APPLICATION OF THE SAFE WORKING CYCLE (SWC) IN HONG KONG CONSTRUCTION INDUSTRY: LITERATURE REVIEW AND FUTURE RESEARCH AGENDA

Daniel W. M. Chan* and Henry T. W. Hung
Department of Building and Real Estate, The Hong Kong Polytechnic University, Hong Kong

ABSTRACT

The accident rate of the Hong Kong construction industry is very high when compared with other developed countries. Since 1990, the industry has introduced different safety initiatives to minimize the occurrence of site accidents, and there has exhibited a significant decrease in accident rate over the years. The Safe Working Cycle (SWC) is one of the effective safety measures aiming to ensure a tidy working site and raise the safety awareness of construction workers everyday. It comprises the Daily Cycle, Weekly Cycle and Monthly Cycle, and it focuses on the causes of construction accidents and improves the overall safety performance on construction sites. This paper will provide a concise introduction of a research project in relation to SWC in the Hong Kong construction industry. It aims to scrutinize the overall research paradigm of a holistic study on the historical development, underlying concepts and applications of SWC in Hong Kong. The investigation will be accomplished by a combination of data collection methods comprised of archival desktop study, in-depth interviews, detailed case studies and an empirical questionnaire survey. Relevant attributes of SWC including the perceived benefits, potential difficulties and effective recommendations for future implementation will be explored and discussed herein. The research findings are expected to help the decision-makers to generate clearer insights into the effectiveness of SWC in improving site safety, and to allow industrial practitioners to explore whether and how the site accidents can be mitigated via SWC.

Keywords: *Construction Industry; Hong Kong; Safe Working Cycle; Safety Measure; Site Safety Performance.*

1. INTRODUCTION

The high-rise buildings in Hong Kong such as the International Commerce Centre and Two International Finance Centre are noticeable in height of higher than 400 metres. Similarly, the accident rate of the Hong Kong construction industry is also high when compared with other developed countries (Choi *et al*., 2012). The industry has introduced different safety initiatives to minimize the occurrence of site accidents since 1990, and there was a significant decrease in accident rate over the years. Nevertheless, the accident rate of the construction industry is still comparatively higher than other major industry sectors (Labour Department, 2011) and other overseas regions. This study will focus on the issue of construction safety in Hong Kong because of the above reason.

The major causes of construction accidents can be basically categorized into management problems, poor working conditions and workers' carelessness (Tang *et al*., 2003). According to these causes, there were different kinds of safety initiatives that were implemented, such as the Safety Management System (SMS), Performance Assessment Scoring System (PASS), Pay for Safety Scheme (PFSS) and Safe Working Cycle (SWC) (Rowlinson, 2007).

The SWC, also named as the Site Safety Cycle (SSC), was modelled from the Japanese construction industry (Highways Department, 2002). As Japan has maintained a good safety record when compared with Hong Kong (Occupational Safety and Health Council, 2001), SWC is believed to be an effective safety measure in improving the prevailing situation in Hong Kong.

* Corresponding Author: e-mail - daniel.w.m.chan@polyu.edu.hk

The SWC is a safety measure embodying a well-organized safety management system. It comprises the Daily Cycle, Weekly Cycle and Monthly Cycle (Li and Poon, 2007). The aim of SWC is to ensure a tidy working site and raise the safety awareness of construction workers every day (Occupational Safety and Health Council, 2006). It does focus on the causes of construction accidents and improves the overall safety performance on construction sites.

The SWC has been widely adopted in the Hong Kong construction industry particularly in the public sector. It was applied to all public works projects since 15 August 2002 (Highways Department, 2002), such as the Environment, Transport and Works Bureau (Environment, Transport and Works Bureau, 2002).

Due to these underlying reasons, the SWC is chosen to be the core of this study since it is regarded as one of the effective safety measures. The investigation of the effectiveness of SWC can assess the site safety performance in the past and now. The exploration of the difficulties in implementing it can allow us to improve the implementation of SWC in future.

