossil fuels, causing GHG
emissions (Energy Task Force, 2004). This energy production and use contributed 68% of Australia’s GHG emissions and is expected to grow to 72% by 2020 (Energy Task Force, 2004). Approximately 25% of Australia’s GHG emissions derive from energy consumption in the residential sector. According to the estimate of the DEWHA (2008) residential sector energy consumption has increased from 299 PJ in 1990 to 407 PJ in 2009 and is projected to increase to 468 PJ by 2020 under the current trends, an increase of 56%. The use of electricity as a major source of energy will also increase from 46% in 1990 to 53% in 2020. This will significantly contribute to the growth of GHG emissions. The use of gas whilst increased over the years is still small at 35% compared to electricity at 52% in 2009.

Each household in Australia on average produces more than 15 tonnes of GHG per year which contributes to approximately 20% of Australia’s total greenhouse gas emissions (Reardon, 2004). The largest source of greenhouse gas emissions from households is from energy used to heat, cool, cook, provide lighting and run household appliances, accounting for approximately 42% of total energy consumption per household (Reardon 2004). Hot water heating represents about 30% of home energy use (Blazey & Gillies, 2008). Energy demand for heating and cooling is projected to increase despite the introduction of minimum building shell performance standards. The main factors driving this trend include the floor area of the average new dwelling continues to exceed that of the stock average. The building shell performance standards only affect approximately 2% of the total stock per annum.

The energy consumption of electrical appliances has increased over the years. It consumes of approximately 17% of energy consumption but more than 25% of CO$_2$ from homes (SDC, 2006). In Australia the growth in electrical appliance energy consumption was the largest among major end users and was estimated to increase from 71 PJ in 1990 to 170 PJ in 2020, an approximately 5% average growth per annum. By 2020 electrical appliance energy use is forecast to almost match space heating as the largest single energy use in the averages Australian households (DEWHA, 2008).

Existing housing stocks in Australia are not sustainable and the NSW government is convinced that sustainability is the only way forward. In NSW sustainable housing is an important focus of the government’s housing policy. In response to the need for sustainable housing the government launched a sustainability assessment tool called BASIX in July 2004 as mandatory to all new residential developments. The introduction of BASIX has a profound impact on the environmental performance of new dwellings (Ding, 2007). All new residential buildings have become more environmentally friendly since the introduction of BASIX. The impact is not confined to building practitioners but has also raised awareness amongst home users. However BASIX does not apply its standards to existing housing stocks. That means the existing housing stocks will continue to impact on the environment for the next few decades. More work needs to be done to sustainably upgrading the existing housing stocks so that it can progress to reduce negative environmental impacts. As discussed previously sustainable upgrading of existing housing stocks is a key foundation to achieving the goal of ecological sustainable development.
In response to the need for sustainable improvement of existing housing stocks, a range of federal and NSW state economic schemes have been introduced to encourage the adoption of sustainable building design features and construction strategies. These rebate schemes subsidize to a minor extent the construction of new dwellings. They operate far more widely than compulsory buildings codes to encourage the owners of existing dwellings to adopt sustainability strategies. The Federal government rebate scheme was operated under the Energy Efficient Homes Package and National Rainwater and Greywater Initiative by the Department of the Environment, Water, Heritage and the Arts. The NSW state rebate scheme was operated under the NSW Home Saver Rebates since July 2007. Table 1 summarises the rebate schemes from the federal government and the NSW state in Australia.

### 4. Research method

NSW is one of the largest states in Australia and has the highest growth in both population and energy consumption. NSW is experiencing increased residential construction activity as a consequence of continual urban growth coupled to the decline of average Australian household size (2.6 person in 2006 compared with 3.3 persons in 1976) and the increase in average floor space of approximately 3% over the last 7 years has imposed significant pressure on the environment (ABS, 2009). NSW is the largest energy consumer in Australia accounting for about 28% of final energy consumption, representing a total of 921 PJ in 2000/1, and it is expected to grow by an average of 2.3% each year to 2019/20 (Standing Committee on Public works, 2004). Residential energy consumption makes up 13% of total energy consumed in

### Table 1 – Summary of rebate schemes from the Federal and NSW state government

<table>
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<tr>
<th>Item</th>
<th>Rebate ($)</th>
<th>Sources</th>
<th>Details</th>
<th>Duration</th>
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<td>Solar bonus scheme</td>
<td>0.60 per kWh</td>
<td>NSW</td>
<td>Solar photovoltaic and wind power up to 10kW</td>
<td>7 years from 2011</td>
</tr>
<tr>
<td>Rainwater tank</td>
<td>150 - 500</td>
<td>NSW</td>
<td>Purchase and install rainwater tank</td>
<td>1/7/2007 to 30/6/2011</td>
</tr>
<tr>
<td></td>
<td>400 - 500</td>
<td>Federal</td>
<td>Purchase and install rainwater tank</td>
<td>Since 1/3/2009</td>
</tr>
<tr>
<td></td>
<td>500</td>
<td>Federal</td>
<td>Permanent greywater treatment system</td>
<td>Since 1/3/2009</td>
</tr>
<tr>
<td></td>
<td>500</td>
<td>NSW</td>
<td>Rainwater tank connection to toilets</td>
<td>1/7/2007 to 30/6/2011</td>
</tr>
<tr>
<td></td>
<td>500</td>
<td>NSW</td>
<td>Rainwater tank connection to washing machines</td>
<td>1/7/2007 to 30/6/2011</td>
</tr>
<tr>
<td>Hot water system</td>
<td>300</td>
<td>NSW</td>
<td>Gas hot water system with a 5 Star or higher energy rating</td>
<td>15/1/2010 to 30/6/2011</td>
</tr>
<tr>
<td></td>
<td>300</td>
<td>NSW</td>
<td>Solar or heat pump hot water system</td>
<td>15/1/2010 to 30/6/2011</td>
</tr>
<tr>
<td></td>
<td>1,600</td>
<td>Federal</td>
<td>Solar hot water system</td>
<td>Since 3/2/2009</td>
</tr>
<tr>
<td></td>
<td>1,000</td>
<td>Federal</td>
<td>Heat pump hot water system</td>
<td>Since 3/2/2009</td>
</tr>
<tr>
<td>Hot water circulator</td>
<td>150</td>
<td>NSW</td>
<td>Install with a new or existing instantaneous gas hot water system</td>
<td>15/1/2010 to 30/6/2011</td>
</tr>
<tr>
<td>Insulation</td>
<td>1,200</td>
<td>Federal</td>
<td>Ceiling insulation</td>
<td>Until 31/12/2011</td>
</tr>
<tr>
<td>Washing machine</td>
<td>150</td>
<td>NSW</td>
<td>New washing machine of at least 4.5 Star rated</td>
<td>15/1/2010 to 30/6/2011</td>
</tr>
<tr>
<td>Dual flush toilet</td>
<td>200</td>
<td>NSW</td>
<td>New dual flush toilet suite with a water rating of 4 Star WELs rating or higher for both the cistern and the pan</td>
<td>15/1/2010 to 30/6/2011</td>
</tr>
<tr>
<td>Fridge</td>
<td>35</td>
<td>NSW</td>
<td>Removal of domestic old second fridge</td>
<td>Until 2011</td>
</tr>
</tbody>
</table>

NSW and has risen approximately 20% across NSW over the last ten years due to population growth and the increasing demand of housing (Standing Committee on Public Works, 2004).

The purpose of the research was to explore how sustainable upgrading of existing housing stocks is a way toward achieving ecologically sustainable development. Three case studies were chosen in the northern suburbs of NSW. They were all detached family houses of roughly similar in size and layout but were built in different years using traditional construction methods. The research was a pilot study to gain a better understanding of the total energy and water consumption, and CO$_2$ emissions in running a family house. At this stage only the operational (in-use) consumption and CO$_2$ emitted in the everyday occupation of the houses were measured. The embodied energy and CO$_2$ emission in the materials will not be included in the next stage of the research. Table 2 summarises the background information and the utility consumption on the three case studies from 2004 to 2008.

**Table 2 – Summary of details for case studies**

<table>
<thead>
<tr>
<th></th>
<th>House A</th>
<th>House B</th>
<th>House C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General details</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Location (Suburb)</td>
<td>Wahroonga</td>
<td>Pennant Hills</td>
<td>Hornsby</td>
</tr>
<tr>
<td>Land area (m$^2$)</td>
<td>432</td>
<td>835</td>
<td>542</td>
</tr>
<tr>
<td>GFA (m$^2$)</td>
<td>180</td>
<td>165</td>
<td>229</td>
</tr>
<tr>
<td>Type</td>
<td>4 Bedrooms</td>
<td>4 Bedrooms</td>
<td>4 Bedrooms</td>
</tr>
<tr>
<td>Age (years)</td>
<td>17</td>
<td>30</td>
<td>5</td>
</tr>
<tr>
<td>Construction details</td>
<td>Brick veneer with slab on ground, tiled roof</td>
<td>Brick veneer with suspended timber floor, tiled roof</td>
<td>Brick veneer with slab on ground, tiled roof</td>
</tr>
<tr>
<td>Family member (No)</td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>Gas</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monthly average (MJ)</td>
<td>1,647</td>
<td>2,877</td>
<td>1,543</td>
</tr>
<tr>
<td>Yearly average (MJ)</td>
<td>19,769</td>
<td>34,525</td>
<td>18,512</td>
</tr>
<tr>
<td><strong>Electricity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monthly average (kWh)</td>
<td>437 (1,573 MJ)</td>
<td>365 ((1314 MJ)</td>
<td>383 (1,379 MJ)</td>
</tr>
<tr>
<td>Yearly average (kWh)</td>
<td>5,241 (18,868MJ)</td>
<td>4,381 (15,772 MJ)</td>
<td>4,597 (16,550 MJ)</td>
</tr>
<tr>
<td><strong>Water</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monthly average (KL)</td>
<td>14</td>
<td>23</td>
<td>12</td>
</tr>
<tr>
<td>Yearly average (KL)</td>
<td>172</td>
<td>270</td>
<td>146</td>
</tr>
<tr>
<td>CO$_2$ emission p.a. (kg)</td>
<td>5,625</td>
<td>5,053</td>
<td>4,957</td>
</tr>
<tr>
<td>CO$_2$ emission/person/yr (kg)</td>
<td>1,406</td>
<td>1,684</td>
<td>1,652</td>
</tr>
</tbody>
</table>

**Summary of expenditure of utility consumption for 2004 to 2008**

<table>
<thead>
<tr>
<th></th>
<th>House A</th>
<th>House B</th>
<th>House C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gas</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monthly average ($)</td>
<td>36.90</td>
<td>55.20</td>
<td>35.68</td>
</tr>
<tr>
<td>Yearly average ($)</td>
<td>442.75</td>
<td>662.40</td>
<td>428.14</td>
</tr>
<tr>
<td><strong>Electricity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monthly average ($)</td>
<td>57.35</td>
<td>49.83</td>
<td>51.29</td>
</tr>
<tr>
<td>Yearly average ($)</td>
<td>688.19</td>
<td>597.92</td>
<td>615.46</td>
</tr>
<tr>
<td><strong>Water</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monthly average ($)</td>
<td>55.05</td>
<td>64.75</td>
<td>52.79</td>
</tr>
<tr>
<td>Yearly average ($)</td>
<td>660.60</td>
<td>776.97</td>
<td>633.45</td>
</tr>
</tbody>
</table>
The three houses have been initially inspected to assess the current conditions and to identify areas of improvement. The environmental performance of the three houses has also been assessed using BASIX to consider the performance so as to develop a sustainable direction for upgrading to improve environmental performance and to comply with BASIX requirements. The costs of sustainable upgrading has also be analysed in conjunction with the available government rebates. The analysis highlights the minimum upgrades the property would be required in order to comply with the BASIX benchmarks for new residential development. The utility consumption was assessed for five years from 2004 to 2008 and included in Table 2.

5. Observations and analysis

5.1 Performance assessment

Gas, electricity and water bills were collected for the three houses for the past five years and details are summarised in Table 2 and graphically presented in Figure 1. The table presents the gas, electricity and water consumption on a monthly and yearly basis and the figures present the data on a quarterly basis. From Figure 1, on average Q2 and 3 have the highest gas and electricity consumption. There is a clear cyclical and seasonal pattern characteristic of the increased demand for heating during the winter months followed by reduced demand during the summer months.

From Table 2 the annual gas consumption of House B was the highest whilst the annual electricity consumption of House A was highest. The three houses consume 3220 MJ, 4191 MJ and 2922 MJ respectively for House A, B and C with House B having the highest energy usage, approximately 23% and 30% more than House A and C respectively. However the CO\textsubscript{2} emissions of House A outweigh the other two houses to be the biggest emitter of 5625 kg of CO\textsubscript{2} per year, approximately 11 to 13% more than the other two houses. Even though House B was the uppermost energy end user, approximately 69% were from gas and gas has much lower CO\textsubscript{2} emission than electricity. Nevertheless if the number of household members were taken into account House A has the lowest annual CO\textsubscript{2} emissions of 1406 kg per person whilst House B has the highest annual CO\textsubscript{2} emissions of 1684 kg per person, approximately 20% more than House A. The analysis of energy consumption from the utility bills was only the secondary energy consumption. There may have wastage and loss in the production and delivery processes from the production side to the side of the consumers where insufficient information is available for an accurate calculation. The primary energy can be approximately three times more than the secondary energy as electricity in NSW is generated by burning coal. Therefore the outcomes from the analysis may be much worse than they appear to be.

The water consumption as indicated in Table 2 and Figure 1 has not revealed a clear cyclical or seasonal pattern. In annual water consumption House B was the highest outconsuming the other two by almost 40 to 50%. The annual per person water consumption House B has outweighed House A and C by
approximately 53% and 46% respectively. The three houses were generally above the benchmarks of energy and water consumption, and CO\textsubscript{2} emissions as set within the BASIX benchmarks.

![Utility consumption for 2004 to 2008](image)

**Figure 1** – Utility consumption for 2004 to 2008

BASIX has been used to assess the planning and design of new residential development in NSW since its introduction in July 2004. It has been widely accepted as a benchmark to evaluate environmental performance of residential dwellings. The three houses were assessed using BASIX to determine the performance and used to guide sustainably upgrading for the three houses in the research. The outcomes from the BASIX assessment were used to determine the areas for sustainable upgrading. Table 3 summarise the outcomes of the BASIX assessment which reveals that all three houses passed the thermal comfort assessment but failed the water and energy efficiency appraisal. House B has the worst water score which has only achieved 11% and House C score the worst in energy consumption.

**Table 3** – Summary of BASIX scores for House A, B and C

<table>
<thead>
<tr>
<th>BASIX requirements</th>
<th>Target</th>
<th>Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>House A</td>
</tr>
<tr>
<td>Water efficiency</td>
<td>40%</td>
<td>30%</td>
</tr>
<tr>
<td>Energy consumption</td>
<td>40%</td>
<td>25%</td>
</tr>
<tr>
<td>Thermal comfort</td>
<td>Pass</td>
<td>Pass</td>
</tr>
</tbody>
</table>

5.2 Economic analysis and strategies of sustainable upgrading

As discussed previously sustainable upgrading of existing housing stocks plays an important role in tackle climate change. However it will only be acceptable to households if it is affordable. Table 2 summarises the monthly and yearly expenditure on utilities for the three houses. House B has the highest expenditure.
on utility bills, 12% and 18% higher. Therefore the sustainable upgrading will be attractive if utility bills can be reduced substantially. A sustainable upgrading strategy has been developed after the initial building audit and BASIX assessment for the three houses. It is intended to improve environmental performance of the three houses to comply with BASIX requirements. Table 4 summarises the key sustainable design initiatives proposed for upgrading the three residences to comply with the three sustainability indices addressed by BASIX. There are more initiatives that can be done to further improve sustainable performance of these homes. However more initiatives will incur more costs which will make sustainable upgrading less attractive. Therefore the strategy used was based on the least cost approach to a minimum amount of upgrading that can fulfil the BASIX requirements. The improvements were also focused on the initiatives that government rebates are available so that the upgrading strategy will be more attractive and viable.

Table 4 Summary of key sustainable design initiatives

<table>
<thead>
<tr>
<th>Initiatives</th>
<th>Description</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixtures and fittings</td>
<td>Upgrade of fixtures to bathroom and kitchen to 5 Star WELs rating including dual flush toilet</td>
<td>All houses</td>
</tr>
<tr>
<td>Washing machine</td>
<td>4.5 Star WELs rated</td>
<td>House B only</td>
</tr>
<tr>
<td>Rainwater tank</td>
<td>Installation of 3,000 litre rainwater tank to collect water from roof area. Collected water to be reticulated to toilets for flushing and to at least one outdoor tap to service the garden of the residence</td>
<td>All houses</td>
</tr>
<tr>
<td>Solar hot water system</td>
<td>Replace existing electric storage hot water system</td>
<td>House B only. Both House A and C have already installed with gas hot water system.</td>
</tr>
<tr>
<td>Hot water circulator</td>
<td>Install to all hot water systems</td>
<td>All houses</td>
</tr>
<tr>
<td>Light fittings</td>
<td>Upgrade of existing light fittings to be energy efficient</td>
<td>All houses</td>
</tr>
<tr>
<td>Insulation</td>
<td>Installation of ceiling insulation, R-Value 3.0, including 2 No wind driven ventilators</td>
<td>House A and C only as House B is not eligible with the installation of a solar hot water system.</td>
</tr>
<tr>
<td>Shading devices</td>
<td>All windows to have blinds to improve indoor comfort</td>
<td>All houses</td>
</tr>
</tbody>
</table>

Table 5 summarises the outcomes of analysis of sustainable upgrading using the following formula:

\[
NPV = \sum_{t=1}^{n} \frac{C_t}{(1 + r)^t}
\]

\(C_t\) = net cash flow expected at time period \(t\)  \(n\) = project life span  \(r\) = selected discount rate  \(t\) = the time of the cash flow

Table 5 – Summary of cost-benefit analysis of sustainable upgrading for the cases

<table>
<thead>
<tr>
<th></th>
<th>House A</th>
<th>House B</th>
<th>House C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discounted costs $ (less government rebates)</td>
<td>8,779</td>
<td>9,752</td>
<td>9,753</td>
</tr>
<tr>
<td>Discounted benefits $</td>
<td>12,017</td>
<td>9,414</td>
<td>11,870</td>
</tr>
<tr>
<td>NPV ($)</td>
<td>3,238</td>
<td>-338</td>
<td>2,117</td>
</tr>
<tr>
<td>IRR (%)</td>
<td>10.405</td>
<td>4.445</td>
<td>8.195</td>
</tr>
<tr>
<td>Payback period (year)</td>
<td>17</td>
<td>25</td>
<td>19</td>
</tr>
</tbody>
</table>
The analysis was undertaken on a life span of 30 years at a discount rate of 5%. The improvements have been calculated based on current market rates less the respective government rebates. The NPVs suggest that the sustainable upgrading be accepted as the NPVs are positive and the IRRs are greater than the required rate of return. Only House B has negative NPV and IRR less than the discounted rate which has demonstrated that the sustainably upgrading is not a feasible option for House B. The payback periods were all more than 15 years with House B the longest at 25 years. The long payback period has eventually reduced the attractiveness of sustainable upgrading in the study. However the proposed sustainable upgrading has represented the least that need to be done to satisfy the BASIX assessment and more may be required to match the standards of new houses. The three projects were re-assessed in BASIX and amendments were incorporated into the original assessment. Eventually all three projects passed the three sustainability benchmarks addressed in BASIX.

The results have demonstrated that sustainable upgrading of existing dwellings is not an attractive option at this stage with the current level of government rebate incentive. It impacts on the affordability of sustainable upgrading even though households are aware of the importance of sustainable development. Economic instruments are important drivers in achieving efficiency. BASIX is now mandated only to assess new development and many suggested that it should be improved and extended to assess existing residential dwellings as it will have a more profound impact on the reduction of CO2 emissions. However should such a goal be successful it will be strategically important that the government provide more incentive schemes to support affordability in sustainable upgrading.

6. Conclusions

The analysis of the utility consumption from 2004 to 2008 for the three cases draws parallel with the areas where the dwellings failed in the initial BASIX assessment. This paper has examined the direction for sustainable upgrading and has also presented an economic analysis alongside with the government financial rebates to pass the BASIX assessment. The three houses represent a typical family home in NSW, Australia. Even though a sample of three houses may be considered a small sample size, the results will provide an understanding on the current environmental performance of each household and its impact on the environment. Consequently a sustainable upgrading strategy to the existing housing stocks can be derived to tackle climate change. The environmental impact of an individual house may be minimal but considering the effects of all the houses together they will make a significant impact to the environment. More work needs to be done to reduce the environmental impact of existing housing stocks. It will be fundamental if statutory requirements such as BASIX can be extended to existing residential buildings.

The study has revealed that upgrading to improve efficiency of existing housing stocks is an ideal and feasible solution to reduce greenhouse gas emissions and depletion of natural resources. The upgrading strategies for the three houses were developed using BASIX requirements as benchmarks. The main focus for upgrading was to install insulations to optimise the building fabric and mitigate heat loss and heat gains through the roof. The scheme also includes the installation of a solar hot water system and hot water
coulter to reduce consumption of non-renewable energy. Energy saved will result CO₂ emissions through a reduced demand for heating and cooling. The water efficiency was improved through upgrading of fixtures and fittings, and the installation of a rainwater tank to reticulate harvested water for toilet flushing, laundry and irrigation. The study has also revealed that sustainable upgrading is achievable but with a cost that may eventually decrease the motivation to improve sustainably. The incentive to consider sustainable upgrading will largely depend on whether the cost of upgrading can be offset by the potential savings and the available government financial assistance. The long payback period of upgrading of the three cases has demonstrated that more government financial assistance may be required to encourage more sustainable upgrading.

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Department of Climate Change (2009). National inventory by economic sector 2007, Department of Climate Change.


A Modest Proposal on E-Dispute Resolution

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Abstract

Construction industry has been plagued by increasing claims, disputes and litigations due to complexity and fragmentation process. Alternative dispute resolution (ADR) techniques do not require full legal process and become mainstream option to litigation. Yet, the actual experience of ADR is very low in construction industry. Therefore, mitigation or prevention measure is necessary as it is a better approach prior to reaching dispute stage. The research addresses the feasibility study on e-Dispute Resolution (eDR) as a potential area of improvement in contract administration and dispute resolution. The objectives are (a) to review the existing approaches of contract administration and dispute resolution in the construction industry, (b) to determine the practice and behaviour of contract administration and dispute resolution in the local scenario (Malaysia), and (c) to develop a conceptual model of eDR using the Data-Flow Diagram (DFD) method. A critical review was conducted on 112 journals published from 1990 to 2007 and four reputed experts of mixed background i.e., arbitrator, lawyer, architect and quantity surveyor were interviewed to determine the local scenario. Subsequently, a detailed and specific literature study related to eDR was carried out in conjunction with a series of discussions with the experts prior to completion of the conceptual model of eDR. The eDR is finalized and explained in the Level-0 DFD. It assists in making of inferences towards a more transparent and systematic approach in the contract administration, and thereby contribute to dispute mitigation or prevention. In principle, the eDR does not aim to replace or jeopardise the functions of legal professionals in the dispute resolution process. It is designed to provide a more effective and proactive means for preliminary references and a useful guide for end-users.

Keywords: contract administration, dispute resolution, e-dispute resolution, and modelling
1. Introduction

Construction industry process is fragmented and adversarial in nature (Cheung et al. 2004). Conflicts would occur when incompatible interests exist (Fenn et al. 1998) in the contract. The conflict and dispute are co-related. Dispute is a state of accelerated conflict, where the conflict goes into an unresolved circumstance. Dispute resolution is required to resolve the dispute at this stage.

Many researchers concluded that alternative dispute resolution (ADR) is cost effective and less time consuming such as negotiation, dispute review board, mediation, and adjudication. However, the actual experience on the practice of ADR is very low according to the study conducted by Brooker and Lavers (1997). The results highlight an interesting dichotomy that the disputants are not active in ADR even though they have great dissatisfaction on traditional dispute resolution. Therefore, mitigation or prevention measure is necessary as it can be the best method to dispute resolution (Vallero and Vesilind 2006).

Standard form of contract is a written agreement of rights and obligations for contracting parties, which should act as a basis in dispute prevention. It is practical to prevent aggravation of the negative impacts on project performance, and to manage the dispute proactively and aim for early settlement (Cheung et al. 2004). The standard form is no doubt more effective in the long run than other ADR means as it addresses the fundamental project management and relationship that actively encourage cooperation and constructive behaviour (Thompson et al. 2000). Thus, contract administration is the key aspect for the proposal of the eDR.

The eDR aims to mitigate contractual disputes by administrating the conflicts systematically with reference to the relevant provisions of the standard form and providing clarifications as well as supported by leading court cases where applicable. It would help to mitigate or prevent the contractual disputes in the construction industry.

2. Contract administration

Contract administration is a process of administrating a business or matter that governed contracting parties” interests. It revolves around the pre-construction stage, construction stage and post-construction stage in construction industry. Generally, it deals with contractual obligations and expectations between the contacting parties (Semple et al. 1994).

On the other hand, the poor understanding of construction contract has led to construction disputes, which highlighted by a large number of researchers (Semple et al. 1994, Broome and Hayes 1997, Hartman et al. 1997, and Mohamad and Zulkifli 2006). Interpretation error and misunderstanding of construction contracts can be traced to the illegibility of contract clauses (Broome and Hayes 1997, Cutts 2004 and Styliis 2005) and legalese or technical legal terms/jargon (Candlin et al. 2002 and Cutts 2004), which results in disagreements between the contracting parties on their obligations and expectations. As an antidote to this perceived complex issues, „Plain English” has established itself as a reform movement focused on making legal language more accessible, in particular to non-
lawyers (Candlin et al., 2002). The Plain English is a good measure to clarify the language usage, e.g. clarity aspects proposed by Chong and Zin (2009) to improve the clarity of construction contracts.

In summary, appreciation of the contractual obligations enables the parties to maintain their legal relationship. However, the understanding issue should be handled with clarified language structure in the first place. Construction contract should not just be treated as a legal document and to be brought out only to provide protection when things go wrong. But, to show how the contracting parties are going to jointly manage the project and enhance their businesses in proactive way (Thompson et al. 2000).

3. Research methodology

A critical review was carried out from year 1990 to 2007. The scope of the study concentrated on the contract administration and dispute resolution techniques in the construction industry. The sources of the review are derived from refereed journals. One hundred and twelve (112) journals have been reviewed and mainly derived from the list of refereed journals as shown below:

- Journal of Construction Management and Economics
- International Journal of Project Management
- Journal of Construction Engineering and Management
- Journal of Management in Engineering,
- Journal of Professional Issues in Engineering Education and Practice

Subsequently, a semi-structured interview was conducted with the experts to determine the practice and behaviour of contract administration and dispute resolution in the local scenario. The experts were interviewed to provide a better understanding on the local scenario and enhance the validity and significance of the research.

DFD method is selected to develop the eDR. It is a graphical representation of the “flow” of data through the processes. DFD uses four basic symbols to show entity, process, data flow and data store to trace and depict the movement of information (Luo and Tung, 1999). As shown in Table 1, the explanation of the DFD elements is based on the proposed eDR model. The Context Diagram is the highest level of diagram in the set of DFD, which reveals an external picture and overall function of an information system (Tam et al. 2001). The next level is Level-0 DFD, which it is made up of a number of processes from the main activity in the Context Diagram.
Table 1. Explanation of DFD elements and notations

<table>
<thead>
<tr>
<th>No</th>
<th>DFD Elements</th>
<th>DFD Notations</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Entity</td>
<td>DISPUTES</td>
<td>It is a data source or sink for the construction related disputes. The data flow, which the contractual issue move out from this entity.</td>
</tr>
<tr>
<td>2</td>
<td>Process</td>
<td>Mitigate/ prevent the issue systematically and proactively</td>
<td>The process is an activity to mitigate or prevent the issue systematically and proactively in the model. It shows in bubble shape. The process will be stated a number to show the sequence and level for the transformation of data.</td>
</tr>
<tr>
<td>3</td>
<td>Data Flow</td>
<td>Contractual Issue</td>
<td>The arrow represents the information flow or movement either from the process, entity or data store to another state. With a rule that the flow must involve a process.</td>
</tr>
<tr>
<td>4</td>
<td>Data Store</td>
<td>D1 Project database</td>
<td>The data store serves as a database in the model. The project database (D1) is retrieved to obtain the reference from previous cases.</td>
</tr>
</tbody>
</table>

4. Results and analysis

4.1 Critical review

After reviewing the previous studies, they could be classified into five categories, i.e., dispute resolution techniques (DRT), application of information technology (IT), contract management and administration (CMA), conflict and dispute analysis (CDA) and modelling (MO). The classification is based on the research area focused by researcher(s) as shown in Table 2.

Table 2. Categories and numbers of journals from year 1990 to 2007

<table>
<thead>
<tr>
<th>DRT</th>
<th>IT</th>
<th>CMA</th>
<th>CDA</th>
<th>MO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution methods (6)</td>
<td>Claim (3)</td>
<td>Interpretation and understanding (8)</td>
<td>Cost/time overrun (2)</td>
<td>Conflict behaviours (1)</td>
</tr>
<tr>
<td>ADR (13)</td>
<td>Decision support system – risk (5)</td>
<td>Clarity (1)</td>
<td>Delay and EOT (8)</td>
<td>Contract bidding (2)</td>
</tr>
<tr>
<td>Negotiation (3)</td>
<td>Decision making – dispute resolution (3)</td>
<td>Claim management (8)</td>
<td>Risk management (4)</td>
<td>Financing conflict (1)</td>
</tr>
<tr>
<td>Arbitration (5)</td>
<td>Litigation outcome (1)</td>
<td>Expert witnessing (1)</td>
<td>Assessment and analysis(2)</td>
<td>Resolution outcome (2)</td>
</tr>
<tr>
<td>Mediation (6)</td>
<td>Procedures and steps (2)</td>
<td>Dispute prediction (1)</td>
<td>Decision making on dispute resolution method (2)</td>
<td></td>
</tr>
<tr>
<td>DRB (2)</td>
<td>Clause - notice (1)</td>
<td>Consequences (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relationship contracting (2)</td>
<td>Contract specification (1)</td>
<td>Conflict management (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Litigation (2)</td>
<td>Dispute avoidance</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DISPUTES

0

Mitigate/ prevent the issue systematically and proactively

Contractual Issue

D1

Project database
<table>
<thead>
<tr>
<th></th>
<th>and prevention (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjudication (3)</td>
<td></td>
</tr>
<tr>
<td>Contract form (3)</td>
<td></td>
</tr>
<tr>
<td>Informal means/tactics (2)</td>
<td></td>
</tr>
</tbody>
</table>

Alternatively, the review can be arranged according to the year of publication. As illustrated in Fig. 1, it shows the trend of each research category. The research on modelling and application of IT in dispute resolution are getting popular. Meanwhile, a large number of researchers also discussed about CMA and DRT according to the consistent increased of the publications.

Figure 1: Critical review on the categories by year in an accumulative mode
Based on the critical review analysis, one of the major findings is the research of dispute resolution and contract administration becomes prevalent in these recent years. The result reflects a growing degree of research in the areas of contract administration and dispute resolution, in the light of the number of articles published. The researches are skewed toward the alternative dispute resolution, understanding of contracts, claim management and IT applications. On the other hand, the review also identified that some areas could be improved based on the numerous recommendations or limitations, such as,

- Contract conditions serve as the basis or tool for dispute prevention or conflict settlement – the principles and obligation provided in contract form should regulate it at daily basis, rather than refer it when a problem or conflict happened.

- Lifelong learning and self-educated research on dispute prevention – this is about a neutral and reliable source of system that could assist the contracting parties in resolving contractual problems equitably and expediently. In addition, it encourages construction practitioners to learn and rectify their understanding on contract principles and expectations.

As a result of the critical review, it shows that it is vital to conduct a detailed literature study on the expert systems/model so as to identify the research gaps related to the current trend on the application of IT, ADR, claim management and understanding of the construction contracts. Six (6) related researches were compared and summarised as shown in Table 3.

<table>
<thead>
<tr>
<th>Model/ Name</th>
<th>Year</th>
<th>Method of decision making/ process</th>
<th>Reference on historical data/ court case</th>
<th>View or from experts</th>
<th>Reference on standard form</th>
<th>Targeted issue</th>
<th>Use of ICT</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISCON (Kraiem 1988)</td>
<td>1988</td>
<td>Flow chart</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Differing site condition</td>
<td>No</td>
</tr>
<tr>
<td>Expert System For Construction Contract Interpretation (Robinson et al. 1991)</td>
<td>1991</td>
<td>Rule based</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Contract Interpretation</td>
<td>No</td>
</tr>
<tr>
<td>Prediction of Construction Disputes (Sim and Molenaar 2000)</td>
<td>2000</td>
<td>Case-based reasoning</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Most severe contractual issues</td>
<td>No</td>
</tr>
<tr>
<td>CoNegO (Cheung et al. 2004)</td>
<td>2004</td>
<td>Even Swaps</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Figure based disputes</td>
<td>Yes</td>
</tr>
<tr>
<td>Graph Model (Kassab et al. 2006)</td>
<td>2006</td>
<td>Prisoner’s dilemma strategy</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>General Dispute’s Problem</td>
<td>No</td>
</tr>
<tr>
<td>FCBR (Cheng)</td>
<td>2009</td>
<td>Fuzzy case</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>General</td>
<td>Yes</td>
</tr>
</tbody>
</table>
et al. 2009) based reasoning construction disputes

All the expert systems as discussed above encouraged the creation of a harmonious atmosphere and adopting a win-win situation for resolving dispute. The systems assist by requiring the users to analyze their decision through self-examination approach. The comparison between the studies has revealed an important insight on their research strengths and limitations, for example, use of IT advancement, contract form, historical/court cases and panel of experts as well as decision making methods on the targeted issues. This comparison would help to improve the value and significance of the future research.

Consequently, the end result from the critical review and comparison of the expert systems/models form the basis of the formulation of the semi-structured interview for the local scenario.

4.2 Semi-structured interview

The experts for the interview consisted of:

1. An academician expert who is a veteran and registered quantity surveyor and holding a professorship in quantity surveying and construction management;

2. A registered architect who serves as the Superintendent Officer up to 15 projects and has been practiced more than 20 years;

3. A registered arbitrator who specialises in contract administration and more than 25 years working experience in the construction industry; and

4. A licensed and practice lawyer who has more than 10 years of working experience in court proceedings regarding construction disputes.

Semi-structured interview was selected to elicit the necessary data, instead of an open discussion. It is because in an open discussion, it tends to get out of scope when the experts are sharing their experience and view. Hence, five (5) main areas or research questions were designed for the interview and it is related to understanding on construction contracts, contract administration, practice of dispute resolution, dispute resolution and comments and recommendations. Content analysis was adopted to compare and analyse the data recorded from the interview. The summary of the experts’ responses towards the five research questions are shown in Table 4.
Table 4. Results of semi-structure interview

<table>
<thead>
<tr>
<th>Areas/Questions</th>
<th>Summary on Experts’ Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding on contract contracts</td>
<td>The interviewees highlighted that poor understanding and lack of clarity are common problems in construction contracts. Interpretation of clauses may vary among the construction users. Occasionally, the meaning is subjective and bias.</td>
</tr>
<tr>
<td>Issues related to contract administration</td>
<td>Personal and human factor is the key aspect in contract administration, albeit some hidden agenda do exist in the contract document and the problems are further compounded by the poor understanding of the issues. Ignorance or egotism exhibited by contract administrator or project manager in a project could accelerate the problem into unresolved status.</td>
</tr>
<tr>
<td>Practice of dispute resolution</td>
<td>The interviewees agreed that there are a few popular methods of dispute resolution in the industry, such as negotiation, mediation, adjudication, arbitration and litigation. These methods are rather common except for adjudication, which is going to be implemented in the near future. Negotiation is the most popular method as it is informal and non-adversarial in nature, while arbitration is also very common and is familiar with the practitioners as there is an arbitration clause in every local standard form of contract.</td>
</tr>
<tr>
<td>Issues related to dispute resolution</td>
<td>The industry players are not well versed on the true philosophy of dispute resolutions techniques. The real practice of alternative dispute resolutions is still very low. Usually, disputes resolve during negotiation stage in an informal way or through arbitration, the formal and binding approach. Other methods are not favourable or appreciated by the concerned parties. Occasionally, arbitration is quite costly and time-consuming as well.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Areas/Questions</th>
<th>Summary on Experts’ Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comments and recommendations</td>
<td>One common solution suggested by all interviewees is that a system/template to enrich or refine the decision making process of the contract administrator need to be established. It shall act like a persuasive mechanism in the system. This could be done by identifying all the root causes of the problem, making clear of the issue via contractual obligations enlightenment and providing clear guidelines as to how the contract is to be managed.</td>
</tr>
</tbody>
</table>

The results of this semi-structure interview have revealed to the interviewer that an effective guideline on contract administration is necessary for dispute prevention or mitigation. The conditions of contract can be used as a basis or tool to prevent/mitigate the conflicts or disputes because the contract clauses are always being referred to during negotiation or dispute resolution. In conclusion, the system or template (eDR) can comply with the suggestion by the experts, as it can organise the essence of the contract for dispute prevention and/or mitigation.

### 4.3 Proposal of eDR

The critical review and preliminary study revealed that the need for a more flexible and comprehensive expert system for contract administration. From the studies above, an in-depth discussion for all construction disputes will not be feasible (Kraiem, 1988). It is impossible to resolve or generate accurate and reliable results for all the issues under disputes due to the characteristics of the particular issues. It is also affected by the time and resources constraint as well as uncertainties of the external factors. However, an expert system presents the principle of contractual obligations and expectations as a guideline in decision making could fine-tune the argument above. The expert system
dealt with the interpretation issues was relevant and practical towards the construction industry as demonstrated by Robinson et al. (1991) in Singapore. Nevertheless, the system adopted by Robinson et al. (1991) has weaknesses in three areas that could be improved, i.e., on the use of advance ICT, reference to the leading court cases and the lack of involvement by experts. It is because an online application in the expert system is able to handle the shortcomings of updating, storing, and exchanging information (Cheung et al. 2004). Furthermore, the leading court cases and involvement of experts are very crucial in an online system because of the reliability and quality of the system’s content.

Basically, there are numerous online applications for dispute resolution, such as Online Dispute Resolution, e-Mediator, e-Arbitrator, e-Dispute Resolution, Online Alternative Dispute Resolution and many more as a complete list is impossible to be generated. However, these online applications are commercially driven when providing the necessary consultation services. Usually, the system will be chaired by a legal adviser/lawyer to give the legal services and decision through the internet.

For a system to be effective, the results generated by a system should not be restricted to case by case basis (Sim and Molnenaar 2000 and Cheng et al. 2009), and applying only court cases as the only source of reference in construction related research. A wider coverage or generic approach is needed and all must be taken into account for dispute mitigation/prevention. Incidentally, the Graph Model (Kassab et al. 2006) may be too general in theory to be applied in the construction industry. Thus, the generic approach should be considered as better, practical and provide value to the construction industry.

Therefore, the self-examination or proactive approach in contract administration towards dispute prevention or mitigation is feasible. It could be served by demonstrating a clarified, organized and reliable source of reference towards the existing contractual obligations and expectations. It will cultivate self-learning and examination by the contract administrators. This reference is very important as currently there is poor understanding of contracts and the lack of prevention/mitigation means on dispute resolution in the local construction industry. In conclusion, this system was proposed by considering the shortcomings from the previous studies and interview. It is named as e-dispute resolution (eDR) in this research.

4.4 eDR model

First of all, the quality of a system is determined by the depth and appropriateness of collected data as well as the interpretation of analysed data. Hence, the eDR model is concerned with the above-mentioned issues and aimed to supply useful information and data for reference to the end-users who make the decisions on the disputed issues.

The Context Diagram is an overall picture of the conceptual process flow model. Figure 2 illustrates how a clarified reference/guideline is produced to the end-users. It just briefly explains a main process, which mitigate/prevent the contractual issue systematically and proactively.
Subsequently, the Level-0 DFD is a child diagram from the Context Diagram. It is the most comprehensive data that presented in this model. This Level-0 DFD of the model indicates detailed information on how the processes involved as illustrated in Figure 3.

The first activity is to classify the project characteristics and contractual issue. There are two information flows into the project database. The first stores the new or additional data from a new case, while the second is a database that contained previous project particulars. This project database is vital as different project characteristics would have different effects and implications on the contractual issue. The project particulars could be classified as below:

- Type of project (*building construction*, *road construction*, etc)
- Contract Type (*lump sum contracts*, *cost reimbursement*, etc)
- Procurement method (*traditional*, *design and build*, etc)
- Project Scale (*small*, *medium and large*)
- Standard form of contract (*international or local contract forms*)

Meanwhile, the contractual issues can be categorized into three main stages. They are pre-contract award stage (seven areas), construction or commencement of work stage (twenty three areas), and post-commencement stage (nine areas) (Chong and Rosli, 2009). These work stages are organized in such a way to make clear the contractual activities that involved by the principal contracting parties.

The second activity is to identify the relevant contract clauses related to the targeted issue. The targeted issue is classified according to the project particulars under the first activity. The expressed provisions either directly or indirectly related to the targeted issue will be referred. The basic principle to be applied is to read and interpret them as whole during this process.

The third activity is related to the expressed provisions under the contract. It is important to consider some background data and legal principles in order to achieve a comprehensive reference and details related to the contractual issue. The latest leading court cases and published literature are the main sources for this exercise. For example, the court cases shall provide the common law principles and legal positions for a particular issue, while the literature sources help in the organising and
recognising the characteristics of the issue from different perspectives. If necessary, the content of each clause may be reverted to the second process if there is extra information generated after investigating the literature and court cases. Subsequently, refinement or new interpretation may be organised or added to the particular issue.

Activity number four involved the comprehensive details that must be clarified due to the weak understanding and poor interpretation of the issues in the industry. The use of Plain English (clarity aspects) is to be adopted to provide a clear meaning of its content so that they are simple and easy to understand. After the clarification process, the draft references/guidelines will be produced.

The activity numbering 5.0 is the last process of the conceptual model of eDR. It is the most important process because it is the centre of the quality system which provides useful information and references to the end-users. Therefore, the Delphi approach has incorporated under this process to denote a consensus result from a mixture of experts. Construction industry is unique and adversarial in nature and this consensus is vital especially when dealing with conflicts or disputes. After the verification and commentary, the clarified references/guidelines will serve as a preliminary reference or to alert the end-users. The verification process by the experts is not confined to language structure only, but also to the meaning and certain legal intents of the contents.

Ultimately, an online system with the help of ICT could be set up after completion of the whole process. The issue on the need of an administrator to monitor the system is not a major concern if the eDR system is properly designed and developed. It is because the eDR is not a decision making tool, rather it is to render a reference/guideline to contractual issues encountered by the end-users.

In summary, the model highlights another perspective of applied social science research which accommodates the Delphi and law in construction. This model could serve as a template for future research, even though there are differences in the legal system and diverse local scenario, it can provide a generic approach to dispute mitigation/prevention.
DISPUTES

1.0 Classify the project characteristics and contractual issue
   - Contractual issue
   - Feedback/data refinement (if any)

2.0 Identify the relevant contract clauses
   - Targeted issue
   - Extra info (if any)

3.0 Investigate and organise the content
   - Contract provisions
   - Comprehensive details

4.0 Clarify the content for the ease of understanding
   - Drafted references/guidelines

5.0 Verify and comment by mixture of experts for the consensus
   - Clarified references/guidelines

END-USERS

- New cases (if any)
- Previous cases
- Extra info (if any)
- Extra info (if any)
- Extra info (if any)

D1 Project database
   - Project database
   - Previous cases

D2 Standard Form
   - Contract clauses

D3 Literature & court cases
   - Background data and legal principles

D4 Clarity references
   - Clarity aspects

D5 Clarity references
   - Clarity aspects

Figure 3. Level-0 DFD of eDR
5. Conclusions

The article highlights the potential improvement that can be derived from the previous studies and semi-structured interview. The previous studies showed a popular trend of research on contract administration and dispute resolution. The interview suggested a template or system to refine the practice of the local scenario leading to the eventual development of the eDR model. It provides a useful reference or approach to the prevention or mitigation in contract administration and dispute resolution. The outcome of the eDR could improve the existing practice in terms of the lifelong learning and self-examination by the end-users.

Certain limitations should be considered, i.e., setting up of the internet system and different cultural dimensions when assessing the practicability of the eDR in the construction industry. Nevertheless, the eDR model represents a useful reference for further development and transforming the poor image and practice of the construction industry.

References


Building Defects: The Spanish Case

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Abstract

Spanish law on building defects was modified in 1999. The current Act of Edification establishes three different liabilities of one, three and ten years, depending on the building defects. There are also three insurances also of one, three and ten years to cover damages caused by building defects during these periods of time. However, only ten years insurance is obligatory. Besides, the liability in the current law is a strict liability, while in the former regulation it was based on negligence, and now obligations of all the professionals and entrepreneurs are clearly defined. Taking into account all these changes, the purpose of the paper is to evaluate the new system ten years after it began running.

The current law intended to improve the situation of Spanish construction by reducing building defects and making the repair process faster and easier. However, the Act of Edification was criticised because of the mandatory insurance and the reduction to one and three years in some building defects cases. The former law recognized a delay of ten years to claim for any kind of defects. The result was an in depth examination of the new situation can reveal the positive and negative effects of the legal change. The research has been accomplished by comparing judicial resolutions that applied the former and the current law. This reveals the different way to resolve similar cases, as well as observing the number of claims pro year during the former and the current law. As a result, the new rules of liability and insurance have reduced litigation, in spite of critics at the time of approving the Act of Edification. In conclusion strict liability, clear delimitation of liabilities and insurance are important tools to prevent building defects and improve the quality of construction. And this provides a guarantee for purchasers.

Keywords: building defects, liability, insurance.
1. Introduction

For a long time, Spanish law did not have specific rules related to liability for construction defects. Only article 1591 of the Civil Code established a guarantee of ten years in which the “ruin” of the building gave rise to liability of constructors or architects, depending on the origin of defects that caused the ruin.

Most of the construction defects had a different nature, not reaching the category of “ruin”. In order to provide protection for purchasers of houses against such kind of defects, courts started to extend article 1591 to all these cases, even though the rule was intended for a different scenario.

New problems arose and the solutions were not defined in article 1591. This rule was established in 1889. Construction procedures, techniques and professionals taking part of it changed significantly during the 20th century (and also now, in the 21st century), so the old legal regulation did not correspond to reality of construction. The rule does not take into account the new professionals of construction and all the evolution in the process of edification. For decades, courts had to look for and create new rules to give answer to the cases that they had to resolve, and in such a context, the Act of Edification was approved in 1999.

The current regulation of liability for construction defects recognises some of the rules created in the courts, but in some aspects the Act establishes new solutions. These are different to the previous solution and introduce new elements, like mandatory insurances. It is interesting to analyse the implementation of the current regulation ten years after the approval of the Act.

2. The former regulation

One decade after the approval of the Act of Edification we could consider that the former regulation has just a historical interest, and nothing else. Contrary to this idea, article 1591 of the Civil Code and all the jurisprudence created around this rule still raise questions for the following reasons:

a.- Even today there are cases in the Courts that must be resolved by the application of this old rule: the Act of Edification was approved on November 5th 1999, but it was not in force until May 6th 2000 and only for constructions whose edification license was applied once the Act was in force. For buildings whose edification license application was issued before May 6th 2000, liability for construction defects is decided according to article 1591. Once these buildings are finished, there is a ten year delay in which the apparition of any construction defect gives rise to an action of liability, with a 15 year delay of prescription. That means that even today a claim can be presented in the Court by the owners of buildings whose edification license application was made at the beginning of 2000 or even before, and it will be resolved with the former regulation.

b.-Many rules included in the Act of Edification are a recognition by the Spanish legislator of the principles and rules established by the Courts in order to give a satisfactory solution to some problems arising through the years, and that article 1591 did not resolve. All these judicial criteria are
considered as a development of article 1591 and the study of them allows a better understanding of
the meaning of the Act.

c.- There is not an explicit derogation of article 1591 by the Act of Edification, thus it could be still in
force. Although several authors like Cabanillas Sanchez (2000, p. 408) and Alvarez Olalla (2002,
p.26) and courts (ROJ: SAP MU 1337/2009, July 10th 2009) consider a tacit derogation of the article,
there is not the certainty about that until the Supreme Court declares it. Nevertheless, I think that this
is the weakest argument about the current importance of article 1591.

Taking these reasons into account, let us briefly describe the former regulation of liability for
construction defects.

Article 1591 established a delay of ten years in which the ruin of a building due to construction
defects gives rise to the constructor’s liability. If the origin of the ruin is a defect in the project or in
the direction of the works, the architect will also be liable for ten years. This delay is just for the
production of the ruin; once it has appeared, a new delay of 15 years starts to claim in the Court. The
first delay is a guarantee and it is not possible to interrupt it; however, the 15 year delay is a delay of
prescription, so it could be interrupted and would start running again from that moment. With such a
system, constructors and architects’ liability is extended for a long time.

Additionally, liability has been extended because of the judicial interpretation of the term of “ruin”
26th 2006). The ruin evokes a total or partial destruction of a building. However, also construction
defects that merely reduced its quality and habitability were considered as ruin. For instance,
dampness and cracks were submitted in the liability of article 1591, and constructors and architects
were considered liable for them in the delays previously explained. In some exceptional cases mere
aesthetic defects were referred as “aesthetic ruins” in the courts. The purpose of this open
interpretation of the concept of ruin was to protect purchasers of houses. There was not any rule that
specifically regulated liability for construction defects and a satisfactory solution had to be found for
them. Article 1591 was the only one rule that regulated a similar situation, and an extensive
interpretation of this article could be a way to find protection in such cases in Spanish law. But,
constructors and architects were placed in a difficult situation as far as liability is concerned. Several
years after works were completed, a claim could give rise to their liability for imperfections of the
building that perhaps had more to do with the running of the time and the use of the building than
with their intervention in the works.

Not only constructors and architects were considered liable, although they were the only persons
mentioned in article 1591. In the 19th century, when this rule was established, constructions were
very simple and only constructors worked on them. Sometimes in the most complex cases, architects
took part of the construction as well. But nobody else was involved in the construction process, so
article 1591 did not mention anyone but constructors and architects. However, as construction became
more complex, new actors appeared in scene:
a.- The developer, who takes important decisions about the construction process, was not taken into account by the legislator in XIX century, so he would not be liable for construction defects, according to the law.

b.- Working with the architect, a new construction professional appeared called the rigger who was not considered by the law.

c.- Sometimes engineers carried out functions normally undertaken by the architect because of the complexity of the construction.

d.- It was more common that the constructor subcontracted part of the works.

This raises the question whether the professionals and companies should be liable for construction defects when article 1591 Civil Code did not mention them. It would be unfair to deny their liability even in a civil law system and as a result the courts forced an interpretation of the law. The developer’s liability was assimilated to the constructor’s (ROJ: STS 7070/1999, November 10th 1999), while riggers and engineers were considered as architects (ROJ: STS 7401/2002, November 8th 2002; ROJ: STS 3402/2005, May 26th 2005, respectively) as far as article 1591 was concerned. Liability for subcontractors’ work was assumed by the constructor, who had an ulterior action against the subcontractor to claim the amount paid for reparation damages (ROJ: STS 3808/2008, July 3rd 2008).

The developers’ liability has a special interest: it was considered that his or her function by promoting, selling and obtaining profits with the works justifies that, in case of building defects he or she has the duty to repair them, even though he or she did not cause it directly.

Theoretically each one of these persons could be liable as they may have contributed to construction defects. Once a construction defect appeared, the cause or origin of it had to be found and the person who assumed that part of the works would be liable. However this subject has presented some additional problems, as follows:

First, it was very difficult in most of the cases to successfully identify who was liable before the trial and submit a claim against them. When the defendant considered that other professionals were liable, it could be unfair that only he was condemned. In such a case, he used to make an exception. However the courts refused it.

Second, in cases of liability with several people, courts found it very difficult and sometimes impossible to define the limits of where one’s liability finished and another's started. If one defendant were missing from the trial the question of liability became more complex. Courts therefore decided that when it was not easy to establish the different extent of liability, liability would be in solido (ROJ: STS 1950/2005, March 31st 2005). Sometimes not all of them had been claimed by the owner. With such a solution, the owner of the building could claim the total amount for damages from one of them, which made the reparation of damages easier. Once the defendant had paid, they could claim in another trial against all the other liable persons. In this second trial, the court fixed the exact extent of liability for each one in order to recover the amount that he paid but did not corresponded to him. But,
if the defendant was not a part in the first trial, there was the risk of an absolutory sentence in the second one.

One of the main reasons to recognise solidary liability in most of the cases was an attempt by the courts to extend liability to some professionals with solvency. Constructors were frequently insolvent, so when they were liable, even with a judicial resolution recognising it, citizens could not obtain reparation for damages. However, architects and riggers used to take out liability insurance, so they were always covered for damages. It was very useful for plaintiffs that these professionals were liable in solido with the constructor, and this was a hidden reason to extent liability to them. However the professionals did not consider this to be fair.

Finally, in order to make the reparation of damages easier, courts considered that in all the cases of construction defects fault was presumed (Lucas Fernandez, 1986, p. 327; ROJ: STS 5987/2001, July 10th 2001) As a result the owner only had to prove damages that they appeared during the ten year delay. The defendant would have to prove that he acted with the diligence to exclude liability, but proving such diligence was not easy. Definitively, that was a way to approach these cases to strict liability even if the law did not recognise it.

After this short explanation of the situation before the Act of Edification, let us see the current regulation of liability for construction defects.

3. The act of edification: overview

The new law has established three different delays of guarantee depending on the seriousness of the construction defects:

- Ten years for defects in the structure and stability of the building, the same as the former regulation (ten years in case of “ruin” of the building)

- Three years for other constructive defects related to the habitability of the building (such as in the case of dampness and cracks, which in the former regulation were submitted in the liability of ten years)

- One year for “aesthetic” defects which even though exceptionally, were sometimes included in the ten years liability of article 1591. According to the Act only the constructor is liable.

If damages appear during one of the delays, there is a strict liability of agents. The responsibility depends on the kind of defect. The Act contains a very detailed description of the “agents of edification”, who are all of the professionals and contractors involved in the construction process. A definition of each one and a list of functions and obligations assumed in the edification process are contained in the Act. This allows identifying liability in the case of building defects, because it is considered that these defects appear as a result of a breach of contract. Once the defect is identified and according to the obligations assumed by each agent, the liable one can be identified, and fault need not be proved.
Through this description and maybe unconscionably, the Act draws the contractual relationships established in the edification process. At the top of the hierarchy is the developer, who resources the project with the required contractors. Next the developer sets the direction of the works to the same professional who made the project or another with similar qualification, and to a rigger. He contracts also the performance of the works with a constructor. There are four main contracts in the edification process and it is very common (especially in the case of the constructor) that other contracts are established in order to fulfil part of these main contracts. However the four persons who contracted with the developer are in charge of each one of the four main sections of the edification process and as we will see later, assume the liability for defects of the building related to their own part of the edification activity. In charge of the four persons is the developer who according to the Act, “leads, programs and founds” the edification process.

This part of the Act is very detailed because one of the purposes of the legislator was to establish the functions and competences of the different contractors of edification. At the same time this regulation is very useful in order to determine liability for construction defects, considering the obligations that each one of them assumes. As previously discussed, with article 1591 it was very common that several persons who worked in the building were liable in solido, so one of them could be forced to repair all damages, although he was not the only one liable agent. With the Act of Edification each contractor is obliged to repair only as much as he contributed to damages, and nothing further.

The Act looks for a delimitation of liability for each of the agents of edification, trying to avoid the cases of solidary liability (ROJ: SAP LE 940/2009, July 16th 2009). At the same time the Act recognises that this individual liability is not only for the damages directly caused by the edification agents with their acts, but also for damages caused by dependents or other agents who contracted with them. The last possibility is a way to introduce simplicity in the claim. For instance, the architect engaged in the project is liable for any defects, which can be personally caused by them or by another person they employ. The owner only knows that damages are caused because of a defect in the project, and that is enough to obtain architect’s reparation for damages. The owner does not have to investigate the identity of the person who caused the defect, in spite of the individual liability of the law. If the project and the management of the works were carried by two different professionals, the director is considered liable for defects of the project. This is enough for the plaintiff to make a claim regarding defects related to these technical questions.

Sometimes it is not possible to identify only one person liable for damages. For instance the origin of damages can be a defect in the project, but also the direction of the works was wrong, and the constructor did not act properly in the construction process. In such a case, all of them are liable, if the plaintiff cannot prove the portion of liability of each one, all of them will be liable in solido according to the Act of Edification.

Solidary liability is also recognised in the Act for cases in which several people assume the same role (i.e., several architects make the project as a team).

The Act of Edification introduces a special rule in order to avoid cases of solidary liability and to resolve some procedural problems that used to appear under the former regulation. Such problems
arose as a consequence of the exception made by the defendant when there were other liable agents who had not been claimed. It was very common that the court held a solidary liability of the defendant(s) and other people who took part in the construction process but were not in the trial. However, the judicial decision had no effects against them because they were not part in the process, it was possible that they were not considered liable in an ulterior trial, so sentences would be contradictory. The Act of Edification tries to resolve this problematic situation by allowing the intervention of these agents in the first process, although they were not defendants, and the sentence would have then effects against them. Some courts have a special understanding of the rule and consider that the sentence can hold their liability, but that is not enough to obtain reparation for damages from them because they were not defendants. Another trial must be pursued against them, but the court will have to respect the first sentence, so contradictory sentences will not be able to exist at the same time (ROJ: SAP VA 526/2009, May 26th 2009; ROJ: SAP BA 521/2009).

Finally, the Act recognises that the developer is liable “in any case”. That means that no matter who is liable for building defects, the developer is liable in solido with him. This is a guarantee for purchasers in two senses: in case of insolvency of the liable agent, and because the plaintiff has no risk of failing in a trial when the developer is the defendant. It is considered that he is the head of the construction process and makes the most important decisions. Besides, the purchasers contract only with him so he must be always liable against them. At the same time such a rule makes the claim easier when damages arise because the owner just has to make a claim against the developer, and there is no need of finding out the origin of damages before. The developer will always be liable, and at the same time he can introduce other people in the process thanks to the special rule of the law mentioned previously (ROJ: SAP MU 633/2009, May 25th 2009; ROJ: SAP M 7171/2009, July 3rd 2009). Not only companies and professionals are considered developers in the current regulation. Also individuals who engage in the construction of their own dwelling are considered developers. That means that they assume the same liability in case they sell the house in the future, even though they are not professionals (Cordero Lobato, 2000, p. 210).

The Act does not require fault in order to recognise liability for building defects. Thus it is enough for the plaintiff to prove that damages appeared in the delay of guarantee because of a defect in the building (Ruiz-Rico Ruiz and Arias Diaz, 2002, p. 104). According to article 17.8 of the Act of Edification, the defendant will be liable unless he or she can prove that damages were caused for another reason, such as by the act of another third party, the act of the owner, or force majeure.

According to the Act, all these cases of liability should be protected with insurances. However, only the insurance for structural defects is obligatory, although the three insurances are contained in the law. A critic must be done at this point because the case of obligatory insurance is least common in practice. A premium is always paid for a tiny risk, while the most frequent cases of liability are not protected with insurance. On the other hand, insurances have a positive effect for prevention: the subscription of the insurance takes place once the building is finished, but the insurance company surveys the construction process in order to assess the risk. If any problem is noticed during the process a rectification is required, so at the end there is a high level of certainty regarding the quality of the building. However that happens only as far as structural damages are concerned.
Finally it must be noted that in addition to the liability system established in the Act, it is clearly stated that contractual liability also exists in these cases. Contractual liability can give rise to a claim in a delay of fifteen years (delay of prescription) after the contract is fulfilled, and tort law allows a claim within a year after the damages appear. The subsistence of both, contractual and non-contractual liability raises questions about the limitation of liability introduced by the Act of Edification through the three delays of guarantee. Is one year really the delay for aesthetic defects, and three years for construction defects? We can make a claim against the developer for fifteen years if we bought directly the building or part of the building from him. If we are the developer and also the owner—typical case of houses in the country—we can make a claim against any of the agents that contracted with us in the same time period—architects, riggers and constructors—. Does this system make sense?

From my point of view there is only one way to make that the delays of guarantee have a special meaning: we must remember that the Act of Edification establishes strict liability, while contractual liability and the general rules of tort law are based on fault. Only if courts consider such a distinction, the legal modification introduced in 1999 would be real. Otherwise these other rules of liability would allow owners to go over the limits of time introduced in the Act. By now, courts seem to forget it and extend liability for damages once the guarantee is done through the rules of contractual liability (ROJ: SAP PO 1985/2009, June 9th 2009; ROJ: SAP AV 258/2009, July 23rd 2009).

4. Effects of the legal change

Litigation has been massively reduced with the current regulation. In 1999, the year of the approval of the Act of Edification there were 557 judicial resolutions in appellation resolving about liability regulated in article 1591. In 2009, we had 238 sentences in appellation related to liability of the Act of Edification, which means a reduction of almost 43% of litigation in appellation.

Nevertheless, insurance does not help in this sense because it is obligatory only for the less frequent cases: structural defects. Therefore it seems that insurance has increased the price of buildings without providing a real protection. It must also be noted that the resolution of November 12th 2009 in the Spanish Court of the Defence of the Competition has concluded that a cartel was established by three insurance companies (ASEFA, MAPFRE and CASER) to establish minimum premiums in the ten years of insurance. The situation as far as insurance is concerned must be criticised since the Act came into force because of the reduced risk covered and abuses by insurance companies.

By comparing the content of sentences applying article 1591 or the Act of Edification some differences can be found, and some surprises too:

1.- The wide concept of “ruin” established by the jurisprudence with article 1591 and delays of guarantee and prescription were reduced in the Act of Edification. As a result, there are some cases in which the courts have denied liability while they could have obtained protection with the former regulation (ROJ: SAP TF 1498/2009, June 5th 2009; ROJ: SAP VA 936/2009, July 15th 2009; ROJ: SAP V 3059/2009, July 15th 2009; ROJ: SAP BU 484/2009, June 10th 2009). At the same time, it seems to be an attempt by judges to extend liability as far as possible according to the terms of the
Act. That is in the case of continuing damages, where the delay does not start when they appear, but once the whole damages are produced, sometime later (ROJ: SAP GC 1967/2009, May 25th 2009; ROJ: SAP CU 263/2009, June 3rd 2009; ROJ: SAP BU 484/2009, June 10th 2009). There is a flexible interpretation of defects included in the three year delay in order to provide protection to cases hardly included in the text of the rule (ROJ: SAP CA 677/2009, June 16th 2009). Finally, the limitations of the Act as far as liability is concerned disappear thanks to contractual liability. If the delays have gone, the court argues that there is still the fifteen year prescription delay established in the law for contractual liability, and no evidence of fault is required in such cases. Therefore agents are considered liable in these cases according to the terms of strict liability although this liability should be based in fault (ROJ: SAP PO 1985/2009, June 9th 2009; ROJ: SAP AV 258/2009, July 23rd 2009). As a result the intention of limiting liability in the time has failed.

2.- Perhaps, the most important effect of the current regulation seems to be the reduction of cases of solidary liability. As previously stated, under the former law most of the cases of construction defects were resolved as solidary liability because it was considered that several were responsible for the defects and it was not possible to determine their part of liability. The Act of Edification also recognises solidary liability for such cases, establishing at the same time that individual liability is preferable. When we compare sentences, we realised that a progressive change from a general situation of solidary liability existed before the Act of Edification (ROJ: STS 1550/1999, March 6th 1999) to individual liability when article 1591 was applied once the Act was approved (ROJ: SAP B 14242/2005, July 13th 2005). Finally there is a recognition of individual liability under the current regulation (ROJ: SAP LE 940/2009, July 16th 2009). The reason for the change is not only the specific mention of individual liability in the law. Also other factors have influence in this sense. There is a new and more casuistic regulation for building defects, with three kinds and each with different delays of guarantee. It is very important in the trial to specify the kind of defect in order to know if it appeared during the period of the guarantee. That makes the reports of experts even more relevant than in the former regulation, and this fact helps in some cases to individualise liability (ROJ: SAP PO 1985/2009, June 9th 2009). The classification of defects implies a delimitation of liability. According to the Act, for the annual delay is only liable the constructor, thus the rigger, who was previously liable in these cases is not liable anymore. As courts hold now, it cannot be required to the rigger such a detailed control and survey (ROJ: SAP GU 252/2009, June 3rd 2009; ROJ: SAP VA 526/2009, May 26th 2009). For the delay of three and ten years there is not an attribution of liability to a specific agent. Courts now consider that the ten year liability is only for architects, whose knowledge of construction techniques and calculation of measures and materials makes them liable in case of structural defects in the building (ROJ: SAP LE 940/2009, July 16th 2009). Only in the three year delay have cases of solidary liability usually arisen for riggers and constructors (ROJ: SAP CA 677/2009, June 16th 2009).

3.- Under the former regulation it was said that it was not possible to make an exception when the defendant considered that the claim should include other agents too (ROJ: STS 1325/2008, February 27th 2008; ROJ: STS 4869/2009, July 22nd 2009). Some problems arose in practice when several agents were liable but not all of them had been defendants in the trial. The result was the risk of contradictory sentences, as previously explained. The Act of Edification tries to resolve it by allowing intervention in the procedure of agents that were not required at the beginning. When the defendant
considers that they are liable, he can apply the court to call them to the trial and, in that case the Act of Edification determines that the sentence will be opposable and effective against them. Nevertheless, some courts have a different understanding of the rule: after allowing the intervention in the procedure of these agents, they say that not being defendants in strict sense, the sentence cannot be opposable nor executive against them (ROJ: SAP VA 526/2009, May 26th 2009; ROJ: SAP BA 521/2009). The purpose of the Act is frustrated in the trial. In other cases, although not often, courts respect the literal terms of the rule and the problem of contradictory sentences can be avoided (ROJ: SAP ZA 329/2009, July 31st 2009).

5. Conclusion

Current regulation has reduced litigation, but also the cases that give rise to liability. Thus, it does not mean that the new rules included in the Act of Edification have improved the edification process and building defects are not as common as before, but that more prerequisites are required for liability. Interests of professionals and companies working in this sector are now better protected which is in the interest of consumers. They spend an enormous amount of money to buy a house, which is in most cases the most valuable asset that they own. However, the spirit of new legislation is to diminish protection for construction defects. Only if contractual liability is finally imposed as a solution for the cases excluded from the Act of Edification, protection could be wider. It does not seem to be the intention of the Act, but could lead to fairer results.

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All judicial decisions can be found in http://www.poderjudicial.es/iversuite/GetRecords
In most building construction projects, the architect, engineer, or employer’s representative is oftentimes also the contract administrator and certifier for the works, together with a myriad of other duties and responsibilities in overseeing and supervising the construction, as well as to resolve technical issues during the progress of the works. As the voluminous administrative paperwork inevitably overwhelms the certifier, the eventual laggardness in observing proper contract protocol and established procedure in ensuring that variations are promptly regularised, and applications for extension of time duly assessed, will ultimately lead to dire consequences. This paper examines this seemingly trivialized matter and highlights the gravity of the contractual and legal ramifications arising from the purported non-compliance with established contract procedures, not only on the parts of the contract administrator, part also the contractor, in matters of time and cost implications.

**Keywords:** extension of time, time at large, constructive acceleration, breach of contract procedure
1. Introduction

Flushed with optimism when a building project deal is struck, developers and contractors alike disdain nit-picking to sieve through the contract parameters too extensively. When goodwill is replaced by acrimony, the illusion of consensus ad idem dissipates. Even the most conscientiously drafted document can attract dissension. Matters extrinsic to the written document are often invoked in support of diametrically conflicting interpretations. The existence of a binding formal contract, carefully drafted to cover every possible aspect of the project, is therefore imperative for both the contractor and the employer, in any building construction project.

Any subsequent failure to observe either the established contract procedure or to adopt the rules of natural justice, either at the outset of the contract or during the course of the works, can inadvertently render some of the terms and conditions of the contract invalid, voidable and unenforceable. We look at a few pertinent but unconventional practices prevalent in the construction industry today, and outlines some common sense approach to alleviate potentially vitiating factors in building construction contracts.

2. The building construction contract

2.1 Basis of law in building construction contract

Stuart Smith LJ defines a contract as follows:

“A contract is essentially an agreement that is freely entered into, on terms that are freely negotiated. If there is a statutory obligation to enter into a form of agreement, the terms of which are laid down, at any rate in their most important respects, there is no contract”.

In building construction projects, the legal relationship between the employer and the contractor is known as the Main Contract. This legal relationship is governed by contract law, providing a framework within which the rubric of contract procedures is explicitly prescribed. Building contracts, like private law, is enforceable in the courts, and the conditions of contract governing the works, whether bespoke or in a standard form, are like private legislation with the appropriate force and rule of law embodied therein. In large projects, there is usually a complex hierarchy of contractors, involving numerous sub-contractors, whether domestic or nominated; including suppliers of goods, materials, equipment and manpower. Whatever the nature and magnitude of the contract involved, all contractual and legal relationships are consensual and intended to have well defined legal consequences and contractual in nature. In this respect, the law of contract becomes very relevant. Traditionally, building construction contracts impose a wide range of duties and responsibilities on

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the contractor; particularly in relation to the quality, safety, accurateness, rectification of defects, maintenance and timely completion of the works that he has contracted to do.

2.2 Litigation and dispute avoidance

The typical building contract encompasses many aspects governing the administration and management of the project that protects the rights and obligations of the parties to the contract, viz., the contractor on the one part and the employer or owner on the other part; with various contractual mechanisms for dealing with cost and time claims and entitlements. With the contract administrator having adequate conferment of jurisdiction and powers to certify and administer the contract, the potential need for or availability of reference to the courts is effectively minimized, while at the same time the contract can remain legally valid whatever contingencies might arise, so as to keep within the protection of the law.

To preserve the rights and obligations of both parties, the contract administrator is usually tasked the paramount role of ensuring that such rights and obligations during the course of the construction are not compromised or prejudiced as a result of some tardiness, negligence and oversight in following established and proper contractual procedures. In exercising these duties, the contract administrator must act with due diligence, and in a fair, reasonable and timely manner.²

As mentioned, the basis of law in all building construction contracts is the contract law; and so do many aspects of law of dispute resolution and law of arbitration. The proper approach whenever a legal question arises pertaining to a construction contract, is to first study and apply the provisions or rules of the general law of contract, and then to see whether any special or peculiar approach (in applying those rules) is needed, bearing in mind that one is dealing with a construction contract. And, of course, the relevant conditions of contract clauses embodied in that particular form of contract have to be kept in mind.³

Due to the complexity and ever evolving development of myriad of issues in major projects, the eventualities of disputes concerning time and cost implications and arising from design revisions, variations and additional works during the progress of the works are oftentimes inevitable and indubitable. Presumably, it is always the common objective of all parties, including the contractors, sub-contractors, employers, and consultants alike, and all who are interested in the smooth and successful and timely completion of the project, that they would certainly welcome a prompt and peaceful settlement of disputes without even having to resort to mediation, adjudication or arbitration, or even litigation and bitter civil suits. Unfortunately, this is oftentimes not the case to be.

² P & M Kaye Ltd v Hosier & Dickinson Ltd [1972] 1 All ER 121; [1972] 1 WLR 146

³ The Brabant [1967] 1 QB 588
Legal issues in relation to building construction contracts are varied, including formation of contract, legal validity of the contract, performance of the contract, assignment, damages, default, breach of performance, breach of warranty, and so on. There are legal and contractual complications arising from a breach of, or failure to comply with, proper contract procedures which are otherwise prescribed in the various forms of building contract terms and conditions governing the works. A couple of common practices will demonstrate how these can inadvertently render the terms and conditions of the contract governing the works as voidable and unenforceable.

3. Breach of contract procedures

3.1 Instructions with cost and time implications

Under most forms of building contracts, the architect or the employer’s representative is usually delegated the authority to issue official instructions constituting as variations and additional works which are necessary in order to facilitate the contractor’s contractual procedural claims to additional payment, compensation and in most instances an extension of time to complete the increased quantum of works. In the course of the works, there will inevitably be design revisions, variations and additional works that are fortuitously issued but inevitably necessary due to the exigency and urgency of the works in progress. These are oftentimes perceived as expediently necessary so as to enable the works to proceed unhindered; instead of having to go through the conventional and bureaucratic protocol of securing the employer’s formal and prior approval. Such variations may be insidiously incorporated and arising from on-site adjustments to suit design intent; design revisions made on shop drawings; other additional information and design modifications which are not otherwise provided; or are necessary in order to resolve some technical discrepancies, design deficiencies, conflicts and omissions not otherwise reasonably foreseen at the outset; or else works which are necessary in order to comply with local authorities regulations and code of practice, so on and so forth. Note however that, all these mentioned may not be arising from any changes sanctioned or requested by the employer.

It is this seemingly arduous paperwork in formalizing, regularizing, and even justifying such instructions constituting as variations which are often the bane of contract administrators, in full knowledge that any subsequent failure to do so would in effect result in an apparent breach of contract procedure. In reality, it is not unusual that the contract administrator tasked such responsibilities are not even familiar with the rubric of contract procedure and protocol.

3.1.1 Employer’s representatives and assistants

Under most standard forms of contract, the architect or engineer is required, either by the express words of the contract or by operation of the general law, to perform two distinct functions. Firstly, he acts as the employer’s representative to administer the contract and enforcing the employer’s requirements. Secondly, he is required to perform the functions of a certifier under the contract, and
must act impartially and fairly between the employer and the contractor.\(^4\) Such dual role has been recognised by the courts.\(^5\)

Under this scenario, the employer’s representative can also appoint assistants to assist in carrying out his duties. However, under most contracts, such assistants usually do not have the authority to issue any instructions to the contractor save insofar as such instructions may be necessary to enable the contractor to carry out their duties and to secure that the plant, materials, goods or work are in accordance with the contract. Their duties are therefore limited to the issuance of instructions to the contractor to ensure that the works are in compliance with the contract; such as identifying rejected works for rectification purposes, as well as to explain, amplify and resolve technical issues that are necessary to enable the contractor to execute the works expeditiously. In other words, such Assistants are not delegated the authority to issue instructions that may constitute as variations and additional works with cost and time implications.

The resident engineer and clerk-of-works, on the other hand, are usually employed on behalf of the employer to supervise the works. He may assist the architect in the supervision of the works, but the architect cannot delegate to him duties of the architect. Similarly, these personnel are usually not delegated the authority to issue instructions that may constitute as variations and additional works with cost and time implications.

### 3.1.2 Instructions constituting as variations

The contractor is obliged to carry out all variations instructed by the employer’s representative. This requirement does not extend to instructions issued by the assistants or other supervisory site personnel not otherwise authorised to issue instructions with variations, as explained earlier. Indeed, the issuance of such instructions constituting as variations, other than by the employer’s representative, would have been construed as \textit{ultra vires}, in that such personnel are not empowered under the contract provisions to issue such instructions. Hence, the contractor, upon receipt of any instructions constituting as variations which are not otherwise endorsed by the employer’s representative, will be prudent to notify the latter that such instructions require a variation under the ambit of the contract provisions. The employer’s representative is then contractually obliged to respond within the stipulated time, to confirm, modify, rescind or contradict in writing the instruction and the contractor shall then comply forthwith.

### 3.1.3 Instructions and directions

Conversely, there are certain rules and procedures, and condition precedents, pertaining to the issuance of instructions and directions, with the former constituting as variations with cost and time implications.

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implications, whereas the latter would not entitle the contractor to additional payment or compensation or an adjustment of the time for completion. Procedurally, the contractor is entitled to challenge the validity of a direction or an instruction which is subsequently shown to have been given in circumstances where there was either no power to do so under the terms of the contract, or no justification in fact for the exercise of such power. Or to the extent that such an instruction does not expressly state that it constitutes a variation but the contractor considers that it does require a variation, the contractor is obliged to notify the contract administrator in writing that the same ought to be confirmed, modified, rescinded or contradicted in writing, accordingly.

The rationale of this contractual procedure, in ensuring instructions are properly regularised as valid variations and formal instructions with cost and time implications, is to enable the contractor, having received such formal instrument, to then thereafter comply with the contract provisions in notifying the contract administrator of any likely delay that would result due to such variation works, and to allow him to plan and re-organize his resources accordingly when there is a definitive response to his entitlement. The employer is also offered the opportunity to review the cost and time implications of such claims, before the contractor intends to proceed with the works. Conversely, the contractor is not contractually obliged, once notification is served, to comply with the same until the instruction is confirmed in writing as a variation. The actual site situation is in reality never like this, where everybody is rushing to get work done, and every bit of information proffered is treated as good for implementation; leaving such contractual claims for cost and time to the back burner and allowing the express provisions of condition precedent to lapse.

Under most forms of contract, such notification of delay within a stipulated time frame, due to any valid instructions with variations, is usually a condition precedent to the contractor’s claim for an entitlement to additional costs and an extension of time. In other words, should the contractor proceeds to comply with such instructions constituting as variations, which were subsequently never regularised as formal instructions, nor ever expressly qualified on his position, he would be deemed to have waived all contractual rights of claims to any entitlement of an extension of time necessary to carry out the extra quantum of works; and indeed would have implied that such additional works would not have any costs implications. Therefore, this contract procedure must be regarded as crucial, in that the employer’s as well as the contractor’s rights and obligations are protected and preserved when valid and excusable delay factors are adequately addressed and equitably recompensed appropriately. That means the contractor is afforded reasonable additional time to carry out the extra quantum of works, and the employer’s rights to deduct liquidated damages due to any likely culpable delay is not prejudiced or unduly relieved.

Indeed, the popular solution is to issue a single formal instruction belatedly and to regularise all previous design revisions, directions and instructions constituting as variations and additional works retrospectively. This is often rejected by arbitrators and the courts, as such global instruction would have had no contractual effect or basis anyway, since each and every such instruction ought to be administered individually and with due diligence in accordance with the contract provisions systematically. The consequential effect of such failure and breach of contractual procedure by the contract administrator, in spite of proper notification by the contractor, is obviously to render the completion time at large, with the contractor’s obligation to carrying out such additional quantum of
works only within a reasonable time thereof. Consequently, all costs for the additional works would be compensated on a „contractual quantum meruit“ or reasonable sum basis – where works are carried out under the existing contract can be based on the acceptance and compliance of this instruction.⁶

The proper approach when assessing „contractual quantum meruit“ works executed under a contract where the terms and conditions are unenforceable is to use fair commercial or prevailing market rates for the works done. It is wrong in principle to apply the provisions of the contract to the assessment of the quantum meruit,⁷ and the value ought also to recognise entitlement to a reasonable or normal profit margin over and above the costs actually and properly incurred in carrying out the work in question.⁸ As a result, the employer’s right to deduct liquidated damages due to any eventual and culpable delay arising from the contractor’s breach and default is irrevocably waived as a result.

3.2 Delay and extension of time

To avoid unnecessary disputes arising, it is important to understand common issues like contractual procedures of submitting and assessing claims; the treatment of float, dominant, culpable and concurrent delays; the relevance of construction programs and the mechanism of updating programs; use of impacted and as-built programs; and the vital necessity of keeping accurate and complete contemporaneous site records. The prime objective is to facilitate expeditious and timely submissions of claims, as well as ensuring a more straightforward approach to analyzing and evaluating such substantiated submissions and to establish what the contractor’s entitlement are under the contract to time and cost. Veritable plethora of prominent authorities, copious references, and textbook are replete with core principles, illustrations and case precedents.

3.2.1 Application for and entitlement to extension of time

Where a contractor is entitled to an extension of time for an excusable delay, he must do so in a diligent and expeditious manner as set out under the contract provisions. The contract administrator is expected to act fairly and reasonably and in a timely fashion in awarding any legitimate entitlement to an extension of time. The purpose for timely submission and early assessment of such claims is in order that the relevant circumstances and merits of the claim can be reviewed and any corrective action that might be possible taken to mitigate the problem,⁹ and in the case of the contractor, to exercise all reasonable measures to mitigate any incurred delay. Any failure to respond to a request

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⁶ ACT Construction Ltd v E Clarke & Sons (Coaches) Ltd [2002] EWCA Civ 972

⁷ Laserbore Ltd v Morrison Biggs Wall Ltd [1993] CILL 896; [1993] 37 BLISS 7

⁸ Sanjay Lachhani v Destination Canada (UK) Ltd (1997) 13 Const LJ 279

⁹ Balfour Beatty v Chestermount [1993] 62 BLR 1
within the prescribed timescale, or actually wrongfully denying a valid claim, for an extension of time, will result in the completion time being declared at large; or compel the contractor to constructively accelerate the works in order to avoid paying any liquidated damages for delay.

Even though most forms of construction contracts do have contractual procedures and condition precedents on application for extension of time, most of them may not contain express provisions on how extension of time claims are to be assessed. Also, most contractors’ programmes do not have the requisite data to show the actual progress on site, or are properly updated in tandem with the actual rate of progress. Such inadequate information usually leads to consequent difficulties in proving the causes of delay and the consequent costs. There is yet uncertainty on any definitive judicial ruling or identifiable principle on how the court assesses and determines the extension of time on delay issues.10

3.2.2 Time At large

The clause providing for time extensions is there for the purpose of preserving the employer’s right to liquidated damages, and not to extend time for breaches by the employer, because to do so would entitle the employer to benefit from its own default. Hence, if delays caused by the employer are not expressly covered by the time extension clause, the liquidated damages clause ceases to apply. Words such as “special circumstances” or “factors beyond the control of the contractor” may not be sufficient to avoid this result. It is then said that “time is at large”. Neither the fact that the work would not have been completed on time anyway, nor the fact that the contractor’s tardiness or wrongful act caused some of the delay, prevents the contractor from being released of its liability to complete by the due date where time is at large due to the employer’s substantial default delays completion.

3.2.3 Constructive acceleration

Constructive acceleration is often defined as “acceleration following failure by the employer to recognise that the contractor has encountered employer delay for which he is contractually entitled to an extension of time and which failure required the contractor to accelerate its progress so as to comply with express instructions to complete the works by the unadjusted contract completion date”. The above approach stipulates that there must be an express order to the contractor to accelerate, failing which any acceleration will be deemed by the courts as self initiated, unless facts are proven that the contractor had been wrongfully refused an extension of time and is therefore compelled to avoid liquidated damages, even without the agreement or consent of the employer.11 There is no contractual obligation on the part of the contractor to mitigate the consequences of the employer’s

10 Henry Boot Construction (UK) Ltd v Malmaison Hotel (Manchester) Ltd [1999] All ER 118, see also Ascon Contracting Ltd v Alfred McAlpine Construction Isle of Man Ltd (1999) 66 Con LR 119

breaches of contract insofar as such acceleration measures would involve financial implications. Therefore any claims for constructive acceleration must be based on the ordinary principles for breach of contract procedures, the breach being either a failure by the contract administrator to grant an equitable entitlement to an extension of time, with the contractor claiming its resultant „acceleration” costs as loss and expense under the contract. For the contractor, the dilemma is that without any extension of time being granted, and in the absence of any instruction to expedite the works, the employer may impose liquidated damages against him for any eventual and inevitable delay; hence presuming it necessary to incurring additional expenses in accelerative measures in order to reduce its potential liability in damages.

For cost claims arising from constructive acceleration to succeed, the contractor must first establish that there are valid and excusable delay, and of which the contractor had furnished prior written notification timeously to request for an extension of time. In addition, the employer or his agents must have explicitly denied the valid claims and have expressly ordered the works to be completed within the unadjusted completion time. Then of course there must be contemporaneous records that the contractor had actually incurred additional costs to mobilise increased resources including manpower, equipment and materials in order to overcome the delay.

In many jurisdictions including the United States and Australia, if a contractor can prove that a delay event was one for which it ought to have been granted an extension of time and the contract administrator either refuses partially or entirely to grant an extension of time, either promptly or at all, a contractor may be permitted to claim acceleration costs on the basis of an implied instruction to pay the contractor to accelerate, overcome delays and finish the project by the contractual completion date. This approach is not easy to establishing the grounds of any purported breach of procedure by the contract administrator, and even if so established, whether the acceleration measures were clearly the natural consequence of such a failure. In the UK, however, the courts do not accept the principle of „constructive acceleration” readily, preferring the dispute resolution provisions in the contract to address such a failure. But such remedies available in the protracted processes of adjudication, arbitration and litigation can offer little help to the contractor at the time when he urgently needs to make the decision whether or not to accelerate.

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12 Ascon Contracting Ltd v Alfred McAlpine Construction Isle of Man Ltd (1999) 66 Con LR 119

13 Envirotech Corporation v Tennessee Valley Authority (1988)


4. Duty of contract administrator and breach of performance

Under most forms of contract, the contract administrator and certifier cannot bind the employer under the contract or vary the contract, unless these powers are expressly given to him. The contract administrator’s powers to certify are usually non-binding, his duties being to validate contractual claims with time and cost implications. In reality, when the contract administrator fails to respond expeditiously on cost and time claims according to prescribed contract procedures, it will probably not amount to a breach of contract on the part of the employer. The contractor is left to show that there is an implied term in the contract to substantiate that the certifier is contractually obliged to discharge his obligations with due diligence. Naturally, there are numerous case precedents where contractors were able to succeed in advancing constructive acceleration claims or declaring completion time to be at large on the basis of an implied term that the employer should ensure that a certifier, appointed by him to oversee and supervise the works, carries out his duties under the contract diligently and with due expedition, whilst proving the employer’s acts of prevention or interference with the certifier’s duties.

5. Conclusion

Failure to recognise the importance of administering the contract expeditiously and in accordance with the prescribed procedures will only result in time and monetary losses at the end. The only viable recourse for the parties seeking to protect their own interests, and to recover such damages and losses due to alleged breach of duty or breach of performance is to resort to adjudication, mediation, arbitration or litigious suits, hence prolonging the project involvement even further, not to mention the added costs for such action. He who asserts must prove, hence it can never be over emphasized therefore, that an early appreciation of the importance of diligent and meticulous record keeping and adherence to established contract protocol will certainly alleviate such eventuality.

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Evaluating Extension of Time Claims

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Abstract

Claims and disputes under construction contracts will invariably involve a myriad of complex issues under countless unique scenarios where legal case precedents and straightforward interpretation of the contract provisions do not always offer instant panacea. Significantly, techniques involving evaluating extension of time claims have evolved over the years with a plethora of methodology, protocol, practice guideline and recommendation together with expertly prepared publications. This paper offers a perspective into how such claims are being documented, submitted and analysed; especially in the context of the evolving construction fraternity still yearning for a unified approach and procedure in preparing and assessing such claims.

Keywords: delay and disruption claims, extension of time, concurrent and culpable delay, liquidated damages
1. Introduction

Prolongation and extension of time claims for delay and disruption under construction contracts tend to tread on the same root problems over time, and it is somehow not easy to arrive at some kind of universal approach to dealing with the numerous possible situations and contractual frameworks. To avoid unnecessary disputes arising, it is important to understand common issues like contractual procedures of preparing, submitting and assessing claims; the treatment of float and of concurrent delays; the importance of construction programmes and the mechanism of updating programmes; and the keeping of accurate and contemporaneous records.

2. Completion time

When a time for completion is specified, and unless expressed otherwise, it is not deemed to be of the essence of the contract. Specifying that “time is of the essence” means that the obligation to perform by that date is essential to the contract. Any failure to meet the date gives the employer the right to treat the contract as being at an end. Most construction contracts recognise that completion may be delayed by unforeseen and unanticipated circumstances. The risks of such delays are borne either by the employer or contractor. These risks are usually allocated by the time extension clauses, which enable a new completion to be set, so the liquidated damages clause can continue to operate from this new date.

The contractor has a contractual obligation to regularly and diligently proceed with the works, to use his best endeavours to prevent or mitigate any delay in the progress of the works, and to prevent the completion of the works from being delayed beyond the completion date. This does not necessarily extend to requiring the contractor to add extra resources, or to work outside its planned working hours, in order to reduce the effect of an employer risk event, unless the employer agrees to compensate the contractor for the costs of such mitigating measures.

2.1 Contractual basis for extension of time

Contractual provision for extension of time is an important mechanism in dealing with extending the period in which the contractor has to complete the works due to various delay factors beyond his control, wherein the contractor is relieved from a liability to pay liquidated and ascertained damages. It also allows the contractor to re-programme the works, and provides the employer with a new date to take possession of the site. Without this mechanism, the contractor’s obligation would be simply to complete the works by the contract completion date. And if there were any delay factor which is beyond his control, time becomes at large. This means the contractor would complete the works within a reasonable period of time, and the employer loses his rights to recover liquidated damages for late completion.
2.2 Application and grant of extension of time

The purpose of granting an extension of time is to fix the period by which the completion date ought to be extended, depending on the incidence of relevant events and measured by the standard of what is fair and reasonable. The revised date is not the date by which the contractor ought to have achieved completion, but within which the contractor ought fairly and reasonably to have completed the works\textsuperscript{1}. Ideally, an application for an extension of time should be dealt with as close in time as possible to the relevant event. Such impact of the employer risk events should ideally be assessed as the work proceeds both in terms of extension of time and compensation.

Where the full effect cannot be reasonably predicted or assessed, an incremental extension of time is then granted for the prevailing predictable effect, and the status reviewed at regular intervals and the extension increased if it becomes justified. In some cases, an in-principle approval to an extension of time is given, and the extension granted as soon as the delay event has ceased to operate, or it becomes apparent. In any event, it would be contractually fatal, in such circumstances, for the contractor to be denied any entitlement to an extension of time, and be coerced into complying with the unadjusted completion date.

3. Condition precedent

Many contracts contain clauses stipulating a notice of delay by the contractor as a condition precedent to the award of an extension of time, which requires submitting of a notification with details of any claim for additional time within a prescribed number of days of becoming aware of the relevant event. If the contractor fails to comply, any appropriate relief under the contract is forfeited, and the clause would have the effect of preserving the employer’s right to liquidated damages for delay that would otherwise have been lost by an extension of time. The liquidated damages therefore remained payable by the contractor where there was a consequent delay in completion. Very often, a contractor in reality does not immediately know the real cause for claim until after the events have lapsed. Notwithstanding, the prudent contractor should be constantly vigilant and to give the earliest possible warning to the owner, of his intent to claim and the anticipated grounds for doing so. This way, the contractor is able to preserve his rights to claim until such time as the necessary information can be collated and appropriate analyses conducted.

On the other hand, any express provision seeking to bar a contractor’s entitlement to relief can be construed as “contra proferentem”. Under the “prevention principle”, neither party can do anything to prevent the other from performing the contract. In London Borough of Merton v Stanley Hugh Leach Ltd\textsuperscript{2}, it was held that such a clause would not be enforceable, and in Gaymark Investments Property v

\textsuperscript{1} Balfour Beatty v Chestermount Properties (1993) 62 BLR 1; (1993) 9 Const LJ 117

\textsuperscript{2} (1985) 32 BLR 51
Walter Construction Group Ltd\(^3\), it was deemed inequitable that the contractor be exposed to liquidated damages as a result of a failure to comply with the notice requirement, with the employer effectively being paid for his own delay.

In some circumstances, the contractor can also prove his rights of claims through „constructive notification“, rather than a written notice. This means the employer ought reasonably to have known that the work is being delayed even though not specifically being notified formally. The contract administrator is often viewed to owe a duty to the contractor, and should be empowered as such, to prospectively grant an extension of time in respect of a risk event even where the contractor has failed to submit a delay notice. As such, extension of time should be granted to the extent that an employer’s risk event is reasonably predicted to prevent the works being completed on time. In the Victorian case of Peninsula Balmain Property Ltd v Abigroup Contractors (No. 2), the court may find that the power conferred upon the superintendent to grant an extension of time of his own volition was to be exercised in the interests of both parties, and is thus obliged to act honestly and impartially when deciding whether to exercise this power.\(^4\)

### 4. Record keeping

Record keeping is generally required for protecting contractual rights and useful for some form of post-contract review. The importance of establishing a documentation system is that it ensures that both the employer and contractor maintain a complete, contemporaneous, chronological and provable record of what happened on site, the problems and their impact upon progress, schedule and cost. The success of a delay and disruption claim always depends on the relevant party’s ability to submit full and complete information. All records need to identify actual costs and delays associated with each entitlement, in order to establish that additional costs or delays were caused by the delay event. Substantiation is invariably required to verify the relevant quantities, costs and the effect on programme and progress of the works.

If all these are neither practical nor possible, it may well be that a global approach to the entitlement may be taken. Global claims are those where a global or composite sum, however computed, is put forward as the measure of damages or of contractual compensation where there are two or more separate matters of claim or complaint, and where it is said to be impractical or impossible to provide a breakdown or sub-division of the sum claimed between those. The claims are not based on any specific loss to a specific breach of contract, but are based on a composite loss as a result of all the breaches alleged, or presumably as a result of such breaches as are ultimately proved.\(^5\) But such

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\(^3\) [1999] NTSC 143

\(^4\) Peninsula Balmain Property Ltd v Abigroup Contractors (No. 2) [2006] VSC 491

\(^5\) John Holland Construction v Kvaerner R.J. Brown Pty Ltd [1996] 82 BLR 83
global claims are generally disapproved and rejected by the courts, tribunals, arbitrators and lawyers. If there are prevailing contractual protocol on application and submission of claims, and if a failure to do so results in the pursuit of a global claim, it is not difficult to see that this would be another aggravating factor for a tribunal to consider when determining the merits of a global claim. Notwithstanding that, global claims have still survived and remain popular with contractors.

5. Construction programme

A construction programme is usually a contractual requirement, but would neither constitute as part of a contract document, nor as a mandatory stipulation as to how works should be carried out. In the absence of specific terms stating otherwise, the contractor is generally free to choose for himself as to how he goes about constructing the works so as to achieve the objective of completing by the contractual finish date.

**As-Planned Schedule.** The initial construction schedule is usually considered as the baseline schedule, presented in network format which clearly shows the interrelationships of the activities. It is advantageous that the as-planned (baseline) schedule be as detailed as possible in order for delays, as they occur, to be incorporated into the schedule in representative locations.

**As-Built Schedule.** The as-planned schedule is updated with progress-to-date information up to the date of the start of the alleged delay. Each updated schedule serves as the as-built schedule for analysing any alleged delay and provide a new baseline as-planned schedule for the next delay.

**Software.** All parties should agree on the software that is to be used for the programme, which should show a critical path network and all the necessary logic links with a listing of all leads and lags. The programme should also be able to dynamically respond to changes in order to achieve the desired effect of the suggested requirement for updating.

**Float.** Contractors often take the view that float is theirs to be expended as they wish, and any benefit of float should not be attributed to the employer, since it is the provision that they have made in programming the job to give themselves some degree of flexibility. On the contrary, float should be viewed as a project resource. In practice, this means that whoever causes delay first will get the benefit of the unused float.

In *Ascon Contracting Ltd v Alfred McAlpine Construction Isle of Mann Ltd*, the position of the court is that it is the project which owns the float. This means if a contract programme has a built-in flexibility that allows certain items to overrun their allotted time without affecting the completion

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date then the contractor is not entitled to an extension of time until such time has been fully utilised. Hence, where delay occurs due to an employer risk event, an extension of time should be granted where the effect of that delay would be to reduce the remaining float attributable to the affected activities below zero. If, as a result of an employer delay event, the contractor is prevented from completing the works by his planned finish date, the contractor would in principle be entitled to be paid the costs directly caused by such event, notwithstanding that there is no delay to the contract completion date, and provided that the employer must be aware at the time of contract of the contractor's intention to complete before the contract completion date and that such intention is then realistic and achievable.

6. Types and causation of delay

Naturally, all contractor-caused delays, as well as those which are deemed to be the risks of the contractor, whether expressed or implied in the contract, are neither compensable nor entitling the contractor to an extension of time. Delays involve either time or cost compensation, and not necessarily both at the same time. Compensable delays are normally those which result from an act or neglect of the employer or his agents. Delays which neither the contractor nor the employer had control, since neither caused the delay and since both parties have been affected by the delay, only time extension is warranted. The contractor is only entitled to additional time and money in so far as that additional time and money has been caused by something which entitles him to time or money.

The Devlin Approach. If a breach of contract is one of two causes of a loss, both causes cooperating and both of approximately equal efficacy, the breach is sufficient to carry judgment for the loss. This approach if applied to delays would always favour the contractor if one of the concurrent delay was a breach of contract on the part of the employer or his agents. For this approach to be applicable, the other causes of delay would have to be a neutral event and not one which the contractor was responsible.

First Past the Post. This approach adopts the logic that where delays are running in parallel the cause of delay which occurs first in terms of time will be used for adjusting the contract period. Other causes of delay will be ignored unless they affect the completion date and continue on after the first cause has ceased to have any delaying affect. In this case only the latter part of the second delay will be relevant to the calculation of an extension of time. This is an appropriate method of resolving the issue of concurrent delays provided there were no delays caused by the employer, and where one of the concurrent delays can be attributed to the employer the courts are determined to ensure the contractor does not incur liquidated and ascertained damages.

