

FEASIBILITY OF THE DELAY AND DISRUPTION PROTOCOL FOR CLAIMS MANAGEMENT IN SRI LANKAN CONSTRUCTION INDUSTRY

R.A.N.M. Pathirana* and L.D. Indunil P. Seneviratne
Department of Building Economics, University of Moratuwa, Sri Lanka

ABSTRACT

Delay and disruption claims are difficult to resolve due to issues in claims management in construction industry. Those issues are occurred due to wrong practices in the industry and having vague areas in delay and disruption. Although, there are some methods to diminish delay and disruption events, still there is no proper way to deal with those issues. Having a guideline for claims management is an effective mechanism. In that scenario, Society of construction law's (SCL) delay and disruption protocol is the commonly used guideline in other countries and which have comprehensive scope. Hence, it is required to discover how far SCL protocol is appropriate to Sri Lankan construction industry. Therefore, the aim of this research is to investigate the feasibility of adopting SCL protocol for dealing with issues in delay and disruption in claims management in Sri Lankan construction industry. A comprehensive literature review, a questionnaire survey and semi structured interviews were done as the research method for this paper. Interviewees were selected from questionnaire survey. The findings of this study prove that having a guideline for claims management is important and awareness of SCL protocol in Sri Lanka is comparatively less. Further, it demonstrates that adopting SCL protocol to Sri Lankan construction industry is feasible. Management can achieve sustainable construction practices such as using human resource efficiently, willingness to work and effective time management. Finally, it confirmed that implementing SCL protocol will improve knowledge related claims management and it will enable to improve the claim practitioners' practices.

Keywords: Claims Management; Delay and Disruption; SCL.

1. INTRODUCTION

Project delay and disruption are most critical problems in the construction industry (Aibinu and Jagboro, 2002). Chan *et al.* (2010) described delay and disruption in construction can occur due to a number of reasons such as late provision of information and drawings, design changes instructed by consultant, insufficient resources, incomplete and unclear drawings and poor risk management. Therefore, delay and disruption claims are quite seen often in the construction industry. However, delay and disruption events noticeably affect to the construction industry through time overrun and cost overrun (Aibinu, 2009). Nevertheless, Ward (2005) explained that time which is used to perform a construction work is very important for both client and contractor. But the problem is that even though, there are some well-established claims management practices, most of time delay and disruption claims develop as complicated when it comes to resolve because having issues in delay and disruption (Scott *et al.*, 2004). Those issues are occurred due to wrong practices in the industry and having unclear areas in delay and disruption. Therefore, most of claims remaining unresolved and lead to disputes (Ward, 2005). Hence, it is not unexpected that there should be a way to deal with these issues and to resolve the delay and disruption claims properly. In order to that it is important to evade those issues. Kumarswami and Yogeswaran (2003) concluded that it is worthy if there is an appropriate way or mechanism to resolve those issues in early stages rather than waiting until issues develop as disputes. Consistent with Nisansala (2009), having a proper policy to get guide for good claim practices in the industry and to get knowledge when delay and disruption claims arise is very essential. As stated by Kumarswami and Yogeswaran

* Corresponding Author: E-mail - madhuni2si@gmail.com

(2003), so far, there are two protocols in construction industry. One is SCL (Society of Construction Law's) protocol and other is AACE 29 R (Association for Advancement of Cost Engineering) protocol. Nevertheless, SCL protocol is the widely used document in globally (Braumah, 2013a). Moreover, it has wide-ranging scope than AACE protocol (AACE 2007). Hence, the aim of this study is to investigate the feasibility of adopting SCL protocol to Sri Lankan construction industry.

This paper initially provides a comprehensive literature review in order to identify the prevailing knowledge and importance of the SCL protocol. Then, findings are obtained and further exposed to a discussion. Finally, conclusions are presented from the results.