2. RESEARCH AIM AND OBJECTIVES

The SWC has been implemented in the Hong Kong construction industry for almost 10 years since 15 August 2002 and there exhibited a downward trend in accident rate. However it is a doubt about the relationship between the implementation of SWC and the site safety performance. The research aims are to explore the application and effectiveness of SWC in accident prevention and reduction, and what are the difficulties in implementing SWC in Hong Kong, based on literature review, in-depth interview, case study and questionnaire survey. In order to achieve the aim, the research objectives are set out as follows:

(a) To provide a critical overview of current application of the SWC in Hong Kong.

(b) To investigate the effectiveness of the SWC in improving the site safety performance of construction projects.

(c) To determine the key features, perceived benefits and potential difficulties of implementing the SWC and analyze their relative importance.

(d) To suggest insightful recommendations for the successful implementation of SWC in the Hong Kong construction industry.

The proposed research is timely and indispensable because SWC has been introduced in the public sector since August 2002. It is timely for us to review its effectiveness in upgrading the site safety performance and seek further improvement for future use. The research findings are also expected to allow industrial practitioners to investigate whether and how the site accidents can be mitigated via SWC.

3. BACKGROUND OF RESEARCH

3.1. SAFETY PERFORMANCE OF THE CONSTRUCTION INDUSTRY IN HONG KONG

Safety on construction sites in Hong Kong remained a prime concern despite significant improvements were recorded in 2001-2010 (Labour Department, 2011). The high-risk construction industry still recorded the highest accident rate and number of fatalities amongst various major industry sectors. As compared with 2009, the number of construction accidents recorded in 2010 soared from 2,755 to 2,884 by 4.7%, while the accident rate per 1,000 workers dropped from 54.6 to 52.1 by 4.5% (Labour Department, 2011). The occurrence of site accidents always generates a risk on construction projects which is not only delay the completion date but also cause enormous financial losses and even casualties.

3.2. CONSTRUCTION SAFETY INITIATIVES IN HONG KONG

In order to deal with the causes of construction accidents, there were different kinds of safety initiatives that have been introduced and implemented. Rowlinson (2007) listed out all major safety initiatives such as the Safety Management System (SMS), Pay for Safety Scheme (PFSS), Performance Assessment Scoring System (PASS) and Safe Working Cycle (SWC) introduced by the government from 1994-2005 (Table 1). The safety initiatives which have been undertaken to improve the site safety performance can be categorized into four aspects – *Statutory*, *Financial*, *Procedural* and *Punitive-administrative*.

Statutory initiatives are based on the Hong Kong Ordinances, together with the Occupational Safety and Health Ordinance (Construction Industry Institute – Hong Kong, 2009). Examples are the Factories and Industrial Undertakings (Safety Management) Regulations enacted in 1999, and the amendments to the Construction Sites (Safety) Regulations in 2003 (Rowlinson, 2007).

Table 1: Summary of the Major Construction Safety Initiatives in Hong Kong from 1994 to 2005 (Source: Rowlinson, 2007)

Year	Major Construction Safety Initiatives
1994	Safety Management System (SMS)
1994	Pay for Safety Scheme (PFSS)
1994	Performance Assessment Scoring System (PASS)
1994	Safety Plan
1995	Consultation Paper on Self-Regulatory SMS
1996	Green Card Scheme: Mandatory Safety Training Programme
1997	Construction Sites (Safety) Regulations
1997	Factories & Industrial Undertakings Regulations
1997	Occupational Safety and Health Ordinance (Cap 509)
1998	Construction Site Safety Manual and Handbook
1998	Site Supervision Plan System
1998	Occupational Safety and Health Regulations
1999	Factories and Industrial Undertakings (Amendment) Ordinance
2000	PASS (Revised to include PFSS provision)
2000	Contractor Performance Index System
2000	Code of Practice for Site Safety Supervision
2001	Automatic Suspension from Tendering System
2002	Safe Working Cycle (SWC)
2002	Factories and Industrial Undertakings (Safety Management) Regulations
2002	Code of Practice on Safety Management
2003	Construction Sites (Safety) (Amendment) Regulations
2005	Safety Partnering Programme

Financial initiatives – Works Bureau launched PFSS in public works projects aiming at motivating the contractor to improve the site safety performance since 1996 (Rowlinson, 2007). It includes a fixed sum under the ‘site safety section' in the Bill of Quantities. Safety-related items will be priced based on total payment to the contractor (Fong, 2000).

