

**This is Peer Reviewed Paper  
FIG Working Week 2011**

## **Appraisal of Common Dispute Problems over Residential Building Projects in Hong Kong**

**Borvorn Israngkura Na Ayudhya, Thailand**

**Key words:** Construction delay; Disputes; Residential projects

### **SUMMARY**

The objectives of this research were to identify and appraising the common dispute problems in residential building projects in Hong Kong. The interview and questionnaire method were used in this research. Randomly distributed questionnaire technique was applied to various construction practitioners of 175 consisting of owners, consultants and main contractors to evaluated the severity of the 43 identified dispute factors. This survey found that contract and specification category was the highest concern among four main dispute categories for construction practitioners. The delay in progress payment by owner factor was ranked as the highest overall dispute factors during construction. The results of the survey also indicated that construction projects faced moderately severe dispute level between owners and main contractors.

# Appraisal of Common Dispute Problems over Residential Building Projects in Hong Kong

Borvorn Israngkura Na Ayudhya, Thailand

## 1. INTRODUCTION

Over the past decades, construction practitioners have tried to develop and implement the right contractual method which fit the best approach of their needs and minimizing disputes in construction project. Nonetheless, construction disputes have still been found from articles and research papers. Assaf and Al-khali (1995) found and reported that the contract disagreement was one of their main delay causes in large building projects. Similarly, Chalab and Camp (1984) conducted a review on project delays in developing countries during planning and construction stage. In their research, they found that the contractual disagreement caused both delay and cost overruns on the early stages of construction. Rwelamila and Hall (1995) found that the timely completion of the project was frequently seen as a major criterion of project success. Wilson (1982) examined the role of the owner and architect/engineer's roles in the prevention and resolution of construction claims. Wilson also summarized the causes of construction claims which include change orders, adverse weather and unclear contract agreement. Construction disputes are common in construction projects and often the result of miscommunication among parties involved in construction project. The degree of seriousness is depended on its nature of cause, content and complexity of contract agreement. It requires an effort and support from legal, design and construction team in order to minimizing the dispute among construction team. Therefore, a realistic time for project execution will decrease the possibility of disputes between clients and the main contractors. A great deal of information concerned with construction disputes may be found in the literature review. The increased interests in construction disputes are due, in part, to efforts by the government to reduce construction delays. There has been a considerable and continued interest in the effect of construction dispute in international contract agreement.

## 2. LITERATURE REVIEW

The litigation in international construction industry has been frequency increased on major international projects. It is still very common in the most parts of the world even with modern management techniques have been implemented (Hinchey and Schor, 2002). The construction disputes have further been found in six studies and outlined the main causes of delay in large construction, building project and their relative importance in the United states (ENR, 2000), Nigeria (Aibinu and Odeyinka, 2006), Indonesia (Manfield *et al.*, 1994), Hong Kong (Kaming *et al.*, 1997), Saudi Arabia (Chan and Kumaraswamy, 1997) (Assaf *et al.*, 1995) and Lebanon (Khalil and Al-Ghafly, 1995). They found substantial agreed on disputes among owners and main contractors caused delay in construction projects. Disputes in construction may be caused by one or a combination of several reasons. It may start with a simple reason and lead to a substantial set of interrelated complex disputes in contract agreement. Most of the typical

disputes are caused by factors such as unrealistic contract duration and cost, differing site conditions, change orders, delays, impact and ripple effects of delays, evaluation the quality and quantity of works, owner furnished items, difference in the interpretation of plans and specifications, unfulfilled duties, acceleration, inefficiency and disruption (Mezher and Tawil,1998) (Groton, 1997). Facts about site conditions that are overlooked at the bidding stage could increase the cost and the risk of disagreement. During construction period, the conflict among owner and main contractor has become increasingly prone activity. Cost overruns may amount to a substantial percentage of the overall contract value and delays may reach disturbing proportions. The allocation of risk among the owner, the main contractor and the designer is stated in the construction contract. However, the construction contract is typically prepared by the owner who ensures that a considerable portion of the risk rests with the main contractor. The main contractor therefore faces a multitude of risk among which are inflation, strikes, labour problems, adverse weather, accidents, shortages of materials and staffs and unforeseen conditions at the construction site. Imbalances in risk allocation may eventually end up in disputes between involved parties and probably seek for settlement in court.

### **3. METHODOLOGY**

Primary data were obtained from various opened-access information which were in the form of documents, reports, rules and regulations, guidelines and procedure prepared by the government institutions/agencies and the consultants. Secondary data were derived from questionnaires and interviews which conducted through owners, consultants, domestic and international main contractors in Hong Kong. The respondents/interviewees were mainly experienced in construction projects. Their positions are director of legal, director of procurement division, director of accounting division, director of budget administration division, project managers, site engineers and top executive positions in private construction and consultant companies.