2. DELAY AND DISRUPTION IN CONSTRUCTION

'Delays' can be commenting as the differences between scheduled time of the project and actual completion time (Ali *et al.*, 2012). 'Delay' is a circumstance which contractor or client bear for non-execution of project within established contract period (Kumarswami and Yogeswaran, 2003). According to these statements, delay can be defined as late execution of the project compared to contract time period. On other hand, 'disruption' can be connoting interruption to normal working procedures (Jayalath, 2013). Consequently, 'disruption' is a circumstance which preventing the construction works (Barry, 2009). When considering these, 'disruption' can be defined as resulting the lower efficiency in contractor's normal working procedures due to disturbance or interruption. However, Beattie (2005) mentioned that delay and disruption are the most prevalent and most costly risks in the industry. Delays and disruptions in construction can cause due to a number of reasons. As stated by Menesi (2007), risk and complexity of modern projects, late provision of information and drawings, design changes instructed by consultant on behalf of client are some causes to arise delay and disruption events in the industry. Furthermore, Birkby and Brough (1993) reported that unforeseeable ground conditions, delayed payments and variance of weather conditions are difficulties for execution of the project. Consequently, consistent with these findings, it can be determined that delays and disruptions occurred frequently in construction industry.

2.1. IMPACT ON DELAY AND DISRUPTION CLAIMS IN CONSTRUCTION

Construction claim is a statement of demand for compensation or extra time by way of evidence formed and point of views advanced by a party (Kululanga *et al.*, 2001). Quantity surveyors, project managers, architects, engineers, external claim consultants and estimators often involve to preparation and assessment of delay and disruption claims (Braumah, 2008). As indicated by research findings of Baduge and Jayasena (2012), delay claim process can be included claim identification, claim notification, claim examination, claim presentation, claim evaluation and claim negotiation.

When contractor identified that he has right for an extension of time or compensation then claim notice has been submitted by the contractor to Engineer. Formerly, during the examination contractor have to use analysis methods to substantiate his claim. After doing analysis contractor should submit the claim to the Engineer with supporting documents then Engineer must examine the claim to evaluate compensation or whether extension of time (EOT) is deserved or not (Hasan, 2013). Then, if contractor does not satisfy with the decision of Engineer then alternative dispute resolution methods have to be taken. Hence, even though there is a well-established delay claim process, claims are difficult to resolve due to having issues in delays and disruptions (Scott *et al.*, 2004). Therefore, most of the time disagreements are occurred between parties. A study by (Barry, 2009) showed that it will not always help to give fair conclusion to the delay claim. Those difficulties are arisen due to wrong practices and having some unclear areas in delay and disruption claim management (Braumah, 2013a).

Some issues are occurred due to wrong practices in the industry such as not updating the construction programme, lacking of updating construction programmes, incorrect mechanism of updating programs, inaccurately use of impacted and as-built programs (Gorse, 2004).

Although, records and documentation system is very important in delay and disruption situation, principle problems are weaknesses in claim notification and presentation as well as most of records and

information submitted by the parties are not relevant to the delaying event or not relevant to master programme (Nisansala, 2009).

According to Jayalath (2013), some issues are occurred related vague areas in delay and disruption. Vague areas mean that those are not clearly expressed, known or described in construction industry. Ward (2011) stated that evaluating the delay claims become very complicated when concurrent delay occurred in the project, because both employers and contractors use the concurrent delay as protection tool. Concurrent delays mean that delays are occurred in a one period of time which more than one event occurred at same time (Barry, 2009). Another issues in current delay and disruption claims practices are problems in assessing process in float such as “who owns the float” (Brammah, 2008). According to Ward (2011), float is the time period which activity or group of activities can be shifted in time without affecting for delay to a completion. On the other hand, researches and practitioners of construction industry use many techniques to evaluate and assess the delay and disruption (Menesi, 2007). Therefore, most of time valuations the delays are become complex due to the inconsistency and not having uniformity of delay analysis techniques (Brammah, 2008). Kumarswami and Yogeswaran (2003) mentioned that it is important to acquire skills and knowledge about delay and disruption events to resolve the claims properly. However, when considering aforementioned literature findings it is clear that still delay and disruption claims are difficult to resolve due to having earlier mentioned issues.