Procedural initiatives are process-based which included the PASS and SWC. They are incorporated in the construction contract for requiring the contractor to achieve a certain level of safety performance (Construction Industry Institute – Hong Kong, 2009).

Punitive-administrative initiatives are referring to those punishments to the contractors who encounter serious accidents on their sites. Examples are the Automatic Suspension from Tendering System promulgated in 2001 (Construction Industry Institute – Hong Kong, 2009).

The performance of those construction safety initiatives is reflected in Figure 1. Tang (2007) mentioned three stages of those safety initiatives: Stage 1 is the technical improvement stage, Stage 2 is the system improvement stage, and Stage 3 is the safety culture building stage. The industry is now in the Stage 3 which the core features of the safety initiatives are being focused on the culture building.

The cultivation of safety culture can be through the implementation of Safe Behaviours. The most popular and recent one is the SWC which originated from Japan. As the Japanese Construction Industry has a significant improvement on site safety records after implementing the SWC and the number of accidents declined significantly (Occupational Safety and Health Council, 2006).

4. BACKGROUND OF SAFE WORKING CYCLE

In 2000, the SWC was introduced to the Hong Kong construction industry, which is modelled from a safety initiative from the Japanese Construction Industry - Safe Working Cycle (Environment, Transport and Works Bureau, 2002). SWC was adopted under the PFSS in six designated contracts for trial run. SWC has been formally launched after two years of trial run and applies to all public works projects (PWP) and capital works contracts since 15 August 2002 (Highways Department, 2002; Environment, Transport and Works Bureau, 2002).

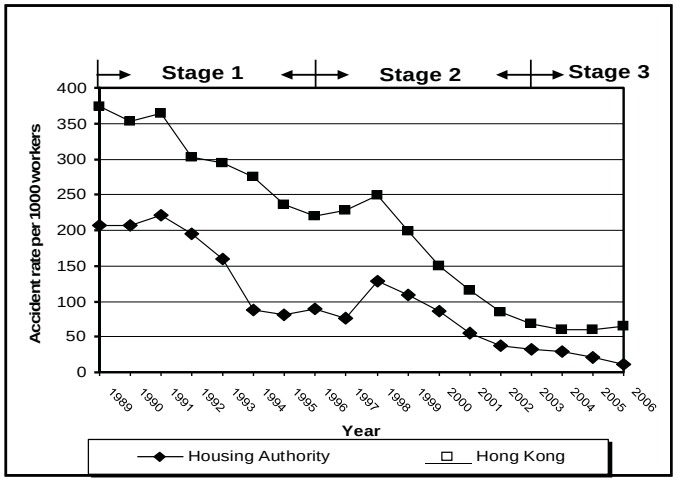

Figure 1: Accident Rate Per 1,000 Workers in Construction Industry (1989-2006) (Source: Tang, 2007)

5. GOALS OF SAFE WORKING CYCLE

The implementation of SWC is aimed to enhance the communication between the safety managers/supervisors and construction workers. It helps raise the workers' safety awareness and ensure a safe site condition (i.e. good housekeeping and tidy site). By achieving those objectives, SWC helps improve the site safety performance and prevent the occurrence of accidents on sites (Environment, Transport and Works Bureau, 2002). The implementation of SWC is aiming at cultivating safety habit for all project team members. It helps develop a safety culture on construction sites and foster safe behaviours of the workers through the repetitive procedures every day (Ozaka, 2000).

6. TYPES OF SAFE WORKING CYCLE

There are three types of cycles and 15 items under SWC, namely Daily Cycle (Table 2), Weekly Cycle (Table 3) and Monthly Cycle (Table 4). The details of each cycle are indicated as follows:

6.1. "DAILY" SAFE WORKING CYCLE

The Daily Cycle comprises 8 items and they are scheduled with relevance to the project schedule and can be presented on a time chart. Every involved person should perform their responsibilities based on the time schedule. Each organization should regulate the working hours for each items by considering the characteristics of the project (Occupational Safety and Health Council, 2006).