In the part of survey, the questionnaires were classified into two different types for owners and main contractors/consultants. The questions were structured according to the purpose of study. The questionnaires comprised open-ended and closed-ended questions. The key target was to examine the existing situation, perceptions, feelings, attitudes, problems and difficulties of owners and main contractors/consultants during construction. A hand-delivered questionnaire method was used in order to minimizing the low respondents. Furthermore, interviewers were also available to answer questions relating to the questionnaire. The survey resulted were analysed by using the severity index approach.

Based on the response to the survey, a severity index was calculated to interpret the degree of seriousness effect of those problems. This index was calculated as follows (Dominowski, 1980)

$$\text{Severity index } (I) = \frac{(\sum_{i=0}^4 (a_i)(x_i))}{(4\sum x_i)} \times 100\% \quad (1)$$

where

$a_i$  = constant expressing weight given to  $i$ th response:  $i = 0, 1, 2, 3, 4$   
 $x_i$  = variable expressing frequency of  $i$

*The response for  $I = 0, 1, 2, 3, 4$  illustrated as follows:*

$x_0$  = frequency of very often response and corresponds to  $a_1 = 4$ ;

$x_1$  = frequency of often response and corresponds to  $a_2 = 3$ ;

$x_2$  = frequency of moderate response and corresponds to  $a_3 = 2$ ;

$x_3$  = frequency of not often response and corresponds to  $a_4 = 1$ ;

$x_4$  = frequency of seldom response and corresponds to  $a_5 = 0$ ;

Equation (1) was used to calculate the severity index for all disputes factors. The index was ranked for residential building projects. The severity index was categorised into five levels. The 0-15.5% was categorised as none severe; 15.5-38.5% is categorised as fairly severe; 38.5-63.5% is categorised as moderately severe; 63.5-88.5% is categorised as severe; and 88.5-100% is categorised as most severe. The categorisations reflect the scale of the respondents answer to the questionnaire. The severity index of a category was the average severity indexes of all its related problems. The results of the survey are shown in table 3 and 4.

#### 4. RESULTS AND DISCUSSIONS

Common dispute factors between owners and main contractors were based from both literature review and interviews. The 43 common dispute factors were identified and shown in table 4. In order to present the identified problems; the common dispute factors were classified into four main dispute categories. Each dispute category reflects issues that have a common purpose. Considering dispute factors among owners and main contractors, Table 1 presented type of organization with their response rate. The total rate of return was 82%(144). The domestic contractors, international contractor and consultant companies returned questionnaire with return rate of 88%(66), 82%(41) and 74%(37) respectively. The evaluation of overall return rate was considered as excellent (Dominowski, 1980). He suggested that any rate of return over 50% can considerably be reported, while the overall value above 60% and 70% can be mentioned as good and excellent respectively.

Information on type of residential construction works were shown in table 2. While, comparison overall severity index of main dispute category in residential construction projects were shown in table 3. These profiles indicated that disputes in residential construction projects were fairly common in Hong Kong. In table 4 showed comparison severity index factors on residential construction projects.

Table 1 Type of organization with their response rate

Organization	Number of questionnaires		Percentage return
	Sent	Return	
Contractor (Domestic)	75	66	88
Contractor (International)	50	41	82
Consultant	50	37	74
Total	175	144	82

Table 2 Type of residential construction works

Classification	Number of projects
Sky-high building	18
Storyed building	37
House	26
Detached house	14
Total	95

Table 3 Comparison severity index of main dispute category in residential construction projects

Overall	Responses					Severity index (%)	Rank
	Most severe	Severe	Moderately severe	Fairly severe	None-severe		
Contract and specification	0	5	3	2	0	56.8	1
Financial	0	2	3	6	1	37.8	4
Environment	0	3	3	2	0	52.5	2
Other common	0	0	13	0	0	46.7	3
Total	0	10	22	10	1	48.45	