As stated by Aibinu (2009), time overrun, cost overrun, disputes, arbitration, total abandonment and litigation are mainly occurred due to difficulties and complex to resolve the claims. Additionally, Ward (2005) stated that the unresolved claims affect poor commercial and legal relationships, client dissatisfaction, damage to the image and reputation in the construction industry. Considering all the facts cited above, it is clear that overall cost of the project and disputes in construction projects will be high due to unsettled delay and disruption claims. Therefore, it is required to study about the mechanism and proper ways to resolve the claims in appropriate ways by mitigating the aforementioned issues related delay and disruptions.

2.2. CONSTRUCTIONS PROVISIONS OF CONTRACTS

According to Dandeniya (2012) most of contracts in Sri Lanka based on FIDIC and SBD documents. Moreover, Dandeniya (2012) indicated that most of standard forms of contracts in Sri Lanka do not define about disruption. It was demonstrated by stating that 82% is not addressing about disruption in standard forms like SBDs and 75% is not addressing in standard forms like FIDIC. Hence, preparing and evaluating the delay and disruption claims in a fair and reasonable manner have converted in to more challenging problems in construction industry. A study by Nisansala (2009) showed that most of contracts in the industry are not providing much details related delay and disruption.

However, issues related delay and disruption claims management should be managed, possibly to the extent of preventing a dispute resulting from the issues. Therefore, it is required to study about the mechanism and proper ways to resolve the claims in appropriate ways by mitigating the aforementioned issues related delay and disruptions.

Although there are some dispute resolutions which parties can utilize such as, litigation, arbitration, negotiation, mediation, and dispute review boards disputes can be more complicated or even worse when involving a third party (Birky and Brough, 1993). In addition, Thomas (1993) explained that arbitration and litigation is quite costly and time consuming.

Hence, better way is avoiding these problems and conflicts before develop as disputes. Brammah (2008) explained that establishing a guideline is better solution for delay and disruption claims before it become complex situations.

On the same way, Hasan (2013) mentioned that since, standard form of contracts not provide considerable details for the delay and disruption issues, it is essential to have a proper guidance to both parties in construction industry.

Nowadays, certain standard guidelines in the world are emerging to avoid the problems in delay assessment and to eliminate disputes or facilitate settlement of disputes (Hasan, 2013). Industry

practitioners have introduced two guidelines up to now like AACE and SCL to select appropriate techniques of delay analysing as follows.

- Society of Construction Law's Delay and Disruption Protocol (SCL Protocol)
- Forensic Schedule Analysis (AACE 29R-03)

AACE is a protocol which can be used in delay analysing and purpose of AACE is to provide a combining technical reference for the forensic application of critical path method (CPM) of scheduling (AACE 2007).

But conversely, AACE (2007) itself recommended that SCL delay and disruption protocol has wider scope than AACE protocol. UK's Society of Construction Law produced SCL delay and disruption protocol by aiming to provide useful guidance to all parties who involve in delay and disruption process in construction. Hence, SCL protocol is the widely used one in other countries (Braithwaite, 2013b). Therefore, it is worth study to find about the significance of SCL protocol in detail.

2.3. BENEFITS AND IMPORTANCE OF SCL PROTOCOL

There are four sections in SCL protocol which provide useful guidelines mentioned as follows. SCL (2002) explained some key areas in delay such as, entitlement of extension of time, procedure of extension of time, float, concurrency, and acceleration disruption under section one in the protocol. Guidelines about construction programme and documentation have discussed under section two.

Extension of time procedure has explained in section three and further explained how parties should establish a suitable claim procedure (Hasan, 2013). In guidance section four, dealing with disputed extension of time issues after completion of the project have discussed. Under this section, the terms of contract, the nature of proof required, the factual material available and the amount in dispute and the cost of the analysis are described (Gorce, 2004).