Table 2: List of Items in Daily Cycle of Safe Working Cycle

Safe Working Cycle (Daily Cycle)		
	Items	**Participants**
(a)	Morning Safety Meeting	All Workers
(b)	Hazard Identification Activity (HIA)	All Work Teams
(c)	Prior-to-Work Inspection	Engineers, Competent Persons, Plant Operators etc.
(d)	Safety Inspection	Project Managers, Site Agents, etc.
(e)	Guidance and Supervision at Work	Team Representatives, Foremen, etc.
(f)	Process Safety Discussion	Project Managers, Site Agents, Foremen, etc.
(g)	Tidying up after Work	All Workers
(h)	Final Check after Work	Team Representatives, Foremen, etc.

6.2. "WEEKLY" SAFE WORKING CYCLE

The Weekly Cycle is an overview of the safety performance in the past week and identifying the problems, and it facilitates the improvement of safety measures for next week and in the future. It consists of 3 steps – inspection and check, process safety discussion and weekly tidying up (Occupational Safety and Health Council, 2006).

Table 3: List of Items in Weekly Cycle of Safe Working Cycle

Safe Working Cycle (Weekly Cycle)		
	Items	**Participants**
(a)	Weekly Safety Inspections and Weekly Check Up	Inspections: Project Managers, Site Agents, etc. Check-up: Engineers, Competent Persons, Plant Operators etc.
(b)	Weekly Process Safety Discussion	Project Managers/Site Agents, Safety Officers, Subcontractor Representatives, etc.
(c)	Weekly Tidying up	All Workers

6.3. "MONTHLY" SAFE WORKING CYCLE

The Monthly Cycle is aimed at reviewing the site safety performance and the works' progress. The safety training can enhance the worker's safety awareness. The promotional campaign is organized to provide recognition of their efforts and safety performance (Occupational Safety and Health Council, 2006).

Table 4: List of Items in Monthly Cycle of Safe Working Cycle

Safe Working Cycle (Monthly Cycle)		
	Items	**Participants**
(a)	Monthly Inspection	Engineers, Competent Persons of Principal Contractor and Subcontractor
(b)	Monthly Safety Training	Safety Officers and All Workers
(c)	Monthly Safety Meeting	All Workers
(d)	Safety Committee Meeting	Members of the Safety Committee

An extensive review of various reported literature has provided the background information for the research on the effectiveness of Safe Working Cycle. The information includes the safety performance of the Hong Kong construction industry over the past decade, different safety initiatives being adopted in Hong Kong and the most important one among others, is the introduction of Safe Working Cycle.

7. RESEARCH METHODOLOGY

7.1. OVERALL RESEARCH APPROACH

Four research tools, i.e. literature review, in-depth interview, case study and questionnaire survey will be used in collecting appropriate and sufficient information and data of projects using SWC based in Hong Kong. Figure 2 demonstrates the overall research framework with reference to the concept of Walker (1997)'s model.

7.2. LITERATURE REVIEW

Desktop search is a direct approach to obtain the useful information. It is a comprehensive review of the related literature sought from journal articles, reference textbooks, conference papers, previous dissertations and on-line materials on SWC, as previously adopted by Chan *et al.* (2011). The information will reveal the present state of site safety performance and safety initiatives in Hong Kong. These will lead to the construction of a background picture for further understanding of SWC. The understanding of background information will facilitate the preparation of the interviews and survey questionnaire, so as to acquire the relevant information.

7.3. IN-DEPTH INTERVIEW

To gain an in-depth understanding of the current practices of SWC, qualitative approaches including pilot interviews and structured interviews will be undertaken. Face-to-face interviews will be employed to solicit information and opinions from the construction practitioners, including both public and private sectors, as used by Chan *et al.* (2007). The selected target organizations will include government works departments and contractors. The target interviewees cover project managers, safety managers/officers and engineers with direct hands-on experience in undertaking the SWC. Experienced and knowledgeable persons in construction projects can provide specific, detailed, valuable information and comments on an in-depth study on the effectiveness of SWC and the difficulties in implementing it.

More than 10 target interviewees will be invited to an interview. The number of interview questions will be limited to 10 only due to the availability of time and avoidance of a tedious interview. A pilot interview will also be carried out as a mock-up and allow for rectifying the ambiguity and deficiency of the interview questions. The interview questions will basically be divided into two parts. Part A will aim at acquiring the basic information about the interviewee and his/her company. Part B will focus on the chosen research area which is the effectiveness of SWC, benefits and difficulties of implementing it, and any recommendations for improving its current implementation. The structure of the interview

is indicated in Table 5. After conducting the interviews, the interviewee's responses will be summarized in a table, and the comparison and contrast will be carried out for further data analysis and discussion.