The Dominant Cause Approach. In some cases where there is more than one cause of delay, there could be one delaying event which is more influential than the others, or it may be that one cause of delay affects a greater area of the works than the others. This being the case the more dominant cause of delay would be treated as the only matter causing the delay. In recognising that a complex interaction between the consequences of the various causes of loss might make it extremely difficult or even impossible to ascertain with accuracy the effects of any single causative event, the court
approved of the dominant cause approach in the case of *John Doyle Ltd v Laing Management (Scotland) Ltd*\(^8\), when it was said: “The question of causation must be treated by the application of common sense to the logical principles of causation. ... In this context it is frequently possible to say that an item of loss has been caused by a particular event notwithstanding that other events for which the employer is responsible can be described as the dominant cause of an item of loss, that will be sufficient to establish liability notwithstanding the existence of other causes that are to some degree at least concurrent”.

**The Burden of Proof Approach.** This applies when one of the causes of delay is due to a breach of contract on the part of the contractor such as delay caused by a domestic sub-contractor. Where this type of situation arises the contractor cannot escape the consequences. If part of the damage is shown to be due to a breach of contract by the employer, the contractor must show how much of the damage is caused otherwise than by his breach of contract, failing which he can recover nominal damages only.

### 6.1 Concurrent and culpable delay

Delay caused by more than one event, when the causes are within the control or the risk of the same party, are called parallel delays, as opposed to concurrent delays when the responsibility is shared by both parties. Where contractor delay or employer delay occurs or has effect concurrently, the contractor's concurrent delay should not reduce any extension of time due. If the contractor incurs additional costs that are caused both by employer delay and concurrent contractor delay, the contractor can only recover compensation to the extent it is able to identify separately the additional costs caused by the employer delay from those caused by the contractor delay.

In *Henry Boot Construction (UK) Ltd v Malmaison Hotel (Manchester) Ltd*\(^9\), the judge agreed that if there are two concurrent causes of delay, one of which is a relevant event, which is on the critical path, and the other is not, then the contractor is entitled to an extension of time for the period of delay caused by the relevant event, notwithstanding the concurrent effect of the other event. This is a different approach taken by the courts in the past, which have looked for the dominant event, where the most causative delay event is identified to determine whether an extension of time is warranted. The reason for this approach is to encourage the parties to deal with extension of time applications as close as possible to the delay event because the “dominant cause” approach encourages a wait and see attitude. The employer cannot take advantage of the contractor's failure to complete on time where that arises from a matter for which the employer is responsible. In such circumstances, time becomes “at large”. Logically, therefore, this argument would always be available to a contractor in cases of concurrency and thus, arguably, the employer delay should always take precedence.

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\(^8\) [2004] BLR 296

7. Analysing delay claims

Most standard forms of construction contracts do not deal adequately with assessing extension of time claims. Techniques used vary, and while most of these techniques are relatively simple to use, they are difficult to operate in practice due to factors such as relevant conditions of contract; the nature of causative events; the value of the dispute; availability of time, records, and programme information; and the programmer’s or contract administrator’s skill level and familiarity with the project.

**As-Planned v As-Built**. This method compares the duration of an as-planned activity against the original programme with the as-built duration for that same activity on the as-built programme. The difference in time between the duration on the as-built programme and the duration on the as-planned programme is taken as the period of delay to which a contractor is entitled to an extension of time as a result of a relevant delay event.

**Impacted As-Planned**. This method adds an identified relevant delay event either as a separate activity or onto the duration of an existing activity into the as-planned programme. The as-planned programme with the delay event incorporated is then re-run, to show a resultant revised completion date on what is then called the impacted as-planned programme. The period between the completion date shown on the as-planned programme and that shown on the impacted as-planned programme, is taken as being the period of delay to which a contractor is entitled to an extension of time.

**Critical Path Methods**. From the as-planned projected procedure, dates are inserted as the project proceeds, such as late provision of information by the employer or additional works. Then under the as-built collapsed network, it takes the as-built programme and deducts the assessed effects of the employer’s delay. It then assumes that any remaining delay is the responsibility of the contractor.

**Collapsed As-Built (or ‘As-Built But For’ Method)**. This method removes from the as-built programme identified relevant delay events to show what the completion date would have been if those delay events had not occurred. The period between the completion date on the as-built programme and the completion date on the collapsed as-built programme, is taken as being the period of delay to which a contractor is entitled to an extension of time as a result of the relevant delay event.

**Time Impact Analysis**. This primarily uses a window analysis method, based on the analysis of the effects of delay events over the entire length of a project by looking at the events which have affected progress within “windows” of the contract period sequentially, usually at monthly intervals. At the end of each “window” the as-planned programme is updated to take account of any delaying inefficiency which is the contractor’s risk, any necessary logic or duration revisions because of mitigation measures undertaken, together with all relevant events during the period since the last update. The closing of a window in this way forms an as-built programme at the end of that window which effectively becomes the as-planned programme for the next window in sequence. At the end of each window a projection is made to the completion date. At the end of the last window a final
revised completion date is provided which, when compared to the original as-planned completion date, indicates the extension of time entitlement of the contractor.

**First Cause Basis.** This analysis starts from the base of a contract programme, to calculate what would have been the effect of that delaying event alone if there had not been any subsequent delaying events. If there are successive causes of delay, a new contract programme is constructed in respect of the position following every delaying event.

**Ultimately Critical Basis.** The sequence planned within the original contract programme is largely irrelevant. What matters is what actually happened and to identify the string of critical activities which in total add up to the actual project duration. Some of those activities will be characterised as delay, and some of those activities will be characterised as contract work which was always necessary.

### 8. Compensation

**Prolongation Costs.** This is based on the actual cost incurred by the contractor: work actually done, time actually taken up, or loss and expense actually suffered. Even if one agrees the rates of compensation which reflected the anticipated activity on site at the time the contract is signed, these would have to be recalculated every time a delay occurred, whether or not an extension of time was granted, because delay inevitably affects the level of activity which the contractor undertakes. Prolongation costs should be recoverable by reference to the period when the effect of the employer risk event was felt, and not by reference to the extended period under the contract. In this case, it will be difficult to pre-agree a daily rate, where that rate will differ at different stages of the construction and where it may increase beyond that envisaged as a result of a combination or accumulation of employer risk events.

**Disruption Costs.** Disruption is defined as „disturbance, hindrance or interruption to a contractor’s normal working methods”, resulting in lower working efficiency and productivity, hindering and interrupting regular progress. When caused by the employer, it should be compensated either under the contract or as damages for breach of contract.

**Compensation for Concurrent Delays.** The contractor should only be entitled to recover the proven cost of the delay caused to him by the employer. He must be able to separate the costs caused by the employer delay from those caused by his own delay. The effect of this approach is that, concurrent delay will give the contractor an extension of time but no compensation, even though the delay caused by the employer would have given rise to compensation, had it occurred on its own.

**Compensation for Lost Float.** This happens when the employer delay has deprived the contractor of the benefit of his float. If the contractor had intended to complete any portions of the work before the scheduled completion dates but the employer delay means he only completes by the programmed completion date thus consuming the available float, then he should receive compensation for the extended period that he has been on site, being the length of the consumed float. This concept must
be agreed at the beginning of the contract, identifying the activities to which each part of the float applies.

**Acceleration Costs.** This can be applicable when the contractor is entitled to an extension of time and is required instead to accelerate the works in order to achieve the scheduled completion date. The contractor may be granted either no extension of time or such lesser extension as may be agreed, and is paid such agreed sum, or a reasonable sum to compensate the contractor for the additional cost of the agreed measures to accelerate the work and the effect of those measures on other aspects of the work together with an allowance for profit. The net effect of the agreed acceleration order will be a variation to the contract. Where the contractor is not advised on any time entitlement, he is under considerable pressure, not knowing if he will be held liable for liquidated damages. Additional plant or labour may be brought in, or overtime incurred. This is known as „constructive acceleration order”, which effectively converts a refusal to grant an extension of time into an implied instruction to accelerate. The employer may be liable for the additional costs involved. Of course it would be important for the contractor to have already submitted a written claim.  

**Claim Preparation Costs.** This is also usually the inherent discretion of the arbitrators or the courts to award such costs. But where it can be shown that the contractor, or employer, has been put to additional cost as a result of „unreasonable actions or inactions” in preparing or defending claims, then these costs should be recoverable.

**Calculation of Costs.** Once the contractor is granted an extension of time with costs, the computation of the recoverable items must also be substantiated with properly maintained records and invoices. Normally, the contractor should prove actual loss from records. Only where this is not possible, and as an exception rather than the rule, will calculation be allowed by reference to formulae such as the Eichleay formula, and the Hudson or Emden formulae. The formula is applied to assess loss where certain things have been established proving that the contractor did actually suffer loss. The contractor must show that it would have secured work on another contractor and would have been recovering overheads from this other project, and that there was profit capable of being earned elsewhere and there was no change in the market thereafter affecting profitability of the work. It must also be established that the contractor was unable to deploy resources elsewhere and had no possibility of recovering the overheads from other sources, e.g., from an increased volume of work. Thus such formulae are likely only to be relevant and of value if the event causing the delay has the characteristic of a breach of contract.

10 *Motherwell Bridge Construction Ltd v Micafil Vakuumtechnik* (2002) CILL 1913

11 *Alfred McAlpine v Property and Land Contractors* (1995) 76 BLR 1, see also *Norwest Holst v Co-Operative Wholesale Society* [1997] APP LR 12/02

9. Liquidated damages

It is often difficult for an employer to prove the amount of damages as a result of late completion. Hence, an appropriate sum for damages arising from any delay is agreed in advance. This provides certainty for both parties, and does not matter whether the employer’s loss turns out to be more or less: the agreed amount is payable. Liquidated damages are often set lower than the amount of potential losses, so as to encourage contractors to tender, and to avoid prices being inflated to allow for the risk of being exposed to unspecified or high damages. However, the courts have always refused to enforce anything in the nature of a penalty. Liquidated damages must therefore be a genuine pre-estimate of the probable losses to the employer, and not to any other party, judged at the time the contract is made. If the amount stipulated is merely a figure chosen as a means of keeping the contractor up to time, and unrelated to any estimate of probable loss, then it is a penalty and unenforceable. The employer can then only recover actual damages.

10. Conclusion

Analysing and evaluating delay and disruption claims, and assessing extension of time and cost entitlement with all the multiple causes of delay to multiple activities will always be a highly complex and difficult undertaking. Legal principles are not straightforward in application to particular factual situations and are likely to remain overly simplistic in the approach to real world factual scenarios. However, the effort is crucial in achieving an appropriate outcome to any complex delay case, and it typically requires a great deal of hard work and close cooperation of a highly capable delay analyst, supporting facts and documentation, and experienced parties familiar with the development of the project. Despite the availability of sophisticated software for construction programmes and schedules, and the incredulous simplicity on its use, with established delay analysis techniques, the evaluation of time extension is oftentimes frustrated by the failure to maintain an updated programme, complicated with a woeful lack of contemporaneous records.
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Alternative Dispute Resolution in Civil Justice

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Abstract

Contractual and litigious disputes can be time consuming, protracted and acrimonious; potentially destroying commercial relationships of contracting parties, and adversely impacting the supply chain. They can add substantially to business costs, negating much of its benefits or advantages. The merits of dispute avoidance as emphasized in the civil justice system as well as the importance of a fast, efficient and cost effective dispute resolution procedure cannot be overstated. Interest in ADR grew steadily among the civil justice system including the judiciary and legal profession over the last decade or so, spurred by the need for fair, speedy and proportionate resolution of disputes, with emphasis on settlement, even before court proceedings are commenced. This Paper takes a quick glimpse on the various ADR processes, the advantages and disadvantages of such ADR procedures, and examines the forms of intervention which ADR might take, and their potential institutional locations, particularly the proximity to the civil justice.

Keywords: alternative dispute resolution, access to justice, legislative provisions
1. Introduction

Contractual and litigious disputes can be time consuming, protracted and confrontational; potentially destroying commercial and business relationships of contracting parties, and adversely impacting the supply chain. They can add substantially to business costs, negating much of its benefits or advantages. It is in everyone’s interest to work towards dispute avoidance from the outset, and this is reflected in the emphasis on improving relationships between the contracting parties through teamwork and partnership. Inevitably, however, disputes do occur and when they do, the merits of a fast, efficient and cost effective dispute resolution procedure is therefore paramount.

Also described as Appropriate Dispute Resolution, the term Alternative Dispute Resolution (ADR) is any procedure or combination of procedures, conducted in a controlled structured manner, which is entered into voluntarily by the parties to a dispute, as opposed to one suing the other publicly in an open court. ADR suggests some form of minimal, facilitated intervention, directed towards orchestrating communication and an exchange of information, leaving the parties as far as possible unconstrained in reaching an outcome within their own universe of meaning.

Interest in ADR grew steadily among the civil justice system including the judiciary and legal profession over the last decade or so. In what was perceived as a contemporary perception of crisis in the civil justice system, judges are viewing ADR as a way to ease the burdening backlog of judicial business, whilst the government inclined towards active sponsorship as a means of reduced spending on the courts; amidst the rising public outcry over the inefficiencies and injustices of the traditional juridical systems. A significant push came from Lord Woolf’s report “Access to Justice” that identified the need for fair, speedy and proportionate resolution of disputes. This was seen as a move to institutionalise alternative modes of dispute management, and to renovate litigation, and potentially extending governmental provision and perpetuating into areas of dispute hitherto firmly in the ‘private’ sphere.

Those principles lay at the heart of the Civil Procedure Rules (CPR), Statutory Instrument 1998 No. 3132 L.17, which included references to ADR in rules of court and introduced pre-action protocols, with their emphasis on settlement using ADR as an expedient and effective means of settling their disputes, even before court proceedings are initiated. In CPR Rule 1.4(2)(e), part of the Court’s duty in managing cases is that the court must further the overriding objective by actively managing cases and in encouraging the parties to use an ADR procedure if the court considers that appropriate and facilitating the use of such procedure.

According to the Department for Constitutional Affairs Legal Policy (now subsumed by the Ministry of Justice), the proportionate dispute resolution strategy is about much more than just ADR. The vision is that people have access to the information and the range of services (such as Small Claims Mediation and Support Services; Community Mediation and Dispute Resolution Service; Toolkits for Mediation Schemes; National Mediation Helpline; Fast/Multi Track Mediation); they need to understand their rights and responsibilities, alleviating legal problems; and where unavoidable, to resolve their disputes effectively and proportionately.
Support for ADR was demonstrated by the civil justice in *Cowl (Frank) v Plymouth City Council*¹, *per* Lord Woolf at [25], where the Court of Appeal held that judicial review was not necessarily the proper way in the face of alternatives, stating unequivocally that “… sufficient should be known about ADR to make the failure to adopt it, in particular where public money is involved, indefensible”.

In *Dunnett v Railtrack plc*, *per* Brooke LJ at [15], the Court of Appeal told the parties to consider ADR; which Railtrack refused to contemplate at a stage prior to the costs of the appeal beginning to flow. Notwithstanding that Railtrack won the appeal, they were denied their cost recovery from Dunnett. The court clarified that if lawyers “turn down out of hand the chance of ADR when suggested by the court, as happened on this occasion, they may have to face uncomfortable costs consequences”.

The leading case of *Burchell v Bullard*³, is an abject lesson on the dangers and inappropriateness of pursuing legal action in the courts when ADR is clearly available and a better way of deciding the contended issue. Here, Bullard was eventually faced with exorbitant costs resulting from their blatant refusal to take advantage of the earlier offer of mediation.

Many more similar cases demonstrate support through the civil justice and the courts for ADR in lieu of adversarial litigation. Take for instance the case of *Leicester Circuits Ltd v Coates Brothers plc*⁴, where Coates was not awarded full costs though they won, on the grounds that they withdrawn from a mediation process.

Lord Nicholas Phillips, Baron of Worth Matravers, Master of the Rolls, and the President of the newly installed Supreme Court of the UK, during the recent case involving overdraft charges by seven banks and the Nationwide building society, had lamented that the long drawn out series of court hearings would have been averted through the use of amicable settlement with the Office of Fair Trading or through ADR at the Financial Ombudsman Service.

## 2. ADR processes

In the “Dispute Resolution Guidance”, published on Mar 2002 by the Office of Government Commerce (OGC), the Lord Chancellor (as he then was, the Lord Irvine of Lairg, Lord Chancellor’s Department. The Lord Chancellor's Department was abolished in July 2003. Its functions, aims, and objectives were incorporated into the new Department for Constitutional Affairs, the latter of which was then subsequently subsumed by the Ministry of Justice) issued a formal *Pledge* committing Government departments and agencies to settle dispute using ADR techniques. This OGC Guidance

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2. [2002] 1 WLR 2434; [2002] 2 All ER 850
3. [2005] EWCA Civ 358
4. [2003] EWCA Civ 474
provides an overview of dispute resolution and the spectrum of techniques ranging from informal negotiations through increasing formality and more directive intervention from external sources, to processes which involve the use of an external third party and which are considered as an alternative to litigation. The expediency of avoiding disputes is now mirrored in the civil justice system as the Government's emphasis at improving relationships between the client and the supplier through teamwork and partnering.

The then Lord Chancellor said: “Disputes that end up in court often mean that all parties concerned suffer long, drawn-out court cases. Settling a dispute out of court and through mediation can often result in a swift resolution that satisfies all involved. The Government wants to lead the way in demonstrating that going to court should be a last resort. The Government has pledged, where possible, for its legal disputes to be settled by mediation or arbitration when the other party is willing. Very often there will be alternative ways of settling the issues at stake which are simpler, cheaper, quicker and less stressful.”

David Lammy, Minister for Civil Justice Policy, said: “Progress on this scale clearly demonstrates that the Pledge marks a major step on the road away from a culture of litigation, towards a culture of settlement. This order of improvement demonstrates Government's very real commitment to use ADR to settle its disputes, in suitable cases. In line with the Pledge and with guidance issued by the OGC, Departments have included ADR clauses in standard procurement contracts. And Departments are taking forward programmes of skills and awareness training, underpinned by the work of the ADR sub-group of the Government Legal Service, embedding ADR in the culture.”

Dispute resolution includes any process which can bring about an effective and expeditious conclusion of a dispute. ADR techniques can be seen as a spectrum ranging from the most informal negotiations between the parties themselves, through the more formal and more directive intervention from external sources, to a full court hearing with strict rules of procedure.

Briefly, ADR Techniques include the following broad categories:

(a) **Negotiation** – where parties attempt to resolve the dispute themselves. A most efficient form of dispute resolution in terms of management time, costs and preservation of relationships, due to its merits like confidentiality, party autonomy of process and outcome.

(b) **Mediation** – a private and structured form of negotiation assisted by a neutral third party that is initially nonbinding. It is seen as the preferred dispute resolution route for commercial cases involving multi-party with high value disputes. The settlement can be made legally binding.

(c) **Conciliation** – like mediation, but a conciliator can propose an effective solution.

(d) **Neutral evaluation** – a private and non-binding technique whereby a third party, usually legally qualified, a retired judge or lawyer, gives a confidential opinion on the likely outcome at trial as a basis for settlement discussion.
(c) **Expert determination** – a private process involving an independent expert with inquisitorial powers who gives a binding decision.

(f) **Adjudication** – an expert is instructed to rule on a technical issue – primarily used in construction disputes as set out in the Housing Grants, Construction and Regeneration Act 1996 where awards are binding on the parties at least on an interim basis, until a further process is invoked. Part II of the HGCR Act 1996 s108 now requires every construction contract to provide for the right to refer disputes to adjudication.

(g) **Arbitration** – governed by statute, it is a formal, private and binding process where the dispute is resolved by the decision of a nominated arbitral tribunal. There is a debate over whether arbitration is a form of ADR but for the purposes of the Government Pledge arbitration is deemed to be a form of ADR.

(h) **Miscellaneous Forms** – including “Med-Arb” or similar combinations, where mediation is initiated and switching to arbitration should mediation fails; variations of “arb-med” and “Med-Rec”, etc.; and “Mini-Trial”, which is a voluntary non-binding process.

(i) **Dispute Resolution Boards** (DRB) – a panel of experienced, respected and impartial members set up within the contract spectrum to resolve differences or disputes at an early phase. Even though recommendation of the DRB is non-binding, they can be admissible in future proceedings.

(j) **Ombudsman** – impartial “referees” in public or private sector organizations, where decisions are generally non-binding.

(k) **Litigation** – in the absence of a consensual process, this is a formal process whereby claims are taken through the civil courts and conducted in public. The judgments are binding on parties subject to rights of appeal. Potentially lengthy and costly, the adversarial process and outcome is controlled by the judiciary

When contemplating ADR processes, careful consideration must be given at the outset on how to achieve or enforce settlement, with clear express contract provisions for the resolution of disputes which are appropriate having regard to their nature and substance and that such mutually agreed provision should, so far as possible, ensure that relationships with contracting parties are maintained. In particular, it is sound policy that litigation should be treated as the dispute resolution method of the last resort.

Once the contract is in place good contract management is the key to dispute avoidance. Good management techniques include expeditious pre-empting of potential disputes and facilitating regular discussions to alleviate possible areas of conflict. When disputes do arise, it is important to manage it actively and positively and at the right level in order to encourage early and effective settlement. Unnecessary delays and inefficiency can only lead to rapid escalation of costs with adverse impact on working relationships.
2.1 Court based ADR initiatives

Since 1996 in the United Kingdom, both the Commercial Court and the Court of Appeal have been instrumental in identifying cases regarded as appropriate and suitable for ADR, where judges suggest, or make an Order directing parties to attempt ADR. Such Orders, implemented as a voluntary scheme, do have a positive impact on settlement by opening up communication between the parties. At the end of the settlement, parties were able to avoid trial costs, leading to substantial savings for the parties.

Although the scheme is non-mandatory, and even facilitated by the courts free or at nominal costs to the parties, such precatory Orders do impose substantial pressure on parties to settle through ADR, particularly with an implicit threat of penalties for refusal without any valid reasons. Notwithstanding, not all cases may be appropriate for ADR, as the timing may not be opportune. Parties may simply refuse, or being overly cautious to even contemplate ADR, having no faith in ADR as a process in general. Sometimes, parties may be concerned with the intransigence of opponents, and the problems caused by pressuring unwilling opponents through an ADR Order to come to the negotiating table. Occasionally, there may be a mismatch between the mediator’s approach to mediation and the expectations of the parties and their advisers, resulting in unnecessarily protracted proceedings.

In the Court of Appeal, there are special characteristics that need to be considered before recommending the cases for mediation, since not all cases are deemed suitable for mediation. A judgment may be required for important cases due to policy reasons; or an appeal may be turned on a point of law, and not entirely appropriate to be resolved using ADR forum.

In the wake of the court initiatives, an accreditation process for ADR providers was mooted in 2005, thus providing a quality benchmark for civil mediation as well. Over time, an effective relationship is bridged between the judiciary and these ADR providers who may be reputable national organisations or professional institutions. More significantly, the scheme resulted in a high rate of success in settlement.

3. Advantages of ADR procedures

Clearly, the civil justice system supports the use of ADR through its *Pledge* to provide the appropriate clauses in their standard procurement contracts and through rules and guidelines for ADR processes governed by the civil justice court procedures.

Some of the significant advantages of ADR procedures are:

(a) The expeditious process where the schedule for proceedings are largely controlled by parties instead of being subject to the vagaries of the court system.
(b) The informality and flexibility to suit the requirements of the dispute. There are in reality no rules of precedents; hence each case is dealt with based on facts and circumstances within the regulated legal regime.

(c) Parties are allowed to control the procedure, including the crucial rules governing evidence, pleadings and procedure that are otherwise strictly enforced in courts.

(d) Providing the parties with an opportunity to be heard and to understand their respective positions. This is important as ADR process is not inquisitorial or accusatorial, hence putting parties on the offensive or defensive mode. Instead, they are encouraged to express their views before the ADR tribunal. This is not withstanding the fact that there are in place clear rules of ADR Procedures.

(e) Providing a forum for „decision makers” to get involved.

(f) Remaining confidential to the extent agreed by the parties. This advantage is popular with parties where sensitive commercial issues and considerations are paramount as opposed to the likely publicity that open court hearings will solicit.

(g) Providing the support of a neutral third party to facilitate discussions and/or resolve the dispute.

(h) Allowing consideration of outcomes other than strict contractual entitlements.

(i) Helping to maintain working relationships.

(j) Reducing litigation and court costs, since no specialized court facilities are utilized, not to mention that the personnel involved are most likely less costly than the judges and law lords themselves!

The above substantive advantages and standards developed by well-established ADR mechanisms has been proven particularly useful in specific areas of law such as in labour disputes, for example in cases of “unjust dismissal”, and just-cause terminations. The presence of a skilled neutral with substantive expertise, the avoidance of issue-obscuring procedural rules, the arbitrator’s freedom to exercise common sense, party autonomy, and the tradition of limited judicial review of arbitral decisions – all make arbitration superior to litigation.

Disputes in which community values, coupled with the rule of law as a rich source of justice, is more successfully resolved through mediation.

4. Disadvantages

Conversely, it has been argued that the institutionalisation of private negotiations promoted as a preferred, primary means of dispute management might seem unnecessary, even absurd. In many respects, a „culture of negotiation” towards an amicable solution is already inherent, whilst the
assertion of legal rights through litigation or resorting to third party adjudication is very much a matter of last resort.

ADR may not be as popular in every discipline as hoped, in that “it is making slow headway on the ground as a means of resolving civil disputes”. The abandonment of formal mediation in divorce proceedings under the Family Law Act 1996 was an obvious example. Pilot Studies by the Legal Aid Board (since replaced by The Legal Service Commission, an executive non-departmental public body created under the Access to Justice Act 1999) on Family Law Act had showed that in private matrimonial matters beyond the hope of reconciliation, couples have invariably passed the point for any effective mediation to be possible. Besides, laws protecting battered women and legal mechanisms to ensure the enforcement of child-support awards, and such like, may become simply a mirage if all “family law” disputes are blindly pushed into mediation. Such issues presented extend beyond questions of unequal bargaining power. For instance, battered women often need the aggressor evicted out of the home or arrested – goals which are fundamentally inconsistent with mediation. The goals of mediation, i.e., communication, reasonable discourse, and joint resolution of adverse interests – work against the most immediate relief the battered women require, which is protection from violence, compensation, possession of her home without the batterer, and security for her children. Only the judicial system has the power to remove the batterer from the home, to arrest when necessary, and to enforce the terms of any decree such as a personal protection injunction if a new assault occurs. Empirical data showed that the therapeutic model in mediation is ineffective adn that firm law enforcement including imprisonment is required to resolve family violence and spousal abuse.

Furthermore, there are certain cases not entirely suitable for settlement through ADR, for example, cases involving intentional wrongdoing like fraud, abuse of power, public law, Human Rights and vexatious litigants. In Halsey v Milton Keynes General NHS Trust\(^5\), the Defendant was held justified in refusing mediation, as not all cases are suitable for mediation, especially when fraud is alleged.

There will also be disputes where, for example, a legal precedent is needed to clarify the law, or where it would be contrary to the public interest to settle. Such spectra of disputes therefore cannot be amicably settled through ADR.

Although ADR is perceived as a sign of reducing state-power, the converse may also be true. This is because of the implied pressure on parties to accept the ADR schemes that the court imposes such as through grants in voluntary sector schemes. When courts threaten with imposing costs for unreasonable refusal to engage in ADR, people intending to decline mediation but relent only because of fear of sanction and costs penalties, and compelled to comply by legislation. The question arises, therefore, as to whether the contemporary rules of ADR are consistent with the requirements of Human Rights Act 1998 Article 6, on any possible tension between the “compulsory or semi-compulsory” nature of ADR and the right of access to the court.

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\(^5\) [2004] EWCA Civ 576
Another aspect is the worry that a growing fashion for mediated negotiations may operate to the disadvantage of weaker parties where significant disparities of power are obviously evident, and the possibility that ADR may enhance imbalances in power between the parties, rather than redressing them. This is because the indigent party may be disadvantaged with less resources than his opponent with deeper pockets in fortifying his team to defend the case. The consequence is that the poorer disputant may be under pressure to settle because they may lack the financial prowess to sustain the dispute all the way to the courts. At the other end of the spectrum, interveners adopting directive or therapeutic approaches, while purporting to orchestrate joint decision-making, may insidiously exercise coercive power over the parties. This power can be potentially covert, in the sense that it may not be experienced as such by the parties; and unregulated, in that these private processes are not attended by any of the procedural safeguards which surround litigation.

More particular weaknesses in the ADR processes can be identified:

(a) Because of the finality of decisions of ADR processes, and the binding nature of some of these determinations, the right of access to appeals depends on the statutory provisions governing the ADR process. But such availability, if any, is usually restricted to judicial review on questions of law rather than any erroneous decisions made by the tribunal.

(b) Even though confidentiality is an added attraction to parties in the dispute, the effect is that cases involving issues of general public importance are not given publicity and consideration that they might merit. The lack of precedent therefore denies each tribunal of that crucial referencing to earlier decisions when adjudging the present case.

The establishment of alternative agencies and the ensuing informal procedures, which enjoy the authority of the court but which are stripped of the procedural safeguards of the judiciary, carry the risk of unregulated coercion and manipulation of weaker parties by stronger ones, and of both parties by the interveners. Attempts by courts to oversee and regulate hitherto private settlement-directed negotiations present the same dangers. These dangers flow from the nature of the authority which successful courts must of necessity enjoy. Since time immemorial, common law judges and the courts perform a narrow function in hearing disputes and then formulating and handing down a decision, and where the authoritative superior mandates a decree; and where judges are equipped with coercive powers in the event of our failure to comply with their orders. This circumstance in itself makes court sponsored negotiatory processes potentially problematic; and evidence so far available in Britain suggests that parties subject to such processes experience them as coercive. It must be doubted whether uncoerced negotiations are possible at all under the supervision of court personnel.

5. Empirical evidence

Initially, there were teething problems and dissatisfaction amongst the legal fraternity over the evolving ADR processes. There were complaints that compromises either came too late, were too expensive, or were too time consuming and too stressful an encounter. The processes through which the parties eventually reach agreement turned out to be too difficult to launch, and the route to
resolution too tortuously indirect and travel over it can be obstructed by emotion, posturing, and interpersonal friction.

Notwithstanding and in support of ADR in line with the government's Pledge commitments, the Ministry of Justice published Annual Reports giving overviews of the main activities undertaken by Government departments and agencies. Each Annual Report contains a review of ADR use in the civil service and a brief summary of the activities under the Pledge, which includes case illustrations and statistical data; information on the development of awareness of ADR use by Government departments and agencies; as well as other ADR activities within Government. This includes Her Majesty’s Revenue and Customs; Department for Environment, Food and Rural Affairs; Ministry of Defence; Department for Work and Pensions; and Treasury Solicitor’s Department. In 2006/07 alone, ADR was used in 331 cases with 225 leading to settlement, saving costs estimated at £73.08 million. This was compared to previous year's returns, where ADR was attempted in marginally fewer cases, (336 cases in 2005/06), with fewer settlements (241 in 2005/06) - a slightly lower settlement rate of 68% (72% in 2005/06).

The legal fraternity has, as a consequence, become notably more settlement-conscious in handling disputes away from their traditional partisan roles, whilst beginning to develop new forms of practice and novel modes of approaches under the theatrics of neutrality. For example, lawyers in family law mooted the establishing of a „Conciliation Board” to administer a „Recommendation Procedure” designed „to give the parties the benefit of an impartial, confidential and economical recommendation how to settle their differences”. Under this procedure, barristers offer neutral opinions on financial issues submitted to them by the solicitors to the respective parties. However, this procedure conceived „in the hope that the intervention of a neutral and experienced outsider might nudge the parties towards a settlement” had not been widely used; as those operating it indicated that advisory opinions have been sought in no more than a handful of cases a year.

6. Critique

By incorporating ADR as part of the judicial repertoire of dispute management, the courts have, in embracing the ADR regime, extended to oversee and regulate the process of negotiation conducted by parties and their legal representatives in the period leading up to the trial, and over reaching an area of activity hitherto in the „private” domain. This inevitably raises the concerns of informal justice and the scope of judicial surveillance of settlement attempts in the pre-trial period. The potential for coercion and exploitative manipulation presented to the court even where the tone of such an appointment remaining muted should not be underestimated. Even the „suggestion” of further negotiation on the part of the judge must weigh heavily with many parties. Such an occasion vigorously handled would impose enormous pressure on the parties to settle. A regime of this kind coerces the parties towards settlement, delays their access to judgment; but the spheres of „settlement” and „adjudication” remain distinct.

The other concern is that consideration must be given as to whether an ADR mechanism is being proposed to facilitate existing juridical milieu, or as an alternative entirely independent from the
established system. Also, whether this will involve public rights and duties or will result in an abandonment of the bedrock of the constitutional system in which the „rule of law“ is created and principally enforced by legitimate branches of government, and whether rights and duties are being delimited by those the law seeks to regulate. Curtailing the jurisdiction of the courts may result in diminished rights for individuals and other groups.

Because the ADR movement is still evolving, the training and expertise of those who serve as neutrals and mediators in the ADR systems must be emphasised to ensure quality, adequate staffing and funding over the long term. Whether private litigants will prefer ADR in lieu of or merely in addition to litigation; what effect ADR may have on the judicial caseload; whether one can avoid problems of “second class” justice for the poor; and whether one can avoid the improper resolution of public law questions in wholly private fora; all these issues must be thoroughly appraised to ensure the system is adequately evaluated before the ADR regime is permanently established.

7. Conclusions

There is a potential tangible role of ADR within the traditional court system; and the use of ADR process has admittedly had considerable benefit to the parties in terms of savings in costs, maintenance of working relationships and freeing up management time to concentrate on future developments rather than being embroiled in past problems. However, ADR must be seen as options or contractual requirements within the range of conflict management and dispute avoidance techniques available in the legal landscape. They may not be appropriate or successful in all cases; nevertheless, there is a powerful case for approaching ADR positively. ADR would never replace litigation, but instead would be used to make the traditional court systems work more efficiently and effectively, and certainly has this enormous advantage of reducing caseloads by enhancing the effectiveness of settlement; whilst because ADR is under the careful supervision of the courts, there is far less danger that ADR would become a nefarious scheme for diminishing the rights of the underprivileged in the community. After all, the overarching goal of ADR is to provide equal justice to all.

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The Office of Government Commerce (OGC)


Sustainable Construction Contracts and the Construction Lawyer: A Case Study

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Abstract

In May 2009 the Joint Contracts Tribunal (JCT) published its Guidance Note “Building a Sustainable Future Together” to assist the construction industry in dealing with sustainability within contracts used for the procurement of buildings. This paper focuses on how the JCT’s guidance note impacts on the work of practicing lawyers. The paper presents a context rich case study using a specialist construction division within a leading firm of lawyers. Findings of the case study are presented in order to stimulate discussion and generate ideas and further work within the wider construction law community. A strong theme which emerged from the findings was a requirement to enforce non-compliance. This paper suggests ways to deal with non-compliance of sustainable clauses in construction contracts.

Keywords: construction contracts, sustainability, law, practitioners
1. Introduction

Environmental matters and issues have become increasingly important for the construction industry. It has been said that the UK construction industry is responsible for at least 20% of the nation’s waste and that energy used in building accounts for 50% of the country’s greenhouse gas emissions (Moore 2009). Thus the construction industry can play a major role in reducing these statistics and consequently the damage done to the environment.

One area that maybe important in reducing the harm caused to the environment might lie in the field of building contracts especially those issued by the Joint Contracts Tribunal (JCT). This was acknowledged by Edmond (2009) who commented that:

“…as over 70% of all UK building contracts are in the [JCT] form any changes will potentially have a huge impact on the construction industry and the built environment”

After consultation with the construction industry, in May 2009, JCT issued a guidance note entitled “Building a sustainable future together” (BSFT). The guidance note included some draft contract clauses to be included in contract documents.

Hibberd (2009), chairman of JCT, explained some fundamental questions to be addressed in the publication of the new JCT guidance note. Table 1 contains a summary of the questions posed:

<table>
<thead>
<tr>
<th>Question</th>
<th>Question posed in JCT Guidance Note, Building a Sustainable Future Together</th>
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<tbody>
<tr>
<td>1</td>
<td>Could sustainability be improved through industry-specific contract documentation</td>
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<tr>
<td>2</td>
<td>Would sustainability fundamentally change the procurement of buildings</td>
</tr>
<tr>
<td>3</td>
<td>Which contract document (if any) was best for setting out and regulating sustainability matters</td>
</tr>
<tr>
<td>4</td>
<td>What should be covered?</td>
</tr>
<tr>
<td>5</td>
<td>Do all contract provisions need to be legally enforceable?</td>
</tr>
</tbody>
</table>

Hibberd (ibid.) explained that a majority of those consulted agreed that sustainability was important and that contract conditions has an important but, interestingly, not necessarily fundamental part to play in regulating sustainability matters. It was also noted that whilst there was support for standardization it was

“…apparent that this would develop in an ad hoc way until users had coalesced on the overall approach.” (p.26)

It was also observed that there were “challenges of implementation” and how sustainability requirements and the level of detail required are problematic. It was acknowledged that different approaches may be used; one approach might involve the imposition of a specification with a generic
contractual obligation to comply, alternatively a schedule of contract provisions operated with performance indicators might be used. A question was asked “What happens if one fails to meet a target?” The answer given was that “detailed requirements may vary significantly” which, with respect, is not the answer one might expect.

The JCT’s publication “Building a Sustainable Future Together” inspired a micro project around this topical yet crucially important area.

2. The Micro Project

The Micro Project took the form of a case study. Case study research (CSR) has been described as “an umbrella term for a family of research methods having in common the decision to focus on inquiry around an instance” (Adelman et al. 1977, p139) In this micro project the focus of the work was to explore the thoughts of leading construction lawyers to the introduction of sustainability related clauses in JCT construction contracts. Gomm (2009, p40) argued that a case study “may be conducted because the case is of intrinsic interest” and the author reflected that this might be interesting to those involved in construction law either as academics or practitioners. Robson (1993) identified three types of case study research which are identified in Table 2 below:

Table 2: Three types of Case Study

<table>
<thead>
<tr>
<th>Case Study Type</th>
<th>Features</th>
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<tbody>
<tr>
<td>Exploratory</td>
<td>Seeks new insights; asks new questions to find out what is happening.</td>
</tr>
<tr>
<td>Explanatory</td>
<td>Aims to explain in terms of causal relationships</td>
</tr>
<tr>
<td>Descriptive</td>
<td>Seeks to give an accurate description of the situation or phenomenon which is being studied</td>
</tr>
</tbody>
</table>

(After Robson, 1993)

The type of CSR developed for the micro project was unashamedly exploratory in nature. Views of a firm of construction lawyers were sought by interviews with the intention to stimulate further questions and ultimately generate hypotheses.

In carrying out work case study it is important to recognise that the study will not yield generalisations (Gomm, op. cit). However as Bassey (1981, p185) argued “the relatability of a case study is more important than its generalisability” or as Lehaney and Clarke (1995, p15) expressed the view that an important question to be asked is whether “the case provides enough information for someone working in a similar situation to benefit”.

The method used for the case study was the interview. Interviews are one of the most commonly recognised research methods (Mason, 1996) and they provide an overpowering positive feature due to richness and vividness of material (Gillham, 2000).
2.1 Micro Project interviews

The idea for the micro project arose from a chance meeting and conversation with a partner of a leading law firm who was also Head of the firm’s Construction division. The firm has not been named for reasons of confidentiality but is a major regional practice covering large areas of commercial law not merely construction related matters. The meeting and discussion with the partner yielded an unexpected outcome in that the partner suggested that our conversation (about sustainable building contracts) was not only of interest to him, but he suggested that this might also be of interest to other lawyers in his firm. As a result, the author interviewed the Partner / Head of Division, Deputy Head of Division, one solicitor and two assistant solicitors. In total five qualified lawyers operating in the field of construction law were interviewed.

The interview questions included those posed by Hibberd (Op. cit) as shown in table 1 earlier with some additional questions added by the author in order to explore the views of the lawyers in more depth. As a pilot, the questions were shown to a partner who worked for a different law firm in a different city. As a result of the pilot, minor modifications were made to the interview questions.

The interviews were held over a period arranged to cause minimum disruption to the lawyers’ work. The lawyers were interviewed individually in the firm’s conference room. To avoid data contamination the interviewer asked the lawyers not to discuss the questions or answers with each other during the two day interview period. Each lawyer was given a printed transcript of their discussion and asked a) whether it represented a true record of their view, and b) whether they required any clarifications or alterations to be made. All of the five lawyers agreed that answers had been accurately stated and there were no alterations to their transcript.

Table 3 (below) gives a complete list of questions presented in the case study. The first five questions were compiled by the Chairman of JCT with the remainder added by the author.

Table 3: Combined list of questions posed to lawyers

<table>
<thead>
<tr>
<th>Question</th>
<th>Source</th>
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</thead>
<tbody>
<tr>
<td>1. Could sustainability be improved through industry-specific contract documentation?</td>
<td>JCT</td>
</tr>
<tr>
<td>2. Would sustainability fundamentally change the procurement of buildings?</td>
<td>JCT</td>
</tr>
<tr>
<td>3. Which contract document (if any) was best for setting out and regulating sustainability matters?</td>
<td>JCT</td>
</tr>
<tr>
<td>4. What should be covered?</td>
<td>JCT</td>
</tr>
<tr>
<td>5. Do all contract provisions need to be legally enforceable?</td>
<td>JCT</td>
</tr>
<tr>
<td>6. What is your opinion of the JCT BSFT Guidance Note?</td>
<td>Author</td>
</tr>
<tr>
<td>7. Have you been asked by any of your client's to draft contract provisions as a result of the JCT BSFT Guidance Note?</td>
<td>Author</td>
</tr>
<tr>
<td>8. Do you think that BSFT will have an impact on your work as a lawyer?</td>
<td>Author</td>
</tr>
<tr>
<td>9. If you answered &quot;Yes&quot; to the last question, how do you think BSFT will affect your work?</td>
<td>Author</td>
</tr>
</tbody>
</table>
The five lawyers were randomly allocated participant codes from A to E and their responses were summarised and tabulated. These are shown in table 4.

**Table 4: Responses to Interview questions**

<table>
<thead>
<tr>
<th>Question</th>
<th>Participant A</th>
<th>Participant B</th>
<th>Participant C</th>
<th>Participant D</th>
<th>Participant E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Could sustainability be improved through industry-specific contract documentation?</td>
<td>Yes</td>
<td>Yes</td>
<td>Possibly</td>
<td>Yes</td>
<td>Possibly</td>
</tr>
<tr>
<td>Would sustainability fundamentally change the procurement of buildings?</td>
<td>Possibly</td>
<td>Not sure</td>
<td>Possibly</td>
<td>No, other matters more fundamental</td>
<td>No</td>
</tr>
<tr>
<td>Which contract document (if any) was best for setting out and regulation sustainability matters?</td>
<td>Conditions</td>
<td>Conditions</td>
<td>Specifications</td>
<td>BQ and Specifications</td>
<td>Don’t Know</td>
</tr>
<tr>
<td>What should be covered?</td>
<td>Materials</td>
<td>Construction materials</td>
<td>Climate Change</td>
<td>Materials used</td>
<td>Water Energy</td>
</tr>
<tr>
<td>Do all contract provisions need to be legally enforceable?</td>
<td>Yes</td>
<td>Yes, Absolutely</td>
<td>Yes</td>
<td>Absolutely</td>
<td>Possibly</td>
</tr>
<tr>
<td>What is your opinion of the JCT BSFT Guidance Note?</td>
<td>Good start but does not go far enough</td>
<td>Disappointing</td>
<td>OK, but have a feeling contractors will ignore it</td>
<td>Too vague</td>
<td>Good but not definite enough</td>
</tr>
<tr>
<td>Have you been asked by any of your client’s to draft contract provisions as a result of the JCT BSFT Guidance Note?</td>
<td>No</td>
<td>No</td>
<td>No, but it is early days</td>
<td>No, too early</td>
<td>Not yet</td>
</tr>
<tr>
<td>Do you think that BSFT will have an impact on your work as a lawyer?</td>
<td>Yes</td>
<td>Minimal</td>
<td>Can’t say at this point</td>
<td>Yes</td>
<td>Yes, possibly</td>
</tr>
<tr>
<td>If you answered “Yes” to the last question, how do you think BSFT will affect your work?</td>
<td>If clients demand this it will mean more work</td>
<td>Perhaps some drafting or general advice</td>
<td>Too early depends on client</td>
<td>Increasingly important area but depends if client driven</td>
<td>Nature of client is important</td>
</tr>
</tbody>
</table>

From the lawyers’ responses it would that they generally agreed that industry specific contract document could improve sustainability in the construction industry. However the lawyers did not see sustainability as a concept which would fundamentally change the way that buildings were procured.
The lawyers generally felt that cost and time were the key influences on the way buildings were procured and that sustainability was important but not as fundamentally important. How sustainability should be dealt with within contract documents was interesting in that 2 lawyers were in favour of using conditions of contract whilst two favoured using specifications with one lawyer undecided. This concurs with the view of the chairman of JCT, Peter Hibberd, who said that sustainability could be dealt with in different ways in construction contracts.

When asked about what ought to covered in contracts in the context of sustainability, materials and energy consumption emerged as the strongest themes with the use of water and waste policy following closely behind.

Most of the lawyers felt that the any contract conditions and/or specifications used for sustainability had to be legally enforceable or they would be ignored by the industry. The lawyer’s view of the BFST ranged from an expression that “it brings sustainability out into the open and that must be a good thing” (positive) to “It is disappointing, the JCT have missed a great opportunity here” (negative). Other comments included expressions concerning the “vagueness” of the document, “the ease at which (it was felt) parties, particularly contractors could avoid the [sustainability] issue” and the lack of legal enforceability.

When asked about the likely impact of BSFT on their work, most of the participants felt that it was too early to give a definitive answer although they felt that the attitude of the [Construction] client was paramount importance in this area.

As one of the participants said:

“It is too early to say how this [BSFT] will affect our work [as lawyers]. If the clients really want this, then I’m sure we will get involved. If the clients ignore it, then it will fade away. It is client driven rather than lawyer driven.”

A consistent theme which emerged from the interviews concerned the lack of enforceability of the sustainable contact conditions. The JCT chairman suggested that Key Performance Indicators (KPIs) might be used as targets to encourage compliance. The lawyers felt that the use of KPIs were administratively difficult and cumbersome and suggested that an alternative measure of enforcement might be adopted. This suggestion involved the provision of an environmental audit based on ratings from the well known Building Research Establishment Environmental Assessment Management tool (BREEAM). A standard might be set before commencement of the works that stakeholders in the project would be expected to achieve, with a tender uplift (bonus) to be paid if the anticipated rating was achieved. There was some controversy over the situation if the rating was not achieved ranging from “no sanction” to the imposition of a cash penalty. Some lawyers felt that the inclusion of a sustainability target might be more meaningful where contractors had a major input into design (design and build contracts) or where partnering arrangements were made. Other lawyers felt that the procurement method used was not important provided that contractors were fully aware of their position as major stakeholders in the process irrespective of their contribution to the design (Clelland, 1995, Newcombe 2003).
3. Conclusion

The Micro Project provided an interesting insight into how one group of lawyers view the proposed JCT Guidance Note on Sustainable Contracts and has raised some interesting points for discussion and debate. It would appear that the group of lawyers interviewed cautiously welcomed the JCT’s stance on sustainable building contracts although there appeared to be an issue of the lack of legal enforceability.

3.1. Recommendations for further research

The author fully acknowledges the limitations of a study based on an n=1 context, however feels that the work represents a useful starting point to gauge attitudes to BSFT. A logical and interesting next development might involve an inquiry to a large number of construction lawyers and thereafter to other groups of construction professionals to provide material for comparison.

References


Breaking through Business and Legal Barriers of Open Collaborative Processes based on Building Information Modelling (BIM)

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Abstract

The involvement of various parties is inevitable due to the increasing complexity of modern building projects. In order to achieve life-cycle sustainability, open integration of information and know-how across different building phases and knowledge disciplines becomes very important. Open collaboration within the project organization requires integrated collaboration frameworks and tools. To a considerable extent, such a need can be met by the state-of-the-art Building Information Modelling (BIM). Unfortunately, there remain significant business and legal barriers. In contrary to the vision of an open and neutral BIM, conflicts of interests (e.g. providing and sharing knowledge) and local constraints can not entirely be avoided in a project organisation. The existing integrated procurement methods have not sufficiently addressed the key issues of open collaborative processes using BIM, such as: the changing roles and responsibilities of the stakeholders, the demand for new roles like a model manager, the legal status of the model and shared information, the new distribution of risks, and the performance-based commissioning and payment schemes. This paper aims at introducing an innovative process management approach to break through the business and legal barriers of open collaboration using BIM. As a research paper, the knowledge is partly based on InPro, an ongoing collaborative R&D project co-funded by the European Commission. A field survey among various stakeholders in Finland, France, Germany, Sweden, Slovenia, and the Netherlands was conducted to define the market viewpoint and current practice experience. The findings from both field and literature surveys are analysed to identify the business and legal issues of BIM in construction projects. A critical review over the existing BIM guidelines is presented. Subsequently, a new approach for BIM-wise process management is proposed together with the relevant business concept and take-up strategy. Finally, the necessary contractual terms for implementation and the direction for future research are discussed.

Keywords: BIM, open collaboration, process management, business concepts, legal issues
1. Introduction

The technical and organisational complexities of a sustainable building project have increased significantly (Sebastian, 2007). Technically, a sustainable building has to meet much higher performance, durability, health, comfort, safety, user-friendliness, and environmental standards. The building also contains various equipments for building automation, makes use of new building materials and construction techniques, and aims to function more effectively with less energy consumption. Organisationally, the building project involves many stakeholders, including: multiple clients and end-users; multidisciplinary advisory, design and engineering teams; numerous construction companies, specialist contractors and suppliers. The way to collaborate between these stakeholders is a subject to the decision on many possible procurement and contractual arrangements.

In order to deal with the increasing complexities, process management was introduced to complement project management. The project management’s mission is to lead a building project on a clear path towards the achievement of the predefined objective. Project management focuses on three main aspects, i.e. quality, cost and time (Wijnen et al., 1993). Consistent with these three aspects, project management aims at delivering a building that meets the previously set quality level within the budget and the planned duration.

Process management deals with processes beyond the limited project boundaries. It operates before project management begins (i.e. before the project definition) and continues throughout and beyond all stages of the project. Process management focuses on two main aspects, namely: information (knowledge) and organisation (collaboration). With regards to these two aspects, process management aims at establishing strategies for collaboration, managing communication, and decision-making among the stakeholders. Based on comprehensive considerations, process management prepares and shapes the path –the project stages, interconnections between global and specific objectives, and involvement of stakeholders– on which project management leads the project through (Allinson, 1997).

For managing complex collaboration and communication processes, integrated collaboration framework and tools are needed. To a considerable extent, such a need can be met by the state-of-the-art Building Information Modelling (BIM). BIM is widely known as an intelligent building model that is able to contain the information and process throughout the life-cycle of a building (NIBS, 2007). Next to the intelligent building model, BIM also comprises a new model-based framework for multidisciplinary collaboration.

At present, BIM has become one of the most important innovations in managing building projects. The technological development of BIM has been advancing rapidly. Open standards, rules, object libraries, and formats, such as: IFC (Industry Foundation Classes), CIS/2 (CIMSteel Integration Standards), IDM (Information Delivery Manual), IFD Library (International Framework for Dictionaries Library), and MVD (Model View Definitions), are being relentlessly improved and more and more software applications support the users to work with BIM (Erabuild, 2008). Although certain technical limitations and R&D problems still exist, and a 100% compatibility and
interoperability level has not yet been achieved, the state-of-the-art of BIM knowledge and technologies makes it possible to deploy BIM in practice.

Despite a sufficient degree of technological readiness, large-scale utilisation of BIM in the building industry has not yet taken place due to existing business and legal barriers. Although BIM is often intended to be open and neutral, conflict of interests and local constraints cannot entirely be avoided in a project organisation. A project-based collaboration is usually shaped after a procurement process and formalized in a contract for a single project. Sharing knowledge openly and neutrally within the context of a one-off project may become disadvantageous for a stakeholder which would not involve in the next projects. In contrary to the universal character of the technology, the local influence at the project level is still strong as methods of procurement and contracting strongly differ between countries. The existing procurement methods have not sufficiently addressed the key issues of open collaboration using BIM, such as: the changing roles and responsibilities of the stakeholders, the demand for a new role such as a model manager, the legal status of the model and shared information, the new distribution of risks, the new collaboration framework, and the performance-based commissioning and payment schemes.

This paper aims at introducing an innovative process management approach to break through the business and legal barriers of open collaboration using BIM. As a research paper, the knowledge is partly based on InPro, an ongoing collaborative R&D project co-funded by the European Commission. A field survey among various stakeholders in Finland, France, Germany, Sweden, Slovenia, and the Netherlands was conducted to define the market viewpoint and current practice experience. The findings from both field and literature surveys are analysed to identify the business and legal issues of BIM in construction projects. A critical review over the existing BIM guidelines is presented. Subsequently, a new approach for BIM-wise process management is proposed together with the relevant business concept and take-up strategy. Finally, the necessary contractual terms for implementation and the direction for future research are discussed.

2. Business and legal issues of using BIM in construction projects

2.1 How does BIM differ from CAD?

BIM is not the same as the well-known Computer Aided Design (CAD) technology. BIM goes further than a tool to generate digital (2D or 3D) drawings. BIM is qualitatively different from CAD because it is not just a depiction, but it is an object-based definition of the facility. The information maintained in a BIM also differs from the level and type of information maintained by CAD (Ashcraft, 2008). In most CAD applications, a building element, for example a wall, is an assemblage of lines that define the geometric constraints of the wall. In BIM, the wall is an object that contains a broad array of information in addition to the geometry or physical shape. Rather than draw lines that describe dimensions of a design, with BIM designers organise intelligent objects into a design. There is a degree of design analysis as well, so BIM is not simply design documentation (London et al.,
BIM can extend beyond the embedded information of object-oriented models. BIM enhances the Data Management System (DMS) as all relevant information is appended and linked to the central model.

Thus, BIM is an integrated framework and a comprehensive tool by which all process and product information is combined, stored, elaborated, and interactively distributed to all relevant stakeholders (Sebastian and Haak, 2009). As a centralised model for all stakeholders in all building phases, BIM develops and evolves as the project progresses. It is meant to be a living model that can be used during the planning, design, construction, and operation of a building. Using BIM, the proposed design and engineering solutions can be measured against the client’s requirements and expected building performance. The functionalities of BIM to support the design process are multidimensional (nD), including: three-dimensional visualisation and detailing, clash detection, material schedule, planning, cost estimate, production and logistic information, and as-built documents. During the construction process, BIM can support the communication between the building site, the factory and the design office – which is crucial for an effective and efficient prefabrication and assembly processes, as well as to prevent or solve problems related to unforeseen errors or modifications. When the building is in use, BIM is also a repository of data for facility management. BIM can be used in combination with the intelligent building systems to provide and maintain up-to-date information of the building performance and the life-cycle cost.

BIM is not simply CAD on steroids as it also serves as a framework for collaboration (Ashcraft, 2008; InPro D16, 2009). BIM is a means for integration between the ICT and business aspects of collaboration. Its essence lies in the collaboration and communication between the stakeholders (Böhms, 2008). The different facets of integration through BIM are illustrated in Figure 1.

![Figure 1: Integration facets through BIM as a framework for collaboration (Böhms, 2008)](image-url)
2.2 Observation of the barriers of BIM implementation from the business and legal viewpoints

Having learned the new possibilities offered by BIM, certain benefits through BIM implementation in a building project can be expected, such as:

- consistent information resulting from the integration of all data in a centralised model;
- efficient and fast design and engineering, as drawing, analysing, verifying and decision-making are done through simultaneous processes involving all disciplines;
- efficient planning and production based on accurate quantity estimation and coordination;
- high quality buildings due to the elimination of design errors;
- sustainable solutions through continuous validation of the design alternatives against the client requirements; and
- effective facility management using the data contained in the model for managing, remodelling, and maintaining the building over time.

However, there remain many barriers for an optimal implementation of BIM in practice. Ashcraft (2008), Chao-Duivis (2009), Eastman et al. (2008), and InPro D9b (2009) comprehensively observed the actual and potential barriers for BIM from the business and legal viewpoints. The identified barriers can be categorised into five main issues, namely:

- the lack of immediate benefits of BIM for the stakeholders;
- the changing roles, responsibilities and payment arrangements;
- the uncertainty of the legal status and intellectual property of the model;
- the inadequacy of the existing contractual frameworks, including the agreements on liability and risk allocation;
- the lack of consensus on the protection of information in conversion and interoperability, and against loss and misuse of data.

Despite the knowledge of the sustainable benefits of BIM, many concerns remain regarding the immediate benefits of BIM for the client, designer, engineer, and contractor. Based on a reflection on several real cases of complex building projects in the Netherlands, Sebastian (2009) found that most clients struggled to translate their ambition and objective of BIM into effective project implementation strategies, both within their own organisations and in the relationships with the other stakeholders from the building supply-chain. Many clients ask costly advice from renowned business
consultants only to discover that there is still a gap between the business and technology, as well as between the management and operational levels. The decisions on ICT solutions for BIM are often not adequately grounded on the business strategy. In contrary to the ambition to endorse a life-cycle strategy to manage the facility effectively and efficiently, traditional procurement that reflects a fragmented approach is still largely used. The contractual limitations of the roles and responsibilities of the building parties in the traditional procurement method hinder the optimal implementation of an integrated collaboration.

Designers and engineers, even more than the clients, must adopt and invest in the new technology. However, for many designers and engineers, BIM’s immediate benefits are less apparent (Ashcraft, 2008). If properly implemented, BIM should increase the efficiency by reducing duplicative and potentially inconsistent data entry. Multiple-use of consistent data and the ability to quickly explore design alternatives also promote efficiency and improved quality. In order to offer BIM based services, design and engineering firms must adopt the new technology, install the advanced software, train their employees, and champion BIM use. They need to restructure their workflows and reinvent the design processes. The asymmetrical rewards for their investment are a limited share and the relatively short-time involvement of designers and engineers in the building project, which makes it impossible to release the full benefits of BIM.

Contractors can also benefit from BIM through less coordination and engineering effort and reduced fabrication costs. If the quality is increased, the cost decreased, and the delivery time is shortened, the contractor can make an agreement on a bonus payment with the client. However, one of the main concerns is how to get an early involvement in the design and engineering stages instead of just constructing the design against the lowest possible price as agreed through a traditional tender procedure. Another concern is the often difficult and costly adoption of BIM approach in the wide-range of the workflows and construction labourer groups within the company and with the subcontractors and suppliers.

Collaborating BIM-wise requires restructuring of the order of activities and redistribution of the roles and responsibilities of stakeholders. Up to now there is a lack of clarity over the changing roles and responsibilities. Among the most debated questions are: Is the architect still the leading designer in the integrated design and engineering? Who is in charge of the total quality of the design? Who assures that all interface problems (clashes) are solved and that the model is full-proof? Which new agreements on responsibilities and input-output workflows should be made if every discipline is involved almost simultaneously in the process? Since a new role of model manager has come to place, what are the general and specific tasks of the model manager with respect to the project manager and the process manager?

Collaborating BIM-wise leads to a shift of activities from the later stages to the early-design stage. Much, if not all, activities in detailed-design, engineering and quantity specification stages will be done in the earlier stages. It means that designers and engineers can no longer expect a significant proportion of the payment in the detailed-design, engineering and quantity-specification stages – which traditionally count up to 40% of the total design fees (Chao-Duivis, 2009). Moreover, as
engineering and quality-control work is done concurrently with design, a new proportion of fee and a new payment arrangement in the design stage come into force.

The next factor that hinders a wide-scaled use of BIM in a building project is the legal status and intellectual property of the model. Can the model serve as a legal contract document? At present, most building information models do not contain all of the construction details required for a project. Thus, the contract documents need to include some information based on 2D documents to complement in the building information model. Next to this problem, many building permit-issuing agencies are not yet ready to review digital information and require paper-based submissions (Ashcraft, 2008). The other question is: Given that the model is an inherently collaborative work, to what extent can anyone claim ownership of the intellectual property? If the model is a collaborative work, then ownership may not be vested in a single party. Nevertheless, Chao-Duivis (2009) argues that considering the model as a combined work, the intellectual property right (IPR) is similar to those of the conventional teamwork. Although it seems to be a fully-integrated design, the model is actually resulted from a combination of works/elements, for instance: the outline of the building design is created by the architect the design for the electrical system is created by the electrical contractor. In terms of a combined work, the IPR of each element rests with its creator. However, due to the large amount of information and complex work processes, such a model-server with an automatic authorship registration function is needed to be able to keep track of the IPR in BIM.

Some questions remain regarding the required legal and regulatory framework, which addresses the coverage on liability and the allocation of risks, e.g. Are there any regulatory impediments to BIM Standards proceeding? What new regulation needs to be put in place? Who is liable for the information in the digital model? How are the users protected? Currently no BIM specific legal framework exists, except for the national BIM standards for project development recently introduced in Finland, Norway, Denmark, and USA (CIE, 2009).

Deciding on the type of standard contract for BIM-wise collaboration is another important legal issue. There is a wide range of forms of contract to meet the diverse needs of the collaboration in the building projects. In the UK, the Joint Contract Tribunal (JCT) makes a distinction between the traditional contract forms and integrated ones, i.e. design-and-build, management, and partnering, and provides a comprehensive description and some guidelines to select the most appropriate type of contract in relation to the procurement methods (JCT, 2007). However, the standard contract forms are country-specific, and the terms for BIM based projects are very limitedly addressed; for instance, in the latest version of the Uniform Administrative Terms for Integrated Contracting in the Netherlands, only a brief note on life-cycle approach has been added (CROW, 2005). Does a BIM based project always require an alliance contract? Eastman et al. (2008) and (Chao-Duivis (2009) state that there is no obligation to adopt an alliance or integrated contract for a BIM based project. However, if the stakeholders intend to achieve an open collaboration, they should opt for an integrated contract. In any case, BIM-wise collaboration requires a changing use, new interpretations and reformulated clauses of any type of contract.

The protection of information in conversion and interoperability, and against loss and misuse of data is a legal issue that is strongly related to the technical capability of BIM. There are many
international norms, standards and agreements available for use of data management; however, in most cases the protection of information is attached to the contractual frameworks which are country-specific. What needed is an agreement on the standard of care and possible conflict resolution on data management as an integral part of the contract.

2.3 Findings from field surveys in Europe

Before a novel business concept and legal framework for BIM-wise collaboration can be defined, the knowledge of the current situation in the building industry is essential. Within the InPro research project, a European survey was conducted (InPro D9a, 2009). The main surveys were carried out in four countries, i.e. Germany, France, Sweden, and Finland. Additionally, a minor inquiry was conducted in the Netherlands. The survey was done by using a questionnaire distributed among the key stakeholders of building projects, i.e. clients, architects, specialist designers, engineers, contractors, project managers, and model managers. The main findings of the field survey can be summarised as follows.

- The concept of BIM-wise collaboration is well known, but most respondents have little experience of its application.

- The advantages of a BIM-wise collaboration are known and evident in the recent BIM based projects (e.g. 3D visualisation, clash detections, energy simulations, determination of volumes and masses, minimising risks). However, the achieved project success up to now has strongly been dependent to a few qualified teams with sufficient competencies and experience.

- In most cases, the existing organisational structures and project approach are not adequate to support BIM-wise collaboration. The new role of model manager is important, but need to be clearly formulated.

- Partnering is seen as the appropriate type of procurement for BIM-wise collaboration.

The survey findings show the high market potential for BIM based projects in Europe. However, incompetence due to the lack of know-how and past experience, and uncertainty due to the lack insight in possible new risks are weighing down the decision to fully release the capacity of BIM in building projects.

3. Existing BIM guidelines for building projects

Currently there are many initiatives across the globe to develop guidelines for deploying BIM in building projects. Several initiatives which are most referred to and have been accepted in the practice to a certain extent are: the National Building Information Modeling Standard (NBIMS) by NIBS (2007) from United States, the Integrated Project Delivery (IPD) by IAI (2007) from United
States, the BIM Requirements by Senate Properties (2007) from Finland, and the open standards developments by BuildingSMART International Alliance for Interoperability (described by Böhms, 2008; Erabuild, 2008; and InPro D19, 2009).

The National Building Information Modeling Standard (NBIMS) by NIBS (2007) describes a technically standardised process to develop and deploy BIM along with the relevant open standards and tools. It aims at promoting open and interoperable information exchanges through BIM. NBIMS document presents the scope and definition of BIM and information exchange and sharing. It recognises and incorporates American and international open standards development processes and products, such as American National Standard Institute (ANSI), International Standard Organization (ISO), International Alliance for Interoperability (IAI), and Open Standards Consortium for Real Estate (OSCRE). NBIMS also illustrates the framework through which a long-term vision of open standard-based BIM may be seen in the facility life-cycle helix (Figure 2). NBIMS sets the minimum requirements of quantity and quality of information to define a building information model. It also discusses the capability and maturity of the model. It explains the procedures of developing and incorporating open standards and templates for BIM, especially Industry Foundation Classes (IFC), Information Delivery Manual (IDM), and Model View Definition (MVD). NBIMS document focuses further on the technical protocols to reach a consensus in using generic BIM Guides and validating data in BIM.

Figure 2: Facility life-cycle BIM repository (NIBS, 2007)

NBIMS focuses on information management and contains comprehensive ICT, definition and standardisation background and procedures of BIM development and deployment. However, it discusses little about the use of BIM in a building project or about managing the inter-relationships between BIM and the project processes and stakeholders. In this sense, the Integrated Project Delivery (IPD) by AIA (2007) can be seen as complementary to NBIMS. IPD focuses on the implementation of BIM in the processes of a building project. IPD describes how BIM can be applied
to a variety of procurement and contractual arrangements. It specifies the roles, activities and required contributions of the stakeholders in each project stage. It points out the consequences of BIM for process restructuring whereby certain project stages are shifted or redefined (see Figure 3). IPD encourages early contribution of knowledge and experience and requires proactive involvement of key participants. However, several limitations can still be found, i.e. the principles have not been accepted in the common practice; the proposed process structure and corresponding contractual arrangements have not been validated; and the transition from the traditional towards the integrated approach is rather moderate and based on the currently available procurement methods.

Figure 3: Differences in traditional and integrated project delivery (AIA, 2007)

In Finland, the institutional establishment of BIM based projects has recently taken place. The Senate Properties –that is the state enterprise under the Ministry of Finance which provides property services to government clients– has been developing and adopting BIM requirements according to the documents by Senate Properties (2007). The documents contain the general operation procedures over how BIM can be generated and utilised in building projects, especially those under Senate Properties’ supervision. The documents represent comprehensive guidelines on how an intelligent building model should be structured in 3D layers and levels of detail, i.e. client requirements model, spatial group BIM, spatial BIM, preliminary building element BIM, and building element BIM. The documents describe the modelling process and the required general and detailed contents of the models in each project stage for each discipline, i.e. architectural design, structural design, MEP design, and facility management. In addition to this, several special BIM functionalities are described, i.e. use of models for visualisation purposes, MEP and energy analyses, quality assurance, quantity take-off, and merging of models.

Despite the extensive coverage of BIM Requirements documents, Senate Properties still acknowledges that a further development is needed, especially with regards to the innovative restructuring of the processes of a building project. The current guidelines focus mainly on managing the models, instead of managing the BIM based projects. Moreover, the guidelines depict how BIM is utilised within the conventional sequence of stages and activities of design and engineering. Senate Properties is fully aware that BIM will not only partially change the documentation from drawings into models, but will also revise the entire investment, design, and construction process. Model-based decision-making will result in the changes to the internal processes of the project stakeholders. The analyses performed through the multidisciplinary collaboration at an early stage must be emphasised
in order to achieve the benefits of using the models to support decision-making and to make the comparison between available design alternatives.

On the international level, BuildingSMART is an international alliance of organisations within the construction and facilities management industries that actively promote interoperability and open standardisation of BIM. BuildingSMART has jointly developed a neutral data scheme or an open standard, known as the Industry Foundation Classes (IFC). BuildingSMART initiatives are dedicated to encourage neutral BIM. Neutral means that it is open and it is not limited to commercial design processes or software tools, or in another word it is not proprietary (public or owned by a non-profit organisation). In neutral BIM, the data is based on a neutral data structure and is stored in a shared database that is accessible and interpretable for all stakeholders (InPro D19, 2009). Although BuildingSMART initiatives and activities extend internationally and embraces many important industrial parties involved in BIM development and implementation, it mainly focuses on ICT. Its intention for the further innovation of building processes faces challenges of the locality of the markets and regulations.

Parallel with the BuildingSMART initiatives, certain international and regional workgroups with a similar aim at further developing and promoting interoperability have been established, such as: the Implementer Support Group (ISG), the Model Support Group (MSG), and the W3C XG Incubator Group on Product Modelling (Böhms, 2008). These initiatives focus mainly on proposing R&D strategies and produce guidelines for technical developments, which are more relevant for ICT companies rather than for most building stakeholders that are primarily interested in the implementation and use of the technology in their building projects.

4. Proposed approach for BIM-wise process management

In order to progress beyond the state-of-the-art, this paper proposes a new approach for BIM-wise process management. In this section, a shift from a linear-sequential towards an iterative-concurrent process based on BIM is described. The two main aspects of process management are addressed respectively. Regarding the aspect of information (knowledge), this paper proposes a way for integrated design and engineering based on open-source object libraries of industrialised solutions. Regarding the aspect of organisation (collaboration), this paper proposed the synergy of the roles of the process manager, project manager, and model manager.

A building project is traditionally structured in a linear process that is characterised by fragmented and sequential activities, decision-making, and involvement of stakeholders. Often the party in charge for the next project stage is assigned just after the sign-off of the preceding stage; for example, the manufacturer and contractor who will produce the building elements and construct the building are selected after the architect finishes the design. Another example is that the specialist designers, energy advisors, and facility managers are not yet involved during the translation of the client’s requirements into the preliminary design by the architect. Such a linear-sequential process brings along problems in terms of major or minor design changes, for instance regarding the buildability of
the design. If design errors are discovered just before or during the construction stage, ad hoc changes must be made while delays and claims are inevitable.

This paper proposes an iterative-concurrent process structure instead. In a BIM based project, the whole life-cycle phases of the building can iteratively be considered in each project stage and the design can be developed concurrently by different disciplines. Through such an iterative-concurrent process, the complete building can be virtually constructed, modified, and improved very many times in a short time. Using an intelligent building model, design alternatives can continuously be validated against the client’s requirements and expected performance in operation. At the same time, interface problems and design errors can be eliminated using clash detection function of BIM. The proposed process structure is illustrated in Figure 4.

Figure 4: Schematic illustration of the proposed BIM-wise process structure

Unlike in the traditional linear-sequential process, in the iterative-concurrent process a clear distinction is made between the building life-cycle phases and the project decision stages. The building life-cycle phases are: initiation, design, realisation, operation, maintenance, renovation, and recycle or demolition. The project decision stages are directly related with the items on which decisions on the continuity or progress of the project are made. These decision stages apply generically either in a new building or a renovation project. The project decision stages are: requirements definition, early design, detailed design, production and procurement, construction plan, delivery. The whole life-cycle phases are addressed dynamically as a yellow spiral in the process; in a somewhat similar idea to the facility life-cycle helix (NIBS, 2007). In each project decision stage, the whole life-cycle of the building is addressed. All relevant stakeholders are involved in a
multidisciplinary project team consists of the client, end-user, architect, specialist designer, engineer, general contractor, specialist contractor, manufacturer, supplier, facility manager, energy advisor, etc. These collaborating stakeholders are represented by the blue circle. The coordination between these stakeholders is carried out on multiple levels by the process manager (strategic collaboration level), the project manager (project operational level), and the model manager (information management level).

The stakeholders collaborate through iterative processes according to the InPro principle, as shown by the green circle, which is further elaborated in Figure 5. According to the principle of InPro collaborative process, each decision is taken after verifying the design based on the requirements and performance analysis. In the decision-making process, ideas are translated into concepts, and then elaborated in proposals for the approval.

Figure 5: InPro collaborative processes (Sebastian & Haak, 2009, refer to F. Verhofstad)

At the centre of the process, BIM facilitates the integration of the activities and outcomes. BIM is represented in this scheme by the red circle, further elaborated in Figure 6. In the iterative-concurrent process structure, BIM comprises three main aspects: 1) the intelligent building model that consists of 3D geometry and details, specifications, and analytical calculation over cost, energy, planning, etc.; 2) open-standard object libraries of industrialised solutions or building components; and 3) open-source model server and communication platform for information sharing. Beyond the building sector, the ongoing COINS and VISI programme in the infrastructure sector in the Netherlands shows an industry-wide BIM initiative to develop object libraries, communication protocols, and a model server (www.coinsweb.nl; www.visi.nl).
Although each project is unique, standard solutions and industrialised building components are largely applicable for the majority of buildings. Using BIM there is a new way for integrated design and engineering. BIM enables the extension of open-standard object-libraries to include as many possible industrialised solutions and building components. Using open-source BIM, designers can access and retrieve the stored objects. Designers do not need to „start from scratch” any longer as a large variety of building typologies, systems and subsystems are available as the basis of their designs. BIM can serve as a dynamic configurator in an iterative and creative design process. In this way, the designers’ creativity remains highly valued and can be effectively integrated with the industrialisation approach. Buildings with high architectural quality can, therefore, be designed, produced, and delivered according to systematic procedures which allow effective control and value optimisation for the clients and end-users. The manufacturers and suppliers will naturally be encouraged to provide and update the object libraries with their products. This will lead to the mass-customisation and open building manufacturing concepts as promoted among others by the European research project ManuBuild (Fuster et al, 2009).

Collaborative working using BIM demands a new expert role of a model manager that possesses ICT as well as construction process competencies (InPro D9b, 2009). The model manager deals with the system as well as with the actors. He provides and maintains the technological solutions required for BIM functionalities, manages the information flow, and improves the ICT skills of the stakeholders. The model manager does not take decisions on design and engineering solutions, nor the organisational processes, but he holds a supporting role in the chain of decision-making that is focused on:

- the development of BIM and relevant tools, in terms of defining the structure and detail level of the model, models checking and merging, and clash detections;
• the contribution to collaboration methods, in terms of facilitating decision-making and communication protocols, and integration of task planning and risk management;

• the management of information, in terms of data flow and storage, identification of communication errors, and decision or process (re-)tracking.

The new role of a model manager is not necessarily conflicting with the existing roles of a project manager and a process manager. In general, the project manager represents the client in a building project. Once the project scope, objectives, resources, and time span have been decided, the project manager exercises the mandate he receives from the client to manage the project in this context (Lautier, 2005). With his mandate, the project manager is entitled to take decisions on behalf of the project. He is also in charge of assuring all stakeholders to fulfil their obligations in conformity to their contracts with the client. When taking decisions related to the technical content of the project (e.g. design, engineering and construction solutions), the project manager can rely on the model manager, who can provide him the necessary information of the project embedded in BIM.

As explained earlier in this paper, the role of the process manager is intended to complement that of the project manager. The main attention of the process manager is given towards the collaboration between the stakeholders on the strategic level. The process manager shapes the inter-organisational processes to achieve an effective collaboration that will benefit the project in short and long-term. In consultation with the client and in cooperation with the model manager, the process manager can, therefore, translate the strategies for communication and decision-making into the BIM based collaboration methods, protocols, and risk management plans. In addition to the qualifications pertaining to their domain, the project manager and process manager of a BIM based project must master the principles of BIM-wise collaboration and management.

5. Proposed business concept, contractual terms, and take-up strategy

The business concept, BIM contractual terms, and take-up strategy presented in this paper mainly are the outcomes of research in the InPro project (InPro D9b, 2009; InPro D11, 2009). The main purpose of the business concept is to ensure the successful BIM implementation by the stakeholders in the building sector. The InPro business concept discusses an innovative approach to partnering, the interface management in the teamwork, the stimulating incentive and payment schemes, and the management of risks.

When thinking about a new business concept, the inevitable questions is: What is the economic gain of open collaboration for the stakeholders in the building industry? Since open collaboration is a quite new, discussions on this subject are still ongoing. Openness issue is also actual in other industries. A thought on the economic value of openness has very recently been posted by Jonathan Rosenberg, Senior Vice President, Product Management of Google (on the Official Google Blog, 12/21/2009 03:17:00 PM): “Open systems are competitive and dynamic. In an open system, a competitive advantage does not derive from locking in customers, but rather from understanding the
fast-moving system better than anyone else and using that knowledge to generate better, more innovative products. Open systems harness the intellect of the general population and spur businesses to compete, innovate, and win based on the merits of their products and not just the brilliance of their business tactics. All other things being equal, a 10 percent increase in share or a 10 percent increase in industry value should lead to the same outcome. But in our industry a 10 percent increase in industry value will yield a much bigger reward because it will stimulate economies of scale across the entire industry, increasing productivity and reducing costs for all competitors. As long as we contribute a steady stream of great products we will prosper along with the entire ecosystem. We may get a smaller piece, but it will come from a bigger pie.”

Open collaborative processes can optimally be accommodated by a virtual enterprise. A virtual enterprise (VE) is a partnering between non-competing companies who share forces using advanced ICT systems for the accomplishment of a specific goal without losing their autonomy. A number of companies can organise themselves in a temporary network based on the common importance in the business. The unique advantage of the VE is the possibility to collaborate closely using BIM despite the geographic dispersal. Next to periodic face-to-face meetings, the direct and more intensive collaboration contributes to accelerate the creation of interpersonal trust in teamwork. A VE reflects an equal collaboration through BIM. Although a certain participant holds the coordinating role, a complex hierarchy is not required. An attention should be given to build the trust that guarantees the „open book” philosophy and the ethics of collaboration regarding the sharing and integration of information.

Within a virtual enterprise, the interface management in the teamwork is essential especially with regards to the communication and decision-making. The research in InPro distinguishes the project team interface, client interface, and external interface; all of which are required for the BIM-wise collaboration. The project team interface integrates the information from all stakeholders and enables concurrent design and engineering processes. The client interface documents the collaborative processes, enables quick response decision, and estimates the consequences of the decisions. The external interface helps the wider group of stakeholders (e.g. local authorities) to interpret and evaluate the impacts of the project. The interface management also provides a systematic approach to decision-making. It clarifies which actor is to take a specific decision at a certain moment. The researcher in InPro develop the Smart Decision-Making Framework method, which is tailored for supporting the formulation of Key Performance Indicators (KPIs) and the evaluation of the alternative decisions against these KPIs. This framework can also be used in terms of change management.

Stimulating incentive and payment schemes are needed to encourage the stakeholders to release the full power of open collaborative processes based on BIM. Incentives based on a bonus-malus system will adjust the payment based on the delivered performance. In contrary to a closed value-chain (where an extra benefit for a stakeholder only means a loss for another stakeholder), such an incentive system stimulates the creation of real added values beyond the original expectations. As these real added values are created, the collaborating stakeholders can have a new share in the extra benefits. Linking incentives with KPIs in order to achieve the best performance requires the redefinition of the KPIs and quantifiable added values. Another issue is the return on investment of
BIM. The fee of the model manager and the investment in hardware, software, and training can be earned back through the higher efficiency of the process, e.g. no recurrent drafting, less labour cost, less independent drawings and documents, more accurate quality control, more efficient production and construction planning, and significantly reduced redesign and ad hoc modification costs.

BIM-wise collaboration is believed to be able to reduce the traditional project risks. BIM simplifies the risk management in a project through a more accurate estimation of cost, time, and quality. However, a new way of working often comes with uncertainties which can be seen as new types of risk by many stakeholders. Some examples of the "new" risks are: the scarce availability of BIM experienced personnel for the formation of a highly qualified team, and the challenges to integrate the new expertise in the sustainable business strategy of the organisation.

The new business concept, collaborative processes, distribution of roles and responsibilities, and the use of new tools and techniques should be formalised and drafted in a contract. In general, the adoption of BIM requires contractual terms between the stakeholders that assure the intensive collaboration and open sharing of the relevant information.

Regardless of the selected type of contract form, particular contractual terms as follows should to be included in a BIM based project to facilitate open and neutral collaboration processes: 1) the agreement on modelling protocols, sharing and integration of open information and open technology —if possible by endorsing the internationally accepted open standards; 2) the workflows, level of authorisation, and access rights in a BIM based decision-making; 3) the intellectual property of the foreground and background information and knowledge; and 4) the legal status of the model. The possible legal status of the model is indicated by Ashcraft (2008). The model can serve as a co-contract document that is used between the contractual parties, but is not to be submitted to permit-issuing agencies. Otherwise, the model can become an inferential document which provides the visualisation of the design intent inferable from the contract documents. Another possibility is to use the model as accommodation document that can be used, but not to be relied upon, by the recipients. It should be taken into account that limiting reliance of the model will undermine the capability of BIM.

Depending to the selected contract form and procurement method, particular contractual terms should be considered as additional clauses to the contract, for instance: 1) the establishment of partnering and the legal entity of the enterprise; 2) the formal roles and responsibilities of the contractual parties; 3) the agreement on the payment features and schemes; and 4) the dispute resolution using BIM for a quicker and more precise retrieval system of errors, liabilities, and the circumstances.

Many of the legal issues related to collaboration are caused by duties and obligations that transcend boundaries. When assessing contractual frameworks, it is useful to compare how they address (or ignore) boundary issues (Ashcraft, 2008). Does working with BIM change the liability position of the stakeholders in the contract? In traditional contracting, the liability of each party is limited within the scope of its contract with the client. Working with BIM does not change the liability position in the contract. This is confirmed by the ConsensusDOCS (2008) of which one of the general principles states: “This Protocol Addendum does not effectuate or require a restructuring of contractual
relationships or shifting of risks between or among the project participants other than as specifically required per the Protocol Addendum and its attachments.”

Following the proposal for a business concept and BIM-oriented contractual terms, a strategy for a quick take-up of the BIM business concept in the European construction industry is presented in InPro research project. This take-up strategy consists of ways to: implement new BIM-oriented regulations on European and national level; raise the stakeholders’ awareness level of the new approach and benefits of BIM-wise collaboration; empower the professionals; create a leadership of BIM based projects, especially through the roles of the process manager, project manager, and model manager; develop a transition plan and a business re-engineering roadmap; and disseminate the state-of-the-art knowledge in science and practice. The take-up strategy intends to positively affect the organisational behaviour of key stakeholders by the development of sound business cases for the stakeholders representing diverse roles and professional domains. The early-design stage is crucial for a quick take-up. In this stage, when merely 1% of the project cost is used, the key decisions that commit 70% of the life-cycle cost of the building are taken (InPro, 2009). Moreover, this is the stage when open collaboration can effectively be set-up.

6. Concluding remarks

Building Information Modelling (BIM) has risen and has been acknowledged as a way to innovate the collaborative processes in a building project. BIM comprises an intelligent building model, a framework for open collaboration, and the required ICT systems, functionalities and standards. Despite the technological advancement, an industry-wide implementation of BIM in building and construction has not yet taken place. This paper began with an assumption that the business and legal barriers were the reasons behind it. In conclusion, this assumption has clearly been confirmed by the findings from the literature and field research.

Breaking through the business and legal barriers to improve the large-scale BIM implementation requires a radical change in the way the processes of a building project are organised. Instead of fragmented and subsequent project stages (each of which is domain-specific and dedicated to a phase in the building life-cycle), the whole life-cycle phases of a building should be addressed in each project decision stage from multidisciplinary domains involving all relevant stakeholders. The application of BIM to support an optimal cross-disciplinary and cross-phase collaboration opens up a new dimension in the roles and relationships between the stakeholders. In this respect, a conclusion can be drawn that the role of the process manager becomes even more significant. This paper shows that in a large and complex BIM based project, the process manager, project manager, and model manager are needed. Although some overlaps may exist, their roles are not substitutionary, but complementary. The process manager operates on the strategic inter-organisational level to shape the context and processes for collaboration; the project manager operates on the project level to lead a well-defined project with the mandate from the client towards the achievement of the objectives; and the model manager operates on the information level to coordinate the data sharing and integration. All of them and the other stakeholders similarly must exercise the ability for a BIM-wise collaboration.
This paper also concludes that breaking through the business and legal barriers of BIM requires a new business concept for partnering that imposes the open integration of ICT between the participating parties. Such a business concept can be accommodated in a virtual enterprise. Adequate interface management, incentive schemes, and risk management are needed to assure the openness, trust and equality in a BIM-wise collaboration. From the process management viewpoint, this paper highlights the important contractual terms for a BIM based project. Some of these contractual terms are generic and should be incorporated to any form of contract used in a BIM based project; some others are depending to the selected contract form and procurement method.

As a way forward, a follow-up joint effort by the process management experts, ICT experts and construction lawyers is strongly recommended for an in-depth investigation on how the new process and business approaches can be embedded in the existing standard forms of contract, or whether a new BIM-oriented form of contract should be developed. More applied research on BIM implementation in building projects is urgently needed to further develop a proof-of-concept. As a growing number of building projects with BIM have been carried out, the preliminary lessons-learned should be collected, analysed and utilised for the further development of the process, organisational and legal frameworks.
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The Use of Animation in the Resolution of Construction Disputes

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Abstract

Construction disputes, like construction projects, are complex, dynamic and multi-faceted. Construction claims on large projects are not only confined to disputes between the client and main contractor, but occur between contractor, sub-contractors, consultants and the supply chain. Advancing a construction claim invariably involves the examination and presentation of long, detailed and technically complex information. Although text, diagrams, graphs, tables, charts, and schedules have been used with varying effect, the use of animation has the potential to simplify complex information and present it in an engaging manner. This paper explores how animation technology can be utilised to deliver the facts that persuade by communicating specific points or elements of analysis. It is clear that although no consensus has emerged as to how such technology is to be used, animation is here to stay. As the use of animation technology increases, the benefits of envisioning complex information will find its way into the construction dispute context. With the complexity of large-scale projects and the sheer quantity and diversity of the documentation involved, animation can assist in illustrating a party’s case.

Keywords: construction, dispute, contract claims, animation, multimedia.
1. Introduction

1.1 The focus of the paper

Construction disputes, like construction projects, are complex, dynamic and multi-faceted. Construction claims on large projects are not only confined to disputes between the client and main contractor, but occur between contractor, sub-contractors, consultants and the supply chain. Construction disputes almost always involve the consideration of complex technical information. Animation in the context of this paper is concerned with the use of a computer software to generate images with each image slightly altered frame by frame in order to mimic actual movement. This can provide an effective medium to visually communicate complex technical information. It is possible to use animation to illustrate the effect of a variation, how a project looks as-planned and as-built, or the consequences of delay or disruption to a construction project. This paper will explore how animation can be used to visually represent the complexities of a construction process, illustrate important points, aid understanding and persuade in order to resolve construction disputes.

1.2 Envisioning information

The most celebrated example of graphical representation of information is Charles Joseph Minard’s famous chart of Napoleon’s disastrous Russian campaign in 1812 (Figure 1). This chart, or statistical graph as it has been called, is also a map and has been described as the “best statistical graphic ever drawn”. This chart depicts Napoleon’s ill-fated 1812 advance into Russia and his subsequent retreat in 1813, having been beaten by the Russian army.

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2 Charles Joseph Minard (1781-1870), a French civil engineer who was an inspector-general of bridges and roads, but whose most remembered legacy is in the field of statistical graphics, producing this and other maps in his retirement (http://en.wikipedia.org/wiki/Charles_Joseph_Minard) (visited 10 January 2010). ]
Figure 1 – Charles Minard’s chart of Napoleon’s Russian campaign.

As a medium to visually represent information, this chart delivers on numerous levels. It collates six sets of data:

- A geographical map of Russia, including rivers, cities and battles which are placed in correlation to their occurrence;

- Napoleon’s army’s course – the path represents the route in and out of Russia Napoleon that followed.

- Napoleon’s army’s direction – which is indicated by the colour of the path (gold leading into Russia and black leading out of it).

- Number of soldiers – the size of the path is relative to the number of the soldiers. As the campaign progresses, the size of the path grows successively smaller. Each millimeter represents 10,000 men.
The temperature – the freezing temperatures of the Russian winter is indicated at the bottom of the chart.

Time – this is in relation to the temperature indicated at the bottom, from right to left.

This chart not only gives information but tells a story. Napoleon entered Russia with 442,000, with the French army fighting its way to and occupying Moscow. However, due to overstretched lines of supply and the extreme winter conditions, the French army was forced to retreat, with Napoleon eventually leaving Russia defeated and with less than 100,00 men.\(^4\)

Even with such complexity, it is possible to envision information accurately and with impact. Before assessing the utility of animation in the resolution of construction disputes, it is necessary to understand the distinctive features of construction and the complexity of the disputes that they give rise to.

### 2. The distinctive nature of construction

#### 2.1 Why so many disputes in construction?

Construction disputes refer to all kinds of disputes arising out of projects for construction work, in particular those relating to the execution of services (e.g. mechanical and engineering services), and work necessary for the implementation of a construction project.\(^5\)

The nature of construction and the potential diversity of the participants involved in a project means disputes arise in a wide array of contexts. Construction industry disputes invariably involve the consideration of complex technical information. Construction can be differentiated from other industries in that the delivery of a construction product is not an event but rather a process that requires participating entities.\(^6\) Capper identifies the distinctive characteristics of construction as follows:\(^7\)

\(^4\) [http://en.wikipedia.org/wiki/Battle_of_Waterloo (visited on 18 January 2010); An article in *The Economist* which has chronicled the way in which some charts successfully visualise data sums up the impact of Mindard’s chart: “As men tried, and mostly failed to cross the Berezina river under heavy attack, the width of the black line halves: another 20,000 or so gone. The French now use the expression *C’est la Bérézina* to describe a total disaster” (see *The Economist*, 19 December, 2007).](http://en.wikipedia.org/wiki/Battle_of_Waterloo)


\(^6\) This is the case even under a design and build contract, where the client employer is likely to have a consultant team acting on his behalf.

\(^7\) Capper, P, “Why are there so many disputes for arbitration in construction”, King’s College, London, Centre for Construction Law & Management 10th Annual Conference (19 September 2007).
• The nature of standard forms of construction and engineering contracts

A large proportion of the construction industry relies on standard forms of contracts that leave a large amount of discretion to the contract administrator (architect or engineer). Though these matters have a contractual basis, the discretion is invariably exercised in relation to matters of a technical nature (this may cover scope of works, valuations for works carried out, the granting of extensions of time and the issuing of payment certificates). Once the discretion is exercised, the resulting decision can be challenged in adjudication, arbitration or before the courts. 8

• The particularity of the design and split responsibility for specification and/or design

The majority of construction projects are one-off structures constructed in accordance with the employer’s requirements, the use of the structure and the environment in which it sits. This places an increased significance on design which may evolve during the life of the project.

• High degree of interactivity between purchaser and supplier

The high incidence of interactivity in the design and construction process is a particular feature of the construction process. The client’s ability to change the scope of the works has significant ramifications for the contractor in terms of budget and time for completion.

3. Visual representation of construction claims

3.1 As built v as planned

Construction disputes often involve claims for delay and disruption that involve large sums of money and require expert input. As to delay, it is acknowledged that a specified completion date agreed between the parties may, because of some intervening event, change, is assumed in standard forms of contract by the provision made for extensions of time. 9

In relation to disruption, it is a particular feature of construction projects that labour productivity is easily disturbed by particular events such as late information, discrepancies between contract and specification documents, variations, lack of access to the site and other contractors working out of sequence. In recognition of this, standard forms of contract make provision for recovery of disruption related costs caused by certain events. Disruption can be described as any change in the method of performance or

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8 The JCT and ICE standard forms in particular leave a large amount of discretion and/or judgment of the architect or engineer.

9 JCT clause 2.9; NEC clause 60; ICE clause 43, 47
planned work sequence contemplated by the contractor that prevents the contractor from actually performing in that manner. It is important that events that cause delay and/or disruption are clearly identified and isolated from those events those that have not. Of the methods that can be used to visually identify the effects of such delay events, the most widely used is the Critical Path Network (CPN) method. The CPN is a graphic representation of a planned construction process showing its interrelationship and interdependency. It is a computerised project management tool that allows a decision-maker to modify the sequence of work for the purpose of effective and efficient completion of the project. A CPN can take account of all the resources required (labour, plant and materials) to carry out the planned works. It is also able to identify the effects of events that occur during construction on the progress of the work and show where any delay and/or disruption occurred and where it could not have occurred. The CPN is a useful method for demonstrating cause and effect of delay by comparing "as-planned" with "as-built" (Figure 2 below).

![Figure 2: As-built v As-planned CPN Programme](image)

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There are two main ways to create an as-built programme. The first is to create an as-built schedule from scratch using various types of project progress records. This is supplemented by information from correspondence, meeting minutes, document issue records, labour returns, and any other project information available. The summary bars shown provide a visual indication of the extent of the delay. The detail within each summary bar, including criticality can be examined to give more detailed information. The programme also shows disruption by the gaps in the bars. This as-built programme is then compared with the as-planned programme. Many CPN programmes on large complex projects detail thousands of activities. The facts in a dispute may not require the same detailed analysis of every activity. The challenge here is to streamline the information presented whilst limiting the risk of compromising the quality of process and the reliability of the results.11

As-planned v as-built can be used for identifying delays to progress but is restricted by its inability to identify concurrency, re-sequencing, mitigation or acceleration. Furthermore, when compiling a claim document or expert report in the traditional way, it can be difficult to convey the full extent of the problems faced on a project by using a series of time-slice programmes supported by narrative, however well-written it might be. This is where animation can assist.

11 In The Royal Brompton Hospital NHS Trust v Hammond (No. 7) a case which concerned the alleged negligence of an architect in relation to the award of an extension of time Judge Seymour stated that the “...accuracy of any methods in common use critically depends upon the quality of the information upon which the assessment exercise was based”. An illustrative example of the pitfalls of putting together a CPN programme can be found in Skanska Construction v Egger (Barony)([2004] EHHC 1748). In Skanska, two delay analysis experts were relied upon by parties to establish entitlement. The [trial judge] preferred the evidence and conclusions of claimant’s expert and criticised the defendant’s delay analysis expert for over reliance on the output of a computer programme. The Judge commented that computer programmes are only as good as the data they are fed. Furthermore, the expert appeared to have overly relied on a team of assistants in compiling his report to the extent that he lacked detailed knowledge of the contents of his own report.
4 Animation examples

4.1 Animation no. 1 - as-built v as-planned

Animation 1 is a comparison between the planned construction progress and the actual progress achieved by June 2008. It shows that the Contractor had planned to have the roof slab in place with the external envelope following, and for the concrete sub-contractor to have left site. In contrast, the progress actually achieved by that date was limited to completion of the roof structure over the stair and lift cores but the main roof sections over the wings had not been progressed. Figure 3 is able to visually convey not only the progress of the works, but project programme information along the lower part of the screen. Like Minard’s chart, it brings project information to life and will support any pleading or claim document.

The animation examples have been produced for illustrative purposes only and do not reflect live projects.
Furthermore, Animation 1 allows the viewer to explore the project further. There are three buttons on the top right hand corner of the screen shot:

- **Introduction** – is able to introduce the animation scenario and provide a brief project history, animation description and claim documents and/or pleadings can be shown here. It is possible for example to start with a slides show presentation illustrating key points of the animation.

- **Timeline** – this can be designed to include date and time, resources, and costs information,

- **Detailed views** – can provide different visual perspectives of the project such as fly through, bird’s eye views, the project on a floor-by-floor basis etc.

### 4.2 Animation No 2 – additional project information

![Animation 2 Additional Information](image)

Figure 4: Animation 2 Additional Information
Animation No. 2 goes further in that it details information in relation to notices, architect’s instructions, variations etc. The key to demonstrating disruption and/or loss of productivity is to establish that a planned event or sequence of events was affected by causes for which the employer bears the risk which results in the contractor being prevented from carrying out the work in the planned sequence. This involves:

- establishing a baseline;
- establishing the actual performance;
- identifying and analysing the differences between the baseline and actual performance.

A further step is to develop an analysis that demonstrates entitlement, damages and causation. A contractor must show that the facts support its contentions that the event actually occurred and had the claimed disruptive effect on its progress. This must be further supported by evidence in support of the loss incurred. Animation No.2 is able to visually represent the information that can illustrate the reasons for the delay and/or disruption. This animation shows that by October 2008, some four months later, the contractor had only managed to make partial progress with the roof slabs due to design issues with the column loading details. The contractor had had to issue and consider 1,900 requests for information and 2,300 responses and instructions from the design team in relation to the feature roof plant rooms and executive offices at roof level. These changes – made well into the construction sequence – disrupted the progress of the concrete subcontractor who was working in a piecemeal manner when areas were released to them following clarification of the design. In addition to this there would have been a significant increased expenditure on design and site supervision which would need to be recovered.

The practicality of linking causation to effect in order to award a just extension to the contractor is a particular problem, given that many delays may be inter-related.