Aibinu (2009) discussed that SCL protocol is a useful guidance and as well as a useful framework for delay and disruption events. Moreover, Aibinu (2009) explained the protocol can be used when negotiating, illustrative, and making agreement regarding rules for assessing and quantifying estimated delay and disruption claims at the pre-contract stage as well as post contract stage. Gorce (2004) indicated that SCL protocol is designed to use as a guided document before enter in to a contract and as well as for dealing with compensation and resolving disputes during the construction of project. The benefits of the use of the protocol's model clauses such as reduction disputes costs, improving site efficiency, image of transparency and professionalism are considered to be valuable advantages (Ward, 2011).

However, according to aforementioned literature findings, it can be concluded SCL protocol is very important to mitigate the issues related delay and disruption claims.

But the problem is that "what is awareness of SCL protocol among industry claim practitioners in Sri Lankan construction industry?" and "how far SCL protocol is suitable to Sri Lankan industry?" Therefore, the data collection and analysis were done in order to find the answers to these problems.

3. RESEARCH METHODOLOGY

A comprehensive literature survey was carried out through journals, books, articles, reports, government publications, dissertations, previous research investigations and web pages to identify the basic facts and the theories already subjected to discussion about claims management and SCL protocol. Then, pragmatic research approach was used since this contains both quantitative and qualitative approaches. As data collection techniques, questionnaire survey used to find the awareness of SCL protocol among industry claim practitioners. Consequently, the survey sample unit was identified as professionals who involve in claims management. Questionnaires were distributed to claim practitioners who have experienced more than 5 years by selecting professionals from snowball sampling technique. Fellows and Liu (2003) proposed that qualitative approach was better approach to obtain in depth information. Hence, semi structured interviews were done to find feasibility of adopting the SCL protocol to Sri Lankan

construction industry since it contains mostly qualitative and lengthy. Interviews were taken from industry practitioners who have used SCL protocol for delay and disruption claim management and selected from questionnaire survey. According to findings, there were ten SCL protocol users. Even though ten SCL protocol users were selected as respondents for semi structured interviews, it was stopped when it come up to seven practitioners. Because data saturation was occurred during collecting the data. The data collected from questionnaire survey was analysed using statistical analysis to find the percentage of awareness of the SCL protocol and content analysis was selected to analysis the data collected from semi structured interviews to investigate the suitability of the protocol.

4. FINDINGS THROUGH QUESTIONNAIRE SURVEY

Respondents comprises with 43% contractors, 30% consultants and 27% clients/developers in questionnaire survey. The respondents perform various roles in their particular organisations. Most of respondents were contract administrators and there were six project managers, six head office quantity surveyors, five claim consultants, four site quantity surveyors and two arbitrators/adjudicators. Average experience of professionals who were responded to questionnaire surveys is from seven years to 25 years.

4.1. ISSUES IN DELAY AND DISRUPTION CLAIMS MANAGEMENT IN LOCAL CONSTRUCTION INDUSTRY

According to results, the three most likely issues relevant to delay and disruption highlighted by respondents are irregular updating of construction programme, deficiencies in documentation - record keeping and lacking of providing much guidance on delay and disruption claim management in standard form of contracts used by the industry. Further, as next main issue respondents were identified that most of the conditions relating to extension of time (EOT) in contracts may not define how to assess an EOT claim and how to evaluate the delay events. Moreover, respondents decided that having disagreements between parties also cause for disputes occurred. In addition, selecting suitable delay and disruption analysis method also the most important issue to be considered. The results suggest that parties in construction industry still face significant problems in determining delay and disruption claims.

Issues on vague areas like concurrent delays, float, disruption and acceleration were ranked as lowest. On the other hand, selecting suitable delay and disruption analysis method also identified as major issue in literature findings. Eventually, in order to deal with this issues appropriately, it is important to first find how far can get guidance from standard form of contracts. Therefore, it is essential to discover the extent of addressing the key areas in the standard form of contracts.

As important consideration, respondents were asked to indicate the extent of addressing of key areas related delay and disruption in standard forms of contract such as FIDIC 1999 red book and SBD documents. Results are illustrated in Table 1.