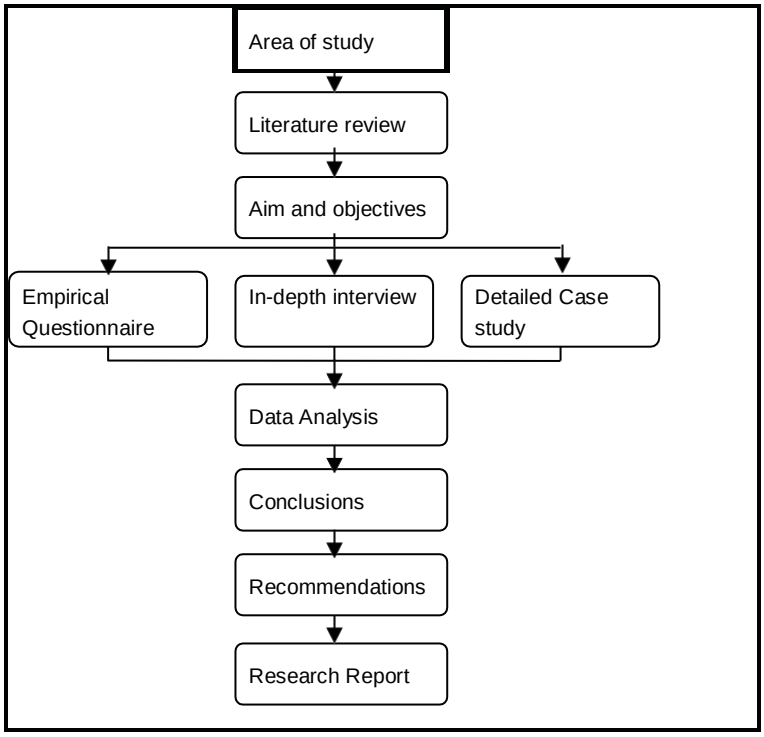

Figure 2: Research Framework for the Proposed Study

7.4. IN-DEPTH INTERVIEW

To gain an in-depth understanding of the current practices of SWC, qualitative approaches including pilot interviews and structured interviews will be undertaken. Face-to-face interviews will be employed to solicit information and opinions from the construction practitioners, including both public and private sectors, as used by Chan *et al.* (2007). The selected target organizations will include government works departments and contractors. The target interviewees cover project managers, safety managers/officers and engineers with direct hands-on experience in undertaking the SWC. Experienced and knowledgeable persons in construction projects can provide specific, detailed, valuable information and comments on an in-depth study on the effectiveness of SWC and the difficulties in implementing it.

More than 10 target interviewees will be invited to an interview. The number of interview questions will be limited to 10 only due to the availability of time and avoidance of a tedious interview. A pilot interview will also be carried out as a mock-up and allow for rectifying the ambiguity and deficiency of the interview questions. The interview questions will basically be divided into two parts. Part A will aim at acquiring the basic information about the interviewee and his/her company. Part B will focus on the chosen research area which is the effectiveness of SWC, benefits and difficulties of implementing it, and any recommendations for improving its current implementation. The structure of the interview is indicated in Table 5. After conducting the interviews, the interviewee's responses will be summarized in a table, and the comparison and contrast will be carried out for further data analysis and discussion.

Table 5: Structure of the Interview

Part	Target Information
A	Basic Information about the Interviewee and his/her Company
B	Comments and Responses on the (1) Effectiveness of Safe Working Cycle (SWC) (2) Benefits and Difficulties of Implementing SWC (3) Recommendations for Improving SWC

7.5. CASE STUDY

Case study methodology will also be adopted in this study as by Chan *et al.* (2010) before. Data on the relevant real-life case study projects of using SWC will be collected through face-to-face interviews and retrieval from collaborating firms. In-depth investigation on some case study projects is not only used to enhance the real understanding of the practice and implementation of SWC, but also it is vital to validate the research findings. All the cases will be analyzed on both an individual basis and collectively in order to draw valid, representative conclusions.