Table 4 Comparison severity index factors on residential construction projects

Issues	Severity index (%)	Rank	Overall rank
<b>Contract and specification dispute category</b>	<b>56.8</b>	<b>1</b>	
Insufficient working drawing details	70.7	4	7
Inaccurate bill of quantities	72.0	2	4
Inability of main contractor to sublet the contract during bidding	50.2	7	19
Government's policy on hand-over the construction site	23.3	10	37
Violating condition of the contract	66.0	5	10
Poorly written contract	71.4	3	6
Unrealistic contract durations	74.1	1	3
Mistakes and discrepancies in design documents	38.0	9	33
Change orders	48.6	8	20
Shop drawing approval	53.5	6	16
<b>Financial dispute category</b>	<b>37.8</b>	<b>4</b>	
Delay in progress payment by owner	77.4	1	1
Fiscal budget	14.6	12	43
Payment system of owner	21.2	8	39
Main contractor financial problems	54.3	4	15
Inflation	21.7	7	38
Exchange rate	30.9	6	35
Bank policies	17.4	10	41
Domestic payment procedure	20.1	9	40
Oversea payment procedure	16.3	11	42
Accuracy of project cost estimate	69.6	2	8
Evaluation of completed works	63.0	3	11
Fluctuation in materials cost and labour during construction	46.7	5	22
<b>Environment dispute category</b>	<b>52.5</b>	<b>2</b>	
Adverse weather conditions	57.5	4	14
Act of gods	66.5	3	9
Unforeseen problem underground	75.3	1	2
Inappropriate type of foundation	71.9	2	5
Noise pollution	41.5	6	29
Dust pollution	36.1	7	34
Approval environment assessing impact from local authority	46.2	5	23
Debris and construction junks	25.2	8	36
<b>Others dispute category</b>	<b>46.7</b>	<b>3</b>	
Lack of communication between construction practitioners in project	62.0	1	12
Lack of skill labour and engineers	45.5	6	24
Slow in making decision from owner	40.1	12	31
Deficiencies in contractor's organization	42.9	7	25
Deficiencies in public agencies'organisation	42.2	10	28
Unexpected social events	42.4	9	27
Bureaucratic	40.8	11	30
Third party delays	42.5	8	26
Major accidents	39.4	13	32
Communication with engineers and main contractor	51.6	3	17
Unavailable of professional construction management	47.7	5	21
Poor quality of completed works	59.2	2	13
Poorly done planning and scheduling	50.7	4	18

#### **4.1 Contract and specification dispute category**

From table 3, contract and specification dispute category was ranked as the highest overall dispute category among four main categories. The rate of severity of was classified as moderately severe. These finding pronounced the need for the provision of evaluation of completed works must be monitored and improved. Furthermore, change orders in large construction project were a consequence of insufficient working drawing details, inaccurate bill of quantities and unrealistic contract durations which affect project durations during the execution of the project. This caused the dispute and delay between owner and main contractor. The main reason why considerable works had been frequently changed by most construction owners was due to sufficient time and effort were not spent at the preconstruction phase for feasibility studies, design and site survey and exploration.

#### **4.2 Financial dispute category**

As far as financial dispute category was concerned, the result showed in table 3 that the overall level of severity in financial category was rated as fairly severe. In table 4, financial dispute category was overall ranked as 4<sup>th</sup> dispute category place. However, delay in progress payment by owner factor was ranked as the highest severity index dispute factor in residential construction projects. This was due to natural of main contractors to concern about the cash flow in their account even though owner had a good reputation on punctuality payment and already been granted for construction loan from banks. Failure to provide steady montly progress payment to main contrator will cause agreed project objectives less carry output.

It was further found from interviewees that the payment was sometime delayed. In times of recession and intense competition with low profit margins, owner had often had to depend on interest earned from delayed payments to maincontractors. The progress payment was usually transferred to main contractor designated bank account within 14 days after all requested documents have been approved by authorised person. Nonetheless, it might take longer than agreed. This is usual case for developing countries in making payment to main contractors at every begining of the payment (Frimpong,2000)(Israngkura Na Ayudhya,2009).

#### **4.3 Environment dispute category**

Regarding to environment dispute category, it was ranked as 2<sup>nd</sup> overall highest dispute category. Unforeseen problem underground dispute factor was the highest severity index in environment dispute category. In order to alleviate the issue, proper investigate on historic background of construction site should be deployed. It was also worth to be mentioned that noise and dust pollution were becoming concern issue among construction practitioners in construction site where high buildings and dense residential place are located. Noise and dust might cause inconvenience for neighbours. Restricted time was given to main contractors. Approval environment assessing impact from local authority factor is now becoming a concern factor to construction practitioners. The new construction site must have evaluation

of environment assessing impact before construction can begin. The commencement of construction can also be delayed for months if evaluation of assessing impact failed. The discussion between local authority and main contractor can lead to serious dispute. Consequently, project can be further delay. Therefore, comply with local authority in every single detail was a wise choice.

#### **4.4 Other common dispute category**

Other common dispute category was rated as moderately severe in residential construction projects. Construction practitioners ranked this dispute category as the 3<sup>rd</sup> highest overall dispute category from four main dispute categories. Lack of communication between construction practitioners in project factor was rated as highest priority concerned in others common dispute category. In order to alleviate the problems in this dispute category, owners and the main contractors should carefully review all aspects of project in order to ensure that there was a minimum error.