Table1: Key Areas Related Delay and Disruption Events in Standard Form of Contracts

Key Areas	RII	Rank
Delay analysis methods	84.67%	1
Updating construction programme	80.67%	2
Float ownership in the programme	79.33%	3
Global claims	74.00%	4
Concurrent Delay	70.67%	5
Disruption	62.00%	6
Claim for payments of interest	55.33%	7
Acceleration	53.33%	8
EOT and compensation	44.67%	9
Valuation of variations	42.00%	10

Based on the results, even though delay analysis methods, updating construction programme and float ownership in the programme identified as least addressed key areas in standard form of contracts it has obtained relative importance more than 75%.

4.2. NEED FOR A GUIDELINE

Through the findings of literature review it was understood that there is a need for a guideline to mitigate these issues in delay and disruption. In order to further confirmation respondents were asked to indicate their opinions on the need for a guideline for delay and disruption to the local industry. 100% of the respondents from contracting firms, 89% of the respondents from consulting firms and 88% of respondents from developers firms stated that there is a need a guideline. When consider overall results the 93% of the respondents considered the need for a guideline to the industry.

4.3. AWARENESS OF PROTOCOLS

Findings show that 54% from contractors, 33% from consultants and 25% from developers are aware about the SCL protocol and while 23% from contractors, 22% from consultants and 13% from developers are aware about the AACE 29R protocol. Based on the summary of result most popular protocol among contractors, consultants and developers, is SCL delay and disruption protocol. AACE 29R forensic analysis protocol has least awareness. When consider overall picture, in local construction industry, 40% of total respondents are aware about the SCL protocol and 20% of total respondent are aware about the AACE 29R forensic analysis protocol.

4.4. USAGE OF PROTOCOLS

When consider with respondents who aware the protocols, then 83% are using the SCL protocol and 33% are using the AACE protocol. Only 33% from total respondents are using SCL protocol and 7% are using AACE protocol. However, consistent with literature findings, Braimah (2013a) stated that SCL protocol is the widely used guidance document in other countries. Although, industry practitioners are not frequently using these guidelines, when compare with AACE document, SCL protocol is the most frequently using guideline than AACE document. Moreover, to investigate the practical usage of these protocols, further respondents were asked the extent of using of the protocols. Nevertheless, interesting finding is that most of SCL users have been used it in medium extent.

5. FINDINGS THROUGH INTERVIEWS

Consequently, interviews were done to investigate the feasibility of adopting the SCL protocol to local industry.

5.1. IMPORTANCE OF SCL PROTOCOL

As the first step to investigate the feasibility of SCL delay and disruption protocol, general opinions about SCL protocol were investigated. Consistent with results, 6 respondents (86%) of the interviewed experts believed that having guidance such as SCL delay and disruption protocol in Sri Lanka is important for claims management in construction. These opinions are in line with ideas given by Aibinu (2009) who explained that SCL protocol is a useful guidance and a useful framework for claims management. One respondent said that “*most of the issues in claims related concurrent delay, float, construction programme, global claims are addressing in SCL protocol. Therefore, SCL can be used as guide in these areas*”. The next most common opinion given by the interviewees was “*this is the only effective document which can be used in any delay claim situation*”. Furthermore, when consider other opinions; protocol has the power to manage employer’s own risks of change during the construction period rather than having to depend upon the contractor. Supplementary, respondents indicate that SCL protocol help to reduce disputes and cost of the project. However, majority was indicated that having SCL delay and disruption protocol is very effective.

When considering the theoretical accuracy of the guidance in SCL protocol, all respondents (100%) were agreed for that and mentioned all guidance are theoretically accurate. five respondents (71%) from interviewees indicated that there are no any guidance which contradict with generally using standard form of contracts in Sri Lanka such as FIDIC and SBD documents. However, two respondents (29%) from interviewees were mentioned “*guidance of prolongation cost in protocol can't be used. Those are different kind of conditions of contract*”.

On the other hand, the analysis of collected data it is revealed that all seven respondents (100%) were expressed that there is no any guidance in SCL which contradict with the country law in Sri Lanka.