### 4.2.1 Concurrent delays

Animation No. 2 is also able to assist with illustrating the very complex concept of concurrent delay. Concurrent delay occurs where a delay is caused by two or more effective causes. When both the Employer and Contractor have caused delay, the central question here is whether or not the Contractor is entitled to an extension of time. Two approaches have been used to assess concurrent delay in construction contracts:

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13 Monarch Steamship Co Ltd v Karlshamns Oliefabriker (1949): “Causation is a mental concept, generally based on inference or induction from uniformity of sequence as between two events that there is a causal connection between them…”
14 Wiltshire Area Health Authority [1988] AC 1074
4.2.1.1 Dominant Cause

This approach to assessing concurrency provides that the delay is to be allocated to the more dominant of the concurrent events. Thus, if the dominant event is an employer-caused relevant event, then a contractor is awarded an extension of time for the delay. However, if the dominant event is a contractor-caused relevant event then no extension of time is allowed. This approach was given support in John Doyle Construction Ltd v Laing Management (Scotland) Ltd (2004) where Lord Drummond Young. \(^\text{16}\): The impact of this approach on delay claims is significant. For the purpose of determining a contractor’s entitlement to loss and expense, a distinction must be made between periods when the employer’s action is the dominant cause of the delay from those where there is concurrent default of the part of the contractor. \(^\text{17}\)

4.2.1.2 Malmaison Approach

This approach, based on Henry Boot Construction (UK) v Malmaison Hotel (Manchester) Ltd\(^\text{18}\), recognises that, as a matter of causation, any one delay or period of delay may be attributed to more than one delaying event. Thus, it appears that it will be sufficient for the contractor to succeed on his monetary claim if one delaying event is a sufficient basis to claim such money. The underlying logic for the Malmaison approach is that it simply reflects the allocation of risk agreed upon by the parties when they entered into the contract. Thus, the parties have been taken to recognise that:

- any one delay and/or period of delay might well be attributable to more than one cause; and

- provided one of the causes affords grounds for relief under the contract, then the contractor should have his relief.\(^\text{19}\)

\(^\text{16}\) “... the question of causation must be treated by „the application of common sense to the logical principles of causation‟...In this connection, it is frequently possible to say that an item of loss has been caused by a particular event notwithstanding that other events played a part in its occurrence. In such cases, if an event or events for which the employer is responsible can be described as the dominant cause of an item of loss, that will be sufficient to establish liability, notwithstanding the existence of other causes that are to some degree at least concurrent...”


\(^\text{18}\) (1999) 70 Con LR 32

\(^\text{19}\) This approach was supported in The Royal Brompton Hospital NHS Trust v Hammond (No. 7) [2001] 76 Con. L.R 148, QBD (TCC). In dismissing a claim against the architect for negligence in granting an extension of time, Judge Seymour stated: “...if Taylor Woodrow was delayed in completing the works both by matters for which it bore the contractual risk and by relevant events, within the meaning of that term in the Standard Form, in the light of the authorities to which I have referred, it would be entitled to extension of time by reason of the occurrence of the relevant events notwithstanding its own defaults” at para 85.
In a construction dispute where matters of concurrency are in issue, an animation can greatly assist to communicate the effects of complex interactions of events. Animation No. 2 is able to illustrate the Malmaison approach. The information bars on the right hand panel can be used to detail the delay event and its impact.

### 4.3 Animation 3 – the impact of design changes

Animation 3 further demonstrates the versatility of animation. The right hand panel details a specific design change activity and its effect. Therefore, after being taken through an animation which provides an overview of the project and an as-built v as-planned analysis (Animation No. 1), one is able to look into the detail in terms of variations, architect’s instructions etc (Animation No. 2). Animation No. 3 completes the visual presentation by providing the all-important detail. In many large and complex construction disputes, this level of detail will be dealt with in a paragraph in a claim narrative, pleadings.
or form part of a schedule. However, bringing an individual activity to life can illustrate the impact of an otherwise complex scenario. This is particularly the case when it is part of a larger trend.

Animation 3 compares the planned sequence of Activity 7 with how it was actually carried out. The text panel on the right details the reasons for the delay (i.e. AI 56) and its impact in terms of additional days. It is possible to go much further. One can click on a particular reference and be hyperlinked to the relevant project documentation.

5 The use of animation before courts and tribunals

5.1 Admissibility

The case for using animation before a court or tribunal in support of a claim can be made positively if the parties have sanctioned its use or adopted during the currency of the project, either at tender stage or as part of a planning process or both. In order not to be accused of taking an opposing party by surprise, the animation should be served with the Statement of Case or appended to an expert witness report. A party’s objections to the admissibility of animation is likely to be similar to those relied on when a pleading or part of a case is being attacked. The central argument will be that the animation presents the opposing party with insuperable difficulty in dealing with, and responding to it, thereby being prejudiced as a result.20 The party using the animation needs to persuade the court or tribunal that they are not putting forward a new or different case or one that cannot be dealt with. The main argument here is that the animation is based on existing materials and facts common to the parties and the project. This can be established by cross-referencing the animation with statements of case, agreed facts and project documentation. This approach seeks to establish that there is no new case to answer or material that is not already in play between the parties.

A party opposing the use of animation may additionally argue animation is not a conventional means of advancing a claim and the time taken to understand and deal with it would be disproportionate and costly. A response to this is to ask what is conventional? Technology is developing quickly and with it, new ways to present information. If animation assists a party in the presentation of their claim, then there is no reason why it cannot be used. If the steps taken and the information used to produce the animation are fully disclosed, then it is the underlying documentation which requires the analysis, a task the court or a tribunal will nevertheless have to carry out. Parties should be free to put their case as they choose, so long as the opposing party has the opportunity to meet and answer it. This might include an opposing party wanting to use animation to demonstrate their perspective that a particular process or scenario did not take

20 See British Airways Pension Trustees Ltd v Robert McAlpine & Sons Ltd (1994) 72 BLR 26: “The basic principle of pleadings is to enable the opposing party to know what case is being made in sufficient detail to enable that party properly to prepare to answer it”, per Saville at pages 33-44.
place in the manner alleged. In this regard, the court in *The Pelopidas*\(^{21}\), a case concerning a collision between two container ships stated as follows:

> “I am anxious to stress this point because there is a danger of losing sight of the true value of reconstructions. Of course they enable the Court and the parties to have a broad bird’s eye view of the events leading up to the collision. But their true probative value is that they may sometimes enable the Court to determine, not what may have happened, but could not possibly have happened.”\(^{22}\)

6. Conclusions

Although no consensus has emerged as to how such animation technology is to be used, animation is here to stay. As the use of multimedia technology increases, the benefits of envisioning complex information will find their way into the dispute context. With the complexity of large-scale projects and the sheer quantity and diversity of the documentation involved, animation can assist in illustrating a party’s case with precision. Like Minard’s statistical chart, animation can be used to communicate a wide variety of information whilst telling a powerful story.

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Practice and Procedure in the Mediation of Construction Industry Disputes: An Exploratory Study

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Abstract

Mediation is emerging as the most commonly used non-adjudicatory method of resolving construction industry disputes. The essence of mediation is resolution based more on party interests rather than legal rights. The construction professions should therefore be able, with some training, to participate in construction mediations not only as advocates but also advocates on behalf of parties to mediation. Unfortunately, the vast majority of the informants used in the reported studies into experience of construction mediation from the UK have been legal professionals. As a first step to identifying the knowledge, understanding and skills necessary to empower the construction professions to play a greater role, an exploratory study was undertaken to capture experience from the perspective of the built environment professions. It entailed semi-structured telephone interviews with sixteen non-lawyer mediators with experience of construction mediation. The interviews allowed the development of a rough picture of construction mediation, particularly the aspects pertaining to the appointments of mediators, mediation styles, mediation procedure, durations of mediations, barriers to settlement, training received, and settlement rates. The study suggests that future research should focus on the costs of mediation, mediation procedure in terms of the specific tasks within phases, party representation and the roles of participants.

Keywords: construction, disputes, mediation, mediator, ADR
1. Introduction

Construction projects are prone to disputes because of a multiplicity of factors such as technical and organisational complexity, supply chain fragmentation and the large sums of money often involved. Traditionally, these disputes were resolved by litigation where attempts at amicable settlement failed. The negative impact of litigation on the cost and duration of disputes and working relationships led to the use of arbitration as an early alternative to litigation. However, arbitration is being perceived as no less costly, slow and damaging to relationships as litigation. The perceived shortcomings of litigation and arbitration, with their rise in costs, delays, and adversarial relationships, have encouraged the rapid growth of alternative dispute resolution (ADR) processes, such as mediation (Chau, 1992; Steen, 1994; Cheung, Suen and Lam, 2002).

The basic concept of mediation entails an independent and neutral third party assisting the disputants to work out for themselves a solution to their dispute. Originating in the late 1960s in the USA (Tackaberry and Marriott, 2003), mediation is now the mandatory first instance method of resolving disputes in some of the states in the USA (Reid 2003; Tackaberry and Marriott 2003) and Canada (Prince 2007) as well as many other jurisdictions. Another development in the use of mediation is an increase in the flexibility in the styles in which it may be conducted. The styles are sometimes categorised as being facilitative, evaluative, narrative or transformative although this oversimplifies the flexibility of mediation as conceptualized by others as a continuum of strategies embodying elements of each of the four categories (Gulliver 1979; Roberts 1992; Palmer and Roberts 1998). In complex cases co-mediation, which involves two mediators acting together, may offer advantages over mediation by a single mediator (Charlton and Dewdney 2004).

The original impetus for the development of mediation was recognition within the more enlightened sections of business communities of the strong commercial case for resolving disputes by assisted negotiation rather than by litigation or arbitration. Several other developments portend a continuing growth trajectory for mediation. These include civil reform in many countries aimed at improving access to justice, transfusion of the outcomes of the civil litigation reform initiatives into commercial arbitration, EU Directive on mediation of civil commercial disputes and globalisation.

Civil litigation reform in many jurisdictions has resulted in disputants being required to make reasonable effort to resolve their dispute by mediation or other appropriate ADR technique before the court can entertain litigation. For example, English civil litigation is governed by the Civil Procedure Rules (CPR), which came into force in 1999 as the final outcome of Lord Woolf’s investigation into necessary reform in civil litigation. The overriding objective of the CPR, as stated in Rule 1.1, is to ensure that cases are dealt with justly. Treating a case justly includes: ensuring that the parties are on an equal footing; saving of expense; ensuring proper proportionality in terms of the amount involved, the importance of the case, the complexity of the issues and the financial positions of the parties; ensuring that the case is dealt with expeditiously and fairly.

In relation to construction disputes the CPR are supplemented by the Pre-Action Protocol for Construction and Engineering Disputes, which is designed to encourage greater contact between the
parties at the earliest opportunity for the purpose of sharing information relevant to the dispute, thereby promoting settlement without litigation. It requires parties at the pre-action stage of their dispute to follow a procedure involving a Letter of Claim, Letter of Response and Pre-Action Meeting as vital signposts. The purpose of these steps is to ensure that, before court proceedings commence, the claimant and the defendant have a reasonable amount of information on their respective positions on the issues in the dispute. It also encourages them to meet and, if necessary, to carry out further pre-action investigation to plug any gaps in the information necessary to dispose of the dispute without the need for the proceedings.

The court is required to promote the overriding objective by managing cases actively. In particular, the court must not only encourage parties to use ADR to resolve their dispute but also facilitate such procedure. Steps available to the court in this respect include proposing ADR to the litigants and staying court proceeding in favour of ADR. The parties themselves are under a duty to assist the court in furthering the overriding objective by seriously considering resolution of their dispute without litigation. To underline the importance of this duty, the court may impose cost sanctions against a party who unreasonably refused to consider ADR or failed to comply with the Protocol. Judges use ADR and mediation interchangeably when describing the duty to consider alternatives to litigation. According to the Master of the Rolls, the head of the courts in civil jurisdiction in England and Wales, as part of the effects of the CPR, the court may even direct parties to take part in a mediation process or attend a mediation hearing at the pre-trial stage of litigation proceedings (Clarke 2008).

It is gradually dawning on arbitrators and arbitration institutions that, after losing ground in popularity to ADR techniques, it is also in danger of even falling behind the new national litigation regimes being created by the civil litigation reform initiatives. It has also been argued that to arrest this trend mediation should be adopted as an integral part of arbitration proceedings (Woolf, 2009).

Considering the large volume of cross-border trade within the EU and the disputes flowing from them, the concerns about the cost and delays of litigation of commercial disputes before national courts and access to justice agenda could not have gone unnoticed by the EU. After many years of deliberation the European Parliament and Council adopted in 2008 an EU Mediation Directive that has to be implemented by all Member states by 2011. Implementation must address such elements of mediation as court support for mediation, recognition and enforcement of settlement agreements, compellability of mediators as witnesses in subsequent legal proceedings; training of mediators, ethical standards and quality control systems, and online access to information on mediators.

Mediation is increasingly the resolution process of choice for most insurers and other multinational companies from jurisdictions with established practice of mediation (Kallipetis 2007; Brady 2009). Gould and Cohen (1998) report a growing practice by UK insurers involved in disputes of requiring their lawyers to justify failure to use mediation. The effect of globalisation inexorably leads to a global expansion of mediation.
The growth of mediation presents, all members of construction supply chains and the related organisational umbrella or professional bodies, great opportunities and challenges. The opportunities reside in the growing requirements for professional services as mediators and advocates that disputants need for effective mediation. None of the traditional professions can validly lay claim to unique competence to provide these relatively new services (Roberts 1992). “Turf wars” are therefore being waged. As the first professional contact often made by project owners in the procurement cycle, the built environment professionals are best placed to take advantage of this opportunity by developing additional capability to take on roles as mediators and advocates. However, this opportunity also poses a challenge to the built environment professional institutions to innovate their institutional arrangements and procedures to facilitate their rapid acquisition of the relevant knowledge, understanding and skills. Our contacts with industry suggest that, compared to the legal profession, the built environment professions and their professional bodies have been extremely slow in responding to this challenge.

This paper is from a study aimed at investigating the extent of the construction professions’ participation in mediations and examining the process knowledge and understanding necessary for development of the relevant skills. The rest of the paper is structured in four sections. An overview of reported research into construction mediation is provided in the first section. The second section contains brief description of the research method used in the study. The findings are presented and discussed in the third and conclusions are drawn in the final section.

2. Overview of previous construction mediation research

Most of the early studies into mediation of construction disputes were surveys aimed at producing descriptive statistics on mediation of construction in terms of extent of use, type of disputes, settlement rates and projections of future use of the resolution method. Chau (1992) reported a settlement rate of 90% achieved in mediations in Hong Kong. Stipanovich (1996) reported that, in a study of 455 construction mediations/conciliation cases in the US, 59.1% of them resulted in settlement of all the referred issues. A further 7.9% resulted in partial settlement. Interestingly, a settlement rate of 71.5% was achieved for evaluative mediations as compared to a settlement rate of 55.2% for facilitative mediations. That study found that mediation “typically requires relatively little time or money (nearly half the reported mediations were concluded in two days or less; fewer than 10 % of the cases consumed more than six days, and more than half of the reported mediations cost $3,000 or less excluding attorneys fees), and fewer than one in 10 mediations cost more than $20,000”.

In the UK Gould and Cohen (1998) carried out a survey to gauge the adoption of ADR methods by the UK construction industry and found that respondents had participated in a total of 1024 mediations, 251 occurring in the preceding 12 months. The overwhelming view of respondents was that the use mediation was set to increase considerably. Lavers and Brooker reported similar type of ADR pulse measurement research but focused on only legal professionals (Lavers and Brooker 2001; 2005). A part of their study was based on data collected by semi-structured interviews with representatives of professional bodies for the legal professionals and their related organisations and
the department of Government responsible for the administration justice. This part of their research produced very interesting insights on the provision of ADR services by legal professionals, ADR training being undertaken and evolving ADR practice from the perspective of the legal profession. The second part of the research produced a more detailed picture of the profession’s engagement with and perceptions of ADR and mediation as mechanisms for resolving construction industry disputes.

A team in City University of Hong Kong report research into the dynamics of mediation of disputes in the Hong Kong construction industry in terms of links between what they refer to as ―mediator tactics‖, ―sources of disputes‖ and mediation outcomes. Three main outputs are: (i) a logistic regression model relating mediator tactics to mediation outcomes (Yiu et al 2006); (ii) linear regression models showing a positive correlation between mediator tactics and mediation outcomes (Yiu et al 2006). (iii) multiple regression models linking mediator tactics, sources of disputes and mediation outcomes (Cheung et al 2007; Yiu et al 2007; Yiu et al 2007).

A recent study led by Nick Gould is probably the most extensive investigation into construction mediation in the UK (Gould et al 2009). The data collection method employed was a quantitative questionnaire survey of the legal representatives of parties to litigation of about 1,600 disputes commenced in the Technology and Construction Court (TCC), the division of the High Court for England and Wales that deals with construction disputes and other disputes of a very technical nature. The key questions that the study sought to answer were: the extent to which they used mediation to settle their disputes; the stage at which settlement was achieved and costs saved by settlement by mediation. To collect data for answering the questions, two sets of questionnaire were designed and handed out to the legal representatives on commencement of proceedings in the TCC in relation to the disputes. One of the forms was to be completed and returned where a case settled before trial. The other was to be filled and returned where the case went to trial. There were 221 responses in relation to disputes that were settled without trial and 40 from disputes that went to a full trial.

Among others, the study made the following findings:

1. Solicitors and barristers accounted for over 70% of the mediators appointed.

2. The vast majority of mediator appointments were made by the parties themselves without any involving any mediation support services provider (MSSP).

3. The main stages at which settlement occurred were: during exchange of pleadings; during or as a result of disclosure; as a consequence of offers to settle and shortly before trial.

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1 A mediation support services provider is body that promotes mediation by undertaking training and accreditation of mediators and providing access to their services.
4. Some of the mediations that did not result in settlement still produced benefits such as better understanding of the dispute, narrowing down of the issues in dispute and generally more efficient litigation than would have been the case without mediation.

5. Considerable savings in costs were made. In 10 of the mediations the cost savings were estimated to have been in excess of £300,000.

3. Methodology

The lack of established knowledge on the issues of interest suggested as an appropriate starting point exploration using a qualitative approach. The data collection method adopted was a semi-structured telephone interview with mediators with direct experience of mediating construction disputes. This method was used in preference to face-to-face interviews because it offers the advantages of convenience to the interviewees and, therefore, better chances of committing them to participate, a short timetable and economy. Every mediator access to whom had been arranged with the assistance of MSSPs based in England and Wales accredited by the Civil Mediation Council, was interviewed for about 30 minutes over the phone. Each interview was audio-recorded for transcription and analysis. As a fail-safe measure, brief notes were also taken during the interviews.

An important consideration in the design of the interviews was the mediator’s duty of confidentiality to the parties to any dispute that he or she mediates. To assure candidates for the interviews that participation in the study would not risk them being put in breach of this duty, the researchers made undertakings of confidentiality to the MSSP and the mediators. The mediators were also reminded at the start of each interview that they could stop the interview at any stage and direct their relevant information to be excluded from the study.

4. Findings and discussion

4.1 Mediator’s background

Fifteen of the sixteen mediators interviewed belonged to the construction industry. They have all been trained in facilitative mediation by various institutions in the United Kingdom such as CEDR, the Academy of Experts, and the ADR Group. The average number of years as a mediator was ten whilst the average number of mediations conducted per year was nine. It would therefore appear that the mediators interviewed spend only a small fraction of their professional time mediating disputes.
4.2 Mediator appointment

There are three main appointment routes: (i) joint appointment by the parties; (ii) appointment by a MSSP or other third party at the request of one or both parties; (iii) appointment by the court. The route taken in any particular case depends on the parties, the nature of the dispute and the contract from which it has arisen. For example, under the Construction Mediation Procedure developed by the Institution of Civil Engineers (ICE) of the UK, the parties have 28 days, after either party has made a formal written request to resolve an existing dispute by mediation, to make a joint appointment of a mediator. Failing such a consensual appointment, either party may request the ICE to make the appointment (ICE, 2002).

All the interviewees reported that most of their appointments were by the joint action of the parties. This practice is in line with the findings in the survey by Gould et al (2009). It would therefore appear that the role of MSSPs as appointers of mediators is much less than the situation with arbitrators and adjudicators.

4.3 Mediation style

All the mediators interviewed use the facilitative style because that was the style in which they had been trained. However, they would have no difficulty taking on the role of an evaluative mediator if the disputant or the MSSP that appoints require them to do so. The survey of lawyer mediators carried out by Lavers and Brooker (2001) found evaluative mediation to be more prevalent. This raises the question whether the tradition of lawyers always acting in advisory capacity explains the difference.

4.4 Mediation process road map

To be effective, a mediator must possess a reasonable level of process knowledge in terms of the phases of the process, their flow from the commencement to the conclusion of the mediation, the tasks by the disputants and the disputants within each phase, the challenges faced and the coping strategies and tools for meeting them. The flexible nature of mediation means that there is no standard mediation procedure in the sense of having labels given to stages, phases or tasks that are universally accepted. It should therefore occasion little surprise that different writers and mediation support services providers have published procedures based on different structuring of the processes within mediation. For example, whilst the CEDR (2004) mediation procedure has the same five phases as that described by Richbell (2008), they differ slightly in terms of the labels employed for the phases. Procedures described by other writers such as Charlton and Dewdney (2004), Stitt (2004), Spencer and Brogan (2006) and Ramsey et al (2009) differ on the number of phases and stages recognised. However, very little differences were found when the individual tasks to be formed were compared across writers.
The interviewee saw the procedural flexibility as an advantage of mediation. Two findings concerning procedure call for comment. Firstly, contrary to the procedures described by some writers, pre-mediation meetings are rarely held. Whilst this has the advantage of avoiding the costs of the meetings, it misses the opportunity to identify possible obstacles and to think up avoidance strategies before the mediation, which omission may generate additional cost albeit of a different kind. Charlton and Dewdney (2004) and Spence and Brogan (2006) suggest that a mediator may follow up on the relations between the parties after the mediation or, where they failed to settle at the mediation, to find out whether they managed to settle it by some other means. Taken in their totality, the interviews suggest that this is rarely the practice in construction industry mediations in England and Wales. Most of the mediators interviewed consider the mediation concluded after the agreement is signed. None could recollect having contacted the parties to follow up as suggested in the literature.

4.5 Duration

Most mediators stated that they rarely need more than a day to mediate. This corroborates the views of writers such as Charlton and Dewdney (2004) and Richbell (2008). However, Stipanowich’s (1996) study found an average of 7.44 days and durations ranging from one day to one year. This difference of experience suggests major differences in mediation between the US and the UK, which needs further research.

4.6 Barriers to settlement

A multiplicity of factors are identified in the literatures as barriers to settlement in mediation. They include unsuitability of the disputes for mediation, unrealistic expectations by the parties or the mediators, lawyers with negative attitudes in mediation, lack of authority to settle, reactive devaluation, power imbalances, hidden agenda, lies, personal attacks, lack of funds to meet any agreed settlement. The interviews suggests as the most common barrier is unrealistic expectations and lack of funds with which to comply with any settlement.

4.7 Skills of an effective mediator

A common feature of practitioner literature on mediation is some attempt to describe the skills of an effective mediator. Legal expertise tends to be towards the bottom of the list of priority. There is some empirical support fort the relatively low priority of legal expertise. A survey reported by Bucklow (2007) found the most important attributes of a mediator as listening, building rapport with people, having empathy, being patient, having a sense of humour and having stamina/persistence. The interviewees in study the identified with prompting only patience, understanding and ability to establish rapport as the most important mediator attributes. In the interest of certainty, a harmonised body of essential mediator knowledge, understanding and skills is still to be developed from a more comprehensive investigation.
When the interviewees were asked to describe the attributes considered necessary for effective mediation their responses were couched in language that often conflated in one attribute the different concepts of knowledge, understanding, skills, competences and behaviours. This semantic ambiguity is also a feature of the mediation literature produced by practitioners. The psychology of and training requires explicit attention to the different concepts in the design of any intervention.

4.8 Mediator training

Mediation training in the UK is undertaken by various organisations often based on their preferred mediation style (Fenn 2006). Most of these organisations were set up by members of the legal profession although most of them now include non-lawyer on lists of mediators. The professional bodies for the built environment professions have only just started to organise training for their members. The training is a two stage process, academic treatment of mediation practice and procedure followed by pupillage under the supervision of an experienced mediator. The mediators interviewed had been trained for 3-5 days in a facilitative style. This raises doubt in the ability for a mediator to apply several styles of mediation when the need arises although the interviewees stated that they would have no problem adopting the evaluative approach if required to do so.

The semantic ambiguity already referred to may be responsible for what looks like a minimalist approach to mediator training, which may be appropriate only for a small group of trainees. Gulliver (1979) doubts whether it is possible to understand mediation without understanding of negotiation. This view is echoed by Palmer and Roberts (1998), thus suggesting that any effective training must first impart knowledge and understanding of the theories of not only mediation but also negotiation. Skill development by role plays and pupillage can then follow. Five days may well be adequate for trainees with reasonable levels of such prior knowledge and understanding from formal education or reflexion on a long period of practice. There is the danger of the cost of mediation limiting access to it unless a sufficiently large pool of mediators keeps costs at affordable levels. To produce such a pool without compromising on quality the training may need a longer period of instruction to develop the foundation knowledge and understanding.

4.9 Success of mediation

The question of the measure of success of a mediation receives different answers from people. Full settlement of the issues is the most widely used measure. On this basis the interviewees reported success rate ranging from 68%-100%.
5. Summary conclusions and recommendations

Most of the literature on construction mediation categorizes it into facilitative and evaluative mediation although transformative and narrative mediation are beginning to appear in the literature. It is to be noted that these labels are used as shorthand for particular types of intended final outcomes and that most mediations entail varying degrees of each of the four behaviours or impacts suggested by the labels.

The interviewees reiterated features of mediation already reported by other researchers such as the preponderance of practice towards facilitative mediation, joint appointment of the mediator by the parties themselves, high settlement rates and training provided by a few industry-based organisations set up by the members of the legal profession. They also described as common procedures similar to that recommended by CEDR.

On the issue of skills of an affective mediator the interviewees mentioned with prompting only patience and understanding and ability to establish rapport …Similarly, the responses on barriers to settlement recognised only unrealistic expectations, lack of finances to meet any settlement… Limitations in the methodology may be responsible for the omission of others. A follow-on study that deals more comprehensively with the issues of barriers and skills is called. Such a study should also consider producing a more detailed mediation that recognises the wide range of tasks that may have to performed in

Civil reform initiatives, enlightened attitudes to conflict resolution within the business community, and moves within the EU to reduce the cost of cross-border trade have worked together to put mediation of a trajectory of greater use by the UK construction industry. Most of the reported research into construction mediation has relied largely on legal informants as informants. Wider studies aimed at capturing the experience of the built environment professions as mediators and advocates and mapping out training requirements to increase their participation in such roles is called for.

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References


An International Perspective of the Suitability of the SCL Protocols “Model Clauses” for use by the Australian Construction Industry

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Abstract

The costs associated with the administration of delay and disruption claims on construction projects are known to be excessive. The poor quality of project documentation, programming, and site records are often cited as a major cause. In October 2002 the United Kingdoms Society of Construction Law (SCL) published a Delay and Disruption Protocol that contains “model” clauses that seek to address and improve the preparation, approval, and updating of the contract programme, and the keeping of suitable and adequate project site records. The aim of this research was to obtain an International perspective of the suitability for adoption and implementation of the SCL Delay and Disruption Protocols “model clauses” by the Australian construction industry. Semi structured qualitative interviews were carried out with representatives of the Protocol drafting committee, US and Hong Kong construction industry professionals involved in the administration, assessment, negotiation, and resolution of delay and disruption claims and disputes. Conclusions are that should the “model” clauses be adopted for use by the Australian construction industry there would be an anticipated increase in project administration requirements and project administration costs, with the degree of impact being dependant upon the size and/or complexity of the project, resulting in a perceived improvement in the honesty and professionalism of those involved in the administration of projects that will provide transparency and clarity in the administrative procedures, resulting in overall project savings due to increased administrative efficiency and improved cost recovery opportunities.

Keywords: claims, delay, disruption, documentation, SCL Protocol.
1. Introduction

It has been stated that disputes have become an endemic feature of the Australian construction industry (Cooperative Research Centre for Construction Innovation 2008), with time and cost overruns on projects becoming an ubiquitous feature of the industry (Love, Tse et al. 2005; Blake Dawson Waldron 2006). The problem is not just unique to Australia, but is reflected in other developed economies with adversarial based legal frameworks (Cooperative Research Centre for Construction Innovation 2009). The costs involved in resolving these disputes are said to be substantial. In Australia it is estimated to be in excess of AU$7 billion per year (Cooperative Research Centre for Construction Innovation 2009). In the United Kingdom (UK) it estimated to be in excess of eight billion pounds per annum (Pickavance 2003), whilst in the United States (US), the cost of construction litigation alone is estimated to be in excess of US$5 billion a year (DeSai 1997; Michel 1998). This figure not only includes the direct costs associated with delay and disruption events on construction projects, but also the indirect costs resulting from the time involved in the administration and the resolution of the disputes through the substantiation of facts and the quantification of damages. This requires the production and collation of evidence/witnesses/experts (normally by both parties), often from inadequate and poorly kept and disorganised project records and disbanded project teams, to determine exactly what events took place, and their likely or actual consequences to the project. The quality and comprehensiveness of construction organisations records and record keeping practices have often been criticised (Wood 1975; Brewer 1993; Kangari 1995; Vidogah and Ndekugri 1998; Chappell, Powell-Smith et al. 2005). This is said to be due to the complex nature of the construction process, where “few events ... occur in a way or at a time they were intended to occur” (Pickavance 2000), and the fact that “the construction industry is notorious for not documenting procedures and transactions... with... most of the information being of a cost accounting nature ... [that]... does not contain information relating directly to resource usage on scheduled project activities but only indicates apparent fluctuations in the cost of the project” (Vidogah and Ndekugri 1997).

The cost implications due to the time and effort involved in the retrospective identification, collection, validation, and collation of suitable evidence from unsuitable construction project records can be excessive. Jones (1988) states that organisations should have a “claim[s] prevention policy” rather than a “claim[s] cure policy”. The regular updating of the project programme and the keeping of adequate and appropriate project records may be a way of establishing and instilling such a culture or policy within a project or organisation. The availability of comprehensive project documentation that fully records what events actually took place, when those events occurred, what resources were involved, and what the likely consequences of those events were, would provide the information necessary for the parties to agree on the outcome of those events and hence resolve the issues and minimise the risks of disputes occurring or escalating. Typically standard forms of construction contracts rarely state the type, form, and frequency of the gathering and updating of project records that if carried out would provide suitable evidence to assist in the establishment and quantification of delay and disruption events, and potentially reduce the number of delay and disruption disputes.

In October 2002, the United Kingdoms (UK’s) Society of Construction Law (SCL) published a Delay and Disruption Protocol (the Protocol) aimed at addressing the issues associated with delay and
disruption on UK construction projects. The protocols objective is “to provide useful guidance on some of the common issues that arise in construction contracts”, whilst its purpose “is to provide a means by which the parties can resolve these matters and avoid unnecessary disputes” (Society of Construction Law 2002).

The Protocol contains suggested “model” clauses that seek to address and improve the preparation, approval and updating of the contract programme for use in the monitoring of project progress, and the keeping of suitable and adequate site records. Comprehensive recommendations are contained in Guidance section two of the Protocol, the Model Specification Clause (MSC), and the Model Records Clause (MRC) contained in Appendices B and C of the Protocol respectively.

The aim of this research was to obtain an international perspective of the likely consequences for the Australian construction industry of the adoption of the Protocols MSC and MRC in respect of project administration, project hardware and software requirements, project personnel, and training requirements. Qualitative interviews were carried out with four members of the Protocols drafting committee, twelve US, and three Hong Kong construction claims consultants specialising in construction delay and disruption claims, all experienced in the administration, negotiation, and resolution of delay and disruption disputes were carried out to obtain their opinions of the likely consequences of adopting the “model” clauses for use on Australian construction projects.

2. The protocols “model” clauses

The “model” clauses recommend the types, form, detail, methods, and periods of updating of the programme and site records, to be kept and maintained during the undertaking of a construction project, to ensure that adequate and suitable records exist that accurately identify and reflect the true occurrences of events that took place on the project that can be used to assist in the clarification and quantification of the consequences of those events should delay and/or disruption occur.

2.1 Model specification clause

The MSC included in appendix B of the protocol “describes the requirements for the preparation, submittal, update, and revision of the contractors programme”, and is meant to be “in addition to or to expand upon the requirements of the clauses of the conditions of contract” (Society of Construction Law 2002). The programme is to be used by the contractor to plan and execute the works. The Contract Administrator (CA) is to use it as a means of monitoring the progress of the works, and as the basis for the assessment of any extensions of time due to the effects of any delay on the progress of the works.

The MSC recommends three programmes to be produced and contains comprehensive requirements concerning the content, form, and timing of the submissions of these programmes.
2.1.1 The initial programme (IP)

The MSC states that within two weeks of the award of contract (or such time as specified in the conditions of contract) the contractor must submit to the CA an IP and all accompanying schedules. The IP should outline the first three months planned construction works, and should be in sufficient detail to ensure that the adequate planning, execution, and monitoring of the works can take place. The programme should be submitted as either a linked bar chart or a precedence network (produced in a format, and using techniques that are acceptable to the contract administrator). The degree of detail to be included in the IP is comprehensive. The MSC acknowledges that the amount of work involved in the preparation of an IP to this degree of detail may be excessive for some smaller projects, and states that in some cases it may be omitted.

2.1.2 The accepted programme (AP)

The MSC states that within four weeks of the award of contract (or such time as specified in the conditions of contract) the contractor is required to submit a programme (incorporating the IP) showing the planned order and procedure with which they intend to carry out the works, to the CA, for approval and acceptance. The CA then has ten working days to accept or reject (giving reasons for the rejection) the submitted programme. Upon rejection of the submitted programme the CA can require the contractor to revise and resubmit the programme. The programme is deemed to be accepted if the CA fails to accept or reject the programme within fifteen working days of receipt of it. Upon acceptance by the CA the programme becomes the AP and is used for the monitoring of progress of the project.

The AP should be submitted to the CA in electronic format (prepared and submitted using a specified or agreed project planning software), together with a hard copy of a bar chart or tabular report in a pre-agreed format. The hard copy requirements can be dispensed with by agreement, but electronic copies must be kept. Upon acceptance by the CA an electronic copy is saved for record purposes. The MSC emphasises the importance of using commercially available proprietary planning software, recommending that the CA and the contractor use the same project planning software, and that such software be named in the contract. The MSC recognises the possibility of the contractor preferring to use their own software, and suggests that if this occurs the contractor should provide the CA with a copy for use on the project, possibly by providing a computer loaded with the relevant software, and an item covering the entire cost (including updates, licences, etc) be included in the bill of quantities. The degree of detail to be included in the submitted programme should be comprehensive. Full guidance is given in the MSC.

If the contractor changes the methods or sequencing of the works, the CA grants an extension of time, or whenever circumstances arise that in the opinion of the CA will affect the progress of the works, the CA can require the contractor to update the AP and any associated documentation for submission for approval within ten working days of the event (or on a monthly basis if it is a regular event). Once the revised programme is accepted by the CA it replaces the previous AP.
2.1.3 The updated programme (UP)

The AP should be updated for actual progress on a monthly basis and the resulting UP archived as an electronic file for record purposes. Actual progress should be recorded by means of actual start and actual finish dates of activities, together with percentage completion and/or remaining duration of incomplete activities. Periods of suspension of activities should be noted. The UP should be submitted to the CA for acceptance as a true record. The CA is to use the UP to monitor the progress of the contractor by comparing it with the AP.

2.2 Additional documentation

The MSC recommends that the contractor also submits a fully cross referenced method statement and a detailed cash flow estimate.

2.3 The model records clause

The MRC has been drafted to be included in the specification section of a projects tender documentation (or in the contract conditions if the parties choose) and consists of two clauses.

2.3.1 Simple records clause

Clause one is intended to be suitable for small projects and identifies the minimum of records that should be kept by the contractor to enable the identification of activities on site, labour on site, plant on site, sub-contractor work on site, materials delivery, site instructions issued, weather conditions, and any delays encountered, to be submitted to the CA on a weekly or monthly basis.

2.3.2 Medium to high value or medium to highly complex projects

Clause two is intended for use on projects of medium to high value or medium to highly complex projects. It is also suggested that it could be used as a menu of potential documents to be submitted on smaller projects, depending on the levels of risk, administrative staff and facilities available.

The clause consists of ten sub-clauses. The contractor is responsible for maintaining and submitting records of all activities carried out on site, in a form agreed between the parties (giving a comprehensive list of what should be recorded), and requiring the parties to agree the intervals at which these records should be delivered to the CA.

The clause also states that daily reports (numbered sequentially) should be delivered to the CA at the end of the working week to which they relate (or as otherwise agreed). These reports are to be signed and dated by the CA. Any deficiency in the work is to be identified, and as they are corrected they are to be acknowledged on the daily report. The CA is to notify the contractor of any non-compliance with the reporting procedure.
The clause states that the contractor is to deliver a weekly report within two working days of the end of the week to which it relates (or as otherwise agreed), and a monthly report within five working days of the end of each agreed monthly period (or as otherwise agreed) to the CA, in a form agreed between the parties, that includes a summary of the work performed and referenced on the agreed programme, with a summary of a list of deficiencies and any delays encountered.

3. Interviews and discussion

The research was conducted in accordance with the Commonwealth of Australia’s National Statement on Ethical Conduct in Research Involving Humans (1999), following procedures approved by the University of Newcastle’s Research Ethics Committee.

Background details of those who were interviewed are contained in Table 1.

Table 1: Participants

<table>
<thead>
<tr>
<th>Participant</th>
<th>Background</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCL1</td>
<td>An independent claims consultant with over twenty years experience of working in the construction and civil engineering industry.</td>
</tr>
<tr>
<td>SCL2</td>
<td>A solicitor and Partner with a leading UK law firm with over twenty years experience of resolving national and international construction and engineering disputes.</td>
</tr>
<tr>
<td>SCL3</td>
<td>Managing Director of a specialist risk, programming and dispute resolution organisation with over fourteen years experience of civil engineering and building disputes.</td>
</tr>
<tr>
<td>SCL4</td>
<td>Head of a large UK organisations forensic engineering and construction disputes team with over twenty years experience as a chartered quantity surveyor and over fourteen years experience as an arbitrator and adjudicator.</td>
</tr>
<tr>
<td>USA01</td>
<td>A director and co-founder of a specialist American construction and asset cost consulting Quantity Surveying Practice with expertise in commercial construction, procurement, and dispute resolution.</td>
</tr>
<tr>
<td>USA02</td>
<td>A lawyer, architect and schedule (programme) consultant specializing in forensic schedule analysis.</td>
</tr>
<tr>
<td>USA03</td>
<td>A forensic claims consultant and expert witness with some 35 years of experience in construction claims specializing in schedule delay and soft cost damage issues throughout North America and abroad in Egypt, China, Kazakhstan, and Trinidad &amp; Tobago</td>
</tr>
<tr>
<td>USA04</td>
<td>A project controls engineer with over ten years of experience of developing and monitoring schedules and provided expert forensic schedule analysis and testimony for contractors and owners in the highway, power, and commercial construction industries.</td>
</tr>
<tr>
<td>USA05</td>
<td>A world-renowned scheduling expert, author of a best-selling professional text on construction scheduling, and founder of an international company providing scheduling products and services to the global construction community.</td>
</tr>
<tr>
<td>USA06</td>
<td>A lawyer and claims consultant with over 30 years experience of resolving national and international construction claims disputes.</td>
</tr>
<tr>
<td>USA07</td>
<td>A certified planning engineer with over 15 years of experience of developing,</td>
</tr>
</tbody>
</table>
monitoring, and resolving construction disputes on international projects.

**USA08**  
A certified claims consultant with over 25 years experience of resolving and negotiating construction disputes.

**USA09**  
The principal of a construction management consulting firm, who is a certified planning, scheduling, and cost consultant involved in the resolution of construction disputes, with over 25 years of experience and involvement in the commencement, execution, and completion of commercial, public, and government projects.

**USA10**  
A certified forensic claims consultant and professional engineer with over 27 years experience in the industry.

**USA11**  
A project control engineer supervisor employed in the petro-chemical industry, with 9 years experience of working in Spain, the UK, and Egypt, in both construction and engineering, who has worked for both clients and contractors.

**USA12**  
A shareholder in a large Attorneys at Law practice who is a lawyer, arbitrator, and mediator, with over 35 years of experience of practicing in construction litigation, international litigation and arbitration.

**HK1**  
Managing director of a Hong Kong based project management consultancy, a Chartered Civil Engineer and Accredited Expert with over 20 years experience in the programming, preparation, negotiation, and resolution of delay and disruption claims for contractors, contract administrators, and employers, who has acted as an expert witness and represented clients in adjudications and arbitrations.

**HK2**  
An expert witness and head of programming and delay analysis within the contracts advisory section for an international consultants operating in the Asia region with over thirty years of experience of working in the construction industry.

**HK3**  
A qualified civil engineer who has worked as an arbitrator for over ten years and held a senior position in the Arbitration Council of Hong Kong, with over forty years of experience of working in the construction industry in Europe, Africa, the Middle East, and Hong Kong.

However, respondent USA08 stated “I think contractors will look at it initially and say “this is going to increase my cost”, but when he really looks at it and implements it and can see the benefits to him in improved delivery he might say “once I started doing this I started making money””.

It was expressed by the protocol drafters and the US participants that the procedures outlined were considered to be nothing new or innovative, but simply “… best practice and good practice.” (SCL1), were “…many jobs actually keep the recommended records anyhow. All that the protocol does is to set up guidelines as to how they should be related to the programme and records of claims.” (SCL3). It was considered to be “something … that has come out of the standard of practice within the industry … and … is pretty traditional” (USA04). However, it was perceived to be beneficial to “standardise those types of things” (USA02) resulting in “more of an understanding about what’s expected in terms of scheduling” (USA02).

Perceived benefits by the Protocol drafters of the implementation of the model clauses requirements were stated to be “… transparency during the job in terms of what the critical path was, what the work flow/sequence was and what mitigation was put in place as a result of events … it is going to make the industry more honest, professional and transparent” (SCL3), “… having forward visibility
to your project in terms of how long it’s going to take, what it’s going to cost, what resources are necessary ... can reduce the cost of doing the works.” (SCL4).

This was reinforced by respondent USA05 who stated “if they do the updating properly it should be a benefit not a cost”. Respondent USA08 stated that in his opinion, if the contractors were asked “if you were to apply these provisions and bring your project in one day less in time and reduce your number of claims for delays in being paid for change work, what benefit does that give you in improved cash flow?”, they may see the potential benefits.

The potential likely benefits were considered to be more relevant depending upon the size of the project. Statements such as “... you wouldn’t want to use this model clause on the construction of a family residence. It would be prohibitive ... you just couldn’t justify the cost” (USA12), and “people are going to argue that the project needs to be at a certain level of complexity, ... there’s no reason you can’t apply good construction practices, although you don’t necessarily need everything you might need for a more major project” (USA04) indicated that the Protocol’s detailed “model” records clause for Medium to High Value or Medium to Highly Complex Projects may not be suitable for smaller projects, but there was scope for the use of the Simple Records Clause and the application of good construction practices.

There was acknowledgement amongst the US respondents of the poor quality of site records and project documentation usually available for the establishment and quantification of delay claims in general. Statements such as “I’ve spent a good deal of time advising contractors that they need to keep good site records ... even with contractors that get that advice, ... many times when you look at the documentation at the end of the project it’s not what it should be” (USA04), and “... a lot of our billing time is going back and checking ... dates and actual dates because a lot of times it’s inaccurate” (USA01), provided evidence that they had experienced the issues the Protocol’s “model” clauses were drafted to overcome.

There was general agreement amongst the US respondents that the implementation and use of the “model” clauses would have a “high” (USA07) consequence on the project administrative function. Comments such as “I'm generally in favour of the model clauses, because what they do is they identify ... a procedure for record keeping to document the project as it goes along, to make sure those documents are retained in a fashion which allows [their] eventual use” (USA02), “... unless you have good records, actual dates, remaining durations, percentage complete, things like that, unless you can rely on that, ultimately it’s garbage in garbage out...” (USA01), and “… in terms of record keeping ... it’s a good guideline for contractors” (USA04) indicated general support for the philosophy of the Protocols “model” clauses.

There was criticism of the additional administrative requirements that may be placed on the contractor by the use and interpretation of the “model” clauses by the judges overseeing the litigation process, with little responsibility being placed on the client. It was felt that there was already a large burden placed on the contractor in having to „prove their case”, and that a judge may see the “model” clauses as an administrative requirement, that if not met by the contractor making the claim, could be construed in favour of their opponent. Respondent USA04 stated “to have the complete burden on
you to prove something on a complex construction project is difficult ... I would like to see a little bit of parallel burden put on the owner to document things as they go along”.

3.1 Project Hardware/Software Requirements

The “model” clauses require the parties to agree and use appropriate computer hardware and software for the preparation, submittal, updating, and storing of the project programme and accompanying records. The participants were asked their opinions of the likely consequences the implementation of these recommendations would have on project hardware/software requirements.

The Protocol drafters indicated that in their opinion the implementation of the “model” clauses would have minimal effect on the project hardware and software requirements. Comments such as “In terms of hardware and software requirements it shouldn’t be any different again to what is going on in this day and age, when on most jobs there is software that is so easily used on projects” (SCL3), “all but the smallest jobs have site computers ... that’s adequate to deal with most projects ... so there is no excuse for saying that the cost of the software or the hardware is any impediment” (SCL4).

Overall the US respondents were of the opinion that the implementation of the Protocol’s “model” clauses “would not increase the hardware/software requirements” (USA02) for a project, it would however “require the project manager to pay more attention and do a better job” (USA02).

With regards to the software and hardware currently available and being used by the industry, respondent USA11 stated “I don’t see any special requirements besides the hardware and software normally used in construction”. Respondent USA05 was of the opinion that “we’re inundated with scheduling software ... project management software is more than we need”, and that “... you could do this on a good laptop with the right programmes” (USA12). This opinion was supported by a number of respondents, with comments such as “there’s obviously a lot of new software that will take care of the record requirements ...” (USA09), “it’s suitable ... you can use any one of a number of products available from these companies” (USA02), and “the software and hardware today is well ahead of these protocols” (USA08).

The Hong Kong participants were of similar opinion stating “Yes it’s sufficient, if anything it’s too much” (HK01), “There’d certainly be sufficient to implement it. Successfully is a different matter” (HK02). Participant HK03 indicated that he felt that there was too much emphasise on the importance of the hardware and software, and that they were only tools of administration, stating “I don’t think any hardware or software is capable of administering, people are the only thing that can administer”.

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3.2 Personnel

The implementation of the recommendations of the Protocols “model” clauses would need to be administered by suitably qualified and experienced personnel. The participants were asked their opinions of the likely consequences the implementation of these procedures may have on project personnel requirements.

The Protocol drafters acknowledged that the adoption and implementation of the “model” clauses may have some effect on project personnel requirements, stating that the “… personnel you might need is proportional … to the size of the contract, so I don’t think it’s going to double the size of your contract administration team but it might increase the responsibilities of your current document control person, so they are going to have more records to keep … but it shouldn’t dramatically increase the size of your team overall” (SCL3). The availability of suitable personnel to carry out the recommended procedures was a concern with one participant commenting “We also recognise that there may be a relative lack of suitably qualified and experienced personnel to do some of these things” (SCL2).

Overall there was agreement amongst the US respondents that there would likely be an increase in demand for suitably qualified and experienced project personnel to implement the Protocol’s “model” clauses. Respondent USA04 stated “it is going to be an increase in personnel in terms of contractors”. Respondent USA11 stated “there would be more existing personnel needed, more qualified”. Respondent USA04 indicated, that in his experience, there may be a need to employ a specialist information technologist operative as well as a general administrator, stating “… with the complexity of the IT … I see more and more contractors with one full time IT guy”. Other respondents indicated agreement. Respondent USA09 stated you “may require additional personnel on the project to handle this”, whilst respondent USA02 stated “… it might actually mean a few more people working on the site in management which will assist in the successful completion of the project”. Respondent USA05 hoped it would result in an increase in demand for personnel because, in his opinion, it was “going to require more people to implement it”.

It was suggested that there would be less of an increase in demand for additional personnel on larger organisations and projects because they were perceived to be “… already doing it …” (USA04), whilst there would be more demand amongst “… small to medium sized contractors, in order to come up to standard, … they’re going to need one or two more people” (USA05).

The Hong Kong participants were of similar opinions stating “at present contractors don’t have enough people on site and don’t have enough staff doing this sort of planning work … yes you need more personnel to do this sort of thing” (HK01), and “I think the people are needed. If you’re going to do the job efficiently you need the people” (HK03).

There was little indication of any views or opinions amongst the respondents concerning any likely resistance by the industry to the employment of additional personnel to undertake and implement the Protocol’s “model” clauses by simply re-allocating or re-distributing the perceived increased workload amongst existing project personnel.
3.3 Training

The implementation of the recommendations of the Protocols “model” clauses could have an effect on an organisations training requirements. The participants were asked their opinions of the likely consequences the implementation of these procedures would have on training requirements.

There was a difference of opinion amongst those interviewed concerning the likely training requirements resulting from the implementation of the “model” clauses. One participant commented “We would need a very considerable amount of training of appropriately qualified personnel, so that would be a cost increase … we suspect that this might be a relatively small investment for a potentially very significant cost saving because all of this work on the programme is not designed specifically with disputes in mind, it is designed with basic project management in mind, mainly getting the project delivered on time and on budget” (SCL2). Whilst another considered on the job training and project experience was more relevant, stating “… in terms of the skills required to do this are no different to what happens on a typical job … The programming, in terms of preparing the base line, updating it monthly and identifying changes that are made rely on the people in the industry anyhow … They are already on every job site, so you do not need to send someone to school to be a programmer, they need to basically have hands on training. I think that training for application of the protocol … are hands on skills so you shouldn’t require any additional training, unless it is someone who has never used computers or who is not familiar with programming” (SCL3). One participant indicated that targeted training would be more beneficial commenting “… I think there is training required on the employers’ side of the fence. I think most contractors have some understanding of critical path and computer software. It’s when you get the architects, who have been doing this for the last thirty years. They think they can give an extension of time without reference to critical path programmes. They are the people with the largest amount of learning to do, and in the short term that is a limitation in that those people are sufficiently not available, and it will take some time before the industry catches up with the requirement” (SCL4).

There was evidence to suggest that there was concern amongst the US participants over the apparent lack of existing appropriately experienced and qualified personnel available to the industry. Respondent USA02 stated “I’m sure the UK has the same problems the United States does in terms of manpower shortages, in Australia its probably even worse. Talented manpower is always a problem and it occurs at both craft and management positions … Does it mean that the personnel have to be better trained? Absolutely”.

Addressing the administrative process proposed by the Protocol’s “model” clauses, respondents USA09 and USA12, reinforced this concern stating respectively “... all of these requirements are prudent, ... they should in fact be maintaining certain records that document the progress of the work and they require additional training for the administration”, and “It certainly requires the training of the administrators who aren’t used to doing it this way”. The overall perceived need for increased training requirements was echoed by respondents USA05 and USA07 respectively, who simply stated “… training is a huge hole. There’s got to be more training”, and “Personnel need to be trained ...”.

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Similar concerns were raised by the Hong Kong participants. Participant HK02 stated “A need for additional training to support that? Absolutely ... It's no part of an architects training for a start ...”, whilst participant HK03 was concerned with the focus of the training expressing an opinion that many proclaimed programming experts know how to make a commercially available computer package “sing and dance beautifully” but do not fully understand the complexities of the construction process, stating that “the training that’s needed is in managing projects and understanding the resources required, not in the manipulation of computer programmes”.

Another concern was the perceived excessive cost that may be involved in the implementation of appropriate training regimes within an organisation that, for them to be successful, must be supported by the organisations senior management. Respondent USA04 stated “I think the training costs are high, and if you’re going to implement something like this full scale, management has to be fully behind it”.

The comments of those interviewed acknowledging the need for training identify an apparent divide in knowledge, understanding, and appreciation of the purpose and possible use of the records and documents between those who collect and compile the data and site records, from those who may eventually use that information in a possible dispute situation. This could be a reflection of the lack of investment by the construction industry in the past but must be addressed. Participants have acknowledged that the adoption and implementation of the Protocols “model” clauses is likely to result in a demand for additional administrative staff on projects, which will be resisted by the industry as a cost reduction exercise, resulting in more responsibility and administrative duties for existing staff. This, together with a lack of knowledge and understanding of the use and importance of the site records they compile and collect may exasperate the problem further. Investment will be needed in the training and education of suitably qualified and competent staff, in the purpose, methods, techniques, systems, and computer hardware and software, to ensure the potential recognised benefits of the adoption and implementation of the Protocols “model” clauses are achievable.

4. Conclusions

Those interviewed agreed that the adoption and implementation of the “model” clauses by the Australian construction industry would likely result in an increase in project administration and project administration costs, with the degree of impact being dependant upon the size and/or complexity of the project. Smaller, less complex projects were felt to be the least likely to benefit from the implementation of the “model”.

Should the “model” clause recommendations be implemented there would be a perceived improvement in the honesty and professionalism of the industry providing transparency and clarity in the administrative processes carried out by the industry, resulting in potential savings due to the improved efficiencies and improved cost recovery opportunities, with the potential to reduce and/or avoid disputes due to pre-agreed procedures.
All of those interviewed agreed that the implementation of the “model” clauses would have minimal effect on the project hardware/software requirements. It was perceived that suitable hardware and software would be available to all involved, with only the problem of compatibility between different hardware systems and software being a potential problem.

Those interviewed agreed that the implementation of the “model” clauses would increase the demand for appropriately qualified and experienced project personnel to carry out the recommended administrative procedures effectively.

Overall those interviewed acknowledged there would be an increased need for investment in training and education by the construction industry in all areas of programming, contract administration procedures, and computer software usage, to ensure the recognised potential benefits of the adoption and implementation of the Protocols “model” clauses could be achieved.

Those interviewed supported the overall philosophy and approach proposed by the Protocol’s “model” clauses for documenting, administering, recording, and the programming of delay and disruption events on a construction project.

The approach suggested by the “model” clauses was not considered to be anything new or innovative, but a standardisation of industry practice giving the benefit of a clearer understanding and appreciation of the processes involved.

The extent and magnitude of the potential likely benefits was considered to be dependant upon the size and complexity of the individual project concerned. The application of the Protocol’s detailed “model” records clause was not considered to be suitable for smaller projects, but there was scope for the use of the simple records clause and the application of good construction practices.

There was concern that the requirement to comply and administer the provisions of the Protocol’s “model” clauses placed an unfair or higher burden on the contractor with little burden being placed upon the client or owner. It was considered that some requirement or responsibility for the administration and keeping of project records should be placed upon the client or owner.

There was some concern that the owners or clients of the industry (who were not regularly involved in the construction process) would be at a disadvantage in terms of the availability and accessibility of suitable hardware and software to enable them to comply with the Protocol’s “model” clauses requirements.

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The Impact of Use-based Categorization in Building Control on Architecture Design of Buildings - A Study of Hong Kong

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Abstract

Under current Hong Kong building control regulations, all buildings are classified as domestic or non-domestic, which imposes control barriers to any mixed-use or merged-use buildings. Furthermore, the profit-oriented market in HK always pushes building design to follow regulations tightly. Design innovations are thus limited and sacrificed for the maximization of development potential. This paper will investigate the principles of use-base categorization in building regulation control and its impact on the architectural design of buildings. Regulation review and comparative data analysis are used as methods. The study uncovers key control aspects and variables in current HK building control and proposes recommendations in code making.

Keywords: use-based code making, building control, domestic building, non-domestic building
1. Introduction

1.1 Building control

1.1.1 Origin of building regulations

The statement of “form follows function” by Louis Henri Sullivan declares the key principle of ideology of modernism in architecture in 1930s. However, when the buildings are significantly valued as commodities in a highly commercialized society, the “form will then follow finance” (Willis, 1995). Such diversion will lead a distinctive inflection to building designs. In a high commodity-based economy society like Hong Kong, the buildings are highly endowed with excessive commercialized identities. Thus, architecture design becomes so vulnerable under such conditions, and it is further interpreted as the case of “form follows building control” (Wong, 2002). Such excessive influence of finical considerations has to be limited; otherwise there is only freedom from the economical power but no control for the public concerns in building designs. What indeed in the building control that makes such critical restrictions to architecture design, and how to improve the building controls accordingly? To find out the answers, this research paper will investigate the principle of current occupancy-based categorization in Hong Kong building control, and its impact on the architecture design of buildings. It will uncover the relationship between architecture design and building regulation controls, and identify the key reasons of the problem in contemporary HK context. Furthermore, recommendations would be made.

Building control was originated to protect the safety of human life and property. Hammurabi’s Code of Laws (1750 BC) stated this principle thousands of years ago. In Code No. 229 of the laws, it states, “If a builder builds a house for someone, and does not construct it properly, and the house which he built falls in and kills its owner, then that builder shall be put to death.”

Historically, people have learnt lessons from failures and disasters that happened to buildings. Knowledge and experiences was accumulated, and it formed the foundation of a building control system. Today, building control typically includes both building regulations as a main component and building administration as a support part. There have been many means to implement building control in history. Building occupancy is widely used in many current building legislation systems, and it has a history of over 100 years in Hong Kong. In current building ordinance (2009), two types of buildings are identified: domestic buildings and non-domestic buildings.

1.2 Architecture design of building

Architecture design includes site planning, building layout/space design, environmental design and specific designs. Additionally, it is a base that supports human activities, coordinating with people’s lifestyles, work, and entertainment. New building types, refreshing concepts and original programming are introduced and reflected in design experiments. Architecture design is controlled by building regulations for certain objectives such as safety, health and density.
2. Building control

This study will not take its approach from the perspective of traditional building occupancy classifications. Instead, a review of origins of building law leads the research to a new approach of re-classification of building controls with three major aspects: building density control, building safety control and building environmental health and sustainable design control.

2.1 Building control on density

2.1.1 What is density?

Density is defined as mass per unit volume. In the planning or building field, density is defined as a measure of the number of people living in a given area, the number of buildings, dwelling units, land uses, modes of transportation, connections, etc. within a prescribed area.

Population intensity is usually measured as the number of persons per hectare. At the macro city planning level, it is an important variable that controls a prescribed area with planned population. At the micro level, such variables help to provide reference data for city infrastructure design such as transportation, urban space, etc. Hong Kong, with an average population density of about 6400 people per square kilometre, is one of the densest cities in the world.

Building density represents the denseness of buildings in a prescribed area. Typically, two control variables regulate buildings: the floor area or plot ratio and the building coverage ratio (BCR). As stated in Hong Kong’s building regulations (2006), the plot ratio of a building shall be obtained by “dividing the total amount of gross floor area of the building by the area of the site on which the building is erected.” BCR is also known as “site coverage or lot coverage.” It controls the horizontal extension coverage of the built-on-site structure. The formula for plot ratio and site coverage is as follows:

Plot Ratio = Maximum permissible gross floor area/site area

Site Coverage = The covered area from the building/site area

As cities grow denser in urban areas, the concerns of nature, environment and living quality become crucial. As a result, new concepts of “green/landscape density,” “water density” and “open space provision intensity” have been created and have become important variables in building control.

2.1.2 How to enforce building density control

2.1.2.1 Historical development of building density control

Historically, as Wong (2003) summarized, there have been three levels of development control: land lease, planning and building.
The earlier development control was mainly focused on land layer and was carried out through the land lease conditions that covered land-related issues such as forms of indenture, conditions of sale, exchange, grant, tender and re-grant (Nissim 1998). The first city planning blueprint was brought to the HK government by Surveyor Gordon in 1843. He suggested that the city centre be divided into different zones for residential, administrative, and commercial use. In 1935, a Town Planning Office was established, and four years later on June 30, the Town Planning Board was appointed and the City Planning Ordinance was published. Hong Kong had been a colony since January of 1841, and since that time there had been two major phases in the development of building control. The first phase from 1841 to 1955 was a stage of original exploration in building control with few control ordinances published. The second phase started in 1955, with the formation of the Building Ordinance (1955), which set the foundation for the current building control system.

The first Building and Nuisances Ordinance was published in 1856 in HK with 19 clauses regulating issues of building definition, construction material and requirement, structure and fire safety, health issues, maintenance, and surveying concepts. In the Building Ordinance of 1889, overcrowding was defined as less than 300 cubic feet of living space per person. Thus, the control of density based on building bulk was established.

The Building Ordinance of 1955 formed the basic foundation of the current building regulation mechanism. Together with three other important regulations, Building (Administration) Regulations, Building (Construction) Regulations and Building (Planning) Regulations (1956), the Hong Kong building development and design control system was established. In the Building Planning regulations (1956), building density control was kept as building bulk control, which was subject to the site area, site conditions like open spaces and lanes, building height, volumes, and building usage. The formula was as follows: Volume=Factor (F) x Street Width x Site Area.

The factor (F) differed according to the site usage. In 1962, the building control through building bulk was changed to plot ratio and site coverage. These systems are still being used in current building control system.

2.1.2.2 Building density control in the current building legislation mechanism

The following introduction will present a few key building control variables that are widely used in Hong Kong’s current system.

- Site Classification

According to HK Building (Planning) Regulations, the first priority of all building control variables is site classification. Three types of sites are identified as Class A, B and C sites based on abutting street conditions. Generally, Class A sites are less accessible to the public than class C sites.

- Site/Building Occupancy
Building occupancy is the second important control variable in Hong Kong’s building control system. Once a site is classified, the site coverage, plot ratio, and building height are all defined according to building occupancy. Occupancy groups are classified as either domestic buildings or non-domestic buildings.

- **Site Coverage**

Site coverage refers to the area of the site that is covered by the building that is erected thereon, and, when used in relation to a part of a composite building, refers to the area of the site on which the building is erected that is covered by that part of the building (2006). The concept of this variable is, on one hand, to formulate an important part of building density control, and on the other hand, to provide a direct control of the building in relation to the site.

- **Building Overall Height/Floor to Floor Height**

Building height is a variable that controls vertical density of a building. The overall building height is usually controlled by a land lease at the planning stage. HK building ordinance also regulates the floor height as not less than 2.5 m for habitation and office use floors.

- **Set Back and Open Space**

Set back and open spaces are designed to control the building’s external space in the immediate surrounding environment. Furthermore, they ensure the minimum openness and building distance in regard to fire prevention.

- **Plot Ratio**

As previously explained, plot ratio is a given numerical value according to site classification, building occupancy, and building overall height. Figure 1 below shows the plot ratio and site coverage requirements based on site classifications and building occupancy groups.
Control on Floor Area

As reviewed earlier, building density control in HK was first carried out through building bulk control and then transferred to plot ratio and site coverage in the Building (Planning) (Amendment) Regulation of 1962. Such changes led to more specific controls in building density. The earlier building bulk control did not pose enough requirements on internal spaces, particularly the vertical layers of floors. In fact, people use the building more in horizontal manners. The new plot ratio and Gross Floor Area GFA control focused more on built floor areas rather than building bulk, which created a close and reasonable linkage to people’s activities in relation to building spaces. Such changes can be viewed as a milestone that transfers building density control from a simple physical construction level to a more complex human behaviour level.

Control on Projections and Surfaces

Current building regulations also include controls on building projections such as eaves, cornices, balconies, verandas, canopies, bay windows and etc.
2.1.3 Discussions

2.1.3.1 Structure of building density control

The diagram below summarizes key building density control variables in Hong Kong's current system. All variables can be classified into two categories within a clear hierarchical structure: quality control variables and quantity control variables.

![Diagram of hierarchical analysis of density control variables](image)

Figure 2: Diagram of hierarchical analysis of density control variables

At the macro level, both quality control and quantity control are enforced. The two main variables in quality control, site classification and site usage or building occupancy, link control from a planning level to a building level. In quantity control, the built up quantum and spacing to surroundings are controlled through site coverage, set backs, and the overall building height. At the micro level, controls on the internal content of the building, such as floor area, component quantum and projections are regulated.

2.1.3.2 The objective of density control and the implementation tools

In residential buildings, for example, the original objective for density control in domestic buildings is to limit the dweller population and maintain good liveable conditions. However, such goals have not been maintained very well throughout the history of building control development. As the city grew faster and denser, controls on either built bulk or built floor area could not control the habitant population without enforcing a clear minimum standard for individuals. The earlier code in the 1900s required a minimum of 300 cubic feet of living space per person. However, with more dwellers, denser build-up structures and heavier rentals, such controls were becoming tighter and tighter. In the 1950s and 1960s, it dropped to around 34 square feet per person, while now, no clear requirement is enforced. Building authorities want to control building density through plot ratio and GFA. Furthermore, they wish to control the people and activity density by modifying building density with plot ratio and GFA. However, this did not work very well as Chan and Wong analyzed (2001). Using
building space to control the geographical distribution of the population is a very indirect mechanism. It is hard to direct people’s residences in a free society.

Figure 3: Relationship of development density, plot ratio and GFA

In dense areas, controls on minimum space/area for a habitant need to be established to secure the basic living quality. In other building types with large numbers of users, similar conditions apply. In general, plot ratio and GFA can be used in building density control, particularly in the physical aspect of buildings. However, despite building occupancy differences, it is very indirect to use such variables to control the building occupants’ population intensity and their activity density. A possible solution is to further regulate minimum space/area for single occupants based on different building occupancy characters. By raising the concern of building occupation conditions, the current building control strategy would be diverted from a “use-based” to a “user-based” concept. Furthermore, this could also make the predefined building occupancy more flexible and transferable after building occupation.

As an overall conclusion, building density control has a very strong impact on architecture design of buildings, but the building occupancy classification is not a very good base in code making for the building density concerns.

2.2 Building control on safety

2.2.1 What are the building safety issues?

Basically, building safety control has three major concerns: disaster-safety concerns, such as safety protection from fire, earthquakes, floods, and even terrorist attack etc.; user safety concerns, such as skid-proof design, safety designs for the handicapped, handrails and other building-elements etc.; and management-safety concerns, such as security control, maintenance safety etc.
2.2.2 How to enforce building safety control

2.2.2.1 Disaster safety control

Fire safety, as one of the most prevalent concerns in disaster safety, will be addressed in this study. There are two principles in fire code writing: to secure people’s lives, including the building occupants, fire fighters and neighbours; and to protect the property and the neighbours’ property from fire. Typically, a fire code will address three aspects in code writing: prevention of fire, evacuation of people, and fire fighting.

Prevention of fire occurrences in building control does not impose many requirements on the building plan layout. It is more focused on construction, mechanisms and materials. Prevention of fire expansion requires some building controls in space design/plan layout to ensure that the building has a certain resistance to the spread of fire.

In evacuation of people, two issues are important: means of egress and occupant load. The concept of means of egress provides a continuous and unobstructed safe channel for building users to exit from the building to safe areas (or safer parts of the building, like refuge floors in sky-rise buildings) in fire or other emergency cases. The safe channel includes three parts: the exit access, the exit, and the exit discharge. It is important to have a clear building occupant population and its peak limit before designing a building egress system. The design reference for occupant load is interpreted as minimum floor area per person in code writing. Furthermore, the occupant status and their familiarity to the building are also considered in code writing. For example, as required in HK fire code (Building Department 1996), the refuge floor for high-rise buildings should be provided in all buildings exceeding 25 storeys. However, for domestic buildings, such requirements could be up to 40 storeys if there is a roof refuge. This is because the building dwellers here are considered to have a greater familiarity to the building in which they live, which would reduce evacuation problems. Occupant load also affects the architecture design of buildings. Three aspects in the building exit system are controlled: the number of exits; the egress capacity like the egress minimum width and maximum amount of people; and the arrangement of exits, which is reflected in the controls of travel distance, compulsory optional exit provisions and access, dead-end spaces, and common path etc.
Fire fighting is mainly conducted by firemen. So, the building occupancy has little impact on this issue.

In addition to fire-safety, building control also has other disaster-safety concerns that affect the building design. Hong Kong’s building authority requires that projects located in certain areas of central HK island need a registered geographical engineer as a professional consultant. Building codes in Japan and some of China’s cities have controls on earthquake safety.

2.2.2.2 Control on user safety and management safety

Disaster safety is mainly focused on emergency circumstances, while user safety and management safety are focused more on the safety issues of a building’s everyday usage. In both aspects, the architectural design is regulated. However, the building occupancy is not the first concern in code writing for the safety issues of the above two aspects. In fact, the user-based concept is more frequently applied; for example, accessibility control in building design.

2.2.3 Discussion

In this section, building safety control is discussed based on two scenarios: the emergency circumstances and the normal daily usage and management. The first scenario is mainly addressed through cases of fire safety control; while the second is highlighted by the issues of accessibility, materials and designs. The following diagram summarizes building controls on materials, designs and planning.
2.2.3.1 Controls for emergency circumstances

Fire safety control has three key considerations in the occurrence of a disaster: prevention, evacuation and salvation.

For prevention, building codes mainly focus on the control of materials, designs and planning. The objective is to protect everyone from each other. Therefore, at a planning level, building setbacks and material controls are used; at the building design level, controls on fire zones, occupancy separations etc. are used. For evacuation, the building code focuses on the design of “safe channels” for the occupants. Accessibility, content capacity and protection time limits of the channel are required. For salvation, building codes have special requirements for fire fighters’ operations. Some of these codes could be shared with evacuations while some are separated from the first two provision requirements.

2.2.3.2 Impact on architecture design

The above study shows that many building safety control variables are not designed based on building occupancy. In fire safety, as an example, only the prevention requires a consideration of building uses. In the evacuation and fire fighting part, building occupancy is not a key control variable that determines the fire code. According to fire engineering strategy, the concern on the anticipated risk of a fire, the combustible, explosive or toxic content of a building, the ability of the structure, the consequential and possible danger, the occupant load, and the occupant characteristics are more important. Building use has very little impact. For other concerns of daily usage safety, there are also very weak linkages between building use and building control.

In conclusion, the building safety control has a strong impact on architectural design of buildings, but the building occupancy classification is not a key concern in the code making of building safety issues.
2.3 Building control on environmental health and sustainable design

2.3.1 What are the issues?

Historically, hygiene control has been a key concern in building code making. Today, more issues are included. In this section, these issues will be divided into two groups: environmental health and sustainable design. Building control on environmental health includes issues of lighting, ventilation and air quality, internal temperature, acoustic issues, moisture, restroom design etc. Technical references are used in designing building control variables. Creating a good physical environment is a basic requirement for building design. Furthermore, with today’s fast development and increasing load on the natural surroundings, sustainable development is critical. Building and construction are major consumers of the resources and energy. Therefore, more researchers and building code writers have begun to integrate sustainable thinking and strategies into building control. In this aspect, building control could be more supportive.

2.3.2 How can this be accomplished?

2.3.2.1 Environmental health control

- Lighting Control

There are two ways of lighting internal spaces, natural lighting and artificial lighting. Natural lighting is always a key concern in building design, and artificial lighting usually compensates by achieving the required lighting standards. However, a good building design could reduce artificial lighting and create favourable natural lighting environment for building occupants. Building control on lighting is mainly focused on the facade or roof design. The differences of lighting standards in building control among various building occupancies are minimal.

- Internal Temperature Control

Similar to lighting control, building codes on thermal comfort issues also have similar standards for all building types including domestic, office and commercial buildings. The control standard is within a range of plus/minus 4 degrees of 22 centigrade.

- Acoustic Noise Control

Building codes have different decibel (dB) requirements according to the space usage. For example, in habitation space, the maximum noise allowed is 45 dB in the daytime and 35 dB at night. For office space, the maximum is 55dB.

- Ventilation and Air Quality

Building ventilation has two means: natural ventilation and mechanical ventilation. In natural ventilation, building codes have requirements on the openings of facade design. In mechanical
ventilation, mechanical systems are regulated. In many building types, such as offices and commercial buildings, natural ventilation cannot provide enough fresh air, so the mechanical ventilation system is required by regulation.

### 2.3.2.2 Sustainable design control

- **Sustainable Energy Efficiency - Overall Thermal Transfer Value (OTTV)**

Hong Kong’s Building (Energy Efficiency) Regulation uses the overall thermal transfer value (OTTV) to control issues of building energy efficiency. In OTTV control, trade-offs are allowed. As long as the OTTV achieves the required standards, there are no specific requirements regulating the detail aspects of each variable in the above formula. For example, if the design needs a large unthrifty energy window, which would not achieve the standard, it could substitute higher class insulation walls to balance the additional energy cost from the window component and maintain the overall value within the requirement. Such control strategy gives designers much more freedom and allowance for innovation.

- **Nature and Communal Space Control**

To improve the environment and natural conditions, Hong Kong’s building authority has enforced new building controls on architectural design and provisions of natural communal space in high-rise buildings. In 2001 and 2002, the first and second “Joint Practice Note” (JPN) regarding “green and innovative buildings” was issued by Hong Kong’s Building Department, Lands Department, and Planning Department. A few aspects were highlighted in such controls, such as the overall life cycle approach strategy, the usage of natural materials and green renewable resources, energy consumption issues and construction and demolition controls.

- **Open Design**

Many building regulations are designed and enforced based on building occupancy classifications. However, building use can be changed many times throughout its life cycle. How can we make appropriate building controls to secure the architectural design with enough flexibility and openness for such changes? Flexibility in code making is thus becoming very important. However, traditional use-based strategy in building codes may not be able to provide such space. Therefore, new strategies and exploration are needed. In this process, strategies from performance-based fire code making and objective-based architecture preservation codes provide good references.

- **Culture, History, Identity and Other Intangible Issues**

It is always difficult for building code writers to integrate intangible issues into code making. Issues like culture heritage, building identity and historic preservation are mainly qualitative in nature and hard to quantify in regulation control. However, for conservation building codes, it would be easier if the key preserved object were clarified. Like the US Columbia Pike Codes establishment, researchers helped the local government to set up a conservation building code of “form-based coding,” which is
mainly based on streetscape preservation objectives. In this case, the code requirements are designed based on building form rather than building occupancy classifications.

2.3.3 Discussion

2.3.3.1 Control development and principles

Originally, building codes were designed to protect people’s safety and health. Looking back on the history of building code development, a clear picture is seen, showing the evolvement of building health controls that started with basic hygiene requirements, such as clean water supply, drainage issues etc. and advanced to more complicated personal needs, such as private belongings and social and natural interactions.

<table>
<thead>
<tr>
<th>Building Health Considerations</th>
<th>Control Aspects</th>
<th>Control Variables</th>
<th>Prescriptive-Based Control Variables</th>
<th>Performance-Based Control Variables</th>
<th>Quantitative Aspect</th>
<th>Qualitative Aspect</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Basic Survival &amp; Living Needs - Min. Physical Level (People)</td>
<td>Temperature Control</td>
<td>Celsius Degree</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
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<td></td>
<td>Acoustic Control</td>
<td>dB (Decibel)</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
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<td></td>
<td>Lighting Control</td>
<td>Lux</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ventilation Control</td>
<td>Operable Window Area</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) Advance Development Needs - High Level (People)</td>
<td>Air Quality</td>
<td></td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Private Belonging</td>
<td></td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Green/Nature Interactions</td>
<td>Floor Area</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Social Interactions</td>
<td>Floor Area &amp; Comfort</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3) Sustainable Development Needs - Long-term Evolution (People &amp; Nature Harmony)</td>
<td>Energy Efficiency</td>
<td>OTTV Formulation Calculation</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
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<td></td>
<td>Open Design</td>
<td>Floor Area Ratio</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intangible Issues like Culture, History, Identity etc.</td>
<td>Facade, Form, Color, Materials etc.</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 6: Building control variables for building environmental health and sustainable design

Today, with even more sustainable considerations, the concept of environmental health has been expanded and further classified. As summarized in the above chart, the regulated items cover both technical quantitative data and intangible qualitative aspects. The controlled issues cover both physical human health and mental needs. The code-making strategy covers both the human and natural environment. It is more difficult than ever before for code makers to tackle all of the concerns.

2.3.3.2 Control variables and building occupancy

The above study shows that in the aspect of health control, many variables are not designed and enforced based on building occupancy classifications. The building occupancy in most control aspects is only a reference, but not a base for controls.
3. A Survey of building control on HK buildings

In previous sections of this study, building controls have been studied regarding aspects of density, safety and environmental health and sustainable design. The impact of use-base classification in code making on architecture design has also been analyzed. This section will present a survey of building control on architectural design. This survey is based on a previous pilot study, literature review and interviews to the professionals and authorities. The pre-study helps to identify the building sub-control aspects and building occupancies as key issues for further investigation. So the general professional opinions of building control intensity on architecture design of different building types are collected. In the survey, data are collected and categorized in different building sub-control aspects according to domestic and non-domestic buildings.

To make comparisons easier, only office buildings will be used in the survey for non-domestic buildings. The survey is conducted in four aspects of building control: density, safety, environmental health and sustainable design. Eighty answers from about 600 experienced designers, architects and authority experts are the informants in the survey. The purpose of the analysis is to quantify the building control intensity of various building types for comparison analysis. Therefore, the questions are designed with a 5-point level of evaluation for quantification, and a new building control stringency index, an arithmetic mean of the sum of surveyed data, is described for comparison.

3.1 Comparison of building control index

As a summary of the survey, the following diagram shows the result of data analysis.

Figure 7: Stringency index of building control in HK
Generally, building control on domestic buildings and office buildings have close control stringency in the four surveyed aspects. In building safety and sustainable design control aspects, domestic buildings and office buildings have very close control stringency. The difference is only less than 4 percent according to the highest index. It indicates that in these aspects, building regulations on both building types share many similar control requirements or standards. On the other hand, in density and health control aspects, the control stringency of two building types has some deviations. In health control, the stringency index of office buildings is about 12.7 percent lower compared to the residential index. In density control, the office index is even lower at 13.7 percent of the residential index.

In fact, all surveyed control variables are the same for both building types. Therefore, such deviation only shows the difference in control standards according to building types. In health aspects, the surveyed variables are lighting, ventilation, air quality, thermal comfort and acoustic control standards. These are all parameters that scale basic environmental comfort of human beings, and did not vary greatly according to building occupancies. However, the deviation comes from the differences of building designs. Office buildings in HK are mainly designed to be enclosed from nature, which requires more mechanical support and building controls to secure the internally built environment quality. In residential buildings, most domestic units are not mechanically controlled built areas. For example, many external windows are operable and central air conditioning systems are not required. Therefore, fewer building controls are imposed on residential buildings.

Comparatively, building controls in residential buildings are slightly more stringent than those on office buildings. Only two control variables show the reverse result. They are shading, heat insulation and internal thermal comfort in health control aspects and energy consumption in sustainable control aspects. Reasons for the variables in the health control are that most office buildings are enclosed with artificial internal environments, which certainly requires more building codes to secure the environmental quality. Higher standards of mechanical and electrical codes are imposed on office engineering. Most units in residential buildings are not designed as enclosed from the natural environment, and natural adjustments are promoted. Therefore, thermal comfort controls are more critical in office buildings than in residential buildings. The second variable of energy consumption further proves this since more energy will be used to secure the physical environmental quality.

Building control on density is the most stringent among all control aspects. The diagram shows that building density control in HK is the strongest with a stringency index of 3.438 for office buildings and 3.982 for domestic buildings. It is followed by building safety control with an index of 2.882 for office buildings and 3.000 for domestic buildings. The health and sustainable design control is the least stringent control aspect with stringency indexes of 2.250 and 2.439 for office buildings and 2.577 and 2.536 for domestic buildings. Moreover, the control on health and sustainable design aspects are very close with an approximate average of 2.500.
4. Conclusion and discussion

This study investigates building controls and their impact on the architectural design of buildings. By reviewing the origin of building controls, it is evident that there is a re-emphasis on the key principles of safety and hygiene concerns in the development of building control and code making. Based on that, four aspects of building control, density, safety, environmental health and sustainable design, have been identified as the core study of this research. Current use-based code making strategy is reviewed and evaluated accordingly. Furthermore, the impact of such control on the architecture design of buildings is studied, and a case-based survey is carried out for the in-depth analysis and comparison.

The study shows that the impact of building regulation controls on architecture design are majorly in the following areas: In building density design aspect, the regulation control affects the built floor area, space height, site set-back, site coverage and building projections. In building safety design aspect, it controls the exit system design such as design of common corridors, staircases and life, fire mechanical and electrical systems etc. In building environmental health and sustainable design aspect, the control impacts are represented as the provision of different building facilities, green provisions and material utilizations.

A holistic review shows that current building control in HK is highly limited by density considerations, and imposes the strongest influence on architecture designs. It further debases the status of the original concerns of building design on safety and health aspects, in particular, the environmental health and sustainable design have conceded to the density design aspect.

![Stringency Index of Building Control](image)

Figure 8: Comparison of stringency index of building control in HK

Secondly, differences in the impact of building control on architectural design of two building types are major from the standpoint of building user distinctness, but not building use variations. Thus, a
user-based strategy in code making is suggested. This concept may further change current code design principles by joining similar building occupancies as a united and complex mixture (or mixed use buildings). In this aspect, the current use-based building occupancy classification may be replaced by population-based or occupant-based building classifications. In fact, many buildings may have functional transactions in their life cycles, while the population-based code would reduce the obvious deviation in density control from different building use types. Furthermore, the control can be more focused on the safety and health issues for the users. For example, the recreation of loft buildings in New York led to a special formulation of the NY building code, which prioritizes safety and health issues as key concerns in the transactions of factories into loft-living studios, and releases density (floor area) control, relaxing the previous regulations. Another case of architecture preservation brings us the form-based building regulations, which also provide building user flexibility in building occupancy, but again, maintains the basic safety and health controls.

Lastly, if we review the original principles of building control and maintain the safety, health and sustainable development as universal thinking in building code making, then building density control would not be an invariable aspect and would be even more important than the others. The significance of building uses in code making may also be degraded. In fact, an X-based building code making strategy with the engraved universal principles in building control would be more possible.

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Is Breaking Up Hard To Do?

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Abstract

This paper examines the issues and factors that courts consider in deciding on the determination or termination of the employment of a contractor for slow performance. The various approaches that the courts have taken in construing whether a contractor is performing diligently and regularly and whether his performance warrants the termination of his employment are looked at. Judgments from the various common law jurisdictions are covered in this paper in order to serve as an overview of the courts’ approach to this perpetual dilemma and, in turn, as a guide on the issues concerning whether or when an employer can terminate contractors whom they consider will not be able to finish the project on time or, at least, within a reasonable time after the contract completion date. The conclusion reached is that there are many facets to the issue of diligent and regular performance that need to be considered in the event of a dispute over whether the contractor is proceeding regularly and diligently with the works.

Keywords: breach, termination, proceeding regularly and diligently, slow progress, delay
1. Introduction

An example of a clause which allows the owner to terminate the employment of the contractor if he has, inter alia, failed to proceed regularly and diligently with the project is Clause 7.2 of the XT Intermediate Form of Contract (IFC 84) which is reproduced herewith:

“Determination by Employer

Default by Contractor

7.2.1 If, before the date of Practical Completion, the Contractor shall make a default in any one or more of the following respects:

…

(b) he fails to proceed regularly and diligently with the Works, or

…

the Architect/the Contract Administrator may give to the Contractor a notice specifying the default or defaults (the "specified default or defaults").

7.2.2 If the Contractor continues a specified default for 14 days from receipt of the notice under clause 7.2.1 then the Employer may on, or within 10 days from, the expiry of that 14 days by a further notice to the Contractor determine the employment of the Contractor under this Contract. Such determination shall take effect on the date of receipt of such further notice.

7.2.3 If the Contractor ends the specified default or defaults, or the Employer does not give the further notice referred to in clause 7.2.2 and the Contractor repeats a specified default (whether previously repeated or not) then, upon or within a reasonable time after such repetition, the Employer may by notice to the Contractor determine the employment of the Contractor under the Contract. Such determination shall take effect on the date of receipt of such notice.”

The issue raised by clauses such as the above is –

Under what circumstance can the contractor be said to have failed to proceed with the works with due diligence or expedition?

This paper attempts to uncover the approaches taken by various courts and the characteristics that they have determined to be relevant in deciding whether the works which are the subject matter of a contract have been proceeded with with due diligence and expedition.
2. Proceeding regularly & diligently with the works

2.1 “Regularly” & “diligently”

The courts have expounded on the meanings of the words “regularly” and “diligently” as follows:

1. The phrase “regularly proceeding” was construed to mean “proceeding with reasonable skill and diligence in prosecuting the works.”¹

2. In the Australian case of Re Arbitration between Stewart’s and Edwardson and Stubbs and Collette Pty Ltd and Bankstown Municipal Council², Moffit J considered the meaning of “proceeding with the work with reasonable diligence” and proffered the following:

   “the substantial question would be whether the builder had in the 14-day period, in a substantial and commercial sense, and not in a nominal or colourable way … proceeded with the contract with reasonable diligence and competence.”³

3. The Singapore High Court⁴ accepted the above practical test and added that the completion target of the works should be taken into consideration:

   “Whether or not a contractor is performing with reasonable diligence is a matter which a court has to determine in accordance with the facts and circumstances of each case. On the facts and circumstances of this case the target of completion of the said excavation works set by the Government to measure whether the [contractor was] proceeding with reasonable diligence or not, is not at all unreasonable. The [contractor] failed to meet the target. Unless they can show that their failure was caused by the unreasonable conduct of the Government or the Government’s agents, and they have not so shown, their failure shows they were not proceeding with the work with reasonable diligence.”

4. “a sensible construction of the phrase [“reasonable diligence”] is that the actual extent of work completed is of some significance”.⁵

5. “the question of what precisely constitutes a failure to proceed with reasonable diligence is a matter of some difficulty however, it is an allegation of a general failure

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¹ Ranger v Great Western Rail Co. [1843-60] All ER Rep 321 HL (per Lord Cranworth LC at 332).
² 1965 NSWR 1671.
³ At p. 1674.
⁴ In Engineering Construction Pte Ltd v Attorney General & Anor [1997] 3 SLR 989.
to proceed with that degree of promptness and efficiency that one would expect of a reasonable builder who has undertaken a building project in accordance with the terms of the Contract in question.”

6. The tribunal in Everton Park Constructions Pty Ltd v Pin-Yao Wang, Ngar-Kan Suen & Wei-Wei Wang agreed with the above quote and added that –

“The fact that the Proprietor may consider a particular item should or should not have been completed is irrelevant.”.

7. “[“Regularly” and “diligently”] [t]aken together[,] the obligation upon the contractor is essentially to proceed continuously, industriously and efficiently with appropriate physical resources so as to progress the works steadily towards completion substantially in accordance with the contractual requirements as to time, sequence and quality of work.”

8. “what is the meaning of the words “regularly” and “diligently”? These are elusive words, on which the dictionaries help little. The words convey a sense of activity, of orderly progress, and of industry and perseverance: but such language provides little aid on the question of how much activity, progress and so on is to be expected.”

9. “Diligence” in this context means not only the personal industriousness of the [sub-contractor] ……, but his efficiency in that of all those who work for him… moreover, it would be wrong to insist that “reasonable diligence” refers only to the personal characteristics of individuals and that evidence of the actual conduct or misconduct of the [sub-contractor] and his servants is alone relevant to the exclusion of evidence of the actual state of the work at the given time … I am entitled to accept as evidence that reasonable diligence had not been displayed by the [sub-contractor], evidence that the work was, at the material time, seriously incomplete, together with evidence that there was no circumstances preventing the [sub-contractor] from overcoming the situation”.

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6 Re Arbitration between Stewart’s and Edwardson and Stubbs and Collette Pty Ltd and Bankstown Municipal Council 1965 NSWR 1671 at paragraph 171.
2.2 Establishing absence of due diligence

2.2.1 Burden of proof and the need to look at the facts fully

It has been held that the onus of proving lack of due diligence lies on the owner.\footnote{Hometeam Constructions Pty Ltd v McCauley [2005] NSWCA 303.}

The courts have also recognised the uniqueness of the facts of each and every case as follows –

(a) “It might be accepted that the [contractor’s] failure to complete the Works by the date for practical completion might be some evidence of delay\footnote{The court in this case made a reference to Westminster Corporation v J Jarvis & Sons Ltd and Another [1970] 1 WLR 637 at 643 per Lord Hodson and at 645 per Viscount Dilhorne.}. However, whether delay is of itself sufficient to raise an inference of lack of due diligence must depend on the circumstances.”\footnote{Hometeam Constructions Pty Ltd v McCauley [2005] NSWCA 303 at para. 169.}, and

(b) Megarry J\footnote{In Hounslow London Borough Council v Twickenham Garden Developments Ltd [1971] 1 Ch 233.} said that the owner had “established some sort of case for having validly determined the contract”.\footnote{This meant that the contractor had failed to proceed regularly and diligently with the works.} However he refused to grant an injunction stopping the contractor from entering the site to continue the works as the “case falls considerably short of any standard on which, in my judgment, it would be safe to grant this injunction on motion.” He went on to state that with so much turning on questions of fact, such a question would be better decided at a trial which has the advantage of witness evidence and the testing process of cross-examination.

The court in Hometeam cited the following passage where the court in Hounslow\footnote{See note 14 for full name and citation.} gave an indication of the onerous task which the owner has to face in proving his case:

’hui regularly” and „diligently” … are words used in a standard form of building contract in relation to functions to be discharged by the architect, and in those circumstances it may be that there is evidence that could be given, whether of usage among architects, builders and building owners or otherwise, that would be helpful in construing the words. At present, all that I can say is that I remain somewhat uncertain as to the concept enshrined in these words; and this necessarily increases the task of [the owner’s counsel] in establishing a strong case that the contractor has failed to proceed regularly and diligently with the works, so that the architect's notice is good.”\footnote{At para. 172.}
2.2.2 No explanation by contractor for delay

In *Eco Zone Engineering Ltd. v. Grand Falls-Windsor (Town)*\(^{18}\), the court remarked that it heard “no cogent explanation of why the work was not completed in the summer of 1995 except for the issue of the anthracite specifications in the tanks.” Thus, the court “could not explain why [the contractor] did not complete the work before mid-October 1995” and held that it had failed to proceed regularly and diligently with the work.

The lesson to be learnt here is that if the contractor does not have a relevant explanation for any delay caused by it, it would not have a chance in defending against a notice of default for failing to proceed diligently and regularly with the works.

2.2.3 Alternative approaches to determining absence of due diligence – showing works not completed by deadline v showing delay in progress

The court in *Hometeam* expounded on 2 ways that the owner could have established that the contractor had failed to perform the works with due diligence.

Regarding the first way, the court explained that the owner could have proved –

“(a) the work the contractor was required to carry out under the Contract; as events transpired this included the original contract works and the rectification work;

(b) what, in addition to the contract period, was a reasonable time within which the contractor ought to have executed the original contract works and the rectification work;

(c) that the contractor had failed to execute the work within that reasonable time;

(d) that, to the extent the contractor proffered explanations of why the work had not been executed within that reasonable time, those explanations were unacceptable.”

Regarding the second way, the court said –

“the [owner] was also entitled to seek to prove lack of due diligence by establishing a case of delay in progress during construction. This appears from both *Stubbs* and *Hooker*. On this basis [the owner] could have established a failure to carry out a reasonable amount of work by a given time; that that period of time be measured by reference to all the work to be performed under the Contract or, in absolute terms, by reference to a lack of activity on site over a significant period that could not be satisfactorily explained. The onus of proving lack of due diligence was on the owner. If the facts established by the owner are capable of giving rise to an inference of lack of

due diligence, the [contractor] may discharge any evidentiary onus that may pass to it, by explaining why the work progressed at that rate: see Hobbs\textsuperscript{19}. That evidence should be “sufficient … to turn the scale”: Brady v Group Lotus Car Cos plc\textsuperscript{20}.”

In short, one could prove lack of due diligence by establishing that –

(a) the contractor failed to complete on time (which meant having to wait until after the contractual completion date had elapsed); or

(b) there was an unjustifiable lack of activity on the site over a significant period.

2.2.4 Need to show inability to complete works

The tribunal in Everton Park\textsuperscript{21} stated that –

“In the absence of any evidence adduced on behalf of the [owner] that these works could not have been completed during the course of construction, I accept the [contractor’s] contention that it could have complied with AI 76 which is properly characterised as an item of rectification.”

However, it is uncertain whether the tribunal would have held that the owner’s default notice was properly given if the works could only have been completed slightly after the contractual completion date.

2.2.5 Owner to prove that no circumstances prevented contractor from better performance

The concept of the owner having to prove that the contractor was not prevented from performing better was brought up in Hooker\textsuperscript{22} where Blackburn J said\textsuperscript{23} that he was entitled to accept as evidence that the defendant had not displayed reasonable diligence –

“evidence that the work was, at the material time, seriously incomplete together with evidence that there were no circumstances preventing the defendant from overcoming this situation”.\textsuperscript{24}

Nevertheless, although the sub-contractor adduced evidence to show that “through no fault of his own, he was unable to get the necessary material to bring the work to the stage where it should have been at the material time”, this did not convince Blackburn J who held that the head contractor had proved the contract with his sub-contractor was validly terminated.

\textsuperscript{19} Hobbs v Petersham Transport Co Pty Ltd [1971] HCA 26; (1971) 124 CLR 220.
\textsuperscript{20} [1987] 3 All ER 1050 at 1059 (CA) per Mustill LJ.
\textsuperscript{21} See note 7 for citation.
\textsuperscript{22} See note 5 for full name and citation.
\textsuperscript{23} At 823.
\textsuperscript{24} Quoted from Hometeam at para. 174 (see note 13 for full name and citation).
The court in Hometeam agreed with the abovementioned principle brought up by Blackburn J –

“it was incumbent on the [owner] … to establish that at the time the Notice of Default was served, the Works were seriously incomplete and there were no circumstances preventing the [contractor] from having performed the Works at a more rapid rate.”

However, unlike in Hooker, the court in Hometeam accepted that the contractor had “established a reason for the delay in undertaking brickwork caused by the late delivery of the Stegbar windows [which the owner had selected and the contractor had ordered].” The reason was that it was not good building practice to commence brickwork before the Stegbar windows had been delivered.

2.3 Other factors considered by the courts

2.3.1 Safety

The court in Engineering Construction had the following comment regarding safety taking priority over speed:

“When the Government took possession of the site on 27 April 1992, installation of the fourth level supports had not been completed. The fourth level supports had also not been inspected and passed by AL Technologies (S) Pte Ltd. The plaintiffs therefore should not have been excavating below RL 93.5. On the basis of the Wang Survey, the average excavation level was now reduced level (RL) (92.3 + 0.494), ie RL 92.794. This shows that the plaintiffs had in fact excavated some 0.706m below RL 93.5 without the fourth level supports being completely installed or checked. This shows that the plaintiffs were not working in the safe and responsible manner as would be expected of a reasonably competent contractor proceeding with reasonable diligence. Even if the plaintiffs had achieved the target but did so only by working in an unsafe manner, it is doubtful whether they can be said to have been proceeding with the works with reasonable diligence.”

Hence, the court did not accept working fast but in an unsafe manner to be “proceeding with reasonable diligence”.

2.3.2 Non-Cooperation

The importance of meetings was emphasized in the following:

(a) “[The contractor] refused to meet with [the Town engineer] as he was requesting. Such a meeting or meetings could have dealt with the inefficiencies and allowed the contract to have

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25 At para. 199.
26 At para. 261.
27 See note 4 for full name and citation.
28 At para. 62.
restarted well before it did. Such meeting or meetings would also have opened the lines of communication between the principal of [the contractor] and the Town engineer and avoided some of the grief and frustration that both sides experienced over the ensuing several months.”

(b) “I am of the opinion that these other problems could and would have been resolved in the normal course if the lines of communication had been open and fall weather conditions (which an earlier start date would have avoided) had not intervened.”

The Singapore courts have also disapproved of non-cooperation –

“What I do find unreasonable was the [contractor’s] conduct. Instead of concentrating their efforts and resources on meeting the target, they responded to the Government’s requirements with petulance and non-cooperation. Their whole attitude towards the discharge of their responsibilities and obligations under the contract was disappointing.”

Conversely, the Canadian courts have recognised cooperation by the cooperative parties to the project –

“It seems to me that the owner, the engineer and the solicitors for all parties did their best to facilitate Eco Zone and enable the work to be done in 36 months rather than the scheduled 20, but despite all their efforts the work was not completed and the arguments continued.”

2.3.3 Accelerative measures

Although this is stating the obvious, there is judicial expectation that the contractual completion date has to be met even if it means that the contractor has to increase his work rate –

“where there was a specified future date for practical completion, whether [the builder] was prosecuting the project diligently was a question of fact, substantially determined by whether it was proceeding at a rate of progress according to which practical completion would be achieved by the specified date but with regard also to whether accelerative measures could bring achievement of completion by the specified date.”

