

**SUBMISSION TO PANEL OF MANPOWER FOR THE MEETING
RESCHEDULED ON 7 JANUARY 2021**

for

**LC Paper No. CB(2)492/20-21(06) - Raising of Penalties of OSHL
by *The Hong Kong Construction Association, Ltd*
on 4 January 2021**

We write, on behalf of the members of the Hong Kong Construction Association, to raise our strongest disagreement and objection to the proposed increase in penalties under the Occupational Safety Health Legislation.

We have written on the subject on 22 March 2019 (copy attached) and regret to note that the revised proposal set out in the captioned paper did not address the bulk of our concerns to save lives.

The government's approach to continue to bias against selective groups within the population by reinforcing an ineffective system rather than taking a holistic approach in promoting health and reform to save lives are most regrettable and discouraging.

The construction industry has registered workers of over 540,000 out of which around 350,000 are active. The CWRO mandates designated workers to work in designated trades since 2017. The historic accident rate per 1,000 workers in 2000 was 149.8 and gradually reduced to 29.0 in 2019. The fatalities of the construction industry during Year 2000 – 2020 ranged between 9 (2010) – 29 (2000); and 2020 year-to-date 18 (see attached chart). Whilst loss of any single life is too many, the statistic showed that the safety performance of the construction industry has not deteriorated at the same level of penalties set years ago.

We believe to approach the issue of OSH only through the framework of "employer and employee" relationship is overly simplifying the matter and has proven to be ineffective. In fact, lives could be saved through focusing our effort to look into resolving the roots of the problem i. e. how could we systematically improve safety in operation rather than relying on a perceived deterrent through increase fines.

Construction safety offences should not be an indictable offence. In most cases, it is contributable to acts or neglects of multi-parties, hence the need to establish non-dischargeable safety responsibilities of all individual stakeholders.

The supply chain of construction comprises of the developer, the design consultants, authorities, supervising staff, main contractors, subcontractors, sole-proprietors and wage workers. Each party shall carry its own share of construction safety liabilities. The proposition that historical verdicts of the independent judiciary to have overwhelmingly handed down "low side of penalty" should also be taken seriously as evident that the punished are not primarily to blame.

Our association put in major efforts in the past 4 years to initiate industry reforms to establish non-dischargeable responsibilities of individual stakeholders. This has recently been set out in a practical reference guide published for consultation by the Construction Industry Council. (Document attached)

Please be aware that main contractors are already subject to other very high concurrent penalties under the government administrative rules, including: Suspension Notices that delayed site progress, RGBC disciplinary actions, suspension from tendering for government projects, and/or other civil claim & compensations etc.

We noted that the proposed cap is much more than that of other jurisdictions and cannot see the rationale behind this huge difference. If penalties were to increase, there must be a mitigation or defence available to "employers"; otherwise, it will deter the business.

Instead of raising penalties, we strongly believe the industry can save lives through:

- imposing personal liabilities to care for others at work
- adopt CDM (Construction Design & Management) and buildability reviews
- legislate to regulate all subcontractors

香港建造商會

Hong Kong Construction Association

- fair and reasonable risk allocation under the contract terms
- reasonable construction period
- upgrade safety training to workers, and,
- eliminates common high risk practices and activities

As a trade association, we have been proactively encouraging practitioners and public to come up with new ideas to improve construction safety. In 2018, we contributed \$10 million as seeding fund to establish the HKCA Construction Safety Fund to pay for development of innovative ideas to improve construction safety. Our works can be viewed from our website. ([香港建造商會「建造業安全基金」HKCA Construction Safety Fund – 支持創新安全思維 Encourage Adoption of Creative Safety Initiatives \(hkca-csf.com\)](#))

The construction sector has come a long way and we, as the representative of main contractors, made our very clear propositions and commitments to improve construction safety in the past few years which had yet to be echoed in particular by the Authorities.