Although SCL protocol is that much important for proper claims management, respondents said that protocol is not widely used in Sri Lanka. As said by respondents, most probable reason for less popular practice of SCL protocol is unfamiliar and unawareness. Less interesting of employers for use SCL protocol also another reason. Moreover, consistent with the interviewees, not having qualified persons in the industry, bureaucratic procedures, and government requirements and thinking attitudes of professionals are also causes for less practice of the SCL protocol in Sri Lanka.

5.2. WAY OF ADOPTING SCL PROTOCOL

Since, SCL protocol is not widely used in Sri Lankan construction industry, analysis is concentrated on applying protocol's guidance into contract document as contractual provisions in order to improve the usage. Nevertheless, respondents mentioned that section 1 and section 4 guidance can be used as contract provisions. But section 2 and section 4 cannot be used because construction programme and delay analysis details cannot be contractual. Because if Construction programme make as contractual, then disputes will be occurred. As well as delay analysis depend on project to project, event by event, person to person.

Therefore, as adopting way, all respondents were pointed out that SCL protocol should use as separate document in claims management. Nevertheless, except three respondents other four respondents indicate that SCL protocol should be used as only guideline. One respondent indicated that “*this protocol should use as separate document. Because this is only guideline. It can't be put in to the contract document*”. Because of according to another respondent “*then disputes can be occurred. Since, parties are bound to do with contract document*”. Moreover, other respondents described that the protocol is not put forward as part of contract document but as a general guide whose endorsements are to be willingly applied with agreement and common sense. Hence, above respondents asserted that parties should themselves refer the SCL protocol's guidance when a situation comes. Because of if try to put in to contract document then parties are bound to do according the protocol and if they do not done along with it then another issues can be occurred. Apart from those believes there were some contradicting ideas of respondents. Moreover, two respondents said that if it does not include then even though, one party prepare delay and disruption claims according to SCL protocol by referring guidance but other party may reject by saying that “*This SCL is not in contract document so there is no any legality to accept*”. Hence, that respondent pointed out there should be legally force to do along with protocol.

Furthermore, according to analysis, five respondents think that protocol should be customised in order to proper implementation. However, there were two respondents who thought that it is not necessary to customize. Those two respondents indicated that the protocol can use as it is because it is the only guideline. If go customise it, other issues can arise. As a consequence of SCL has prepared by experiments over years and experienced persons. When consider other opinion, other five respondents stated that, “*there is a gap between Sri Lankan construction industry level and level mentioned in Protocol. SCL is worthy. But Sri Lankan construction practice is not good*”. Because, respondents indicated that not having qualified persons and not having good construction culture in Sri Lanka are the main reasons.

Consistent with respondents, suggestions for customisation of sections 3 and 4 in protocol have illustrated in table 2.

Table 2: Suggestions to Customize the SCL Protocol

Section	Suggestions
Section 2	<ul style="list-style-type: none"> ▪ Details on breakdown the programme ▪ Details on link ▪ Details on putting lags in construction programme ▪ Submitting sequence of the programme ▪ Details on including miles stone ▪ Details on what records should keep in each situation
Section 4	<ul style="list-style-type: none"> ▪ Details on claim preparation ▪ Details on analysing the delays

Eventually, when consider all above analysis it is revealed that there is a need to implementing a guideline such as SCL protocol to manage the time of the project by doing proper delay and disruption claims in Sri Lankan construction industry. For that, improving knowledge on programming, and teaching SCL guidance in universities and in institutes understanding of SCL should be improved. Supplementary, SCL protocol can be familiarise among employers and other industry practitioners by having workshops and by increasing the awareness of SCL among clients.