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31 Engineering Construction.
2.4 Examples of acts constituting failure to proceed regularly and diligently

2.4.1 Removing men and plant from site

Lawton LJ\textsuperscript{34} gave an indication of the relationship between proceeding regularly and diligently and the removal of men and plant by the contractor from the site in the following dicta:

“All that can be said against them is that by removing men and plant from the site in the way they did\textsuperscript{35} they were not “regularly and diligently” proceeding with the works.”\textsuperscript{36}

2.4.2 Intentional delay by contractor

According to the Court of Appeal\textsuperscript{37}, the Official Referee who was referred a question by the trial court found that the contractor could not fulfil the contract except at great loss. He found further that “if proper dispatch had been used in the building of the house for the [owner] the roof might have been on by the end of September, but that the work was intentionally delayed by [the contractor] in the hope that the work would be stopped by a refusal of a licence under the Order of the Minister of Munitions dated July 14, 1916.”\textsuperscript{38}

Based on the above finding, the Official Referee went on to find that “the failure to carry out the agreement was not caused by the refusal of the licence to proceed, but by the neglect and failure of [the contractor] to proceed with due diligence in the performance of his contract.”\textsuperscript{39} Hence, this case illustrates that intentional delay of works with a view to eventually putting an end to the contract can be construed as failure to proceed diligently with the works.

\textsuperscript{34} In J. M. Hill & Sons Ltd v London Borough of Camden 18 Build LR 31.
\textsuperscript{35} The facts leading up to the removal and the way in which the contractor effected the removal were as follows: The contract was made in 1976. On 15 March 1979, an architect’s certificate was issued for the amount claimed by the contractor. However, this certificate was not as promptly paid as the certificates for the previous two months. On 23 March 1979, the contractor reduced its labour force and also started removing equipment eg. dampers and concrete mixers from the site. On 11 Apr 1979, the contractor determined his own employment pursuant to the contract terms.
\textsuperscript{36} Lawton LJ remarked that it seemed clear to him that the contractor was annoyed at finding that the owner was not going to pay as they had done for the previous two months.
\textsuperscript{38} At 529-530.
\textsuperscript{39} At 530.
3. Conclusion

It is hoped that the principles and characteristics mentioned above have helped to shed some light on how the question of whether the contractor has failed to proceed regularly and diligently with the works will be judged.

Nevertheless, it should be noted that termination, determination or expulsion from site should only be invoked as a last resort. As much as possible, the parties should always aim towards moving the project forward rather than towards assigning blame.

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References

The need for reduction of CO2 emissions by the use of fossil fuel is evident. The building sector contributes for about 40% to the total use of energy. Therefore the energy performance regulations for houses and other buildings will be put on increasing levels during the next decade. Several European countries are formulating policies aiming at net zero energy or carbon neutral houses in the years 2015 - 2020. Technical solutions do exist and are already brought into practise. In some European countries more and more examples of passive house projects are realised. However there is quite some evidence that it will be a big challenge to achieve these performances at a large scale in the construction practice. Research under houses built in the last decade in the Netherlands demonstrates that in many cases even the current levels of required performances are not met, due to mistakes in the design and in the construction processes. Besides that, also a recent research project indicates that strengthening of the required energy performances did not lead to corresponding use of energy for heating. One of the major explanations for this is that buildings and their installations do not perform as demanded. Higher performances need more accurate and precise design and construction processes. Also the final quality of the buildings should be checked. These developments will form a new challenge for the systems of building regulations and building control. In the last 20 years there has been a clear trend in reducing the role of governments and more freedom for the private sector. In this paper we present findings that emphasize the need for accurate building control. This can either be conducted by public authorities, but will more likely be based on compulsory forms of complete and accurate certificated self-control.

Keywords: building regulations, building control, energy performance, energy saving, climate change
1. Introduction

The European building sector is responsible for about 40% of the total primary energy consumption. To reduce this share, the European Commission (EC) has introduced the Energy Performance of Buildings Directive, the EPBD (2002/91/EC). This framework has lead to energy performance certificates for buildings. The EC has also highlighted that future adaptations of the EPBD may be extended to include ‘low energy or Passive Houses’ as a requirement, setting a target date of 2015. For newly built houses the national building regulations prescribe increasing levels of energy performances. More and more countries, but also regions or municipalities, formulate ambitions for net zero energy or carbon neutral houses.

Formulating ambitions and sharpening regulations is relatively easy to do. Technical solutions are currently available to realize the passive house standard in building projects. There is quite some evidence however that the mainstream of building processes do not lead to the pre-defined quality. Traditionally the municipal departments of building control in most countries had an important role in assuring that building plans and construction processes would lead to buildings that meet the minimum required quality levels. There is a tendency to put more emphasis on the responsibilities of owners and private parties to ensure quality. This means that the private parties will have to improve their working process and will have to learn to handle performance guarantees. Owners will require guarantees from the designers and building companies for the quality of their property. Certification and accreditation of parties, processes and products will become more important for building processes in general.

For the realization of high energy performance standards, a reliable quality assurance system will be very important. In most countries that have some experiences with passive houses some form of performance guarantee and associated quality assurance scheme exists. It is crucially important to study these examples.

This paper continues in section 2 with an elaboration on the trends in regulations and building control. Section 3 presents some signs of failures in current building process in the Netherlands. In section 4 the results of a study on the relation between the levels of energy performance regulations and the actual energy use in the built houses are presented. In section 5 finally we draw conclusions.

2. Developments in systems of building regulations and building control

Building regulations are the subject of an ongoing debate between, on the one hand, those in favour of deregulation and reducing the administrative burden and, on the other hand, new quality demands that require government intervention. Currently in the Netherlands, both sides of this debate appear to be gaining in importance. Deregulation, as well as high targets
for energy conservation, save guarding structural safety and a reliable government, are high on the politicians’ agenda. The desire for deregulation is leading to the opinion that greater emphasis should be placed on the responsibility of property owners, which could lead to less government intervention. However, the existing forms of quality control for private actors in the Dutch building industry seem to be of quite a low standard. Accidents occur and physical quality does not appear to be sufficiently important. As the CO2 and energy targets increase, stronger regulations and accurate building control become a priority. In the past ten years, it has become increasingly clear that the quantity and quality of assessments carried out by many municipal authorities leave something to be desired (VROM Inspectorate, 2007).

In this context we should remember that the client and the parties who engage for the design and construction stages have primary responsibility for complying with regulations. When a building permit is granted, this suggests that the plan has been shown to comply with all the regulations. But this is not the case. In practice, a permit is granted because, during the checking process, the plan was not found to deviate from the regulations.

We will now return to the continuing call by politicians for greater deregulation and easing of the administrative burden. In 1997 we contributed to the building-regulations project as part of the MDW (Market Forces, Deregulation & Legislative Quality) programme of the Ministry of Economic Affairs. The purpose of our research was to formulate deregulation proposals on the basis of examples from other European countries (Visscher, 1997). Notably, in those countries, many private-sector parties are involved in assessment and inspection. We have studied (Visscher, 2000) how the responsibility for these tasks could be transferred to the private sector in the Netherlands too, primarily through the certification instrument. The Ministry of Housing, Spatial Planning and the Environment (VROM) also took up this idea. Since the end of the 1990s, it has been developing a process certificate for assessing building plans against the requirements of the Building Decree.

The current cabinet is aiming to reduce the administrative burden by 25%. Again, the field of building regulation is seen to have a great deal of potential in this regard. The Ministry of Economic Affairs and the Ministry of VROM appointed the Construction Sector Fundamental Review Committee (Commissie Fundamentele Verkenning Bouw) chaired by Sybilla Dekker, the former Minister for VROM, to draw up proposals for the far-reaching simplification of building regulations. The committee recommended the abolition of preventive assessment of building plans by local authorities. The client should be responsible for complying with the regulations and should also ensure that sufficient checks are in place. It can engage a certified body to do this, but there may be alternatives. The role of the municipal authorities will shift towards that of process auditing, i.e. supervising the checks. The question is then: how this can be put into practice?

In many countries there are problems with a lack of compliance with building regulations, and this often serves as a stimulus for reviewing and improving the system of building control. The considerable pressure to deregulate in the Netherlands has parallels in other countries. There is a clear trend towards increasing the role of private parties. In many
countries, the role of local authorities in carrying out assessments and implementation inspections has virtually disappeared.

Therefore it is interesting to study innovative ways in which quality is guaranteed by private parties. The certification of passive houses is a field that requires building actors to transform the usual building process into a performance based approach and to learn by doing. In the next section we illustrate how the building process can be impacted when the client requires a passive house.

Besides the conditions described in the previous section, the poor performances of the building industry in the mainstream building projects in combination with a withdrawing government from building regulations and actual building control is perhaps the most important reason to develop reliable certification schemes.

3. Failures in the Dutch building industry

The cost of failures in the Dutch building industry amounts to more than 10% of turnover (USP marketing consult, 2007). Total investment costs (including maintenance) in homes were € 46 billion in 2005, which means annual wastage of € 4.6 billion in this part of the building industry. Vereniging Eigen Huis, a consumer organization for homeowners, carries out final inspections on many new homes. In 2005 it was reported that construction companies are gradually improving their standards. The average number of deficiencies in more than 1,400 homes examined at new build housing areas was 17.5 per home. However, some homes had as many as 71 deficiencies. There are also many problems with aspects of building physics, as revealed in a study of 78 housing projects by the VROM Inspectorate (Kuindersma et al., 2007). The researchers observed acute health risks, reduced living comfort and, above all, poor energy performance. In order to comply with EPC regulations, a system whereby heat is recovered from the ventilation system (balanced ventilation) is often installed. In the past few years, this system has been installed in approximately 400,000 Dutch homes. Problems with the system in the Vathorst area of Amersfoort have featured regularly in the news (Duijm et al., 2007). An analysis of the problems has shown that they are not necessarily due to the ventilation system itself, but that poor quality management throughout the construction chain can lead to an accumulation of faults.

We suspect that the Dutch situation is not unique. At a meeting of the European Consortium of Building Control in Riga in 2008, representatives from many countries reported on problems in the individual countries. Although the problems are very diverse, it is apparent that in many countries there is a discussion about the organization of building control in the context of quality problems.

There are major challenges in terms of realizing and maintaining the physical performance of homes. Requirements will become much more stringent than is currently the case, particularly with regard to energy conservation, the indoor environment and integral environmental
quality. Quality management and, above all, quality assurance are becoming more and more important. In the future, responsibility for these aspects will be increasingly transferred to parties in the building sector.

4. The realisation of required energy performances in building processes

4.1 Introduction

In the Netherlands the energy consumption of new buildings is subject to performance based legislation. The energy performance is based on the Energy Performance Coefficient (EPC). The lower the EPC, the more energy efficient the building should be. Ever since its introduction in 1995, the EPC-value has become stricter. At that time, the compulsory EPC-level was 1.4. Since then it has been lowered regularly down to a value of 0.8. It is likely that the level will be lowered again in the near future. In the framework of the Energy Performance of Buildings Directive, 30 European EN-norms are being developed to establish the methods on which the energy performance is calculated. In the Netherlands, the norm has been compulsory for almost 15 years now and the evaluation of its effects on the actual energy used in dwellings was useful to determine the efficiency of this type of regulation. In this section the effect of the Dutch EPC regulation on the energy use for heating in dwellings built after 1995 is described.

4.2 Methods and data

This section is based on a study (Itard e.a., 2009) for a group of stakeholders (Government, real estate developers, the construction sector and the umbrella organisation for housing associations) that signed a covenant (The Spring Agreement) for the realisation of new housing estates in the coming years with 50% lower energy consumption than the current level of regulations. Therefore it is useful to get more insight in how the energy performance regulation (EPC) actually works out in practice. The EPC-value accounts for space heating, space cooling, tap water heating, and electricity needed for mechanical ventilation en lighting. Energy use for cooking and electricity consumption for white and brown goods is excluded, because they are not related to the building itself. It is evident in all cases that there is no direct match between the measured consumption and the components of the EPC. Monitoring the EPC is therefore not an easy task because it cannot be achieved by conventional monitoring (monitoring of the energy used at the meter box, getting the data either from the occupants either from energy companies).

There were only three surveys conducted during the past fifteen years to assess the effectiveness of the energy performance regulation against the actual energy used for heating. The first one by Jeeninga e.a. (2001), on a sample of 146 dwellings, the second one by PRC
(2004) and Uitzinger (2004), with a sample of 649 dwellings, and the last one in 2008, by Itard e.a. (2009), on a sample of 217 dwellings. The scarcity of data and the relatively small size of the samples may be related to the difficulties of monitoring as was explained in previous section.

In the OTB sample, two sources of data were used: a survey among households in two districts in the Netherlands, and Energy Performance calculation files from municipalities and architect firms. The obtained Energy Performance files were those from the dwellings where the survey was conducted, therefore allowing to match the respondents from the household survey with data on building characteristics. The survey was carried out in autumn 2008 in two districts in the Netherlands built after the introduction of the EPC. The final sample size was 217 households. The energy reported by the respondents was from the last available energy bill.

However, none of these samples may be assumed to be representative for the Dutch building stock build after 1995. There are many historical data about energy use in dwelling, but from these databases, the WoON survey is the only one accounting for a performance comparable to the EPC: the Energy Index (EI). Instead of being based on design data like in the EPC, the EI is based on inspections and the formula used for the calculation is comparable to the EPC formula. The WoON survey was carried out in 2005 by the Ministry of Housing in the Netherlands. It consisted on two questionnaires applied to the occupants, and a dwelling inspection. The energy data included in the database refers to the real gas used during one year in the dwelling. The sample of buildings built after 1995 contains 584 cases.

### 4.3 Results

In the OTB sample the dwellings were characterized according to EPC categories ‘no EPC’, ‘1.4≥ EPC>1.2’, ‘1.2≥ EPC>1.0’, ‘1.0≥ EPC>0.8’ and ‘EPC≤ 0.8’. These categories were chosen because the maximum allowed EPC value was set at 1.4 in 1996, and tightened to 1.2 in 1998, 1.0 in 2000 and 0.8 in 2006. No statistical significant differences were found between the actual energy consumption of houses with different EPC categories (for detailed statistics, see Guerra Santin e.a. 2009a., 2009b. and 2009c.). There is only a statistical difference between dwellings in the category ‘no EPC’ en dwellings with an EPC, meaning that the introduction of the EPC regulation had an effect on the actual energy use, but not the further tightening of the EPC-values. There were also no significant differences when the actual energy use per square meter was used instead of the actual energy use of the whole dwelling. Figure 1 shows the mean energy used per type of dwelling and per EPC category in the OTB sample. With the exception of corner houses, for which the decrease is significant, no differences in energy use were found for different EPC categories in flats, maisonettes, terraced, double and detached dwellings.
Similarly, analysis of the WoON database (for dwellings built after 1995) also shows the absence of correlation between the actual energy use and the Energy Index. Furthermore, an analysis of the gas consumption of dwellings built during different construction periods seems to indicate as well that there was no significant reduction of the energy used for heating in buildings built in the periods 1996-1997, 1998-1999 and 2000-2006 (see Figure 2).

Figure 1: Energy used (mean LOG) per dwelling type and EPC level. For reasons of clarity, the 95% confidence interval is not plotted.

Figure 2: Average gas use per m2 dwelling in 2004 [10]
In the OTB survey a correlation was found between the actual and the theoretical energy consumption, although the real energy consumption is mostly lower than the theoretical one.

Therefore we can state that although the EPC itself is not related to the actual energy use, some of its constituents are. This indicates that the formula used to calculate the EPC, summing up space cooling, ventilation, lighting and auxiliary energy, and using neutralization coefficients introduces some kind of noise.

In a previous study using the KWR survey, which is a the predecessor of the WoON survey and contains less detailed data on the building characteristics and occupant behaviour than the WoON, we already found that 42% of the variation in energy consumption could be attributed to building characteristics, the type of dwelling being by far the most important parameter, followed by the useful living area, the construction year, the insulation degree, the presence of a thermostat, the number of heated rooms and the hours of presence home. It was found that 4.2% of the variation on energy consumption could be attributed to household characteristics and occupant behaviour. However, this study encompassed the whole Dutch building stock and not only the recent one. Because the recent dwelling stock may be assumed to be more homogenous, it can be expected that building characteristics will explain less variation and occupant behaviour more variation. The study was therefore repeated with the WoON survey with the dwellings built after 1995. In a regression analysis, taking into account only the significant parameters, 23% of the variation in energy used could be explained by the building characteristics, the most important parameters being the heat transfer surfaces and the number of bedrooms.

In the OTB survey detailed data on the dwelling characteristics were gathered through municipalities and architects, and a statistical regression model showed that the thermal properties of the dwellings could predict 19% of the variation in energy used, heat transfer surfaces and number of bedrooms being again the most important parameters. The OTB survey was also designed to allow for a better screening of possibly relevant households characteristics and occupant behaviour and showed indeed that these were responsible for 11.5% of the variance in energy used for heating.

5. Conclusions

After almost 15 years of EPC regulation in the Netherlands, only three statistical studies were conducted to assess the effect of the regulation on the actual energy use. The samples were of limited size. In two of these samples, no statistical correlation was found between EPC-level and actual energy use per dwelling or per square meter. In the analysis of the WoON survey, representative for the Netherlands, no correlation was found between the EI and the actual energy use per dwelling and per square meter.

We found that building characteristics (including heating and ventilation equipment) were responsible for 19 to 23% of the variation in energy used in the recent building stock.
Household characteristics and occupant behaviour seem to be responsible for 3 to 15% of the total variance. Neither our study nor the studies found in the literature allow to state that building characteristics, household characteristics and occupant behaviour altogether are responsible for more than 38% of the variation on energy consumption of dwellings built after 1995. Therefore at least 62% of the variation in energy use is unexplained yet.

There are indications from literature that the explanation for this unexplained part could be related to buildings being realized differently than written in official documents and to HVAC services running under very different conditions than assumed on paper. A report by Nieman (2007) showed that in a sample of 154 dwellings, 25% did not meet the EPC requirements: the EPC was incorrectly calculated; nevertheless the building permit was issued. In 50% of the dwellings, the realization was not in accordance with the data used to calculate the EPC. Gommans (2007) monitored for 17 years the energy performances of energy efficient buildings. 40% of solar boilers appeared to function poorly. Only 25% of the heat pumps reached the expected efficiency. This was essentially due to realization faults, lack of control and lack of continuous monitoring. Another study by Elkhuizen e.a. (2006) in office buildings showed that up to 28% energy could be saved by better monitoring.

Taking into account the fact that tightening the EPC did not lead to less energy use for heating and that 62% of the variation in energy use is still unexplained, it seems legitimate to be careful about a further tightening of the EPC and to search if there are more efficient means to really decrease the energy consumption of new built. This could be done by ensuring a correct realization and monitoring of the calculated performances, putting attention on the knowledge needed by contractors and on an effective building control process.

In the last 20 years there has been a clear trend in reducing the role of governments and more freedom for the private sector. This paper has emphasized the need for accurate building control. This can either be conducted by public authorities, but will more likely be based on compulsory forms of complete and accurate certificated self-control.

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The UK Legal Context for Building Information Modelling

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Abstract

This paper considers the legal ramifications of Building Information Modelling ("BIM") and proposes a route for future research to improve legal outcomes. First the literature is considered in order to define the terms of study. Then features of BIM procurement which may prove problematic in legal terms are identified. Accounts of practical implementation of BIM procurement are drawn on to contextualise and illustrate the earlier points before considering what the literature indicates may be an appropriate best practice model to consider for BIM procurement. Two US BIM procurement initiatives are then discussed – AIA Document E202 and ConsensusDOCS 301 – and assessed in relation to their fit with the model for BIM procurement in the UK market. The paper concludes that collaborative procurement, perhaps by way of partnering, appears to be an appropriate model for BIM procurement in the UK, drawing on lessons learned from the AIA and ConsensusDOCS initiatives, but that empirical research is required in order to identify precisely the best legal approach.

Keywords: construction law, construction contracts, BIM
1. Introduction

This paper considers the legal ramifications of Building Information Modelling ("BIM") and proposes a route for future research to improve legal outcomes. The method adopted is first to consider the literature in order to define the terms of study; then to draw out from the literature features of BIM procurement which may prove problematic in legal terms; consideration will then be given to two US based initiatives for improving the legal aspects of BIM, which will be problematised by reference to the literature, before considering a potential way forward in the UK for legally effective BIM procurement.

2. Definition of terms

2.1 What is BIM?

Van Nederveen et al. (2009) propound the following definition of BIM:

“a model of information about a building (or building project) that comprises complete and sufficient information to support all lifecycle processes and which can be interpreted directly by computer applications. It comprises information about the building itself as well as its components, and comprises information about properties such as function, shape, material and processes for the building life cycle” (p. 1).

A more concise definition is offered as part of the US National Building Information Modeling Standard ("NBIMS") in terms that a BIM is “a digital representation of physical and functional characteristics of a facility” (NIBS, 2007, p.23).

Van Nederveen approaches BIM from a theoretical standpoint. What, in a perfect world, should BIM be? It should be a single, computerised representation of a building, in which each fact is expressed only once, thereby avoiding the risks of inconsistency inherent in systems which accommodate data duplication. For van Nederveen “any solution that allows that the same information is stored in multiple places is fundamentally wrong” (2009, pp. 9 – 10). In that perfect world, a single, virtual model would represent all elements of a building or project, down to the finest detail. The model could generate accurate costings, fabrication drawings for any trade, and would permit simple identification of element clashes.

Such a utopian model is, however, rarely, if ever, achieved in practice. Instead the “BIM” consists more usually of a federation of virtual models, each addressing discrete elements of the

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1 The English spelling of "modelling" is used throughout this paper, save where the term appears as part of cited US documentation.
construction process, and in these cases, interoperability – the facility for one BIM to interact faithfully with another BIM – becomes ever more important. There are certain standards in place to try and promote faithful interoperability, for example, ISO 10303, or STEP – the “Standard for the Exchange of Product model data” - however, these are not universally adopted, and problems remain with the interface between different federated BIMs, and the fact that federation equates to duplication of data and potential for inconsistency and error (Van Nederveen, 2009).

The US NBIMS (NIBS, 2007) is a conceptual model which defines what information must pass between stakeholders on a BIM procured project, rather than defining how that process should occur (Suermann and Issa, 2009). This reflects the fact that to leverage the full benefits from BIM technology requires a paradigmatic shift in approach. Though the construction industry underwent a minor revolution a few years ago with the introduction of Computer Aided Design (“CAD”), implementation of CAD did not radically alter the way work was done, it simply speeded up its delivery. The focus with CAD was on format and output, whereas with BIM the focus needs to be on open information and workflows (Livingston, 2007 cited in Suermann and Issa, 2009, p. 139).

To this end a feature of NBIMS is a rating system, the Interactive Capability Maturity Model, or I-CMM (NIBS, 2007), which permits any BIM project to be rated on grounds of interoperability. Lower scores indicate projects where BIM is in fact being used as an enhanced CAD system, whereas higher scores indicate true interoperability between stakeholders and paradigm shift. Suermann and Issa (2009) indicate that currently the highest I-CMM scores relate to the initial design and construction phase, with much lower scoring occurring in relation to the lifecycle aspects of the built environment.

3. Legal issues

As outlined above, it is a feature of idealised BIM implementation that there is a collaborative approach to design and delivery embraced by key stakeholders – contractors, engineers, architects, employers. “The design” is not whatever the latest issue drawings say, but whatever the BIM currently says, and what it actually says may depend not just on input from the “designers” but from contractors and/or the employer, and on whether it is handling data correctly or not.

A number of commentators have reflected on the legal implications that BIM procurement raises. Those which are commented on most regularly are outlined in the sections which follow.
3.1 Process

Hurtado and O’Connor (2009) highlight aspects of BIM implementation which need to be addressed regarding the process of implementation. Who is required to produce what from the BIM, and when? Who is allowed to amend the BIM? How are the contractual structures to be implemented to facilitate the BIM process?

Contracts are historically bipartite agreements. BIM is a collaborative process. There is an immediate conflict between these two conceptions, and one which needs to be addressed. Possible solutions are discussed later in this paper.

3.2 Interoperability

On a pragmatic level, leaving aside the sunny uplands of Van Nederveen’s perfect BIM, how will the BIMs interact? (Hurtado and O’Connor, 2009). Will all participants be expected to use the same commercial BIM product? If not, how robust and faithful will be the interoperability of different BIMs? And how reliable will the software itself be? Aschraft (2009) cites one example where a bid based on BIM produced data was $1.95m low owing to software flaws, but the software supplier’s liability was limited to the software acquisition cost owing to a limitation of liability clause in the supply agreement.

3.3 Use of the model

The intended use of the model(s) can also raise legal issues. Ashcraft (2009) points out that a BIM which resolves to a definition fine enough to accommodate steelwork tolerances, may not be adequate for installation of curtain walling. Olatunji and Sher (2009) confirm that BIMs could be used to generate estimating information, but only if the requisite elemental cost data has already been inputted accurately and early enough.

3.4 Status of the model

There is much discussion of the extent to which the BIM or one of the BIMs could stand as a contract document (Hurtado and O’Connor, 2009, Ashcraft, 2009 and Haynes, 2009). This prospect is catered for by Appendix A of the American Institute of Steel Construction’s Code of Standard Practice for Steel Buildings and Bridges (AISC, 2005, p.65), although no data as to the adoption of this Appendix has been located during the preparation of this paper. Practical problems with such a solution are identified by the foregoing authors, not least the tendency for public authorities to require 2D, often paper-borne, representations of designs for checking conformity with planning and building regulations. Moreover, Hurtado and O’Connor (2009) and Ashcraft (2009) both flag up the potential for ambiguity and complexity if the “contract”
documents are 2D, and yet the project is constructed in accordance with the virtual, collaboratively produced BIM design.

3.5 Cost of BIM process

Ashcraft (2009) notes that without a change in practices the immediate adopter – the designer – could bear the cost of BIM implementation without reaping the rewards.

3.6 Design liability

In the US context, Haynes (2009) flags up the potential impact of BIM procurement on one of the US contractor’s long established protections. In America the *Spearin*\(^2\) doctrine relates to an employer’s implied warranty that plans and specifications are adequate and sufficient for the purpose supplied. The doctrine cannot be substantially ousted even by express words requiring the contractor to examine the site, and to check the plans (Bruner and O’Connor, 2010, § 3:27). Whereas the principle may be limited primarily to situations where the employer is providing design information (e.g. typically in a traditional procurement setting), it is nonetheless substantially different from the position in England and Wales, where the common law is happy to load the contractor with risk\(^3\) albeit being also more amenable to contractual moderation.

This is not, however, to down play the potential significance of BIM collaborator participation in design development even in the English and Welsh setting. As in the US the principle of privity of contract largely limits contractual liability to bi-partite, consensual arrangements. In addition, in tort the “standard position” has been, since the House of Lords decisions in *D & F Estates Ltd v Church Commissioners for England*\(^4\) and *Murphy v Brentwood*\(^5\) that a building contractor will generally not owe a duty of care in respect of pure economic loss, the typical such loss being the cost of repairing a defectively constructed building. By contrast, professional designers have been treated differently, on the basis of the line of authority dealing with “special relationships” which is derived from *Hedley Byrne v Heller*\(^6\). These two modes of liability have frequently created tensions, with “difficult decisions” peppering the legal annals. Most recently in *Robinson v P.E. Jones*\(^7\) the (admittedly first instance) Court has reaffirmed that the existence of tortious liability for pure economic loss depends on the precise

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\(^3\) *Thorn v The Mayor and Commonalty of London*, (1875-76) L.R. 1 App. Cas. 120, HL

\(^4\) [1989] AC 177

\(^5\) [1991] AC 398

\(^6\) [1964] AC 465

\(^7\) [2010] EWHC 102 (TCC)
factual nature of the relationship between the parties, and not on their broad designation as “contractor” or otherwise. Accordingly, a key issue arising out of BIM based collaborative design is the extent to which participation may give rise to legal liability, even where no contractual relationship may exist.

Sieminski (2007) highlights the fact that insurance of design liability also becomes problematic in a context where design responsibility is relatively fluid.

On a related point, Ashcraft (2009) identifies that a corollary of one of the key perceived benefits of BIM – the ability to detect design “clashes” virtually, rather than when workers are on-site – could ultimately result in an increase in the standard of performance expected of professionals; whereas in the pre-BIM days, clashes were an unfortunate but inevitable fact of construction life, perhaps in the post-BIM era they will become instances of negligent practice.

### 3.7 Design delegation

A feature of BIM procurement which exercises most US commentators is the tension between, on the one hand, the potential disaggregation of design liability and, on the other, the public authority requirement to have one design professional take responsibility for a project (e.g. Sieminski, 2007 and Hurtado and O’ Connor, 2009). It is not clear that this will be a regulatory problem in the UK, however, Ashcraft (2009) highlights a related issue that could prove problematic, even in the UK. Some BIMs can be pre-loaded with criteria to permit “easy” compliance with local building regulations, but what if these criteria are in fact non-compliant? Where will responsibility for non compliance lie?

### 3.8 Ownership and protection of data

Ireland (2009) points out the critical issue of ownership of the design. For example, if a specialist M&E contractor inputs all the fine specification detail into a model which is shared with all team participants, what happens to that data when the project is over? What if that data finds its way to a competitor? The same concern is echoed by Sieminski (2007) and Gu et al (2009) coupled with the problem of data integrity; if all design is virtual, file corruption could be enormously damaging to the success of the project. Gu et al (2009) do make the point, however, that such concerns are not exclusive to BIM projects, albeit the severity of the ramifications may justify taking greater steps to protect against losses. Ashcraft argues this should include archiving protocols, and data protection insurance (Ashcraft, 2009).

O’Connor and Hurtado (2009) raise the issue of the lifecycle use of a BIM. Ordinarily a “design” remains the property of the designer following the completion of a project, but BIM capabilities offer great possibilities for the ongoing management of a building, for example in relation to energy efficiency ratings, and hence an owner, and future owners or occupiers, may well wish to continue to use and develop the BIM.
4. Reflection on BIM implementation

In order to contextualise some of the more theoretical aspects of this consideration of BIM and its legal issues, in this section some accounts of practical implementation of BIM into projects will be set out.

Gu et al (2009) conducted a review of the adoption of BIM in the Australian Architecture, Engineering, Construction/Facilities Management (AEC/FM) sector. From their study it appeared that BIM tools were not yet perceived as being mature enough for full adoption. BIM was envisioned by many of those canvassed as CAD “with bells on” and not as a paradigmatic shift change design and realisation tool. Full BIM adoption was thought to necessitate shifts in working practices, data management and role definitions, whereas legal issues were considered as peripheral and not in substance different for BIM procurement than for any other procurement.

Writing for the April edition of the Engineering News Record, Journalists Nadine M. Post and Tom Sawyer provide anecdotal insight into 4 BIM projects which highlight the variety of approaches being implemented on the ground. None of the projects described come very close to Van Nederveen’s “perfect” BIM, involving no redundancy. In one a BIM approach had been adopted to the construction of a hospital (Post, 2009a) where the employer promoted collaborative, virtual design, lean construction, and integrated project delivery (see further below). On a legal front, the project was delivered by all 10 key players engaging on a single contract (hence resolving the privity of contract issue referred to above), with remuneration based on cost plus expenses, and profit only being earned if the project were to be delivered at less than an agreed target cost. The project was only in its fairly early stages when Post reported on it, and already problems were being encountered as a result of compatibility and interoperability issues between the federated BIMs of different disciplines.

In the second case study, BIM was promoted by the employer for the construction of a Courthouse in Mississippi, US (Post, 2009b). The BIM idea was introduced part-way through the design process, with not all participants being contractually obliged to use it. The intention was for BIM to perform clash detection, reduce mid stream Requests for Information, minimise variations, and to produce construction drawings. Post reports half way through the process, at which stage some goals had been met – notably clash detection – but others not at all – for example fabrication from BIM information. There were also a total of 19 federated design BIMs and over 60 construction BIMs, with a notable problem being expressed that specialist subcontractors had not had a chance to collaborate in the early stages, which lead to difficulties, and changes later down the line as more details became clear. In the third example (Sawyer, 2009a) a 3 page “virtual design and construct” contract addendum had been developed by the parties, supplemented by a 7 page “BIM execution plan” which specified team roles and responsibilities, and made successful BIM collaboration a deliverable for each of the participants. Finally, Sawyer (2009b) reports how in the fourth case there was a requirement for collaboration in order to maximise the benefits of BIM, with all the designers collocating into the same physical space, each with a lap-top in order to thrash out the coordination between
interlinked disciplines. A key element in that instance also was the development of detailed subcontractor terms relating to BIM, specifying the level of design detail a subcontractor is required to supply, what element is to be detailed, BIM standards and naming conventions, to maximise interoperability.

In 2008 McGraw-Hill Construction conducted a survey of 302 construction participants (82 architects, 101 engineers, 80 contractors, and 39 employers) about the implementation of BIM into the US construction industry (McGraw Hill Construction, 2008). Despite an awareness that BIM procurement was associated with unique risks, all of those surveyed would be most likely to use conventional contracts without any BIM specific amendments, and very few were adopting new kinds of contracts on BIM projects, despite awareness that some BIM contractual initiatives had been implemented (notably by the AIA and AGC, both of which are discussed further below).

This non-exhaustive and partly anecdotal insight into the legal aspects of BIM implementation in relatively recent times does at least substantiate the idea that some of the problems identified in the original review were genuine, as well as giving a brief insight into some of the methods used to mitigate those effects. Next there will be consideration of some of the literature and initiatives that have been attempted to address the legal issues, before a final exploratory section on what might work best in the UK market.

5. Possible procurement solutions

It may already be clear from what has preceded that BIM procurement is a spectrum of practice. Some people use the technology as advanced CAD software, keeping single point design control. Others use the technology collaboratively with multi-participant engagement with one or many BIMs. The “CAD with bells on” use of BIM is not under consideration here, since few of the BIM related legal issues outlined earlier relate to it. Focus remains on the collaborative use of BIM, since it is here that the real legal issues are posed.

McGraw-Hill Construction’s survey of attitudes to BIM procurement in the US (2008) indicated the perhaps unsurprising view that where participants are collaborating on design via BIM technology, trust between participants is vital, but so too is transparent location of liability risk. NBIMS highlights the need to clearly define terms and to establish how collaborative work should proceed (NIBS, 2007, p.15 and p.23).

As outlined above, a basic hurdle to overcome in collaborative working is how to square the circle of bipartite history of contracts with the multiparty nature of collaborative design.

Hatem (2009) discussed the use of Integrated Project Delivery (“IPD”) and the liability and insurance risks which may arise from it, with some discussion of its applicability to BIM procurement. Hatem defines IPD as a form of procurement in which the main players, which at the very least will mean the employer, designer and main contractor, all enter into a single
contract to develop the design of the project, and to share the risk of defective design. This solution clearly overcomes problems of privity, but in the US context, Hatem worries whether there are insurance solutions in place to cover the activity and from a regulatory standpoint whether the buck will necessarily stop with the professional designer. As discussed above, it is not clear that this last point will be problematic in a UK context, and it is clear from the case study described by Post (2009a) that this type of approach is being implemented on BIM projects already.

Owen (2009) envisages an even greater process shift, in which BIM is simply the most advanced technological tool in a system for creating buildings which is viewed from an even broader perspective, one where “new forms of contracting, transparency and risk management (including insurance models)” will be required (p.5). Owen terms this process Integrated Design and Delivery Solutions (IDDS) and highlights a number of features which are required for successful implementation of IDDS, including the cultivation of trust between participants, ongoing working relationships (i.e. from project to project, and a move away from “silo mentalities”. Owen argues that current structures and processes are inadequate to achieve the IDDS goal and that paradigm shift is required.

Taxonomy tends to be a contentious field with the originator of each taxonomical model favouring their own over anyone else’s. Whilst there may be specific features of IDDS which differ from any other model, IDDS does flow from the long line of change initiatives in construction procurement stemming back at least to the Simon Report of 1944 (see Lord, 2008), with the collaborative aspects very much in the partnering vein. Ashcraft’s own view (2009) is that “alliancing” may be an appropriate procurement mode for BIM and this is another name for partnering.

In the UK, partnering, or at least collaborative procurement, has a reasonably long pedigree, and is currently benefitting from state support. NEC3 (ICE 2005) is a contract form which promotes working in a spirit of “mutual trust and cooperation” (ICE 2005, Cl 10.1). The form has come to prominence owing to a series of public endorsements. Latham (1994) praised an earlier edition and the Office of Government Commerce subsequently proclaimed that NEC3 satisfies the OGC’s Achieving Excellence in Construction criteria (ICE 2005 and OGC, 2009a). This Government initiative promotes a number of features of procurement which echo some of the issues raised by Hatem (2008) and Owen (2009), for example:

- Involvement of key stakeholders throughout the project;
- Roles and responsibilities clearly understood by everyone involved in the project, with clear communication lines;
- An integrated project team consisting of client, designers, constructors and specialist suppliers, with input from facilities managers/operators;
• An integrated process in which design, construction, operation and maintenance are considered as a whole;

• Procurement and contract strategies that ensure the provision of an integrated project team.

NEC3 is currently being used on publicly procured projects including many of those related to the 2012 Olympics (OGC, 2009b) on the basis that it is a form which promotes these objectives. This public endorsement of a single contract suite continues despite the findings of OGC commissioned research which indicates that two other contract forms, JCT Constructing Excellence (Howe and Dixon, 2006) and PPCC2000 (Mosey, 2008) are just as compliant with the OGC’s initiative as is NEC3 (Ove Arup & Partners Limited, 2008 and OGC, 2008).

All three of these contracts promote collaborative working and partnering. NEC3 and JCT Constructing Excellence are intended to be operated with project participants contracting on the same (or similar) form, but mainly simply in pairs, whereas PPC2000 promotes the use of a single contract for multiple parties, in the IPD vein. All of these contracts have been described as management tools, in addition to being statements of obligations (Ove Arup Limited, 2008, p.76) and they all tend towards a less is more philosophy, leaving much of the detailed aspects of who should do what to be individually negotiated, within the overall “management” framework.

Without considering the introduction of BIM to this mode of procurement, Ove Arup Limited do highlight a series of issues that using this type of procurement may raise:

• Collaborative procurement can fail if the whole of the supply chain is not involved.

• Collaborative procurement may give rise to actionable liabilities in novel ways, as a specific result of the method adopted

• Simple understandable contracts and processes have more chance of being effectively understood and implemented than complex ones.

• Collaborative approaches are becoming more prevalent in the UK construction industry, but can still be resisted, and prevailing market conditions may militate against the use of such approaches.

Despite these caveats, bearing in mind the type of procurement approach which seems most suited to BIM procurement, it may well be that one of these forms could be appropriate for use as part of successful BIM delivery. Clearly, however, none have been drafted with that in mind, and so it is appropriate now to consider a couple of standard form contracts which have been.
6. Contract initiatives

Two BIM specific contract initiatives have been developed in the US. The American Institute of Architects (AIA) have published *Document E202 – Building Information Modeling Protocol Exhibit* (AIA, 2008), and ConsensusDOCS have published *ConsensusDOCS 301 – Building Information Modeling Addendum* (ConsensusDOCS, 2008).

The AIA is an organisation similar in significance and role in the US as the RIBA is in the UK. Just as in the UK, where permission to practise as an architect is governed by the Architects Registration Board, rather than by RIBA, membership of AIA is not necessary in order to practise as an architect, which is handled by state level registration (NCARB, 2010) but the AIA is a well respected trade organisation which promotes best practice and proper ethical standards (AIA, 2010). ConsensusDOCS is an organisation similar in role and approach to the Joint Contracts Tribunal in the UK, in that ConsensusDOCS contracts are developed by a “coalition of 23 leading industry associations representing owners, contractors, subcontractors, designers and sureties” (ConsensusDOCS, 2010). In the particular case of ConsensusDOCS 301, the addendum drafting was in fact led by the BIM forum of the Associated General Contractors of America BIM forum, albeit that forum too contained industry wide representation (Lowe and Muncey, 2009, p.1).

In this section an overview of these addenda will be provided, followed by a critical analysis of the extent to which the initiatives are apt to accommodate the legal issues of BIM procurement outlined above and their suitability for adaption to a UK context.

6.1 Consideration of the contract addenda

6.1.1 Document E202 – Building Information Modeling protocol exhibit

Document E202 is a 9 page document intended to be incorporated in identical form into the contract(s) of all those who are to participate in the collaborative development of BIM(s) in relation to a given project. The document expressly takes precedence over any other contract terms if there is a conflict.

Fundamental to it is a progressive description of the construction processes, defined as “Model Elements”, which are borrowed from the Uniformat classification of building processes (see CSI, 2010). This lists out each construction process, for example, Part A of the Uniformat classification includes, A10 Foundations, which itself is split into A1010 Standard Foundations, A1020 Special Foundations, A1030 Slab on Grade. In relation to each of these Model Elements, Document E202 requires that the parties to the addendum specify the Level of Development (“LOD”) which that element needs to reach, and who is to be the Model Element Author in respect of that element.
Five LODs are outlined, and these specify the amount of detail which the element has to contain in order to achieve that level, as well as identifying the “standard” uses for an element at that level of development. So, an element developed to LOD100 should include “overall building massing indicative of area, height, volume, location” and can be used for basic levels of analysis, cost estimating and scheduling. By contrast, elements developed to LOD300 “are modeled as specific assemblies accurate in terms of quantity, size, shape, location, and orientation” and the BIM may be used to produce construction and shop drawings.

Document E202 tackles the problem of collaborative design by specifying that each Model Element Author retains ownership of each contribution, and that any subsequent use of that contribution by other parties is only normally permitted to the extent that it is necessary for the ongoing design and construction of the project, albeit that a wider licence – e.g. for lifecycle purposes – could of course always be separately agreed.

Central to Document E202 is the designation of a party who will be responsible for managing the various models. Although there is provision in E202 for initial agreement as to file format and so on necessary for the BIMs, the model manager is tasked with hammering out precise protocols, and also with ensuring interoperability and archiving.

The document does not make any claims to be a partnering document, though it does specify that if anyone does notice a conflict or an error “the discovering party shall promptly notify the Model Element Author” who is then tasked with rectifying the problem.

6.1.2 ConsensusDOCS 301 – Building Information Modeling addendum

This is an 8 page document which again, like E202, is intended to be incorporated in identical form into the contract(s) of all those who are to participate in the collaborative development of BIM(s) in relation to a given project. The document expressly takes precedence over any other contract terms if there is a conflict.

Though there are other similarities of theme between E202 and ConsensusDOCS 301, the approach of the latter has a different emphasis. An Information Manager is specified, but its obligations are delineated in more detail. There are requirements to manage access to the various BIMs which may exist in relation to the project; requirements to take care of archiving, and to record subsequent changes to the models. The default position is that the Owner/Employer shall be responsible for all the costs incurred by the Information Manager.

Key to the information management is the BIM Execution Plan. This is a detailed plan which sets out protocols for interoperability, design delivery milestones, dimensional accuracy and so on. ConsensusDOCS 301 does not specify what these should be, but instead requires that these are agreed upon between participants in a meeting/s which the document does specify should occur, shortly after execution of the contracts.
In relation to design development, ConsensusDOCS 301 deals with the issue of design collaboration head on. A Contributor is defined as any Project Participant who makes a Contribution, which itself is a widely defined term relating to the provision of information for use in or in connection with a BIM. Each Contributor is then required to specify what level of dimensional reliance that Contribution should be given. There are three representations set out, namely that the dimensions in the Contribution are:

- accurate and should take precedence over any other part of the design;
- accurate to the extent that those dimensions are agreed to be accurate in the BIM Execution Plan, with any other dimensions to be retrieved from the Drawings (itself a defined term referring to contract drawings and information independent of the BIM)
- not necessarily accurate and accordingly the model can only be used for information purposes only.

Even in this context, reliance is limited, since the representation is limited to the other parties to the Governing Contract. Quite who they are will depend on the facts of each procurement, but the Governing Contract could simply be between the Owner and the Architect, or the Contractor. To add to the mix, the ConsensusDOCS 301 expressly states that any Contribution by the Contractor shall not count as performing design services. Elsewhere, though subject to the representation limits referred to above, the Risk Allocation section provides that each Party shall be responsible for any Contribution made to a model, albeit equally each party will also waive claims for consequential losses arising from use of a model.

ConsensusDOCS 301 also makes provision for parties to notify clashes, and to take out data loss insurance, and includes details IP provisions covering a wide range of actual and possible future uses of the information provided. The form also states that notwithstanding the BIM process, the Architect/Engineer retains overall responsibility for the design.

### 6.2 Reflective analysis and applicability to UK market

The discussion of legal issues outlined eight areas which could prove problematic for BIM procurement, being Process; Interoperability; Use of BIM; Status of BIM; Cost of BIM; Design Liability; Delegation; and Ownership/Protection. Both E202 and ConsensusDOCS 301 make some provision in relation to these issues.

E202, despite being the physically longer document, arguably contains less detail, since a chunk of space is occupied by the LOD schedule. It contains some requirements in relation to management of the process, but is silent as to how the cost of the management should be dealt with. The LOD mechanism itself, whilst intellectually satisfying, arguably introduces an additional level of complexity into the procurement process.
ConsensusDOCS 301 puts management of the BIM process at the forefront of its recommendations, and provides much more detail as to issues of ownership and use of the information. The focus on liability flowing from Contribution is a feature that reflects the reality of how BIM procurement occurs, though this in turn emphasises the importance of being able to identify who did what later down the line. Whilst cost of the Information Manager is expressly addressed, there is silence regarding the wider costs of BIM procurement.

The discussion of procurement modes set out above suggested that collaborative procurement was best suited to BIM implementation. Neither addendum envisages altering the basic structure of the construction contracting arrangements, content instead to slot into the existing scheme. Neither expressly advocate a partnering approach, though this is perhaps understandable bearing in mind the US provenance. That said, neither document is weighed down with US specific terminology, and either could be readily adapted for UK use.

On the basis of this brief review and in view of ConsensusDOC 301’s more active focus on process management, there seems to be grounds to suspect that ConsensusDOCS 301 may map more closely against the realities of construction procurement than E202, however, the proof of that particular pudding could only be in the eating, since there is a certain elegance in the way that E202 tries to address the BIM problems.

Certainly either document could assist informing the process of BIM procurement in the UK arena. There are indications that a collaborative and perhaps a partnering approach is best suited to successful BIM procurement and to that end one of NEC3, JCT Constructing Excellence or PPC2000 might be appropriate. There has been some suggestion that NEC3 contracts may be better suited to situations where design has been substantially resolved prior to works being let (Ove Arup Ltd, 2008, and Eggleston, 2010), whereas PPC2000 is based around early involvement of a wide range of participants. However, since all three collaborative contracts are heavily dependent on the bespoke schedules, it is not appropriate on current evidence to opt one way or another, simply to recommend that there is a need for empirical study into this aspect of law and procurement in order to identify best practice, and perhaps develop UK specific BIM procurement addendum

7. Conclusion

It has been possible to establish from the foregoing that designing a building using BIM technology in a collaborative manner raises certain specific legal problems that are not associated at all, or to such a large extent, with other types of design approach. In legal terms the most challenging is the possibility for disaggregation of design responsibility, and the potential for acquiring tortious liability. In wider terms, management of the BIM process, and the interplay between the conceptual clarity of the process, and its relative messiness in practice, creates legal and organisational challenges. BIM is a process which is here to stay and it has many positive features. The challenge is to establish the best way of ordering the contractual and organisation structures in order to give the process maximum support.
References


Will the Mandatory Floor-based Provision of Waste Collection Facilities be Successful in Promoting Recycling? A Hong Kong's Investigation

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Abstract

It has been a common belief that efficacy of waste recycling is closely associated with the environmental sustainability of a city. Through amending the Building (Refuse Storage and Material Recovery Chambers and Refuse Chutes) Regulations, the Hong Kong Government took a bold and determined move to promote waste recycling in Hong Kong. The new legislative amendment made the provision of a refuse storage and material recovery room (RSMRR) on every domestic floor of new buildings mandatory. Although most Western literature suggested that kerbside recycling resulted in a higher participation rate in domestic waste recycling, whether the same result applies to Hong Kong’s situation is uncertain. One should be reminded that most literature has studied the factors affecting waste recycling in low-rise low-density housing, and little ink has been spilt on the same in a high-rise high-density residential setting. In this paper, the determinants of the amount of recyclables collected in high-rise housing estates in Hong Kong were investigated, with the use a set of aggregate data. The analysis results show that the amount of recyclables collected did not have a significant relationship with the location of the waste collection facilities. The research findings also suggest that the new mandatory requirement for the provision of RSMRR on each domestic floor of buildings may not be effective in promoting recycling, keeping other things constant. Perhaps, the most credible explanation for such result is the overwhelming concern of the residents over environmental cleanliness in their living places after the outbreak of the Severe Acute Respiratory Syndromes in 2003. The findings of this study help offer valuable policy insights to the public administrators to formulate schemes in promoting waste recycling effectively.

Keywords: waste recycling, convenience, waste separation facilities, high-rises, Hong Kong
1. Introduction

Strategic waste management has been regarded as an important element of a sustainable city (Tanaka 2007). Although waste recycling is less preferable than waste minimization or reduction which is at the top of the waste management hierarchy, the latter is somehow a remote ideal because its effectuation requires a significant change in people’s life styles (Price and Joseph 2000). Therefore, recycling which aims to lessen environmental damage and achieve environmental sustainability is often adopted as an intermediary solution to the waste problem (Rondinelli and Berry 2000; Tsai 2008). Like many other jurisdictions, Hong Kong has faced the challenge of waste management. Given her small land area, the scarcity of landfill space is ever growing in Hong Kong. It was estimated based upon the prevailing waste generation rates that the existing three landfills would be full in a decade (Environmental Protection Department 2005). Meanwhile, creating new landfill sites or extending existing ones is, if not possible, prohibitively costly. Against this background, the Hong Kong Government started promoting waste recycling in different sectors after the handover of sovereignty in 1997. In the Waste Reduction Framework Plan published in 1998, a ten-year implementation programme was set out, and the Government ambiguously targeted to raise the domestic waste recovery rate from 8% in 1997 to 14% in 2004 and 20% in 2007 (The Hong Kong Special Administrative Region Government 1998). Later, in the policy document A Policy Framework for the Management of Municipal Solid Waste (2005-2014), the target recovery rate of domestic waste was further pushed up to 26% by 2012 (Environmental Protection Department 2005).

To achieve these targets, a number of initiatives were devised and implemented. For example, the Government piloted placing waste separation bins, or three-colour recycling bins, in designated common areas in public housing estates to collect waste paper, aluminium cans and plastic bottles (Waste Reduction Committee 2000). In 2008, the Hong Kong Government made provision of refuse storage and material recovery room (RSMRR) on every domestic floor of new private buildings compulsory. However, in order to promote waste recycling among the community, it is necessary to first understand what determines people’s recycling behaviour. Without any support by scientific research, it is not convincible to say that the Government’s mandatory initiative leads to a higher recycling rate in high-rise housing in Hong Kong. While plentiful literature has studied how socio-demographic and housing characteristics of residents affect their willingness to participate in domestic waste recycling, the impacts of recycling architecture (e.g. location of recycling facility) on recycling behaviour have seldom been the research focus. More importantly, although most Western literature suggested that kerbside recycling could achieve a higher level of residents’ participation in waste recycling, this may not apply to the situation in Hong Kong because of the differences in the cultural and physical settings. It has been a general consensus that promotion of waste recycling among households in a multi-family housing, particularly in high-rise housing estates, is challenging (De Young et al. 1995; Ooi 2005). Besides, one should be reminded that low-rise residences and high-rise apartments dominate the housing sectors in the West and in Hong Kong, respectively. For that reason, this study serves to straddle the existing research gap by exploring the determinants of waste recycling behaviour in private multi-storey residential buildings in Hong Kong.
2. Domestic waste recycling and buildings ordinance

In the initial stage of official promotion of domestic waste recycling, the Government strongly advocated that three-colour recycling bins should be put on each domestic floor of the housing blocks to facilitate the recyclable disposal by the households. Ample space for accommodating these waste separation facilities could be easily incorporated in the design of public housing constructed by the Housing Department. Nonetheless, the provision of recycling facilities was voluntary in nature in private residential buildings. The picture changed in January 1985 when the Building (Refuse Storage Chambers and Chutes) Regulations (Chapter 123H of The Laws of Hong Kong), the first piece of law regulating the provision of refuse storage chamber in domestic buildings in Hong Kong, came into effect. Refuse storage chamber had to be provided in domestic buildings with total usable floor space of 1,320m² or more, as indicated in Table 1. The minimum total size, materials of construction fire safety standards and ventilation requirements were specified in the regulations. The regulations were then replaced by the Building (Refuse Storage and Material Recovery Chambers and Refuse Chutes) Regulations in November 2000. The major differences between the two sets of regulations lie in the introduction of the idea of “material recovery” in the regulatory framework and the increase in the minimum required floor space of waste storage and recovery facility, as shown in Table 1.

Table 1: Specifications of refuse storage or waste recovery facilities in domestic buildings

<table>
<thead>
<tr>
<th>Regulations</th>
<th>Total Floor Area of Building</th>
<th>Type of Facility to be Provided</th>
<th>Minimum Floor Space of the Provided Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building (Refuse Storage Chambers and Chutes) Regulations</td>
<td>Usable floor space 1,320m² or more but less than 13,200m²</td>
<td>Storage chamber</td>
<td>Total usable floor space in m² divided by 440</td>
</tr>
<tr>
<td></td>
<td>Usable floor space 13,200m² or more</td>
<td>Storage chamber with vehicular access</td>
<td>Total usable floor space in m² divided by 440</td>
</tr>
<tr>
<td>Building (Refuse Storage and Material Recovery Chambers and Refuse Chutes) Regulations</td>
<td>Usable floor space 1,320m² or more but less than 13,200m²</td>
<td>Refuse storage and material recovery chamber</td>
<td>Total usable floor space in m² divided by 347</td>
</tr>
<tr>
<td></td>
<td>Usable floor space 13,200m² or more</td>
<td>Refuse storage and material recovery chamber with vehicular access</td>
<td>Total usable floor space in m² divided by 347</td>
</tr>
</tbody>
</table>

To motivate developers to provide extra space for refuse storage and waste recovery in original building designs, incentives were offered by the Government. The Building Authority permitted floor space solely used for refuse storage and waste recovery to be non-accountable for gross floor area calculation under the Building (Planning) Regulations (Chapter 123F of The Laws of Hong Kong) in 2000. Perhaps based on the findings of Chung and Poon (1994) in which doorway recycling was found more acceptable than a bring system, it has long been the perception of the local government officials that a floor-based recycling system would work better. Moreover, the Audit Commission (2002) recommended the Hong Kong Government to expedite the floor-to-floor provision of waste separation facilities. It is thus the Government’s goal to “see waste separation facilities set up on each
With a view to the enhanced convenience for the residents to separate domestic waste at source, the Government dedicated to promote a floor-based system of recycling architecture. In the light that one of the most typical obstacles in waste recycling promotion is lack of a refuse collection room or floor space to accommodate the waste separation bin, the possibility of making the provision of a refuse storage and material recovery room (RSMRR) on every domestic floor of new domestic buildings compulsory was considered in 2005 (Environmental Protection Department 2005), and a bold and determined step was taken in 2006 to propose amending the Building (Refuse Storage and Material Recovery Chambers and Refuse Chutes) Regulations. Upon the approval by the Legislative Council, the amended regulations came into operation on 1 December 2008. As per the new regulations, a RSMRR is required on every domestic floor of all new domestic buildings except

- hotels, guesthouses or boarding houses
- domestic buildings and composite buildings with one staircase only;
- domestic buildings designed for occupation by one single family only and with not more than 3 floors designed for habitation;
- composite buildings the domestic parts of which comprise not more than 3 floors and are designed for habitation by one single family only; and
- domestic buildings and composite buildings on a site of an area of not more than 500m².

In cases of multi-floor units such as duplexes, the RSMRR will only need to be provided on one of the floors. As illustrated in Figure 1, no dimension of a required RSMRR shall be less than 1500mm. Though previous studies like De Young (1989), Margai (1997) and Ludwig et al. (1998) proved a positive correlation between proximity of collection facility and recycling behaviour level, Robinson and Read (2005) evidenced that people living in high-density housing opted bring sites while usage of kerbside service was higher in areas with a high concentration of single-family dwellings. In other words, it is reasonable for one to cast a doubt on the positive impacts of putting waste separation facilities on each domestic floor or requiring a floor-to-floor provision of RSMRR mandatorily on the promotion of domestic waste recycling. In this regard, it is the aim of this study to explore the determinants of waste recycling behaviour of private high-rise housing residents in Hong Kong, with particular focus on the impacts of recycling architecture on residents’ recycling behaviour.

3. Research design and explanatory model

To achieve this aim, an explanatory model was developed and empirical analysis was carried out using a set of aggregate data. To arrive at dataset with a higher level of reliability, self-reported information on residents’ socio-demographic characteristics obtainable via household survey was not used. Instead, officially released figures were opted in this study. However, in Hong Kong, socio-demographic data are released by the Census and Statistics Department as detailed as the street-block
level only for the sake of statistical reliability and information privacy. With this constraint, it is impossible to conduct the research on a building basis, and that is why an estate-based exploration was employed in this study. Moreover, since data on the total amount (or weight) of wastes collected in each estate are not available in Hong Kong, it was impossible to calculate the recycling rate or efficacy in each housing estate. In this light, recycling intensity (i.e. the total weight of recyclables per household collected for recycling) was adopted as an indicator of the outcome of recycling behaviour. Undoubtedly, higher recycling intensity does not necessarily mean that the residents are more environmental friendly because it is possibly that a greater amount of recyclables are collected when the overall recycling rate decreases. Yet, it was still sensible to assume that recycling rate and recycling intensity went in the same direction as total quantity of domestic waste disposed in Hong Kong has been decreasing continuously since 2001 (Environmental Protection Department 2008a).

Figure 1: Suggested layout plans of RSMRR (Building Authority 2008)

Based on a comprehensive literature review, waste recycling behaviour was found contingent on socio-demographic characteristics (Judge and Becker 1993; Gamba and Oskamp 1994; Scott 1999; Owens et al. 2000; Smallbone 2005), housing characteristics (De Young 1989; Oskamp et al. 1991; Owens et al. 2000; Nixon and Saphores 2009), economic incentives (Allen et al. 1993) and recycling architecture (De Young 1989; Judge and Becker 1993; Vencatasawmy et al. 2000). Therefore, in this study, waste intensity was taken as a function $g(.)$ of the above attributes. After operationalization, function $g(.)$ became

$$WASTE_i = \alpha_0 + \alpha_1 A_i + \alpha_2 B_i + \alpha_3 C_i + \alpha_4 D_i + \alpha_5 E_i + \alpha_6 F_i + \alpha_7 G_i + \alpha_8 H_i + \alpha_9 Z_i + \epsilon \quad (1)$$
where $WASTE_i$ is the amount of recyclables per household collected for recycling in estate $i$ in one year (measured in kg per household); $A_i$ is the percentage of residents with post-secondary education attainment in estate $i$; $B_i$ is the percentage of male population in estate $i$; $C_i$ is the median age of resident in estate $i$ (measured in years); $D_i$ is the median income of household in estate $i$ (measured in HK$); $E_i$ is the average size of household in estate $i$; $F_i$ is the percentage of households owning and occupying their properties in estate $i$; $G_i$ is the average number of rooms in each dwelling unit in estate $i$; $H_i$ is a dummy variable that equals one if a regular reward scheme is practised in estate $i$, and zero if otherwise; and $Z_i$ is a dummy variable that equals one if waste separation facilities are provided on each domestic floor of the buildings in estate $i$, and zero if otherwise. $\alpha_j$ (for $j=0, 1, 2, \ldots, 9$) are the coefficients to be estimated, and $\varepsilon$ represents the stochastic term. In Hong Kong, reward schemes of various types are launched by owners’ associations or property management companies to promote waste recycling among residents. Some reward schemes operates like a barter system in which residents can use waste paper or aluminium cans to trade for daily commodities such as instant noodles, shampoo, toilet tissues and bleaching agents. In some other schemes, recyclers earn “green points” or equivalent when they recycle. In the explanatory model above, the coefficient $\alpha_9$ measures the partial effect of enhanced convenience of recycling on recycling intensity. Placement of localized waste separation or drop-off facility on each domestic floor serves as a proxy measure of recycling convenience. As plenteous literature evidenced a consistent positive relationship between proximity of collection facilities and level of recycling behaviour, it was hypothesized that the estimated coefficient $\alpha_9$ was positive and statistically significant.

### 4. Data and analysis results

In the research, 122 private housing estates in Hong Kong were studied, and housing blocks in these estates were of 10 storeys or more. The data on recycling intensity, which was measured as the total amount of paper, plastic and metal collected for recycling per household in an estate from 1 January 2008 to 31 December 2008, were obtained from the property management companies managing the housing estates. It is rather common in Hong Kong for property management companies to keep formal records on the amount of recyclables collected from the residents or sold to recyclers or recycling companies. These records thankfully offer reliable information for this empirical study. Other than the quantities of recyclables, information about the implementation of regular reward scheme and location of waste separation facility was collated from the property management companies. Among the 122 housing estates, regular reward schemes were practised in 45 estates (36.9%), and waste separation facilities were provided on each domestic floor of buildings in 43 estates (35.2%). In terms of the quantity of recyclable collected, paper was ranked the top. On average, the per-household weight of paper collected was 58.5kg in one year, and represented 86.7% of total stock of recyclables collected. At the other extreme, plastics was the least collected recyclable.

Data on socio-demographic and housing characteristics of the residents were available from the 2006 By-census dataset compiled by the Census and Statistics Department. The descriptive statistics of the continuous variables for model estimation are summarized in Table 2. Since the functional form of Model (1) was not known *a priori*, a linear specification was used for simplicity. Based on the
empirical data, Model (1) was estimated using EViews (version 6.1), a commonly used statistical software. The results of the Ordinary Least Square estimation of the explanatory model, with the use of White’s heteroskedasticity-consistent standard errors and covariance, are shown in Table 3. The adjusted $R$-squared of the estimated model was 0.36, meaning that 36% of the variation in recycling intensity could be explained by the variations in the independent variables.

Table 2: Descriptive statistics of the continuous variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Measurement unit</th>
<th>Maximum</th>
<th>Mean</th>
<th>Minimum</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>WASTE</td>
<td>kg per household</td>
<td>149.94</td>
<td>66.22</td>
<td>15.19</td>
<td>28.16</td>
</tr>
<tr>
<td>A</td>
<td>%</td>
<td>73.70</td>
<td>37.83</td>
<td>10.20</td>
<td>14.81</td>
</tr>
<tr>
<td>B</td>
<td>%</td>
<td>54.75</td>
<td>46.07</td>
<td>36.91</td>
<td>3.27</td>
</tr>
<tr>
<td>C</td>
<td>years</td>
<td>51.00</td>
<td>38.16</td>
<td>32.00</td>
<td>3.04</td>
</tr>
<tr>
<td>D</td>
<td>HK$</td>
<td>155,820.00</td>
<td>54,261.75</td>
<td>20,000.00</td>
<td>28,107.03</td>
</tr>
<tr>
<td>E</td>
<td>nos.</td>
<td>4.30</td>
<td>3.00</td>
<td>2.10</td>
<td>0.43</td>
</tr>
<tr>
<td>F</td>
<td>%</td>
<td>98.30</td>
<td>79.22</td>
<td>36.50</td>
<td>13.49</td>
</tr>
<tr>
<td>G</td>
<td>nos.</td>
<td>6.12</td>
<td>3.88</td>
<td>2.31</td>
<td>0.66</td>
</tr>
</tbody>
</table>

Table 3: Results of the Ordinary Least Square estimation of Model (1)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>t-statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-50.54384</td>
<td>57.04826</td>
<td>-0.885984</td>
<td>0.3775</td>
</tr>
<tr>
<td>A</td>
<td>6.133905</td>
<td>29.71509</td>
<td>0.206424</td>
<td>0.8368</td>
</tr>
<tr>
<td>B</td>
<td>-38.37743</td>
<td>79.74880</td>
<td>-0.481229</td>
<td>0.6313</td>
</tr>
<tr>
<td>C</td>
<td>1.756570</td>
<td>0.714964</td>
<td>2.456864</td>
<td>0.0155</td>
</tr>
<tr>
<td>D</td>
<td>0.000338</td>
<td>0.000176</td>
<td>1.924915</td>
<td>0.0568</td>
</tr>
<tr>
<td>E</td>
<td>5.199810</td>
<td>8.558664</td>
<td>0.607549</td>
<td>0.5447</td>
</tr>
<tr>
<td>F</td>
<td>0.958395</td>
<td>16.61010</td>
<td>0.057712</td>
<td>0.9541</td>
</tr>
<tr>
<td>G</td>
<td>5.794764</td>
<td>4.827127</td>
<td>1.200458</td>
<td>0.2325</td>
</tr>
<tr>
<td>H</td>
<td>19.53496</td>
<td>5.121183</td>
<td>3.814541</td>
<td>0.0002</td>
</tr>
<tr>
<td>Z</td>
<td>2.003168</td>
<td>5.061237</td>
<td>0.395786</td>
<td>0.6930</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.411224</td>
<td>Akaike Info Criterion</td>
<td>9.139872</td>
<td></td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.363912</td>
<td>Durbin-Watson Statistic</td>
<td>1.903642</td>
<td></td>
</tr>
<tr>
<td>F-statistic</td>
<td>8.691692</td>
<td>No. of Included Observations</td>
<td>122</td>
<td></td>
</tr>
<tr>
<td>Prob(F-statistic)</td>
<td>0.000000</td>
<td>Dependent Variable</td>
<td>WASTE</td>
<td></td>
</tr>
</tbody>
</table>
As far as the control variables are concerned, only median age of resident and median household income were found to have statistically significant relationships with recycling intensity. In other words, housing characteristics (namely tenure mode and number of rooms) and other socio-demographic factors (namely education level, gender and household size) did not hold any relevancy in determining waste recycling behaviour in the housing estates under investigation. A positive correlation significant at the 5% level was found between median age of resident and per-household weight of recyclables collected, *ceteris paribus*. This result confirms the empirical findings by Gamba and Oskamp (1994) and Scott (1999). In line with the findings by Gamba and Oskamp (1994) and Owens et al. (2000), wealthier residents were found in this study to be more active recyclers. Median household income was positively correlated with the dependent variable, with the estimated coefficient statistically significant at the 10% level. As for the practice of regular reward scheme, it was found to have a significant (at the 1% level) and positive impact on recycling intensity. As implied by this result, people are positively stimulated by the financial incentives to take pro-environmental behaviour.

### 5. Discussion on the research findings

As shown in Table 1, the estimated coefficient of the dummy variable *Z* was positive in sign but statistically insignificant even at the 10% level. This result suggests that compared with putting the waste separation bins on a building’s ground floor, locating the bins on upper floors of the building did not the per-household amounts of recyclables collected in the investigated housing estates. In other words, proximity of waste separation facility to the residents did not increase recycling intensity. In contrast, studies by De Young (1989), Margai (1997) and Ludwig et al. (1998) found that more active participation in recycling by households was driven by more conveniently located waste collection or separation facilities. Indisputably, the findings of this study cannot support us to deny that enhanced level of convenience helps encourage residents to participate in waste recycling. Nevertheless, they can at least provide important evidence that a floor-based provision of recycling waste facility does not bring residents positive net benefit which is large enough to motivate the latter to participate or increase participation in recycling. Perhaps, the divergent results between this study and the previous ones can be explained with the difference in the physical contexts of the residence investigated. Unlike the settings of residential neighbourhoods in western countries, dwellings in Hong Kong are predominately high-rises with sizeable communal space and facilities inside the buildings. These “common parts” (e.g. communal corridors and staircases) serves amenity and communication functions, and are often used by the residents. In this light, their quality or state of condition has a strong bearing on the residents’ well-being.

Given that common parts in apartment buildings in Hong Kong are usually enclosed and not well-ventilated, unhygienic or filthy state of the common parts may adversely affect the health-being of the residents. Unquestionably, there could be some irresponsible recyclers who dispose soft-drink cans to the waste separation bins without prior cleansing. When the waste separation bins are located on the upper domestic floors which are usually less airy, they could likely become breeding places for pests and rodents, and the residents may suffer from the hygienic problem created by the mismanagement of floor-based waste separation facilities. On the contrary, recycling bins placed on the building’s...
ground floor are less prone to insanitation because the areas are more open and airy. After the painful lesson of the outbreak of Severe Acute Respiratory Syndrome in 2003, the community in Hong Kong became more cautious of the dreadful consequences of neglecting environmental hygiene in their living place. They worried that poor hygienic conditions would be resulted from the mismanagement of the waste separation facilities, increasing the risk of disease spreading. In view of the hygienic concern, people do not recycle more even though the waste separation facilities are located closer to them. It is a vivid reflection of the fact that the costs of locating waste recycling bins on every domestic floor exceed its benefits. In line with the findings by Robinson and Read (2005), this study confirms that in high-density housing, residents prefer bringing recyclables to recycling facilities farther located.

The empirical findings of this study suggest that the Hong Kong Government’s recent initiative to make the RSMRR provision on every domestic floor of new residential developments may not be justifiable or rationalized. To put it another way, the Government’s efforts in promoting domestic waste recycling by adjusting the recycling architecture is unfounded, and thus could be in vain. This circumstance is a lively example of the use of unrealistic assumptions in formulation of government policy or scheme. In the inception stage of the law amendment, there was no inclusive public consultation or comprehensive study on the recyclers’ preference. Only, the Advisory Council on the Environment, the Building Sub-Committee of the Lands and Building Advisory Committee and the Legislative Council Panel on Environmental Affairs were consulted on the proposal (Environmental Protection Department 2008b) but definitely, their views were too narrow to represent the public voice. The policy-makers did not acquire essential knowledge about the public’s responses to the proposal for more informed decision making. Without carefully taking residents’ recycling practices and concerns into consideration, the schemes or policies formulated by the Government to encourage wider public participation in waste recycling in the city can be fruitless.

Rational individuals seeking to maximize their utility or wealth are expected not to sort waste and take them to waste separation facilities for recycling for little or no economic gain. That is why the empirical analysis above found that regular reward schemes were more effective in driving people to participate in domestic waste recycling, compared with enhanced convenience of recycling. As implied by these findings, the Government can consider subsidizing reward schemes in housing estates, or launching a centralized reward scheme in which residents can earn green points by recycling and use the points to redeem tickets for amenity facilities like badminton courts and swimming pools or services like operas and concerts. Besides, given the increasing accent on corporate social responsibility, more and more enterprises are willing to voluntarily participate in the promotion of pro-environmental behaviour. Therefore, resources in the private sector can be also mobilized. At the same time, long-term efforts such as intensified civic education and information strategies are needed to make waste recovery more popular among the community. The net benefits of a floor-based system of waste separation facilities can be amplified through intensified civic education. Not only should the general public be encouraged to recycle, but also should they be taught to be responsible recyclers. Shaping “responsible” waste recycling as a social norm may be helpful in reducing the costs of putting waste separation bins on each domestic floor of buildings.
6. Concluding remarks

Economic activities in Hong Kong have resulted in a surge of refuse output over the past few decades. As Hong Kong is tiny in terms of her land area, the scarcity of landfill space in the city is ever growing, resulting in an inevitable landfill crisis. In the light that waste reduction requires adjustments in life style of people, which is difficult to achieve, the Hong Kong Government turned to promoting recycling to solve the landfill problem. Recycling can improve environmental quality, by reusing materials as secondary products. Yet, to successfully promote waste recycling or recovery by devising policy instruments, it is necessary to first understand what encourages people to recycle; otherwise, the efforts paid in promoting waste recycling can be fruitless. Based on a set of aggregate data, the recycling behaviour of the residents in 122 private high-rise housing estates in Hong Kong was investigated. Median household income, media age of resident and practice of regular reward schemes were found to have significant and positive relationships with the per-household weight of waste collected for recycling. While some scholars were optimistic about the effects of conveniently located waste separation facilities in motivating people to recycle, the analysis results of this empirical study suggest that a floor-based system of waste separation facilities is by itself not likely to be effective in promoting waste recycling in high-rise residential buildings. For these empirical findings, the effectiveness of the new mandatory requirement for the provision of RSMRR on every domestic floor of new residential developments is doubtful. As implied by the research findings of this study, more importantly, determinants of waste recycling behaviour could be different between housing in high-rise and low-rise settings. In this regard, due care has to be taken in the transfer of policies about waste recycling promotion across board. To tackle the contemporary waste problems in Hong Kong, resorts should be made to more intensive civic education and economic incentives. Yet, the merits of the initiatives should be carefully investigated before their implementation.

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A Study of Collective Agreements to Abolish Retention in the UK

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Abstract

The subject of retention has received widespread criticism in the industry and in UK government reports in recent years. Despite such criticism, retention still remains a prominent feature in the construction industry in the UK. In an attempt to abolish retention, certain sub-contractor trade associations formed collective agreements to refuse to accept retention in their contracts. However, these agreements were removed after accusations from the Office of Fair Trading that they were anti-competitive. This paper aims to establish whether such agreements could be used for the purpose of abolishing retention in the UK construction industry. The first part of the paper sets out the legal basis of competition law in the European Union drawing on the outcome and reasoning in ten competition cases decided by the UK and European Union competition authorities. The paper then conducts a legal analysis of the facts of two no-retention agreements. The study demonstrated that collective agreements to abolish retention were anti-competitive insofar as the agreements restricted competition. On balance it was also found they provided the greatest benefits to the subcontractors themselves and not to consumers. The agreements could therefore not be used for the purpose of abolishing retention. The paper also highlights potential solutions to facilitate change in this area.

Keywords: competition law, retention, construction contracts, collective agreements
1. Introduction

1.1 Background

Retention is a mechanism where a portion of a payment due to the contractor is withheld until completion of defined contractual stages. This mechanism was recognised by the House of Commons (2002) as being almost exclusively used in the construction industry.

Competition Law is also an important aspect of the construction industry. The industry has received a large amount of publicity in recent times for the anti-competitive practices. An investigation into the practices of more than 100 companies in the industry was concluded recently by the OFT with significant fines being imposed on a number of them, see OFT (2009).

The subject of retention has been widely debated in recent years and has received widespread criticism. Industry spokesmen, experts and several Government led reports have all concluded that change is necessary. Champion (2005) indicates this practice has been established since 1827 with the majority of the literature found to be supportive of abolishing retention altogether. Nonetheless, retention still remains a prominent feature in the construction industry.

In the early 1990’s, members of several sub-contractor trade associations formed collective agreements refusing to enter into contracts with retention clauses. The aim of these agreements proved successful when they were in place, with sub-contractors able to avoid retention within certain specialist trade groups. However, the Office of Fair Trading (OFT) carried out investigations into the agreements, alleging that they were in breach of the Competition Act 1998. The sub-contractors agreed to withdraw the agreements stating that they wished to avoid bad publicity and legal costs. Although the investigations never reached a formal decision, they had a large impact on the construction industry. A proven method of limiting the use of retention in the industry was prevented from being used for fear of being anti-competitive. Research was therefore required to consider whether the agreements were a breach of Competition Law as alleged.

The analysis concluded that the two „no retention” agreements studied were more likely than not to be anti-competitive.

1.2 Methodology

The first stage was to investigate the current practice of retention in the UK construction industry. The second stage was to identify the relevant retention agreements. It should be noted that both of the agreements considered in this paper received attention from the OFT, but were voluntarily rescinded by the trade associations themselves. Documentation relating to the agreements were obtained by direct request to the OFT and to the trade associations.
The final part of the research was to analyse the no retention agreements together with decided competition law cases in the context of the competition principles of the Treaty of Rome\(^1\) and the Competition Act\(^2\). The questions asked arising out of the legislation were as follows:

- Do the trade associations fall into the category of Undertakings or an Association of Undertakings?
- Did the collective agreements fall into the category of an Agreement, Decision or Concerted Practice?
- Was the object or effect of the collective agreements to prevent, distort or restrict competition.

### 1.3 Limitations of research

Information used in this research was limited to that which was requested from the OFT under the Freedom of Information Act together with information voluntarily provided by the trade associations and also freely available on their respective websites.

The conclusions reached are only based on two agreements one by the Federation of Piling Specialists ("FPS") the other by the Lift and Escalator Industry Association ("LEIA"). Other agreements were briefly researched and found to be similar to the FPS and LEIA agreements.

### 2. Retention

#### 2.1 Purpose of retention

Champion (2005) describes retention as a contractual mechanism, whereby a percentage of a payment due to a contractor is temporarily withheld until satisfactory completion of defined stages within the contract. The percentage of retention being typically 3 to 5% of the total amount due. Half of the retention fund is usually released on practical completion of the works, with the second half released upon completion of the defects liability period (usually one year later).

Latham (1994) described the purpose of retention to “act as an inducement to the contractor to remedy any defect during the defect liability period”. Hughes et al (1998) agree that retention gives contractors an incentive to rectify defects, because they do not receive complete payment until all the defects have been rectified. Champion (2005) (citing DTI Report ref: Ev 98, 102) indicated that

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\(^1\) Article 81 (1) The EC Treaty
\(^2\) Competition Act 1998, section 2
clients in the higher education sector needed the retention system “to ensure that the contractor returned to complete defects”. Retention provides a remedy to the high number of defects in construction for some clients, in giving the contractor an incentive to return and rectify them.

Retention can also be used for the following purposes:

- default by Contractor i.e. client can engage alternative contractors if Contractor fails to return to rectify defects and deducts the cost from the retention fund.

- Champion (2005) suggested retention provided additional protection against insolvency as a form of insurance to the client in the event of the contractor’s insolvency removing the requirement for additional insurance policies and bonds.

- Protection against overvaluation and used as a counter-balance in the situation that the contractor is over-paid (see Champion (2005).

- Incentive to complete quickly. Although retentions do provide an incentive to complete the works more quickly, the House of Commons (2002) suggested other methods such as provisions for delay or liquidated damages were considered more effective.

Champion (2005) and Hughes et al (1998) both state that the retention system requires less administration than a retention bond.

However, many authors believe that there are other more effective methods. These methods are claimed to be less damaging to the industry, but still provide the advantages of retention including retention bonds, performance bonds and retention on-demand bonds. Clients can also withhold money under the contract for defective or incomplete work. Building relationships and trust also gives contractors an incentive to rectify defects in order to obtain repeat business.

The House of Commons (2002) stated that the industry should target a reduction in defects, and an improvement in trust and relationships within the industry. The report states that if there were a vast reduction in defects, there would be no need for retention so it would naturally stop being used. The prospect of repeat business can also used as the incentive for contractors to correct defective work.

### 2.2 Abolition of retention

Government reports including Banwell (1964), Latham (1994), Egan (1998) and House of Commons (2002) examined the use of retention in the industry and concluded that change was required. It is widely accepted that retention has a negative impact on the construction industry and that there are valid alternatives. Such alternatives, most of which are used in other industries, include: retention bond; performance bond; parent company guarantee; collaborative relationships and the prospect of continuing work; other contractual provisions. House of Commons (2002) recognised that retention is of most benefit to small or occasional clients to encourage contractors to rectify latent defects.
Latham (1994) suggested that retention bonds should be used in lieu of retention and that standard form contracts should have alternatives so that retention was an option rather than a requirement. More recently a Government select committee, see SEC Group (2004) concluded that Government departments should set an example by eliminating the practice of retention as soon as possible. However, a survey was carried out by the SEC group in 2004 that was completed by 77 local authorities, with a combined construction expenditure of 1.26 billion pounds with all authorities surveyed admitting withholding retention on some contracts.

A step that appeared to generate the most success in abolishing retention was when certain groups formed collective agreements to reject retention clauses, leaving contractors with little choice but to use alternatives such as retention bonds. However under pressure from the OFT the agreements were rescinded.

3. The resolutions

The Federation of Piling Specialists (“FPS”) is a trade association representing specialist piling sub-contractors within the construction industry. At the time the no-retention agreements were entered into, there were 15 member companies with combined turnovers of approximately £230 million. Work carried out by its members includes bored piling, embedded retaining walls and driven piles. FPS provide expertise to members in innovation, technical excellence, design, workmanship and commercial awareness (see www.fps.org.uk). They also provide advisory publications for use by members in each of the areas stated. FPS also claim to represent 80% of the piling industry.

The agreement titled „Retention Resolution” was described by the FPS (2002) as a “zero retention policy”. FPS (2002) also went on to state “Members are able to agree with clients any form of security apart from retention”. This resolution had been in force since 28 October 1994 but was rescinded under pressure from the OFT by FPS (2003) on 13 February 2003.

LEIA is a trade association representing companies in the lift and escalator industry. Members of LEIA have a market share of approximately 95% (see www.leia.co.uk). Products that are supplied by members of LEIA include passenger lifts, escalators, lifting platforms, goods lifts, stair lifts, and passenger conveyors in addition to a selection of parts for such products.

LEIA state that their objectives are: the provision of advice on health, safety and standards matters; determination of skills requirements and the promotion of education and training; co-operation within the sector and between the sector and its customers and suppliers; development of the commercial environment; and maintaining the best standards of quality and workmanship.

On 14 July 1999, members of LEIA agreed a policy to refuse to enter into contracts with retention. The OFT (2002) reported that this policy was removed in May 2002.
4. Analysis and evaluation

4.1 Were FPS and LEIA ‘associations of undertakings’?

Article 81(1) of the EC Treaty and Chapter I of the Competition Act 1998 expressly prohibits decisions by associations of undertakings which have as their object or effect the prevention, distortion or restriction of competition through directly or indirectly fixing purchase prices or other trading conditions.

For an agreement to be anti-competitive, it must have been made by an „undertaking” or an „association of undertakings”. The key authority of Hofner and Elser v Macrotron described an undertaking as an “entity engaged in an economic activity regardless of legal status”.

Entities that are acting in public interests to perform a task which forms an essential function of the state are not classed as „undertakings” even if they are involved in economic activities.

The general activities of FPS included the improvement of technical skills and commercial awareness for member companies. For LEIA, activities included the provision of advice on health and safety issues, the promotion of education and training and the development of the commercial environment. The main function of both associations is to provide services to their members. In some instances this may involve providing advice on economic matters, such as contract conditions.

BetterCare highlighted that an organisation might be an undertaking when carrying out certain activities, but not when carrying out others. This could be applied to FPS and LEIA, because certain objectives such as health and safety at work could be viewed as social objectives. Activities that pursued those objectives may therefore not be economic. However, they could still be undertakings when pursuing other activities. It is therefore important to establish whether the particular activity in question was economic, not just the general activities of the entity. The activity in question is the co-ordination of member companies to collectively refuse retention clauses.

It is important to establish exactly what is meant by the term „economic activity”, as the judgement in Hofner & Elser v Macrotron stopped short of a clear definition. Commission v Italy described economic activity as “one which consisted of offering goods and services on a given market”.

When producing and co-ordinating the no-retention agreements, FPS and LEIA did not provide any products or services to the market themselves. None of the services they provided were open for use

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3 EC Treaty Article 81(1), Competition Act 1998 Chapter I
7 BetterCare CP/1321-00/S, CA98/10/2002, 1 February 2002
9 Case C35/96 Commission v Italy [1998] ECR I-3851
by the market. Their only purpose was to provide services to their members. The associations were therefore not undertakings themselves. However, the member companies did provide products and services to the market in the form of lifts, escalators, piled foundations etc. These products were open for purchase by the common market. The member companies are therefore engaged in economic activity and are undertakings. The trade associations are associations of the member companies, so are associations of undertakings for the purpose of Competition Law.

In *Concordato Incendio*\(^{10}\) a non-profit making association representing companies in the Italian fire insurance industry and as an association of undertakings, were found to be engaging in economic activity when producing and recommending the use of standard terms and conditions.

Associations representing book publishers (*Publishers Association Net Book Agreements*\(^{11}\)) cattle auctioneers (*Northern Ireland Livestock and Auctioneer’s Association*\(^{12}\)) agricultural machinery (*Vimpoltu*\(^{13}\)) and film distributors (*Film Distributors’ Association*\(^{14}\)) were associations of undertakings. The conclusion, derived from judicial interpretation of the European legislation arising out of case law and the particular facts, is that both FPS and LEIA were associations of undertakings and therefore capable of anti-competitive behaviour.

### 4.2 Did a decision by an association of undertakings exist?

The EC Treaty and the Competition Act 1998 only apply to agreements, decisions and concerted practices by associations of undertakings, therefore one must have existed to constitute a breach of competition law.

The „no retention” agreements were described by FPS (2002) as a “zero retention resolution” and acknowledged to OFT (2002) as a “retention resolution” by LEIA. It is not evident that these resolutions or policies are legally binding or whether the associations would have enforced them had members broken them. However, the fact that the „no-retention” agreements may not have been legally binding (see the gentleman’s agreement in *ACF Chemiefarma NV v Commission*\(^{15}\) and a simple understanding in *Re Stichting Sigarettenindustrie Agreements*\(^{16}\)) does not mean that they are not agreements for the purpose of Competition Law. Whish (2005) commented that actions by a large number of firms can often be coordinated by a Trade Association. Recommendations by trade associations have also been found to be anti-competitive despite the fact that the recommendations were not binding on members\(^{17}\). All that needed to be demonstrated is that whether there is intention that parties would act on the decision

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12 *Northern Ireland Livestock and Auctioneers’ Association* [2003] CP/0504-01, CA98/1/2003, 3 February 2003
14 *Film Distributors’ Association* CP/1321-00/S, CA98/10/2002, 1 February 2002
(Publishers Association Net Book Agreements\textsuperscript{18}). Where such behaviour is found to exist the trade association can be fined (AROW v BNIC\textsuperscript{19}).

In Concordato Incendio\textsuperscript{20} members were free to decide whether to use the standard conditions of trade, but they were advised to use them. The commission decided that although members were free to use different conditions of sale, they were unlikely to do so. If they did not wish to follow the advice of their trade association, they would be unlikely to pay membership fees and participate in meetings.

Members of FPS and LEIA participate in trade association activities and pay membership fees. Similarly to Concordato Incendio\textsuperscript{21} it is unlikely that member companies would apply their resources to the membership in this way if they had no intention of following its resolutions. It was likely that members would act upon the „no retention“ agreements.

Using the principles of Concordato Incendio\textsuperscript{22}, Netbooks\textsuperscript{23}, Verband\textsuperscript{24} both of the no-retention agreements were decisions by associations of undertakings. Although the agreements may not have been legally binding, it was likely that the members would act on them. The agreements also co-ordinated the activities of their members.

4.3 Was the object or effect of the agreements to prevent, distort or restrict competition?

In IFTRA Aluminium \textsuperscript{25} the parties claimed that the rules they put in place had the purpose of preventing unfair practices by companies in the market. The rules also included several anti-competitive terms. The fact that the parties claimed that their objective was not to restrict competition had no impact on the judgement. The court confirmed an objective view must be taken, not an analysis of the subjective intentions of the parties.

In FETTCSA\textsuperscript{26} the parties claimed that their agreement had the object of providing price transparency and easier cost calculation in the shipping industry. This agreement was still found to have the object of restricting competition. The reasons that FPS and LEIA claim they introduced the no-retention agreements are therefore not important. It is of no consequence to any decision on anticompetitive behaviour that one of stated objectives of the agreement was to prevent or reduce an unfair practice.

\textsuperscript{18} Publishers Association Net Book Agreements OJ [1989] L 22/12, [1989] 4 CMLR 825
\textsuperscript{19} AROW v BNIC OJ [1982] L 379/1 [1983] 2 CMLR 240
\textsuperscript{20} Concordato Incendio Rischi Industriali OJ [1990] L 15/25, [1991] 4 CMLR 199
\textsuperscript{22} Concordato Incendio Rischi Industriali OJ [1990] L 15/25, [1991] 4 CMLR 199
\textsuperscript{23} Publishers Association Net Book Agreements OJ [1989] L 22/12, [1989] 4 CMLR 825
\textsuperscript{24} Verband de Sachversicherer eV OJ L35/20 [1985] 3 CMLR 246
\textsuperscript{25} IFTRA Rules for Producers of Aluminium Containers OJ [1975] L228/10, [1975] 2 CMLR D20
\textsuperscript{26} FETTCSA OJ [2000] L268/1, [2000] 5 CMLR 1011 substantially upheld on appeal case T-213/00 CMA v Commission
(such as the imposition of retention at subcontractor level) thereby improving the construction industry.

If it cannot be established that the object of the no-retention agreements is the restriction of competition, it must be analysed whether the effects of the agreement was the restriction of competition. To establish this, an economic study of the market and the practices in question must be carried out.

Anti-competitive behaviour often aims to restrict competition over price. However, this is not the only method by which firms compete. They can also compete over the service provided, the risk taken on by each party and the terms and conditions of sale. When the „no-retention” agreements were in place, they did not eliminate competition within the market. Firms were still free to compete on tender price, quality of work, service provided and many other important factors. However, members of the associations were not free to compete on whether to offer retention to customers as a contract clause.

A similar situation arose in *Vimpoltu*²⁷ in which a trade association introduced certain uniform conditions of sale. One of the restrictions was that companies must include the cost of delivery when quoting for the supply of agricultural machinery. This condition did not restrict price directly, because companies could simply add the cost of delivery onto their quotations. However, it did restrict competition in the market. Companies were not free to compete over this particular aspect of the work, for instance to offer discounts in return for collection by the customer. This had negative effects on both the consumers and the suppliers. Consumers had less freedom to choose their method of collection. Suppliers also had less freedom to attract additional business by offering better delivery terms.

*Vimpoltu*²⁸ had many similarities to the FPS and LEIA agreements. The restriction that members are no longer able to offer retention does not impact on the tender price that they were able to offer. Members were still free to offer lower tender prices to reflect the change in contract conditions. However, members were not free to attract new business by offering different retention clauses. Customers were also not free to choose whether to have retention clauses in the contracts, even if they were prepared to pay additional money. The no retention clauses limited customer choice and also limited the suppliers’ ability to compete on certain conditions in a similar way to *Vimpoltu*²⁹.

Restrictions of secondary aspects of competition, that is restrictions on aspects other than price, have been established in many other cases. In *IFTRA Aluminium*³⁰ rules were made that no member companies could offer discounts from their published prices, even though they were free to set their published prices at whatever level they wished. This restricted the companies’ ability to offer discounts in order to attain additional business. It also restricted consumers’ freedom to barter or

³⁰ IFTRA Rules for Producers of Aluminium Containers OJ [1975] L228/10
negotiate to attain discounts. In Film Distributor’s Association\(^{31}\) cinemas were prevented from showing different films on the same screen within a given period of time. This would restrict the companies’ ability to compete with their competitors by offering different services to customers.

It is clear from these cases that restrictions on secondary aspects of competition are also taken very seriously and can still have damaging impacts on the market. Both the Competition Act 1998 and the EC Treaty also expressly cover the fixing of terms and conditions, such a term may include retention.

When LEIA and FPS introduced the no-retention agreements, it was quite clear that the member companies’ ability to compete over retention clauses was restricted. Retention was eliminated from all of their members’ contracts by limiting customer choice. The object of the no-retention agreements was therefore the restriction of competition. It is not necessary to establish that the effect of the no-retention agreements was the restriction of competition, because the object was the restriction of competition.

### 4.4 Effect on trade between member states

The research assumed that the agreements directly affected UK companies and that therefore the Competition Act should apply. The question of whether the FPS and LEIA agreements fell within Article 81 of the EC Treaty as affecting trade between member states of the EC was outside the scope of this research. If researched, it is possible the further research could conclude the agreements may serve as a barrier to entry of the UK market.

### 5. Conclusions and recommendations

The research found that most authors were in favour of abolishing retention from the construction industry, although there is no clear consensus on how this should be achieved even though there are alternatives. It was found that there were a number of uses for retention and that for clients, retention was a successful method of providing a form of insurance or leverage for defects to be rectified.

The alternatives available provided equivalent advantages to retention, with one exception. Clients with good relationships with their contractors can use the prospect of repeat business as leverage for rectification of these defects. If retention was abolished, certain one-off clients would therefore be in a less favourable position than they would if retention was in place. For other clients, such as Government bodies or regular private developers equivalent alternatives are available.

The review investigated no-retention agreements at sub-contract level described by certain trade associations as „retention polices”. Ten settled cases were considered with similarities to the no-retention agreements.

\(^{31}\) Film Distributors’ Association CP/1321-00/S, CA98/10/2002, 1 February 2002
Applying the principles of BetterCare\textsuperscript{32} and FENIN\textsuperscript{33}, the members of FPS and LEIA were undertakings for the purpose of competition law because they were engaged in economic activity. FPS and LEIA were associations of undertakings, because they represented the undertakings, as applied in the cases of Vimpoltu\textsuperscript{34} and Film Distributors’ Association\textsuperscript{35}.

The retention policies were decisions by associations of undertakings. The fact that members paid fees to the trade associations and participated with their activities meant that it was likely that member companies would act on the policies of their trade association using the precedents set in Concordato Incendio\textsuperscript{36} and Net Book Agreements.\textsuperscript{37} The retention policies also represented a clear intention to co-ordinate the activities of their members and were therefore, on balance, anti-competitive.

Furthermore, the FPS state on their website that it is for members to continue to offer alternatives to retention. This paper has not considered the effect of this statement as to whether or not it continues to be anti-competitive but as yet, it appears to remain unchallenged by the OFT. Further research is envisaged to test this statement.

This paper did not consider whether the agreements at subcontractor level could be eligible for exemption under sections 4-11 of the Competition Act 1998 (or Article 81(3) of the EC Treaty). A factor that could be significant is that no-retention agreements at sub-contract level shift the burden of retention to contractors, this shift of responsibility providing no advantage to the industry as a whole. So, whilst, a no retention agreement at subcontractor level may not be granted exemption (this being envisaged as further element of the current study by the authors) there may be stronger arguments in favour of the grant of a block exemption at contractor level.

If change is to happen, the abolition of retention must start from the top of the supply chain with clients. Various Government reports have concluded that the industry would be better without retention and that public sector procurers should take the lead on this change in practice. If clients fail to take this lead, further research is envisaged to consider whether a no retention agreement at contractor level would be eligible for exemption under sections 4-11 of the Competition Act 1998.

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Abstract

In The Netherlands, the quality of installations (heating, plumbing, sewage, water, electricity, ventilation) of new houses is a growing concern. This creates safety and health risks and there are many indications that current requirements for energy saving and ventilation are not met due to imperfect installations. Quality control is no longer carried out by local government and/or public utility companies. Formal completion reports are rare, mostly because clients seldom request them. This paper describes a study, commissioned by the Dutch association for installation companies (‘Uneto-VNI’), which examined the need for and value of a procedure associated with the completion of installations in new houses in The Netherlands. In Belgium, the UK and Germany, a much stricter control on new installations is practiced by government and public utility companies. As a result of discussions about options with a peer group of experts, a procedure for the quality control of installations was proposed. Following this procedure, installation companies are no longer liable after completion. Instead, the owner or client has to prove that malfunctioning was caused by neglect of the installation company. To examine if the proposed procedure would receive support, an expert meeting was organized and a survey was sent to key players in the building industry. Stakeholders regard the proposed procedure as useful and think it will improve the quality of installations. However, practical feasibility, extra costs and the added administrative operations, for a procedure which follows systematic instead of spot checks are a concern. The perceived added value of shifting liability was apparently not considered very important by the survey respondents. The new procedure could be successful if it can be proven that costs and administrative burden for installation companies and other involved parties will be negligible. The most significant result was that the majority of stakeholders believe that the new procedure needs a legal basis. Although a renewed legal obligation for completion checks seems not to meet the attitude of most politicians, this seems the only way to assure the quality of all installations of newly built houses.

Keywords: installations, completion, quality control, procedure, liability
1. Introduction

1.1 The issue

During the last decade the Dutch government has sought to deregulate the building industry. The Dekker Committee was charged with developing options for deregulation and a key focus of their attention was ‘trust’ and ‘responsibility’ among the stakeholders in the building industry. In a recent report (Ministry of VROM, 2008) on this matter, written by the Dekker committee, it was recommended the government should set only the framework for consistent and unambiguous regulations for the building industry. In this way administrative burdens are expected to decrease. Companies should take full responsibility for the services they offer and are therefore entrusted with. But if they breach this trust, harsh sanctions should be imposed. In this context, a return to a more compulsory based situation, i.e. found in countries surrounding the Netherlands, is not very likely.

The main research question for this paper is: Are private parties able to take their responsibilities for sound and safe installations and therefore maintain this trust? The research that is presented in this paper is based on the full report Opleveren van installaties in nieuwe woningen (Kroese et al., 2009) and can be regarded as an example of the consequences of withdrawing government enforcement with regard to quality control in the building industry, in favour of self control by market parties.

The Dutch Association of Installation Companies (‘Uneto-VNI’) regards the current situation, where there is only limited quality checks of installations of new housing (i.e. heating, plumbing, sewage, water, electricity and ventilation), as insufficient. Since the early ‘90s, public utilities do not check quality at completion and municipalities, which have a responsibility in this matter usually don’t have the staffing or knowledge to adequately perform this task. The increasing demands for comfort, health and energy efficiency puts even more emphasis on the quality of installations. There is growing concern that the lack of testing seriously affects the quality of new installations of housing and increases the risks of accidents, unhealthy and inefficient installations. The aim was to develop a view on the usefulness and necessity of a standardized procedure for the formal completion of installations of new houses.