7.6. EMPIRICAL QUESTIONNAIRE SURVEY

The use of empirical questionnaire survey will provide a structured format to obtain the necessary information and opinions on the SWC adopted on construction sites (Chan *et al.*, 2011). The sample size of questionnaire will be expected to be as large as possible (more than 30), and a larger sample size will allow the result to be more representative and reliable.

In order to increase the response rate, the questionnaire will be designed to 2-3 pages only. The questions to be asked only require short answers in form of ticking boxes and writing a few words. The design of this format aims to minimize the time spent by and inconvenience caused to the interviewee on completing the questionnaire. A pilot questionnaire will also be launched as a mock-up and allows for rectifying the ambiguity and deficiency of the questionnaire. The questionnaire survey will be distributed to the target respondents who are mainly Project Managers, Safety Managers/Officers and Engineers from both public and private sectors who have obtained direct hands-on experience in projects with SWC.

The areas of questions will be categorized into two parts. Part A is the basic information about the respondents and his/her company. Part B focuses on the current practice of SWC. The main objectives of the questionnaire are to evaluate the effectiveness of the implementation of SWC in improving site safety performance and evaluate the potential benefits and difficulties of implementing the SWC.

The evaluation will be based on the level of effectiveness of the essential items in the SWC and the level of agreement on the potential benefits and difficulties of implementing the SWC. The structure of the questionnaire shows as follows:

Table 6: Structure of the Survey questionnaire

Part	Target Information
A	Basic Information about the Respondent and his/her Company Indication on the Level of Effectiveness of the Essential Items in Safe Working Cycle (SWC) in Achieving Better Site Safety Performance: (1) Daily Cycle (8 Items) (2) Weekly Cycle (3 Items) (3) Monthly Cycle (4 Items)
B	Indication on the Level of Agreement on the Potential Benefits and Difficulties of Implementing the SWC: (1) Benefits (2) Difficulties

A five-level of effectiveness or agreement will be provided for each question as the basis for calculating the mean score of each item in SWC and benefits and difficulties of implementing SWC. The respondent's responses will be used for further data analysis through the ranking of mean scores. The mean score will be calculated by the following formula (Chan *et al.*, 2011):

$$\text{Mean score} = \frac{\sum(\text{Frequency of responses received x Score given by respondents})}{\text{Total number of responses received}} \quad \text{(Equation: 01)}$$

where 1 = Strongly disagree; 3 = Neither agree nor disagree; and 5 = Strongly agree ($1 \leq$ Mean Score ≤ 5)

8. VALIDATION OF RESEARCH FINDINGS

Triangulation from multiple sources will be employed to reinforce the credibility of the findings obtained from the research data and subsequent analyses. Results derived from the questionnaire survey and case studies will be cross-referenced to the published literature as well as with each other whenever appropriate. Appropriate workshop discussions with prominent industrial practitioners who have acquired extensive hands-on experience in dealing with the SWC on construction sites will be organized to generate relevant information and to supplement and/or confirm the outcomes of the analyses, and a set of possible recommendations for improving the implementation of SWC. A meeting will be scheduled via discussions and moderations to validate the research findings and explanations with practitioners involved in the study.

9. CONCLUSIONS

This research study will launch an in-depth investigation of implementing the Safe Working Cycle (SWC) in the Hong Kong construction industry. It will provide a critical review of the current application, features, benefits and difficulties of applying Safe Working Cycle (SWC), together with improvement measures for successful implementation. By consolidating the different opinions on the above attributes of PFSS between clients, consultants and contractors, project team members can maximize the perceived benefits obtained from and minimize the potential difficulties of adopting SWC. Moreover, the results will establish a positive environment on future development of SWC and encourage the private property developers to implement SWC in the near future.

10. ACKNOWLEDGMENTS

The authors wish to thank the Department of Building an Real Estate of The Hong Kong Polytechnic University for providing financial support to this research study (Departmental General Research Grants Allocation 2011/12 with Project Account Code: 4-ZZC2). This paper forms part of a funded research project entitled "*An Exploratory Study of the Implementation of Safe Working Cycle (SWC) in the Hong Kong Construction Industry*" with several research objectives sharing common background of study and research methodology.

11. REFERENCES

Chan, D. W. M.., Chan, A. P. C., Lam, P. T. I.., Lam, E. W. M. and Wong, J. M. W., 2007. Evaluating Guaranteed Maximum Price and Target Cost Contracting Strategies in Hong Kong Construction Industry. *Journal of Financial Management of Property and Construction*, 12(3), 139-149.