6. CONCLUSIONS

Claims are inevitable in the construction industry due to the complexity and the multi-disciplinary involvement in the project. As well as, delay and disruption claims are quite seen often in the industry. However, delay and disruption claims are difficult to resolve due to having issues in claims management. Issues in claims management are deficiencies in documentation and recordkeeping, improper updating construction programme, problems in unclear areas such as concurrent delays, float and not having proper method to select suitable delay analysis technique. Since, most of contracts not providing much details related delay and disruption, if there is a guideline can be mitigate those issues in delay and disruption claims management in Sri Lanka. The SCL protocol is very beneficial document because it addresses vague areas in claims, help to manage the time of construction and transfer the risk fairly among parties. Conversely, it is only effective document which has comprehensive scope prevailing in the industry. Awareness of SCL protocol among claims practitioners in Sri Lanka is comparatively less. There is high usage of SCL protocol among industry practitioners who aware about the protocol. However, as whole there is less usage of the protocol in Sri Lankan construction industry. On the other hand, using the SCL protocol in Sri Lankan construction industry is feasible. Ultimately, there should be improvement of the construction culture in Sri Lanka through enhancing the professionals' thinking, mind and attitudes in order to effective implementation of the SCL protocol to claims management. However, SCL protocol will enable to account the delay and disruption claims more accurately and will benefit to mitigate issues in claims management in Sri Lankan construction industry.

7. REFERENCES

- AACE International Recommended Practice, 2007, January. *Forensic Schedule Analysis TCM Framework: 6.4 – Forensic Performance Assessment* (Publication No. 29R-03) [online]. Available from: <http://www.aacei.org/non/rps/29r-03.pdf> [Accessed 8 June 2014].
- Aibinu, A.A., 2009. Avoiding and Mitigating Delay and Disruption Claims Conflict: Role of Pre-contract Negotiation. *Journal of Legal Affairs and Dispute Resolution in Engineering and Construction*, 1(1), 47-58.
- Aibinu, A.A. and Jagboro, G.O., 2002. The Effects of Construction Delays on Project Delivery in Nigerian Construction Industry. *International journal of project Management*, 20(8), 593-599.
- Ali, A., Smith, A. and Pitt, M., 2012. Contractors' Perception of Factors Contributing to Project Delay: Case Studies of Commercial Projects in Klang Valley, Malaysia [online]. *Journal of Design and Built Environment*, 7(1). Available from: <http://fbe.um.edu.my/images/fab/Files/JDBEVOL7/vol7-04.pdf> [Accessed 22 April 2014]