1.2 Research framework

The research was commissioned by Uneto-VNI. It consisted of a look into previous recent studies on the quality of installations of existing housing stock and other research on new housing. This is presented in part 2. Furthermore, the history and current quality assurance of new installations was examined. This is presented in part 3. In part 4 the way Belgium, Germany and the UK handle quality control of new housing installations is presented. Based on lengthy discussion meetings with a guidance committee, comprised of installers, contractors, experts of Uneto-VNI and the Ministry of Housing, Spatial Planning and the Environment (VROM), a new procedure for the formal completion of installations was developed. This is presented in part 5. The proposed procedure was then presented to contractors, installers, property developers and housing associations by means of an
expert meeting and an internet survey to determine the support for such a procedure. The results of these surveys are presented in part 6. The conclusions follow in part 7.

2. Research on quality of and risks associated with installations

To start off our research, we looked into previous studies conducted on this subject matter. Based on assumptions that the quality of installations has deteriorated in recent years, due to the cessation of quality control by public utility companies and more DIY work by home owners on installations, the Ministry of VROM commissioned two studies (PRC Bouwcentrum, 2003, PRC/ABF Research, 2007), investigating the quality and risks associated with installations in houses. These research projects investigated mostly gas and electricity installations of a sample of the existing stock. Therefore they did not give information on the quality of installations of recently built houses. But installers, interviewed for both reports, indicated that the quality of new installations in mass production houses has deteriorated in recent years, due to the use of cheaper materials and a lack of professional skills.

In a study (Bureau Nieman, 2007) commissioned by the Ministry of VROM, 154 new houses in 78 different projects were checked on indoor environmental quality. Also the realised installations were compared with the installations in the design plans. The researchers concluded that in some occasions requirements on ventilation facilities were not met: In 20% of the researched houses the requirements on the supply of air were not met, in 50% the removal of air was insufficient. Furthermore, in 48% of the projects there was no instruction manual available. The safety of electricity and gas installations was found to be sufficient. In 90% of the houses the noise made by mechanical ventilation was louder than considered reasonable in the Standard for Sound-proofing in Dwellings (NEN 1070: Geluidwering in woningen). In nearly all of the researched houses the quality of tap water was unsatisfactory, because of high levels of heavy metals and microbes. But there were no acute health risks reported. In a letter based on this and other research, sent to parliament from the minister of Housing, Spatial Planning and the Environment, similar conclusions regarding installations were drawn.

3. Quality assurance

3.1 Introduction

Until the early nineties, public utility companies supervised the quality of newly built installations in houses in the Netherlands. They checked the quality of new installations before supply of gas and electricity started. An adequately working system existed in which a big role was played by the federation of energy suppliers (Energiened) who checked new installations and the recognised installers, who had the necessary skills. Professional skills were promoted by the requirements in the
Establishment Act (*Vestigingswet*), which regulated the establishing of a business. But through the 1990’s, there were two important developments:

- The privatization of public utility companies meant that they began to greatly reduce their inspection system for new housing installations. Municipalities, who are formally responsible for this task in accordance with the Housing Act\(^1\) (*Woningwet*), did not take over.

- Grid management companies disputed their involvement in the management of recognised installers. Furthermore, in 1996 the requirements regarding professional skills for installers were dropped from the Establishment Act. In 2007 the act was completely abrogated. From that moment on, establishing a business (i.e. an installer company) was no longer controlled by legislation.

Following these developments, quality control of installations and installers is no longer established by legislation nor is it the preserve of a single designated responsible authority. The public law system was partly replaced by method of self verification: recognition and, by private law regulations, certification. Quality assurance was now the responsibility of the installers.

### 3.2 International developments of public and private responsibilities for building control

Control on the quality of installations is part of the systems of building control which are changing. Building control was originally performed by building authorities, but there is currently a trend towards the gradual privatization. The tasks assigned to private parties vary by country. Recent international comparative research on building control is quite scarce. Within this field, the OTB Research Institute for the Built Environment conducted a comparative study of building regulations and systems of building control in eight European countries (Meijer et al., 2002). The study showed a broad variety of organizational models for building control systems, with private parties playing an important role. The Consortium of European Building Control (CEBC) conducted a study on the building control systems in Europe (Mikulits, 2006). Information about 21 European countries was collected and analysed. The main conclusion was that there were fewer differences among the building control systems in the responding countries than had been expected. In nearly all countries private control elements were found at least as a means of delegating tasks to independent private experts.

Later, OTB conducted an analysis of the consequences of private sector involvement in building regulatory enforcement (van der Heijden, 2009). To support the analysis, the regulatory enforcement

\(^1\) Article 100, Woningwet
regimes of eight case studies in Australia and Canada were compared. One of the results was the identification of five types of building regulatory enforcement regimes.

Most recently OTB studied the systems in 34 European countries (Branco Pedro et al., 2010). Parts of the results of that study are included in section 4.4 of this paper.

3.3 Self verification by means of recognition and certification for Dutch installers

Currently, two recognition agencies for the installer companies exist, SEI and Sterkin. Installers can obtain SEI or Sterkin recognition by presenting themselves to the agency as employing at least one adequately skilled worker (proven by relevant diplomas) and having the proper equipment. Sterkin gives recognition for four disciplines: gas, water, electricity and heating. An installer can apply for one or more disciplines and after approval on skills and equipment, the installer is registered. After testing a new installation, the installer reports via a Sterkin website that the work is completed. After that, the installer receives a declaration of accordance, which can be presented to the client. Sterkin performs random checks on quality. However, announcing a finished installation costs a fee. Furthermore, the checks by Sterkin can reveal failures which cost money to repair. It is not likely installers associated with Sterkin will use this service a lot. SEI separates the following professional disciplines: gas, electricity, water, heating, ventilation, air conditioning, sewage and heat pump installations. Applying for SEI recognition is similar to Sterkin, with the addition that installers need to prove they the required publications regarding norms and standards. SEI does not perform random checks on completed works.

The Dutch Foundation for Construction Quality (Stichting Bouw Kwaliteit) defines certification as: a methodology, on the basis of which a certification institute (approved of by the Dutch Accreditation Council) announces the subject of certification meets the desired standard (Stichting Bouw Kwaliteit, 1997). The certification seal for installers is called KOMO Instal and its based in the National Assessment Guideline BRL6000. This BRL 6000 is a system of certified quality assurance systems, recognised by law. This means the content of the BRL 6000 is carefully tested against relevant installation requirements in the Building Code. It offers therefore the opportunity for recognition by public law. The BRL 6000 is an umbrella guideline. The general part contains the requirements for the design, installing and maintenance that all installations should meet, regardless of the type of installation. Besides that, there are specific clusters of installation types, which are further divided into more detailed types (Bijzondere Delen) of installations which companies can choose to be certified for. The contract with a certification institute is concluded for at least three years. A year after the contract is lent, the first audit takes place and this is repeated every year. The audits are split between an organisational audit and a project audit, where the quality of the new installations is checked. A special but similar certification regulation exists for professional heating systems (power > 100kW), called SCIOS.

An important conclusion after assessing the Dutch recognition and certification regulations is the fact that they are based on voluntarism. Installers who want to start a business have no obligation to apply
for either recognition or certification. Recognition and/or certification performed by the private sector are therefore not watertight systems of quality control. Furthermore, the guidance committee reported that contractors almost never specifically ask for either registered or certified installers to work on their projects.

### 3.4 General terms and conditions

At lot of installers adopt general terms and conditions for their work, in which some aspects of testing, completion and liability are written down. For this research three of them were examined.

The Uniform Administrative Terms and Conditions – Technical Installations (UAV-TI 1992) is based on the more general Uniform Administrative Terms and Conditions for construction (UAV 1989), which is commonly used in the Netherlands by contractors for works. An important addition to the UAV-TI is article 8a (testing). It states that testing is done to assess the quality of the installation. But testing is only done if this was agreed on by the parties involved.

The ‘General Terms and Conditions for Installing Companies’ (Algemene Leveringsvoorwaarden Installerende Bedrijven, ALIB 2007) drawn up by Uneto-VNI, speaks of testing and laying down the results in testing reports in articles 3 and 9, but only when this was agreed on between the installer and the client. It is not known how often this is the case. It is also not known how often testing is done even if it was agreed on. Article 16 states that after completion the contractor is no longer liable, unless the defects were the contractors fault, the client has not noticed the defects before completion and if the client at the completion moment reasonably has not noticed the defects. A similar document exists for consumers: General Terms and Conditions for Installations for Consumers (AVIC 2006). These are mandatory for members of Uneto-VNI. Completion is mentioned in the Terms, but nothing is mentioned about testing the finished installations. Any imperfections after completion are to be corrected within guarantee terms set in these General Terms.

### 4. Quality assurance in other EU countries

To place the Dutch situation in an international context, we looked at quality assurance of heating, gas and water systems of new houses in Belgium, Germany and the UK. In general, in these countries it is mandatory to show a certificate which proves the installation was completed by a certified installer, before delivery of gas, electricity and water starts. Inspection of the installation can also be part of completion checks as part of the overall building control system. An overview of countries that require a completion check is included in section 4.4.

#### 4.1 Belgium

In Belgium, officially every owner of a newly built home must be able to produce an electricity file containing a test report. Delivery of gas in new homes is only allowed if a certificate of accordance
can be produced. In Flanders, a biannual test by a certified installer, of existing gas installations (power exceeds 20 kV, according to article 8 of the EPDB) is mandatory. The delivery of tap water can only start after a test and a certificate of a positive result. Testing can be performed by the local water company or an authorized testing agency.

### 4.2 Germany

In Germany, every state is responsible for their building legislation, but when compared the legislation is very similar. In every state it is mandatory to present proof that all installations meet the legal requirements and are completed and checked by registered installers. Technical requirements on installations are established in public law documents (the building codes of the state and German standards). Before an installation is connected to the grid, the installer notifies on a standard form that the installation is built and connected according to legal requirements. The public utilities act as the enforcers. The same rules apply for fundamental changes on existing installations. Inspections on existing installations are recommended by a number of organisations, but it is unclear if there is any legal basis for enforcing this.

### 4.3 United Kingdom

In the UK, all new houses are checked regularly at certain moments during construction. When the results are approved by the Local Authority Building Control, a free certificate of completion follows which ‘proves’ installations to be safe. Next to this general certificate, extra requirements on installations exist. The electrical systems in a new home need to be conform to part P (Design and Quality of Electrical Installation) of the Building Code. The work should only be done by certified and registered installers. The Gas Safety and Use Regulations (public law) set the standards on the safety, maintenance and use of gas installations in new and existing buildings. Every installer who works on gas installations needs to be registered by an umbrella registration organisation. Social and private landlords have an obligation to do a yearly check on safety, done by registered installers. The Water Supply (Water Fittings) Regulations 1999 set the standards for the design, installing and maintenance of plumbers work, tap water and sanitation installations. Local water companies enforce these regulations. For the installation and replacement of warm water and heating systems, bathrooms, toilets and washing facilities a similar Self Certified Scheme is in place.

### 4.4 Completion certificates

Once the construction work is finished, the building authorities are notified in most countries (Branco Pedro et al., 2010). A final site inspection is usually conducted by the building authorities and other authorities. If problems are found, the building authorities specify the corrective measures to be undertaken. If satisfied with the final site inspection, the building authorities issue or approve a document that certifies that the construction was completed successfully (i.e. a completion certificate) or can be used for the intended purpose (i.e. a use permit). In some countries, the building
authorities rely on declarations by the private parties that conducted the building work or the site inspections, and they do not perform a final site inspection. According to the information that has been gathered to date, public parties conduct final site inspections for all types of buildings in the majority of the EU countries (Table 1). In almost all the remaining countries, the final site inspection is required only for certain types of buildings, usually those that are open to the public.

Table 1: Who conducts the final inspection, if required? Source: Branco Pedro et al., 2010

| Building authority | Austria | Belgium | Bulgaria | Cyprus | Czech Republic | Denmark | Estonia | Finland | France | Germany | Greece | Hungary | Ireland | Italy | Latvia | Lithuania | Luxembourg | Malta | Netherlands | Norway | Portugal | Romania | Slovakia | Slovenia | Spain | Sweden | United Kingdom |
|--------------------|---------|---------|----------|--------|----------------|---------|---------|---------|-------|--------|--------|---------|---------|-------|-------|------------|------------|-------|-------------|---------|---------|---------|---------|---------|-------|
| Not required        |         |         |          |        |                |         |         |         |       |        |        |         |         |       |       |            |            |       |              |         |         |          |         |         |       |       |            |            |
| No information      |         |         |          |        |                |         |         |         |       |        |        |         |         |       |       |            |            |       |              |         |         |          |         |         |       |       |            |            |

5. Proposal for a procedure for the completion of new installations

In order to make sure a hundred per cent of new installations of houses are tested in a uniform and transparent way a procedure was developed. This standard procedure should become commonplace and used to test and complete all installations, not at random. Part of the procedure is laying down the test results in a test report. The content of this report demonstrates the installations meet both the requirements of the Dutch Building Code and the specifications of the client. Fine-tuning of heating and ventilation system also needs to be taken into account. Preconditions to the new procedure were:

- It should be simple and transparent;
- It should be reliable;
- No new legislation;
- No extra paperwork for clients, owners and government;
- No or very little extra paperwork for installers working with the general terms and conditions of the UAV-TI and/or installers who are certified.

When an installer completes his work, with standardised tests, and hands it over to the client, liability shifts mostly from the installer to the client or owner. Completion in this case means the installer demonstrates adequately that the work complies with the requirements. If there were to be problems with (parts of) the installations, the owner or client has to demonstrate these problems were caused by negligence of the installer. A reference to the definition of completion in the Dutch Civil Code can be found as follows:

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\[\text{Article 758, book 7 (Specific Contracts I), Dutch Civil Code}\]
strengthen this procedure. Following the above considerations and discussions with the guidance committee, a new procedure was considered and the proposal consists of the following steps:

1. The installer and client establish in the contract which parts of the installations will be tested before completion
2. The standards of the installations are determined by the requirements of the client, but also includes the minimum standards determined in the Building Code
3. The installer lays down the results of the tests in an (electronic) document, called ‘test report installations new houses’
4. The test report is made available to the client, i.e. by means of a website
5. The installers provide instruction manuals and maintenance manuals, and makes sure these are available to either the client or the owner or user of the installations
6. The installer lays down the test results with regards to the public law part (Building Code) in a public database, which is accessible for anyone.

The aim is not to develop new recognition and/or certification regulations or to add to existing legislation. The existing systems of quality assurance should be maintained and operate alongside the proposed procedure. It is important to note that first and foremost the installer is and will be responsible for the testing and therefore the quality of his work. The supervision of an independent third party outside and inside the existing quality control systems could be researched in the future.

The test reports are to be based on existing and proven testing methods and should contain the necessary basic tests to assess sufficient quality. A computerised consistency check of the results and measurements can enhance the quality of the test reports.

It is really important that the users of the new installations are well informed on how to use the installations correctly. An explanation at the site for first time users, to be repeated after a certain period (i.e. when autumn starts) is also important.

The procedure does not contain a repeated test or fine tuning of the installations after a period of time. But sometimes the correct functioning can only be assessed after using the installations for some months or at the start of the colder seasons. Of course retesting can be agreed on in the contract. It can also be connected with the maintenance and service terms in the aforementioned General Terms and Conditions (UAV-TI).

6. Support survey

In order to determine the support for such a procedure, an expert meeting was organised and an internet survey was held. The expert meeting was attended by contractors and consumer organisations. Housing associations and property developer associations were consulted through writing. They were asked about their opinion about the current situation. The experts at the meeting agreed that the current situation is unsatisfactory, but they estimate the proposed extra tests are very costly. The customer or dweller is considered most important by the experts Safe installations should
be guaranteed and user friendly instructions should be provided on the optimal functioning of installations. The experts don’t see how Uneto-VNI can contribute in this matter. The experts agreed testing and consequently the costs should be established in the contract between parties.

The internet survey on how the proposed procedure was judged was sent to four categories of respondents: installers (38), housing associations (8), contractors (7) and property developers (15), at a total of 68. Only installers (6) and property developers (7) responded, but they confirmed the findings from the expert meeting: they are aware of the quality issues and regard the proposed procedure as useful. At the same time they are concerned for the increasing or additional costs and stress the need for legislation to: 1, ensure the actual use of the procedure and 2, to ensure uniformity of contracts to discourage unfair competition.

7. Conclusions and recommendations

7.1 Conclusions

If we look at the research question (Are private parties able to take their responsibilities for sound and safe installations and therefore maintain this trust?) the study illustrates that the currents systems of quality control of new installations of homes in the Netherlands, partly set up by the private parties involved, are not watertight.

If we look at more detail to the case study, it can be concluded that many parties involved in policy making, building, construction and installing are aware of the problems with new installations and endorse the necessity of a standardized and formalized completion of new installations of houses. However, there is doubt whether the proposed procedure will be widely accepted and applied by the parties involved. Main objections include the extra costs and administrative burden. At the moment tests of new installations are rarely performed or only when it was agreed on and laid down in the contract (i.e. with application of general terms and conditions of installers). The proposed procedure proposes a hundred per cent check of new installations, which brings extra costs.

To increase the chances of the new procedure being broadly used in the future, some steps need to be taken. To conclude our research, a number of recommendations were made. These include promoting and facilitating the new procedure, stimulating awareness that the owner is foremost responsible for the quality of their homes and therefore the installations. Government and branch organisations are most suited for these tasks. Independent supervision on the self control should be researched further; an at random check of completed installations by a third party, when an installer is not certified for that particular type of installation, could be an option.

The most important result was the remark of most stakeholders involved in the discussions that an overall application of the new procedure needs a legal basis. Although a renewed legal obligation for completion checks does not seem to meet the attitude of most politicians, it seems the only way to assure the quality of all installations of newly built houses.
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Modernising Construction Contracts Drafting – A Plea for Good Sense

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Abstract

Construction contracts users may be grouped into primary and secondary users. Primary users are those who would use the contract on a day-to-day basis including: (i) parties to the contract such as the client, contractor, and subcontractor, and (ii) the party administering the contract. Secondary users are occasional users such as lawyers, mediators, adjudicators, arbitrators, and judges who may be involved when disagreements arise. Construction contracts must be drafted in a style that suits both user groups. Unlike secondary users, primary users are unlikely to be legally trained. Modern legal drafters call for documents to be written in plain language. They assert that it is possible to write legal documents in plain language without losing legal intent. We critically examine the drafting style of construction contracts from several commonwealth jurisdictions and compare them against plain language drafting styles. We also compare “before and after” examples to establish the potential benefits of plain legal drafting. Many published standard forms of construction contracts are still written in complex traditional style. Typically there is redundant legalese, long and convoluted sentences, and multiple cross-references. And many do not comply with modern practices such as gender-neutral drafting. We find plain legal drafting is practically achievable in construction contracts - without compromising legal intent but we would caution against overdoing it to prevent legal issues on interpretation. Some jurisdictions publish plain language guidelines and adopt them in statutory drafting. But we found no equivalent being used by construction contracts drafting bodies. We conclude with a plea for good sense in drafting construction contracts. We recommend a model set of plain language drafting guidelines for construction contracts be developed and adopted. This may be used when amending existing contracts and when drafting new contracts. Drafting contracts based on such guidelines can result in greater clarity to primary and secondary users, more efficient contract administration, and reduce unwarranted disputes. Drafters’ thought-process would be clearer, enabling them to allocate risk more clearly. Drafting bodies can continue to maintain their freedom on conceptual approaches in allocating risk between contracting parties.

Keywords: construction contracts, construction industry, contracts drafting, modern legal drafting, plain language drafting guidelines
1. Introduction

1.1 Construction contracts

Construction contracts form the basis of contractual relations among parties to construction projects. They include (i) main or head contracts between clients and contractors, and (ii) subcontracts between contractors and subcontractors or between subcontractors and sub-subcontractors. These contracts, particularly the main or head contracts are commonly based on published standard terms of construction contracts.

1.2 Primary and secondary users of construction contracts

Many of the standard terms of contracts provide for the contract to be administered by a third party. In this paper we refer to the third party generically as contract administrator.

The parties to the contract and the contract administrator form the core people that would use the contract on a day-to-day basis. We call them the primary users. It is important that the parties to the contract fully understand the contract including their rights and obligations under them. Equally importantly, the contract administrator must understand and administer the contract based on the express provisions of the contract and what may be implied in law. An important example of an implied term imposed on a contract administrator - whether or not expressly stated in the contract - is the obligation (when exercising certain decision-making functions like certification of payment) to administer the contract in a fair and independent manner.\(^1\)

Whilst the contract administrator would usually have some construction related background and is expected to have sufficient knowledge of construction contracts and aspects of construction law, the contract administrator is not expected to be (and is usually not) legally qualified.

If disagreements arise under the contract and they evolve into a formal dispute, others like lawyers, claims consultants, party representatives, mediators, adjudicators, arbitrators, or judges may be involved. We call them secondary users. Secondary users are occasional users who are only involved when there are disputes to be resolved. They are usually interested in the legal interpretation of the contract.

\(^1\) *Canterbury Pipe Lines Ltd v Christchurch Drainage Board* [1979] 2 NZLR (CA)
1.3 Construction contracts and drafting style

Construction contracts must be drafted to serve both primary and secondary users’ needs. They must be clear enough for the contract administrator and parties to the contract to understand their duties in administering the contract and their rights and obligations under the contract. And they must be capable of clear contractual interpretation if a dispute arises.

The drafting styles to cater for the needs of these two groups of users’ need not be different. Some contracts are drafted in traditional legalese, and have explanatory notes or guides in plain language. The assumption here may be that it is not possible to effectively express legal concepts in plain language. Butt (2005) dispels this as a myth, and goes further in suggesting that plain legal language even saves money. He says there is now over 20 years of research on the topic of plain language in law. He encourages the construction industry to consider using plain language and reassures:

The evidence is overwhelming. Plain legal language brings substantial benefits. It would bring those benefits to the construction industry. Carefully used, plain language is legally safe; it saves time and money; lawyers and non-lawyers alike have a better chance of understanding it; and most judges prefer it. (Butt 2005, p.9)

Thus plain language should be seriously considered when drafting construction contracts.

2. Modern plain legal drafting

2.1 What is plain language?

Before analysing and considering the use of plain language, we must first ask what plain language is. Much has been written about plain language and plain legal language. See for example Eagleson (1990), Garner (2001), Asprey (2003), Cutts (2004), Painter (2005), Kimble (2006), Butt and Castle (2006), and Adler (2007). In essence plain language means writing that is “clear and effective for its intended audience” (Butt and Castle 2006, p.113) and writing that is straightforward, and “avoids obscurity, inflated vocabulary and convoluted sentence structure” and “using only as many words as are necessary”, (Eagleson 2010). All these make it easier for the audience to understand what the writer intended.

Garner suggests the fundamental principle is that „anything translatable into simpler words in the same language is bad style.” He defends this strict principle, by saying „that may sound like a facile oversimplification that fails when put into practice – but it isn’t and it doesn’t.” (Garner 2001, p.662).
2.2 Modern legislative drafting guidelines

In support of modern plain legal language there are now legislative drafting guidelines which advocate plain legal drafting. See for example the New Zealand’s Parliamentary Counsel Offices” (PCO) drafting guideline (Parliamentary Counsel Office 2009) and Australia’s Office of Parliamentary Counsel Plain English Manual (Office of Parliamentary Counsel 2003). Rule 3.12 of the New Zealand PCO drafting guideline (Parliamentary Counsel Office 2009, p.5) instructs, among others:

- Use the simplest word that conveys the meaning
- Eliminate unnecessary words
- Do not use archaic language
- Always use gender-neutral language

Australia’s Office of Parliamentary Counsel’s Plain English Manual states their aim of plain English drafting in Chapter 1, Paragraph 10: „to simplify all official writing by removing unnecessary obscurity and complexity” (Office of Parliamentary Counsel 2003, p.5). Their commitment to plain English takes a wide approach in Paragraph 11: „The Office policy is to draft in plain English, but to do more than that. It is to develop a whole art of making laws easy to understand” (Office of Parliamentary Counsel 2003, p.5).

These statutory drafting guidelines are comprehensive. We did not find any comparable plain language drafting guidelines published by any of the construction contracts drafting bodies.

2.3 Common traits of modern plain language

In addition to plain language parliamentary drafting office guidelines, many modern legal writers advocate various plain language guidelines. For example, Painter (2005) lists 40 „rules” in his book The Legal Writer: 40 Rules for the Art of Legal Writing. There are many common traits suggested by plain language experts. We list below a small selection of some of them.

2.3.1 Average sentence length

Plain language experts suggest sentence length should be around 20 words per sentence. For example, Painter (2005, p.66) suggests an average of 18 or fewer. This is the suggested average. Sentences could have more than 20 words – if it communicates clearly. Raj et al analysed and concluded that the average length of sentence in the FIDIC White Book has increased from 32 in the 1990 edition to 34 in the 2006 edition. They then acknowledge that „most style guides recommend much shorter sentences because it is widely accepted that shorter sentences are easier to understand.” (2009, p.218). Even instructions to authors of quality journals such as the Construction Management and Economics suggest simple, short sentences make better communication (Construction Management and
Economics, 2010): „Simple language, short sentences and a good use of headings all help to communicate information more effectively.”

The easiest way of reducing the average words per sentence is to break up long sentences into shorter ones using the period or full stop. Listing and the use of numbering also help break up sentences to present them more effectively. Long sentences make reading difficult. Berry (2009, p.38) explains:

One of the major reasons why readers of legislative documents have difficulty in understanding them is that long and complex sentence structures overtax the cognitive capacity of the short-term memory.

2.3.2 Legalism

All modern legal drafters suggest legalism such as whereas, hereinbefore, hereinafter, desirous, said, and the said are unnecessary. Some suggest redundant doublets be omitted, for example, Butt and Castle (2006, p.27) suggest void alone will do instead of null and void – except possibly if used in bijural countries such as Canada.

Other phrases to be avoided include „subject always”, „provided always” and „and/or”. These phrases are not straightforward and require readers to undertake some analysis before the clause could be understood.

Genuine „terms of art“ may of course be maintained, but these are generally only few. One study of a real-estate sales agreement by Benson Barr, George Hathaway, Nancy Omichinski and Diana Pratt, „Legalese and the Myth of Case Precedent” (1985) 64 Michigan Bar Journal 1136-1137, quoted in Kimble (2006, p.11) found that only about 3% of the words had significant legal meaning based on precedent. In construction contracts this is estimated to be much less than 3% (Ameer Ali, 2008b, p.16). He suggests a few possible terms of art in a construction contract: „reasonable skill and care, fitness for purpose, collateral warranty, regularly and diligently, time is of the essence, practical completion, liquidated damages, bills of quantities, provisional sums, loss and expense, and termination of the contractor’s employment.”

2.3.3 Plainer words preferred over more complex words

Plainer words are preferred over more complex words. For example: use is preferred over utilise, terminating or ending a contract is preferred over determining a contract.

2.3.4 Consistent use of words

Words should be used consistently, and preference should be given to words with a unique meaning over words with multiple meanings. The first part may be best expressed as: „Never change your language unless you wish to change your meaning, and always change your language if you wish to change your meaning” (Aitken and Butt 2006, p.19), crediting Jeremy Bentham as originating this
drafters golden rule. For example, the word determination has multiple meanings, so termination or ending is preferable when used in the context of bringing a contract to an end.

Shall is commonly used throughout traditionally drafted construction contracts. But shall is rarely used in a consistent manner. Depending on context, shall has multiple meanings beyond meaning the imperative must. Modern legal writing experts have identified many more meanings of shall. For example, in addition to must and may, Butt and Castle (2006, pp.131-132) identify shall to mean giving a direction, stating circumstances, negating a right or duty, expressing an intention, stating a condition precedent, or stating a condition subsequent. In writing about avoiding shall, Garner (2001, p.939) suggests a word that has multiple meanings, even in midsentence, „runs afoul of several basic principles of good drafting”. Professor Kimble (Kimble 2006, p.159) is more direct and concludes, „give shall the boot”. Their advice, paraphrased in my words: shun shall.

2.3.5 Redundant parenthetical numerals

Omit redundant duplication through parenthetical numerals like fourteen (14). With the advent of printed and typed text, this practice serves no purpose. Worse still the words and numbers could be in conflict - leading to unnecessary legal arguments.

2.3.6 Multiple cross-referencing

Cross-referencing may be inevitable in long and complex contracts but multiple cross-referencing should be limited. This might sometimes mean inferring interpretation from reading the contract as a whole or repeating contractual provisions. Whilst plain language often results in shorter documents than those written in traditional legal language, clarity should take priority over brevity. An appropriate balance would serve the parties best.

2.3.7 Active and passive sentences

Active sentences get the message across more directly and efficiently using fewer words. „The contractor must submit a programme” is written in active style and is more direct and uses six words. „A programme must be submitted by the contractor” is written in passive style and has eight words (33% more than the active style). When writing on reducing complexity of legislative drafting, Berry (2009, p.68) discusses the use of active and passive sentence structures then concludes:

In sum, the research suggests that legislative counsel should, as a general rule, draft legislative documents in the active voice. Writing experts and research studies both support the general value of active sentences for understanding.

2.3.8 Gender-neutral drafting

In addition to the actual style of words, proponents of modern plain language suggest documents should be written in line with modern approaches and structured for ease of reading and comprehension. Among these would be gender-neutral drafting. The least preferable way to achieve
this is to use he or she, his or her, him or her, or she or he, her or him, or her or him. Using the plural, rewording in the passive, and repeating the noun enable gender-neutral drafting without the cumbersome he or she.

2.3.9 Lists and numbering

Using listing and numbering helps break paragraphs into more readable shorter sentences.

2.3.10 Headings, sub-headings, font type, font size, and use of white spaces

The use of headings, sub-headings, appropriate font type and size and white space around paragraphs can all make an impact on readability.

3. Applying modern plain legal drafting style to published standard construction contracts

In this section, we have taken examples from published standard terms of construction contracts found in several commonwealth jurisdictions, and discuss the application of plain language to construction contracts. We do this by comparing examples of traditional drafting with re-drafts and through examples from contracts that are in plain language.

3.1 Joint Contracts Tribunal (JCT) contracts

The most recent suite of the JCT contracts published in the UK has had much publicity. Showcasing projects between GBP 40 million and GBP 80,000.00, it has been referred to as being versatile (JCT 2010a, p 1). Neil Gower, chief executive of JCT claims „JCT has been setting the standard in construction contracts for almost 80 years” and that they continue to „strive to ensure” the contracts are „up-to-date” (JCT 2010b).

The JCT Standard Building Contract (JCT 2007a) has been said to be the „industry standard” against which all others are measured” (Murdoch and Hughes, 2008, p 106). A survey of contracts used in 2007 (RICS, 2007, p 13) showed the JCT contracts were used on 79.3% of the number of projects from the respondents to a survey. This was followed by the New Engineering Contract (7.7%) and GC/Works contracts (6.1%).

Historically many other jurisdictions such as Hong Kong and Malaysia had used the earlier JCT documents as a base, but which have now conceptually evolved in their own ways. The traditional drafting style has however generally remained.

The JCT revisions over the years have focused on addressing the way risks are allocated between the parties and how up-to-date technical provisions are incorporated in the contracts. In addition, there has been some refinement on the drafting style. For example, the word „determination” which has
multiple meanings has now been replaced with „termination” and the phrase „extension of time” has now been rephrased „adjustment of time” as the duration for completion could be reduced. Much of the drafting style is however still traditional and not in plain English. Consider, for example, the following.

### 3.1.1 JCT Standard Building Contract

Clause 4.14 from the JCT Standard Building Contract (Joint Contracts Tribunal 2007a, p.53) reads:

> Without affecting any other rights and remedies of the Contractor, if the Employer, subject to any notice issued pursuant to clause 4.13.4, fails to pay the Contractor (including any VAT properly chargeable in respect of such payment) by the final date for payment as required by these Conditions and such failure continues for 7 days after the Contractor has given to the Employer, with a copy to the Architect/Contract Administrator, written notice of his intention to suspend the performance of his obligations under this Contract and the ground or grounds on which it is intended to suspend the performance, then the Contractor may suspend such performance until payment in full occurs.

This is a 112-word sentence with a Flesch Reading Ease score of 0. Whilst it can be understood after several reads, by re-drafting and re-arranging the clause and using listing or numbering, readability improves. Consider this re-draft:

4.14.1 Subject to any notice issued by the Employer under clause 4.13.4, if the Employer fails to pay the Contractor (including any VAT chargeable), by the final date for payment under these Conditions, then the Contractor may suspend performing his obligations under this Contract until full payment is made, if:

4.14.1.1 the Contractor has given to the Employer written notice of his intention to suspend performing his obligations under this Contract, with a copy to the Architect/Contract Administrator;

4.14.1.2 the Contractor has stated the appropriate grounds in the notice; and

4.14.1.3 such failure continues for 7 days after the Contractor’s written notice.

4.14.2 The Contractor’s other rights and remedies are not affected.

The total number of words has decreased only slightly but clarity has improved – at least on the sentence structure and the Flesch Reading Ease score (now 7.2). If this were accepted as having the same meaning as the original, then the re-draft serves the intended primary audience better.

These improvements were achieved by applying only some of the modern legal drafting guidelines. A complete review would see the clause drafted in gender-neutral style without any reference to „his” and the longish Architect/Contract Administrator shortened to just one or two words omitting the
virgule or slash (/) but maintaining legal intent through appropriate definitions in the definitions section or the articles of agreement. This can be done assuming there are no extrinsic reasons such as „political” or diplomatic reasons for maintaining the term „Architect/Contract Administrator” throughout the entire contract. The cumulative effect of using these modern drafting styles when re-drafting across the entire contract can be significant.

**3.1.2 JCT Design and Build Contract**

There are other similar examples that could be given from within the JCT suite. The survey of contracts in use in 2007 (RICS, 2007, p.19) suggests Design and Build contracts take up a significant portion of market share as a procurement route, and the JCT Design and Build contract accounts for 19% of all contracts used and „the proportion by number is the highest figure ever recorded”. Given its relative popularity, we have taken our next example from the JCT Design and Build contract.

We chose clause 2.17.1 on design work liability for two reasons: (i) this is a major distinguishing feature from the traditional contracts, and (ii) the 134-word sentence typifies similar design liability drafting style in other standard terms of construction contracts within the UK and far beyond such as the those found in Malaysia. The similarity of these clauses reflects the „boilerplate” or cut-and paste approach that is common in construction contracts drafting. It also shows modern drafting style guidelines are rarely used when drafting construction contracts.

Clause 2.17.1 (Joint Contracts Tribunal 2007b, p.32) reads:

> Insofar as his design of the Works is comprised in the Contractor’s Proposals and in what the Contractor is to complete in accordance with the Employer’s Requirements and these Conditions (including any further design required to be carried by the Contractor as a result of a Change), the Contractor shall in respect of any inadequacy in such design have the like liability to the Employer, whether under statute or otherwise, as would an architect or, as the case may be, other appropriate professional designer holding himself out as competent to take on work for such design who, acting independently under a separate contract with the Employer, has supplied such design for or in connection with works to be carried out and completed by a building contractor who is not the supplier of the design.

This has 134 words in a single sentence, and has a Flesch Reading Ease score of 0. The equivalent design obligation clause found in clause 10(2) Alternative A of the GC/Works/1 Single Stage Design & Build contract (Property Advisers to the Civil Estate 1998, p.19) and that found in clause D1(b) under option module D of the CIDB contract (Construction Industry Development Board Malaysia 2000, p.107) are similar in style.

The essence of clause 2.17.1 (and the equivalent in the GC/Works/1 and CIDB contracts) is:

> The Contractor owes a reasonable skill and care obligation for design, as would a professional appointed independently. [17 words]
That has been the intended meaning for decades – since the Bolam\(^2\) days, but the JCT clause stop short of making plain what the current standard of care for design is. The NZIA Standard Conditions of Contract (New Zealand Institute of Architects 2009, p.16) stipulates a similar design obligation in 14 words (and a Flesch reading Ease score of 41.5) in the first part of clause 8.6.5:

The Contractor must carry out all Contractor design with reasonable care, skill and diligence.

It may be that the JCT contract drafters wanted to ensure the clause is flexible enough to cater for changes in the standard for design obligation of professionals. Even if this flexibility were to be preserved, the essence of the 134-word sentence can be captured in 23 words:

The Contractor has the same liability to the Employer for design, as would any other appropriate professional designer appointed separately by the Employer.

Judges have long criticized the JCT contracts with strong words like "Afarrago of obscurities"\(^3\) and that they contained among the most obscurely and ineptly drafted clauses in the United Kingdom\(^4\). It appears, whilst the JCT has partly responded to some of these judicial criticism, there is a notable advice that remains unheeded. Putting aside the accusation that it was deviously drafted with what in parts can only be a calculated lack of forthright clarity" Sachs LJ suggested in the Bickerton case:

*The time has come for the whole to be completely redrafted so that laymen – contractors and building owners alike – can understand what are their own duties and obligations and what are those of the architect.*\(^5\)

We would however caution against overdoing to prevent loss of legal intent. For example: „the Contractor must be careful when designing“ does not carry the same legal meaning.

Perhaps what needs to be done is to maintain the negotiated concepts and the technical refinements found in the current JCT contracts that have been introduced over the years, but to re-draft the contract in plain English, heeding modern legal drafting styles - some of which are highlighted in this

\(^2\) *Bolam v Friern Hospital Management Committee* [1957] 1 WLR 582, CA

\(^3\) *English Industrial Estates Corporation v George Wimpey & Co Ltd* [1973] 1 Lloyd’s Rep 118, CA at 123

\(^4\) *Peak Construction (Liverpool) Ltd v McKinney Foundations Ltd* [1970] 1 BLR 111, CA at 114

\(^5\) *Bickerton & Son Ltd v North West Metropolitan Regional Hospital Board* [1969] 1 All ER 977, CA at 979
paper. But that won’t be easy. The creator of the Flesch Reading Ease himself, Rudolf Flesch, warns (Flesch 1979, p.2):

Legalese is worse than smoking cigarettes. To kick the habit is extremely hard. So don’t kid yourself. If you want to write plain English, you’ll have to learn how. You’ll have to study it as if it were Spanish or French. It’ll take much work and lots of practice until you’ve mastered the skill.

3.2 GC/Works/1 contracts

Apart from the dominance of the JCT suite of contracts, the survey of contracts used in 2007 (RICS, 2007, p 13) shows the GC/Works contracts accounted for 6.1% of the total number of contracts. The publisher of the GC/Works contracts - the Stationery Office for the Property Advisors for the Civil Estate (PACE) did not refer to any plain language drafting guidelines used, but do make a claim on having adopted plain English for the suite of contracts. The PACE Information Note 26/99 (Property Advisers to the Civil Estate, 1999, p.2) claims:

The contracts are written in plain English and are accompanied by a comprehensive commentary. This ensures that users are able to easily interpret and understand the general conditions without the need to seek additional expensive legal advice.

Consider the following two clauses in the light of the claim that the contracts are written in plain English. Clause 8A(1) on professional indemnity insurance for design reads in a single 156-word sentence (Property Advisers to the Civil Estate 1998, p.18):

The Contractor shall maintain professional indemnity insurance covering (inter alia) all liability hereunder in respect of defects or insufficiency in design, upon customary and usual terms and conditions prevailing from the time being in the insurance market, and with reputable insurers lawfully carrying on such insurance business in the United Kingdom (in an amount not less than that required by the Abstract of Particulars) for any one occurrence or series of occurrences arising out of any one event, for a period beginning now and ending 12 years (or such other period as is required by the Abstract of Particulars) after certification under Condition 39 (Certifying completion) of the completion of the Works or the last Section thereof in respect of which completion is certified, or the determination of the Contract for any reason whatsoever, including (without limitation) breach by the Employer, whichever is the earlier, provided always that such insurance is available at commercially reasonable rates.

And clause 51 headed recovery of sums (Property Advisers to the Civil Estate 1998, p.47) is a 159-word sentence:

Without prejudice and in addition to any other rights and remedies of the Employer, whenever under or in respect of the Contract, or under or in respect of any other contract between the Contractor or any other member of the Contractor’s Group and the Employer or any other
member of the Employer’s Group, any sum of money shall be recoverable from or payable by the Contractor or any other member of the Contractor’s Group by or to the Employer or any other member of the Employer’s Group, it may be deducted by the Employer from any sum or sums then due or which at any time thereafter may become due to the Contractor or any other member of the Contractor’s Group under or in respect of the Contract, or under or in respect of any other contract between the Contractor or any other member of the Contractor’s Group and the Employer or any other member of the Employer’s Group.

Both score 0 on the Flesch Reading Ease scale. And contrary to its claim of having adopted plain English, neither clause can be said to comply with modern plain English drafting style suggested in this paper. Both clauses are not easily understood on first reading.

Such traditional drafting style is not unique to the United Kingdom. They are also found in other commonwealth countries that adopted the original British construction procurement systems. Here are some examples from Singapore.

### 3.3 Singaporean contracts

#### 3.3.1 Singapore building contract

The first part of clause 1(2) of the Articles and Conditions of Building Contract (Singapore Institute of Architects 2008) provides a basic provision relating to the difference between an Architect’s direction and instruction. It does so in one sentence. The gist of this clause can be re-drafted more clearly and more efficiently using shorter sentences and using sub-numbering. Consider the following comparison:

<table>
<thead>
<tr>
<th>Clause</th>
<th>Original</th>
<th>Re-draft</th>
</tr>
</thead>
</table>
| 1(2) In this Contract or when used by the Architect the term “direction” shall mean an order of the Architect (as opposed to suggestions, recommendations or agreements with proposals made by the Contractor), compliance with which will not under the terms of the Contract entitle the Contractor to additional payment or compensation or to an increase in the Contract Sum, but which may in some cases result under the terms of the Contract in a reduction of the Contract Sum, whereas the term “instruction” shall mean an order of the Architect, compliance with which, while it may in some cases involve... | 1.2.1 Direction means an Architect’s order for which the Contractor will not be entitled to additional payment or an increase in the Contract Sum.  
1.2.2 Instruction means an Architect’s order, which in principle will entitle the Contractor in appropriate cases to additional payment or an increase in the Contract Sum. |
a reduction of the Contract Sum, will in principle entitle the Contractor in an appropriate case under the terms of the Contract to additional payment or compensation or to an increase in the Contract Sum.

1.2.3 Both directions and instructions may in some cases result in a reduction in the Contract Sum.

<table>
<thead>
<tr>
<th>Total words</th>
<th>135</th>
<th>67</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average words per sentence</td>
<td>135</td>
<td>22.3</td>
</tr>
<tr>
<td>Flesch Reading Ease score</td>
<td>0</td>
<td>27.5</td>
</tr>
</tbody>
</table>

The total number of words in the re-draft is half of the original. The average number of words per sentence is now 22.3 - close to the recommended average of around 20. The Flesh Reading Ease score, which is one of the most commonly found readability formula, improves from 0 to 27.5.

We suggest the re-draft serves the users of the contract better. The numerical analyses additionally support our view. If a modern plain legal drafting guideline had been used, the original would have been re-drafted with greater clarity, shorter average words per sentence, and most likely fewer words. And all this is achievable without losing the original legal meaning.

The traditional drafting style is also common in other construction contracts in Singapore and in legislative drafting in Singapore. Ameer Ali and Wilkinson (2009) suggest that among nine jurisdictions that have introduced legislation affecting payment and adjudication in the construction industry, Singapore ranks among those with the most traditional style. They also conclude that retaining the traditional legislative drafting style is not "justified to a user who suffers the consequences of complex drafting style." (p.22)

### 3.3.2 Singapore Contractors Association Limited (SCAL) domestic sub-contract

Here is clause 6 on performance bond from the SCAL *Conditions of Sub-Contract for Domestic Sub-Contracts* (Singapore Contractors Association Ltd, 2005).

The Obligor agrees that its liability hereunder shall not be discharged, affected or impaired in any way by reason of any modification, amendment or variation in or to any of the conditions or provisions of the Sub-Contract or the works or reason of any arrangement made between the Sub-Contractor and the Contractor or by reason of any breach or breaches of the Sub-Contract, whether by the Sub-Contractor or by the Contractor, and whether the same is or are made or
occurs with or without the Obligor’s knowledge or consent. The Obligor further agrees that no invalidity in the Sub-Contract nor its avoidance, suspension or termination shall discharge, affect or impair its liability hereunder and that no waiver, compromise, indulgence or forbearance, whether as to time, payment or any other matter afforded to the Sub-Contractor under the Sub-Contract, shall discharge, affect or impair the Obligor’s liability hereunder.

Wydick (2005, p.3) writes about such style commonly found in legal writing:

We lawyers do not write plain English. We use eight words to say what could be said in two. We use arcane phrases to express commonplace ideas. Seeking to be precise, we become redundant. Seeking to be cautious, we become verbose.

Such legalism is common in this contract. It must be borne in mind that the primary users of this contract are the contractor and subcontractor – most of whom would not be legally trained and some of who might not have English as their first language.

Legalism can be avoided to ensure greater clarity to users of construction contracts and to prevent unwarranted inconsistency leading to legal arguments. A plea needs to be made – *a plea for good sense* in drafting construction contracts.

Apart from difficulty in understanding contract provisions, an added risk of long and convoluted sentences in legal drafting combined with multiple cross-referencing is the increase in the chances of errors, uncertain or inconsistent use of words. See the following examples from this contract.

### 3.3.2.1 Inconsistent terminology – termination of contract and termination of the contractor’s employment

Clause 45 refers to *terminating the Sub-Contract*. Clauses 46 and 47 refer to terminating the *employment* of the Sub-Contractor. In cross-referencing to clauses 46 and 47 clause 48 refers to *termination of the contract* instead of termination of the *employment* of the Sub-Contractor whereas Clause 49, when cross-referring to clauses 46 and 47 refers to terminating the *employment* of the Sub-Contractor.

Many construction lawyers distinguish *terminating the contract* from *terminating the employment of the subcontractor*. The JCT contracts consistently distinguish them. Even the authors of the SCAL contract themselves differentiate them in clause 51. And even if they are the same, or have the same effect, different words and phrases should not be used interchangeably. It goes against a basic rule of legal drafting - different words are taken to refer to different things, and the same words to the same things.

To further worsen the inconsistency, clause 51 introduces yet another variant. After referring to the *termination of the Main Contract* and the *termination of the employment of the Contractor*, it then refers to *determination of the Sub-Contract*. That word „determination“ has historically long been used in the JCT contracts and their many derivatives around the world. The word determination has
multiple meanings. It is best avoided. As part of improved drafting, the JCT suite of contracts has now replaced the word determination with termination. But many other jurisdictions have yet to follow suit.

3.3.2.2 The uncertain and inconsistent meanings of shall

Clause 53 from the SCAL contract (Singapore Contractors Association Ltd, 2005) reads:

If a dispute arises between the parties under or out of or in connection with this Sub-Contract or under or out of or in connection with the Sub-Contract Works, the parties shall endeavour to resolve the dispute through negotiations. If negotiations fail, the parties shall refer the dispute for mediation at the Singapore Mediation Centre in accordance with the Mediation Rules for the time being in force. For the avoidance of doubt, prior reference of the dispute to mediation under this clause shall not be a condition precedent for its reference to arbitration by either party nor shall it affect either party’s rights to refer the dispute to arbitration under Clause 54 below. [Emphasis added for clarity]

Shall is used four times, but they are not used consistently to mean the imperative must. The words „the parties shall endeavour to resolve the dispute through negotiations“ might mean that negotiations are mandatory, but reading the whole clause it could be argued otherwise.

„If negotiations fail, the parties shall refer the dispute for mediation …”. On first reading, shall here appears to mean „must”. However, the subsequent provision stating that mediation is not a condition precedent to arbitration could construe this shall to arguably mean may.

The word „shall” has multiple meanings. Plain language experts suggest avoiding using shall as it is rarely used in one consistent meaning. Modern legislation in many jurisdictions have stopped using shall now. For example, legislation on payment and adjudication affecting construction contracts in New Zealand, Queensland, New South Wales, Victoria, South Australia, Western Australia, and Northern Territory do not used shall at all. Instead, must is used to indicate the imperative.

More recently in the United Kingdom recommendations were made for legislative drafters to stop using shall. The Drafting Techniques Group Paper 19 (final): March 2008 recommends in paragraphs 51 and 52:

51 The Group considers that “must” in this context means the same as “shall” but is clearer, more modern and more consistent with Plain English drafting. There is no real argument that “must” is weaker (or stronger) than “shall”, or that it should be used for directory as opposed to mandatory obligations. Its use to impose duties is increasing, and there is no real danger that, if this became more widespread, the courts would think a different meaning was intended. This development would align practice in this Office more closely with practice elsewhere in the UK and in other jurisdictions.
52 The Group recommends that there should be a presumption in favour of alternatives to “shall” to impose obligations.

With this and other developments, even more developed countries are embracing legislative drafting in plain language. Other jurisdictions, particularly developing countries within the commonwealth jurisdictions, would benefit from following these developments.

3.4 Modern plain language construction contracts

Construction contracts have generally been late in adopting plain language drafting style. Many construction contracts found in the UK, Hong Kong, Malaysia, Singapore, and to a lesser extent Australia and New Zealand are drafted wholly or partly in traditional style.

There are a few minority exceptions. Among those attempting to use plain English drafting, catering for much smaller projects, are the JCT 05 HO or home owner/occupier, with or without consultant (Joint Contracts Tribunal 2005) and the NZS 3902:2004 New Zealand Standard Housing, Alterations and Small Buildings Contract (Standards New Zealand 2004).

Three other contracts are notable in their attempt to adopt plain English drafting. They are the Engineering and Construction Contract ECC commonly known as NEC3 suite of contracts (Institution of Civil Engineers 2005), the NZIA (New Zealand Institute of Architects 2009), and the Model Terms of Construction Contract for Subcontract Works (Construction Industry Development Board Malaysia 2007).

3.4.1 NEC3

The NEC suite of contracts has grown in popularity. A survey of contracts used in 2007 (RICS, 2007, p 12) shows the NEC contracts were used on 7.7% of the number of projects. Based on value of construction work, the NEC contracts account for 14%. The report states in its introduction (RICS, 2007, p.2) that the „NEC contracts are seeing an increase in usage“.

The NEC contracts declare and adopt a plain English drafting style. The early criticisms of them were partly because of initial teething problems during their infancy, and possibly because the present tense drafting style adopted was difficult to adjust to.

For example, clause 32.2 (Institution of Civil Engineers 2009, p.9) reads: „The Supplier submits a revised programme to the Supply Manager for acceptance …“. The traditional drafting style might have read: „The Supplier shall submit a revised programme to the Supply Manager for acceptance …“, and an alternative equally acceptable plain English version might read: „The Supplier must submit a revised programme to the Supply Manager for acceptance …“

Although in law they might all mean the same, current users of construction contracts might understand the last version best.
In addition, as the NEC3 attempts to promote good project management practice and provide multiple options to keep the high degree of flexibility to cover many procurement options, the contract might have been complex to understand in the early days due to unfamiliarity. One other observation is, although the NEC3 is mainly drafted by repeating the nouns, it does slip into referring to „he“ and thus breaching gender-neutral style.

3.4.2 NZS and NZIA contracts

Among the most commonly used standard form of construction contracts in New Zealand are the New Zealand Standard Conditions of Contract for Civil Engineering and Building Work (NZS3910:2003) (Standards New Zealand 2003) and the two primary contracts published by the New Zealand Institute of Architects – the National Building Contract (New Zealand Institute of Architects 2003) and the NZIA Standard Conditions of Contract (New Zealand Institute of Architects 2009). In drafting style, all three are well structured with relatively short sentences and sub-numbering that break up clauses into short sentences.

They are generally drafted in gender-neutral style with the NZS 3910 adopting the more cumbersome „he or she”, „him or her”, and „his or her” but not „she or he”, „her or him” or „her or his”. Presumably an oversight left out a „or her” in clause 14.1.2 (b) (Standards New Zealand 2003, p.63), likewise clause 14.1.2 (b) in the NZS 3915 contract (Standards New Zealand 2005, p.57).

The NZIA contracts adopt plainer language. For example, they clearly and plainly refers to „ending the contract” rather than „terminating the contract” or (worse still) „determining the contract.” As stated earlier using the word „determination” goes against good rules of modern legal drafting, since „determine” has multiple meanings.

Whilst the NZS 3910 maintains 756 shalls (used in different senses including the imperative must) in addition to 53 other musts, the NZIA contracts are more consistent and clearer using mainly must for the imperative. It however slips into „shall” and other minor redundant doublets in parts of the contract. Among the schedules used with the contracts those relating to fluctuations, insurance, and warranty provisions have a few shalls (19 in total) alongside 79 musts. Most but not all the shalls are used in the imperative sense. The main conditions of contract have 8 shalls along with 334 musts – and again, most but not all are used in the imperative sense.

The performance bond format falls into steep traditional style in the NZIA NBC contract (Standards New Zealand 2003). Presumably the revised edition due soon will remove the outstanding legalese.

NZIA SCC:2009 is drafted in gender-neutral language without the cumbersome he or she except on one occasion under 14.12 (New Zealand Institute of Architects 2009, p.29). This is presumably unintended.

The small amount of traditional style such as the few instances of shall might well be an oversight whilst the traditional „null and void” might be used because of the assumption that void alone might not be an adequate equivalent.
3.4.3 The CICC model terms of construction contract for subcontract work

The CICC Model Terms of Construction Contracts for Subcontract Work (Construction Industry Development Board 2007) adopts plain language throughout, has no multiple cross-referencing, and is drafted in gender-neutral style without the cumbersome he or she.

Ameer Ali (2008a, pp.20-21) states the CICC Model Terms has an average of 19 words per sentence. One notable feature is the unique structure of the contract which clusters the entire contract under 7 broad main clauses: (1) general obligations, (2) administration and changes to the work, (3) time obligations, (4) payment, (5) quality, safety, health, and environmental obligations, (6) legal rights and termination, and (7) disagreement and resolution of disagreement. This logical structure is intuitive to those familiar with the 3 tenets of project management – time, cost, and quality, and makes the contract relatively easy to navigate despite it being a relatively new contract. These broad main clauses and the sub-numbered clauses are set out in the contents pages of the contract (Construction Industry Development Board 2007, pp.2-3).

The contract is not drafted in the present tense like the NEC, but it is plain and clear. For example, Part A – 1 reads: „The date of this contract is stated in C.1” (Construction Industry Development Board 2007, p.4). Instead of the traditional „party A on one part and party B on the other” the first part of A.2 (Construction Industry Development Board 2007, p.4) reads simply: „The parties to this contract are Contractor and Subcontractor.”

Another provision, A.12 (Construction Industry Development Board 2007, p.5), states the governing law: „The law stated in C.11 governs this contract.” This combines the benefits of both brevity and flexibility to state the governing law. C.11 then also provides a default provision. The brevity is a contrast to many other contracts published in Malaysia. The public works department government contract clause 72 (Government of Malaysia 2007, p.44) reads: „This Contract shall be governed by and construed in accordance with the laws of Malaysia and the Parties irrevocably submit to the exclusive jurisdiction of the courts of Malaysia.” Clause 49.1 of the CIDB 2000 contract (Construction Industry Development Board Malaysia, 2000, p.92) reads: „The law governing the Contract shall be the law of Malaysia, and the parties hereby submit to the jurisdiction of the Malaysian Courts for the purpose of any action or proceedings arising out of the Contract.” The most commonly used private sector has a shorter provision but it can be made plainer by omitting the shall and rephrased in direct style. Clause 38.1 (Pertubuhan Akitek Malaysia 2006, p.43) reads: „The law governing the Contract shall be the Laws of Malaysia.”

Where the clause provides for more elaborate provisions, the CICC Model Terms also uses sub-numbering to break up the clauses for greater clarity. For example clause 2.2.2 (Construction Industry Development Board 2007, p.8) reads:

All Contract Administrator’s instructions, decisions, and certificates must be:

i) in writing;
ii) dated; and

iii) clearly identified as the Contract Administrator’s instruction, decision, and certificate respectively.

### 3.4.4 Construction contracts in Australia

Among the most commonly used construction contract in Australia is the AS 4000-1997. The layout of the contract is relatively clear but the drafting style is still partly in traditional English. The use of 298 “shall” is the most notable traditional style. And not surprisingly “shall” in the AS 4000-1997 is not used consistently throughout in one sense to mean only one thing such as the imperative must.

Given the overall good structure of the contract, the contract will read much better if it were to adopt plain language drafting guidelines such as those used by Australian legislative drafters. The Australian Office of Parliamentary Counsel’s legislative drafting manual instructs in Chapter 4, Rule 83: Say “must” or “must not” when imposing an obligation, not “shall” or “shall not” (Office of Parliamentary Counsel Australia 2003, p.19).

## 4. Conclusions

Many industries in more developed countries like Australia, New Zealand, USA, and Canada have progressively adopted plain English. Many commonwealth jurisdictions adopt plain language in legislative drafting. But the construction industry has been relatively slow to embrace plain language drafting. The majority of construction contracts in Commonwealth jurisdictions are drafted in traditional language. Some are steeped in redundant legalese.

There is enough evidence to show that it is possible to draft construction contracts in plain language – without losing legal intent. The evidence can be seen in re-drafts and in the few construction contracts that have adopted plain language. Plain language contracts would be better understood by both primary and secondary users and can lead to greater efficiency when administering construction contracts.

There are many traits that are common in plain language. The development or adoption of a plain language drafting guideline for construction contracts that have these relevant and common traits can benefit the construction industry. We recommend that a set of plain language drafting guideline be developed for universal use for all construction contracts. Drafting bodies can continue to preserve their concepts and risk allocation strategies, but can communicate their contracts more effectively and efficiently by adopting plain language.

If legalese persists after this, Kimble (2006, p.12) offers an explanation of why it might happen:

> Legalese persists for the same reasons as always – habit, inertia, formbooks, fear of change, and notions of prestige. These reasons are more emotional than intellectual. … And besides,
since legalese has nothing of substance to recommend it, its dubious prestige value depends on ignorance. We cannot fool people forever. Our main goal should be to communicate, not to impress.

We hope research on plain legal drafting is expanded and its findings disseminated widely to prevent ignorance. To those who insist on persisting with legalese when drafting construction contracts after this, we have a plea - a plea for good sense.

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Responsiveness to change by standard-form contract drafters in the construction industry: A case study of the FIDIC White Book


Potential Conflicts with Procurement Law during Architect Selection

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Abstract

In the context of architect selection procurement law assumes the process of decision making as rational. However, results of two case studies of public commissioning clients selecting an architect based on observations and interviews showed that rational processes provide merely the structure for a process more aptly characterized as sensemaking. This paper addresses three aspects of the selection process that underlie this interplay of the legal and behaviour rationality: the challenges and dynamics of services, implicit ways of aggregating value systems, and the incremental and iterative character of the selection process. Because this process of sensemaking starts as clients are confronted with the design alternatives on the basis of which they choose their future design partners, it cannot be predetermined beforehand and therefore conflicts with legal rationality.

Keywords: procurement, client perspective, architect selection, services, rationalities
1. Introduction

1.1 The selection of architects in EU context

The selection of architects by contracting agencies (public clients) in current practice has its roots in three distinct systems: tendering for a contract, the selective search to identify a suitable architect or design team, and architectural competitions (Strong, 1996). This paper indentifies two rationalities that originate of this mixture as currently potential causes of conflicts between the current expectations from the professional field of architecture and the decision making behaviour of administrative of public client bodies.

In an attempt to address issues of fair competition, the European Union has imposed strict rules for the tendering of public contracts. The rules intend to enhance integrity, objectivity, and transparency of the selection process (Essers, 2006) As is stated in Directive 2004/18/EC the selection of an architect should be considered as the allocation of a contract for architectural design services. Most Dutch contracting agency choose the restricted tender procedure for the selection of an architect (Geertse et al., 2009). Procurement law requires that decision criteria for comparison of the requests for invitation in the selection phase and proposals in the award phase are known and announced beforehand. The design competition (design contest in legal terms) is another procedure offered in procurement law (Directive 2004/18/EC, article 67 to 74). Traditionally a design competition not only fulfils the pragmatic aim of selecting an architect, but fulfils also more political and societal goals as to discover new talent, create a dialogue on design, market a project, or coordinate different interests (Spreiregen, 1979, Svensson, 2008). The choices made by architectural juries in design competitions are often controversial and could lead to public debates or scrutiny (Strong, 1996). This increased the current pressure to make jury decisions more transparent and to include the public more directly in decision making. In current tender practice, jury panels of a tender often consist of politicians and stakeholder representatives. Both design competitions as well as tender regulations hold their own rationality about decision making. Design competitions are expert judgement based, while procurement is based on rational decision processes. This paper shows based on two empirical case studies that both rationalities apply on architect selections and that certain characteristics could potentially cause conflict in decision making.

Awarding a contract is based on a decision. Theories in decision making show in general two kind of rationalities (Beach and Connolly, 2005): a rational approach, which considers decision making as a sequential process of evaluating alternatives, and a behavioural approach in which decision making is considered as an incremental process of sensemaking. The rational approach portrays the process of decision making as a sequence of the following phases: problem definition, identification of decision criteria, allocation of weights to the criteria, development of alternatives, and evaluation of alternatives with use of the criteria (Harrison, 1999). This approach views decision making as an individual process and implies that decision criteria and weighing factors can be defined beforehand. External influences and changes of preferences are not taken into account. However decision makers in public organisations do not simply act as individuals – they form their opinion as part of a decision.
making body that has to consider implications for others and need to liaise with others to create sufficient support for a decision. In these situations, sensemaking appears to be more important than rational evaluation and actual choice (Sutcliffe and Weick, 2008). Balogun, Pye and Hodgkinson (2008) define sensemaking as a social process of meaning construction and reconstruction that enables individuals through interacting with others to collectively create, maintain, and interpret the world. The concepts of sensemaking, framing (sharing the meaning of a subject with others), sensegiving (attempts to influence sensemaking), sensereading (perception of circumstances), and sensewrighting (shaping the understanding of the world) are all related to the resource, process and meaning power effects in organisational decision making (Balogun et al., 2008). The subjective and public debatable characteristics of decisions about design quality in the context of public administration context indicate that tendering for architect selections must not consider evaluations of alternatives only but also as a process of sensemaking.

Tender decisions about architectural quality require domain specific skills relevant to the built environment as well as knowledge of procurement law. According to Tetlock (1983) a public decision maker can be considered as a politician who is accountable to their ‘constituents’ and who are constantly concerned with questions regarding the justification of the decision and reaction of others. Decision makers in public organisations have to take national and international policies, stakeholder interests, and laws into account in order to legitimize their decision. This responsibility is often accompanied by mixed feelings of anxiety, enthusiasm, and fear — especially in situations where domain specific knowledge is lacking (Mosier and Fischer, 2009, Hutton and Klein, 1999). Currently the fear of lawsuits resulting from ambiguities in tendering processes is high with Dutch public clients (van der Pol et al., 2009). Case law on EU law nor national procurement law does not (yet) provide enough support to guide the client on compliance of the regulations. Because developments have increased the complexity of selecting an architect in the past decades, legal and specialist consultants are often hired to support the commissioning client in organizing the tenders. This increases the complexity of the organisation and motivation of a tender decision (Kieser and Wellstein, 2008). The effect has been to encourage defensive and risk avoiding strategies of public clients in decision making (Architectuur Lokaal, 2009). The potential conflict between the rational and expert based rationalities of decisions during selection processes is worrying, as the discussion of procedural quality seems to the quality of outcome. The empirical cases clearly show that architectural judgement and legal requirements need to be better aligned to improve decision making during architect selections.

1.2 Dutch case law on architect selections

Until a few years ago Dutch architects did not, as contractors did do, go to court when decisions during the tendering phase were not acceptable and possibly legally wrong. This practice has changed and we find more and more case law on tender procedures in which architects are the suing party. Besides this new body of case law there are cases in other fields that are of use for tenders concerning architectural services. These cases show that in general judges are willing to take the specific nature of the work of the architect into consideration. The starting point is that in using the award criterion of the economically most advantageous offer (the obvious criterion with these contracts) contracting
agencies have some room for discretionary decisions. Judges tend to test these decisions only marginally. To give the reader an impression on the situation in the Netherlands several more or less representative cases are being described.

The District Court of 's Hertogenbosch stated on 8 February 2008 (168487/KG ZA 07-822, LNJ: BC3956) that in cases of intellectual qualities candidates and tenderers should accept a considerable amount of subjectivity, provided chances for all candidates remain equal. On 2 April 2009 the District Court of Haarlem (154394/KG ZA 09-79, LNJ: BH9497) acknowledged that awarding a contract of taxi services based solely on the criterion of quality is not easy to reconcile with the basic principles of objectivity, transparency and equal treatment, because of the subjective judgement required. Therefore the assessment system should be as objective as possible. The contracting agency is not required to describe in full detail how he expects the tenderers to show how they prove that the meet the required standards. The system should leave room for tenderers to ensure some level of competition and innovation. The tenderer has to show not only that but also how a maximum score will be reached. According to the judge the contracting authority secured the basic principles of procurement law by the use of an independent committee of experts. This committee first judged the proposals individually and then discussed the results in order to determine the final score. The District Court of 's Gravenhage (332764/KG ZA 09-336, LNJ: BI8767) argued on 29 May 2009 that even if the motivation of a decision is not fully clear, the use of the panel, consisting of 9 people judging independently from another, implied a careful judgement. By supplying the scores on the criteria and further explanation about the argumentations the contracting authority provides enough insight in the way the assessment was done. The element of independent members of the jury is considered an important one by Dutch judges. See e.g. the Appellate Court of The Hague, 8 February 2007, 06/1421 KG en 06/1430 KG, LNJ AZ8670. In this case the jury consisted of several disciplines and the offers were anonymous: these two aspects formed a sufficient guarantee that the jury would act in a non-discriminatory manner. The District Court of Middelburg (13-02-2009, 65920 KG ZA 08-244, LNJ: BJ1373) confirms that announcing the weight of the sub-criteria is enough. A further breakdown of the used criteria is not required by the Dutch procurement regulation. In the same case the use of a presentation as one of the award criteria was deemed to be allowed. A presentation offers the opportunity to judge the level of performance in relationship to the requirements for the assignment which is being tendered. It is essential that contracting agencies stick to the way they announced they would judge the offers. A mistake is easily made here, as is shown by the case judged by the District Court of Utrecht, 1 August 2006, nr 214609 (to be known from van Wijngaarden and Chao-Duivis, in press). In this case the contracting agency had announced that points would be awarded for specific qualities. The actual awarding of the points however was based on the relationship of the presentations from the different tenderers and not on the qualities itself. This meant a forbidden change of criteria. Another mistake which could have been avoided played in the following case, decided by the Appellate Court of Amsterdam, 200.026.280, 4 August 2009, LNJ: BK8538. In this case the members of the jury had judged the tenderers on the basis of 11 points with either 'positive' or 'negative' followed by a motivation. An employee of the contracting agency was supposed to translate these judgements numerically after which the jury would check this. This last check had not taken place. The contracting agency therefore was not allowed to award the contract to the winning party, but was ordered to let the jury finish its work. In this same judgement the Court allowed the contracting agency to use wishes on the one hand and requirements on the other hand.
Not living up to the wishes does not automatically mean the candidate or tenderer is excluded from further participation in the procedure. The Court judged this to be acceptable. Not everybody is convinced of the correctness of this judgement.

The selection of architects via a tender procedure still poses difficulties for contracting agencies and more case law can be expected. Based on current case law it can be concluded that contracting agencies limit this risk by: a) using independent jury members and jury members who are properly qualified, b) following the procedure the way this was announced, c) using unambiguous language and d) motivating their judgements. However, as the cases and literature in the research suggest, also these four possibilities to limit the risk, contain potential conflicts between the legal expectations about client behaviour and observations of clients’ behaviour in current practice. It proves for example to be very hard to find independent jury members in a relatively small professional committee such as architecture. Besides, expertise does not guarantee independency. The concept of sensemaking shows that decision processes do not always go as expected, especially because the subjective and intangible characteristics make architectural quality almost ambiguous by nature. Therefore intuition is often required to make judgement about the quality level of designs. This makes motivation of decisions difficult and subject to conflicts between clients and tenderers in selection processes.

2. Research focus

In the long history of design competitions hardly any attempts has been made to observe, analyze, or evaluate the selection process of architects. Most publications on design competitions show the richness of the competition and a reflection of the jury on the relevance and quality of the entries for the architectural profession in general (e.g. Glusberg, 1992). Others describe the aims, procedures, potentials and pitfalls in a historical perspective (e.g. Lipstadt, 2005). About the only publication that explicitly includes EU procurement law in architectural competitions is written by Judith Strong (1996), a former Competitions Director for the Royal Institute of British Architects. Just recently a number of scholars studied the judgement process of jury panels in the context of design competitions (Kreiner, 2008, Kreiner, 2006, Kazemian and Rönn, 2009, Svensson, 2008, Spreiregen, 2008) or the strategies of architectural teams that join competitions (Kreiner, 2007b, Kreiner, 2007a). Case law plays an important role in the understanding of procurement law. Procurement law, although going back to the Middle Ages, is a relatively new discipline, which got a ‘boost’ when the EU came into being. For the understanding of the law on procurement court decisions are therefore very instructive not to say essential. The decisions of judges shape the interpretation of the official regulations. This paper addresses the complexity and nature of assessing design quality in the context of EU tendering regulations. The paper focuses on the question of how public commissioning clients decide on the selection of an architect in the context of EU procurement law and which aspects influence this process. It uses the results of two case studies to identify three underlying processes of judgement and decision making from a psychological perspective on sensemaking and choosing among alternatives. In a legal and political context the justification of a decision is very important. It is within this conflictive, strategic, dynamic, and elusive context that public clients have to select their architect.
3. Methods

3.1 Research approach and methodology

This paper concentrates on the results of two cases. The case study method was chosen to account for the fact that the research field is nascent, lacking both empirical studies and theories that address processes of decision making in this context. Building theory from case studies is a research strategy that involves using one or more cases to create theoretical constructs, propositions and/or midrange theory from case-based empirical evidence (Eisenhardt, 1989) and that typically answers research questions that address 'how' and 'why' particularly well in unexplored research areas (Edmondson and McManus, 2007). Each case serves as a distinct experiment that stands on its own as analytic unit and theory is built based on induction and replication logic. Because the research aims at developing theory instead of testing it, theoretical sampling is appropriate. In this situation cases were selected because of opportunities for unusual research access and revelatory situations (Yin, 2009). Although transparency of governance seems to imply otherwise, gaining access to tender situations proved to be very difficult. Tenders and design competitions appear to have a very sensitive and delicate nature. Next to that it is hard to trace clients preparing a tender before the official announcement is made to trace their motives. Within these limitations and the available time, one case, an elementary school, was conducted in the context of a restricted tendering procedure and one case, an open international ideas competition, was conducted in the context of providing input for the brief of a tender.

Different types of data were collected for each case to allow for triangulation between self-report, observed behaviour and official justifications. In the first case, a tender for a school building, document analysis, observations of the meetings of the selection and award committee and eight semi-structured interviews with most of the decision makers provided the input for the case. In the second case, an ideas competition with price money for a university building, most of the data were collected by participant observation for a period of 32 weeks and six interviews with the project manager and jury members. Participant observation studies are "in the tradition of 'verstehen' sociology and cannot by repeated in the experimental manner of the natural sciences" (Jackson, 1983). The role of participant-researcher was known to the other actors. The first author made field notes whenever possible but could not always record 'private' information as it occurred because of the sensitivity of the situation (Creswell, 1994).

The cases were set up according to the principles of Yin (2009) and Stake (1995) in order to address the potential shortcomings of using a case study method in terms of limited generalisability, validity, and reliability. The semi-structured interviews were recorded and transcribed. All data were first analyzed in Atlas.ti, a software package to support qualitative coding, and discussed with the second author. The cases were first analyzed separately and classified in themes. A distinction was made between the actors, the project characteristics and the aspects of decision making. Then the findings were compared per case. During analysis relevance was mainly taken in the considerations made by the project team and jury members as representatives of the commissioning body. Therefore some parts of the data were not used for the purpose of this paper.
3.2 Case descriptions

The first case focuses on the tender process for the architectural design of a large sized elementary School with a sports facility of two halls. The selection process took place in the period from August till November 2007. The client in this case consisted of the School Board, two departments of the City, and representatives of a holding company developing the neighbourhood. The School Board and the Department of Sports formed the official awarding authority. The restricted tendering procedure with a selection and an award phase was chosen to find a suitable architect. The selection committee consisted of the four client parties with equal voting rights; the award committee consisted of the School Board, the Department of Sports, advised by the Common Exploitation Company, and the Department of Education. In both phases decision criteria were stated, and different weights were assigned to these criteria. Selection as well as awarding would be ‘based on unanimity’. In total 35 firms applied for this tender of which three were excluded from selection because they did not meet the exclusion requirements. The client decided to select six parties for the award phase. After studying the requests for participation of 35 firms, the selection committee selected six candidates for the award phase. These six candidates presented their proposal to the award committee that decided about the winner of the tender. After the award decision was made the participants received a letter announcing the award decision, accompanied by the minutes and a matrix form filled with the assessment scores of all six participants (award criteria on the horizontal axis and participants on the vertical axis).

The second case concerns an international open ideas competition for a university building offering a prize of €60.000 in which 471 international participants took part. The impetus of the competition was that the old faculty building had been destroyed by fire. The selection procedure was first intended as a European tender, but was changed into an ideas competition to provide input for a future procurement process as decision makers became more aware of the complexity of tendering rules. The evaluation procedure consisted of an assessment phase and an evaluation phase. During the assessment phase the entries were analysed by two internal analysis teams on the content of the proposals and checked against the rules and assignment of the competition by the project team. Only 42% of all submissions fulfilled all requirements as stated in the competition programme. The chair of the jury, however, decided to include all technically valid submissions (466) in the jury evaluation process. The results of the assessment—a typology of the entries and a quantitative analysis—were made available to the jury for evaluation in January 2009. The competition prize money totalled was to be distributed by the jury at its own discretion among the winning entrants. All entries received a registration number and were evaluated anonymously by the jury. The jury selected six prize winning entries and two honourable mentions in two rounds based on an integral judgement. During the first day, 50 submissions were selected, on the second day these 50 were first reduced to 8 nominees and finally to six winners (three first prizes of €15.000 and three second prizes of €5.000). Among the winners were many young professionals, which had been stated as one of the aims of the competition. The winners and their ideas were announced during an award ceremony during which also the jury report was presented.
4. Results

Analysis of the cases showed that the legal perspective of the tender procedure mainly explains the rational structure of the decision process, while the behavioural approach better describes the course of the process of sensemaking. The selection of an architect is therefore best understood as an interplay of both rationalities. Three aspects - the decision challenges and dynamics of services, implicit ways of aggregating value judgements, and the incremental and iterative character of a selection process - were found that characterize this interplay. The aspects will be described in the following sections.

4.1 The decision challenges and dynamics of services

The selection of an architect required a complicated process of judgement and decision making. This process had to be prepared while the aim of the process is still somewhat indistinctive. During both cases one of the main questions of the decision makers was ‘how should we select an architect and what should be the focus of the decision process?’ Figure 1 presents the dilemmas that the actors experienced in both cases. The left side of the figure shows the issues that relate to finding the right partner for a building project that is capable of designing the future building. This was the dominant frame in the Tender case. The School Board was searching for a partner to build their dream. Such a process focuses on maximum value for the client and acts in the market context with several parties acquiring a contract. The right side of the figure relates to the architectural tradition in which architects show their competences to the public and the client anonymously. The focus lies on the design or vision on the future building. The architectural community is represented in a jury committee. The frame in which decisions were taken in the Competition case focused on the right side of the figure.

Figure 1: Dilemmas as experienced by clients during architect selection
Both the partner focus and the product focus require intuitive judgements as well as rational analytical thinking to judge the competences of the tenderer as well as the quality of the proposal. We consider this process as 'sensereading', a process of perception of the circumstances, but also a process of framing because expectations are exchanged between decision makers (Balogun et al., 2008). In spite of the assumptions in procurement law, the selection of an architect always relates to the package which includes the person, the potential product and the firm they represent - it cannot be taken apart. In both the product and the partner focus a dialogue between the client and the architect is sought in which the design proposal acts as a boundary object to carry multiple meanings (Boland and Collopy, 2004). In this dialogue the dilemmas of security versus innovation, details versus concepts, present versus future and requirements versus feedback featured, which is in line with Rönn (2008). These dilemmas contribute to the amount of uncertainty that accompanies a selection process. Clients expect to be surprised by the proposals of the architects but also fear the possible consequences of the decision outcome.

The results of the competition case indicated that the dynamics and uncertainties of the situation make it hard to explicitly design the regulations to address the aims of the competition. The Tender case was based on the legal requirements as perceived by the School Board. In the Competition case a model (van Campen and Hendrikse, 1997) was used to create the regulations and the competition programme. This model determined the structure and the items included in the competition and, therefore, the playing field of the selection process. The playing field is directed by the decisions made about the competition programme and rules. Some of the violations of the rules do not influence the quality level or principles of the competition (e.g. no registration number) but have an effect on administrative issues. Others could cause deviations in the playing field (e.g. different scale levels). This raised two issues during assessment of the competition entries: how strict should the rules be applied and do the rules negatively influence the character of the competition? For a project team it proofed very hard to make an estimation what to effects of a certain rule could be. For example, the obligation to be registered in an architect register could have shut a lot of (international) professionals out, but it is not sure how many potential participants would have been affected by this requirement until the deadline of registration has passed. In case of the Competition, the members of the project team were relatively experienced in the field of architectural design competitions or related procedures but even then a lot of time was spend on how to design the competition to reach their aims of stimulation creativity, research, and debate. A call for participation is always a speculation, and it is only after the submission deadline a client becomes aware of the response of the market. Then officially the moment has passed to make adjustments. In the Competition the situation arose that the temporarily housing accommodation suited the faculty so much that silently the staff and students started to expect they would not leave that building. Participants that were aware of these expectations could, therefore, have advantageous over participants from outside because the competition brief did not mention this option. The project team had decided not to change the brief in order not to change the basis of the competition, but the results show that the jury panel did take this information into account while choosing a winner.

The procedure of an ideas competition provided room for increasing insights in order to respect the response on the call for participation. A strict legal context, such as in the Tender case, does not allow for the same kind of flexibility. During a tender procedure, the chair would not have been able
to allow the entries that did not meet the requirement into the jury assessment procedure. The market parties decide if they feel the balance between costs and benefits is worth the risk to participate or not. In both cases the response of the market was better than expected. For the competition the project team had hoped for a response of around 350 entries but could not have imagined that the competition would have such an impact, especially among young professionals. The School board was also very positively surprised with the response of 35 firms. They felt that they had to do justice to practice and decided to select six firms for the award phase, while they intended to have five. The jury of the competition also decided similarly for a joint first, second and third prizes. The responses of the market thus affected the course as well as the outcome of the process. The direction of the decision challenges and the dynamics of this interaction could not have been predicted beforehand.

\section*{4.2 Implicit ways of aggregating value judgements}

In the Tender case the decision criteria and their weight were input for a decision matrix which supported the decision process of the client. This method can be compared to a multi criteria analysis (MCA) or situations as described in prospect theory (Kahneman and Tversky, 1979). Procurement law even suggests that the use such a system would safeguard transparency. However, if a measurement on an ordinal scale (which is the case in architectural design) is taken as basis for the calculations, the outcome has limited power and validity (de Keyzer, 1998). In the matrix criteria with different measurement scales were treated as equal input for the ranking, while observations showed that aspects were definitively treated differently during the discussions between the decision makers. The ease with which the results of the matrix sheet with judgements from all parties involved in the Tender case was accepted indicates that the weighing factors incorporated in the sheet were already taken as a given during the decision process. However, they were never explicitly discussed. The decision about the weight of the criteria, therefore, has important implications, yet these are likely to remain implicit.

The matrix used in the Tender case also strengthened the effect the criteria had by structuring the decision process. Once entries were ranked in the matrix, original judgements seemed not important anymore. Everybody trusted the excel sheet and focused on the total scores. This was needed to pursue the discussion on a more general level and find a balance between the selected firms and the personal interests of the decision makers. The aggregation system was taken for granted and not critically assessed by the decision makers. The criteria were used very explicitly during the beginning and the end of the process, but very implicitly during the discussion in between. One of the School panel members explained: ‘You only use the criteria because you have to be transparent and because you have to explain later on. But I have not looked at the criteria during evaluation, I would lie if I would say so...’.

Procurement law or competition regulations do not distinguish between an individual, a person in real life and an ‘artificial’ person or legal body. It also does not tell who and how many persons should take decisions or how many qualities should be judged. In analyzing the data, a clear difference was exposed between an individual judgement, a judgement of a group, and a decision about design quality. Decisions in a tender situation are intentions for action that include an element of choice
(Hodgkinson and Starbuck, 2008) because a winner is chosen out of all candidates that expressed interest in the contract. Decisions can be perceived as the final result of a judgemental process. In the context of architect selections decisions have to be holistic because one proposal is chosen as a winner of the tender competition. The results of the cases show that both value judgements and decisions include comparisons of alternatives at holistic as well as on an aggregated level. Aggregation is needed to come from individual judgements to group judgements aggregation and to come from fragmented design qualities to holistic design quality. In the analysis of the data, two ways were distinguished to come from individual judgements to a common judgement for the group: discussion and summation. In the discussion approach the differences between the individual judgements are discussed first, and then one judgement for the group is defined. This approach was mainly used in both cases. However, it was used in combination with voting or individual preference statements. These methods belong to a second approach of aggregating individual statements without interaction. In the Tender case the final decision was based on a discussion, while in the Competition case voting determined the final winner. Both methods can be regarded as inter-subjective. A decision about design quality can, therefore, be considered as an inter-subjective consensus among the members of a group of decision makers. Inter-subjectivity contributes to the process of sensemaking of the members of a group. The main benefits of discussions appeared to be that more information was put on the table and discussions contribute to decision acceptance can be considered as a benefit. At the same time there is more pressure to conform, possible domination of one or two members, and chances of group think (Robbins and Judge, 2008). The method of aggregation eliminates social influences and is, therefore, often perceived as more accurate in current tender practice. The results show that both methods—discussion and summation—are needed to structure the decision process.

The insights from these findings are shown in Figure 2. This figure shows four points of departure for an assessment about design quality. A clear distinction is made between separate design qualities and holistic design quality and the judgemental of an individual versus the judgement of a group. Connecting these points of departure displays the six approaches to come to a decision about design quality. These approaches provide the input in the current logic of tender decision making but also appear to be the basis for design competitions. Depending on the aim and starting point of an assessment, one or more steps are needed to make a decision about the level of design quality of a proposal. Figure 2 portrays more ways to deal with the aggregation of judgements than were found in these two cases. The legal structure of an architect selection requires the distinction of criteria for several design qualities but one architect to win the tender. It does not mention the amount of decision makers, which suggests relation 2 or relation 5. The regulations used in the Competition case suggest the relation from individual qualities to a holistic group level (relation 5). The other relations can be found in current research and practice, such as the Delphi method, in which experts individually express their weight about different qualities and are then compared to each other (relation 1), the Song festival method, in which jury members individually state their grades in order to be summed up with the other grades (relation 3), or the Olympic scoring system, in which jury members base their individual score on the elements of a performance (relation 2) and then average the grades of the jury members (relation 3). The frame in which a meaning is shared with the other members of a group is largely determined by the chosen way that the judgements are aggregated in
the design of the selection process. The cases show that this is usually done implicitly while the differences between the systems are significant.

Figure 2: Aggregation principles of value judgements about design quality

4.3 The incremental and iterative character of a selection process

In both cases the procedure of the selection process determined the amount of phases in decision making in both cases but not the interpretation. The Competition was an open procedure, which meant that there was no pre-selection of the submissions. This was in contrast to the restricted tender procedure of the School, which consisted of a selection and an award phase. In the first phase a selection was made among the architects that showed interests in the contract based on the technical, financial and organisational qualities of the firm. In the second phase a decision was made which resulted in the allocation of a contract related to the offer or proposal submitted by the firm. In the Tender case the proposal was accompanied with a verbal presentation of the designer, as is usually the case in restricted tenders. The results showed that narratives and additional background information supported the decision process among the members of the group. Decision makers were able to check their assumptions with the designer of the proposal, which is in line with the statements of Weick (1995) and Vidaillet (2008) about narratives supporting the process of sensemaking.

The findings of both cases confirm the six stages of the overall selection process as described by Kazemian and Rönn (2009): submission check, determination of order of work, choice and preliminary judgements, presentation of interesting contributions, ranking, and decision making with architectural criticism. The evaluation procedure in the competition programme contained a strict distinction between the assessment phase (a check against requirements and ‘objective’ analysis of information by the project team and analysis team) and an evaluation phase (a value judgement about design quality based on different kind assessment by the jury panel). Only the jury was entitled to make judgements about the quality of the submissions and their decisions were binding. Decisions
had to be made regarding approval of a submission on a certain topic or not. The check against the requirements was done by the members of the project team. A team of 25 volunteer employees individually analysed all entries of the competition with respect to how each entry dealt with the themes and requirements of the assignment. The results of the analysis were collected in a database, analysed by two student assistants and discussed in three meetings by a small team of four employees as representatives of the issues addressed in the decision criteria. Observations of the assessment process imply that preparations for an assessment frame can be made, but they cannot be developed without the actual submissions. In this sense assessment could be compared to the process of qualitative data analysis: the structure of analysis arises from the data. This in contrary to most quantitative research, which typically consists of testing assumptions that already guided the process of collecting data. Procurement law assumes a quantitative process while our findings suggest a qualitative process. In every phase of the decision process a group of decision makers went through this process of sensemaking.

In both cases, members of a group reached a consensus by several rounds of discussion or voting. The consensus was not the same as an average of opinion; it was rather the result of a negotiation process, which is in line with the results of Svensson (2008). In both cases decision makers needed time to interpret the criteria, the assignment and the written ambition that was mostly built by others not belonging to the jury panel. The observations suggest that the ongoing discussions between the decision makers about the criteria and their implications for a certain proposal increased the appreciation of other interests as well as the perception of the submissions. Discussion also seemed to increase satisfaction and acceptance of the process and of the decision itself. These effects contributed to the transparency of the decision process. In the Tender case the selection and award criteria were used to iteratively build a frame of reference between the decision makers. In the Competition case, the program of the jury meeting guided the members of the jury through an iterative process of: 1) initialization, 2) perception, 3) individual judgement, and 4) group decision making. Discussions were aimed at getting a decision accepted by the other jury members. Before the vote discussions were limited to ‘I think this is one is interesting’ and ‘I agree’. After the first voting round more explicit arguments were put on the table in order to convince the other jury members, such as the need to rethink education and repositioning the faculty on a more general level. The winners of the competition showed a mixture of pragmatic solutions and ambitious ideas about a fundamental change in the current campus setting. The division of prize money enabled the jury to opt for a consensus solution of several winners, which would not have been possible in a tender situation for the allocation of one contract. Finally, two entries were given an honourable mention because they did not convince all jury members, but did show a lot of quality and input for debate. Six entries were left for a final anonymous voting round, which decided on the ranking of the winners of the competition. These results suggest that judgements were adjusted during the different phases of the decision process due to external influences, such as opinions of other members of a group, changes in the context, such as time pressure, or internal personal factors, such as moods or emotions. Consequently, decision making was an incremental and cyclic process based on a dynamic interplay of judgements.
5. Conclusion and discussion

This paper addressed the process of architect selection from the perspective of public clients in the context of procurement law. We analysed two cases and compared the decision making process in terms of the underlying rationality of procurement law and of sensemaking. The cases show that the decision process of selecting an architect is a result of the interacting of the decision makers with the alternatives once they are confronted with them and start to make sense of the proposed designs. It is, therefore, almost impossible to design a selection procedure and announce the criteria and weighing factors up front, as required by procurement law. In this respect the rationality of the legal requirements clash with the psychological rationality of decision making. On the other hand, both rationalities strengthen each other by providing a public client with the structure and room needed for successful decision making. Several iterative stages of the decision process were identified of which the interpretation and actual course cannot be predicted and shows almost several facets of sensemaking. Three aspects were found to cause this interplay of rationalities: 1) the decision challenges and dynamics in the design of the selection process; 2) implicit ways of aggregating value judgements; and 3) the incremental and iterative character of decision processes.

Both of our case studies addressed architectural design but were taken from a different context. While the situation was very specific, the three factors we identified are likely to apply to other tender situations of less tangible issues and a high level of subjectivity. Public clients represent their users, visitors, and employees. Because a decision about the selection of an architect has large implications for the community, we found that decision makers not only aimed for the best alternative but also for the alternative that received strongest support from the stakeholders. This required an intensive analysis of meanings and potential consequences. Decision makers used this uncertain character of the decision process to follow their intuition and reach an inter-subjective consensus. Such a decision made sense for the all those involved, but was usually hard to accept by others unless properly explained. The process of sensemaking therefore only involved to the decision makers themselves and not the other stakeholders who did not take part in the selection process. Procurement law, on the other hand, reasons from the concept of fair competition for all market parties. An important practical implication of this research is to explore options for how both rationalities can be reconciled in a decision procedure.

An interesting issue for discussion concerns the use of decision support systems in relation to transparency and legitimization of the process. In traditional design competitions it is accepted that the names of the jury members are published beforehand rather than an exact procedure and predefined criteria of decision making. In case of an experienced and well-known jury, the names actually provide a hint for participating architects to decide if they stand a chance in the competition. Traditionally the justification of the final decision was included in a written jury report and participants trusted the jury members in making sound decisions. Clients currently hesitate to write a report about their considerations. Instead they use the output of a decision support system to justify the decision. The recent increase of the number of lawsuits indicates that the outcome of a decision system is not always accepted as the final decision. Given the results of this research one might suggest that decision support systems should only be used to improve the transparency of the process, because the outcome of such a system does not automatically reflect the final decision, or necessarily
leads to a valid decision. Further research will have to investigate the influence of decision support systems on transparency and motivation of a decision. Additional research about the decision processes of judges could mean an interesting ‘triangulation’ of the perspectives on transparency, objectivity and equal treatment in the light of psychology of decision making and jurisprudence.

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Contractual Issues in the Total Use of Building Information Modelling

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Abstract

In the UK, Building Information Modelling (BIM) has been embraced by a number of designers who are aware of its advantages, particularly in enhancing the ability to share design information. A smaller number of leading contractors have also adopted its use; in some cases, insisting that their subcontract designers and other key supply chain members adopt compatible software. It is not clear whether any project has yet reached the stage where all participants share all information through a BIM environment. Nevertheless, this situation is a predictable outcome of its continuing uptake. Whether in Williamson’s “neo-classical” approach to transaction costs to Macneil’s relational analysis of contractual behaviour, information is a critical issue for contract theory. The paper explores the problems that arise when systems that facilitate (or even demand) the costless sharing of information, exist alongside a contractual context that presupposes its guarded ownership.

Keywords: BIM, contract theory, information, ownership, sharing
1. Introduction

This paper is about the growing use of Building Information Modelling (BIM) and (excluding this Introduction) has five parts. The first considers the impact of BIM on the UK construction industry, both current and prospective. The second reflects on some of the contractual challenges that need to be faced if BIM is to be used to its full potential. The issues raised are not exhaustive: for example, there are technical challenges concerning software interoperability and data integrity; and organisational challenges around the parties’ receptiveness to innovation and the willingness to adapt their working practices. However the focus of the paper is on the contractual challenges that will present themselves if BIM is to be exploited to its full potential. This is followed by a theoretical reflection on what is at stake in terms of these contractual issues. In the fourth section of the paper we examine what progress, if any, has been made to address these challenges, by the drafters of standard form contracts. To conclude, an agenda is set for further research into some of the preceding issues, and we indulge in some speculation about BIM’s impact on the future workings of the construction industry and its projects.

2. The use and impact of BIM

Building Information Modelling or BIM is an umbrella term for a series of theoretical and technical developments that have reached a level of maturity where they may now have relevance and impact on the construction sector. For software vendors it has proved useful to market BIM as the brand of the next generation of Computer Aided Architectural Design (CAAD) and to promote the idea that this is a new and a standard way of working for the industry (AutoDesk Ltd, 2010). In reality, at present, there is little coherence to the available BIM solutions and significant commercial drivers to move away from standardisation.

BIM is best defined by its theoretical basis which lies in the software discipline of object-oriented analysis and design (OOAD) (Booch, 1986). This new approach to software development emerged in the 1980’s and has led to a new generation of software tools which are developed around the “real world” entities and objects they are modelling (doors, windows, floors) rather than the functions the software performs. This approach combined with the ability to handle complex 3-D parameterised representations on relatively low cost computing platforms forms the basis of BIM.

It also leads to one of the key challenges facing the information content of BIM systems, which is “fitness for purpose”. There is an inherent tension between the vision of BIM set out by Lee and Eastman (Lee, 2006) that BIM is the “process of generating and managing building data throughout its life-cycle” and the OOAD principle of Essential Representation which states that conceptual models should only be designed with characteristics that are applicable in all possible worlds. The tension then is that at one extreme we have conceptual BIMs that are designed to address the whole building life-cycle and contain only information that is applicable to all stages of that life-cycle, but at any stage in that life-cycle, additional information and alternative representations will be needed.
It is theoretically possible that a single standard conceptual building model will be agreed and adopted by the industry; the most developed and internationally agreed at present are the Industry Foundation Classes (IFC) (buildingSMART, 2010a). Software vendors provide tools that embody BIMs for a specific purpose, e.g. spatial layout, structural design, energy analysis, due to the issue of “fitness for purpose” the information and representation in these BIMs differ. The IFCs are designed to be applicable to the whole building life-cycle and provide a standard mechanism for exchanging information between the proprietary BIM tools. It is at these exchange points where the “fitness for purpose” of the information must be validated and managed.

Currently this exchange of information is being controlled by converting the BIM data into the traditional two dimensional plans, sections, elevations and schedules; these are then visually inspected and approved. Whilst this mechanism supports a heterogeneous mix of traditional and BIM working practices it negates any of the advantages that may be gained through exchange of semantically rich information models. In order to gain these advantages it will be necessary to define and automate the checking of “fitness for purpose” of BIM data during these exchanges, this is addressed by relatively new initiatives such as the Information Delivery Manuals (buildingSMART, 2010b) and Model View Definitions. At present there exists a standard for exchange between the project team for general project coordination and a standard for quantity take-off, structural design facility management handover and others are under development.

These exchange standards could be embodied in the next generation of standard contracts to define the control mechanisms required for information exchange during the procurement process. As BIMs contain information about the actors in the design team, their roles and responsibilities it is likely that in the future exchange standards may be developed not only for contract definition but also administration.

The adoption of BIM varies greatly from country to country. Although the UK played a key role in the research and development of BIM technologies in the 80’s and 90’s it has been slow to adopt its use. There are currently two main drivers to BIM uptake; software vendors and governments. In the UK, the BIM software market is dominate by US software companies such as AutoDesk and Bentley; however in Europe these have had a lesser impact and the German and Nordic BIM vendors have an established base. Government agencies have also been slow to respond in the UK,. In the United States, Australasia, Asia and other European countries influential authorities have adopted the use of BIM in their procurement and regulatory processes. Examples include the Texas Facilities Commission (TFC), the US General Services Administration (GSA), Norwegian Directorate of Public Construction and Property (Statsbygg) and the Singapore Building and Construction Authority (Singapore Government).

In the UK BIM uptake appears to be led by industry and the design team, its usage is often justified on the grounds of improved efficiency and quality. Initial results of studies being carried out by the University of Northumbria indicate that designers often perceive BIM as an easy route to delivering 3-D design, while contractors focus on the benefits of reducing construction errors and improving clash detection and engineers value improved models for simulation and analysis. There is no clear
indication that BIM adoption is being led by any specific partner in the procurement chain nor is there clear demand from clients or government.

Although there is clear potential for BIM to be exactly the kind of integrating mechanism that would satisfy calls by Latham (1994) and Egan (Construction Task Force, 1998) for more integrated project delivery, there appears to be little general awareness in the UK industry of problems associated with the kinds of enhanced information exchanges that BIM could precipitate.

3. Contractual challenges

Hughes and Greenwood (1996) describe the main purposes of standard construction contracts as recording a business deal; planning for the effect of contingencies by allocating risks; as a management procedures manual; as an agenda for litigation; and as an „industry reference point”. If BIM is to be used to its full potential, then standard forms must change accordingly.

At the root of a contract is Agreement or consensus ad idem. Despite this, there is clear evidence that contractual provisions are frequently ignored (Macaulay, 1964; Beale and Dugdale, 1975) or simply misunderstood, with parties relying on third party enforcement (courts, arbitrators, adjudicators) to interpret or even identify the deals they have „signed up to” (Yule, 1995; Greenwood et al., 2005).

Some of the more immediate BIM-related issues that surround its use in a project are: the „ownership” of the model or its parts; confidentiality; and the contractual status of the model; i.e. whether the BIM model is considered to be a contract document in the fullest sense, and thus be „relied upon”.