Chan, D. W. M., Lam, P. T. I., Chan, A. P. C. and Wong, J. M. W., 2010. Achieving Better Performance through Target Cost Contracts - The Tale of an Underground Railway Station Modification Project. *Facilities - Special Issue on Performance Measurement and Management in Facilities Management*, 28(5/6), 261-277.

Chan, D. W. M., Chan, A. P. C., Lam, P. T. I. and Wong, J. M. W., 2011. An Empirical Survey of the Motives and Benefits of Adopting Guaranteed Maximum Price and Target Cost Contracts in Construction. *International Journal of Project Management*, 29(5), 577-590.

Choi, T. N. Y., Chan, D. W. M. and Chan, A. P. C., 2012. Potential Difficulties in Applying the Pay for Safety Scheme (PFSS) in Construction Projects. *Accident Analysis and Prevention - Special Issue on Accident Analysis and Prevention in Construction and Engineering*, 48, 145-155.

Construction Industry Institute – Hong Kong, 2009. Summary Report of the CII-HK Research Project – Safety Initiative Effectiveness in Hong Kong, October 2009.

Environment, Transport and Works Bureau, 2002. Implementation of Site Safety Cycle. Available from: http://www.devb.gov.hk/filemanager/technicalcirculars /en/upload/129/1/ C-2002-30-0-1.pdf [Accessed on 2 May 2012].

Fong, H. S., 2000. An Analysis of the Construction Safety Policy for Public Works Projects in Hong Kong. Unpublished MPA thesis, The University of Hong Kong.

Highways Department, 2002. Site Safety Cycle. Available from: http://www.hyd.gov.hk/eng/public/publications/newsletter/Issue52/ eng/E9.PDF [Accessed on 2 May 2012].

Labour Department, 2011. Occupational Safety and Health Statistics 2011 Bulletin. *Occupational Safety and Health Branch, Labour Department*, Issue No. 11 (July 2011). Available from: http://www.labour.gov.hk/eng/osh/pdf/Bulletin2011.pdf [Accessed on 2 May 2012].

Li, R. Y. M. and Poon, S. W., 2007. Effectiveness of Safety Measures in Reducing Construction Accidents in Hong Kong. *Proceedings of the CII-HK Conference 2007 - Never Safe Enough: A Wider Look at Construction Safety and Health* (Chan, A.P.C. and Chan, D.W.M. as Editors), 20 November 2007, Hong Kong, China, ISBN 978-988-99558-3-0, 177-185.

Occupational Safety and Health Council, 2001. Benchmarking Study on Construction Safety in Japan. Available from: http://www.oshc.org.hk/download/ publishings/1/309/p32.htm [Accessed on 2 May 2012].

Occupational Safety and Health Council, 2006. Safe Working Cycle Handbook – Implementation of Safe Behaviour, 66 pages, ISBN 962-968-262-1, June 2006.

Ozaka, H., 2000. Safe Working Cycle Activities for Preventing Industrial Accidents in Construction. Proceedings of the Symposium on Safe Working Cycle, Occupational Safety and Health Council, Hong Kong.

Rowlinson, S., 2007. 10 Years of Construction Safety Measures in Hong Kong: Lessons Learned? *Proceedings of the CII-HK Conference 2007 - Never Safe Enough: A Wider Look at Construction Safety and Health (Chan, A.P.C. and Chan, D.W.M. as Editors)*, 20 November 2007, Hong Kong, China, ISBN 978-988-99558-3-0, 3-11.

Tang, S. L., Poon, S. W., Ahmed, S. M. and Wong, F. K. W., 2003. Modern Construction Project Management, Second Edition, Hong Kong University Press, Hong Kong.

Tang, W. S., 2007. Construction Safety Management System and Beyond. Proceedings of the CII-HK Conference 2007 - Never Safe Enough: A Wider Look at Construction Safety and Health (Chan, A.P.C. and Chan, D.W.M. as Editors), 20 November 2007, Hong Kong, China, ISBN 978-988-99558-3-0, 37-43.

Walker, D. H. T., 1997. Choosing an Appropriate Research Methodology. *Construction Management and Economics*, 15(2), 149-159.