- Baduge, S. and Jayasena, H.S., 2012. Application of Concurrency Delay Claims. In: *World Construction Conference 2012 – Global Challenges in Construction Industry* [online]. 69–78. Available from: http://www.academia.edu/1772698/Application_of_Concurrency_in_Delay_Claims [Accessed 2 March 2014].
- Barry, D., 2009. Beware The Dark Arts! Delay Analysis and the Problems with Reliance on Technology. In: *A paper presented at Society of Construction Law International Conference* [online]. 1-13. Available from: <http://www.scl.org.uk> [Accessed 8 May 2014].
- Beattie, C.S., 2005. Apportioning the Risk of Delay in Construction Projects: A Proposed Alternative to the Inadequate "No Damages for Delay" Clause [online]. *William & Mary Law Review*, 46(5), 1857-1885. Available from: <http://scholarship.law.wm.edu/cgi/viewcontent.cgi?article=1297&context=wmlr> [Accessed 12 May 2014].
- Birkby, G. and Brough, P., 1993. *Extension of Time Explained*. London, UK: RIBA publications Ltd.
- Braimah, N., 2008. *An Investigation into the Use of Construction Delay and Disruption Analysis Methodologies* [online]. Thesis (MSc.). University of Florida, USA. Available from: http://wlv.openrepository.com/wlv/bitstream/2436/38824/3/Braimah_PhD%2520thesis.pdf?ev=pub_ext_btn_xdl [Accessed 12 June 2014].
- Braimah, N., 2013a. Approaches to Delay Claims Assesment Employed in UK Construction Industry. *Buildings*, 3(1), 598-620.
- Braimah, N., 2013b. Construction Delay Analysis Techniques—A Review of Application Issues and Improvement Needs. *Buildings*, 3(3), 506-531.
- Chan, M., Coffey, V. and Trigunarysah, B., 2010. Steering Towards Pinnacle of Success: The NEC Tenets in Australian Construction Contracting. In: *W113 - Special Track 18th CIB World Building Congress* [online], 402-415. Available from: <http://www.lawlectures.co.uk/w113/documents/wbc2010-proceedings.pdf> [Accessed 21 April 2014].
- Dandeniya, D.A.D.M., 2012. *Contractor's Perspective Concerning Provisions for Disruption Claims in Conditions Of Contract*. Unpublished Dissertation (BSc). University of Moratuwa. Sri Lanka.
- Fellows, R. and Liu, A., 2003. Research Methods for Construction [online]. 2nd ed. Available from: [http://books.google.lk/books?hl=en&lr=&id=bHXPkARZLSwC&oi=fnd&pg=PR8&dq=Fellowes,+R.+%26+Liu,+A.\(2003\).+Research+methods+for+construction+\(2nd+ed.\).&ots=x2SpdeBPr9&sig=D8Q2alNTgHAoAHUuKf24vzULVLM&redir_esc=y#v=onepage&q&f=false](http://books.google.lk/books?hl=en&lr=&id=bHXPkARZLSwC&oi=fnd&pg=PR8&dq=Fellowes,+R.+%26+Liu,+A.(2003).+Research+methods+for+construction+(2nd+ed.).&ots=x2SpdeBPr9&sig=D8Q2alNTgHAoAHUuKf24vzULVLM&redir_esc=y#v=onepage&q&f=false) [Accessed 21 April 2014].
- Gorse, C. A., 2004. Monitoring, Planning and Tracking: Delay, Disruption and Legal Risk Management. In: *20th Annual ARCOM Conference Association of Researchers in Construction Management* [online], 1247-1256. Available from: http://www.arcom.ac.uk/-docs/proceedings/ar2004-1247-1257_Gorse.pdf [Accessed 7 February 2014].
- Hasan, K.T., 2013. *Extension of Time (EOT) and Related Costs in Construction* [PowerPoint slides] [online]. Available from: <http://fidic.org/sites/default/files/FIDIC%20Lecture%20%20EOT%20%26%20Related%20Costs%20in%20Construction.pptx>. [Accessed 5 May 2014].
- Jayalath, C., 2013. *Arguing Construction Claims*. Colombo: S. Godage and Brothers (Pvt) Ltd.
- Kululanga, G.K., Kuotcha, W. and McCaffer, R. 2001. Construction Contractors' Claim Process Framework. *Construction Engineering and Management*, 309-313.
- Kumarswami, M.M. and Yogeswaran, K., 2003. Substantiation and assessment of claims for extensitions of time. *International Journal of project Management*, 21(1), 27-38.
- Menesi, W., 2007. *Construction Delay Analysis under Multiple Baseline Updates*. Available from: <http://hdl.handle.net/10012/2737> [Accessed 18 July 2014].
- Nisansala, M., 2009. *Management of Delay Claims*. Unpublished Dissertation (BSc.). University of Moratuwa, Sri Lanka.
- Scotts, S., Harris, R.A. and Greenwood, 2004. Assessing the New United Kingdom Protocol for Dealing with Delay and Disruption [online]. *Journal of Professional Issues in Engineering Education and Practice*, 130(1), 50-59. Available from: <http://cedb.asce.org/cgi/WWWdisplay.cgi?139669> [Accessed 18 July 2014].
- Society of Construction Law, 2002. *SCL Delay and Disruption protocol* [online]. Available from: <http://www.scl.org.uk/scl-delay-and-disruption-protocol> [Accessed 4 August 2014].

Thomas, R.W., 1993. *Construction Contract Claims*. London, UK: The Macmillan Press Ltd.

Ward, P., 2005. The SOCL's Delay and Disruption Protocol and the Australian Construction Industry. In: *21st Annual ARCOM Conference* [online], 1165-1174. Available from: <http://hdl.handle.net/1959.13/35635> [Accessed 16 August 2014].

Ward, P., 2011. A UK and Australian Perspective of the Suitability of the SCL Protocols' Provisions for Dealing with Float for Adoption and Use by the Australian Construction. In: *27th Annual ARCOM Conference* [online]. 5-7. Available from: http://www.arcom.ac.uk/-docs/proceedings/ar2011-0623-0632_Ward.pdf [Accessed 19 May 2014].