A further function of a standard form contract is to „presentiate”, that is, to allow for contingencies and allocate the resulting risks (Campbell et al., 2003). There are many risks that could be envisaged in terms of the adequacy of the design. The situation is not an unfamiliar one, and is regularly dealt with in construction standard forms, with the risk ultimately being transferred through insurance. However, a BIM-based design produces added complications: first, in addition to pure design errors, there is the possibility of software errors. These could range from simple loss or corruption of data to unwanted additional data that have been unintentionally imported in „object properties”. For example, the current legal situation with information issues largely centres on omission or inadequate information and it is the responsibility of all parties to ensure they have adequate information for their purpose. Information rich BIM models have a tendency to reverse this problem and increase the likelihood that unnecessary and incorrect information may be exchanged; existing standard forms of contract may need to consider this problem in the future. The other complication, if BIM is used to its full potential as a „shared entity” (involving contributions from designers, specialist subcontractors and component manufacturer) is the allocation of liability between the contributors. Traditional Professional Indemnity (PI) insurance is based on the individual design practice (as opposed to the project itself) and demarcation between individual responsibility, such that a fully integrated BIM model would cause difficulties for construction insurers. Such matters have begun to be addressed in the United States (see, e.g., AIA Trust, 2009).
According to Hughes and Greenwood (1996) standard contracts can acquire “the status of a management procedures manual incorporating control mechanisms” and “the definitive document for guiding the various contributors through the project”. This view of the standard form is very much confirmed by its more recent variants, the New Engineering Contract (NEC) and the Association of Consulting Architects’ PPC2000 Contract. If the powerful potential of BIM were to be fully embraced on a project, this would have to be reflected in the form of contract used. Issues to be addressed would include design delegation and leadership and administration and control of the BIM model itself.

Typically, standard form contracts will also contain remedies for situations where parties fail to meet their contractual obligations. In this, they must accord with the legal position on a variety of related matters. These include (as already mentioned) specifics, such as the adequacy of the model itself, technical shortcomings such as software errors and data loss. Additionally, the legal approach to more general considerations such as Reliance, Privity of Contract, and Third Party Rights will be complicated by the multi-faceted and multi-user nature of the full BIM model.

Finally, standard forms „provide a useful point of reference” … „to those at the periphery of the industry”…” (Hughes and Greenwood, 1996). The most obvious example (and this has to some extent been addressed earlier) is the Insurance Industry; but there are others, for example the funders of private projects who „benefit from the continuity provided by standard forms”, and this is an important role for one that properly and fully accommodates BIM.

4. A theoretical perspective

The use and availability of information is at the root of BIM: it is also at the root of contract formation. One of the main tenets of neo-classical contractual analysis is that access to information is (normally) imperfect, asymmetrical, and costly (see, for example, MacNeil 1978; Kronman and Posner, 1979; Campbell, 2001). The influence of transaction cost or new institutional economics is clearly in evidence here (see, for example, Williamson, 1979; 1981) as is the work of principal-agent theorists, for whom bounded rationality and information asymmetry are fundamental contractual problems. Indeed, it would not be an exaggeration to say that in the neo-classical approach to contract formation the prospect of incomplete and asymmetric information is possibly the most significant element. Casson (1994) has argued that the use of standard forms of contract is based on the fact that they minimise information costs. After the contract has been formed, the absence of information or an imbalance in its possession can have adverse effects on parties’ relationships. As Yates and Hardcastle (2002) observe “…contractual incompleteness [sic] is the key to opportunism. If there were no gaps in contract documentation and no subsequent changes in client requirements and design, there would be no requirement for ex post “adjustments” and consequently no opportunity for the contractor to behave opportunistically”.

Information plays an equally important but quite different role for those theorists, led by Ian Macneil who advocate the so-called relational model of contracting. Macneil's perception of contract formation emphasises ‘the relations among parties to the process of projecting exchange into the
future’ (Macneil, 1980:4). In relational contract analysis, society, not law, is what contracts are about: as Macneil observes, exchange and [contract] planning, the basic areas of expertise of the contracts scholar, have now become just two of the many factors in a complete social organism (Macneil, 1978: 898-99). Uzzi (1997: 42) proposes three components of the „embedded relationships” that are the basis of relational contracts, namely: trust, fine-grained information transfer, and joint problem-solving arrangements” [italics not in original]. Similarly, Buckley and Casson (1988) suggest that sharing information leads to the emergence of common values such as trust, reciprocity and solidarity, and this has been supported by applied work by Greenwood and Yates (2007) on construction partnering arrangements.

5. The response of drafting bodies

At present none of the standard-form drafting bodies in the United Kingdom that we have consulted have sought to incorporate any provisions that address these issues, although there is an awareness of the existence and potential implications of virtual modelling. Standard-form contracts in the United Kingdom commonly adopt the traditional approach of closely guarding copyright in designs created as part of the construction process, allied with the granting of a restricted license to use such designs only in the context of the construction of the asset itself. Such licenses may in some instances not even extend to any extension of the works (see for example JCT 05 DBC clause 2.38.2).

In the United States a number of standardised contractual approaches to BIM have been published. In 2007 a group of industry organisations collectively known as ConsensusDOCS published an Electronic Communications Protocol Addendum which requires the parties to make specific decisions with respect to a variety to protocols governing the creation, transmission and storage of electronic communications generally. More recently, ConsensusDOCS issued a BIM Addendum pursuant to which the parties develop a BIM Execution Plan that is intended to address many of the process and contractual issues arising out of BIM technology. This document also contains provisions addressing the allocation of responsibility for liability that may arise from modelling. The risk allocation section (Section 5) requires each party to be responsible for its contribution to the model but allies this with a waiver of consequential damages by all parties in relation to the use of or access to a model.

To the extent that models are contract documents, the parties are entitled to rely upon the accuracy of information in these models provided by others to the extent of the contribution made by each party. The level of this contribution is defined in the Addendum. Each party is required to procure appropriate insurance coverage for its contribution. Each party also retains the copyright to its contribution to the model and agrees to the provision of a licence to the other parties to use its contribution for the purposes of the project only. To this extent, this approach mirrors that adopted in the UK as briefly outlined above but, as the presence of the BIM Execution Plan makes plain, the co-ordination and maintenance of the detailed model requires a far more sophisticated approach than that currently catered for in standardised contracts.
The AIA (American Institute of Architects) has also issued a BIM protocol which focuses more on the extent which parties can rely on information contained within the various contributions which go to make up the model. This protocol details the level at which each party contributes but again in article 4 specifies that whilst each contribution is intended to be shared with the other parties contributing to the overall model that contribution can be relied upon only to the extent of the level of detail specified in the protocol and any reliance beyond that and outside the context of the project itself is at the sole risk of those relying upon it.

In summary, the approach taken in US indicates that whilst the basic right of a party to maintain copyright in its contribution to the design process is likely to be preserved, more flexibility will be required in relation to the manner in which that contribution is used.

6. BIM and collaborative working: a synergistic match

The contractual issues raised by BIM include risk allocation, copyright and insurance in addition to more detailed matters such as: the ownership of a „shared” BIM design; the precise purposes for which the model will be used; the schedules of deliverables; interoperability issues; the management of the modelling process; the reliance to be placed on modelled information; and the use of the model after construction is completed.

BIM provisions have yet to be properly incorporated into UK standard form contracts. There have been attempts to do this in the United States but in the UK, although moves have been made to tackle the issue of electronic data transfer generally, there appears to be nothing that specifically deals with BIM.

The industry faces a choice between continuing to guard the existing restrictive copyright and insurance positions, which will make the management and development of BIM increasingly difficult, or embracing a more collaborative process in which parties are able to agree that each other may, within defined parameters, use and rely upon the information provided by the other parties as contributing to the overall model within the context of the project itself. It would seem clear that this latter approach would result in the most effective use of the BIM process but would require a relaxation of insurance and intellectual property rights that is currently unavailable in the UK. Furthermore, the current economic climate may pose a threat to any serious attempts to move towards a truly integrated project delivery. There is a real possibility that BIM is a potential catalyst for these changes, though there are real obstacles in the way.

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Opinions of Legal Professionals Regarding the Use of ADR in the Construction Industry

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Abstract

Disputes are inevitable in the construction industry, and litigation, the formal way of settling disputes, is time-consuming and expensive besides several other drawbacks. This has led the industry to seek and establish non-judicial dispute settlement methods in quest for more cost-effective and swifter solutions that prevent deterioration of business relations between the parties. Such alternatives to litigation are generically called Alternative Dispute Resolution (ADR) methods. Being a rather new phenomenon, different opinions are present among different parties such as employers, contractors and legal professionals regarding the use of ADR in the Turkish construction industry. Following a survey investigating employers’ and contractors’ perceptions of ADR, this paper aims to examine the opinions and experience of the legal professionals in the use of ADR in construction disputes through in-depth interviews. The results reveal remarkable findings regarding the experience of legal professionals with ADR, opinions of legal professionals regarding the performance of various ADR methods, the perceptions that legal professionals have about the use of ADR in the Turkish construction industry, the role of legal professionals in ADR, preferred professional background of neutrals working in construction disputes and barriers to the widespread use of ADR in the Turkish construction industry.

Keywords: alternative dispute resolution (ADR), lawyers, legal professionals, Turkey.
1. Introduction

Although all parties have the same objective in a construction project, the motivation for fulfilling this objective is generally concerned with the profit to be earned or the benefit to be obtained. Profit for the contractor, sub-contractor and the promoter of the project is earned in different ways. It is often assumed this means that when the profit position of either party is threatened, conflict will emerge. (Hibberd and Newman 1997). Cheung et al. (2002) also suggest that disputes are frequently the rule rather than exception in the construction industry and they arise during a construction process for a number of reasons. The quality of materials, standard of workmanship, contractor delays, applications for extensions of time not being granted, variations, cost overruns and the meaning of contractual terms can be the subject of expensive claims and turn into disputes that threaten the success of the project (Adriaanse 2005). Given that disputes are a significant phenomenon within the construction industry, the question arises almost automatically as to how they are resolved. Traditionally, the means of resolution have been straightforward: construction disputes were resolved by litigation or arbitration, like other commercial disputes. The former could be regarded as the legal system’s provision of a response to the need for dispute resolution, the latter as industry’s alternative, an alternative historically so much favoured that major construction and engineering contracts included provision for it. Yet currently neither can be said to generate unqualified enthusiasm within the construction industry. As a result of a general disappointment with the traditional dispute resolution methods, interest in Alternative Dispute Resolution (ADR) began to grow (Brooker and Lavers 1997).

Alternative dispute resolution methods are non-adversarial processes which are aimed at resolving disputes without resorting to the traditional forms of either litigation or arbitration (Ashworth 2005, p.53). The most widely used ADR methods are negotiation, mediation, expert appraisal, executive tribunal, adjudication and dispute review boards/panels. The discussion on arbitration in the literature seems to result in defining arbitration not an ADR method but a quasi-judicial procedure because of its features closer to (or worse than) litigation in terms of duration, cost and the level of bureaucracy (Adriaanse 2005, p.347; Carmichael 2002, p.265). Rubin and Quintas (2003) suggest that the salient characteristics of ADR make it an attractive option for settling the complex and time sensitive disputes that often arise during the course of construction projects. Beside being a faster, less bureaucratic and more cost-effective process that do not require the use of attorneys to present claims, the real-time approach to disputes can prevent deterioration of business relations and the consideration of disputes by knowledgeable industry professionals can provide reaching more equitable results based on the realities of the construction process instead of applying the strict letter-of-the-law removed from its relevant context. The negative perceptions of the use of ADR in the construction industry, on the other hand, have been analysed by Brooker and Lavers (1997) on the basis of an extensive survey in the UK construction industry which identified the following most frequently stated negative attitudes to ADR: (i) proposing ADR to the other side is a sign of weakness; (ii) ADR reveals one’s position to the other side; (iii) ADR before discovery of documents could result in a settlement being entered into when one should have gone for something better; (iv) ADR can be used to delay payment; and (v) ADR is non-binding and therefore too weak to be effective (for non-binding methods of ADR). Despite these negative perceptions, Broker and Lavers
(1997) conclude that the widespread dissatisfaction with its long-established 'rivals' speaks in favour of ADR; many respondents who had never used ADR expressed an interest in doing so and ADR was perceived as enjoying real advantages over litigation and arbitration, in terms of reduction of damaging confrontation, reduced cost and time, and the expectation of flexibility and a good settlement rate.

According to Cheung (2006), ADR is widely used in developed countries’ construction industries and is spreading fast globally. However, the widespread adoption of such new methods is obstructed by ingrained prejudice against new methods of doing business in some countries. Being a rather new phenomenon, different opinions are present among different parties such as employers, contractors and legal professionals regarding the use of ADR in the Turkish construction industry. Following a questionnaire survey investigating perceptions that project managers comprised of twenty-five employers and twenty-five contractors have about ADR (part of the findings of this survey were previously reported in Ilter and Dikbas (2009a) and Ilter and Dikbas (2009b)), this paper aims to examine the opinions and experience of legal professionals in the use of ADR in construction disputes through interviews in the quest for making projections for its further development in the Turkish construction industry.

2. Methodology

The methodology selected for the legal interviews was “in-depth interviewing by expert sampling”. This methodology was chosen for a number of reasons. Expert sampling involves the assembling of a sample of persons with known or demonstrable experience and expertise in some area (Trochim, 2010). Expert sampling was used in the exploration of the opinions of legal professionals regarding ADR in the construction industry since the number of legal professionals (lawyers, claim consultants and legal scholars) who have knowledge and experience of the subject is still limited in Turkey. With the aim of reaching these experts, a letter was sent to request an interview to the members of Alternative Dispute Resolution Centre of the Ankara Bar, members of the Arbitration - Mediation and Expert Appraisal Centre of the Istanbul Chamber of Commerce and legal scholars who have publications about ADR. There were 12 interviews in total, which comprised 4 claim consultants (working for prominent contractor firms in Turkey), 5 lawyers and 3 legal scholars.

On the other hand, in depth interviewing methodology enabled detailed discussion of the issues tackled in the research, as well as testing the results revealed in the questionnaire with the contractors and employers that was completed in the earlier stages of the research. Structured interview technique was adopted and the questions formulated to explore the opinions of the legal professionals regarding ADR included the ones to elicit the interviewees’ experiences with ADR, perceptions of the performance of various ADR methods in construction disputes, opinions on the current and future use of ADR in the Turkish construction industry, role of lawyers in ADR, preferred professional background of neutrals working in construction disputes and barriers to the widespread use of ADR in the Turkish construction industry.
3. Experience of legal professionals with ADR

The experience of the legal interviewees with dispute resolution methods varied however all had used some form of ADR, which was expected due to the expert sampling methodology adopted in the study. The interviewees confirmed the results that had been revealed in the questionnaire with contractors and employers that little use is made of ADR (except for negotiation) in the Turkish construction industry. Table 1 and Figure 1 show the frequency and percentage of the legal interviewees who had been involved in each of the dispute resolution method while resolving a construction dispute. While nine out of twelve interviewees had been involved in litigation, only five had been involved in arbitration while resolving a construction dispute. More legal professionals were involved in negotiation and executive tribunal (eight in each) than in arbitration. This finding, that arbitration is not as of often used as perceived in the Turkish construction industry, is compatible with the findings that had been revealed in the questionnaire with contractors and employers.

Table 1: Frequency and percentage of the legal interviewees who had been involved in each dispute resolution method while resolving a construction dispute.

<table>
<thead>
<tr>
<th>Method</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Litigation</td>
<td>9</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Percentage</td>
<td>75</td>
<td>25</td>
<td>100</td>
</tr>
<tr>
<td>Arbitration</td>
<td>5</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td>Percentage</td>
<td>41.7</td>
<td>58.3</td>
<td>100</td>
</tr>
<tr>
<td>Dispute Review Boards (DRB)</td>
<td>3</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>Percentage</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>Adjudication (contractual)</td>
<td>4</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Percentage</td>
<td>33.3</td>
<td>66.7</td>
<td>100</td>
</tr>
<tr>
<td>Expert Appraisal</td>
<td>2</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Percentage</td>
<td>16.7</td>
<td>83.3</td>
<td>100</td>
</tr>
<tr>
<td>Executive Tribunal</td>
<td>8</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>Percentage</td>
<td>66.7</td>
<td>33.3</td>
<td>100</td>
</tr>
<tr>
<td>Mediation</td>
<td>5</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td>Percentage</td>
<td>41.7</td>
<td>58.3</td>
<td>100</td>
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<tr>
<td>Negotiation</td>
<td>8</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>Percentage</td>
<td>66.7</td>
<td>33.3</td>
<td>100</td>
</tr>
</tbody>
</table>
Figure 1 reveals that most of the legal interviewees were involved in litigation, which is followed by negotiation and executive tribunal, arbitration and mediation, adjudication, DRBs and finally expert appraisal. When compared with the results that had been obtained from the survey with fifty project managers (Figure 2), it can be seen that the ranking of some of the methods are considerably different. If this is taken as an indicator of the involvement of the legal professionals in various dispute resolution methods, then Figure 1 and Figure 2 show that although expert appraisal is a frequently used method in the construction industry, rarely a role is given to legal professionals in this process. On the other hand, legal professionals are more frequently involved in litigation, arbitration and executive tribunals compared to the other processes and as a result these methods get a higher ranking among the legal interviewees than they do among project managers.
4. Performance of ADR methods

Figure 3 and Figure 4 show the perceptions that legal interviewees and the project managers have about the performance of various dispute resolution methods respectively.

These figures reveal that the opinions of the project managers and the legal interviewees on the performance of various dispute resolution methods are considerably different as well. It can be seen that while the processes that involve technical opinion of neutrals, such as expert appraisal, DRBs and adjudication are favoured by project managers, adversarial methods, namely litigation and arbitration get higher scores among legal interviewees. This finding is a strong indication of the different perspectives that construction and legal professionals have regarding the resolution of disputes in the construction industry.
5. Use of ADR in the Turkish construction industry

The survey had revealed that despite the low level of knowledge of ADR and very low level of current use of ADR among project managers (except for negotiation), nearly all project managers would think of using ADR in future. After these results were presented to the legal interviewees, they were asked to give their opinions on the current and future use of ADR in the Turkish construction industry. All of the legal interviewees agreed with the findings of the survey in this regard and stated that construction disputes constitute one of the most suitable dispute types for the implementation of ADR methods. One of the interviewees explained this statement with the fact that disputes are inevitable in construction projects and that construction disputes cause delays and cost over runs immediately, which require a prompt resolution. The legal interviewees think that ADR methods are perceived as “intermediate techniques” by most of the legal professionals who prefer litigation and arbitration since they have a more conclusive nature. Some legal interviewees added that it is the responsibility of the professional institutions to raise the awareness about ADR among legal professionals.

6. Role of lawyers in ADR

Figure 5 shows the legal interviewees’ opinions regarding the role of lawyers in various dispute resolution methods.

According to the results revealed in Figure 5, all of the legal interviewees think that lawyers should be present in litigation and arbitration. Nine out of twelve legal interviewees believe that lawyers should be present in executive tribunal due to the involvement of upper management of the parties in the process. On the other hand less than half of the interviewees believe that lawyers are needed in DRBs, mediation, negotiation and adjudication. Only one interviewee believes lawyers are needed in

Figure 5: Legal interviewees’ opinions regarding the role of lawyers in various dispute resolution methods

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the expert appraisal process. These results are compatible with the implications made in the third section (experience of legal professionals with ADR).

7. Preferred professional background of neutrals

In order to shed light on the expectations of the Turkish construction industry in this regard, respondents’ perceptions of the professional background of a neutral working in the industry had been investigated in the survey with project managers. The results revealed that 78% of the project managers would prefer a neutral working on construction disputes to be an architect or an engineer provided that s/he has a fundamental training in law, while 22% would prefer an architect or an engineer as a neutral but did not think that training in law should be a requirement. None of the project managers preferred a lawyer to resolve their dispute, however, it should be noted that all of the project manager respondents are architects and engineers themselves. This finding shows that potential users of ADR methods in the Turkish construction industry are likely to prefer their disputes to be resolved by neutrals with relevant technical knowledge, rather than legal qualifications. On the other hand, while 75% of the legal interviewees would prefer a neutral working on construction disputes to be an architect or an engineer provided that s/he has a fundamental training in law, while the rest of the interviewees would prefer a neutral to be a lawyer. This means that while approximately 75% of each respondent group (project managers and legal interviewees) agree on neutrals working on construction disputes to be an architect or an engineer provided that s/he has a fundamental training in law, the rest would prefer to see a professional colleague as a neutral.

8. Barriers to the widespread use of ADR

Figure 6 and Figure 7 show legal interviewees’ and project managers’ perceptions of the barriers to the widespread use of ADR in the Turkish construction industry respectively.
Figure 6: Legal interviewees’ perceptions of the barriers to the widespread use of ADR in the Turkish construction industry

Figure 7: Project managers’ perceptions of the barriers to the widespread use of ADR in the Turkish construction industry

Figure 6 and Figure 7 reveal that “lack of knowledge of ADR in the industry” is perceived as the most important barrier to the widespread use of ADR in the Turkish construction industry by both legal interviewees and project managers. “Lack of a sector specific institutional framework”, “the slow adaptation of the industry to new practices” and “non-binding nature of ADR” follow. It can be seen that while “the perception that suggesting ADR is a sign of weakness” is perceived as a more important barrier among legal interviewees, “the possibility of ADR to be misused to detain the other party” is perceived as a more important barrier among project managers.

9. Conclusions

Given the inherent positive attributes of ADR in resolving construction disputes, it is needed to explore the perceptions of ADR among different stakeholders present in the Turkish construction industry, where no such study has previously been carried out, in order to make projections for its further development.

Findings from the project managers’ survey that had been completed at an earlier stage of the research had shown that despite the low level of knowledge and current use, ADR has been perceived positively by most of the contractors and employers. All of the legal interviewees agreed with the findings of the survey in this regard and stated that construction disputes constitute one of the most suitable dispute types for the implementation of ADR methods. However, the legal interviewees also think that ADR methods are perceived as “intermediate techniques” by most of the legal
professionals and added that it is the responsibility of the professional institutions to raise the awareness about ADR among legal professionals.

Another remarkable finding reveals that the opinions of the project managers and the legal interviewees on the performance of various dispute resolution methods are considerably different. While the processes that involve technical opinion of neutrals, such as expert appraisal, DRBs and adjudication are favoured by project managers, adversarial methods, namely litigation and arbitration get higher scores among legal interviewees. This finding is a strong indication of the different perspectives that construction and legal professionals have regarding the resolution of disputes in the construction industry.

The perceptions that project managers and legal interviewees have about the preferred professional background of neutrals working in the construction industry are different as well. Approximately 75% of each respondent group (project managers and legal interviewees) agree on neutrals working on construction disputes to be an architect or an engineer provided that s/he has a fundamental training in law, while the rest would prefer to see a professional colleague as a neutral in construction disputes.

Finally, regarding the barriers to the widespread use of ADR in the Turkish construction industry “lack of knowledge of ADR in the industry” is perceived as the most important by both legal interviewees and project managers. “Lack of a sector specific institutional framework”, “the slow adaptation of the industry to new practices” and “non-binding nature of ADR” follow. While “the perception that suggesting ADR is a sign of weakness” is perceived as a more important barrier among legal interviewees, “the possibility of ADR to be misused to detain the other party” is perceived as a more important barrier among project managers.

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Framework to further Utilise the Use of Private Dispute Resolution in Malaysia Construction Contracts

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Abstract

Problematic issues in litigation are evidenced by thousands of cases backlog in the Malaysian courts. One of the recommended solutions is active utilisation of private dispute resolution. However, preliminary research conducted indicates that the private dispute resolution is not widely accepted. Thus, this research tends to investigate the reasons behind. The methodology of this research is mixed methods of quantitative and qualitative. Empirical data for quantitative research was collected via cross sectional survey and qualitative research was gathered via in depth semi-structured interviews. Out of 1000 sampling frame of G7 contractors in Malaysia only 231 responses were received and analysed quantitatively and 30 interviews were conducted consists of 18 experienced in arbitration and 12 experienced in mediation. Verbatim data was recorded, interview transcriptions were reverted back to the respondents and analyses of qualitative data were performed via qualitative software. Critical issues were addressed in the analyses and recommendation to further utilise and enhance private dispute resolution has been made. Consequently, a framework to further utilise and improve private dispute resolution in the Malaysian construction industry was proposed and validated by 18 construction professionals, construction law experts and representatives from government agencies. The result observed that active supports from various agencies are crucial and dispute resolution should be simple in order to ensure active utilisation in the Malaysian construction industry.

Keywords: private dispute resolution, success factors, framework, validation
1. Introduction

3.1 Introduction

This paper focuses on the final task of the PhD research objective which is to develop framework to settle construction disputes and further improve and utilise private dispute resolution in the Malaysian construction industry. The establishment of the framework was drawn from the analyses and results of two stages data collection mainly cross sectional survey and semi-structured interviews. A framework was developed based on the use of private dispute resolution, perceptions and experience with the available private dispute resolution in the Malaysian context, previous researches in similar field and the latest development of private dispute resolution in other developed countries such as United Kingdom, Australia and Singapore. The proposed framework had undergone series of validation and verification exercise via face-to-face interviews and focus group feedback by various parties consists of construction industry professionals, construction law experts and representatives from government agencies.

3.2 Rationale of establishment

The establishment of a framework is mainly due to considerable low utilisation of private dispute resolution in construction industry, problems with the current scenario of private dispute resolution and lack of support from various agencies to further improve private dispute resolution whereas the private dispute resolution is far more establish and develop in the common law countries. Thus, this research is expected to provide significant contribution to the Malaysian construction industry.

The framework was established after considering the factors for dissatisfaction towards private dispute resolution, perceptions of the private dispute resolution and factors to further utilise private dispute resolution.

At the first stage of the establishment, a mechanism for efficient settlement of construction disputes was established and the Dispute Resolution Board (DRB) consists of private dispute resolution practitioners applying Caseload Management System (CMS) to ensure efficient settlement of disputes was proposed to be adopted in the construction contracts. The terminology of Caseload Management System was subsequently changed to Dispute Management System (DMS) after considering views from the panel of verifiers. Based on the characteristics of the DRB, it is expected to be a cheaper mechanism, efficient and non-adversarial. DRB is a concept of both dispute avoidance and settlement which is appropriate for large construction projects and it is consistent with the purpose of this research.

As a result from the second part of the qualitative data collected, a mechanism consists of various tasks to further utilise and improve private dispute resolution was framed by assigning stakeholders and it roles to ensure utilisation and improvement of private dispute resolution in the construction industry was established. Both mechanisms had undergone the process of piloting and verification process by various
parties. Thorough process of verification was performed in two stages by 18 verifiers from different background. All comments to further upgrade the framework to ensure practicality were attended and the final version of the framework was sent back to the verifiers.

3.3 Confirming the framework for private dispute resolution

The verification exercise was adopted and upgraded from Faridah (2009) and Padzil Fadzil (2005) and it was devised into two parts: verification of qualitative results and the proposed framework. The verification for qualitative results will ensure internal validity, accuracy and to ensure it matches the reality (Creswell J. W., 2007; Creswell J. W., 2003; Creswell J. W., 1994). The purpose of verification exercise was to verify practicability, ensure significant and validity of the approaches underlined for the improvements. Thus, the qualitative results and proposed framework were evaluated by panels consist of construction professionals and construction law experts.

The verification process - triangulation

Triangulation strategies have been rigorously applied in this validation and verification process (Creswell J. W., 2005). Potential verifiers were selected based on participation in the first and second stage of data collection with knowledge in construction law and dispute resolution and construction law experts.

Further amendments were made and verification process was executed. A set of documents consists of interview transcription, qualitative result and the proposed framework were e-mailed to 40 potential verifiers consist of 30 respondents and 10 construction law experts in Malaysia. Duration of two weeks was given to scrutinise and provide comments starting from 1st of May 2009 and the first verification assessment was conducted at 13 May 2009. The experts were selected from the list of Construction Industry Contracts Committee (CICC) established by CIDB and prominent construction law experts in Malaysia. The last stage of focus group session was conducted in concurrent with Construction Industry Development Board (CIDB) Workshop on National Adjudication Competency Standard (NACS). Prior to the session, the researcher had asked permission from the facilitator and Chair of the Construction Industry Working Group on Payment (WG 10) Sr Noushad Ali Naseem Ameer Ali to conduct a short focus group session to validate and verify the proposed framework and permission was granted. The session was initially conducted with two members of the panel and subsequently with four other members.

2. A framework for private dispute resolution

The framework for private dispute resolution consist of summary of quantitative and qualitative data, mechanism for efficient settlement of construction disputes and a mechanism to further utilise and improve private dispute resolution. Results from both quantitative and qualitative analyses triggered the
establishment of framework for efficient settlement and utilise and improve private dispute resolution including arbitration, adjudication and mediation.

3.4 Result from quantitative and qualitative analysis

A survey was conducted to 1000 selected respondents in Malaysia (G7 contractors) at the beginning of the research; the response rate was 23% which is acceptable rate after three attempts to get acceptable results. As a result, reasons for dissatisfaction towards dispute resolution and perceptions of dispute resolution were tabulated. Five most dissatisfactions of private dispute resolution were time and cost issues, complicated process, unsatisfactory results and problems with records and evidences. Meaning, a mechanism need to be formulated to ensure fast resolution, cheaper than the existing private dispute resolution that will produce reasonable acceptable results to both disputing parties.

Three major obstacles in private dispute resolution were: tedious process and complicated, the process of private dispute resolution is considerably long process, time consuming and add additional costs for the disputing parties. The data highlighted that the current practice of private dispute resolution was complicated and inflexibility. There was a trend to suggest that private dispute resolution should not be used at the end of the projects; involvement of third party should be minimised due to bias and abuse of power; and problem in record keeping, evidences and witness. Thus, a simple mechanism but efficient mechanism should be proposed.

Qualitative research produces success factors for private dispute resolution and factors to further utilise and improve private dispute resolution. The success factors are grouped into stages based on the narrative started from the appointment of dispute resolution practitioners, pre-dispute resolution, during dispute resolution and settlement.

Criteria for appointment of private dispute resolution practitioner

- Appointment should be made during pre-contract.
- Basis for appointment of suitable private dispute resolution practitioners to consider nature of dispute
- Highly experience (more than 15 years of experience and sufficient exposure in dispute resolution)
- Well verse in construction contracts and law.

Elements which were important when involve dispute resolution

Pre dispute resolution

- Sufficient documentations and adequate evidences.
• Adversarial or non-adversarial: suitable modes depend on relationship of the parties.

• Background and attitude of the parties: for international party arbitration may appropriate but it depends on relationship of the parties.

• Disputed amount: arbitration may be appropriate for large amount at stake.

**During Dispute Resolution**

• Spirit to resolve dispute fast.

• Sufficient amount of documentation to prove the claim and presentation.

• Appointment of experts to assist the arbitrator/mediator.

• Abide with contractual time.

• Presentation of case by chronological and narrative.

• Participation of working level who actually involved in dispute.

**Settlement**

• Predict the outcome, dispute may discharge earlier prior to arbitration or mediate before arbitration ends.

• Flexible in accepting the settlement.

• Accept the final decision and fulfill the obligations.

**Factor to further utilise and improve private dispute resolution**

• An establishment of framework for efficient dispute resolution.

• Amendment of standard forms to promote private dispute resolution.

• Active promotion and education of alternative methods in dealing with construction disputes encompasses: short courses for construction participants including lawyers; induction course on construction law and dispute resolution to project managers and regular publication of cases discussing on construction disputes.

• Establishment of Construction Advisory Committee.

• Economical and maximum period for dispute resolution.
• Establishment of construction court (similar to Technology and Construction Courts in the UK and court annexed mediation should be regulated).

• Final and binding settlement and enforcement regime for private dispute resolution.

• Maximise the potential of dispute resolution practitioners.

• Upgrade the standard of dispute resolution.

• Multipart dispute resolution mechanism

• Stages of dispute resolution

• Third party resolution anytime during contract period

### 3. A mechanism for efficient settlement of construction disputes

The establishment of a mechanism to efficiently settle construction disputes was based on Pappas (2004) who develop a Flexible Framework For Prevention and Resolution of Construction Disputes, Singapore Network Information Centre Pte Ltd who developed a Framework for Resolving Disputes Over Internet, Alternative Dispute Resolution (ADR) Guidelines by Australian government and Dispute Resolution Guidance by the Office of Government Commerce, United Kingdom. The purpose of having this mechanism is to ensure settlement of construction disputes by combining all methods of dispute resolution available in the construction industry and to encourage active utilisation of Dispute Resolution Board.

#### 3.1 Background

A mechanism for settlement of construction dispute is part of process to fully utilise private dispute resolution. Similar to previous research by Pappas (2004) it is flexible in nature and a strategic approach to dispute resolution. However, the mechanisms has been modified by introducing Dispute Management System (DMS) to manage the process of dispute resolution instead on Coverning Session in Pappas (2004) and based on the current scenarion of the Malaysian construction industry by fully utilising arbitration and internal mediation. Pappas (2004) added that the current practice in construction disputes resolution generally reflects one of two perspectives: that “one size (or resolution method) fits all” disputes and that dispute resolution is a menu of independent stand alone-choices. Therefore, he recommended that effective approach by diagnose the problem first and then select the least invasive procedure that will correct it. Similarly, OGC UK (2002) recommended stages of dispute resolution and
encourage non-adversarial dispute resolution for disputes involving government including construction issues.

The stages of dispute resolution is adopted in this mechanism almost similar to CIDB 2000\(^1\) dispute settlement mechanism and PAM 2006\(^2\). However, there is grave difference in term of the appointment and establishment of Dispute Resolution Board at the beginning of construction contract and combination of other methods such as expert determination and two stages of internal mediation: working level mediation and senior management level prior to adversarial dispute resolution.

### 3.2 Rationale behind the establishment

As a result from strong dissatisfaction towards existing process of private dispute resolution as illustrated in quantitative analyses and strong recommendation for non-adversarial process of dispute resolution as contended by large percentage of respondents in qualitative research, Dispute Resolution Board (DRB) and Dispute Management System (DMS) were proposed by the researcher as one of the solutions.

However, DRB and DMS are suggested as one of the options that can be adopted as part of the existing process of private dispute resolution such as arbitration, adjudication and mediation. In comparison to other private dispute resolution, DRB is not been widely introduced to the Malaysian construction industry if compared to other common law countries such as the UK, Hong Kong and US (Chern, 2007; Stanton, 2007). This research tends to introduce a modified version of DRB by combining DMS as part of dispute management which is believed to efficiently resolve construction disputes.

### 3.3 Dispute Resolution Board (DRB)

The appointment of dispute resolution practitioners has to be made very much earlier such as before signing the contract and before dispute actually happens. Thus, the establishment of Dispute Resolution Board is seen as the best mechanism to avoid escalation of disputes. The Dispute Resolution Board may consist of one dispute resolution practitioner, a tribunal of three or any odd number. The criteria for selection should be appointed based on the nature of construction project, highly experience and well verse in construction contracts and law. As adopted and modified from the existing concept of DRB, the scope of work for DRB is the following:

1. Regular visit at site to look put to analyse potential dispute and resolve it as it comes.

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\(^1\) CIDB stands for Construction Industry Development Board of Malaysia. CIDB 2000 is the first standard form of contract published by this agency to cater for construction projects in Malaysia.

\(^2\) PAM stands for Persatuan Arkitek Malaysia or Architects Association of Malaysia. PAM 2006 is the latest version of standard form of construction contract for private building projects.
2. To initiate DMS to look at the possibility of settlement and if necessary to assist the parties in settlement of disputes by looking into various means of settlement both non-adversarial and adversarial mechanism.

3. To act as an informal dispute resolution mechanism and Early Neutral Evaluator (ENE) to produce a non-binding result that aims to provide an objective and independent assessment of the merits of a case.

4. To assist the parties on appropriate mechanism of settlement. DRB is expected to assist the parties in all stages of dispute resolution in term of preparation for documentation and requirement for further dispute resolution such as appointment of suitable third party for private dispute resolution process.

5. DRB is flexible and the parties may agree on the jurisdiction.

The tendency of the construction industry to introduce DRB is not new. In mid 1990s Xavier (1995) highlighted that clear guidelines should be formulated laying down the specific instances as to when parties may proceed to arbitration after a dispute had been heard and reviewed by the DRB before the concept can be introduced in the Malaysian construction industry. However, until to date DRB is not been actively publicised and introduced to the Malaysian construction industry. Thus, this framework is expected to further inform on the availability of such dispute resolution.

At the time of writing up this paper, there was an intention by Procurement and Project Delivery Systems Research Unit, Kulliyyah of Architecture and Environmental Design International Islamic University Malaysia; Department of Urban Management Graduate School of Engineering Kyoto University, Japan; and Construction Law and Economics Circle in Asia and Pacific Rim (CLECAP) to promote dispute resolution board by way of education, training and accreditation of dispute board members (Khairuddin, Kobayashi, Omoto, Preece, & Sharina Farihan, 2009). In consistent with this research, the committee expected to produce a framework for training in contract administration by putting efforts from prominent professors in construction law (Khairuddin, 2009). Even it is still in preliminary stage but a significant approach has been shown by the committee members to promote another mode of private dispute resolution.

### 3.4 Dispute Management System (DMS)

DMS is a unique process of overall management, tracking and expeditious administration of dispute. The process of Dispute Management System was adopted from the court system known as Caseload Management or Case Management System for both criminal and civil cases in the common law countries (Abu Haniffa, 2008; Fiadjoe, 2004) and it is applied in the other industries such as Health Science, Business Management and Education (Sage & Simon, 2008). The objectives of CMS are:-
1. to save or cut down on expenses;

2. to allocate resources in proportion to the subject matter of dispute;

3. to be expeditious; and

4. to be fair.

For the purpose of this research a proposed guideline for DMS in the construction industry is designed to ensure faster and cheaper process:

1. DMS to monitor and manage both its caseload and individual cases.

2. DMS cannot be successful without strong leadership and commitment from DRB and disputing parties.

3. Procedures and rules must be clearly established by looking into existing legislation, rules and written practices.

4. Cases must be brought for settlement by DRB soon after their commencement.

5. Different kinds of cases require different kinds of management.

6. The degree and intensity of management must be proportionate to what is in dispute and to the complexity of the matter.

7. The number of dispute resolution proceedings should be minimised.

8. Realistic but expeditious timetables must be set and, unless there is good reason, must be adhered to.

9. A key objective is to identify the issues really in dispute early in the proceedings.

10. Dates for dispute resolution trial dates must be established as soon as practicable and must be definite, so as to ensure compliance with timetables.

11. Both internal and external private dispute resolution should be encouraged and sometimes mandated (contractually).
12. Monitoring of the caseload must provide timely and comprehensive information to dispute resolution practitioners and disputed parties. Time standards may be useful in focusing the attention of all those involved.

13. Ongoing process of communication and consultation within the disputing parties.

### 3.5 Stages of Dispute Resolution/Multi-tier dispute resolution

If the issue is not resolved within certain period of time (may be specified in DMS), private dispute resolution may be conducted and stages of dispute resolution are recommended. **Stages dispute resolution** consists of negotiation, non-binding and binding mechanism has been introduced by the Office of Government Commerce UK in 2002 as a result from statement by Lord Chancellor in 2001 actively apply ADR to settle disputes in order to preserve relations (OGC, 2002). Similar mechanism should be applied as part of CMS. It is expected the parties might reach settlement prior to adversarial dispute resolution. Stages of dispute resolution can be divided into three stages namely:

1. Stage one: Non – binding mechanism; third party mediation may be conducted since internal resolution consists of working level negotiation, expert determination and internal mediation with senior management failed.

2. Stage two: Contractual adjudication may be performed. The adjudicator need to decide dispute within certain period of time and the decision may be revised by arbitration. It is recommended for non-payment and set-off issue to be resolved via adjudication and it should be a condition precedent to arbitration.

3. Stage three: Further arbitration proceedings may be conducted to open up and revise decision by the adjudicator and acts as the final mode (Rajoo, 2008). If not the adjudicator’s decision may be final and binding. In comparison to adjudication, any issue under the contract may be referred to arbitration.

At the end of the private dispute resolution litigation (public dispute resolution) may be conducted and the aggrieved party may bring the case to litigation. However, due to final and binding mechanism of arbitration under the Arbitration Act 2005, no recourse to the courts other than in limited and specified circumstances specified in the Act. Other than arbitration, there is no similar issue for adjudication and mediation. The framework is diagrammatically illustrated below.

### 3.6 Benefits of having this mechanism

Benefits of having the mechanism in the construction contracts are as follows:-
1. Efficient settlement is expected since DMS will be adopted by DRB to assist the parties from the very beginning.
2. Non-adversarial dispute resolution will be promoted prior to adversarial dispute resolution as a result it will save time and cost.
3. Stages dispute resolution will determine the appropriate mechanism for settlement.
4. Encourage the parties to actively involve with dispute resolution.
5. Encourage early settlement of disputes through other means other than arbitration.
Figure 1: A Mechanism for Efficient Settlement of Construction Disputes

**PRE-DISPUTE RESOLUTION**
- The appointment of DRB in pre-contract.
- Consists of single or a tribunal of three or odd number.
- Criteria for selection based on nature of project, experience and well verse in law and contract.

**DISPUTE MANAGEMENT SYSTEM**
- DMS to Monitor and control the progress of the case from initiation until disposition.
- DMS to include recommending settlement (Early Neutral Evaluation), assisting the parties in preparation of documentations and evidences for internal resolution or further utilization of private dispute resolution.
- Set a time frame for each stage of dispute resolution process.
- Creating an atmosphere for dispute resolution.

**Stages of Private Dispute Resolution**
1. Third Party Mediation
2. Adjudication
3. Arbitration
   - Combination of non-binding and binding mechanisms to preserve relations.
   - Settlement is expected to reach prior to adversarial dispute resolution.

**Internal Resolution**
1. Working Level Negotiation
2. Expert Determination
3. Internal Mediation by Senior Management
   - Internal resolution to combine non-binding and binding mechanisms to preserve relations.
   - Settlement is expected prior to reach prior to adversarial dispute resolution.

**Settlement Agreement**

**PUBLIC DISPUTE RESOLUTION**
- Involvement of court in litigation.
- Adversarial dispute resolution.
- Legal aspects of dispute will be scrutinised.
4. A mechanism to further utilise and improve private dispute resolution

The establishment of a mechanism to further utilise and improve private dispute resolution is based on the comparison of the current development and application of private dispute resolution in the Malaysian construction industry and other common law countries. Data collected from qualitative research was further developed by looking into the current problems, success factors and further improvement for private dispute resolution.

4.1 Background

It is believed that strong support from various agencies in promoting private dispute resolution will prosper the use and development of such resolution in Malaysia (Ezulike & Hoare, 1998). In the United Kingdom, strong support by academic institutional by way of promoting dispute resolution as one of post graduate programme; establishment of various societies to offer services for private dispute resolution under the umbrella of professional bodies and strong government support by way of establishment of Acts, construction courts and producing dispute resolution guidelines. On this basis, this research recommends a framework consists of those entities to prosper the development of private dispute resolution.

4.2 Rationale behind the establishment

Many can be done by the government to improve and ensure utilisation of private dispute resolution. Collaborations with professional bodies and academic institutions should be encouraged to perform the following tasks:-

- An establishment of Construction Advisory Committee (CAC) – the CAC is expected to advice disputing parties on the settlement and selection of appropriate mechanism for settlement of construction disputes. The committee should be independent and impartial and consists of various experts from different agencies.

- Dispute resolution legislations – The establishment of Acts for private dispute resolution is seen as the best mechanism to further promote and utilise it and stages dispute resolution should be mandatory. Similar research by Australian government indicates a “light regulatory approach” of dispute resolution framework was preferred to maintain a flexible approach of dispute resolution (Australian Government, 2006). Thus, similar approach is expected.

- An establishment of Construction Industry Courts similar to Technology and Construction Courts in the United Kingdom should be encouraged exclusively to dispose construction disputes and provide enforcement mechanism.
Establishment of a framework for efficient settlement of construction disputes is crucial as guidance for disputing parties.

Upgrade the standard of private dispute resolution by way of maximising potential of dispute resolution practitioners in all aspects and mode of private dispute resolution such as dispute board, early neutral evaluation, expert determination and mini trial. Active collaboration with national and international dispute resolution centre and professional bodies.

Induction course on construction disputes and settlement to be conducted by CIDB for Project Managers.

Professional bodies such as Chartered Institute of Arbitrators, Institution of Surveyors Malaysia, Malaysian Institute of Architects and Institution of Engineers Malaysia should be promoting private dispute resolution by way of upgrading standard forms of contract to include other private dispute resolution instead of arbitration and mediation as ultimate dispute resolution. More training for potential dispute resolution practitioners should be conducted at the minimum charge and join activities such as dispute resolution competition with both national and international dispute resolution centre should be encouraged to upgrade the current standard of dispute resolution.

Regular publication of case studies discussing on construction disputes and settlement should be encouraged to provide in-depth knowledge on the potential disputes and appropriate resolution.

Participation of industry bodies consists of representatives from contractors such as Master Builders Association (MBAM), subcontractors, suppliers and developers such as Real Estate and Housing Developers Association (REDHA) are highly recommended to participate in term of providing input and suggestions in term of use of private dispute resolution and how it will benefit the industry from their point view. This concept is similar to the Joint Contracts Tribunal (JCT) in the UK to serve the construction industry by producing standard forms agreed by the industry.

Support from academic institutions is crucial to create awareness to students and stakeholders by way of short courses on dispute resolution and provide introductory training to potential dispute resolution practitioners. Active research in the area of dispute resolution and post graduate courses on Dispute Resolution should be promoted. In early 2000, Professor of Law Syed Khalid Rashid from International Islamic University of Malaysia urged alternative methods of private dispute resolution to be introduced as part of LLB course. He pointed out that the legal education in Malaysia continues to be court-centered, litigious and adversarial in nature and students hardly get a chance to know about other modes of dispute resolution. He added that the legal education in Malaysia need to be more proactive and in line to the needs of contemporary society, thus becoming more socially relevant (Syed Khalid, 2000). Clearly, alternative modes need to be introduced not only to construction related courses but to new and upcoming
lawyers since they are normally be appointed as legal advisers to the construction organisations. If the legal advisers are prone towards litigation it will not prosper the use of alternative modes.

In concurrent Syed Khalid (2000), Singh & Mohd Fisol (2008) pointed out that Quantity Surveyors should be equipped with knowledge, skills an practical exercises in alternative modes of private dispute resolution in order to provide professional services domestically and internationally to parties aggrieved. They attempted to propose that Quantity Surveyors are able and capable to be Negotiators, Mediators, Conciliators, Adjudicators, Arbitrators or Expert Witnesses as the case may be. Consistent with this researcher, they urged that Universities offering qualifications in Quantity Surveying must move along with the developments taking place in the construction industry as far as dispute resolution process is concerned to create an enthusiastic interest in this area of expertise so that a holistic basic qualification will provide the younger Quantity Surveyors with the required tools to go on further to achieve the above qualifications. Furthermore, they strongly proposed that Universities must embark on providing short courses in respect of alternative modes of private dispute resolution processes to contractors, sub-contractors, clients (whether public or private), and suppliers of building materials so that all these parties who are involved in the construction industry may be able to adopt a more efficient and prudent method of resolving disputes when faced with one.

The researcher aware that there are most academic institutions provide basic knowledge on construction law and dispute resolution to construction related programme at both undergraduate and postgraduate level. But it seems insufficient to create awareness and better understanding in the area. Currently, only one public university which is University of Technology Malaysia conducting MSc in Construction Contract Management with the main objective to provide knowledge in contract management encompass contract law, statutory obligations and dispute resolution. Similar programme should be conducted in other built environment faculties of the public universities such as University of Technology MARA and University of Science Malaysia. At the present moment construction law and dispute resolution subjects are part of project management programme in the stated universities. The framework is diagrammatically illustrated in Figure 8.2.

4.3 Benefits of having this mechanism

The mechanism may be adopted to encourage active participation by different agencies to further utilise and improve private dispute resolution. Government agencies such as CIDB and Public Works Department have to play active roles in upgrading the standard of private dispute resolution in Malaysia. Without strong political support from those agencies active development may not be seen.
Figure 2: A Framework to further improve and utilise private dispute resolution

- Construction Advisory Committee.
- Construction Industry Court
- Dispute Resolution Legislations.
- A Framework for Efficient Settlement of Disputes.
- Upgrade the standard of private dispute resolution.

PROFESSIONAL BODIES
- Regular publication of case studies.

INDUSTRY BODIES
- Amendment of standard form to promote private dispute resolution.
- Induction course to Project Managers.

GOVERNMENT AGENCIES

ACADEMIC INSTITUTIONS
- Short courses for stakeholders on awareness of private dispute resolution.
- Preliminary training for potential practitioners.

IMPROVEMENT AND FURTHER UTILISATION
5. **Summary**

As a result from the analyses of two stages of data collection this chapter has illustrated the process of establishment, benefits and the characteristics of the framework for private dispute resolution encompasses a mechanism for efficient settlement of private dispute resolution and how to further utilise and improve private dispute resolution in the Malaysian construction industry. The framework has undergone the process of piloting and verification by various parties using triangulation strategy to different parties within the construction industry. At the initial stage of the establishment, the framework was piloted to construction professionals consist of a Senior Quantity Surveyor, a Senior Project Planner and a Designer; academics with construction law background; PhD holders and PhD researchers. All comments and suggestions on the overall layout and content of the framework were attended. Subsequently, the process of verification was conducted to ensure internal validity of the research by three groups of people consists of construction professionals who participated in the first and second stage of data collection, prominent construction law experts and representatives from the government agencies pertaining to construction: the Construction Industry Development Board (CIDB) and Public Works Department (PWD). Generally, all verifiers agree with the importance, appropriateness and content of the framework. However, minor amendments were suggested by some verifiers and it was attended by the researcher. The final version of the framework was sent back to all verifiers and a focus group session was conducted as the final stage of the verification processes. In general most of them agreed with the proposed framework and it is appropriate for the context of this research and construction industry. Thus, the significant of this research is evident and noted by all parties participated in all stages of the research.

**References**


sing the Standard-A quality framework for primary dispute resolution under the Family Law Act 1975-September 2002


Abstract

Contractual relationships have become increasingly strained in recent years in the construction industry result in the use of the judicial system for the settlement of contractual disagreements. Why is this so? Evidence from anecdotes suggest that the lack of capacity amongst owners and contractors to carry out a contract using a good practice approach during the construction of a project contribute to the occurrence of conflicts, losses, deficient contractual relationships and poor performance of the construction work. Recognizing that current forms of contract in use today perpetuate a legacy of construction problems, we are conducting explanatory research to examine whether the widely publicized benefits of New Engineering Contract (NEC) could be realized in the Australian construction industry. This paper outlines a research agenda that will help shed light on how contract forms are able to be used as a mechanism to ensure construction projects are delivered successfully whilst also meeting the goals of multiple stakeholders. Understanding the Critical Success Factors (CSFs), commonly used construction contracts and the NEC system can help us address some of these issues. However, there are gaps in the validation of the benefits of NEC and its link with project success. We identify some of these gaps and propose a methodology by which to gain insights into this phenomenon.

Keywords: project success, construction contracting, new engineering contract (NEC)
1. Introduction

In line with the development in Standard Forms of Contracts, this research attempts to examine the possibility of implementing the New Engineering Contract (NEC) issued under the sanction of the Institution of Civil Engineers (ICE), United Kingdom (UK) in the Australian construction industry, to ensure that construction projects are delivered successfully whilst also meeting the goals of multiple stakeholders. Unlike traditional forms of contract, the NEC seeks to achieve improvement in contractual relationships, managerial practices and business values. Additionally, it is seen as one of the best solutions to the perennial problem of adversarial relationships and often costly disputes. It is clear that a radical and more effective new standard form of contract is needed to play a more dynamic role in the continuous improvement vital to the construction industry. Given that Australia’s culture is not too different from the UK’s culture, one may argue that if the NEC is implemented in Australia, its use might be able to cure some of the common ills in our national construction industry.

As a radical contract, the NEC is a potential answer for the long quest to establish a single form for each delivery method that is available for use across all sectors of the industry. However, despite widely known benefits of the NEC, there is still resistance to using this new form of contract for construction works in Australia. There are hardly any studies that have established the validity of such claims and established a link between the NEC contract use and project success. There have also been a large number of publications which have identified success factors on construction projects, but many of them focusing on specific aspects of the project or on critical criteria such as time and cost. Therefore, this study primarily concerned with developing a contracting strategy as an approach by the vanguard of the construction industry to remedy the affliction of increasing problems in the Australian construction industry.

Professionals worldwide bemoan consequences of ineffective contracts - occurrence of conflicts, losses, deficient contractual relationships and poor performance of the construction work and the ease with which schedules and budgets are derailed. Why is construction projects beset with such problems? What can we do to understand them better and mitigate their effects? We plan to discuss these issues in the rest of this paper. In the next section we describe some of recurrent problems in construction projects. Based on this discussion, we identify a research agenda that will lead to a better understanding of the need for contract reform. We then review the literature on project success, construction contracts and the NEC, and identify gaps in these areas to our research questions. We then delineate our research methodology and discuss some of the contributions that we hope to make.

2. Theoretical framework

The construction industry has become increasingly adversarial in both the public and private sectors and among stakeholders, the working relationships, communication, and the commitment to a successful job and to each other are often not performed in a spirit of good faith (Thompson et al., 2000). For all parties involved, these issues cause difficulties and are a source of additional costs in
accomplishing the construction activities. At present, contract documents do little to minimize adversarial thinking and provide too little incentive to avoid disputes. Most often than not, these contract documents are left in the drawer untouched and only surface when problems arises for finger pointing purposes.

On the other hand, stakeholders in the industry namely the Architects, Engineers and Quantity Surveyors were seen trying to grapple with the novel and unfamiliar conditions of numerous forms of contracts that ripple through the industry. One of the circumstances of many standard forms also appear to lack clearly defined design objectives and to disregard modern principles of risk allocation and project management has been widespread criticism of standard forms for failing to meet the needs of the construction industry (McInnis, 2001). Duncan-Wallace (1996) said poor draftsmanship and tinkering of contracts in an amateurish way by non legal professionals caused uncertainties to the construction process. Consequently, contracts then become confrontational with opportunities for disputes at every turn.

Changes in construction technology and the complexity of projects have made the building process more complicated. Presently used contracts and project management techniques are struggling to keep up with the dynamics of the industry. Additionally, owners have become highly leveraged with tighter budgets and restricted cash flow. Pressures to get projects up and running have led to tighter time schedules and experiments with new accelerated project delivery methods. As a result, the cumulative effect of these factors caused traditionally cooperative relationships to deteriorate, and be replaced by adversarial, antagonistic relationships, “win-lose” attitudes, and general dissension (Thompson, 1998).

In essence, one of the recurrent problems during the construction of a project is the lack of capacity amongst owners and contractors to carry out a contract using a good practice approach. This brings about consequences, the occurrence of conflicts, losses, deficient contractual relationships and poor performance of the construction work. Additionally, there has been a proliferation of forms sitting within existing contract document suites, and the continued utilisation of be-spoke or heavily amended forms of contract attempting to grapple with some long standing issues in the industry. Based on the above problem formulation, four (4) research questions have been identified, the pursuit of which could lead to a better understanding of the need for contract reform. These research questions are:

- What is project success and what is the impact of standard form contracts on it?
- What has been the process used to develop and implement the NEC in the UK construction industry and the evaluation its use?
- What are the salient aspects of the NEC setting it apart from traditional forms of contract and how does NEC differ from such other forms of contract?
• What are the means to quantify the evaluation of the NEC system and the factors that will influence the NEC’s wider adoption in the Australian construction industry, and if any changes may be require to be implemented as a means of improving the value of NEC?

If we could begin to answer these questions, we could then understand the dynamics behind the contractual problems in construction projects. We could then attempt to predict and find ways to mitigate the contractual risks that result. Our next step then is to see what the academic literature has to offer towards answering these research questions. In this paper, we will primarily focus on the first research question that has been identified above. We will first look at the existing academic literature has to offer towards answering these research objectives.

3. Project success

Sanvido et al. (1992) define success for a given project participant as “the degree to which project goals and expectations are met” (pp94-111). They added that these goals and expectations may include technical, financial, educational, social, and professional aspects. Meanwhile Takim and Akintoye (2002) said functionality, profitability to contractors, absence of claims and court proceedings and “fitness for purpose” for occupiers have also been used as measures of project success. Furthermore, Nguyen et al. (2004) found that a construction project is commonly acknowledged as successful when it is completed on time, within budget, and in accordance with specifications and to stakeholders’ satisfaction.

There is a proliferation of research studies investigating the subject of “construction project success” over the past few decades and that literature pertains to achieving success on a wide range of projects, either in a generic sense or related to particular areas, for example, focusing on time, budget, productivity and disputes etc. However, little is known about the impact of actual contract forms on project success as many researchers have failed to identify the form of contract as a critical success factor.

Jaselkis and Ashley (1991) investigated the determinant factors required in order to achieve budget, schedule and outstanding project performance. They identified “reducing team turnover” and “program constructability”, as the two key factors required for achieving such project success on construction works. Meanwhile, Chan and Kumaraswamy (1997) determined and evaluated the factors causing delays for construction projects in Hong Kong. They identified five common causes of delays: poor site management and supervision, unforeseen ground conditions, low speed of decision making involving all the project team, client initiated variations and necessary variations of works.

There has also been research which identifies success factors that influence the performance of certain procurement strategies. Tiong et al. (1992) identified the critical success factors in winning build-operate-transfer (BOT) contracts. Several researchers have focused on the factors affecting construction project success and have proposed either general factors (Sanvido et al., 1992) or specific factors (Chua et al., 1999). Cheng et al. (2000) identified the critical success factors for
Project Finance Initiative (PFI) contracts and partnering projects respectively. Similarly, Chan et al. (2004) observed certain necessary critical success factors needed in bringing successful outcomes to partnering and identified five of the success factors as being critical: establishment and communication of conflict resolution strategy; willingness to share resources among project participants; clear definition of responsibilities; commitment to win-win attitude; and regular monitoring of partnering process.

In a business context, the Performance Evaluation and Professional Development System (PEPDS), (2004) defined success factor as “any knowledge, skill, trait, motive, attitude, value or other personal characteristics that is essential to perform the job or role and that differentiates solid from superior performance”. Meanwhile, Phua (2004) is of the view that multi-firm project success can be defined and measured, at least at the operational level, as the extent to which projects meet a combination of budget, timetable and technical specifications. Following that, Low and Chuan (2006) noted that project success is a basic concept in project management. However, they argued that the traditional definition of project success – which emphasizes time, cost, and quality – is not so adequate and comprehensive.

According to Austin et al. (2002), the most important problem is project and contract management and these aspects are analyzed by many researchers who emphasize the need for the construction industry to increase its efficiency to be competitive in the market. Project management embraces the development of a contract to be signed by employer and one or more contractors. Economic success of both parties largely depends on the contract developed, which also determines the behavior of managers seeking to increase profit and protect themselves from losses (von Branconi and Loch, 2004). These authors (op. cit., 2004) also determined eight key criteria of contract evaluation to be analyzed by top managers in developing contracts.

Although there has been a great deal of research on success on specific areas of construction projects, there has been no such study on the efficiency of contract forms in relation to steering construction projects towards success. For instance, in the conceptual framework of project success developed by Chan et al. (2004) using a grounded methodology, the form of contract is not even mentioned. Similarly, in an industry survey of success factors connected with large scale construction projects in Vietnam, once again the „form of contract” has not been identified as having a significant impact on project success (Nguyen et al., 2004). In short, this is rather surprising from a commonsense standpoint raising doubts on the adequacy and accuracy of such findings!

4. Why contracts go wrong

According to Uff (1989), the growth and proliferation of construction contract forms is notable and suggests an intention to achieve some objectives. These objectives are however, rarely defined other than generally, usually consisting of a desire to „improve” the operation of the form. Observation on trends and bad results in construction contracts was made by (Shumway et al., 2004) who reviewed some of the significant changes in construction contracts in the past 10 to 20 years that had become the source of many problems between owners and contractors. Various researchers have also made
the efforts to understand the reasons for project failure in construction contracts. Contemporary research into construction disputes reveals that some researchers have attempted to identify the sources of disputes and provide some information on why construction contracts go wrong.

While Clegg (1992) notes that conflicts appear to be one of the main reasons for failure, Jones (1994) highlighted ten areas which contribute to failure in contracts. A study by Bristow and Vasilopoulos (1995) discovered contract documents as one of the reasons why contracts failed and following that, Alkass et al. (1996) argued that delays are the root cause to the failure of a construction contract. Fenn et al. (1997) meanwhile revealed that contract conditions cause dispute and there are some contracts which cause more dispute than others. A model based on problem situations was later produced by Mitropoulos and Howell (2001) which classified project uncertainty, contract, working relations and problem solving effectiveness as the sources of dispute; hence the reason construction contracts go wrong.

It is found that it is almost impossible to find an agreement on causal factors of construction disputes as the existing literature cites many different causes. Ample literature is available which reviews why construction disputes arise or why contracts fail. However, scarce data on the key issues to be incorporated in the contracts or why the areas of increased risk are found in today’s construction contracts and what could be done to mitigate these disputes in contracts, exists. Limited research has been carried out to look for improvement to avoid the loopholes currently found in contract forms. It is clear that a more efficient or fit-for-purpose contract is required to overcome the shortcomings of today’s contracts and eradicate the mountains of disputes for the benefits of the stakeholders in the industry.

According to Loosemore and Hughes (1998), traditional contracts are inflexible, restrictive and ineffective during the construction crisis. From this perspective, the researchers explained that project participants tend to opt out contract procedures that are prone to changes which, in turn, lead to a loss of organizational and managerial control. Following that, Zaghloul and Hartman (2003) found that present contractual relationships are mainly based on confrontational situations that reflect the level of trust (or mistrust) in the contract documents. The study advocated that trust actually determines the relationships among contractors. The study also posited that trust relationship between the contracting parties provides some opportunities for developing a better risk allocation mechanism and contracting strategies, as well as for significant saving for construction.

Meanwhile, Ramazdeen and Rajapakse (2007) carried out a survey to measure the ability of construction contract clauses having different readability values. It is observed that the study did not provide an algorithm for the difference in contract clause interpretation despite acknowledging the relationship between readability and contract interpretation. It is also ascertained that a very limited body of research has addressed the precise rule specifying solutions in the context of problems associated with construction contracting success.
5. A call for a revolutionary contract

Many traditional contracts do not embrace change and instead attempt to specify all possible eventualities by drafting contracts to prepare for the worst case scenario. In the past, many construction employers have sought a greater certainty of time, cost and quality by amending traditional contracts, adopting their own contract forms, creating be-spoke contracts and in many instances, continue using older versions of traditional contracts. Trebes and Mitchell (2005) said this led to inappropriate risk between the parties where it seems clear that a change is required. Figure 1 set out some of the issues surrounding the case for change.

![Diagram showing the case for change](image)

Latham (1994) stated that the revolutionary new form of contract was developed to improve upon existing standard forms of contract by better flexibility; greater clarity and simplicity; and provides a stimulus to good project management. NEC is claimed to be suitable for use on virtually any engineering and construction projects due to its exclusion of discipline specific matters (Cox and Thompson, 1998) and avoids words denoting a particular engineering discipline. Additionally, (Wright and Fergusson, 2009) suggested that the NEC incentivize contract performance by the use of its pricing mechanisms.
Broome and Hayes (1997) in a comparison study indicated that the NEC is a dramatic improvement in terms of clarity over traditional forms of contract used in the U.K. On the language of NEC, Burrows (2002) asserted that the NEC is „beautifully simple” with no more than 40 words per sentence. In addition, Gould (2007) claimed that one of the most noticeable features of the NEC is its short direct clauses while the simplicity of the language would reduce the occurrence of disputes. Perry (1995) and Barnes (2006) meanwhile asserted that the most important characteristic of the NEC is stimulus to good project management. It was said that the NEC would ensure project parties have early awareness of the cost and time implications, allowing for effective planning and reductions in disputes by an Early Warning procedure which requires either party to notify the other promptly if they become aware of anything going wrong (Thompson et al., 2000, Barnes, 2000).

Regarding dispute resolution, (Wright and Fergusson, 2009) said contracts are adversarial in nature and used as weapons traditionally, therefore, most projects are successful when contracts are kept in the drawer. If the contract is used in these cases, then it tends to be part of a dispute or claim. (Broome, 1997) suggested that the adoption of NEC on civil projects is fast finding favour in the process and building sectors. In his detailed interviews with 28 NEC procured projects, (Broome, 1997) acknowledged some of the benefits that use of the NEC have produced in the UK. It is speculated that the advantages of the NEC discussed earlier set the foundation for a project that is less adversarial, thus preventing problems and, consequently, building strong relationships. Barnes (2000) has claimed that, “in nearly all cases, the users of the NEC report a real improvement in relationships and an improved outcome for both the client and the contractor” (pp73-78). Patterson (2001) meanwhile suggested NEC really is a well-structured and flexible tool that can deliver rather than dictate procurement strategy.

The implementations of the NEC can be referred to a few specific projects. Most notably, the NEC was used on the £30 billion Channel Tunnel Rail Link Project. NEC Users” Group (1997) reported that the choice of using the contract was justified as “managing all the different interfaces and to use a system, which stimulates collaborative problem solving” (pp3-4). Additionally, one of the largest users of the NEC is South African electricity public utility, known as Electricity Supply Commission (ESKOM). ESKOM is the fifth largest electric company in the world and has vast experience with the NEC system (NEC Users' Group, 1995). Furthermore, the Royal Hong Kong Jockey Club in Hong Kong has also been using the NEC since 1993 (NEC Users' Group, 1996) for construction of its many facilities.

NEC3 is reported to be taking off in the Middle East (NEC Users' Group, 2007) and has also been selected by the Olympic delivery authority for the production of new buildings and infrastructure in connection with the London 2012 Olympics (NEC Users' Group, 2008). Meanwhile, in a study conducted by Wright and Fergusson (2009) on the use of NEC in New Zealand, it was reported that Meridian, a government owned Electricity Company involved in sustainable energy has gained benefits from use of the NEC and is likely to encourage its wider use in the New Zealand industry. Wright and Fergusson (2009) claimed that the contract provides a forward-looking proactive environment to manage time and cost.
It is evident that generally, the literature presents a positive view of the NEC in generalist use since inception. While much of the literature reflects the UK origins of the NEC, a number of overseas cases outside the UK are cited including in South Africa, Hong Kong and more recently in New Zealand. However, there has been no research into the use of the NEC in Australia despite its widely publicised benefits. Therefore, in establishing an evaluation of NEC in the Australian construction industry, there is an opportunity to explore the capability of this form of contract in making considerable contribution to improvements in the ways that projects are managed, thus benefiting the productivity of the industry and the competitiveness of its clients.

6. Methods employed

In term of data collection, we will rely to a great extent upon surveys which underpin identification of distinct features on the NEC, quantifying the value the NEC system and the consideration of factors to ensure the wider implementation of the NEC in the Australian construction industry. We have selected questionnaire-based surveys as the means to evaluate the NEC system and the factors that might influence NEC’s wider adoption in the Australian construction industry. In order to ensure a reliable assessment, we targeted respondents who specialize in the interpretation and application of standard forms of contract in the construction industry as well as players in the industry in general.

The first part of the survey sets out to identify some of the drawbacks from current use of contract forms in Australia. The second part of the survey will help to determine which of the NEC characteristics identified from the literature review might constitute significant opportunities for an effective contracting system in the Australian construction industry. This part will consist of a list of the major issues within a contract and how NEC attempts to overcome the shortcomings of existing construction contracts in Australia. The structured questionnaire for this survey will be developed mainly based on a Likert scale as we believe it is probably more reliable and provides a greater volume of data than many other scales.

As the proposed framework is a fundamental vehicle for evaluating its benefits, interview with a wide range of industry personnel will be conducted to elicit further information on the suitability of the developed framework and test its significance before making an attempt to trial it. The comments and perception of the respondents will be used to facilitate the development of the framework in addition to knowledge acquired from literature review and feedback obtained by questionnaire. This segment carries an assessment of the industry’s perception if the NEC’s concept is acceptable at this point of time. Due to the complexities of the subject under study and having considered that NEC is fairly a new concept to the industry, the respondents will be selected from amongst an elite group of highly prominent professionals who specialize in the interpretation and application of standard forms of construction contract. In conjunction with the data collected through questionnaires, the results of the interviews can effectively be used to support and cross-validate the questionnaire findings.

The use of focus groups will further reinforce the evaluation on developed framework and enable modifications based on the feedback obtained. An attempt will be made to trial out NEC on few projects side by side with other forms of contract in order to gain new insights on issues that impact
on project success. An essential part of this study would be to explore the relationship between "success" and "form of contract" as it will facilitate the development of a suitable framework to assess the benefits of NEC. In order to validate the framework so developed, one possibility would be to apply the framework to existing projects and assess the validity of the findings through an independent verification process of comparing stakeholder perceptions of success and failure with the results of the framework outputs.

We plan to conduct case studies to perform comparative analysis. By doing this, it will provide an answer quantifying the benefits of the NEC system and identifying factors and changes required for a successful implementation of NEC in the Australian construction industry. In order to validate the framework so developed, it will be applied to existing projects and the validity of the findings will be assessed through a triangulation of the interview results with knowledge obtained from literature. The synthesised framework will be validated by selecting a suitable approach vis-à-vis through an independent verification process of comparing stakeholder perceptions of success and failure with the results of the framework outputs.

In term of analysis, we plan to identify how contract impacts on project’s performance. We then plan to identify perceptions of the industry on the acceptance towards NEC main tenets that could steer project towards success and analyse NEC’s application in different types of projects. We also plan to analyse the difference between NEC and other forms of contract in order to gain new insights on issues that impact on project success. We will also be able to identify other contracting principles that can be used as a mechanism to achieve project success, how the vary contract, type of project and how they influence the productivity of the industry. By performing such analysis, we hope to be able to answer the research questions that we have posed.

7. Conclusion

With this research we hope to contribute both to theory and practice. We plan to contribute to the body of knowledge by quantifying the salient aspects of NEC specifically from an Australian perspective. We hope to eliminate, or at least minimize the current use of heavily amended forms of contract and lead to an improved universal use of a contract form that will better facilitate construction productivity and lead to greater project success. Establishing a means to ensure this outcome would provide indications on how it may be reformed in order to present a clear business case for industry to give it more widespread use. We also plan to help stakeholders of the industry identify issues that they will need to consider before embarking on a contract, as well as helping them to understand the extra time and cost that may result by detriment contractual relationships and how best to mitigate them. Finally, based on our experiences in the field, we also hope to make suggestions regarding appropriate research methodologies for this kind of research.
References


NEC Users' Group 1996. NEC in Hong Kong.


NEC Users' Group 2007. NEC3 takes off in the Middle East.


Analysis of Business Process on Urban & Environment Maintenance Project by using BPMN Modelling in Republic of Korea

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Abstract

From 2000s, development to make urban area more useful has been requested because of unorganized urban development in 1960~70s. For this reason Urban Redevelopment project has been changed to Urban & environment maintenance project based on the renewed law. Recent Urban & environment maintenance project are bigger and more complex than ever. Although these kinds of projects require good communications among project stakeholders, there are some difficulties due to lack of standardized business process. The purpose of this study is to provide common business process of Urban & environment maintenance project for stakeholders to improve understanding project business process through analyzing a union type of Urban & environment maintenance project and modelling business process by Business Process Modelling Notation (below, BPMN) methodology. And also it is expected to improve communication between stakeholders and to shorten project time through prompting project parties with the proposed business process.

Keywords: urban & environment maintenance project, BPMN, business process
1. Introduction

1.1 Background and purpose of study

In Korea, construction projects in urban area are getting bigger and more complex because there is need of making space maximized and various businesses in small space. In these conditions, Urban & environment maintenance project has several projects in one big project, and also there are various stakeholders in each project. However, project delivery time has been delayed because it has difficulties in communication between stakeholders for the lack of standardized business process model. To solve these problems, this study proposes business process model through analysis of business process centred on administration process based on current law to help communication between various stakeholders (Developer, Constructors, Owner, Government, etc) in various projects.

1.2 Scope and research method

There are various project delivery methods in the law of Urban & environment maintenance, Article 8. This study proposes the business process for a union type of Urban & environment maintenance project because it has more various stakeholders and more complex business process.

Research method for this study is to analyze administration process of a union form based on the law of Urban & environment maintenance, and to perform the expert interview for review. And business process modelling is performed through comparing various process modelling methods. Finally, the proposed business process model is reviewed by several experts.

2. Pre-study

2.1 Study of Urban & environment maintenance project

2.1.1 Definition of Urban & environment maintenance project

The Law of Urban & environment maintenance, Article 2-2 defines “Maintenance project” as a project to maintain base facilities, to improve or to construct buildings for regain city functions. And it contains Residence Environment Improvement, Residence Redevelopment, Residence Reconstruction, and Urban & environment maintenance project. And Urban & environment maintenance project are defined as a project for improving urban environment such as regaining city functions or revitalizing commercial rights in industrial or commercial area.
2.1.2 Main developers of Urban & environment maintenance project

The Law of Urban & environment maintenance Article 8 defines the main developers for Urban & environment maintenance project, and they are as follows in Table 1.

The Law of Urban & environment maintenance Article 8 categorizes project delivery form into six types by main developers. They are land owner type, a union type, public companies type, etc. Project delivery method also can be categorized into land owner type, a union type, and selected developer type from developing types” view point, and each developing type has various business processes and stakeholders.

<table>
<thead>
<tr>
<th>Table 1: Project developers and promotion types</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main developers</strong></td>
</tr>
<tr>
<td>Land owner</td>
</tr>
<tr>
<td>Land owner with mayor, Korea National Land and Housing Corporation(LH), Local public enterprise(LPE)</td>
</tr>
<tr>
<td>A union</td>
</tr>
<tr>
<td>A union with mayor, LH, LPE</td>
</tr>
<tr>
<td>- Mayor promotes directly</td>
</tr>
<tr>
<td>- A person with 50% of land, and 50% of recommendations from land owner</td>
</tr>
<tr>
<td>- To appoint Qualified party as a developer, land owner</td>
</tr>
</tbody>
</table>

2.1.3 Current situation of Urban & environment maintenance project

According to Seoul Balance Development Office, 48 area, 467 sectors, and about 2,450,000㎡ are designated for Urban & environment maintenance project from 1973. About 39.2% of projects are already completed, and 16.2% are in progress. And about 44.6% are being waited for authorization by city government. (See Table 2)
Comparing area size by developing types, land owner types are about 900,000㎡, a union type are about 2,000,000㎡, and selected developer types are about 56,000㎡. Based on this data a union type has bigger size and bigger size per project than other types. This means a union type is bigger and more complex than other developing types.

### 3. Analysis business process and modelling of Urban & environment maintenance project

#### 3.1 Analysis of business process of Urban & environment maintenance project

Analysis of business process of Urban & environment maintenance project are performed based on The law of Urban & environment maintenance, enforcement legislations, enforcement ordinance, basic plan guide for Urban & environment maintenance project, and other related laws. And also it is based on two-times interviews with experts who is working practice in public and private sectors.

<table>
<thead>
<tr>
<th>Duration</th>
<th>2009.7.24~2009.8.27</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of experts</td>
<td>Public Sector(4), Private Sector(3)</td>
</tr>
<tr>
<td>Career of experts</td>
<td>5~10 years(4), Over 10 years(3)</td>
</tr>
</tbody>
</table>

Experts almost pointed levelling of business process, and difference between the process in law and process in practice. And also they pointed relevant matters from other related laws. Based on expert interview, pointed matters are reflected in the proposed business process. Business processes contain 3 phases of main categories and 7 phases of sub-categories, and have total 83 business processes. (See Table 4 and 5)

BPMN modelling method is easy for non-experienced user based on BPD (Business Process Diagram), Swim lane Diagram. And it allows users to design business process through dividing and modelling parties and activities. Each party is included in rectangular box of pool, and pool has sub-Swim lane called lane. Activity includes details of process, and each activity is connected through
Table 4: Classification of a union type

<table>
<thead>
<tr>
<th>Main category</th>
<th>Sub category</th>
<th>Procedure</th>
<th>Law and Legislation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>General planning</td>
<td>A basic study for general planning</td>
<td>A guide 3-2-3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prepare a proposal for general planning (over 14 days)</td>
<td>A law article 3-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Resident show</td>
<td>A law article 3-3</td>
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<tr>
<td></td>
<td></td>
<td>Obtain a local assembly’s opinion</td>
<td>A law article 3-3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Consult with relative administrators</td>
<td>A law article 3-5</td>
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<tr>
<td></td>
<td></td>
<td>Deliberation of local city planning commission</td>
<td>A law article 3-4</td>
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<tr>
<td></td>
<td></td>
<td>Establish/approve a general planning</td>
<td>A law article 3-4</td>
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<td></td>
<td></td>
<td>An official report and notification of local government</td>
<td>A law article 3-6</td>
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<td></td>
<td></td>
<td>Report to the ministry of Land, Transport and Maritime Affairs (in Republic of Korea)</td>
<td>A law article 3-7</td>
</tr>
<tr>
<td></td>
<td>Project plan phase</td>
<td>Basic study for renewal planning</td>
<td>A Presidential decree article 10-2</td>
</tr>
<tr>
<td></td>
<td>Renewal planning</td>
<td>Confirm suitability of basic study</td>
<td>A Presidential decree article 10-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Confirm return and disposal about foundation facilities and national properties</td>
<td>A law article 4-10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Obtain intendment’s opinion about national properties</td>
<td>A law article 4-10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prepare a proposal of renewal planning</td>
<td>A law article 4-1</td>
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<td></td>
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<td>Notice in document</td>
<td>A law article 4-1</td>
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<tr>
<td></td>
<td></td>
<td>Residents demonstration</td>
<td>A law article 4-1</td>
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<tr>
<td></td>
<td></td>
<td>Demonstration for residents (over 30 days)</td>
<td>A law article 4-1</td>
</tr>
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<td></td>
<td></td>
<td>Obtain a local assembly’s opinion</td>
<td>A law article 4-1</td>
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<td></td>
<td></td>
<td>Apply for renewal district</td>
<td>A Presidential decree article 10-2</td>
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<td></td>
<td></td>
<td>Deliberation of local city planning commission</td>
<td>A law article 4-4</td>
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<td></td>
<td></td>
<td>Designate renewal district</td>
<td>A law article 4-4</td>
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<td>An official report and notification of local government</td>
<td>A law article 4-5</td>
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<td>Report to the Ministry of Land, Transport and Maritime Affairs (in Republic of Korea)</td>
<td>A law article 4-5</td>
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<td></td>
<td>Organize a committee (tentative)</td>
<td>A law article 13-2</td>
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<td></td>
<td>Request for agreement on a committee approval</td>
<td>A law article 13-2</td>
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<tr>
<td></td>
<td></td>
<td>An approval committee</td>
<td>A law article 13-2</td>
</tr>
<tr>
<td></td>
<td>Promoter selection</td>
<td>Select renewal service provider</td>
<td>A law article 14-2</td>
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<td>Financial audit</td>
<td>A law article 76-1</td>
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<td></td>
<td>Request for agreement of establishing a union</td>
<td>A law article 13-2</td>
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<td>An inaugural meeting</td>
<td>A law article 14-3</td>
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<td>Apply for permit of establishing a union</td>
<td>A law article 16-1</td>
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<td></td>
<td>Permit of establishing a union</td>
<td>A law article 16-1</td>
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<tr>
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<td></td>
<td>Register an union</td>
<td>A law article 18-2</td>
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<td>Execution</td>
<td>A general meeting for selecting constructor</td>
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<td>A general meeting for project execution permit plan</td>
<td>A law article 30-1</td>
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<td></td>
<td>Prepare a proposal for project execution permit plan</td>
<td>A law article 24-3</td>
</tr>
<tr>
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<td></td>
<td>Deliberation of construction commission</td>
<td>A law article 28-2</td>
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<td></td>
<td></td>
<td>Apply for project approval</td>
<td>A law article 28-5</td>
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<td></td>
<td>Consult for disposal national property</td>
<td>A law article 66-1</td>
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<td></td>
<td></td>
<td>Confirm whether education facilities exist or not within 200m (218.7 yards)</td>
<td>A law article 28-4</td>
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<td></td>
<td></td>
<td>Consult with a superintendent of educational affairs</td>
<td>A law article 28-3</td>
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<td>A Public show (over 14 days)</td>
<td>A law article 31-1</td>
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<td>Project execution permit</td>
<td>A law article 28-4</td>
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<td>Table 5: Classification of a union type (continued)</td>
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<tr>
<td>Main category</td>
<td>Sub category</td>
<td>Procedure</td>
<td>Law and legislation</td>
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<tr>
<td>Approval</td>
<td>(continued)</td>
<td>An official report and notification of local government</td>
<td>A law article 28-4</td>
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<td>Financial audit</td>
<td>A law article 76-1</td>
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<td>Consult for disposal national property</td>
<td>A law article 66-1</td>
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<td>Confirm whether education facilities exist or not within 200m(218.7yards)</td>
<td>A law article 28-4</td>
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<td>Consult with a superintendent of educational affairs</td>
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<td>A Public show(over 14 days)</td>
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<td>Project execution permit</td>
<td>A law article 28-4</td>
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<td></td>
<td>An official report and notification of local government</td>
<td>A law article 28-4</td>
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<tr>
<td></td>
<td></td>
<td>Financial audit</td>
<td>A law article 76-1</td>
</tr>
<tr>
<td>Disposal</td>
<td></td>
<td>Select an appraiser</td>
<td>A law article 48-5</td>
</tr>
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<td></td>
<td>Solicit for evaluating assets(before and after)</td>
<td>A law article 37-2</td>
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<td>Notice subdivision for land owner</td>
<td>A law article 46-1</td>
</tr>
<tr>
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<td></td>
<td>Apply for subdivision for land owner</td>
<td>A law article 46-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Establish disposal plan</td>
<td>A law article 48-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Notice demonstration plan</td>
<td>A law article 49-4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Demonstrate and obtain opinion</td>
<td>A law article 49-4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A general meeting for disposal plan</td>
<td>A law article 24-3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Request/Provide for liquidation</td>
<td>A law article 57-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Apply for disposal plan permit</td>
<td>A law article 49-2</td>
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<td></td>
<td></td>
<td>Disposal plan permit</td>
<td>A law article 49-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Request/Provide for liquidation</td>
<td>A law article 37-1</td>
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<tr>
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<td></td>
<td>Select supervisor</td>
<td>Building codes article 15-1</td>
</tr>
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<td></td>
<td>Draw lots subdivision for land owner</td>
<td>The Housing Laws article 38-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Contract subdivision for land owner</td>
<td>The Housing Laws article 38-4</td>
</tr>
<tr>
<td>Subdivision &amp; construction</td>
<td></td>
<td>Arbitrate/Deposit acceptance</td>
<td>The law of Land Compensation</td>
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<td></td>
<td>Demolition</td>
<td>Act of public project article 28-1</td>
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<td>Submit assurance for construction</td>
<td>A law article 48-21</td>
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<td></td>
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<td>Confirm assurance for construction</td>
<td>A law article 51-1</td>
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<td></td>
<td>Declare starting construction</td>
<td>A law article 51-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Notice to general subdivision</td>
<td>A law article 51-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A permit for building completion</td>
<td>A law article 48-3, A Presidential decree article 51</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Draw lots general subdivision</td>
<td>A law article 48-3, A Presidential decree article 51</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Contract general subdivision</td>
<td>The Housing Laws article 38-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Construction</td>
<td>The Housing Laws article 38-4, Building Codes article 21</td>
</tr>
<tr>
<td>Completion &amp; liquidation</td>
<td></td>
<td>Official report and notification on local government</td>
<td>A law article 32-3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Definite site estimation③</td>
<td>A law article 54-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Apply for building completion permit</td>
<td>A law article 52-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Financial audit</td>
<td>A law article 76-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A permit for building completion</td>
<td>A law article 52-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Confirm building completion</td>
<td>A law article 52-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Notice transfer</td>
<td>A law article 54-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Apply for registration entrust</td>
<td>A law article 36-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A liquidation meeting</td>
<td>A law article 24-11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Liquidate and dismiss the union</td>
<td>A law article 57</td>
</tr>
</tbody>
</table>
Table 6: Descriptions of BPMN Modelling

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
<th>Notation</th>
</tr>
</thead>
<tbody>
<tr>
<td>event</td>
<td>An event is something that “happens” during the course of a business process. These events affect the flow of the process and usually have a cause (trigger) or an impact (result). There are three types of Events, based on when they affect the flow: Start, Intermediate, and End.</td>
<td></td>
</tr>
<tr>
<td>Text Annotation</td>
<td>Text Annotations are a mechanism for a modeler to provide additional information for the reader of a BPMN Diagram.</td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td>An Activity is represented by a rounded-corner rectangle and is a generic term for work that company performs. An Activity can be atomic or monatomic (compound). The types of Activities are: Task and Sub-Process.</td>
<td></td>
</tr>
<tr>
<td>Gateway</td>
<td>A Gateway is represented by the familiar diamond shape and is used to control the divergence and convergence of Sequence Flow.</td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>A Group is represented by a rounded corner rectangle drawn with a dashed line. The grouping can be used for documentation or analysis purposes, but does not affect the Sequence Flow.</td>
<td></td>
</tr>
<tr>
<td>Sequence Flow</td>
<td>A Sequence Flow is represented by a solid line with a solid arrowhead and is used to show the order (the sequence) that activities will be performed in a Process. Note that the term “control flow” is generally not used in BPMN.</td>
<td></td>
</tr>
<tr>
<td>Message Flow</td>
<td>A Message Flow is represented by a dashed line with an open arrowhead and is used to show the flow of messages between two separate Process Participants (business entities or business roles) that send and receive them. In BPMN, two separate Pools in the Diagram will represent the two Participants.</td>
<td></td>
</tr>
<tr>
<td>Pool</td>
<td>A Pool represents a Participant in a Process. It is also acts as a graphical container for partitioning a set of activities from other Pools, usually in the context of B2B situations.</td>
<td></td>
</tr>
<tr>
<td>Lane</td>
<td>A Lane is a sub-partition within a Pool and will extend the entire length of the Pool, either vertically or horizontally (see the figure to the right). Lanes are used to organize and categorize activities.</td>
<td></td>
</tr>
</tbody>
</table>

4. Business process model of Urban & environment maintenance project

Business process model of Urban & environment maintenance project is divided in big phases of project plan, execution and completion, mid phases of initial plan of urban regeneration, improvement plan, promoter selection, approval, disposal, subdivision and construction, completion and liquidation. Upper side of the table divided in government, promoter and user. This government is divided into Metropolis/big-city mayor, mayor and etc. And promoter is divided in a committee and a union. User is divided in land-owner and resident. Constructor in subdivision and construction phase are grouped and added into a committee.

4.1 Project main developer selection phase

It is promoter selection phase that appears a significant different in a union type comparing to other type, which contains a committee for establishing a union. The committee represents an organization for establishing a union and preparing a project execution, which is comprised of land owners. And it
carries out all or part services until a permit of establishing a union, but once the union establishes
the committee handovers all tasks and dismisses itself. When permitted to organise a committee from
a mayor it selects renewal service provider and conducts to request for agreement of land owner and
so on. And if permitted establishing the union, it conducts registration to hold an inaugural meeting.

4.2 Evaluation business process model

In this paper evaluation was carried out to verify business process model of a union type, which is
intend to 12 workers who have worked for at least 5 years through interview and e-mail. (Table 7)

<table>
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<tr>
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<tbody>
<tr>
<td>Target of Experts</td>
<td>Government official(5), renewal service provider(5) and workers in the union(4)</td>
</tr>
<tr>
<td>Career of Experts</td>
<td>Under 5 years(2), 5~10 years(7), over 10 years(3)</td>
</tr>
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</table>

Major questions are originality, necessity, identification, utilization which were evaluated in 5
criteria of “very necessary (very excellence)”, “necessary (excellence)”, “ordinary”, “do not
necessary” and “totally don’t necessary”. The interview coming out showed “do not necessary” and
“totally don’t necessary” criteria were not selected, and all interviewees selected over “ordinary”. In
view of utilization different results appeared depended on its target of expert. 4 experts among
government officials evaluated utilization “ordinary”, but all workers in the union evaluated “very
necessary”. It is because the officials are more aware of law than workers in the union so they
consider business process model less necessary.

5. Conclusion

In this paper business process of the union type among Urban & environment maintenance project
was arranged into total 83 activities through interview and e-mail, and was represented in BPMN
modelling. Also the business process diagram had feedback from interview and e-mail.

To sum up, this paper

1. Divided business process of union type which is the most complex having many parties into
3 main categories and 7 sub-categories based on Urban & environment renewal legislation
fully reflecting administration workflow.

2. Is enable for various parties to recognize workflow easily, and this will not only help the
union members, workers understanding difficult articles in legislation, but shorten the period
of project. Further it will also give various parties a smooth communication.
Figure 2: Business process modelling of a union type (continued)
3. Carried out evaluation to verify necessary and originality through expert interview and e-mail.

4. Needs to make comparative studies such as land owner type, a union type and specified developer (e.g., the Korean housing Corporation), come up with reaction against today’s fast-paced business environment. And further information about more detailed process could represent in manual and so on.

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Security of Payment Regimes in the United Kingdom, New South Wales (Australia), New Zealand and Singapore: A Comparative Analysis

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Abstract

Several developed countries have adopted security of payment legislation. The term ‘security of payment’ refers to the legislative intervention that provides rights to payment and adjudication. The United Kingdom introduced this legislation first followed by the New South Wales state in Australia. These two are arguably the leading models of this legislation. The trend has been followed in New Zealand, other states and territories of Australia (Victoria, Queensland, Northern Territory and Western Australia), the Isle of Man and Singapore. Except for New Zealand (which is a hybrid of the UK and NSW Acts), the regime in each jurisdiction closely follows either the UK or the NSW model. A few other countries are also contemplating to introduce similar legislation. The paper reports the initial findings conducted via a literature review and legal research methods. This paper attempts to examine the profiles of the security of payment regimes in the UK, New South Wales in Australia, New Zealand and Singapore to highlight the available leading models that a particular jurisdiction can adopt. Further this paper will highlight some of the difficulties concerning the operation of these regimes so that other legislators may consider them when drafting their own legislation. There are two types of regime that are currently in place which are adjudication independent of payment and adjudication related to payment. The ambit of the regimes is different, covering certain types of contract and excluding some others. The scope and application of payment and adjudication machineries are essentially different from one jurisdiction to another. Similarly, enforcement options are also dissimilar. Despite their differences all these regimes fundamentally have similar objectives i.e. to facilitate payment and improve cash flow within the construction industry. The New Zealand and Singapore Acts have arguably improved some of the questionable features of the UK and NSW Acts. Furthermore, the Singapore Act has included some distinctive features that are unique to its

¹ This paper is a part of the writer’s PhD study undertaken in the Centre of Construction Law and Dispute Resolution at King’s College London. The supervisors of the PhD study are Professor Phillip Capper and Mr. Nicholas Gould. The writer gratefully acknowledges the valuable comments given by the supervisors and Professor Philip Britton during the course of the PhD study that led to the publication of this paper. Views and errors are, of course, the writer’s own. The writer also gratefully acknowledges the sponsorships of the PhD study provided by the Ministry of Higher Education of Malaysia and University of Malaya.
construction industry. Legislators in other jurisdictions contemplating to introduce similar legislation can benefit from the rich and recent precedents set in these regimes.

**Keywords:** adjudication, cash flow, contracts, disputes, payment.
1. Introduction

The introduction of security of payment legislation for the construction industry in certain Commonwealth jurisdictions has appeared to address the issue of prompt payments in their respective industries. ‘Security of payment’ is the phrase sometimes used, notably in the titles of legislation, as in New South Wales and Victoria in Australia, and Singapore. It refers to ‘the entitlement of contractors, consultants or suppliers in the contractual chain to receive payment due under the terms of their contract from the party higher in the chain’. It provides new statutory rights to payment (added on top of existing contractual rights); together with a mechanism for determining some or all of the rights of parties to construction contracts via adjudication, a quick and effective quasi-judicial method of statutory dispute resolution. Linked to adjudication are enforcement options, if the decision of an adjudicator is not respected. Throughout this paper, for the sake of consistency, the term ‘security of payment regime’ will be used to describe these two central pillars of this legislative intervention: rights to payment and adjudication mechanisms by which these rights may be asserted, determined and enforced.

Security of payment legislation thus aims to overcome at least some of the myriad problems of payment which are prevalent in the construction industry. The United Kingdom was the leader in this revolutionary development towards cash flow improvements in the construction industry by passing the Housing Grants, Construction and Regeneration Act (the UK Act) in 1996. This was later followed by New South Wales in Australia three years later, when the Building and Construction Industry Security of Payment Act (the NSW Act) was enacted. The operation of the UK and NSW regimes is somewhat different despite their fundamentally similar objectives. The key difference is that the scope of the UK Act is considerably wider than that of the NSW Act, allowing all types of disputes to be subject to adjudication, whilst the NSW Act only allows disputes related to progress payments to be taken to adjudication. Arguably, these two are the leading models with regard to the operation of security of payment regimes in the Commonwealth’s jurisdictions.

Since then, the trend of having industry-based legislation to improve payment practices has been followed in New Zealand, other states and territories of Australia (Victoria, Queensland, Northern Territory and Western Australia), the Isle of Man and Singapore. Except for New Zealand, the

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3 Actually under Part II of the Housing Grants, Construction and Regeneration Act 1996. Amendments have been made to Part II of this Act and have been included as Part 8 of the Local Democracy, Economic Development and Construction Act 2009. At present, this part however has not come into force. Throughout this paper reference will be made to the Part II of the Housing Grants, Construction and Regeneration Act 1996.
4 This Act was amended in 2002. Accordingly throughout this paper reference will be made to the NSW Act as amended.
8 Construction Contracts (Security of Payment Act) 2004, Northern Territory, Australia.
9 Construction Contracts Act 2004, Western Australia, Australia.
regime in each of these jurisdictions closely follows either the UK or the NSW model. New Zealand’s
Construction Contracts Act 2002 (the NZ Act) is a hybrid, following the UK’s approach to
adjudication but the NSW’s approach to payment. Singapore introduced its Building and Construction
Industry Security of Payment Act 2004\(^\text{12}\) (the SG Act) and incorporated some distinctive features that
are unique to its construction industry. The paper reports the initial findings of a PhD study conducted
via a literature review and legal research methods. The aim of the PhD research is to develop a
framework for an effective security of payment regime in Malaysia. The aim is supported by the
following objectives:

1. To examine the profiles of the payment security regimes in the UK, New South Wales, New
   Zealand and Singapore;
2. To identify the lessons learned from the operation of the payment security regimes in the UK,
   New South Wales, New Zealand and Singapore;
3. To identify influential factors that policymakers should consider when drafting payment
   security legislation in Malaysia; and
4. To identify the key elements of an effective payment security regime in Malaysia.

This paper attempts to examine the profiles of the security of payment regimes in the UK, New South
Wales in Australia, New Zealand and Singapore. Examining these profiles will be beneficial in terms
of highlighting the approaches these jurisdictions took when drafting their legislation. This exercise
will highlight the available leading models that a particular jurisdiction can adopt. Further this paper
will also highlight some of the difficulties concerning the operation of these regimes so that other
legislators may consider them when drafting their own legislation. The reason for choosing the United
Kingdom is obvious: statutory adjudication was introduced first there. Since the UK Act has the
longest history, a significant body of case law has been developed to illustrate its operation. As for
New Zealand, the adjudication regime operating in this country is regarded by some as an improved
version of the UK regime.\(^\text{13}\) The NSW Act is also chosen as a case study because the security of
payment regime in operation in this state is regarded as the main alternative version to the UK regime,
with different coverage and procedures, but with a fundamentally similar objective. Moreover, the
fact that the NSW Act has been in force longest in Australia also means that there is useful case law
about its function. Singapore is chosen as a case study due to the uniqueness of some of the features
provided under its statute.

\(^{10}\) Construction Contracts Act 2004, The Isle of Man.
\(^{12}\) The SG Act came into force on April 1, 2005.
p. 130.
2. Operation of security of payment legislation

A close scrutiny of the operation of all four statutes considered in this case study reveals that there are two operative mechanisms being used in those jurisdictions, which are as follows:

a. Parallel contractual and statutory scheme for both payment and adjudication provisions (the UK model)

b. Parallel contractual and statutory scheme for payment provisions and a purely statutory scheme for adjudication provisions (the NSW, NZ and SG models)

2.1 The UK model

The UK Act is unique as it tolerates the establishment of contractual regimes for both adjudication and payment as alternatives to the statutory regime. It introduces minimum parameters with regard to adjudication and payment machineries. Section 108 of the UK Act describes all the requirements that must be included in construction contracts to allow resolution of disputes via adjudication whilst sections 109-113 impose requirements regarding payment provisions to be incorporated into construction contracts. These requirements are minimal and the parties involved can agree to more stringent requirements provided they do not contradict the compliance provisions. Failure on the part of a construction contract to comply with the requirements imposed by the Act will result in the deployment of the Scheme for Construction Contracts (England and Wales) Regulations 1998 (the English Scheme) which has the impact as implied terms of the contract. However, the effect of deploying this default scheme varies according to the non-compliance of payment provisions or adjudication provisions. If a payment provision in a contract fails to comply with the requirements imposed by the UK Act, it will be substituted with the relevant payment provision of the English Scheme. This is because the deployment of a default provision is on a ‘section to section basis’ which means that if a particular section of a contract does not conform with UK Act requirements, the relevant provision of the English Scheme will apply. By contrast, non-compliance of a particular adjudication provision in a construction contract will cause all adjudication provisions to be repealed and replaced with the full set of English Scheme adjudication provisions.  