### **5. CONCLUSIONS**

The conclusion can be drawn from this research and the results of the analysis of the survey dispute problems in residential building construction projects in Hong Kong as follows. This research has identified and classified 43 related factors of common interface dispute in construction projects in Hong Kong. These common dispute issues are between owners and main contractors. The main dispute problems can be classified into 4 main categories: contract and specification, financial, environment and other common. All main dispute categories and their related dispute factors were found to have frequency of very often to seldom response on the dispute factors among construction practitioners. It can be further concluded that residential building construction projects were evaluated as moderately severe dispute with overall severity index of 48.45 percent. The conclusion can be further drawn from identified results that contract and specification dispute category was ranked as 1<sup>st</sup> dispute category and followed by environment, other common and financial. The delay in progress payment by owner factor was the highest individual severity index and followed by unforeseen problem underground, unrealistic contract durations, inaccurate bill of quantities and inappropriate type of foundation. In order to minimise the dispute risks and burden costs of dispute impact, owner should also open-minded on introducing other type of contracts such as target cost contract, cost-plus-incentive-fee contract and design build and construction management. Including, promoting and providing incentives to construction practitioners should be transplanted and faired if project can be early completed.

Nevertheless, in this research had few obstacles which were shortcomings in the identified data such as the contract agreement and construction experience of the interviewers. The inclusion of the construction experience of the main contractors as predictor within the questionnaire and the model underlines the importance of this extension of the analysis into the internal information of the firms. The interview and collecting of the company specific



data were both costly and time consumed compared with that of publicity available data.

## ACKNOWLEDGEMENT

This study was partly financially supported by Grant-in-Aid for Scientific Research No.18206048 from Ministry of Education, Culture, Sports, Science and Technology of Japan.

## REFERENCE

- Assaf, S.A, Alkhali, M. Al-Hazmi, M.(1995) Causes of delay in large building construction projects. *Journal of Management in Engineering, ASCE*,11(2), 45-50
- Aibinu, A. A. And Odeyinka, H. A. (2006) Construction delays and their causative factors in Nigeria. *Journal of Construction Engineering and Management, ASCE*, 132(7), 667-677
- Chalabi, F.A. and Camp, D. (1984) *Causes of delay and overruns of construction projects in developing countries CIB Proc, W-65, 2, 273-734*
- Dominowski, R. (1980) *Research methods*. Prentice Hall, Englewood Cliffs, N.J.
- Engineering News-Record (ENR) (2000) *Arbitrators found on the web*, 245(7), 37
- Frimpong, Y. (2000) Project management in developing countries: causes of delay and cost overruns in construction of ground water projects. Unpublished Master Research Project. University of Technology, Sydney, Australia.
- Groton, J. P. (1997) Alternative dispute resolution in the construction industry. *Dispute Resolution Journal*, Summer, 49-57
- Hinchey, J. and Schor, L. (2002) The quest for the right questions in the construction industry. *Dispute resolution Journal*, August/October, 10-20
- Israngkura Na Ayudhya, B. and Kunishima, M. The performance of disbursement procedures in highway works in Thailand. *International Journal of Engineering, Science and Technology*, 2009; 1(3), pp 136-145.
- Kaming, P. F. Olomaliye, P. O. Holt, G. D. Harris, F. C. (1997) Factors influencing construction time and cost overruns on high rise projects, *Construction Engineering and Economics*, 15, 83-94
- Khalil, A. and Al-Ghafly, M. A. (1999) Delay in public utility projects in Saudi Arabia. *International Journal of Project Management*, 17(2), 101-6
- Mansfield et al. (1994) Causes of delay and cost overruns in Nigerian Construction projects. *International Journal of Project Management*, 12(4), 254-60
- Mezher, M. and Tawil, W. (1998) Causes of delays in the construction industry in Lebanon. *Engineering Construction and Architectural Management Journal*, 5(3), 251-60
- Rwelamila, P.D. and Hall, K.A. (1995) Total system intervention: an integrated approach to time, cost and quality management. *Construction Management and Economics*, 13, 235-241
- Wilson, R.L. (1982) Prevention and resolution of construction claims. *Journal of Construction Division*, 108(CO3), 390-405

## **BIOGRAPHICAL NOTES**

Dr. Borvorn Israngkura Na Ayudhya is senior lecturer at Department of Civil Engineering at Rajamangala University of Technology Krungthep. He holds B.Eng in Civil Engineering from University of London, a Master in Structuring Engineering from University of Surrey and a Ph. D. in Construction management and infrastructure system from University of Tokyo. His current research interests included international disbursement procedures, project administration, construction delays and claims.

## **CONTACTS**

Dr. Borvorn Israngkura Na Ayudhya  
Rajamangala University of Technology Krungthep (Civil Engineering Department)  
Address 2 Nanglinchi rd. Tungmahamek Sathorn Bangkok 10120  
Bangkok  
THAILAND  
Tel. + 6681-838-1112  
Fax + 662-2879638  
Email: [ayudhya2003@yahoo.com](mailto:ayudhya2003@yahoo.com)