2.2 The NSW, NZ and SG model

The rest of the jurisdictions considered in this case study differ from the UK Act with respect to the operation of their regimes. The establishment of a contractual regime as an alternative to a statutory regime is only permitted in the context of payment provisions. Thus, the adjudication regime imposed by the respective legislation is purely statutory. Furthermore, since the whole legislative framework for both payment and adjudication is virtually provided in the primary legislation, there is no default scheme that will operate in the event of non-compliance of these provisions. Similar to the UK Act, the NSW, NZ and SG Acts impose mandatory requirements in construction contracts regarding payment and adjudication provisions. In the event of non-compliance, default provisions are

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embedded in the main body of the primary legislation. The inclusion of adjudication provisions in construction contracts is mandatory and must strictly follow the prescribed requirements of the statutes. The deployment of default payment provisions in NSW and NZ is similar to the UK when a contract fails to comply with the payment provisions imposed by the legislation. However, the situation is different in Singapore, as the deployment of a default statutory regime is only impinged upon the contractual terms if they are silent on payment terms or if the contract so provides the terms of which are considered to be unfair or not in tandem with the intention of the SG Act. Some standard forms of contracts in Singapore have been amended to take into consideration the requirements imposed by the SG Act whilst others remain unchanged. This would likely give rise to legal issues in adjudication or in the courts as to whether a particular payment term is in line with the intention of the SG Act.

3. Scope of application of security of payment legislation

A detailed examination of the security of payment legislation in the selected jurisdictions shows that there are two regimes in operation which are as follows:

a) Adjudication Independent of Payment (the UK and NZ Acts)
b) Adjudication Related to Payment (the NSW and SG Acts)

3.1 Adjudication independent of payment

The UK and NZ Acts provide that any dispute can be referred to adjudication without limitation to progress payment disputes. A dispute, as long as it arises under a contract, can be adjudicated at any time. In the UK, the fact that adjudication is made available to all types of disputes has caused considerable debate among academics and practitioners alike about the effectiveness of such a system. One view is that since all types of disputes can be adjudicated, this would open the floodgates to include professional negligence disputes. The consultants’ quality of services will now be subject to ‘rough and ready’ adjudication. Arguably, professional negligence claims are unfit for time-bound adjudication. The element of ‘rough and ready justice’ offered by adjudication may not be suitable in this class of disputes, as ‘fine justice’ offered by litigation or arbitration could be more desirable in order to truly reflect the rights and obligations of both parties in this complex area of law. One the other hand, if professional negligence claims are subject to adjudication, this in turn will compel professionals to be more prudent in exercising their duties. This could result in improved quality of services that will benefit projects and end users. New Zealand, despite offering all types of disputes to be adjudicated under its Act, somewhat excludes these professional negligence disputes from the constituency of adjudication. This is achieved by expressly excluding professional services contracts from the operation of the NZ Act.

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3.2 Adjudication related to payment

The NSW and SG Acts allow only disputes over progress payments to be referred to adjudication. Progress payments in the NSW Act are defined to include final payments.\(^{16}\) In Singapore, notwithstanding the absence of express provisions regarding the inclusion of final payments, it could be construed from the wording of the SG Act that progress payments are also deemed to include final payments.\(^{17}\) The application of the NSW and SG Acts could be seen as limited, but there has been an instance in NSW where a dispute over prolongation claims was considered to be a progress payment dispute and thus covered by the Act.\(^{18}\) It is reasonable to suggest that disputes regarding defects, liquidated damages, variation order, and loss and expense could all be within the ambit of the NSW and SG Acts so long as they are related to progress payments. A close scrutiny of the NSW and SG Acts show that their application, albeit not as wide as the UK and NZ Acts, attempts to resolve common disputes encountered in the day-to-day running of a project.

4. Ambit of security of payment legislation

4.1 Definitions of constructions contracts

The definitions of construction contracts are important, as the determination of whether a contract is covered by security of payment legislation is contingent upon successful qualification under these definitions. An examination of legislation provided in these selected jurisdictions shows that there are three ways of defining contracts that are subject to the application of the legislation which are as follows:

1) Contracts for construction operation/work
2) Contracts for the supply of services
3) Contracts for the supply of goods

Contracts for construction operations/work

The definitions of construction operations/work covered by the operation of the statutes considered in this case study are described in an almost similar fashion.\(^{19}\) However, different terminologies are used to describe the types of operations/work covered by the Acts. The UK Act uses the term ‘construction operations’, whilst the NSW, NZ and SG Acts use ‘construction work’ to refer to the types of activities covered by them. Furthermore, the list of exclusions associated with the definitions of construction operations and work differ between the statutes. The UK Act features an elaborate list of operations/work that is not covered by it. First, the exclusion relates to activities associated with the

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\(^{16}\) See the definitions of ‘Progress Payment’ under Section 4 of the NSW Act.

\(^{17}\) ‘Progress Payment’ is defined under Section 2 of the SG Act to include a payment that is based on an event or a date. Since a final payment is triggered after the issuance of a Final Completion Certificate, it satisfies the definition of ‘Progress Payment’ provided under Section 2 of the SG Act.


\(^{19}\) Section 105 of the UK Act, Section 5 of the NSW Act, Section 6 of the NZ Act and Section 3 of the SG Act.
extraction of oil and natural gas. The UK Act further excludes activities of mineral extraction from its ambit. The third exclusion is known in the industry as the ‘process plant exception’ clause. This clause refers to process plant operations which are not covered by the Act, namely, the assembly, installation or demolition of the plant, machinery and associated steelwork that provide support or access to a site whose primary activity is related to ‘nuclear processing, power generation, or water or effluent treatment; or the production, transmission, processing or bulk storage (other than warehousing of chemicals, pharmaceuticals, oil, gas, steel or food and drink’. This process plant exception clause has resulted in a satellite of unwarranted litigation regarding whether a particular operation is included or excluded from the operation of the UK Act.

Essentially, examination of the definitions of construction operations/work in the selected jurisdictions pointed to four categories of construction operations/work that are subject to the application of adjudication and payment legislation. They are as follows:

1) Building work
2) Civil and infrastructure engineering work
3) Operations forming part of the work
4) Cleaning, painting and decorating work

Contracts for the supply of services

An extensive analysis of the security of payment regimes in the selected jurisdictions show that contracts for the supply of services are placed into two categories: namely contracts for supply of labour and contracts for supply of professional consulting services. Amongst four jurisdictions considered for this case study, only the NZ Act excludes these contracts. The rest of the jurisdictions considered for this case study provide contracts for supply of labour to be governed by the provisions of the legislation. It is unclear why the NZ Act excludes contracts for supply of labour from its ambit but the better view is that these contracts were not intended to be part of its constituency. As for professional consulting services contracts it could be assumed that its exclusion was the result of extensive lobbying by professional bodies not to be covered by the NZ Act. Further analysis of the scope of professional consulting services contracts provided in the UK, NSW and SG reveals that, notwithstanding the drafting styles, there are essentially three types of contracts covered by adjudication and payment legislation. However, there is a careful qualification that these contracts should relate to construction operation/work. The contracts are as follows:

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20 Section 105(2)(a) of the UK Act.
21 Section 105(5)(b) of the UK Act.
22 Section 105(c) of the UK Act.
23 Section 105(c) of the UK Act.
25 Section 104(c) of the UK Act, Section 6(1)(b)(i) of the NSW Act and Section 3(1)(d) of the SG Act.
1) Contracts for architectural, engineering and surveying services
2) Contracts for project management services
3) Contracts for specialist advisory services

Contracts for the supply of goods

The UK Act expressly excludes contracts for the pure supply of goods. The exclusion of these contracts from the ambit of the UK Act was a total departure from the Latham Report. The Report highlighted that cash-flow problems are confronted not only by contractors, but also by suppliers. However, the drafters of the UK Act chose not to include these contracts by expressly prohibiting contracts for manufacture and delivery to site of components, materials, plants and equipment to be covered by the Act unless the contracts also provide for their installation. The NZ Act also excludes supply of goods contracts; however, the NSW and SG Acts include these contracts. The reason for exclusion could be due to the fact that suppliers are not typically considered as vulnerable parties, notwithstanding the fact that they are normally placed at the bottom of the payment chain. The NSW and SG Acts on the other hand, provide protection to suppliers of materials, components, plants and equipment. A potential area of peculiarity is likely to arise if supply contracts are not covered by the legislation. Consider a situation in which a contractor is liable for liquidated damages as a result of a supplier’s late delivery of material. The contractor in this situation will not be able to recover his loss swiftly against the supplier if adjudication is not made available to him under a contract. Another area that could also give rise to absurdity is contracts of supply of prefabrication components. If a manufacturer is delayed in supplying materials, the contractor will be in danger of receiving an adjudication notice for such delay by the employer. The manufacturer’s delay, however, will not be referred to adjudication as a result of the exemption provided by the legislation. It is true that there is nothing to prevent the parties from inserting a contractual adjudication provision in their contract, but without legislative support there will be difficulties with regard to the enforcement of an adjudication decision.

The SG Act as well as its predecessor i.e. the NSW Act provides refuge to suppliers of goods. In these two jurisdictions the definitions of goods are broad and comprise of ‘materials and components’ to form any part of any building, structure or work, as well as ‘plant and materials (whether supplied by sale, hire or otherwise) for use in connection with the carrying out of construction work’. However, the SG Act defines supply of goods contracts as including contracts under which ‘one party undertakes to supply goods to any other party who is engaged in the business of carrying out construction work or who causes to be carried out construction work’. The first part of the definition

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26 Section 105(2)(d) of the UK Act.
27 Section 105(2)(d) of the UK Act.
28 Section 6(1)(f)(iv) of the NZ Act, however, states that prefabrication components, whether carried out on- or off-site, is construction work and thus covered by the Act.
29 Section 6 of the NSW Act.
30 Section 2 of the SG Act.
31 Section 6 of the NSW Act and Section 2 of the SG Act.
32 Section 4 of the NSW Act and Section 2 of the SG Act.
33 Paragraph (a) of the definition of ‘supply contract’ in Section 2 of the SG Act.
covers the normal supply of goods contracts entered into by contractors and suppliers. The second part of the definition effectively covers supply of goods contracts between employers, owners or developers, and suppliers.

4.2 Contracts in writing

An investigation into the operation of the security of payment legislation in the UK, NSW in Australia, NZ and SG shows that there are two approaches in defining what constitutes a contract in writing and thus subject to payment and adjudication provisions. The approaches are as follows:

a) Contracts that are in writing or evidenced in writing (the UK and SG models)
b) Contracts that are in writing or oral (the NSW and NZ models)

The UK and SG model

The UK Act, by virtue of Section 107, provides that the provisions of the Act apply only to construction contracts that are in writing. The definition of writing as provided by the Act is wide and beyond what one would expect as the common form of writing. Notwithstanding the fact that the SG Act is closely modelled after the NSW Act, the definitions of what constitutes an agreement in writing as stipulated in its Section 4 (3) bear close similarity to the UK Act. The drafting of Section 107 of the UK Act is not without controversy. The problems posed by the current drafting have called for the section to be under judicial scrutiny, as the courts have been asked several times to interpret the true intention of the UK Act intended by Parliament with regard to the requirement of a contract to be in writing. On the one hand, we find the judgment of Ward LJ in an appeal case of *RJT Consulting Engineers v. DM Engineering*[^36], where an enforcement of the adjudicator’s decisions was refused on the ground that all of the express terms were not made in writing. On the other hand, in the same case we find Auld LJ’s statement that, despite allowing the appeal, disagrees as to the requirement of what constitutes a contract that is evidenced in writing to confine to material terms that are of relevant to the dispute in question. The first proposition has been given judicial support in the cases of *Debeck Ductworth Installations Ltd v. T & E Engineering Ltd*[^37] and *Trustees of the Stratfield Saye Estate v. AHL Construction Ltd*[^38], whilst *Bronlow Ltd. v. Dem-Master Demolition Ltd*[^39] followed the latter.

There are further difficulties concerning the above propositions made by both learned judges. The principle introduced by Ward LJ requiring that all the terms be in writing for a contract to be within the ambit of the Act could cause difficulties in a situation where a contract is varied by an oral agreement. This was in fact experienced in the case of *Carillion Construction v. Devonport Royal...

[^34]: Section 107(1) of the UK Act.
[^38]: [2004] EWHC 3286 (TCC).
[^39]: [2004] ScotSC A904/03.
Dockyard\textsuperscript{40}, which leaves further scope of argument among academics and practitioners alike. The fact that a construction contract that is within the provisions of the UK Act with regard to payment, suspension and adjudication ceases to be subject to the Act if the contract is varied orally poses peculiarities in the operation of the Act.\textsuperscript{41} The substantive rights and obligations of the parties will be significantly altered when an oral variation to the written contract is made. For example, the employer who was initially required to issue a withholding notice under a written contract is no longer under that obligation if the contract is varied orally. By way of contrast, the contractor could be in repudiatory breach against the employer if suspension of work is resorted to by the former following an oral variation to the written contract.

The principle introduced by Auld LJ requiring that all the material terms be made in writing for the Act to be operative is also not without difficulty. It should be noted that adjudication is not the only outcome of the contract being caught by the application of the Act. Payment and suspension regulations are also part of the package if a contract is subject to the Act. This could cause further difficulties in the sense that in determining whether a contract is subject to the coverage of the Act, a reference will be made to a dispute that might not have crystallised.\textsuperscript{42} For the sake of clarity and certainty as to which types of contracts are within the purview of the Act, the blanket inclusion of all contracts, either written or oral, as provided by the NSW and NZ Acts seems sensible to achieve the desired objectives. Arguably, the interpretations of Section 107(2)(c) by both learned judges has narrowed the application of adjudication, which could be inconsistent with the intentions of the UK Act. However, the fact that the restriction imposed by the strict interpretation of that particular section to contracts that have greater certainty as to contract terms seems to coincide with the short time frame and the summary nature of the UK’s adjudication regime.

Taking into consideration the particular difficulties inherent in Section 107, specifically regarding what constitutes an agreement in writing, proposals have been made to amend Part 2 of the UK Act. A proposal has been made to abolish Section 107, allowable under the Local Democracy, Economic Development and Construction Act 2009. Effectively, the abolishment of this section opens the possibility for oral contracts to be governed by the new legislation. The inclusion of oral contracts in the new UK’s payment and adjudication legislation seems to be consistent with similar legislation in New South Wales and New Zealand. Strangely, however, the Bill requires construction contracts to include written adjudication provisions. In essence, this means that a construction contract can be oral, but must also have written adjudication provisions. The fact that a default scheme for adjudication provisions will be deployed in cases where a contract does not conform to the New UK Act makes the requirement of written adjudication provision redundant. Under the New UK Act, if an oral contract does not include express adjudication provisions, it is still subject to the legislation. Nonetheless, this triggers the default adjudication provisions provided by the English Scheme. Consequently, the required inclusion of adjudication provisions even in oral contracts seems not to serve the obvious benefit to the operation of the legislation.

\textsuperscript{40} [2005] EWHC 778 (TCC).
\textsuperscript{42} Ibid.
The NSW and NZ model

Section 7(1) of the NSW Act provides that the Act applies to any construction contract, whether written or oral, or partly written and partly oral. Similarly, the NZ Act applies to every construction contract that is written or oral, or partly written and partly oral. Essentially, the application of the payment and adjudication machineries in these jurisdictions is considerably wider than those in the UK and SG Acts. Small subcontractors who either carry out construction projects or supply labour for projects are also prone to cash flow problems. Being the last party on the contractual payment ladder makes them most vulnerable to payment problems. One disruption higher up on the payment ladder could have a disastrous effect on the financial position of subcontractors and the effect of nonpayment could result in insolvency. The inclusion of oral contracts within the ambit of the security of payment legislation could provide them with statutory protection.

5. Payment: scope and application

A detailed analysis of the payment provisions provided under the chosen statutes reveals that there are two types of payment mechanisms introduced by the security of payment legislation, which are as follows:

a) Prescriptive payment mechanism
b) Non-prescriptive payment mechanism

5.1 Prescriptive payment mechanism

Except for the UK Act, the rest of the statutes chosen for this case study provide a rule-based prescriptive payment mechanism. This mechanism introduces the concept of payment claim and payment schedule/response\(^\text{44}\), which is currently non-existent in the context of the UK Act, to ensure compliance by parties in the contract. The claimant who has carried out construction work or supplied goods and services in relation to construction operation/work under a contract is entitled to make a payment claim under the NSW and SG Acts. Conversely, under the NZ Act, only parties who have carried out construction work are entitled to make such a claim. The definition of ‘claimant’ differs between the NSW and SG statutes. The NSW Act defines ‘claimant’ as ‘a person by whom a payment claim is served’\(^\text{45}\), whilst the SG Act makes more explicit expression of the definition of ‘claimant’, which means ‘a person who is or claims to be entitled to a progress payment’.\(^\text{46}\) The NZ, on the other hand, does not use the term ‘claimant’, but instead uses the term ‘payee’, which is defined as a ‘party

\(^{43}\) Section 9 of the Construction Contracts Act 2002, New Zealand.

\(^{44}\) The NSW and NZ Acts use the term ‘payment schedule’ whereas the SG Act uses the term ‘payment response’.

\(^{45}\) Section 4 of the NSW Act.

\(^{46}\) Section 2 of the SG Act.
to a construction contract who is entitled to a progress payment’. This definition is synonymous with the definition of ‘claimant’ provided under the SG Act.

5.2 Prescriptive payment mechanism

The UK Act prescribes minimum parameters that construction contracts must comply with in regard to payment provisions. The Act stipulates that contract parties may agree upon a payment scheme, such as payment by instalments, stage payments or other periodic payments. In order to be regulated by the payment mechanism afforded by the UK Act, the duration of the work specified in the contract or agreed between parties must be less than 45 days. If a contract meets that requirement, an ‘adequate mechanism’ to determine what payments are due and when they are due should be provided in the contract. Further, the mechanism should also specify the final date of payment with respect to any amount that becomes due. There is, however, no express definition of ‘adequate mechanism’ in the Act. The practical view is that a comprehensive method of establishing the quantum of payments will likely comply with the requirement of the Act. Consequently, the certification process prescribed by most standard forms of contract could fall within this definition. The fact that contract parties are at liberty to agree upon the mechanism of determining what is due and when it is due, as well as the final date of payment in relation to what is due, means that the freedom of contract between the contracting parties is preserved.

5.3 Prohibition of conditional payment mechanism

To further protect the financial interest of vulnerable parties, security of payment legislation provides a mechanism to prohibit the use of conditional payment provisions in construction contracts. The degree of protection offered by the legislation is, however, varied between one jurisdiction and another. The UK’s legislative drive seems to have banned the use of what the industry refers to as the ‘pay-when-paid’ clause. The ‘pay-when-paid’ clause is a provision that defers the payment obligation on the part of the contractor to the subcontractor to a later date, until the former is paid by the employer. This provision, however, does not extinguish payment obligation completely. The obligation to make such a payment still exists, but has been deferred to a later date. The UK Act, however, permits the use of the conditional payment provision in situations where an employer who is supposed to make payment to the contractor is insolvent. This provision is known in the industry parlance as the ‘pay-if-paid’ clause. The effective use of this clause could extinguish the main contractor’s payment obligation to the subcontractor completely. For example, in the event of the employer’s insolvency, a main contractor is relieved from paying his subcontractor for the same work.

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47 Section 19 of the NZ Act.
48 Section 109(1) of the UK Act.
49 Ibid.
50 Section 110(1)(a) of the UK Act.
51 Section 110(1)(b) of the UK Act.
52 Section 113(1) of the UK Act.
53 Ibid.
if such a clause is in existence. The exemption provided under the UK Act is consistent with the *pari passu* rule (with equal step, equally without preference) which stemmed from English Law.

In recent years, innovations have been orchestrated by the drafters of the standard forms to circumvent the requirement imposed by the UK Act with respect to the prohibition of conditional payment provisions. One of the most notable innovations was the ingenious inclusion of ‘pay-when-certified’ clauses in various UK standard forms of contract. These clauses have the effect of deferring the main contractor’s payment obligation to the subcontractor until payment for the same work is certified by the contract administrator in the main contract. Furthermore, since the UK gives a *carte blanche* to parties who agree to the timing of payment, a party with a considerable bargaining position may impose unfairly long payment periods on the other to ease the former’s cash flow. This delay in payments is possible due to the unenforceability of the conditional payment provisions.

Other statutes considered for this case study also prohibit the use of conditional payment provisions in contracts. The ambit of prohibition offered by these statutes is, however, considerably wider than the one provided under the UK statute. For example, these statutes effectively render the use of ‘pay-if-paid’ clauses ineffective. A provision that places liability on a main contractor to pay his subcontractor, contingent on the former being paid by the employer, is referred to as a ‘pay-if-paid’ clause. This clause is to be contrasted with the ‘pay-when-paid’ clause, which defers the due date of payment but does not relinquish the main contractor’s payment obligation to the subcontractor in a situation where the latter is not being paid for the same work. The NSW and SG Acts, however, do not make any reference to the ‘pay-if-paid’ clause in their legislation. Reference is only made to ‘pay-when-paid’ provisions. The definitions of the ‘pay-when-paid’ provision, as provided under the NSW and SG statutes, are, however, broad enough to cover a provision that places liability on the contractor to make payment to the subcontractor, so long as the latter receives payment from the employer. Despite unclear drafting, the NSW and SG Acts have also effectively outlawed the effect of ‘pay-if-paid’ clauses in a contract. Conversely, the NZ Act clarifies that a payment conditional provision that is commonly referred to in the construction industry as the ‘pay-when-paid’ or ‘pay-if-paid’ clause is unenforceable.

In regard to the effect of conditional payment provisions, the NSW Act provides that they shall have no effect in relation to payments under a contract. In contrast, the NZ and SG Acts provide clear consequences of the inclusion of conditional payment provisions by not merely rendering them ineffective, but also unenforceable. The NZ Act states that ‘a conditional payment provision of a construction contract has no legal effect’ and is thus unenforceable. Similarly, the SG Act stipulates that a conditional payment provision is unenforceable and has no effect in relation to payments made under a contract. The intended consequence of the use of the conditional payment provision is made explicit under the security of payment legislation in these jurisdictions, which offer certainty and clarity as to the operation of the legislation. In this regard, the approach taken by the legislators in

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54 Section 12(2)(a) of the NSW Act, Section 13(2)(a) of the NZ Act and Section 9(2)(a) of the SG Act.
55 Section 13(2)(c) of the NZ Act.
56 Section 13(1)(a) of the NZ Act.
57 Section 9(1) of the SG Act.
New Zealand and Singapore with respect to the prohibition of the use of conditional payment provisions is desirable for adoption. The use of a ‘pay-when-paid’ provision, which effectively defers a payment due date for the subcontractor to the date that the contractor is paid, is also banned in New South Wales, New Zealand, and Singapore jurisdictions. Furthermore, the NSW and SG Acts also disallow a provision that makes the liability or the due date for payment contingent on the operation of any other contract. In anticipation of future efforts to circumvent the operation of the payment security legislation in regard to the nullity of the prohibition of conditional payment provisions, the legislators in New Zealand and Singapore introduced a ‘catch all’ clause to cover a full range of possibilities on the form that the provisions may take. These ‘catch all’ clauses, which are currently absent in the context of the UK and NSW Acts, could be the answer in ensuring that the policy of the security of payment legislation in prohibiting conditional payment provisions from being tolerated by ‘innovative’ contractual devices.

6. Adjudication: scope and application

Comparative analyses of the adjudication regimes in the selected jurisdictions indicate that a two-step approach is used to implement the adjudication process in all jurisdictions. The first step requires the claimant to issue a notice specifying his intention to refer the dispute to adjudication. The UK and NZ Acts provide the unfettered right to adjudication; the NSW and SG Acts do not. Reference to adjudication in the UK and New Zealand can be made by any parties in contract, at any time and with virtually any types of disputes. Upon the appointment of an adjudicator, formal reference to adjudication is then made by the claimant. Conversely, the NSW and SG adjudication regimes limit adjudication to disputes about progress payments. Such adjudication can only be initiated when a dispute about progress payment crystallises.

6.1 Should the legislation allow for dispute settlement period?

The SG Act uniquely includes a provision that allows both parties in a dispute to clarify for each other any matters relating to payment claim. The dispute settlement period begins on the expiry of the date when the payment response is due to be issued and expires on the seventh day following the due date of the payment response. Reference to adjudication can be made upon the expiry of the dispute settlement period. The fact that this settlement period promotes an early exchange of information between the disputing parties could also increase the prospect of settlement, should the matter proceed to adjudication. The existence of a dispute settlement provision in security of payment legislation is not without controversy. Such an existence delays the delivery of an adjudicator’s decision and could ultimately worsen the vulnerable party’s cash flow. The right to refer a dispute to adjudication should

58 Section 12(2)(b) of the NSW Act, Section 13(2)(b) of the NZ Act and Section 9(2)(b) of the SG Act.
59 Section 12(2)(c) of the NSW Act and Section 9(2)(c) of the SG Act.
60 Section 108(2)(a) of the UK Act, Section 17(2)(a) of the NSW Act, Section 28(1) of the NZ Act and Section 13(1) of the SG Act.
61 Section 108 of the UK Act and Section 28 of the NZ Act.
62 Paragraph 7 of the English Scheme and Section 37 of the NZ Act.
63 [Teo, P. J.], op. cit., p. 227.
not be delayed by any preceding activities. In the UK, there have been instances where judges held that the existence of a mandatory preceding activity (e.g., mediation) before adjudication can commence is enforceable, as it obviates a party’s right to rapid adjudication. The unenforceability results in the deployment of the adjudication provisions of the English Scheme to substitute not only the offending provision, but also the entire adjudication provision in the contract.

6.2 Should the legislation allow for review of decision?

The SG Act uniquely features a provision that allows respondents who are dissatisfied with the outcome of adjudication to apply for the review of the adjudicator’s determination. The review of the adjudicator’s determination is carried out by a new adjudicator or a panel of adjudicators and should be applied for within seven days after the determination has been made. However, the right of review is limited and is only available when the adjudicated amount is in excess of $100,000 greater than the response amount. Furthermore, parties seeking a review are required to pay the adjudicated amount in full in the first instance before a review can be applied. This requirement works in line with the principal objective of the Act to facilitate cash flow improvements. Moreover, this review mechanism is a novel innovation orchestrated by Singapore’s legislators to provide an opportunity for dissatisfied parties to have their case reviewed without having to experience expensive and protracted litigation and arbitration. With this mechanism in place, dissatisfied parties’ degree of acceptance could increase should the adjudicator or the review panel reach the same conclusion.

6.3 Jurisdiction of the adjudicator

The issue of the jurisdiction of the adjudicator is of paramount importance. This is because an adjudicator’s decision will not be enforceable if such a jurisdiction has been exceeded. Parties disputing the adjudication’s decision would normally argue that the adjudicator has exceeded his jurisdiction to resist payment. The UK Act does not outline the jurisdiction of the adjudicator nor does it allow the adjudicator to determine his own jurisdiction. It is submitted that, apart from not breaching the principles of natural justice, the decision of the adjudicator will only be enforceable if the adjudicator does not exceed the jurisdiction, i.e., there is a dispute that arises under a construction contract, as defined by the Act. Thus, the jurisdiction of the adjudicator is includes disputes of any magnitude and complexity as long as they arise under a construction contract as defined by the UK Act.

However, the UK Act does not give the adjudicator the power to determine his own jurisdiction. This has resulted in an increasing number of cases challenging adjudicators’ jurisdictions and refusals by

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64 Section 18(2) of the SG Act.
65 Section 18(2) of the SG Act.
66 Regulation 10(1) of the BCISP Regulations.
67 Section 18(3) of the SG Act.
the courts to enforce decisions due to a lack of jurisdiction. This could defeat the UK Act’s policy objectives of expediting payment and improving cash flow. To avoid this, the Technology and Construction Solicitors Association (TeCSA) has included in its Adjudication Rules a provision giving adjudicators the power to determine their own jurisdiction. It is believed that the number of cases concerning adjudicators’ jurisdiction brought before the courts would decrease significantly and the policy objectives of the Act would be met. However, such a change would require the industry to be confident about extending adjudicators’ powers. Before that can happen, any industry concerns about the quality of adjudicators must be addressed. Accordingly, the current training for adjudicators should be reviewed.

The NSW Act outlines the jurisdictions of the adjudicator to determine the amount of progress payment, the due date for payment, the rate of interest on the unpaid portion of the progress payment and the apportionment of adjudication fees. These are similarly outlined in the SG Act. The jurisdictions of the adjudicators in NSW and SG are thus considerably narrower than those in the UK. This is understandable since the scope of the application of NSW and SG’s adjudication regime is confined to disputes relating to progress payments. The NZ Act gives adjudicators much broader powers than the NSW and SG Acts. Adjudicators in NZ have the ability to determine the liability of any party of a construction contract regarding payments, whether they be progress or other payments. They also have the ability to question disputes about the rights and obligations of the parties under the contract. Furthermore, the NZ Act provides that an adjudicator’s jurisdiction can extend to other matters as long as there is written agreement of the parties involved. The NZ Act also permits adjudicators to consolidate two or more pending adjudications into one adjudication with the written consent of all the parties involved.

### 7. Enforcement mechanism

Legislators wishing to establish security of payment legislation must also decide what remedies should be included in the event of non-compliance regarding payment terms and adjudication decisions by respondents. These remedies are needed to ensure that the overriding objective of the legislation, which is to expedite payment and improve cash flow, is not compromised.

#### 7.1 Suspension of work or supply

Pursuant to the payers’ or respondents’ non-conformance with the payment terms, all the statutes give payees or claimants the statutory right to suspend their obligations under the contract. The security of payment legislation has fundamentally altered the common law position with regard to suspension of performance. A payee or claimant is vested with express power to suspend the work or supply depending on jurisdictions if payment terms have been breached by the payer or respondent.

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70 Section 22(1) of the NSW Act.
71 Section 17(2) of the SG Act.
72 Sections 38, 48, 49(1)(c) and 50(1)(c) of the NZ Act.
73 Section 38(2) of the NZ Act.
74 Section 40 of the NZ Act.
safeguard the payer or claimant’s interests with respect to unwarranted suspension of construction work or supply of goods or services, a number of safety measures have been put in place by legislators. For example in the UK, such a right can only be exercised when a sum due under the contract is not paid in full by the final date of payment\textsuperscript{75}, when a withholding notice has not been issued by the payer\textsuperscript{76} and when an effective notice of intention to suspend performance has been issued by the payee.\textsuperscript{77} With respect to the NSW and NZ Acts, a claimant or payee may only invoke the right of suspension by issuing a notice of intention to suspend performance\textsuperscript{78} if one of the conditions provided by the legislation is met. These conditions are as follows:

a) If no payment schedule is issued, failure on the part of the payer or respondent to pay the claimed amount either in whole or in part when payment is due\textsuperscript{79};

b) If a payment schedule is issued, failure on the part of the payer or respondent to pay the scheduled amount either in whole or in part when payment is due\textsuperscript{80}; or

c) Failure on the part of the payer or respondent to pay the adjudicated amount\textsuperscript{81}.

The SG Act, on the other hand, only gives the suspension right to the claimant/payee during the post-adjudication period.\textsuperscript{82} If no payment is made by the payer or respondent by the prescribed period\textsuperscript{83} after a notice of intention has been issued, which varies from one jurisdiction to another, a payee or claimant may suspend the work or supply of services\textsuperscript{84} or goods.\textsuperscript{85}

The UK, NSW, NZ and SG Acts unanimously exclude the period of lawful suspension from the calculation of the completion period.\textsuperscript{86} However, these statues differ with respect to the recovery of loss and expenses incurred pursuant to the suspension of work or supplies. The UK Act is silent on this matter and consequently the recovery of losses and expenses following suspension is contingent on the terms of the contract. On the other hand, the NSW and SG Acts provides monetary relief to cover losses and expenses arising from the suspension.\textsuperscript{87} The NZ Act provides an express provision prohibiting the payee who has suspended the work to claim any costs incurred as a consequence of the suspension.\textsuperscript{88} The NSW, NZ and SG Acts further provide an express provision relieving the claimant

\textsuperscript{75} Section 112(1) of the UK Act.
\textsuperscript{76} Ibid.
\textsuperscript{77} Section 112(2) of the UK Act.
\textsuperscript{78} Sections 15(2)(b) and 16(2)(b) of the NSW Act and Section 72(1)(b) of the NZ Act.
\textsuperscript{79} Sections 15(1)(a) and (b) of the NSW Act and Section 72(1)(a)(i) of the NZ Act.
\textsuperscript{80} Sections 16(1)(a) – (d) of the NSW Act and Section 72(1)(a)(ii) of the NZ Act.
\textsuperscript{81} Section 24(1)(b) of the NSW Act and Section 59(2)(b) of the NZ Act.
\textsuperscript{82} Section 23(1)(b) of the SG Act.
\textsuperscript{83} Seven days after the issue of notice of intention to suspend performance under the UK Act, two business days after the issue of notice of intention to suspend performance under the NSW Act, five working days after the issue of notice of intention to suspend performance under the NZ Act and seven days after the issue of notice of intention to suspend performance under the SG Act.
\textsuperscript{84} Only in the UK and New South Wales, Australia.
\textsuperscript{85} Only in New South Wales, Australia.
\textsuperscript{86} Section 112(4) of the UK Act, Section of the NSW Act, Section 72(2)(c) of the NZ Act and Section 26(7) of the SG Act.
\textsuperscript{87} Section 27(2A) of the NSW Act and Section 26(3) of the SG Act.
\textsuperscript{88} Section 72(2)(c)of the NZ Act.
or the payee who invoked the right of suspension from claims of loss and damage by the respondent or payer and any third party.\textsuperscript{89} No corresponding provision is provided under the UK Act. The mechanism allowing loss or additional expenditures incurred by the payee or claimant during the period of suspension to be recovered from the payer or respondent as provided under the NSW and SG statutes seems preferable. This mechanism affords statutory protection to the payee or claimant who incurs loss and expense as a consequence of the suspension. This allows certain recovery of losses or expenses by the payee or claimant, as such a recovery is not made contingent on the terms of the contract.

7.2 Statutory debt enforced through court judgment

Unique to the NSW, NZ and SG Acts is an express provision allowing a claimant or payee to recover the unpaid amount from the respondent or payer, whether it be a progress payment\textsuperscript{90} or adjudicated amount\textsuperscript{91} as a statutory debt that may be recovered in a court of competent jurisdiction. The right to sue for the unpaid amount as a debt due to the payee or claimant in the UK, albeit in the absence of any explicit provision in the UK Act, exists under common law. However, if certainty and clarity are the objectives of legislators hoping to introduce security of payment legislation, the approach taken by NSW, NZ and SG legislators to include an express provision allowing payment debt to be recovered as statutory debt is preferable.

7.3 Lien

A lien is the right to take and hold or sell the property of a debtor as security for a debt until payment is made. This mechanism is used extensively in the US and Canada and is known as a mechanic’s lien. Under the NSW legislation, apart from seeking a summary judgement in the event where the unpaid portion becomes a statutory debt, the claimant is given the right to place a lien on unpaid and unfixed goods he supplied.\textsuperscript{92} Goods are defined in this jurisdiction as including not only materials and components to form part of the work but also as ‘plants or materials (whether supplied by sale, hire or otherwise) for use in connection with the carrying out of construction work’.\textsuperscript{93} A claimant’s right to place a lien on goods in the event the respondent has breached the payment terms is thus far unique to the NSW regime. It provides an alternative remedy, apart from suspension of work and adjudication, which may be commercially practical in certain situations. However, the right of lien vested by the NSW statute is limited and does not extend to a third party who is an owner of the unfixed plant or equipment.\textsuperscript{94} The right of lien may be exercised by the claimant on the due date stated in the contract (if there is no stipulation in the contract, the right of lien may be exercised ten business days after a payment claim is made)\textsuperscript{95}. The SG Act also provides a provision for a right of lien, but such a right

\textsuperscript{89} Section 27(30 of the NSW Act and Section 72(2)(b) of the NZ Act.
\textsuperscript{90} Sections 15(2)(a)(i) and 16(2)(a)(i) of the NSW Acts and Section 24(2)(a) of the NZ Act.
\textsuperscript{91} Section 25(1) of the NSW Act, Section 73(3) of the NZ Act and Section 23(2) of the SG Act.
\textsuperscript{92} Section 11(3) of the NSW Act.
\textsuperscript{93} Section 11(5) of the NSW Act.
\textsuperscript{94} Section 11(1)(ii) of the NSW Act.
\textsuperscript{95} Section 11(1)(b) of the NSW Act.
may only be exercised in a situation where a respondent has failed to pay the adjudicated amount. The procedures for exercising the right of lien on goods supplied which are unfixed and unpaid for are similar to those in the NSW Act. This is understandable since the SG Act is largely modelled on the NSW Act.

### 7.4 Charging order

The NZ Act provides a novel remedy to the right to issue a charging order over a construction site, which is an alien concept in other jurisdictions. ‘Charging order’ refers to placing a charge on the debtor’s property. The NZ Act is the only legislation considered for this case study that confers such an additional right on the claimant in the event of the respondent’s failure to pay the adjudicated amount. The fact that the NZ Act permits a claimant to include an owner of the land in the adjudication opens the possibility for the claimant to apply for a charging order. The claimant may serve the owner a notice of adjudication if he seeks a determination of owner’s liability and approval for the charging order. However, the involvement of the owner in the adjudication proceeding between the claimant and the respondent is only permitted if it can be proved that the respondent is an owner’s associate, as defined by the Act. The definitions of ‘associate’ are many and include spouse, child, parent, partner and trustees of the respondent and a person or company who owns 20% of the controlling interest in the respondent company.

If it is determined that the owner is jointly and severally liable with his associate’s respondent to pay the claimant, the adjudicator must approve the issuing of a charging order over a construction site. The charging order will then be immediately issued by the Registrar of the District Court upon entry of judgment against the owner. The owner, however, is allowed to apply to the District Court to review the adjudicator’s determination. Notwithstanding the fact that this right can only be exercised in limited situations (for example, the respondent must be an associate of the owner), the effect of this clause should not be underestimated. If this right is lawfully invoked, it could force the owner to either pay the respondent’s debt directly to the claimant to avoid the site being subject to sale as a result of the charge or it could compels the respondent to pay the debt.

### 7.5 Direct payment from the principal

Unique to the SG Act is the existence of a provision allowing the principal of the respondent to directly pay the claimant any outstanding adjudicated amount. Invoking this provision is up to the discretion of the principal and may be done in order to protect the principal’s interests. This right is invoked by issuing notice that direct payment shall be made by the principal to the claimant, a copy of

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96 Section 25 of the SG Act.
97 Sections 49 and 50 of the NZ Act.
99 Section 28(1)(b) of the NZ Act.
100 Sections 50(1),(2) of the NZ Act.
101 Section 76 of the NZ Act.
102 Section 52 of the NZ Act.
103 Section 24 of the SG Act.
which is sent to the respondent.\textsuperscript{104} The respondent is afforded two days after the receipt of such notice to present evidence that payment has in fact already been made, failing which the principal is entitled to pay the claimant directly.\textsuperscript{105} Such a direct payment constitutes a reduction of the payment to the respondent that the principal owes or may in future owe to the respondent in connection with relevant construction work or the supply of goods and services.\textsuperscript{106} Alternatively, it may be recovered by the principal as a debt owed by the respondent.\textsuperscript{107} This unique right, which is currently not found in other security of payment legislation, may provide an alternative route by which a claimant may recover the adjudicated amount. It might be desirable to invoke this right, although it is purely discretionary on the part of the principal, in situations where the smooth running of the construction project is the principal’s main concern.

8. Conclusion

This paper has reported the findings from initial literature review and legal research methods conducted for the purposes of examining the profiles of the security of payment regimes in the United Kingdom, New South Wales in Australia, New Zealand and Singapore. This exercise has highlighted what are the available leading models that may be adopted in a particular jurisdiction. Difficulties concerning the operation of these regimes have also been presented. Other legislators should give a great deal of attention to these and consider them when drafting their own legislation. From this study it was discovered that there are two types of regime that are currently in place which are adjudication independent of payment and adjudication related to payment. The ambit of the regimes is different, covering certain types of contract and excluding some others. For example the UK Act excludes supply of goods contracts from its constituency whereas the NSW and SG Acts include them. The scope and application of payment and adjudication machineries are essentially different from one jurisdiction to another. For example the UK Act imposes a non-prescriptive payment mechanism whereas the NSW, NZ and SG Acts provide a prescriptive payment mechanism. Similarly, enforcement options are also dissimilar. For example the UK Act only provides a right to suspend the work or supply (apart from the right to refer a dispute to adjudication) in the event of non-conformance of payment terms. The NSW Act and NZ Acts, on the other hand, on top of those two rights, afford a right to lien and a right to charging order respectively. However, notwithstanding their differences all these regimes fundamentally have similar objectives i.e. to facilitate payment and improve cash flow within the construction industry. The New Zealand and Singapore Acts being enacted later, have arguably improved some of the questionable features of the UK and NSW Acts. Furthermore, the Singapore Act has included some distinctive features that are unique to its construction industry. The provision of requiring the parties to attempt to resolve their dispute within the dispute settlement period is currently non-existence in the rest of the jurisdictions. Legislators in other jurisdictions contemplating to introduce similar legislation can benefit from the rich and recent precedents set in these regimes.

\textsuperscript{104} Section 24(2)(a) of the SG Act.
\textsuperscript{105} Sections 24(2)(b),(c) of the SG Act.
\textsuperscript{106} Section 24(4)(a) of the SG Act.
\textsuperscript{107} Section 24(4)(b) of the SG Act.
References


Appendix ‘A’ – Comparative Analysis of the Operation of the Security of Payment Regimes in the United Kingdom, New South Wales in Australia, New Zealand and Singapore

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Ambit of Security of Payment Legislation

Definitions of Construction Contracts

1. Contracts for construction operations/work                       | √      | √       | √      | √      |
2. Contracts for the supply of services                             | √      | √       | √      | √      |
   i. Contracts for supply of labour                                | √      | √       | √      | √      |
   ii. Contracts for supply of professional consulting services     | √      | √       | √      | √      |
      a) Contracts for architectural, engineering and surveying services | √      | √       | √      | √      |
      b) Contracts for project management services (management contracts included) | √      | √       | √      | √      |
      c) Contracts for specialist advisory services                  | √      | √       | √      | √      |
3. Contracts for supply of goods                                    | √      |         |        |        |
   i. Contracts for supply of goods between the contractor and the supplier | √      |         |        |        |
   ii. Contracts for supply of goods with the developer and the supplier | √      |         |        |        |
4. Excluded contracts                                               |         |         |        |        |
   i. Residential occupier contracts                                 | √      |         |        |        |
      a) Contracts under which one party intends to occupy or reside | √      |         |        |        |
      b) Contracts that do not require the approval of Building Authority | √      |         |        |        |
      c) Residential occupier contracts included (only right to adjudication available) | √      |         |        |        |
   ii. Private Finance Initiative (PFI), finance and development agreements | √      | √       | √      | √      |
      a) PFI/PPP agreements                                         | √      |         |        |        |
      b) Finance agreements                                         | √      | √       | √      | √      |
      c) Development agreements                                     | √      |         |        |        |
   iii. Employment contracts                                       | √      | √       | √      | √      |
iv. Construction contracts outside jurisdiction

Definitions of Construction Operations
1. Building operations/work
2. Civil and infrastructure engineering operations/work
3. Operations forming part of the works
4. Cleaning, painting and decorating
5. Excluded construction operations
   i. Extraction of oil and natural gas
   ii. Extraction of mineral
   iii. Process plant exception clause
      a) Plant and machinery
      b) Structural steelwork that provides access and support to the plant

Appendix ‘A’ – Comparative Analysis of the Operation of the Security of Payment Regimes in the United Kingdom, New South Wales in Australia, New Zealand and Singapore (Cont’d)

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</tr>
<tr>
<td>1. Pay when paid clauses</td>
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<td>✓</td>
<td>✓</td>
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</tr>
<tr>
<td>2. Pay if paid clauses</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>3. Other innovative conditional payment mechanisms (e.g. pay when certified clauses)</td>
<td>✓</td>
<td></td>
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<tr>
<td>Adjudication: Scope and Application</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Dispute Type</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>1. All types</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>2. Progress payments related</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Nomination of the adjudicator</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Agreement between parties</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>2. Nominating Body/Authority chosen by agreement between parties</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>3. Any Adjudication Nominating Bodies/Authorities</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Duties of the adjudicator</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Act independently, impartially and in a timely manner</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>2. Avoid incurring unnecessary expenses</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>
3. Comply with the principles of natural justice √ √ √
4. Disclose any conflict of interest to the parties in adjudication √
5. Resign from the adjudication proceeding if a conflict of interest is present √

**Powers of the adjudicator**

1. Open up, revise, review and revise any decision made or certificate √ √
2. Award interest √ √ √ √
3. Request the parties to supply the necessary documents √ √ √ √
4. Decide on the choice of language for adjudication √
5. Meet and question the parties and their representatives √ √ √ √
6. Carry out site visits and inspections √ √ √ √
7. Carry out tests or experiments √ √
8. Appoint expert witnesses and advisors √
9. Issue directions concerning the timetable of adjudication and deadlines √ √ √ √
10. Issue directions relating to the conduct of the adjudication √ √ √ √
11. Award the cost of adjudication √ √ √ √
12. Conduct the adjudication in a manner seen fit √ √ √ √
13. Correct the decisions √ √ √ √
14. Approve the charging √

**Determination of the adjudicator’s jurisdiction**

1. Allowed
2. Not allowed

**Consolidation of one or two pending adjudications into one adjudication**

1. Allowed
2. Not allowed √ √ √ √

**Dispute settlement period prior to adjudication**

1. Provided √ √ √ √
2. Not provided √ √ √ √

**Review of decision**

1. Provided √ √ √ √
2. Not provided √ √ √ √

**Enforcement Options**

**Suspension of work or supply**

1. Loss and expense non-claimable √
2. Loss and expense claimable √ √ √ √

**Statutory Debt Enforced Through Court Judgment**

1. Express provision √ √ √ √
2. No express provision √

---

**Appendix ‘A’ – Comparative Analysis of the Operation of the Security of Payment Regimes in the United Kingdom, New South Wales in Australia, New Zealand and Singapore (Cont’d)**

<table>
<thead>
<tr>
<th>Item</th>
<th>UK Act</th>
<th>NSW Act</th>
<th>NZ Act</th>
<th>SG Act</th>
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<td>Adjudication: Scope and Application (Cont’d)</td>
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<tr>
<td>Powers of the adjudicator (Cont’d)</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Conduct the adjudication in a manner seen fit</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>13. Correct the decisions</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>14. Approve the charging</td>
<td>√</td>
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<td></td>
<td></td>
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<tr>
<td>Determination of the adjudicator’s jurisdiction</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Allowed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Not allowed</td>
<td></td>
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<tr>
<td>Consolidation of one or two pending adjudications into one adjudication</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1. Allowed</td>
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<tr>
<td>2. Not allowed</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
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<tr>
<td>Dispute settlement period prior to adjudication</td>
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<td></td>
</tr>
<tr>
<td>1. Provided</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Not provided</td>
<td>√</td>
<td>√</td>
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<td>√</td>
</tr>
<tr>
<td>Review of decision</td>
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</tr>
<tr>
<td>1. Provided</td>
<td></td>
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<td>2. Not provided</td>
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<td>Enforcement Options</td>
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<td>Suspension of work or supply</td>
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<td>1. Loss and expense non-claimable</td>
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<td>2. Loss and expense claimable</td>
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<td>Statutory Debt Enforced Through Court Judgment</td>
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<tr>
<td>1. Express provision</td>
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<td></td>
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<td>2. No express provision</td>
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<td>Lien</td>
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</tr>
<tr>
<td>1. Provided</td>
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<td>✓</td>
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<tr>
<td>2. Not provided</td>
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<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2. Not provided</td>
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<table>
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<tr>
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<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2. Not provided</td>
<td></td>
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Legal Implications of BIM: Model Ownership and Other Matters Arising

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Abstract

Building information modelling (BIM) promises some potentially radical benefits if it is fully adopted and correctly deployed on construction projects. However, significant literature evidence suggests that certain benefits of innovations such as BIM only become feasible and realizable when their legal frameworks are clear and implementable. Interestingly, existing legal frameworks for professional service delivery in architectural, engineering, construction and operations (AECO) industries are apparently biased to fragmented conventions than contemporary contractual risks in e-business. This, potentially, is a major concern against speedy adoption of BIM. Arguably, AECO industries have not remained static in the past years regarding the adoption of integrated technologies that enable creation and sharing of information across discipline boundaries. Moreover, integrated systems have a long history in construction which is not limited to BIM - there are other software applications that are being deployed to service integrated innovations and multidisciplinary business systems. Whilst the industry still struggles to improve on the speed of adopting and deploying these innovative technologies, the herculean task is how to create workable legal frameworks that will service the potential benefits being proposed in BIM. Some variables of contractual risks in changing technologies have been conceptualized in some recent studies; with recommendations on some useful modifications to conventional legal frameworks in e-contracting, which are not yet definitive at present. This article reviews scholarly perspectives regarding legal implication of BIM adoption: ownership and control of BIM models, potential revolution in standard of care as a reaction to changes in processes and practices that are driven by past technologies. Professional liabilities in electronic and integrated project delivery systems are also discussed. In the end, conclusions are drawn on potential benefits of resolving these challenges.

Keywords: building information modelling, contractual risks, duty of care, e-business, professional liability.


1. Introduction

Until recently, various elements of the construction industry (architectural, engineering, estimating, construction and operations - AECO) have raised some significant concerns on the limitations of 2-dimensional and entity-based tools. Hitherto, these issues are being raised in different perspectives, and have generated a wide range of polemical arguments mostly on technical rather than theoretical grounds. Whilst some past studies express these limitations in terms of spatiality (e.g. (Jereb 2009; Winch and Deeth 1994)), others link them to weakening the frameworks for facilitating and servicing certain goals of construction clients; including virtual project visualization and integrated building information systems throughout project life (Jeng and Eastman 1998). Further to these, (McKinney and Fischer 1998) reported unequivocal evidence on many limitations of entity-based CAD, including its inability to drive effective communication between different levels of end-users (including designers and other users), value integration and thorough collaboration amongst project teams.

As a workable alternative, a new tool – building information modelling (BIM) has been developed to trigger potentially radical revolution in the industry, and this is being adopted in different parts of the world in slightly different patterns. According to (Olofsson et al. 2008), BIM reduces the gap between the construction industry and other industries that have used similar concept of digital technology to drive product performance with its unique characteristics. Empirical evidence that is available in literature suggests that innovative attributes in BIM are unconventional, and these features are strongly anchored on effective collaboration between all parties that are involved in project life (Aranda-Mena et al. 2008; Sher et al. 2009). Technically, most reports on BIM mainly target its concept either as an introduction or implementation of new sets of strategies and procedures for electronic data management systems (EDMS) through different functions and stages in project life.

This study reviews BIM’s facilitative attributes and its evident limitations in e-business models in construction. The ability of BIM to facilitate project performance as promised is being threatened by some lingering questions bothering on designing appropriate methodologies for bridging legal frameworks in conventional systems and similar provisions in BIM. Quite a significant number of studies have attested to this; suggesting that BIM implementation still has many unique challenges which may worsen in the future if they are not resolved quickly (Holzer 2007). Whilst some studies focus on slow adoption of BIM and allied innovations as a vitally important challenge, others have seen the focal point of BIM as a question of workability rather than adoptability. For instance, (Aranda-Mena et al. 2008) reported some case studies to outline certain fundamental attributes that must be active before BIM benefits become realizable – operators need appropriate business processes and skills to drive electronic data transfer and management, and must exhibit collaborative behavioural patterns, among others. To those, (Tse et al. 2005) and (Sher et al. 2009) have added the need to meet certain system requirements (hardware and software) and skill needs respectively.
2. Industry issues on legal feasibility of BIM implementation

Available evidence from a recent survey as reported in (Ahuja et al. 2009) and a pool of market reports suggest that e-business is getting more popular in the industry. Moreover, (Luciani 2008) surmised, based on a significant analogous corollary, that the era of e-processes has truly begun in many facets of practices in the construction industry. Whilst it is still difficult to gauge and compare rates of intra-discipline adoption of e-processes, and the performance of allied strategies; it is possible to conclude that the use of manual and paper-based procedures and tools will become less attractive and fairly unmarketable as the world head into the world of digital innovation. Our world is not just folding down its space and system of conducting information, it is also unfolding proactive opportunities to improve service quality and transaction outcomes. Yet, the gap between legal frameworks that service fragmented business models and proposed alternatives in electronic innovations is still a major concern (Engsbo 2003). Existing legal frameworks in the industry have remained relatively unchanged for many decades. Consequently, to drive future and recent developments in the direction of change being triggered by e-innovations, existing legal instruments must be reformulated and strategically deployed to achieve all necessary goals as and when due.

BIM is many steps away from fragmented processes. There is clear evidence in literature regarding its attributes. Specifically, a recent survey reported by (Huang et al. 2009) shows that BIM is being used as a digital repository for integrated system whereby players are provided with platforms to contribute and share data, simulate and visualize possible outcomes during design, embed virtual objects with robust information at different stages and deploy several instruments of collaboration to drive project goals. To this, (Maher 2008) added some facilitative attributes such as ability for multiple users to access project database and interact simultaneously thereby saving time and improving outcomes through real time communication. Ultimately, other studies (e.g. (Bedrick 2006; Gül et al. 2008; Marshall-Ponting and Aouad 2005)) have summarized how these attributes impact on the industry: it uniquely manage inputs’ conflicts, automate updated reviews, can be used and stored not only during design but throughout project life, and can be animated in multiple dimension – never has this been possible in the history of construction development process.

Meanwhile, while the industry continues to explore extended potential benefits of BIM in different parts of the world, some issues have continued to emerge. For instance, as BIM adoption continued to improve, it is still slow (Azhar et al. 2008). Much effort is being invested into BIM adoption by many industry stakeholders. However, the overarching question therefore is: can BIM deliver its technical benefits without adapting existing legal instruments, or possibly formulate new ones? Some problems with existing legal instruments in the industry have been underlined in (Campbell and Harris 2005). Akin to this, a perspective that was reported in (Holzer 2007) also suggest that BIM may not facilitate lasting solutions to the limitations of conventional fragmented processes unless apparent issues which are complicated by gaps in its legal frameworks and e-business models are addressed. Some of these challenges are identified Figure 1 below, and reviewed subsequently.
2.1 Duty of care: model authorship and ownership

Inputs in conventional design systems are fragmented, and existing regulations regarding responsibilities and management of professional services are made to support this. Consequently, focus of legal provisions is that input authors reserve most rights to issue, protect and be answerable to all issues arising from their services. It is not yet definitive from literatures how independent ownership of inputs to project development processes contributes to the problems of fragmented processes. However, some studies have presented significant empirical evidence regarding client involvement and project performance (e.g. (Abrahams and Farrell 2003; Kajewski et al. 2003; Kometa et al. 1995; Moses et al. 2008)). Similarly, the conceptualization of BIM has been hinged on its focus on clients, and its legal frameworks are being targeted at this as procedural strength. The American Institute of Architects (AIA) is one of the few professional organizations in the world that have formalized and documented legal regulations for digital design systems. Section 2.2 of AIA’s E202 Document™ states:

_In contributing to content of the Model [BIM], Model Element Author [every participant in BIM integrated system] does not convey any ownership rights in the content provided or in the software used to generate the content. Unless otherwise granted in separate license, any subsequent Model Element Author’s and Model User’s right to use, modify or further transmit the model specifically limited to the design and construction of the project, and nothing contained in this Exhibit conveys any other right to use the Model for another purpose._ (AIA 2008)
Figure 1: A taxonomy of legal limitations in BIM

Akin to AIA’s position on model ownership as stated above, (Bedrick 2006) argued that since BIM model is a product of collaboration, ownership of the final output (i.e. the design model) belongs to the client rather than designers’ individual ownership of inputs as obtainable in conventional systems. This position is aimed at fostering longer relationship between clients and project teams as extended duty of care not only during construction but throughout the life of the model – presumably, beyond project life. However, not many studies agree with this AIA’s philosophy on model ownership, and
several reports have queried that this could result in certain unsatisfactory consequences to the client. According to (Dean and Ryan 2009), the inclusion of disclaimer notes in design is an indication that designers no longer want to bear to the risks of design errors, rather use this as excuse to transfer risks due to them to clients. Apparently therefore, model ownership as a legal challenge is multifaceted:

Foremost, contributors to BIM models may depend on inputs from other members of the project team. On the one hand, all parties are bound by relative responsibilities to industry standards on duty of care in a new world of innovation and virtual enterprise where data generation is quick and external sources are not necessarily verified (Haynes 2009). The crux however is that there is no guarantee that such over-reliance on external sources would not be detrimental to client’s goal in the long run. On the other hand, all users have the choice to adopt tools that serve their purposes best, including software, connotations, detailing, language of expression, professional communication pattern, presentation style and so on. These indices will not always agree with other users’ inputs, even though a common goal is been pursued. A dimension to this has been reported in (Ballesty et al. 2007). The study argues that BIM deployers have different adoption and implementation capabilities, and thus, will generate outcomes with variable accuracy. Reported case studies in (Aranda-Mena et al. 2008) also evidence the theory that inaccuracies can be transmitted from one modeller to the other, and this can affect final project outcomes.

On the other hand, modellers have different targets on consensus project goals; and those targets commonly align with professional backgrounds. In cases where integrated services are provided, different professionals apparently provide different aspects of professional services at every stage as they become necessary – this has always been the safest way in conventional practice. In conventional systems, individual team members are not just responsible for their inputs; they also manage the use of what comes of those inputs after the project. It is a possibility that when models are enshrined exclusively to clients, inputs can be put to unauthorized uses that are not constructive to originators’ goals and intents. Moreover, as there is no provision yet on all feasible rights and obligations of all parties that are involved in BIM development and deployment, there could be severe legal consequences wherever existing legal provisions are silent or could deserve further interpretations.

2.2 Consideration

Common liabilities, responsibilities, expectations from design teams and professional indemnities are hinged on remunerations for professional services rendered by individual members of the project team (Hoxley 2000). Existing provisions for remunerations of professional services in the industry are largely driven by conventional fragmented concepts. Significant evidence also exists suggesting that new processes and skills are required in BIM to achieve improved project outcomes – as these are not akin to conventional processes (Sher et al. 2009). However, definitive scales of fees which are commensurate with professional responsibilities in BIM project development processes are not yet in place. Although, no empirical evidence has yet been reported on the relationship between lack of proportionate consideration as a disincentive factor and the reluctance of many practitioners to adopt
BIM, it is clear that formulation of commensurate compensation is, and will continue to be, a strong motivation. This is because there is high probability that BIM improves service delivery and new process instruments are required to drive this.

Moreover, there is little empirical evidence upon which to conclude on how the cost of BIM compares, in terms of direct costs and effectiveness, with other design tools. In a case study made available in (Azhar et al. 2008), BIM costs significantly less than the minimum allowable professional fees in conventional design processes in any part of the world, and many significant savings were also made non-value adding processes. (Aranda-Mena et al. 2009) have also suggested some ways it makes business sense to implement BIM. The limitation of both studies cited above is that they are not based on strong empirical explanatory variables like size of firms, nature of projects, strategising model and implementation instruments or similar. On this basis, contrary opinions may thrive against generalization of perspectives regarding cost effectiveness of BIM. Different situations apply in different parts of the world and it is possible that BIM implementation cost is higher than predicted due to varying project factors. The best way to address this polemical situation is to standardize service procedures and formulate workable legal instruments to service BIM attributes and allied innovations.

2.3 Legal framework for electronic design management

Existing industry laws target manual and fragmented design and construction processes. Apart from copyright and allied title deeds, most design documentations are paper-based as participants are often expected to sign off documentation with definite instruments. Arguably however, there is a world of difference between activities and procedures of integrated electronic design and fragmented systems. Even though the industry deploys e-innovative tools to service process and product improvement, legal framework for transacting universally are apparently grossly inadequate in the industry. Many studies have identified several issues regarding legal liabilities in electronic mediums, including effective formulation of e-contracting, acceptability of authorization styles, repudiation, jurisdiction and acceptability of electronic documents as inexorable evidence in many law courts, taxation laws and cyber snooping problems (Mao et al. 2007; Reimers 2001; Ren and Hassan 2007).

BIM seems to be an exception in terms of players’ exposure to dispute and dysfunctional relationships. According to (Bedrick 2006), not many disputes have been reported on BIM projects since its evolution. Although there seems to be many potential platforms that can foster lasting harmony between role payers in BIM, however several case studies on BIM now exist in literature showing that BIM is an end in itself and not an absolute solution to wipe off all limitations in the industry (Aranda-Mena et al. 2008; Barbosa et al. 2009; Fusell et al. 2007; Olofsson et al. 2008). Meanwhile, there are also strong indications that BIM is vulnerable several issues like most e-process products. For instance, BIM is a cross-boundary system. However, instruments are limited by geographical boundaries. Different legal instruments (e.g. laws, regulatory frameworks, codes and industry standards) apply in different places while virtual enterprising, an internet-based phenomenon, enjoys unlimited boundary of the ‘global village’. Also, where the industry is driven by fragmented frameworks, virtual enterprises are not only derecognized, they may be sabotaged by
certain government policies and taxation laws. To address this (Succar 2009) suggests that BIM adoption and implementation frameworks must be comprehensive and objective, involving all stakeholders – the industry, government and research.

3. Conclusion

The construction industry is currently recording some phenomena issues regarding paradigm shifts from fragmented processes to digital innovations. BIM, as an example of this, promises a wide range attributes that can generate many potentially radical outcomes. Unlike fragmented process, BIM trigger process improvements through its facilitative platforms for integrative communication, data generation and transfer, better understanding and commitment of players to team spirit, and unequivocal reliance on collaboration to succeed. This study relied on these attributes and other existing theories on contemporary skill structures that are needed to drive BIM, to argue that BIM requires a new set of legal instruments to achieve its promises. Moreover, as new set of process patterns and tools are required to generate improved outcomes through BIM, it is necessary that these reflect in remunerative considerations. BIM also purports extended relationship between model authors and project life by extending ownership of model to clients. The challenge this poses however is that data generation system in BIM is not error-proof. Also, BIM deployment has a number of unresolved issues. These include methods for aligning economic benefits when leveraging parties’ support and commitment to BIM instrumentation. Admissibility of e-documents as strong legal instruments, authorization and jurisdiction are other issues which are conceptualized in the study. Also identified as important is the issue of liability in cyber security. Electronic files are still vulnerable to worms and viruses, data theft, snooping and hacking. The overarching recommendation therefore is that as BIM purports a new order and fraternity, new legal instruments are required. However, the pattern of departure from all existing aspects or all provisions already made for fragmented instruments must be studied based on reliable empirical data before those new tools are formulated.

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Pathology of Mediation Failure

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Cheung, S.O.

Abstract

The last two decades witnessed a surge in the use of alternative dispute resolution (ADR) to resolve construction disputes. Mediation is one of the popular forms of alternative dispute resolution used in construction. In Hong Kong, the 2009 Civil Justice Reform introduced voluntary mediation to take place before court proceedings. Correspondingly, Practice Direction 6.1 was published and details the implementation provisions. In essence, unreasonable refusal to mediation will attract an adverse cost sanction. Moreover, the success or otherwise of voluntary use of mediation is vested with the application of the mediation process, the attitude of the disputants and the mediator. This paper reviews the provisions under Practice Direction 6.1 of the Civil Justice Reform. In addition, the potential pitfalls of mediation are discussed with supplemental metaphorical illustrations.

Keywords: mediation, construction
1. Introduction

A new chapter for the Civil Justice System in Hong Kong commenced on 2nd April 2009 with the launch of the Civil Justice Reform. Back in 2000, the Chief Justice of the Hong Kong Judiciary appointed a working party to review the civil rules and procedures of the High Court and to recommend changes thereto with a view to ensuring and improving access of disputants to justice at reasonable cost and speed. Alternative dispute resolution (ADR) is considered a potentially useful process in appropriate cases as an alternative or adjunct to civil proceedings. After wide consultation, voluntary mediation is introduced and becomes an integral part of case management of civil proceedings. Mediation is regarded as a cost-effective means of resolving construction disputes. This conception of mediation as an alternative to the legal process is increasingly being enshrined in legislation. A new version of Practice Direction 6.1 was published for cases to be handled under the Construction and Arbitration List of the Hong Kong High Court. To foster genuine attempt to mediate disputes, cost sanction is used to deter unreasonable refusal to attempt mediation. Item 41 of the Practice Direction 6.1 indicates that "where a Mediation Notice has been served, an unreasonable refusal or failure to attempt mediation may expose a party to an adverse costs order". Item 42 adds that where a party: (1) has engaged in mediation up to the minimum level of expected participation agreed by the parties beforehand or as determined by the Court; or (2) has a reasonable explanation for non-participation, he/she should not suffer any adverse costs order. What constitutes an adverse costs order will be a matter of the Court’s discretion after taking into account all relevant circumstances (Item 43) However, in determining whether a party has acted unreasonably in refusing mediation, the Court will not take account of or inquire into: (1) what happened during the mediation; (2) why the mediation failed; or (3) whether any failure in the course of mediation may be ascribed to unreasonable conduct by any party (Item 44) Item 44 thus preserves the distinctive features of confidentiality and privacy of mediation. This paper aims to enhance the success of construction mediation through the discussion of the Practical Direction 6.1 and the potential pitfalls in handling mediation. Metaphorical examples are used to relate our daily life experience with the tacit knowledge for ease of reference (Smith 2005) Further research in this connection is also suggested.

2. Construction mediation under the civil justice reform in Hong Kong

Practice Direction 6.1 defines alternative dispute resolution (ADR) as a process whereby the parties agree to appoint a third party to assist them to settle or resolve their dispute, but settlement negotiations between the parties do not amount to alternative dispute resolution. Mediation is a common and popular mode of alternative dispute resolution used in construction. Mediation is flexible and incorporates a variety of processes in which a neutral third person actively participates with the disputing parties working towards an assisted agreement. The Civil Justice Reform advocates the use of mediation. While concerns and/or objections were voiced upon the appropriateness of mediation for resolving all disputes before the Tribunal, cases unsuitable for mediation would inevitably be caught by the inflexibility of the rule. As such mediation should not be made compulsory in all cases while it is a potential means of facilitating quick and cost-effective
settlement in appropriate cases. In this regard, the modern practice in civil proceedings is to empower the Tribunal to exercise active case management in encouraging and facilitating voluntary use of mediation. The use of mediation under Practice Direction 6.1 is outlined in Figure 1.

Figure 1: The use of mediation under Practice Direction 6.1

There are two key features of Practice Direction 6.1. First, it is the party who does not wish to mediate to explain why mediation is not appropriate rather than the party who seeks to mediate to justify why mediation is used. As such, mediation is assumed to be appropriate unless explained otherwise. Second, the criteria for minimum amount of participation have to be attempted before proceeding to the actual trial. Appendix C of Practice Direction 31 gives an example of a specified minimum level of participation: “Agreement between the parties as to the identity of the mediator and the terms of his or her appointment, agreement as to the rules applicable to the mediation (if any) and manipulation by the parties in the mediation up to and including at least one substantive mediation session (of a duration determined by the mediator) with the mediator”. In the following sections, the mediation process, the mediator and the disputants are discussed in seriatim.
3. Mediation: the process, the mediator and the disputants

Construction dispute is inherently embedded in construction projects (Jehn & Mannix 2001) It is a double-edged sword (De Dreu & Van Vianen 2001; Jehn 1997) On the positive note, it creates opportunities for negotiators to practice and polish skills in problem-solving and decision-making (Chen & Chang 2005; Cohen & Bailey 1997; Katzenbach & Smith 1993) On the downside, it takes contracting parties” focus away from their core works and drains their energy that would be used more productively elsewhere (Nelson & Quick 2008) Excessive disputes therefore are counter-productive (Jehn 1995; McGrath et al. 1991; Pinto & Prescott 1988) In fact, there is a growing realization that construction disputes are particularly amenable to mediation (Chau 2007) According to Wall (2009a, b), mediation in Hong Kong has its origins in the construction industry. In 1984, the Hong Kong Government introduced mediation in some civil engineering contracts as a pilot run. The pilot scheme was considered as successful. In 1999, the government when revising the general conditions of contract for construction, incorporated voluntary mediation to be taken place before arbitration that can only be commenced upon practical completion. A review on the construction industry was conducted in late ninety’s and as a result, a report entitled “Construct for Excellence - Report of the Construction Industry Review Committee” was published in 2001. One of the recommendations was to introduce the use of alternative dispute resolution. In Hong Kong, mediation has been identified as a possible cost-effective means of resolving construction disputes (Hong Kong Judiciary 2009) Mediation is a form of assisted negotiation. There is strong assumption that by voluntarily submitting to mediation, the parties at least are willing to discuss their differences. It is quite understandable that disputants find it difficult to discuss their disagreement face to face. In mediation, mediator uses caucus sessions to understand a dispute and solicit possible solutions. As such, the shuttle diplomacy service of the mediator can narrow and eventually bridge the differences between the disputants. Because of the non-binding nature of mediation, participating parties should be mindful of certain percept of the process so as to enhance the prospect of mediation (Bercovitch 1992; Kleiboer 1996)

The success or otherwise of the implementation of the Practice Direction 6.1 depends on the level of respect and allegiance from the disputing parties (Crowe and Filed 2008) The force of mediation, i.e. normative legitimacy, is based on the voluntary consent of the disputants. Its judgment is intractable particularly in terms of vulnerable and/or impecunious parties that are often not having other viable options for a resolution of the dispute. Thus, it is to examine: (1) whether the Practice Direction 6.1 uses coercion to enforce the use of mediation? and (2) whether the Practice Direction 6.1 claims legitimate normative force? The following provides a brief account on the issues. Firstly, mediation process and outcome are determinative between disputing parties, since „mediation is neither structured for the general benefit of the community nor salient as a mode of coordinating social action”(Crow and Filed 2008) It may be sufficient to legitimize its outcomes if the disputing parties accept to follow the mediation process. Thus, the form of coercion does not depend on the consent of the parties. The possibility to trigger legal enforcement traces back to whether the parties agree to mediation or not. In this respect, the possibility to resort to protracted litigation and arbitration provides coercive backing to mediation. As such, the normative force of mediation process is supported by the coercive potential of litigation and arbitration. Secondly, the disputing parties are free to make arguments and decisions which are advantageous to themselves. The likelihood of
securing a more favorable outcome in court inevitably, in part, affects the willingness of the disputing parties to accept mediation. Nevertheless, a party who is unwilling to accept a mediated outcome may not resort to the courtroom in view of an adverse costs order. Thus, the threat of costly litigation and arbitration has formed part of the backdrop for mediation. From this perspective, mediated outcomes should appear not to depend on the exercise of coercion and/or claims to practical authority; instead, they reflect the individual decisions and preferences of the parties. In fact, the settlement reached as a result of mediation is typically enshrined in a legally binding document, such as a supplementary agreement. In this way, the normative weight of mediation outcomes is supported by the coercive mechanisms of law at the point of agreement.

Mediation is intended to be cost and time efficient. There is no point to labor on arguments, especially legal, that aim to defeat the counterparts. Thus, “mediation process does not focus on obtaining insight into the history of conflict, nor does it attempt to change personality patterns” (Rose 1996) Instead, all the parties should seize the opportunity to identify common grounds so that mutually acceptable settlement can be craved. Ideally, “mediation is not a sporting competition but a common journey” (Smith 2005) The duration for mediation is relatively short and limited to a few days or at the most one week in practice. Protracted mediation process run against the spirit of mediation and has proved to be futile. It is therefore essential for the mediator to foster the desire to settle and push forward the resolution process. “Mediation ,bicycle” is at risk of falling if sufficient momentum is not maintained” (Cohen 2003) Impasse is detrimental to the success of mediation. Enthusiasm quickly dissipates if there is no apparent progress. Once this occurs, regaining the momentum may not even be possible. An impasse in mediation is like a car that’s tuck in mud – An attempt to “step on the accelerator” and/or “spinning the wheels may just get further “stuck in the mud” (Rose 1996)

Mediator shall commence the mediation as soon as possible after the appointment and shall use his/her best endeavours to conclude the mediation within 42 days of the appointment under the Hong Kong International Arbitration Centre (HKIAC) mediation rules. Thus, mediator plays a pivotal role in facilitating a settlement to be concluded within a relatively short period of time. If the disputants come into the mediation play with a competitive approach, the disputants may perceive mediation as a sport like ballgame, where a “level playing field” is required; mediators are thus “umpires” or “referees” who can call “timeout” (Cohen 2003) A competent mediator holds the proceedings together. “Mediator is a puzzle-cracking problem solver, cutting through Gordian knots and climbing decision tree” (Cohen 2003) In addition to this technical role, a skilful mediator helps the disputants to focus on common grounds and potential benefits in resolving the dispute without going to court. This facilitating role, perhaps is more important and effective, requires a mediator to go beyond the technical stature. In the words of Rose (1996), “in thinking of clients as ,consumers”, mediator is viewed as a ,salesperson”. Madden (2001) adds that “mediator should sell the aroma of success and bring the taste in line with the smell”. An agile mediator should “seize the opportune moment and take the bull by the horns”. To exercise this facilitating role, “a mediator from within the conflict, whose acceptability to conflictants is rooted not in distance from the conflict or objectivity regarding the issues, but rather in connectedness and trusted relationship with the conflict parties” (Wehr & Lederach 1991:87) A mediator may drift backwards and forwards between approaches in response to feedback by the parties, as appropriate. The role of mediator as a facilitator (“counselor”) or
evaluator ("umpire") depends on the timely response contingent to the contexts. From these orientations, a mediator utilizes a range of strategies to effectuate the mediation plan. Stulberg (1997) revisited those strategies and suggested that mediator should *pierce the “grid” lock* and be flexible in using the strategies to the situation.

In fulfilling his/her role, the mediator should adopt tactics contingent to the dispute sources. In this respect, Cheung and Yiu (2005) studied the tactics used by construction mediators in Hong Kong and developed a contingent model relating dispute sources, mediator tactics and outcome (Yiu and Cheung 2005). It was found that construction dispute sources fall into eight categories: variation, incompetence of work, cost of delay, sub-contractor related, ceased works, site availability, parties’ internal problems, and process overload. Nine groups of mediation tactics; encourage for self-improvement, reality test, process control, caucuses, trust building, analyzing, ice-breaking, seeking progress, and pressing settlement, were also identified. Applying multiple moderate regression (MMR), it was found that reality testing enables the disputants to reflect more systematically and practically on their position, behavior and/or attitude, as well as to think beyond the present situation to future consequences. Boulle and Nesic (2001) suggested that reality testing can be effective to deal with (i) the parties’ substantive, procedural, and emotional interest; (ii) resources like time and cost; (iii) all aspects of a proposed settlement, including, its degree of specificity, its durability and its fairness to all parties; and (iv) the possibilities which exist should the matter not settle. Reality testing serves to restore objectivities. Reality testing is thus applicable to most of the dispute sources. Employing a more generic perspective, mediator’s role varies between purely facilitative to evaluative. This difference has once been identified as the dividing line between mediation and conciliation. However this distinction is a bit academic. Table 1 compares these approaches.
<table>
<thead>
<tr>
<th>Mediator Involvement Category of strategy</th>
<th>Facilitative</th>
<th>Evaluative</th>
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<tbody>
<tr>
<td>Passive Reflective Behavior</td>
<td>Proactive Nondirective Behavior</td>
<td>Active Directive Behavior</td>
</tr>
<tr>
<td>Principal Trust-Based &amp; Neutral Communicator</td>
<td>Formulator</td>
<td>Power-Based &amp; Principal Manipulator</td>
</tr>
<tr>
<td>Entailing activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- seek to familiarize with the dispute</td>
<td>- limit publicity (e.g. identify the number and identity of the present parties)</td>
<td>- take the form of offering proposals</td>
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<tr>
<td>- establish groundwork upon which later actions are built</td>
<td>- control conflict management environment (e.g. choose a neutral location for mediation)</td>
<td>- exercise direct pressure</td>
</tr>
<tr>
<td>Purpose</td>
<td></td>
<td></td>
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<tr>
<td>- reduce degree of complexity and uncertainty inherent by producing knowledge and information about the dispute and the parties</td>
<td>- affect the structure of the mediation</td>
<td>- encourage a specific solution</td>
</tr>
<tr>
<td>Objective</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- try to achieve some convergence of expectations by reducing distortion, ignorance, misperception, or unrealistic intentions</td>
<td>- encourage the disputants themselves to arrive at a mutually acceptable solution to the dispute, with a minimum of help from the mediator</td>
<td>- seek to manipulate the parties directly into ending the dispute</td>
</tr>
<tr>
<td>Example</td>
<td></td>
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<tr>
<td>- act as a passive conduit and repository</td>
<td>- think innovatively</td>
<td>- use his leverage to manipulate the parties into agreement</td>
</tr>
<tr>
<td>- serve as a channel of communication as contact breaks down between the parties</td>
<td>- help parties to redefine issues</td>
<td></td>
</tr>
<tr>
<td>- act as go-between to carry information, proposals, or concessions back and forth between the conflicting parties</td>
<td>- find a formula for the resolution of their conflict</td>
<td></td>
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<tr>
<td>- act more analytically than a communicator</td>
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</tbody>
</table>

The outcome of mediation depends largely on the disputants’ behaviors during the mediation (Zubek et al. 1992) Fear of showing weakness by accepting mediation and resistance to the idea of compromise were cited as the main reasons for the low take up of mediation as well as its failure (Nesic 2001; Zubek et al. 1992) Studies have pinpointed the behavioral issues associated in construction dispute resolution. The likelihood of success of mediation decreases with the increased occurrence of disputants’ hostile and contending behaviors and the prominence of intangible issues happened in the case. It is advisable to separate the human factors from the problem so that more rational approach can be taken in dealing with the dispute (Fisher and Ury 1991) because individuals generally are more inclined to dwell on positions especially if personal interests are involved. However, the mediator, as a bystander is in a unique position to offer insight and suggestions.
Analogously, a spectator is better than the chess player. For a more balanced assessment of the dispute, it is essential to “put oneself in [another side’s] shoes”, but hopefully without stepping on their toes. Thus, what is needed is to be “shoulder to shoulder, side by side” (Cohen 2003) In this respect, disputants should avoid “fault-finding which is like picking off a scab covering an unhealed wound” (Rose 1996) Limiting the participants to those having authority to settle is one of the golden rules to avoid “too many cooks spoil the broth”. The encouragement of the purely voluntary mediation in the mediation reform in Practice Direction 6.1 was uncontroversial. Better information on available facilities is now provided and the parties are required to indicate whether they have considered alternative dispute resolution. It is in favor of adopting the reform as part of an overall effort to educate all concerned parties about using mediation, in conjunction with other measures designed to offer mediation as an effective adjunct to traditional court proceedings.

4. Concluding remarks

Voluntary use of mediation is introduced in the Civil Justice System under the 2009 Civil Justice reform in Hong Kong. An underlying objective of the new Practice Direction is to facilitate the settlement of construction disputes. To this ends, Practice Direction 6.1 came into force on 2nd April 2009 and gives the procedural details on the use of mediation before trial of cases under the Construction and Arbitration List of the Hong Kong High Court. The provisions of Practice Direction 6.1 serve as the last attempt for a cost and speed effective resolution for construction disputes. Cost sanction is instigated against unreasonable refusal to mediate. The courts can give robust encouragement by means of costs sanctions but cannot compel the use of mediation. As such, the success or otherwise of mediation is rested with the attitude and mindset of the disputants as well as the process itself. The mediator who takes up either facilitating and/or evaluative role is also central. This paper presents the mediation process under the new Practice Direction and revisits some fundamental attitudinal issues associated with the mediation process, the mediator and the disputant. It is suggested that coupling the directive effort of the court and the supportive efforts of the mediator and the disputants, mediation can be an effective and economic means to resolve difference.
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Cultural Factors Influencing Disputes in Public Construction

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Abstract

Although dispute in construction industry has been widely discussed in literature worldwide, few studies have examined the specific nature of the relationship between disputes and cultural factors. This paper presents a study of the influence of cultural factors on disputes in public construction. An exhaustive review of literature is undertaken to identify the effects of organisational culture and leadership in avoiding or minimizing disputes in construction organisations. A proposal is presented for further research based on data collected from governmental agencies and contractors in order to introduce a framework to deal with cultural issues affecting disputes.

Keywords: disputes, culture, organisational culture, construction projects
1. Introduction

Disputes and conflicts in construction projects are considered as unpleasant events that occur in a particular stage of the execution of projects and have negative effects on cost, performance and completion targets. Disputes are ubiquitous and difficult to avoid in construction projects since „conflicts are inherent in construction projects” Zack (1995), but they can be minimized and controlled. Disputes and conflicts may divert valuable resources from the overall aim, which is completion: on time, on budget and to the quality specified Fenn (2007). In addition, they generally cost money and take time and they can ruin relationships, which may have taken years to develop”. In brief “There are no winners under these circumstances” Ashworth (2006). There are some disagreements in the differences between conflicts and disputes, conflicts are considered often to be the prime driver of disputes Chan (2008).

Culture is an important concept of great interest in dispute research. To make construction industry organizations, groups and project teams more efficient and effective, it is an imperative to better understand the role that culture plays within them. Contextual research shows the significant effect of culture on disputes in international and national construction. Cultural issues contribute to conflicts among parties to an international project and increase difficulties in the management of such projects Fellows and Hancock (1994). In this paper, a comprehensive review of literature is performed to demonstrate the impact of cultural factors on construction disputes with the intent of understanding the interplay between them.

2. Causes of disputes

Disputes in construction projects have been widely researched throughout the world, especially with emerging international projects in developing countries. Delays, in most cases, are accompanied with disputes, failures and ineffective performance in most of construction projects. Arditi et al. (1985) performed research into the reasons of delays in publicly funded construction projects for the period 1970-1980 in Turkey. They identified 23 reasons for construction delays concluding that the major causes of delays were: shortage of materials, difficulty in receiving payments from agencies, contractor's difficulties, organisational characteristics of contracting companies and public agencies. However, Mansfield et al. (1994) argued that most of the problems were human and management problems, not technical in nature. The list of major factors included finance and payment arrangements, poor contract management, materials shortage, inaccurate estimation and overall price fluctuations.

Similarly, Noulmanee et al., (1999) remarked that delays can be caused by all parties in a highway construction project. However, main causes come from inadequacy of sub-contractors, organization that lacks of sufficient resources, incomplete and unclear drawings and communication deficiencies between consultants and contractors. Their study suggested that delays can be minimized by discussions that lead to understanding. Chan and Kumaraswamy, (1997) also cited five principal factors for delay disputes: poor risk management and supervision, unforeseen site conditions, slow
decision making, client-initiated variations, and work variations. Table 1 shows a summary of some common causes of construction disputes and conflicts mentioned in literature.

Table 1: A summary of the common causes in the literature of disputes and conflicts in construction projects.

<table>
<thead>
<tr>
<th>Researcher, Year &amp; Location of the research</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arditi et al. (1985), Turkey</td>
<td>Investigated the reasons for delays in publicly funded construction projects for the period 1970-1980 in Turkey. They identified 23 reasons for the construction delays. Their findings concluded that the delays were due to: shortage of materials, difficulty in receiving payments from agencies, contractor's difficulties, organisational characteristics of contracting companies and public agencies.</td>
</tr>
<tr>
<td>Fern (1991), Australia</td>
<td>Identified 10 main causes of cost overruns. Among them are design errors, manufacturing errors, variations, delays and discontinuity.</td>
</tr>
<tr>
<td>Mansfield et al. (1994), Nigeria</td>
<td>Identified the causes of delays and cost overrun problems in Nigerian construction projects. Their findings concluded that most of the problems were human and management problems.</td>
</tr>
<tr>
<td>Waits and Scrivener (1995), UK and Australia</td>
<td>290 sources from 65 projects in both countries have been identified. The most common cause of dispute in the United Kingdom is negligence, while in Australia it is failure and determination.</td>
</tr>
<tr>
<td>Conlin et al. (1996), UK</td>
<td>Grouped conflict causes into six broad categories. The groupings covered: payment and budget; performance; delay and time; negligence; quality and administration.</td>
</tr>
<tr>
<td>Smith (1996), USA</td>
<td>Provided a top ten list of root causes of disputes in the US construction industry as follows: unrealistic contract clauses, unrealistic expectations, ambiguous contract provisions, low bid contractors, poor communications, deficient management, reluctance with changes and unexpected conditions, the absence of team spirit, a predisposition toward adversarial relationships and contract administration.</td>
</tr>
<tr>
<td>Chan and Kumaraswamy (1997), Hong Kong</td>
<td>A survey of 83 potential delay factors in Hong Kong construction projects and found five principal factors: poor risk management and supervision, unforeseen site conditions, slow decision making, client-initiated variations and work variations.</td>
</tr>
<tr>
<td>Kaming et al. (1997), Indonesia</td>
<td>Studied influencing factors on 31 high-rise projects in Indonesia and found that cost overruns are caused mainly by cost increase due to inflation, inaccurate material estimation and degree of complexity.</td>
</tr>
<tr>
<td>Noulmanee et al. (1999), Thailand</td>
<td>Investigated causes of delays in highway construction in Thailand. Main causes are inadequacy of sub-contractors, organization that lacks sufficient resources, incomplete and unclear drawings and deficiencies between consultants and contractors.</td>
</tr>
<tr>
<td>Daoud and Azzam (1999), Middle East</td>
<td>Studied the sources of dispute in construction contracts in the Middle East. Identified five main sources of dispute in the Middle East as: modifications, lack of understanding, changes in legislation and regulations, poor documentation during contract administration and the influence of local culture on the performance of contract parties.</td>
</tr>
<tr>
<td>Lim and Zain Mohamed (1999), Malaysia</td>
<td>Studied recurring construction problems in construction projects in Malaysia and found management problems are the most common.</td>
</tr>
<tr>
<td>Mitropolous and Howell (2001)</td>
<td>Carried out a comparative analysis of 24 construction disputes which occurred on 14 projects in USA. They produced a model that show the</td>
</tr>
</tbody>
</table>
development of disputes and develops a classification of "problem situation", based on three elements: project uncertainty, contract, working relations and problem solving effectiveness.

73 causes of delay were identified. The identified causes were combined into nine groups. Lowest bid was cited as the most frequent factor of delay.

Studied disputes in Sino-Foreign Joint Venture construction projects in China. Contractual, cultural, and legal matters are suggested as the primary sources of disputes.

Conducted research on construction claims in UAE. One of the common problem areas is “changes” and “Extra-work” type of claims.

Categorically identified six conflicting factors in construction in Korean construction: Change of site condition, public interruptions, change order evaluation, design errors, Excessive quantity variation, double meaning in specifications.

Kumaraswamy (1997) conducted an important empirical work in Hong Kong to examine the common causes of claims and disputes on construction projects. He suggested a classification of sources and dispute into two areas: root causes and proximate causes. For instance, adversarial culture and lack of professionalism of project participants are considered as root causes while poor communications and personality clashes are categorized as proximate causes. He suggested further studies to isolate the real root causes of avoidable disputes. Kumaraswamy’s classification has been criticized by Love et al. (2005) because causes were not traced and isolated which would give rise to claims and disputes especially since he suggested that the causes identified were all controllable to a certain extent. Fig 1 shows the root and proximate causes as per Kumaraswamy’s classification.

Accurate contract documentation is an important issue in avoiding disputes. Several attempts have been made by researchers to prevent or minimize disputes through choosing the proper contract procurement approach. Jannadi et al. (2000) proposed techniques that can be incorporated in preparing construction contracts for dispute avoidance including: fair allocation of contract risks, drafting dispute clauses, team building, and provision of a neutral arbitrator and binding arbitration. In addition, contractual factors have been recognised as causes of disputes and if not treated effectively may cause disagreements among project parties Mitropulos and Howell, (2001); Bristow and Vasilopoulos, (1995); Smith, (1996); and Conlin et al., (1996).

Researches studying the causes of disputes in construction industries from USA, UK, China, Saudi Arabia, Nigeria, Canada, Thailand, Indonesia, Korea, Malaysia, Jordan, UAE and Turkey are summarized in Table 1. Although the circumstances for each construction environment are different from the others, disputes remain similar in many regards. Among others, the dispute causes mentioned in the studies are:

1. Management and leadership problems.
2. Contractual problems, mainly poor documentation during contract administration.
3. The influence of culture on contract parties.
4. Unqualified and inexperienced manpower.
5. Late payments and financial issues.
6. Changes and modifications.
7. Unrealistic expectations.

Figure 1: The root and proximate causes of claims and disputes (Kumaraswamy, 1997).
Hewit (1991) suggested six main categories of claims: change of scope; changed condition; disruption; acceleration; and termination. Daoud and Azzam (1999) conducted a study on the sources of disputes in construction contracts in the Middle East pointing to “the influence of local culture on the performance of the contract parties”. In addition, research by Watts and Scrivener (1995) found that the most common causes of disputes in the United Kingdom are negligence, while in Australia it was failure and determination. The effect of interaction of technical, contractual and behavioural factors on the development of disputes was studied by Mitropoulos and Howell (2001). The authors identified three basic factors that directly affect disputes: project uncertainty, contractual problems and opportunistic behaviour.

3. Cultural factors

3.1 Culture in construction

In order to understand the impact of culture on construction disputes and to tackle the roots of disputes, it is important to understand culture and organisational culture in the construction industry. Hofstede (1984) defined culture as “the collective programming of the mind which distinguishes the members of one human group from others”. Culture is considered to be one of the most difficult and complex issues to understand. The anthropologist Tso (1999) suggested some parameters within the following fields: “culture describes the social system created by a group of people; it starts from the moment that a few people get together regularly and begin to establish norms and rules through which they will interact and communicate with each other and maintain order; it is about patterns of meaning; it is about shared beliefs, values, perspectives, and worldviews; it is about shared behaviour, practices, rules, and rituals; it is not limited to groupings by race or ethnicity, but can describe a sub-culture within a society-designers, for instance; it is often associated with language and communication; it is viewed as a mental or cognitive construct, created in the minds of people; it is learned; it can be found in materials: objects, artefacts, clothing, artwork, and so forth; and it can emanate from social institutions and structures, such as governments, economies, and legal systems, as well as geographic and environmental factors”. In a competitive construction industry, culture plays a considerable role in the performance, success and failure of projects. The dynamics of the construction business have become more dependent than ever on the cultural behaviours of construction organisations; it has become clear that sustained profitability and high financial returns are not enough to survive and remain successful in highly competitive markets because there is considerable evidence of conflicts and misunderstanding caused by cultural practices Oney-Yazic et al. (2005).

3.2 Organisational culture

It is essential for construction firms to understand their own culture in terms of behaviours, attitudes and processes, in other words their organisational culture. Organisational culture is a key ingredient that differentiates the successful firms from the others, because it is the major distinguishing feature, the most powerful factor, and the most competitive advantage in gaining success Cameron and Quinn (1999). Attempts to define organisational culture showed divergence in the concept. For example, Schein (1992) defined organizational culture as “a pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration that has worked well enough to be considered valid, and therefore, to be taught to new members as the correct way you perceive, think, and feel in relation to those problems”. However, Hofstede (1997) saw it as the
collective mental programming that distinguishes the members of one organisation from another. In 1968, Hofstede conducted what is still today known as the most important cross-cultural value study in the field of different cultures and their approach to management. Hofstede’s research (1980, 2001) indicated that managerial and organizational practices may be different in countries that belong to different clusters based on cultural value similarities. Hofstede identified four dimensions of culture drawing on a large sample of 116,000 employees of IBM in 72 countries. Based on the previous study, Hofstede (2001) concludes that the four dimensions used to differentiate between cultures are: power distance, individualism versus collectivism, uncertainty avoidance and masculinity versus femininity.

One of the major reasons for the widespread popularity and interest in organizational culture stems from the argument (or assumption) that certain organizational cultures lead to superior organizational financial performance Ogbonna and Harris (2000). Rahman and Kumaraswamy (2003) argued that key success factors for construction companies are the “flexible organisational cultures” of the organisations involved, so that they can both contribute and adapt to the emerging project culture. This will, in turn, open up the organisations to absorbing back positive culture-building elements that will collectively feed into an enhanced performance-oriented construction industry culture. However, many researchers attribute success, good performance, organizational effectiveness of construction organisations to their strong organisational culture Deal and Kennedy (1982); Schein (1992); Barney (1986); Hoecklin, (1996); Denison and Mishira (1995). It is argued that organizational culture will remain linked to superior performance only if the culture is able to adapt to changes in environmental conditions Denison (1990).

Many studies discussed the cultural influence on construction industry and how it affects relations between project parties. A study conducted by Zhang and Liang (2008) reviewed the trend of the studies in international construction from the cultural perspective, focusing on effect of culture on communication, dispute resolution, negotiation, and international construction joint ventures. They concluded that:

- Cultural differences do contribute to adversarial attitudes and disputes in international construction projects.

- Organizational culture of each participant in the global projects is always complicated by national culture distance and professional barriers.

- Hofstede’s work is still the most widely referenced in researches when cross-cultural considerations are being made.

According to Akintoye and Main (2006), the five main factors identified (apart from senior management support and the relationship being perceived as very important to the partners) for successful construction collaboration are: commitment, trust, shared risk; responding to clients’ needs; and good communication. The five main failure factors in order of significance are lack of trust; communication breakdown; lack of belief in the system; clash of organisational cultures; and unchanging attitudes.
It is accepted that disputes in construction projects may arise as reflection of cultural differences or culture clashes between teams working in the same project. In this vein, Chan (2003) found that the most significant factors contributing to disputes in international projects are: inappropriate contractual arrangements and cultural clashes. Ankrah and Langford (2005) performed a comparative study of organizational culture between architects and contractors in order to explore the cultural clash at the inter organization level. They found that contractors are largely formal organizations in which control and coordination are achieved through formal methods and procedures while Architects are largely informal organizations in which control and coordination are achieved through empathy between organizational members and through direct personal contracts. Conflict management is influenced by organisational culture. The relationship between culture and conflict management styles in an organizational setting was investigated by Elsayed Elk holy and Buda (1996). They surveyed employees in companies located in the Middle Eastern countries as well as in the United States. Their data collected from the Middle East and USA showed Middle Eastern executives to display more integrating and avoiding, while U.S. executives used more obliging, dominating and compromising styles. Kozan (1989) also studied conflict behaviour of managers toward superiors, peers and subordinates in Jordan, Turkey and U.S., founding managers acting, peacefully, to avoid conflicts in all the three countries. Some researchers suggested particular approaches to examine how cultural factors act through decisions and behaviours of project participants in the generation and resolution of disputes Liu and Fellows (1996).

Weddikkara (2003) pointed out that causes of disputes are relevant to the nature of a certain country or region because of the specific cultural, religious, political, economic, social and environmental states. For example, Watts and Scrivener (1995) found a significant similarity in the proportion of cases classified by the particular parties to disputes between Australia and the UK. They alluded to the similarities of building contracts; the legal system and several cultural aspects in the two countries. Construction remains a people’s business and construction organisations are human institutions. As long as it can be argued that organisational behaviour within these institutions is not random Ankrah et al. (2007), it can also be argued that there are cultures that regulate behaviour Hofstede (1984).

Rahman et al. (2003) argued that the key success factors for construction companies are „flexible organisational cultures” of the organisations involved, so that they can contribute and adapt to the emerging project culture. This will, in turn, open up the organisations to absorbing back positive culture-building elements that will collectively feed into an enhanced performance-oriented construction industry culture. However, organizational culture, and its influences on construction organisations are not yet fully understood. There is still need for more research because many changes have been associated with organisational culture over the past decade. The growing awareness of the importance of culture in construction has seen increasing interest from researchers on culture and related issues, though much of this still remains anecdotal Ankrah (2007).
3.3 Leadership and Culture

A review of the literature shows that leadership and organisational culture in construction are interrelated in many respects. For example, Schein (1992) observed that organizational culture and leadership are „intertwined“; or it can be said that „leadership and culture may be two sides of the same coin“ Senge (2000). Current models of organizational performance and change suggest that leadership and organizational culture are central explanatory constructs Burke and Litwin (1992). When organisations are first established, leaders create culture in their organisations depending on which development model they adopt and shape organisational culture that reflects, positively or negatively, the leadership styles, behaviours and values. Hennessey (1998) found that the most effective leaders foster, support, and sustain organizational cultures that facilitate the type of management reform envisioned by “reinventing government” and the attendant increases in effectiveness and efficiency. Organizational culture can be seen in how leadership reacts to critical incidents and it can be found in leadership’s role modelling and coaching actions Able (2007). Investigating the relationship between leadership and organisational culture in the literature conclude that: (1) the style of a leader affects performance, (2) certain types of culture are linked to superior performance, and (3) culture and leadership are related, the precise nature and form of interaction between these three concepts is not fully understood Ogbonna and Harris (2000). A plethora of studies are needed to understand these relationships; „leadership and culture are so central to understanding organizations and making them effective that we cannot afford to be complacent about either one“ Schein (1992).

A leader’s philosophy and attitude towards dealing with disputes and conflicts is embodied in the managerial practices taking place in the organisation. Successful projects are significantly concerned with managers identifying and responding to various forms of conflict. Ultimate success or failure in achieving project goals can often depend on a project manager's ability to identify the causes and respond appropriately Zikmann (1992). In times of conflict, real leaders are highly needed. „There has to be clear leadership; communication is the answer, and there is a need for absolute commitment” Ankrah and Proverbs (2008). It is arguable that industry culture may in fact have a stronger influence on expected behaviours and norms of leaders that may override the influence of organisational cultures Dastmalchian et al. (2000). Organisational leaders are expected to be sensitive to local cultures and traditions yet at the same time become initiators of change Kabasakal and Dastmalchian (2001). Thus, a definition of organizational leadership emerges: “the ability of an individual to influence, motivate, and enable others to contribute toward the effectiveness and success of the organizations of which they are members” House et al. (2002).

Kabasakal and Dastmalchian (2001) presented a study that focused on values and practices as well as effective leadership attributes that are widely shared in Middle Eastern societies. Their finding was that there are major similarities in the societal and organisational cultures of Iran, Kuwait, Turkey, and Qatar. Some of the similarities can be explained by the common Islamic religion that the people of these four nations share. Regarding organisational leadership, they are expected to be sensitive to local cultures and traditions yet at the same time become initiators of change. To examine the nature of this relationship, Ogbonna and Harris (2000) presented empirical evidence which suggests that the relationship between leadership style and performance is mediated by the form of organizational
culture that is present. The paper indicated that leadership style is not directly linked to performance but is merely indirectly associated. Also, Limsila and Ogunlana (2008) found that the transformational leadership style has a positive association with work performance and organizational commitment of subordinates more than the transactional style. Transformational leaders produce higher leadership outcomes than transactional leadership.

Block et al. (2003) summarized literature on the relationship between leadership and organizational culture into the following conclusions that have been suggested by researchers:

- The impact of leadership on firm performance is mediated by organizational culture.
- Leadership creates an environment in which fundamental organizational change is more or less likely to occur.
- Specific leadership behaviours are associated with distinct cultural traits.
- Contextual factors such as organizational culture have an impact on the emergence of specific leadership styles.
- Leaders use their knowledge of organizational culture to affect change.
- The behaviours of leaders influence the perceptions of organizational culture among followers.

Despite the explicit role of leadership and culture in the ultimate success of construction projects, little critical research attention has been devoted to understanding the interrelationship between organisational culture and leadership and the impact that such an association might have on construction organizations.

4. Research and proposal

From the above literature presentation, it is clear that cultural factors are among the significant causes of dispute, yet these factors have not been deeply investigated. This paper is an attempt to understand the cultural factors (organisational culture and leadership) in construction to establish a solid ground to explore the impact of these factors on disputes. The long term aims of this research are therefore to study cultural factors influencing disputes in public construction projects and to identify the relationships between them. Once the relationships are understood, a theoretical framework will be developed to better understand the parts of research helping to deal with disputes in construction projects towards dispute reduction. A focus will be on the role of leadership in construction organisations and how effective leaders behave in the context of emerging disputes in their organisations. From the previous discussion, the proposed research questions can be outlined as the following:
What are the causes of disputes in public construction?

What are the cultural factors influencing disputes in public construction?

How do cultural factors impact disputes in public construction?

What kind of relationship exists between leadership and organisational culture in public construction?

What is the impact of leadership and organisational culture on disputes in public construction?

Can effective leadership help minimize construction disputes?

The research methodology includes a comprehensive literature review on culture, organisational culture and leadership characteristics of public construction environment. Questionnaire survey and interviews are to be used to collect data from government agencies and contractors. The organisational culture instrument OCAI developed by Quinn and Cameron (1999) for measuring organisational culture profile will be used. This tool is based on theoretical model titled “the competing Values Frame Work” (CVF) which is used to diagnose and facilitate change in organisational culture Cameron and Quinn (1999). A leadership model is to be proposed as a need for more genuine project leadership development. It is envisaged that the model will be similar to that presented by Grisham (2006) of trust, empathy, transformation, power and communication.

References

Change Order Process Behind of FIDIC, AIA and KIK Standard Contract Documents

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Abstract

During construction, the reasons such as unforeseen conditions, changes that are instructed by the owner in the scope of the Work, failure of the drawings and technical specifications indicated in the contract documents can cause the change order on the construction process. So; determining whether the change is necessary, indicating the causes of the changes, preparing the additional information, revision drawings, specifications and prices properly become important in this way. Especially to avoid delays and to minimize disputes timely proceeding and coordination between participants and communication process are fundamental components. The international standard contract forms such as AIA and FIDIC have described the change order and its processes in detail. In this study; the standard contract forms used in Turkish public biddings which is the name of KIK will be examined by comparing FIDIC and AIA standard contract forms with the provisions of change order.

Keywords: change order, Turkish construction sector, AIA, FIDIC, KIK standard contract documents.
1. Introduction

The reasons as encountered unforeseen conditions resulted from different demands and uncertainties furthermore including a lot of participants inside its structural property cause that construction sector is a more risky and complex sector when it is compared to other sectors. Therefore, various organizations and institutions have published standard contract documents to determine the construction process, to be able to solve encountered problems in an easily way during this term, to determine the distribution of risks through describing the duties, authority and the responsibilities of the participants and to clarify the process control and monitoring on a certain standardization.

Today; primarily contract documents widely used in international construction projects are standard contract forms published by AIA (American Institute of Architects) and FIDIC (International Federation of Consulting Engineers). On the other hand, in Turkey, standard contract documents named as KIK (Public Procurement Law) is used for the construction projects issued by public procurement authority. However, during the implementation of construction projects, the factors such as unforeseen conditions in the design phase, changes in requirements or additional requests of the owner can cause some changes in the scope of the projects and construction contracts. Generally ‘changes in construction projects’ are defined as revisions or modifications upon the qualities or quantities that agreed within the contractual drawings and specifications. These changes can occur as omission or addition of some construction materials, revisions in projects, in plant and machinery requirements or in technical specifications stated in contract documents. As it is known, the main objective in the process of construction is completing the Project within the targets of time, cost and quality conditions that earned at the beginning. But during construction, it is possible to encounter some changes which can be effective on these three components, upon some of them, all of them or sometimes none of them. So; determining of contract changes, their process, application, instructions and provisions become important for the realization of time, cost and quality targets.

In international construction contracts such as FIDIC and AIA, changes in contract are defined as under the title of ‘variation (FIDIC) and ‘change order’ (AIA). But in Turkish Public Legislation, contract changes are not as certainly defined as FIDIC or AIA, in the scope of KIK that is the standard contract forms used in Turkish construction sector. So; in the context of this study, the basic aim is determining decencies, failures, similarities and as a result making recommendations for KIK by analyzing related provisions about contract changes in FIDIC and AIA standard contract forms.

2. Change order process in construction contracts and its position in contract administration

In construction projects, it is important that, work completion must be reach on proposed cost, time and quality. In the scope of this aim, contract documents should determine all of these process’ responsibilities, risks, limits, control, actually the procedure of the process. So, prepared documents, general conditions or specifications should be prepared as be able to response to all of the possible problems during application. However, it is impossible that there will be no modification during
building a project. Because construction work is so complicated because of its physical qualities with lots of various participants. So, contract documents must also define the possible contract changes. These changes can affect the contract sum or time, design requirements as in partial or completely. Therefore provisions and instructions of changes should clearly be expressed in contract documents. As it is defined in introduction above, in international construction contracts such as FIDIC and AIA, changes in contract are defined as under the title of ‘variation (FIDIC) and ‘change order’ (AIA).

According to AIA contract documents, the document of A201 General Conditions changer order is defined as a written instrument; Prepared by the Architect as the agent of the Owner, signed between the Architect and the Contractor, stating the participants’ agreement upon changes in the work, changes in contract sum, if it is necessary, changes in contract time, if it is necessary or both of them (CSI, 2005). From this definition; project revisions, omissions or additions that affect the scope, duration or budget of the construction work are executed by the instruction of change order after signing the contracts. The emergence of change orders may be eventuate in two ways as sourced by the owner / architect or by the contractor:

a) Requests for changes can directly come from the Owner or alternatively the Architect can submit a proposal to the Owner in the scope of project or contract.

b) On the other hand, if the contractor request a notice by the architect / engineer as a result of causes such as unforeseen conditions, design and contract documents’ deficiency, problems or questions of the subcontractors and suppliers during construction phase. This process may cause the change order as a result (Levin, 1998).

2.1 Causes of change order

Change orders arise by unforeseen conditions during construction process, deficiency of the drawings and technical specifications described in the contract documents, scope change (additional or enhancement) by owner, technological changes, financial changes, changes in projected requirements, constructive acceleration, force majeure (O'Brien, 1998).

In addition the causes listed above; changes in Legislation after the bidding, comments of the regulators of public law, the end of manufacturing of a specific material in the BOQ list, the emergence of new information about designated materials in the BOQ list can be classified as the causes of change orders during construction process.

During the approval process of change order, it is necessary that to be indicated the causes of changes correctly, determined the requirement of changes and prepared additional information, changing drawings, specifications and price revisions in detail. Particularly, to avoid delays and minimize disputes between participants, timely coordination and communication becomes important during construction process. Management of changes in the work is a real test for success of contract
administration (Gould, Joyce, 2000). In this context, it is once again indicated that a correct contract administration is so important for executing construction contracts once again.

2.2 Change order process

During construction process, before preparation of change order, it is envisaged that the determination of the problem, requirements, causes of the changes and solutions, stating cost factors, additional unit prices, effects of these changes on contract sum and time, coordination between architect/engineer and the contractor in the detection of this process.

Published by The Project Resource Manual (PRM 2005) and served basis to international contracts such as FIDIC and AIA, the change order process is mentioned in Figure 1.

Figure 1. Change Order Process (CSI,2005),( Tasoluk, 2006)
3. Change order process in standard contract forms

3.1 Change order process in FIDIC standard contract forms

FIDIC contract forms are classified on the basis of two main components as it is stated between the owner and contractor. These are to whom are the contract documents prepared / who is the design responsible and to whom are the risks allocated in case of increasing/ decreasing of the quantities during construction work. In October 1999, FIDIC has published a set consisting of 4 standard contract forms:


2) (1999 Yellow Book – The Plant and Design – Build Contract (Conditions of Contract for Electrical and Mechanical Plant, and for Building and Engineering Works, Designed by the Contractor)

3) (1999 Silver Book - (Conditions of Contract for EPC (Engineering, Procurement and Construction) Turnkey Projects)


In FIDIC contract forms change order process does not vary according to the contract forms and contract types. In FIDIC Red Book standard form; contract provisions related to change order application have been determined in Clause 13 ‘Variations and Adjustments’ as a part of General Conditions and in this study the discussions are collected around this clause.

The provisions of this clause are grouped as Clause 13.1 Right to Vary, Clause 13.2 Value Engineering, Clause 13.3 Variation Procedure, Clause 13.7 Adjustments Changes in Legislation, Clause 13.8 Adjustments for Changes in Cost.

According to FIDIC Red Book, Clause 13.1; the Engineer is the responsible for controlling and monitoring the construction process on behalf of the owner. So the engineer has rights to notify necessary changes about the quality or quantity of any work to the contractor. Clause 13.1 defines the meaning of change under 6 different headings:

a) Changes to the quantities of any item of work included in the contract (however, such changes do not necessarily constitute a variation)

b) Changes to the quality and other characteristics of any item of work

c) Changes to the levels, positions and/or dimensions of any part of the works
d) Omission of any work unless it is to be carried out by others

e) Any additional work, plant, materials or services necessary for the permanent Works, including any associated tests on completion, boreholes and other testing and other testing and exploratory work

f) Changes to the sequence or timing of the execution of the works. (FIDIC, 1999)

Change (variation) Order process is defined in the scope of Clause 13.3 ‘Variation Procedure’, in FIDIC Red Book. According to this article, the Engineer can demand a proposal from the contractor before issuing the change order. The Contractor shall instruct the proposal and after that the engineer shall, as soon as practicable after receiving such proposal, respond with approval, disapproval or comments by making necessary negotiations with the owner.

### 3.2 Change order process in AIA standard contract forms

AIA has published a standard document as the name of AIA 201 that contains the agreements of the architect, the owner and the contractor and defines the general conditions of executing construction contracts. However, when considering the special conditions that affect a construction project (construction type, project type, the user/owner requests, etc.), general conditions may be insufficient alone. In this case, supplementary conditions are required according to the type of construction projects. AIA contract forms do not include standard supplementary conditions, but there are some methods that may help to write these conditions in the context. AIA contract documents classify the contract types as lump sum contracts and guaranteed maximum price cost + fee contracts according to the payment conditions.

In AIA contract forms, change order application does not vary according to the contract types and in both cases it is based on A201 General Conditions. Within the scope of this thesis, the document of AIA 201-2007 General Conditions is based on reviewing the change order provisions in the scope of AIA contract documents.

In the context of A201 – General Conditions-2007, the provisions of changes in the work are defined under the Article 7 around following headings: Article 7 – Changes in the Work, Article 7.1 – General, Article 7.2 – Change Orders, Article 7.3 – Construction Change Directives, Article 7.4 – Minor Changes in the Work.

As understood from related contract provisions, in AIA contract documents, change order applications are separated into 3 basic parts as: Change orders, Construction change directives, Orders for the minor changes in the work.

Article 7.2 Change order: According to the AIA contract documents; change order is a written instrument prepared by the Architect and signed by the Owner, Contractor and Architect; stating their agreement upon changes in the work, changes in the contract sum or contract time
Article 7.3 Construction change directive: Construction change directive is a written order prepared by the Architect and signed by the Owner and the Architect, directing a change in the Work prior to agreement on adjustment, if any, in the contract sum or contract time, both. (http://www.aia.org), (AIA G701-2000). The Owner has the right to notice the changes to the Contractor by the construction change directives in the scope of contract provisions. The owner uses this right when a change order cannot be obtained due to limited time or disagreement between the parties with regard to associated changes in contract sum or contract time. Construction change directives may be effective on the contract sum or contract time, both or none of them. But change orders certainly impact the contract sum or contract time or both of them. When the Contractor gets the change order directive, he can perform changes without any claim or he can apply to the Architect for related issues. If an agreement is stated upon the changes in contract sum or time regarding to the Contractor’s demand, change orders directive is issued as a change order.

Article 7.4 Minor changes in the work: Minor changes in the Work do not involve any adjustment in the contract sum or extension of the contract time and they are not inconsistent with the intent of the contract documents. The architect has the authority to order minor changes so the agreement of the Owner or Contractor is not necessary for these changes.

3.3 Change order application in KIK (Public Procurement Law)

In response to standard contract documents used in international construction contracts; in Turkish construction sector, standard contract forms are stated in the context of KIK (Public Procurement Law ) No.4734 that is used for the construction works ‘under the control of public’ as it is accepted on 04.01.2022 and published on 22/01/2002 in the Official Gazette No.24648

Principles and procedures related to the regulation of the contracts are determined in KISK (Public Procurement Contracts Law) No. 4735 in accordance with KIK (Public Procurement Law). In the context of KIK Legislation, Regulation of the Biddings of Construction Works Application (YIUY) has been published for determining the principles and procedures of construction biddings’ in accordance with KIK and KISK. General conditions of the contracts related to the Public procurement Legislation are determined in the document named as General Conditions of Construction Works (YIGS) which is the annex of this regulation.

In the scope of public procurement contracts, there is no title as the name of ‘Change Order’ as stated in FIDIC or AIA contract documents. However changes in the Work are included in the scope of law within the clauses listed below:

a) KISK Clause 15 - Changes in the contract
b) KISK Clause 24 - ‘Additional works, decreasing and liquidation of the works in the scope of the contract’ that is published under the title of ‘Changes in the contract, Transfer and Termination of the contract’

c) YIGS Clause 21 - Additional works, decreasing and liquidation of the works in the scope of the contract

d) YIGS Clause 22 – Determining contract price of additional works

YIGS Clause 29 – Duration of the work and time extension

a) KISK - Clause 15: According to this clause, it is placed as a condition that the contract sum will not change and the mutual agreement must be obtained.

b – c) KISK – Clause 24 and YIGS- Clause 21: Changes in the work are defined as the same meaning in KISK Clause 24 and YIGS Clause 21.

In tenders of public construction works, as understood from the relevant laws’ clause; unit price and lump sum turnkey contracts are widely used.

- Change order process in lump sum turnkey contracts: In this type of contract; in the rate of up to 10% of the contract price within; related changes except time extension under the provisions of the contract and bidding documents can be made to the same contractor.

- Change order process in unit price contracts: In unit price contracts; in the rate of up to 20% contract price within; related changes except time extension under the provisions of the contract and bidding documents can be made to the same contractor.

The Council of Ministers can raise this rate up to %40 in accordance with the contract.

d) YIGS - Clause 22: Calculating of the price of additional Works, consequently changes in the contract sum are defined within the scope of this clause.

e) YIGS – Clause 29: According to the article YİGŞ 29; situations and procedures of time extension are defined as determined below:

In case of force majeure and/or administrative decisions cause the delays in work, the construction duration is extended partially or entirely within the consideration of the responsibility does not belong to the contractor (http://www.kik.gov.tr).

As it is understood from the provisions of changes in contract sum and time, it is possible to say that in the scope of KIK, owner (administration) has much more effectiveness than the contractor on controlling and monitoring changes in the work.
4. Comparing change order process behind FIDIC, AIA and KIK standard contract documents

In the scope of the study, the change order clauses in KIK standard contract forms are analysed based on the provisions and applications of AIA and FIDIC standard contract forms and it is identified that KIK standard contract clauses involve lots of deficiency regarding this issue. Identification of these deficiencies and the consequences are listed below.

a) Change order clauses in the scope of contract: The change order clauses stated in KIK contract documents have many defectives concerning with the provisions as defining the change, the change order process and the application of instructions when it is compared the related clauses stated in FIDIC and AIA standard forms.

This situation complicates the resolution of potential disputes between the Contractor and the Owner in a fair way.

b) Using of standard forms: In the context of KIK; not involving any recording systems regarding to the indemnification and finalization contract changes and participants’ views during the dispute resolution process unlike the FIDIC and AIA standard forms, complicate the agreement based upon a common contracting language and cause prolonging the treaty process unnecessarily.

c) Clearness of the contract language: The change order application is grouped under a single article in the context of general conditions in AIA and similarly FIDIC contract documents. However; under the provisions of KIK, related articles are determined in five different laws and specifications. This situation makes executing of the contract difficult through complicating the clearness of contract language by causing a large number of comments. But contracts by definition must be open, understandable, clearly and should not cause more than one interpretation.

d) Change order process according to the contract types: As it is indicated under previous parts, KIK contract forms divide the construction contracts into 2 separate groups on the basis of lump sum and unit price contracts. KIK standard provisions limit the cost increases as a result of changes in the Work by separating them according to the contract types unlike the FIDIC and AIA contract documents. So there occurs a handicap for the settlement of the standardization of general conditions in the context of contract.

e) Resource of change order: In the scope of FIDIC and AIA standard contract provisions, it is identified that how the change order process will work if the contract changes are sourced by the owner’s or contractor’s claims and similar steps are followed for each contract type. On the other hand; in the provisions of KIK, it is considered that the changes in the work mostly occur as a result of owner’s demand and contractors do not have any claim rights related this issue.

f) Responsible people for monitoring the change order process: In all three form of the contract; a responsible is assigned for monitoring and controlling the contract provisions on behalf of the Owner.
However, in KIK contract forms, change order provisions are not determined in a specific title as expressed in FIDIC and AIA, the authority and the responsibilities of the person who will monitor and control the process are not defined clearly. Within this framework, based on these 6 items mentioned above, the change order application’s provisions, process and impacts are examined in AIA, FIDIC and KIK standard contract forms. In the schedule below it is summarized the similarities and the differences of these three forms.

Table 1: Comparing change order process behind FIDIC, AIA and KIK standard contract documents

<table>
<thead>
<tr>
<th>TOPICS</th>
<th>FIDIC RED BOOK</th>
<th>AIA A201</th>
<th>KIK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Change order clauses in the scope of contract</td>
<td>Clause13* 'Variations and Adjustments'</td>
<td>Madde 7* 'Changes in the Work'</td>
<td>NO CLAUSE</td>
</tr>
<tr>
<td>2 Using of standard forms</td>
<td>+</td>
<td>+</td>
<td>NO STANDART FORM</td>
</tr>
<tr>
<td>3 Clearness of the contract language</td>
<td>+</td>
<td>+</td>
<td>DEFICIENT</td>
</tr>
<tr>
<td>4 Change order process according to the contract types</td>
<td>SIMILAR</td>
<td>SIMILAR</td>
<td>DIFFERENS IN APPLICATION</td>
</tr>
<tr>
<td>Lump Sum Contracts</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Cost + Fee Contracts</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Re-measurement Contracts</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Unit Price Contracts</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>5 Resource of change order</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>By Owner</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>By Contractor</td>
<td>+</td>
<td>+</td>
<td>NO CLAUSE</td>
</tr>
<tr>
<td>6 Responsibilities for monitoring the change order process</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Architect / Contract Administrator Engineer</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Construction Control Officer</td>
<td>-</td>
<td>-</td>
<td>*RESPONSIBLE FOR ONLY TECHNICAL CONTROL, NOT ADMINISTRATIVE</td>
</tr>
</tbody>
</table>

*Remark:
+ : Clauses stated in related contract form.
- : Clauses not stated in related contract form.
4.1 Conclusions and recommendations on the scope of change order application operating in KIK standard documents

It is possible to classify the solutions for providing a healthy operating system of change order application and resolving deficiencies related provisions in KIK contract documents within the scope of the items mentioned above:

1. A clear definition should be stated in the context of the contract, under a single provision through the definition as ‘Changes in the scope of the Work’, not in many different contract or specification clauses.

2. In the context of KIK standard contract documents, standard forms absolutely should be used for the instructions of changes to the related responsible people, as it is seemed in AIA and FIDIC. These forms should be recorded by classifying according to the types of changes, for instance the changes that impact the contract sum or contract time or not. Thus it will make easy following the process.

3. The same definitions should be included in the documents which may be references to each other for relevant provisions as KISK and YİGŞ for the availability of easily understood of contract language. The current situation causes confusion and uncertainty how the process will be operated through which related contract or specification clause will be used as the basis of the application. Therefore, all relevant provisions should be occurred in the frame of a single document through using open, clear and concise expressions.

4. Various change order applications which are separated according to the contract types, create an obstacle to stating the general conditions for the signed contracts unlike the standard forms as AIA and FIDIC. Contract changes are an issue that may directly affect the process of construction, so it must be certainly stated in the context of general conditions of the contract regardless of differences. If any demand is occurred, the differences should be expressed in the scope of supplemental conditions.

5. For providing a fear risk distribution between the participants through defining the authority and the responsibilities clearly, it must be considered that the contractor has the rights for demanding the change order as the owner has, but in KIK standard forms a disparity is created by stating the changes mostly can be sourced by the owner. Therefore, contractor claims should be occurred in the relevant conditions and the provisions.

6. FIDIC, AIA and KIK standard contract forms define the responsible that has the tasks of following the change order process on behalf of the Owner with different names, respectively engineers / architects or building control officer. But in the scope of KIK, the duties of relevant responsible must be expressed under the provisions of change order process, as it is occurred in AIA and FIDIC forms.
5. Conclusion

Finally, the change order application stated in KIK standard contract documents, which is the conduct of public procurement in Turkey, are examined by comparing relevant provisions in FIDIC and AIA standard forms widely used as the international construction contract forms in many countries today. As a result, it is determined that KIK contract forms involve lots of failures and deficiencies when it is compared to FIDIC and AIA, in the scope of change order. By the way; resolutions and recommendations are stated for related identified defects executing of KIK standard forms.

It can be said that elimination of these lacks will be helpful for stating the coordination more successfully between the participants in the Turkish construction sector, ensuring communication, preventing delays, minimizing disagreements and completing the works in the optimum time and price conditions. In this context, it is once more emphasized that an accurate contract management is so fundamental item for executing the construction contracts regularly.

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Main Problems in Standard Contract Documents of Turkish Construction Industry

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Abstract

Today, construction projects have gradually been more complicated and extensive while having to be performed in a wide geography. Contractor firms undertake several projects by operating both in domestic and international construction markets. When the risks caused by this complexity added to the basic risks lie in the unpredictable nature of the construction activities; construction contracts become one of the most important tools in the construction industry. Turkish contractor firms undertake private and public projects not only in domestic construction market, but also in international ones. While the execution of these projects, they encounter different types of construction contracts. Even they have successfully completed several construction projects in different geographies; they have still faced some problems in practice. These problems generally caused by the insufficient standard contract documents and general conditions of the contract documents which are used in public construction works in Turkey. In this study, main problems regarding standard contracts and general condition of the contract documents are identified by comparing Turkish standard documents with AIA document. The differences between these documents are put forward and appropriate suggestions are improved.

Keywords: construction contracts, contract documents, general conditions, AIA A201, Turkish construction industry
1. Introduction

Today, construction projects have gradually become more complicated and extensive, requiring coordinated efforts of various professions. Construction projects involve huge amounts of money and a union of skills, materials and equipments. In order to successfully manage both money and work, there is a need for managerial skills and good documentation. An owner can no longer rely on verbal agreements, or leave work requirements, quality of construction, and matters of cost to trust or chance (Poage, 2000). A written, legally agreement is required in order to complete the construction project within the desired time, cost and quality. This written, legally agreements is defined as a construction contract in the construction industry.

The aim of this study is to identify the main problem areas regarding standard contracts and general condition of the contract documents which are used in the public works of Turkish construction industry. In order to reach this aim Turkish standard documents are compared with AIA A201 document, the differences between these documents are put forward and appropriate suggestions are improved.

2. Construction contracts

A contract is a legal agreement between two or more parties. They can be individuals, companies, joint ventures or any combination of them. These parties are bound to each other for a certain period of time by a unique and exclusive relationship they have created for their mutual benefit (Collier, 2001). In construction industry, these parties can be an owner, a contractor, an architect, a consultant and subcontractors. The most common contract is the agreement between the owner and the contractor for construction industry.

Although there are many types of construction contracts, these are mainly identified based on the method of payment to the contractor. Construction contracts differ according to the time schedule, cost, contractor’s profit, quality and risk of the parties. These are named mainly as: lump-sum contracts, unit-price contracts, cost-plus-fee contracts and the guaranteed maximum price contracts.

Lump-sum contracts: In lump-sum contracts, the contractor agrees to perform all work specified in the contract at a fixed price. In this type of contract, the contractor takes most of the risk since he offers to accomplish the work for the stipulated sum including the profit. Lump-sum contracts are preferred when the scope of the project is well defined with predictable costs and low implementation risks (Collier, 2001).

Unit-price contracts: Unit price contracts are based on the unit price for each parties of the construction. In this type of contract, the owner takes the advantage of not paying risk margin to the contractor. However, the owner takes the risk on make the contractor complete the project within the budget. Whereas, the contractor does not take any risk. The decision whether to choose working with
unit price contract depends on the amount of risk which is inversely proportional to the definiteness of the available information (Collier, 2001).

Cost-plus-fee contracts: Cost-plus-fee contracts are derived either by adding a pre-established percentage mark-up to each item in the schedule, or by applying a fixed pre-determined fee for overhead and profit (Poage, 2000). This type of contract provides the maximum flexibility to the owner and minimizes the risks that the contractor takes. On the other hand, this type of contract has some disadvantages since it encourages specification of high-cost features and excessive design changes by owner which can cause time extension and increase in cost (Ferreira and Rogerson, 1999). There are various types of cost-plus-fee contracts such as cost plus percentage contracts, cost-plus-fixed fee contracts, cost-plus incentive fee contracts and maximum cost-plus-fee contracts.

Guaranteed maximum price contracts: A guaranteed maximum price contract is agreed upon a maximum contract sum not to be exceeded. In this type of contract, the contractor guarantees that the project will be constructed in full accordance with the drawings and specifications and the cost to the owner will not exceed some total upset price (Clough et al., 2005). Furthermore, the owner has a possibility of reducing costs and the contractor has a chance to increase his profit.

As they are listed above, there are different types of contracts depending on the money paid to the contractor and risk shared between the two parties. The main issue is choosing the right type of contract in the right construction projects. Owners and contractors can select contracts from a variety of different sources. The American Institute of Architects (AIA) (www.aia.org), the Engineer’s Joint Contract Documents Committee (EJCDC) (www.ejcdc.org), the Construction Management Association of America (CMAA) (www.cmaanet.org) and International Federation of Consulting Engineers (FIDIC) (www.fidic.org) and others have developed standard construction contract forms. These construction contract forms are based on similar purposes, applications and clauses and are commonly used and accepted throughout the construction industry. In this paper the documents of the American Institute of Architects (AIA) are given as examples for contract documents.

2.1 Contract documents

The usual construction contract consists of a number of different documents. In order for the work to be completely defined, the contract must be accompanied by a number of other documents that (for the sake of convenience and propriety) are prepared separately from the body of the contract (Poage, 2000). This collection of documents is known as contract documents. Although which documents constitute construction contract is variable, the following is a listing of documents that are essential in most construction contracts.

The Agreement: The agreement is a document specifically designed to formalize the construction contract. It acts as a single instrument that serves the purpose of presenting a condensation of the contract elements, stating the work to be done and the price to be paid for it, and provides suitable spaces for the signatures of the parties (Clough et al., 2005). AIA Document A101-2007 Standard
Form of Agreement between Owner and Contractor is an example for a standard agreement form and is intended for use on construction projects where the basis of payment is a stipulated sum.

Addenda: Addenda are critical documents because they are issued during the bidding period to make changes in bidding documents, and so usually they become part of the contract documents when a contract is made; unless they are issued solely to modify a bidding document that does not become a contract document (Collier, 2001). The purpose of these documents is modifying or clarifying the intent of the contract documents.

General Conditions of the Contract: The General Conditions serve as the definitive or explanatory document among the contract documents. The General Conditions draw the responsibilities of the owner, the design professional, the contractor and subcontractors. The General Conditions also contain miscellaneous provisions to define time, and include matters pertaining to payments and completion, protection of persons and property, insurance requirements, changes in the work, uncovering and correction of unacceptable work, and termination of the contract (Poage, 2000). AIA Document A201-2007 General Conditions of the Contract for Construction is an example for a general conditions form which provides the terms and conditions under which the owner, contractor and architect will work together during the building construction process.

Supplementary Conditions of the Contract: Supplementary Conditions are modifications of and additions to statements which are made in the General Conditions. Supplementary Conditions are amendments and amplifications to standard General Conditions, and are of the same nature as General Conditions; and while standard General Conditions usually are basic to most projects, Supplementary Conditions should be for the special and peculiar requirements of a particular owner and project (Collier, 2001). AIA Document A503-2007 Guide for Supplementary Conditions is a document which contains amendments to the standard General Conditions and additional conditions which may be needed for a particular project.

Drawings: Drawings are important component of the contract documents. The CSI Manual of Practice defines the drawings as they are a graphic representation of the work to be done and they indicate the relationships between the components and materials (2005). The drawings, also known as the plans or blueprints are the primary vehicle by which the physical, quantitative, or visual description of the project is conveyed (Hinze, 2001). Drawings and specifications cannot be considered as independent documents. As with the writing of specifications, well-prepared drawings should be orchestrated to be in harmony with the other contract documents (Poage, 2000).

Specifications: Specifications are the contract documents which complement the drawings. The Construction Specifications Institute (CSI) (www.csinet.org) and Construction Specifications Canada (CSC) (www.csc-dcc.ca) created the MasterFormat which is the specifications writing standard for construction projects. It lists titles and section numbers for organizing data about construction requirements, products, and activities. By the help of specifications, communication among architects, specifiers, contractors and suppliers is provided and owners’ requirements, timelines and budgets are met.
Modifications: Construction contracts should be designed to allow for changes, additions or deletions. Modifications are the documents which are issued after the contract has been made. Although modifications have much common with addenda, they are not subject to the same urgency. Change orders to modify the work, a construction change directive or an order for a minor change are examples for modifications which are made to the construction contracts.

The documents listed above are the contract documents that are essential and necessary for the successfully completion of a construction project within the desired time, quality and budget. Contract documents play an important role in the development of a project and provide the bridge between the owner’s conceptual image of a project and the actual construction of the physical facility (Hinze, 2001). All of the contract documents are construed together for purposes of contract interpretation, each giving meaning and effect to each other, because it is presumed that everything in the contract has been inserted deliberately and for a purpose (Clough et al., 2005).

### 2.2 Contract documents in Turkey

In Turkey, Public Procurement Authority (Kamu Ihale Kurumu-KIK) (www.ihale.gov.tr) is the only organization which develops standard construction contract documents. All the contract documents are developed based on the Turkish Public Procurement Law- 4734. The purpose of this law is to establish the principles and procedures to be applied in procurements held by all public entities and institutions governed by public law or under public control or using public funds. Although owners and contractors are free to use any standard contract documents in their private construction works, using the standard contract documents which are developed by KIK is compulsory for the public construction works in Turkey. Contract documents that used in Turkish public construction works are as follows:

**Standard Contract for Construction Works:** This document is the agreement which is used in the public construction works.

**General Specifications for Construction Works:** This document is the general conditions of the construction contract. The purpose of the General Specification is to establish the general principles and procedures that will be applied in performance of the works that are contracted as per Turkish Public Procurement Contracts Law- 4735. This General Specification covers the works that are awarded as per the provisions of the Law by the contracting entities subject to Public Procurement Law- 4734 and that are contracted over the lump sum or unit cost as per Public Procurement Contracts Law- 4735.

**Administrative Specifications:** Administrative specifications are prepared on the basis of the Standard Administrative Specification annexed to the Regulation on Implementation of Construction Works Procurements hereby according to the procedure applicable in the construction works procurement.

**Technical Specifications:** The technical specification indicating the technical details and requirements, and the project of the works to be performed are prepared and included in the contract.
documents. It is essential that the technical criteria set forth in the technical specifications to be prepared by the owner ensure productivity and functionality, and do not contain the matters hindering competition, but provide equal opportunity for all bidders.

All these contact documents are the standard documents which are used in the public construction projects in Turkey. In addition to the contract documents listed above drawings, location lists, clarifications and other appendixes are considered as other contract documents.

3. Comparison of the general conditions

All the contract documents are important for successfully completion of a construction projects, but general conditions are vital as they constitute basic principles and procedures of construction contracts and sets forth the responsibilities of the owner and contractor. In this part, the general conditions prepared by Public Procurement Authority (KIK) in Turkey are compared with the general conditions of American Institute of Architects (AIA). Thus, the standard general conditions document KIK General Specifications for Construction Works (GSCW) are compared with AIA Document A201-2007 General Conditions of the Contract for Construction.

AIA Document A201-2007 General Conditions of the Contract for Construction is the most commonly used general conditions document on building projects in the United States. The American Institute of Architects (AIA) published the first general conditions document in 1911 and A201-2007 is the sixteenth edition. A201-2007 document provides the basic legal framework for the construction contracts. It is considered the keystone document of the A201 family of documents, and is incorporated by AIA Owner-Contractor agreements. The document contains fifteen basic articles in terms of the purposes, agreements and responsibilities between and among the parties.

KIK General Specifications for Construction Works is the general conditions document on public construction projects in Turkey. Public Procurement Authority (KIK) prepared this document in 2001, in order to establish the general principles and procedures that will be applied in performance of the works that are contracted as per public procurement contracts. The document composed of ten basic chapters which consist 51 articles.

Following tables compares the general conditions of AIA A201-2007 General Conditions of the Contract for Construction and KIK General Specifications for Construction Works (GSCW) in terms of the basic articles they are composed of. To compare the two general conditions document, firstly AIA A201-2007 document’s basic articles are given in separate tables from 1 to 15 and these articles are expanded. Then, it is searched that whether the KIK GSCW document contains these articles and corresponding ones are given in the tables.

Firstly, KIK / GSCW document is compared with AIA A201-2007 document in terms of general provisions (Table 1). In both documents, definitions are given concerning the contract documents, contract, work, project, drawings and specifications.
Table 1: Comparison of general conditions in terms of general provisions

<table>
<thead>
<tr>
<th>AIA / A201-2007</th>
<th>KIK / GSCW</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1. Basic definitions</td>
<td>4. Definitions</td>
</tr>
<tr>
<td>1.2. Correlation and intent of the contract documents</td>
<td></td>
</tr>
<tr>
<td>1.3. Capitalization</td>
<td></td>
</tr>
<tr>
<td>1.4. Interpretation</td>
<td></td>
</tr>
<tr>
<td>1.5. Ownership and use of drawings, specifications and other instruments of service</td>
<td></td>
</tr>
<tr>
<td>1.6. Transmission of data in digital form</td>
<td></td>
</tr>
</tbody>
</table>

Both documents give information about the owner’s roles, rights and responsibilities during the construction process (Table 2). The only difference is the articles are given by the name of projects in KIK document.

Table 2. Comparison of general conditions in terms of owner’s roles, rights and responsibilities

<table>
<thead>
<tr>
<th>AIA / A201-2007</th>
<th>KIK / GSCW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article 2. Owner</td>
<td>Chapter 3. Projects</td>
</tr>
<tr>
<td>2.1. General</td>
<td></td>
</tr>
<tr>
<td>2.2. Information and services required of the owner</td>
<td>11. Handover of application projects to the contractor in turnkey lump sum works</td>
</tr>
<tr>
<td>2.3. Owner’s right to stop the work</td>
<td></td>
</tr>
<tr>
<td>2.4. Owner’s right to carry out the work</td>
<td>25. Maintenance and correction responsibilities of contractor</td>
</tr>
</tbody>
</table>

Furthermore, both documents clarify the contractor’s roles, rights and responsibilities in the construction work (Table 3). In spite of AIA A201-2007, there is not any information about warranty, taxes, permits, fees, samples, royalties, patents and copyrights in the KIK document.

Table 3. Comparison of general conditions in terms of contractor’s roles, rights and responsibilities

<table>
<thead>
<tr>
<th>AIA / A201-2007</th>
<th>KIK / GSCW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article 3. Contractor</td>
<td>Chapter 5. Execution of the Work</td>
</tr>
<tr>
<td>3.1. General</td>
<td>14. Supervision of works</td>
</tr>
<tr>
<td>3.2. Review of contract documents and field conditions by contractor</td>
<td>14. Supervision of works</td>
</tr>
<tr>
<td>3.3. Supervision and construction procedures</td>
<td>18. Contractor being present at work</td>
</tr>
<tr>
<td>3.4. Labor and materials</td>
<td>19. Personnel and tools necessary for the execution of the work</td>
</tr>
<tr>
<td>3.5. Warranty</td>
<td>27. Expenses to be borne by the contractor</td>
</tr>
<tr>
<td>3.6. Taxes</td>
<td></td>
</tr>
<tr>
<td>3.7. Permits, fees, notices and compliance with laws</td>
<td></td>
</tr>
<tr>
<td>3.8. Allowances</td>
<td>27. Expenses to be borne by the contractor</td>
</tr>
<tr>
<td>3.9. Superintendent</td>
<td></td>
</tr>
<tr>
<td>3.10. Contractor’s construction schedules</td>
<td>17. Work schedule</td>
</tr>
<tr>
<td>3.11. Documents and samples at the site</td>
<td></td>
</tr>
<tr>
<td>3.12. Shop drawings, product data and samples</td>
<td>15. The authorizations of the construction supervisor</td>
</tr>
</tbody>
</table>
As it is shown in Table 4, in the KIK document there is no evidence about architect’s roles, rights and responsibilities.

Table 4. Comparison of general conditions in terms of architect’s roles, rights and responsibilities

<table>
<thead>
<tr>
<th>AIA / A201-2007</th>
<th>KIK / GSCW</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1. General</td>
<td>-</td>
</tr>
<tr>
<td>4.2. Administration of the contract</td>
<td>-</td>
</tr>
</tbody>
</table>

Subcontractor’s roles, rights and responsibilities are given in the both general conditions document (Table 5).

Table 5. Comparison of general conditions in terms of subcontractor’s roles, rights and responsibilities

<table>
<thead>
<tr>
<th>AIA / A201-2007</th>
<th>KIK / GSCW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article 5. Subcontractor</td>
<td>Chapter 5. Execution of the Work</td>
</tr>
<tr>
<td>5.1. Definitions</td>
<td>20. Award of subcontractors and responsibilities</td>
</tr>
<tr>
<td>5.2. Award of subcontracts and other contracts for portions of the work</td>
<td>20. Award of subcontractors and responsibilities</td>
</tr>
<tr>
<td>5.3. Subcontractual relations</td>
<td>20. Award of subcontractors and responsibilities</td>
</tr>
<tr>
<td>5.4. Contingent assignment of subcontracts</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 6 gives the articles of AIA document in terms of the roles, rights and responsibilities when the construction work is done by owner or separate contractors. On the contrary, there is no information on this matter in the KIK document.

Table 6. Comparison of general conditions in terms of separate contractor’s roles, rights and responsibilities

<table>
<thead>
<tr>
<th>AIA / A201-2007</th>
<th>KIK / GSCW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article 6. Construction by Owner or by Separate Contractors</td>
<td>Article 6. Construction by Owner or by Separate Contractors</td>
</tr>
<tr>
<td>6.1. Owner’s right to perform construction and to award separate contracts</td>
<td>-</td>
</tr>
<tr>
<td>6.2. Mutual responsibility</td>
<td>-</td>
</tr>
<tr>
<td>6.3. Owner’s right to clean up</td>
<td>-</td>
</tr>
</tbody>
</table>

In AIA document, sufficient information is given about changes in the work in terms of change orders, construction change directives and minor changes. Although changes are vital in construction projects, it is not mentioned in the KIK document (Table 7).
Table 7. Comparison of general conditions in terms of changes in the work

<table>
<thead>
<tr>
<th>AIA / A201-2007</th>
<th>KIK / GSCW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article 7. Changes in the Work</td>
<td></td>
</tr>
<tr>
<td>7.1. General</td>
<td>-</td>
</tr>
<tr>
<td>7.2. Change orders</td>
<td>-</td>
</tr>
<tr>
<td>7.3. Construction change directives</td>
<td>-</td>
</tr>
<tr>
<td>7.4. Minor changes in the work</td>
<td>-</td>
</tr>
</tbody>
</table>

In Table 8, the comparison of AIA and KIK documents in terms of time is shown. In both documents, there is information about the progress of the work, delays and extensions.

Table 8. Comparison of general conditions in terms of time

<table>
<thead>
<tr>
<th>AIA / A201-2007</th>
<th>KIK / GSCW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article 8. Time</td>
<td>Chapter 5. Execution of the Work</td>
</tr>
<tr>
<td>8.1. General</td>
<td>29. Duration and extension of the work</td>
</tr>
<tr>
<td>8.2. Progress and completion</td>
<td>29. Duration and extension of the work</td>
</tr>
<tr>
<td>8.3. Delays and extensions of time</td>
<td>29. Duration and extension of the work</td>
</tr>
</tbody>
</table>

Payments and completion are mentioned in both AIA and KIK documents (Table 9). Both in documents information concerning progress payments, substantial completion, final completion and final payment are given.

Table 9. Comparison of general conditions in terms of payments and completion

<table>
<thead>
<tr>
<th>AIA / A201-2007</th>
<th>KIK / GSCW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article 9. Payments and Completion</td>
<td>Chapter 8. Progress Payments</td>
</tr>
<tr>
<td>9.1. Contract sum</td>
<td></td>
</tr>
<tr>
<td>9.2. Schedule of values</td>
<td>39. Temporary progress payment reports</td>
</tr>
<tr>
<td>9.3. Applications for payment</td>
<td>39. Temporary progress payment reports</td>
</tr>
<tr>
<td>9.4. Certificates for payment</td>
<td>39. Temporary progress payment reports</td>
</tr>
<tr>
<td>9.5. Decisions to withhold certification</td>
<td></td>
</tr>
<tr>
<td>9.6. Progress payments</td>
<td>39. Temporary progress payment reports</td>
</tr>
<tr>
<td>9.7. Failure of payment</td>
<td></td>
</tr>
<tr>
<td>9.8. Substantial completion</td>
<td>41. Temporary acceptance</td>
</tr>
<tr>
<td>9.9. Partial occupancy or use</td>
<td></td>
</tr>
<tr>
<td>9.10. Final completion and final payment</td>
<td>40. Final payment report and closing accounts</td>
</tr>
<tr>
<td></td>
<td>44. Final acceptance</td>
</tr>
</tbody>
</table>

In Table 10 it is shown that both in the AIA and KIK documents, information concerning protection are given. In AIA A201-2007 protection is examined in four headings such as safety precautions and programs, safety of persons and property, hazardous materials and emergencies. However, in KIK / GSCW these are only explained by protecting and insuring the works and worksites.

Table 10. Comparison of general conditions in terms of protection of persons and property

<table>
<thead>
<tr>
<th>AIA / A201-2007</th>
<th>KIK / GSCW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article 10. Protection of Persons and Property</td>
<td>Chapter 2. Worksites</td>
</tr>
<tr>
<td>10.1. Safety precautions and programs</td>
<td>9. Protecting and insuring the works and worksites</td>
</tr>
<tr>
<td>10.2. Safety of persons and property</td>
<td>9. Protecting and insuring the works and worksites</td>
</tr>
<tr>
<td>10.3. Hazardous materials</td>
<td>9. Protecting and insuring the works and worksites</td>
</tr>
</tbody>
</table>
In AIA A201-2007, insurance is mentioned in terms of contractor’s liability, owner’s liability and property. Moreover, performance bond and payment bond are also mentioned in the same article (Table 11). As it is in the previous table, KIK only points out protecting and insuring the works and worksites. There is not any evidence about performance or payment bonds.

Table 11. Comparison of general conditions in terms of insurance and bonds

<table>
<thead>
<tr>
<th>AIA / A201-2007</th>
<th>KIK / GSCW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article 11. Insurance and Bonds</td>
<td>Chapter 2. Worksites</td>
</tr>
<tr>
<td>11.1. Contractor’s liability insurance</td>
<td>9. Protecting and insuring the works and worksites</td>
</tr>
<tr>
<td>11.2. Owner’s liability insurance</td>
<td>9. Protecting and insuring the works and worksites</td>
</tr>
<tr>
<td>11.3. Property insurance</td>
<td>9. Protecting and insuring the works and worksites</td>
</tr>
<tr>
<td>11.4. Performance bond and payment bond</td>
<td>9. Protecting and insuring the works and worksites</td>
</tr>
</tbody>
</table>

Table 12 shows the AIA’s and KIK’s articles concerning uncovering and correction of work. Both documents give information about faulty, defective, incomplete works, works that are not in compliance with the contract, maintenance and correction responsibilities of contractor.

Table 12. Comparison of general conditions in terms of uncovering and correction of work

<table>
<thead>
<tr>
<th>AIA / A201-2007</th>
<th>KIK / GSCW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article 12. Uncovering and Correction of Work</td>
<td>Chapter 5. Execution of the Work</td>
</tr>
<tr>
<td>12.1. Uncovering of work</td>
<td>23. Works that are not in compliance with the contract</td>
</tr>
<tr>
<td>12.2. Correction of work</td>
<td>24. Faulty, defective and incomplete works</td>
</tr>
<tr>
<td>12.3. Acceptance of nonconforming work</td>
<td>25. Maintenance and correction responsibilities of contractor</td>
</tr>
</tbody>
</table>

Table 13 deals with the general conditions in terms of miscellaneous provisions. These are governing law, notices, rights, remedies, tests, inspections and so forth. Both documents mention about these subjects. Only KIK document does not have any information about time limits on claims.

Table 13. Comparison of general conditions in terms of miscellaneous provisions

<table>
<thead>
<tr>
<th>AIA / A201-2007</th>
<th>KIK / GSCW</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.2. Successors and Assigns</td>
<td>16. The authorizations of the construction supervisor</td>
</tr>
<tr>
<td>13.3. Written Notice</td>
<td>13.6. Interest</td>
</tr>
<tr>
<td>13.4. Rights and Remedies</td>
<td>13.7. Time Limits on Claims</td>
</tr>
</tbody>
</table>
Both documents deal with the termination and suspension of the contract (Table 14). However, in the KIK document termination by the contractor is not mentioned.

Table 14. Comparison of general conditions in terms of termination or suspension of the contract

<table>
<thead>
<tr>
<th>AIA / A201-2007</th>
<th>KIK / GSCW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article 14. Termination or Suspension of the Contract</td>
<td>Chapter 10. Contractual Relations</td>
</tr>
<tr>
<td>14.1. Termination by the contractor</td>
<td>47. Termination of the contract and dissolution of the work</td>
</tr>
<tr>
<td>14.2. Termination by the owner for cause</td>
<td>47. Termination of the contract and dissolution of the work</td>
</tr>
<tr>
<td>14.3. Suspension by the owner for convenience</td>
<td>47. Termination of the contract and dissolution of the work</td>
</tr>
<tr>
<td>14.4. Termination by the Owner for Convenience</td>
<td>47. Termination of the contract and dissolution of the work</td>
</tr>
</tbody>
</table>

The last article is concerning claims and disputes. As it can be seen in Table 15, only AIA document gives information about mediation and arbitration for resolution of disputes.

Table 15. Comparison of general conditions in terms of claims and disputes

<table>
<thead>
<tr>
<th>AIA / A201-2007</th>
<th>KIK / GSCW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article 15. Claims and Disputes</td>
<td>Chapter 10. Contractual Relations</td>
</tr>
<tr>
<td>15.1. Claims</td>
<td>51. Resolution of disputes</td>
</tr>
<tr>
<td>14.2. Initial decision</td>
<td></td>
</tr>
<tr>
<td>14.3. Mediation</td>
<td></td>
</tr>
<tr>
<td>14.4. Arbitration</td>
<td></td>
</tr>
</tbody>
</table>

4. Conclusion

Construction contracts are vital documents which define various aspects, obligations and relations between participants of the construction project. These documents are also really important in order to complete the construction projects within the expected time, quality and budget. In order to reach the expected goals, general conditions play an important role as they constitute basic principles and methods of the construction contracts.

In Turkey, Public Procurement Authority (KIK) is the only organization that prepares standard contract documents for construction projects. Although using these standard documents is compulsory for public construction, there are many problems due to the lack of the nature of these documents.

In this study, standard general conditions in the United States and Turkey are compared. For comparison, AIA Document A201-2007 General Conditions of the Contract for Construction and KIK General Specifications for Construction Works (GSCW) are used. It is found that some important aspects are missing in the KIK Document. The most important one is the lack of supplementary conditions. When there is a need of making modifications or additions to the statements in the general conditions, it is impossible to make changes in the GSCW document. While GSCW document is basic to all projects, another document –supplementary conditions- is necessary.
for the special and peculiar requirements of a particular project. The second problem concerns the changes in the work. Because of the nature of the construction itself, construction contracts should allow changes in projects. In KIK document changes in the work such as change orders, construction change directives or minor changes are not even mentioned. Another problem in the GSCW document is the lack of a mechanism about dispute resolution procedure. If any dispute arises between the parties, GSCW document should propose a mechanism such as mediation or arbitration as there are in the AIA document.

To conclude, in order to successfully complete of the construction projects within the desired goals, contract documents are vital. Especially general conditions are need to be sufficient, correct and up-to-date, as they serve as the definitive or explanatory document among the contract documents.

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Improving Dispute Resolution on Construction Projects in Kuwait

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Abstract

The number of different parties involved in most construction projects can result in a high risk of conflict which, if not dealt with quickly, could develop into disputes that can take years to settle. These disputes add little value to a construction project but increase the cost burden on different parties when taken to arbitration or litigation. Dispute costs are often in addition to the costs of project delay which together influence the hardening of attitudes of the parties. Dispute avoidance or early dispute resolution is desirable for all parties concerned. The nature of the construction business in the State of Kuwait is probably no different to other countries as one of the most litigious industries. However, improved dispute resolution practices within Kuwait, could result in significantly reduced costs and wastage. This paper presents early findings from a literature review, as a part of PhD researching disputes and different dispute resolution strategies. It aims to determine the ability to employ the current alternative dispute resolutions strategies in the State of Kuwait.

Keywords: construction management, Kuwait, ADR, alternative dispute resolution
1. Introduction

After stability returned to the Gulf area following the Gulf war in 2003, many international companies started to explore the possibility of working in the area, especially in Kuwait. These companies came from different cultures with different legal systems which had their own dispute resolution mechanisms. Sometimes these do not meet the requirements of Kuwaiti civil law, nor its dispute resolution system. As a result, contracting with the Kuwait market may be too risky for some international and domestic companies, especially when it is clear that the most important issue for the Kuwait government, in respect of such contracts, is that they must be under the jurisdiction of Kuwaiti civil law.

At the same time, it is important for the international companies to be able to resolve disputes amicably under the Kuwaiti civil law. However, Kuwaiti civil law does not contain an amicable alternative dispute resolution system. Furthermore, it usually directs contract parties straight to arbitration or litigation directly or both in some other cases, and this is based on the conflict clauses in the contract terms.

1.1 Claims, conflicts and disputes

In this section, the various definitions of claim, conflict and dispute are presented. The most suitable have been selected and adopted as the definitions used in this research. Where an appropriate definition cannot be found, an alternative definition has been proposed to suit the needs of the present research.

Levin (1998 p.2) stated that in 1980, a ‘claim’ was defined by the US federal government as ‘a written demand or written assertion by one of the contracting parties seeking, as a matter of right, the payment of money in sum certain, the adjustment or interpretation of contract terms, or other relief with arising under or related to a given contract’. The 1987 edition of the American Institute of Architects (AIA) standard form construction contract added, ‘a claim is a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation of contract terms, payment of money, extension of time or other relief with respect to the terms of the contract’ (Levin 1998). The parties mentioned in both definitions could include owners, designers, main contractors, subcontractors or any other party of contract or their representatives.

From a legal point of view, these two definitions could be considered or interpreted in different ways by different parties, because of the conflict of interests between these parties. Also, in the construction industry, the word ‘claim’, generally, refers to the claims raised by the contractor. That is why some other recent authors have added the word ‘contractor’ to the definition. For example, Uff (2005 p.436) referred to claims as ‘additional payments which may be due to the contractor under provisions other than those covering valuation of the work done’ and ‘the damages for breach of contract’.

Similarly, for Kuwaiti construction projects, Alsabah (1997 p.2) defined ‘claim’ as ‘a statement by the contractor that he believes that he is entitled to extra payment or extra time to complete the works. Such payment may be as prescribed under a clause of the contract, or arise from a breach of the
contract or Kuwaiti Civil Code (KC code). In this research, Alsabah’s definition has been chosen as the most suitable one for the Kuwaiti construction industry and the nature of claims in this sector.

The conflict of interests between parties, mentioned in the previous sub-section, may lead to conflicts or disputes if the parties do not achieve an early agreement on the claim. Conflict has been defined by Collins (1995) as a ‘serious disagreement and argument about something important’ and more specifically, ‘a serious difference between two or more beliefs, ideas or interests’, however, this definition is for conflicts in general. In order to make this definition distinctively applicable to construction projects, and to those in Kuwait in particular, the following definition has been developed and adopted for this research: ‘the first stage disagreement, after the contractor’s unsettled claim statement under a clause of the contract, or in breach of the contract or Kuwaiti Civil Code’.

According to Alsabah (1997 p.2), a dispute is defined as ‘an issue affecting the parties to the contract which they have been unable to resolve without reference to a third party’. Furthermore, construction disputes seem to be an inevitable phenomenon, especially when today’s construction projects are faced with many uncertainties, after the world economic crisis and its effects on the construction industry. Disputes may lead to project disruption, loss in money and time, and detrimental relationships between contractual parties. Lewis et al (1992) advocated that the respective damages could be much alleviated, if construction disputes were be more appropriately and swiftly resolved.

The previously mentioned definition relates to disputes and the inability to resolve problem issues. This definition neglects the conflict stage, which is an important stage after the unsettled claims and during which conflicts can be resolved amicably. Considering this, disputes in the Kuwaiti construction industry may be defined as ‘issues which are not amicably settled during the conflict stage and which need to be referred to a third party to be resolved under the Kuwaiti Civil Code and the terms of the contract’.

### 1.2 Dispute avoidance

Dispute avoidance is one of the main aims of partnership in construction projects, and one of the main aims to be reached to facilitate success in partnering. In order to achieve this aim, some contract amendments should be made earlier, rather than using standard forms of contract, a measure designed to ensure consistency with the partnering objectives (Partnering in Public Sector, 1997). However, disputes are a reality in every construction project and without the means to address them, minor issues can fester and grow, and it is very difficult to limit them under one contract. Jannadia et al (2000) generalised that different parties to a contract negotiate small and uncomplicated conflicts, while larger and more complex cases commonly delay the project through some lengthy legal issues. Normally, if parties cannot reach an early resolution themselves, legal procedures begin, severely affecting all of the participants concerned.

In the construction industry in Kuwait it is possible to take steps to avoid litigation, and to control disputes, by developing and employing various mechanisms for alternative dispute resolution that can be implemented during almost any stage of a construction project. Jannadia M. et al. (2000) make it clear that rising costs, delays and risks of litigation in construction disputes have prompted the
construction industry to look for new and more efficient ways to resolve these disputes outside the courts, which is one of the intentions of this research.

2. Literature

This review is based on a study of the literature, reinforced with preliminary interviews with a number of experts in the construction industry in Kuwait. The particular focus of this paper is to present the early findings from a literature review, as a part of PhD researching disputes and different dispute resolution strategies. The interviewees represent the construction industry in Kuwait both public and private sectors, however, their views on dispute resolution in Kuwait that it should be improved as it will be shown later on. More interviews would of course be needed to find significant results upon the ability of employing the current alternative dispute resolutions strategies in the state of Kuwait.

_‘In a perfect construction world there would be no conflicts, but there is no perfect construction world’_ (Acharya and Lee, 2006), therefore, it is clear that conflicts in construction projects are inevitable, exactly like in any other form of human relationship, and Cheung (1999) describes disputes in the construction industry as an _‘endemic problem’_. Construction projects involve a variety of different participant groups including owners, designers, general contractors and subcontractors among others. Each of these groups has their individual objectives and concerns in terms of interest conflicts and disputes and the construction industry has gained a reputation for being contentious and litigious, in a manner that often damages the reputation of both parties. Inevitably, such disputes affect quality and punctuality of the construction project progress.

The conflict problems encountered have lead to prolonged delays in implementation, interruptions and sometimes suspension of projects. Due to being attributable to various groups, large investments and low profits, conflict continues to maintain its highly explosive character (Awakul and Ogunlana, 2002). Furthermore, Acharya and Lee (2006) concluded that most of the conflicts are minor in nature in the initial stage, but if not handled well, these could result in claims, counter claims, troubles, and bad relationships between project participants.

Kassab et al. (2006), concluded that _‘it is difficult, if not impossible, to completely avoid construction conflicts’_, however, minimising the impact of conflicts brings many advantages and reduces contractual problems. Creating alternative dispute resolution mechanisms and training construction staff to increase their capability to resolve conflicts could be the first two steps to avoiding and resolving dispute in future construction projects.

Alsabah (1997) argued that if the parties are unable themselves to resolve the claim, then the claim becomes a dispute, which must be resolved by a third party. This third party might be a conciliator, a mediator, an adjudicator, an arbitrator or the court, and construction contracts normally specify the procedures for processing claims and disputes.

Despite the potentially unpleasant connotations and consequences of conflict, beneficial aspects of conflict have also been recognized, and conflict management has been said to be a major component in construction project management (Gardiner and Simmons, 1995). Kumaraswamy (1997) shows the
benefits of a properly managed conflict, through an example in which he notes that "a conscious shift of conflict occurrences from the construction to the conceptual design stage is seen to contribute to more creative and constructive inputs, in comparison to what may have transpired in the absence of such conflicting views. The cross-fertilization of ideas and the consideration of more alternatives, through such constructive conflicts at the design stage, would usually lead to 'better' designs as well.'

2.1 Dispute elements

![Figure 1: Circle of Dispute Elements Adapted from Fereig (2007)](image)

Fereig (2007) and Furlong (2005) have discussed dispute elements. They found that the nature and dimensions of any dispute are verified by some elements, identified as: values of parties, the nature of their relationships, external effective factors (moods), available data on the dispute and its sides, individual authority structure in different parties, and also the disputed interests.

Fereig (2007) stated that it is the values and beliefs of various parties that play a part in the occurrence of a dispute. These values include religious values, ethical values, professional ethics and professional conscience. Furlong (2005) added that some simpler day-to-day values are employed in business or work contexts (such as the value of customer service, loyalty to the company, etc.). Disputes are usually the result of differences in viewpoints and understandings of the above-mentioned values, which affect the evaluation of the parties from each other. Some of these include 'good and bad; right and wrong; and honesty and corruption.

Value conflicts occur when there is a clash in the differing values of the parties, which either cause or exacerbate the situation, and because values, morals and ethics are so important to human beings, value related conflicts tend to be very heated and personal (Furlong 2005).

Fereig (2007) describes this as the history of interactions between the parties, and if the previous interactions have been of a negative nature, this will result in motivating one party to have a negative perception of the other party. Furthermore, Furlong (2005) concentrated on past relationships and established that the term 'relationship' in conflicts identifies specific negative experiences in the past (past history, poor relationship) as a cause of conflict. Relationship conflict occurs when past history or experience with another party creates or drives the current negative situation, and therefore, the relationship is a product of previous experiences between parties. These experiences can weaken communication and have a negative affect on the dispute. Some of these experiences are: general impression; previous failed relationships; repeated negative actions; organisations’ internal responsibilities; history of relationships; and nature of relationships.
Khan (2009) stated that, in conflicts, the term ‘moods’ covers external factors, which are not directly a part of the situation, but still contribute to the clash. In negotiations, a bad mood could drive any issue to a major problem, or make a difficult situation worse as a result of an outside force. Fereig (2007) related ‘externals and moods’ to a wider variety of external factors, such as the general environment in which the dispute occurs, moods of the different sides of the dispute (some could be lenient and others could be intolerant), surrounding factors and the effect of those factors on the dispute, as well as the on-site general conditions, surrounding circumstances (such as weather conditions and the emotional state) and also the parties’ emotional connection to the disputed issue.

The availability of data is an important issue for each party to understand the conflict (Fereig 2007), and any missing information can lead to ambiguity and the ability to understand and solve the problem. Correct data, on its own, is not enough to build common ground, because the understanding and interpretation of such data, as well as how these items of data are linked, and the type of recognition that results from this linkage, may vary.

Accordingly, data is identified by Furlong (2005) as a ‘key driver’ to conflict. The inaccuracy and deficiency of information between working parties cause data conflict or dissimilarity in both access to the information and appreciation of its importance. These data problems often lead to further negative statements and further data problems, while another significant data issue is the question of interpretation, where the same information is understood by different parties in different ways, and this interpretation opens the door to notably different versions of the same information.

The internal responsibility structure and decision-making process of each party is one of the most important defining elements in many disputes. Fereig (2007) and Furlong (2005) believe that misunderstanding of the authority structure triggers a large number of disputes, and exploitation of the authority and the rivalry between the employees of one party could create dispute. Responsibility distribution and limited power of some parties’ representatives restricts the negotiation power of the representative in preventing and solving the problem at an early stage of its occurrence. On the other hand, unlimited power can also cause dispute, especially when this power is not used in a proper manner.

Based on Fereig (2007), interests represents the parties’ welfare and the valuable issues for them. In any construction project, each party works for their own interests, and the party whose interests are threatened will try to stop and regain any losses by making claims. These claims are one of the principle causes of conflicts, project delays and even termination of contracts.

### 2.2 Dispute origins

Results of the preliminary interviews (some of which are presented in the following section), show that origins of disputes in construction projects in Kuwait could fall within a number of causes including: changes and variation to orders; environmental factors and weather conditions; political circumstances; the economy; parties’ and staff mistakes; different regulations and legal systems; and cultural issues.
Fereig (2007) categorised different types of dispute origins in construction project contracts under nine main categories; origins related to management; origins related to the owner; origins related to the contractor; origins related to the work nature; origins related to the quality of the work, as well as the insurances and guarantees submitted by the contractor; origins related to the site status; origins related to safety issues; origins related to the sub-contractors; and origins related to the workers.

2.3 Dispute resolution strategies

_The construction industry continues to struggle to identify ways to resolve disputes equitably and economically. Solutions proposed often focus on defending unilateral benefits or creating _win–win situations’ when disputes go into litigation’ (Cheng et al., 2009). Consequently, a _win-win situation’ is difficult to achieve, or impossible in some cases. Based on previous known causes of disputes in different cases, some additional clauses could be added to construction project contracts in Kuwait to safeguard the rights of different parties, and to avoid conflicts. So that they could minimize reaching the dispute stage and/or resolve conflicts amicably._

Brooker (1999) regards the construction industry as being _contentious’ as its disputes are widespread. The means of resolving construction disputes traditionally have been through arbitration or litigation, and yet in recent years both procedures have fallen into disrepute, particularly in terms of their costs, delays, procedural complexity and adversarial approach (Latham, 1994; Hoare et al., 1992). The effect of dissatisfaction with the traditional systems of dispute resolution has led to interest in the idea of alternative dispute resolution (ADR) in the United Kingdom, as it has in other comparable jurisdictions, notably the United States (Stipanowich and O’Neal, 1995; Stipanowich and Henderson, 1993). However, it is worth noting that Uff (2005) claims that _the term, ADR, has been in circulation for some years, having been imported from the USA’._

A construction project involves a variety of different participant groups, including owners, designers, general contractors and sub-contractors, among others. Each has its individual objectives and concerns, in terms of interest conflicts and disputes, and according to Cheng et al. (2009), the construction industry has gained a reputation for being contentious and litigious in a manner that often damages the reputation of both parties in dispute. Such disputes affect work quality and delays construction project progress’. As a result, Min-Yuan Cheng et al. (2009) added that _the construction industry continues to struggle to identify ways to resolve disputes equitably and economically.’_

A _win-win situation’ is usually an aim of each party in a conflict (Cheng et al., 2009; Fereig, 2007), but when disputes go into litigation a _win-win situation’ will be very unusual. Based on Fereig (2007), a _lose-win situation’ will be the outcome, or even a _lose-lose situation’ in some cases, due to wasted time and the cost of lawyers. At the same time _lawyers competent in engineering issues or engineers with legal backgrounds are difficult to find’ (Cheng et al. 2009). Cheung (1999) depicts the escalation of hostility and costs as a result of moving to higher levels in the hierarchy of disputes, in the form of rising steps shown in Figure 2 below.
Figure 2: Construction Dispute Resolution Steps Adapted from Cheung

Andrew (2001) believes that the many ADR processes that have saved time and money, compared to conventional methods, cannot be compared to each other, but ADR techniques rely very much on retaining the parties’ involvement in shaping the solution. Most significantly, they are private, voluntary and non-binding, and there are many different forms of ADR, but the most common in the United States - and the techniques most likely to be adopted here - are mediation and the mini-trial.

ADR is a broad definition incorporating a variety of processes, which are alternative to the formal litigation system, where the parties prove their arguments in court through an adversarial system of examination, cross-examination and challenge. Furthermore, the UK construction industry has a long history of employing other procedures outside the formal system of litigation (Brooker 2007).

According to Andrew (2001), ADR is a spectrum of voluntary, negotiation-based processes, in which representatives of the parties to a current or potential dispute meet together for collaborative problem solving and consensus building, with the goal of achieving a mutually acceptable resolution. The processes are intended to be less adversarial alternatives to traditional conflict resolution pathways.

‘Disputes exist in all building and construction projects. Alternative dispute resolution methods are now commonly used as a means to resolve construction disputes.’ (Yiu, 2005) Alternative dispute resolution techniques are important to be applied for early dispute resolution in construction contracts in Kuwait.

Stipanowich (1997) argues that alternative dispute resolution, such as mediation _is the most popular and familiar of settlement-oriented alternatives among contractors, design professionals and attorneys’, and he adds that _its popularity appears to be a direct reflection of the relatively positive experiences all these groups report with the process. Construction attorneys generally perceived mediation to be the most effective approach for achieving a wide range of goals, including reducing the cost and duration of dispute resolution’, and this is depends on _where parties are able to agree to mediate after disputes arise’.
Brooker and Lavers (1997) state that the most clearly voiced perception of the appropriateness of ADR for resolving construction dispute was that it is relatively quick and cheap when contrasted with both litigation and arbitration, and they calculate that ADR is seen as saving management time by 61%. Nevertheless, they also identified the non-binding nature of ADR as a disadvantage. Ellison and Miller (1995) demonstrated that ADR techniques are becoming increasingly common to resolve disputes in the construction industry. By resolving disputes in a timely fashion, the owner has a better idea of his final costs, and the contractor is more accurately aware of his expenses, as-built schedule and cash flow. Moreover, as the contractor has experience with the concept, the dispute review boards will tend to lower contingencies and legal costs in future bids (Kohnke 1993).

Cheung (1999; p190) states that alternative dispute resolutions arose in the last two decades as a response to the high cost and lengthy process associated with arbitration and litigation. However, ADR procedures tend to be relatively informal, but their range is very wide (Uff 2005; p60). In the United Kingdom different types of ADR mechanisms have been used in order to amicably resolve disputes in construction projects, such as conciliation, mediation, mini-trails and adjudication.

Mediation, involves a neutral person finding middle ground between the position of the parties with the aim of achieving a negotiated solution acceptable to all parties (Uff 2005; p61). However, in North America and Australia mediation is pre-eminent (L. Street; 1992). In Hong Kong mediation is the favoured choice (Cheung; 1999).

Some contracts include recourse to a conciliator empowered or required to express his provisional view on the merits of the case (Uff 2005; p62). Cheung (1999; p.190) states that —Conciliation and Mediation are very similar both in nature and in process”. However, the difference has been positioned on the degree of participation by the neutral person. Street (1992) concluded that Conciliation seems to be the preferred choice in international and European usage. Uff (2005; p62) concludes conciliation as a form of aided settlement in which each side present a summary of its case, in trail mode and using advocates and experts, before a tribunal composed of a senior representative of each side and natural chairman”.

Statutory adjudication is presently the most widely used form of dispute resolution in the UK construction industry” (Uff 2005; p.63) with the adjudicator's decision binding until the dispute is finally resolved by formal means.

3. **Necessity of improving dispute resolution process in Kuwait**

Kuwait has been distinguished by rapid growth in development over the last thirty years, with remarkable achievements in various fields: economic, social, educational and construction. The Kuwaiti government has considered the construction industry to be one of its prime considerations, with the highest priority among non-oil sectors. The rapid increase in growth of the population made it essential for the government to concentrate on construction activities, and the construction industry, therefore, occupies a very important place in the economic activities of the country (Alsabah, 1997).
Kuwait’s construction industry sector has been hit by a combination of factors in the last quarter of 2009, resulting in a decrease in forecasted growth to 0.65 billion Kuwaiti dinars. Falling oil prices and new OPEC quotas are set to reduce petroleum production, which accounts for 80% of government revenues. Meanwhile the global credit crisis, along with local political uncertainty, is greatly impacting investor confidence in Kuwait and these factors have lead to an exodus of ex-pat’ workers and mean that some infrastructure projects may be cancelled or postponed until confidence returns. By 2013, the construction industry’s value is set to reach 0.78 billion Kuwaiti Dinars (KD). The country’s construction industry value growth has slipped down marginally from 2.67% growth in 2008, to 2.28% in 2009, and is expected to fall further to 1.03% in 2010. Kuwait’s construction industry growth will recover slightly by 2013, with growth of 1.60% expected by then. There are already signs of delays in several large infrastructure projects, notably the $7 billion metro system for Kuwait City, which is expected to be delayed by 18 months, and the extensive Al-Zour refinery which may be revised. However, there is news that the Kuwaiti government is investigating diversification in energy production, with analysis of nuclear generation potential (Kuwait Infrastructure Report; 2009).

3.1 Existing dispute resolution process in Kuwait

In Kuwait (based on directorate of experts rules and conditions) the process of resolving disputes is depends on the agreement between the parties in the contract, for example if parties have mentioned that they will resolve any dispute under the Kuwaiti civil law at Kuwaiti courts which is litigation step. Otherwise, the contract parties can choose Arbitration which should be mentioned in the contract if both parties wanted to resolve their disputes with arbitrator, the decision of the arbitrator is binding without any further agreements.

By using standard forms of contract, a fairer balance may be achieved in case of dispute. Conversely, if one party imposes his own standard terms on other party. This tend to contain one-side provisions which place the other party at a disadvantage in a dispute. The interviewees made sure that the improving of dispute resolution mechanism in Kuwait is a demand to recuperate the construction industry. However, improving the strategy of dispute resolution is not as easy as adding a clause in the contract. Study the causes, elements and origins of disputes in construction projects should be done before assessing the method of improvement. From the interviewees point of view, the shortage of experience in dispute resolution with ADR for construction projects in Kuwait as well as the lack in training and education, are the significant inconvenience issues against the usage of ADR to resolve construction industry dispute.

4. Summary and conclusion

This paper has highlighted different definitions for claims, conflicts and disputes, in order to adopt suitable definitions fitting the construction industry in Kuwait, which is the main concern of this research, and the principal objective of this section (shown in the Table below).
Table 1: Definitions for Claim, Conflict and Dispute suitable for the construction industry in Kuwait

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Claim</td>
<td>A statement by the contractor that they believe to be entitled to extra payment or extra time to complete the works. Such payment may be as prescribed under a clause of the contract, or arise from a breach of the contract or Kuwaiti Civil Code (KC code).</td>
</tr>
<tr>
<td>Conflict</td>
<td>The first stage disagreement, after the contractor’s unsettled claim statement under a clause of the contract, or in breach of the contract or Kuwaiti Civil Code.</td>
</tr>
<tr>
<td>Dispute</td>
<td>An issue which is not amicably settled during the conflict stage and needs to be referred to a third party to be resolved under the Kuwaiti Civil Code and the terms of the contract.</td>
</tr>
</tbody>
</table>

A dispute in the construction industry is similar to a dispute in any other industry, or any other human relationship, with few differences. These were discussed in this section by presenting the nature of disputes and dispute resolution, and emphasising the elements of disputes, specifically in the construction industry.

The main causes of disputes depend on different issues, such as one of the parties’ points of view, which makes it very complicated to understand and/or to judge, if the parties do not have the will to resolve the conflict amicably.

Sometimes, it is better for the contract party to neglect its rights in order to achieve his/her interests; it is better to save the costs and time of going through to arbitration and litigation, and to reach a "win-win situation" with the other party, and to continue amicably during the remainder of the contract period. However, resolving disputes through litigation, arbitration or alternative dispute resolution has different procedures, advantages and disadvantages, which will be studied in further stages in the PhD research.

This article paves the way for the research to concentrate on the main causes of disputes, and on the standard resolution processes based on other experiences, in order to apply the previous experiences to improve the dispute resolution in the construction industry in Kuwait.

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A Study on First Hand Residential Quality In Hong Kong

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Abstract

Hong Kong has long been famous for her skyrocketing dwelling price. The high cost of mortgage has clipped the wings of many high-educated working class and raise their expectation on quality of residential units. This paper study first instance court cases with regard to the quality problem in first hand residential units over the past 9 years. Results have shown that most of the developers in Hong Kong seldom overstated the quality of residential units and the majority of the cases which end up in court are caused by subcontractors’ failure in providing merchantable quality products.

Keywords: first hand, residential, quality, court cases, Hong Kong
1. Introduction

In Hong Kong thousands of dwelling units are built every year to satisfy the needs of dwellers (figure 1), however, price of newly built residential housing units remain high over the years. Most of the families spend more than half of their salary on monthly bank payments for their residential units. It is therefore natural that residents have high expectations on quality of private dwellings -- no wonder builders in Hong Kong invest a huge sum of money on modern kitchenware and bathroom utilities, well design cabinet (So and Leung, 2004) as well as smart technology which integrates a variety of home systems such as lighting, security climate control to enhance the quality of these residential units (Petersen et al., 2001). Nevertheless, developers often conduct forward sales before building completion, vendors may worry that housing units sold in this way turn out to be substandard -- a typical moral hazard problem. Nonetheless, such payment method has become very popular in Hong Kong. One plausible explanation is that the market has already efficiently adjusted the forward price for this potential quality problem according to developers’ reputations (Chau et al., 2007, Chau et al., 2001) as they are not fly-by-night developers which can be found in China (Li, 2009). Alternatively, quality of the first hand residential units is high on average, home purchasers have confident on developers’ fittings. This paper aims to reveal the quality of first hand residential units by studying the relevant court cases in 2000-2008. Under the common law jurisdiction, the research results are likely to be used in other common law cities, such as Bangladesh and United Kingdom.

Figure 1:  Housing units completed from 2004 to 2009 (Rating and Valuations Department, 2009)

*2009 is an estimated figure   #forecast by Rating and Valuations Department
2. Legislation govern the quality of fittings

Quality fittings and furnishings is important to all the residents of the housing estates. They reduce maintenance and renovation costs, improve sustainability (Li and Chau, 2010) and enhance success rate of resale. The outbreak of severe acute respiratory syndrome in 2003 in Hong Kong Amoy Garden reminds us the importance of fittings’ quality on people’s health. In view of these, acceptable quality of fittings provides benefits to both investors and home purchasers (Stoker, 2002). To ensure the quality of fittings, Property Law Group of the Australian Law Council had issued a sample standard form of residential property contracts in various states of Australia. Some of the Hong Kong people were impressed with this approach and recommended this standard form to give considerable protection to residential purchaser (Stoker, 2002).

There are some laws and regulations which govern the goods sold in the market, e.g. residential units sale. Cap 26 Sale of Goods Ordinance Section 2(5) has stated clearly that goods of any kind should be of merchantable quality if they are 1) fit for the purpose(s) for which goods of that kind are commonly bought; 2) of such standard of appearance and finish; 3) free from defects (including minor defects); 4) as safe; and 5) durable.

To prevent sellers overstate quality of goods and services, Misrepresentation Ordinance has been drafted specifically for this. Under Misrepresentation Ordinance section 3, a person who has entered into a contract after a misrepresentation which lead to other party’s loss, the one who makes misrepresentation would be liable even if such misrepresentation was not made dishonestly, unless there is sufficient ground to prove that he had and did believe the statement he made up to the time the contract was made.

To ensure the quality of dwellings, legislators have also drafted and implemented pieces of legislation specially for residential units, e.g. Cap 123F Building (Planning) Regulations has stated explicitly that all the dwelling units have to be provided with kitchen unless exempted by the Building Authority. The internal surface of every kitchen shall be either rendered in cement mortar or covered with tiles. Every kitchen shall be provided with a sink and fittings for water supply and properly constructed cooking slab or fireplace. There is also specific requirement for bathrooms that room-sealed gas water heater has to be provided in every bathroom in a building. Where the room-sealed gas water heater installed in any place other than bathroom, appropriate provision has to be made for the installation of such room-sealed gas water heater. In Cap 123 F, Regulation 15 has also specified the requirement of door and window that no gate, window, door or shutter opening shall be placed at a height of less than 2.5 m above the ground level.

3. Objectives of the paper

As Hong Kong people become wealthier, their demand on quality of fittings also increases. Provisions of fittings are no longer restricted on basic wall and floor tiles, kitchen and bathroom TV has become
more and more popular. It is worthwhile to study the claims which concern quality of materials provided by contractors and developers. The objectives of this paper are to:

1. Identify the court cases related to quality of residential developments
2. Nature of disputes
3. Amount of compensation and the corresponding heads of claims

4. Research method

Relevant court cases over the past 9 years in 2000-2008 concerning first hand housing were obtained from Hong Kong Law Report by using the keyword search “residential”, “housing”, “flat” and “dwelling”. To achieve the aforementioned objectives, First Instance cases include poor quality of fittings and furnishings provided by 1) subcontractors to their corresponding contractors, 2) main contractors to developers, 3) developers to dwelling purchasers. There are 6 first hand dwelling cases only within the study period. Although they are relatively small in number, careful consideration can provide us insight on how the judges made decisions.

1) Ng Chi Keung v Jade Art Design & Contracting Ltd [2008], District Court
2) Maze Aluminium Engineering Co. Ltd. v Go-tech Fire Protection Co. Ltd. [2006], Court of First Instance
3) United Building Material (Hong Kong) Ltd. v E Man Construction Ltd. [2006], Court of First Instance
4) Prudential Project Ltd. v Lau Hon Kwong Henry Trading Co. Ltd. [2004], High Court
5) Luk Kwan Hung Nelson v Victory Mark Investment Ltd. [2003], High Court
6) Bordon Construction Co. Ltd. v Chi Lik Window Works Co. Ltd. [2002], Court of First Instance

The above cases can be categorized into 3 categories 1) Products not of merchantable quality, 2) no problems with the products themselves but they fail to adhere to the contract requirements, 3) contravene legal legislation requirement.

4.1 Products are not of merchantable quality

Among the seven cases concern quality of fittings, 4 cases fall under this category:

1. Maze Aluminium Engineering Co. Ltd. v Go-tech Fire Protection Co. Ltd. [2006],
2. United Building Material (Hong Kong) Ltd. v E Man Construction Ltd. [2006],
3. Court of First Instance Prudential Project Ltd. v Lau Hon Kwong Henry Trading Co. Ltd. [2004],

4. Ng Chi Keung v Jade Art Design & Contracting Ltd [2008]

All plaintiffs except the last one win the case and receive compensation.

**Maze Aluminium Engineering Co. Ltd. v Go-tech Fire Protection Co. Ltd. [2006]**

Maze, was an aluminium contractor which provided service to a domestic development in Tuen Mun. Maze contracted with the defendant (Go-Tech) for the supply of FRP glass. The supply began in November 2001 and Maze completed the installation in August 2002. By September in the same year, Go-Tech had fully received the contracted price for the glass. The principal contractor, Hip Hing Construction Co. Limited complained Maze of defects in FRP glass in August 2003. Maze informed Go-Tech about this. Nevertheless, no remedial work had been undertaken until February 2004. To replace the defective panes, the developer had made another contract with Winner Max to supply and install new FRP glass from June 2004 to September 2004. The cost of that came to $1,500,202. Hip Hing paid that and reimbursed by Maze. Maze sought recovery from Go-Tech. Go-Tech claimed that they would not be liable for any claim which Maze not made within a week’s time according to terms stated in contract. The defendant further argued that the defects were far from being minor imperfections. However, the judge held that the defendants were liable because there were significant material defects in large number of FRP glass panes and there was no express or implied contract terms which concluded that any claim had to be made in 7 days. Consequently, Go-Tech was in breach of its contract in the sense that it fails to provide good merchantable quality panes and Go-Tech had to recover the cost in damages at the costs of 1,500,202.

**United Building Material (Hong Kong) Ltd. v E Man Construction Ltd. [2006]**

E Man, a subsidiary of Henderson Land Development Company Limited, entered into contract with United on 1st December 1997. United supplied E Man 500,000 sq. m. mosaic tiles at $31 per square metre. Tiles delivered by United were not of merchantable quality on several days between December 1997 and August 1999. Some of the tiles’ color faded after they were washed with a cleaning agent KF-28. E Man therefore alleged United for breach of the Contract, United. E Man also argued that the tiles delivered on site had been failed to comply with the Japanese Industrial Standard which was specified in the Contract. United denied its obligation under Japanese Industrial Standard and claimed that the tiles delivered which would not be discoloured when they are washed with KF-28.

It is evident from the contract that colour was an important consideration for the parties. Hence, the learned judge held that United had not fulfilled its obligation under the contract. Tiles with colours which easily discolored by applying common cleaning agent would negate the importance of the contract attached to colour. United's catalogue stated that "Atlantic" glazed ceramic tiles can be cleaned with 3-5% HCl, it would be reasonable for E Man to assume that tiles would not be
discoloured upon being washed with a 3-5% HCl solution. Thus, the defendant had to pay 301,415.70 to the plaintiff as compensation.

**Prudential Project Ltd. v Lau Hon Kwong Henry Trading Co. Ltd. [2004]**

The Plaintiff was the main contractor of a residential development project. The Defendant was interior decoration sub-contractor. The defendant failed to supply doors of merchantable quality. 1) The main door surfaces were ridged and patterned with four and half pieces or six pieces of veneer instead of four pieces; 2) the vertical and horizontal members of the door frames were not properly jointed with 45 degree joint; 3) colour of the doors and frames did not match; 4) the locks were not properly installed; 5) marble works were damaged by the installation.

The judge assessed the Plaintiff's damages to be $1,991,687.45 under the following headings:

Costs of completing outstanding works and rectifying defective works

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative and supervision charges</td>
<td>$60,000.00</td>
</tr>
<tr>
<td>Deductions by main contractor</td>
<td>$8,850.00</td>
</tr>
<tr>
<td>Costs of preservative treatment test</td>
<td>$4,500.00</td>
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<tr>
<td>Labour Tribunal pay-outs</td>
<td>$278,497.59</td>
</tr>
<tr>
<td>Over-payment</td>
<td>$152,893.70</td>
</tr>
<tr>
<td>Total</td>
<td>$1,991,687.45</td>
</tr>
</tbody>
</table>

**Ng Chi Keung v Jade Art Design & Contracting Ltd [2008]**

Mr. NG and Mr. Kwong (director of Jade Art) worked together between October/November 2004 and October 2005 for decoration and fitting out works at 17 residential premises. Mr. Ng mainly carried out woodwork at the premises and arranged for wooden furniture to be made. Mr. Kwong’s company provided interior design and decoration works for clients. Mr. Kwong liaised between the clients and other contractors which included Mr. Ng to provide different aspects of decoration and fitting out works at the premises. Fees agreed in respect of the works covered by these 17 projects was $1,219,777, and that Mr. Kwong paid to him a sum of $971,300 between November 2004 and May 2006. Mr. Ng claimed that a balance of $231,375 remains owing and unpaid. Defects were found in the woodwork of Mr Ng. The claims were dismissed because of four reasons:
1. Allegations of errors made in the work carried out on projects are unsupported by any of his original designs, drawings or photographs.

2. The plaintiff had continued to make payments to Mr. NG until May 2006 without any evidence of complaint, does not in line with his claim of the defects detected in the projects.

3. Mr. Kwong was happy to give Mr. NG new projects between commencement of work at the Hang Fa Chuen project in mid-November 2004 and the last project in July 2005. This contradicts his claim that Mr. NG had made errors and produced defective work.

4. When cross examined on this, Mr. Kwong accepted that defects in the work on the projects had all been remedied to his satisfaction.

4.2 Breach of contract

Second type of claims arises because the contractor has provided products which have no problems or defects themselves but there was deviation in the requirements as specified in the contract. There was, however, only one case within the past 9 years.

**Bordon Construction Co. Ltd. v Chi Lik Window Works Co. Ltd. [2002]**

The plaintiff was the main contractor for a residential development on the Peak. The defendant was the sub-contractor for doors, louvers, sky light, windows installation and canopy works. The sub-contract was dated 23 September 2000 but terminated on 21 December 2000 by the plaintiff. The defendant was accused of breach of contract because it had used 1) sliding doors instead of folding/sliding doors as specified in contract; 2) mullions/transoms comprising of small components instead of one single piece as specified in contract.

In determining the head of quantum, the judge considered the issue under 4 heading:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of completing the works</td>
<td>$500,000</td>
</tr>
<tr>
<td>Wasted expenditure (for preparing a new tender)</td>
<td>$47,708.48</td>
</tr>
<tr>
<td>Indemnity against further liquidated damages claim</td>
<td>employer will make a claim against the plaintiff for the liquidated damages</td>
</tr>
<tr>
<td>Interest</td>
<td><em>nisi</em> order (infra)</td>
</tr>
</tbody>
</table>
4.3 Contravene current legislation

Luk Kwan Hung Nelson v Victory Mark Investment Ltd. [2003]

On 25 September 1996 the plaintiff bought a flat as his future matrimonial home. The property sales manager mentioned that Flat 25 A was one of the best dwellings among entire building units and would also be opened and spacious with have a ceiling of more than 8-feet high.

Nevertheless, the plaintiff's case sued the developers because the unit had suffered from the following defects: 1) the height measured from the floor to the underside of the beams in rooms was not less than 2.3 m which contravened the provisions of the Building (Planning) Regulation section 24(1); 2) the height of the security bar along the bay window openings was less than the 1,100 mm requirement in height, contravened the provisions in 3A of the Regulations; 3) the height of the bay window base was less than 500 mm from floor level which had failed to meet the requirement stated in the Practice Note for Authorized Persons and Registered Structural Engineers PNAP No.68.

The defendant defended that even if a breach of the Regulations and a contravention of the building plans really existed, flat 25A was still a legal and authorized structure. The judge accepted it as a valid point, but such contravention meant that the defendant had to pay the plaintiffs as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>House value reduction due to the low beams</td>
<td>$1,102,967</td>
</tr>
<tr>
<td>Replacement costs of hardwood board on window</td>
<td>$6,000</td>
</tr>
<tr>
<td>Additional lighting system installation costs</td>
<td>$45,000</td>
</tr>
<tr>
<td>Additional security bars along bay windows installation costs</td>
<td>$5,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$1,158,967</strong></td>
</tr>
</tbody>
</table>

The aforementioned six court cases can be summarized as follows:
### Table 1 Summary of the six court cases

<table>
<thead>
<tr>
<th>Plaintiff and defendant</th>
<th>Plaintiff's background</th>
<th>Defendant</th>
<th>Date of Judgment</th>
<th>Date of dispute</th>
<th>Background</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ng Chi Keung v Jade Art Design &amp; Contracting Ltd</td>
<td>Designing and decorating company</td>
<td>Woodwork contractor</td>
<td>2008/03/14</td>
<td>2004/10-2005/10</td>
<td>Defects or errors in the works carried out under the Contracts</td>
<td>0</td>
</tr>
<tr>
<td>Maze Aluminium Engineering Co. Ltd. v Go-tech Fire Protection Co. Ltd.</td>
<td>Aluminium windows fitting specialist</td>
<td>Glass supplier</td>
<td>2006/04/21</td>
<td>2004/02/01</td>
<td>Panes of the FRP glass suffered from readily observable air bubbles</td>
<td>1,500,202</td>
</tr>
<tr>
<td>United Building Material (Hong Kong) Ltd. v E Man Construction Ltd.</td>
<td>Developer</td>
<td>Tile contractor</td>
<td>2006/01/24</td>
<td>1998/12/01</td>
<td>Color of mosaic tiles faded after they were washed with a commonly used cleaning agent known as KF-28.</td>
<td>3,301,416</td>
</tr>
<tr>
<td>Plaintiff and defendant</td>
<td>Plaintiff's background</td>
<td>Defendant</td>
<td>Date of Judgment</td>
<td>Date of dispute</td>
<td>Background</td>
<td>Total</td>
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</tr>
<tr>
<td>Prudential Project Ltd. v Lau Hon Kwong Henry Trading Co. Ltd.</td>
<td>main contractor</td>
<td>sub-contractor of interior decoration and fitting</td>
<td>2004/07/26</td>
<td>2002/10/21</td>
<td>1) The main door surfaces were ridged and patterned with four and half pieces or six pieces of veneer instead of four pieces; 2) the vertical and horizontal members of the door frames were not properly jointed with 45 degree joint; 3) colour of the doors and frames did not match; 4) the locks were not properly installed; 5) marble works were damaged by the installation.</td>
<td>1,991,687</td>
</tr>
<tr>
<td>Plaintiff and defendant</td>
<td>Plaintiff's background</td>
<td>Defendant</td>
<td>Date of Judgment</td>
<td>Date of dispute</td>
<td>Background</td>
<td>Total</td>
</tr>
<tr>
<td>Lak Kwan Hung Nelson v Victory Mark Investment Ltd.</td>
<td>Vendor of residential unit</td>
<td>Developer</td>
<td>2003/09/19</td>
<td>1997/10/8</td>
<td>1) The height measured from the floor to the underside of the beams in the bedroom was not less than 2.3 m; 2) the height of the security bar along the middle of the bay window openings was less than 1,100 mm height ; (3) the height of the bay window base was less than 500 mm from the floor level.</td>
<td>1,158,967</td>
</tr>
<tr>
<td>Bordon Construction Co. Ltd. v Chi Lik Window Works Co. Ltd.</td>
<td>main contractor</td>
<td>sub-contractor</td>
<td>2002/07/09</td>
<td>2000/12/21</td>
<td>1) Used sliding doors instead of the folding/sliding doors as specified in contract; 2) used of mullions/transoms comprising of small components instead of one single piece as specified in contract.</td>
<td>547,708</td>
</tr>
</tbody>
</table>

5. Discussions

Disputes over quality issues which ended up in court can only be found occasionally in Hong Kong. While there were more than 10,000 units produced each year, there were only 6 court cases in
2000-2008. Despite its small number, the above cases have illustrated several important information: 1) most of the cases concerned the quality of dwellings arose when subcontractors failed to provide merchantable quality products; 2) there was once in a blue moon case that the contractors contravened the requirement stated in the contract, e.g. the provision of sliding door instead of sliding and folding doors in the case aforementioned; 3) efficiency of court was quite low, it took a long time for parties to receive settlement from judges. Some of the cases, e.g. United Building Material (Hong Kong) Ltd. v E Man Construction Ltd. [2006] took the parties more than 2600 days. Even simple case as Bordon Construction Co. Ltd. v Chi Lik Window Works Co. Ltd took more than 580 days to receive the decision from the judge 4) In considering the decisions on heads of compensation, the judge mainly considered a) costs of completing the task by other contractors e.g. Prudential Project Ltd. v Lau Hon Kwong Henry Trading Co. Ltd. [2004], Bordon Construction Co. Ltd. v Chi Lik Window Works Co. Ltd. [2002], Luk Kwan Hung Nelson v Victory Mark Investment Ltd. [2003] and b) administrative costs for new contract arrangement, e.g. Bordon Construction Co. Ltd. v Chi Lik Window Works Co. Ltd. [2002], Luk Kwan Hung Nelson v Victory Mark Investment Ltd. [2003].

6. Areas for further research

There are a number of other areas which are worth studying so as to further develop the research. Firstly, this research only reveals cases happen in the latest 9 years, longer time span might yield a better view on the developers and contractors’ fittings issues. Second, this study only focuses on quality issues in Hong Kong; it will be valuable to expand the study to other cities, such as London, Singapore and Bangladesh.

References


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TG72 Public Private Partnership
TG73 R&D Programs in Construction
TG74 New Production and Business Models in Construction
TG75 Engineering Studies on Traditional Constructions
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TG78 Informality and Emergence in Construction
TG79 Building Regulations and Control in the Face of Climate Change
TG80 Legal and Regulatory Aspects of BIM
TG81 Global Construction Data
W014 Fire
W018 Timber Structures
W023 Wall Structures
W040 Heat and Moisture Transfer in Buildings
W051 Acoustics
W055 Construction Industry Economics
W056 Sandwich Panels
W062 Water Supply and Drainage
W065 Organisation and Management of Construction
W069 Housing Sociology
W070 Facilities Management and Maintenance
W077 Indoor Climate
W078 Information Technology for Construction
W080 Prediction of Service Life of Building Materials and Components
W083 Roofing Materials and Systems
W084 Building Comfortable Environments for All
W086 Building Pathology
W089 Building Research and Education
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W098 Intelligent & Responsive Buildings
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W104 Open Building Implementation
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<table>
<thead>
<tr>
<th>Fee Category</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
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</thead>
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<tr>
<td>FM1 Fee level</td>
<td>11837</td>
<td>12015</td>
<td>12195</td>
<td>12378</td>
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<td>FM2 Fee level</td>
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<td>8010</td>
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<td>FM3 Fee level</td>
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<td>2756</td>
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<td>AM1 Fee level</td>
<td>1364</td>
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<td>1246</td>
<td>1371</td>
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<td>IM Fee level</td>
<td>271</td>
<td>275</td>
<td>279</td>
<td>283</td>
</tr>
</tbody>
</table>

All amounts in EURO

The lowest Fee Category an organisation can be in depends on the organisation’s profile:

FM1 Full Member Fee Category 1 | Multi disciplinary building research institutes of national standing having a broad field of research
FM2 Full Member Fee Category 2 | Medium size research Institutes; Public agencies with major research interest; Companies with major research interest
FM3 Full Member Fee Category 3 | Information centres of national standing; Organisations normally in Category 4 or 5 which prefer to be a Full Member
AM1 Associate Member Fee Category 4 | Sectoral research & documentation institutes; Institutes for standardisation; Companies, consultants, contractors etc.; Professional associations
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