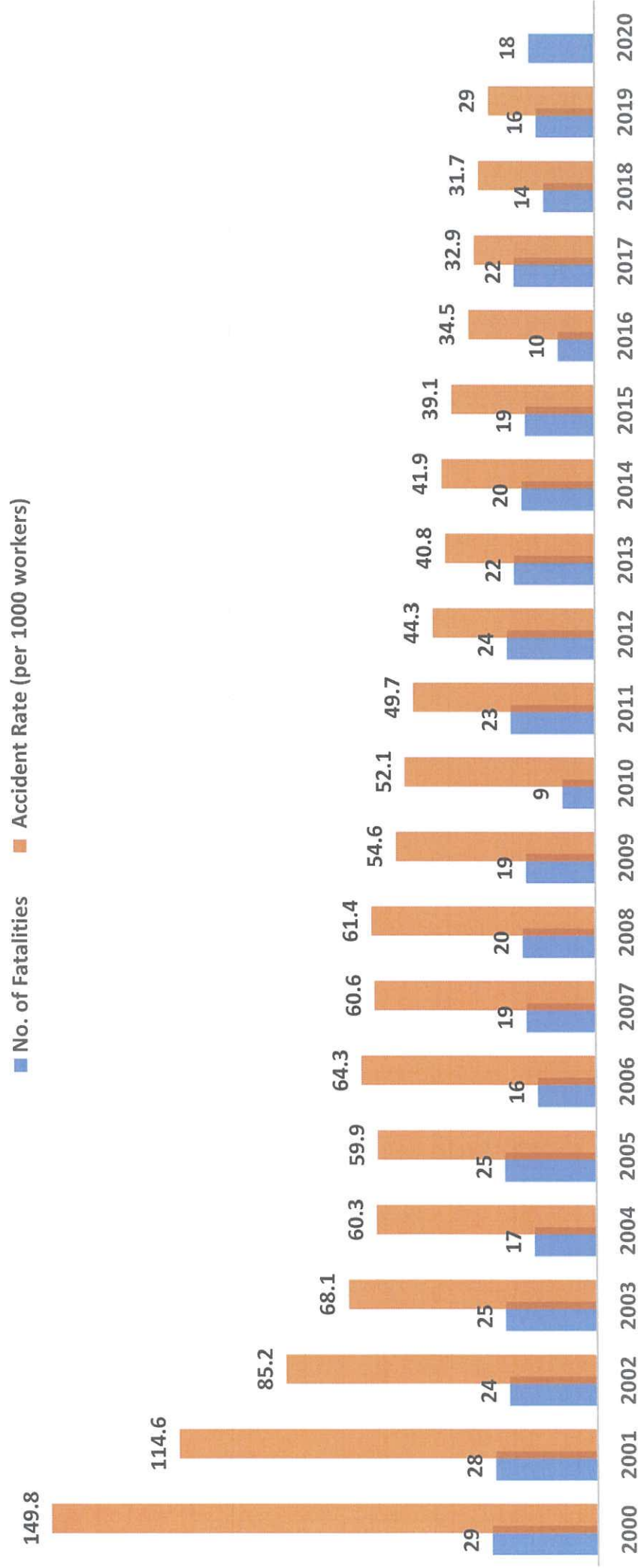
To conclude, we object to the current proposal to raise the level of penalties before a holistic review of the facts and prevailing situation of the construction industry. This is despite we remain fully committed to improve on our industry safety and to protect as much as we can those families making a living out of construction.

Thomas Tse
Chief Executive
The Hong Kong Construction Association, Ltd.

Document enclosed as stated

- Historic accident rate and fatality chart in construction (2000-2020)
- Letter 22 March 2019 on the same subject
- CIC Reference Materials (Jul 2020 draft) on safety roles and responsibilities of Key stakeholders in the Hong Kong construction industry

Hong Kong Construction Industry Safety Performance 2000 - 2020





22 March 2019

Legislation Review Team
Occupational Safety and Health Branch
Labour Department
13/F., Harbour Building
38 Pier Road, Central, Hong Kong

Our Ref.: 0200031371

By fax and post

2157 1245

Dear Sir,

**Re: Raising Penalties of Occupational Safety and Health Legislation
Comments from the Hong Kong Construction Association, Ltd.**

We write on behalf of our 300 Members to object to your proposal to increase the maximum fines and the maximum imprisonment terms under the Occupational Safety and Health Legislation applicable to construction.

Our objection is not that we do not care about construction safety, on the contrary, the whole industry had poured in lots of resources over the past decade to improve site safety, some in join hands with your department.

We object because we do not believe raising penalties on main contractors alone could reduce accidents nor is it a key factor positively contributing to better construction site safety. Raising the penalties misled public with the wrong impression that main contractors are the main contributor of safety incidents and the obvious party liable.

Construction site accidents were caused by a wide varieties of mishaps and reasons. To improve construction site safety, all stakeholders along the supply chain, including property owners, designers and consultants, main contractors, subcontractors, site supervisors, workers and authority must own and take up their fair share of site safety responsibility. For example, the design and detailing needed to consider construction methods, contract periods need to

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be reasonable and achievable. Design and construction period are two major contributors to construction risks. Others included ageing of skilled workforces, shortage of suitably skilled workers and workers' attitudes.

Hong Kong construction industry contributed 5.2% of GDP in 2017, and employing 8% of the working population. Main contractors are sizeable local employers. Over 481,000 construction workers are registered, qualified for green cards and working to Designated Workers for Designated Trades in new work projects while another 8,400+ are registered minor works workers working in RMAA. They are all registered and own personally duty to practice safe site working not only to care for themselves but also to their peers. It is current good practice norm that main contractors of new projects make it compulsory for workers to attend induction safety trainings and regular safety trainings on sites they attended to. Nonetheless, accidents still happen.

If we look at the accident rate for the past 10 years. The accident rate per 1000 workers dropped from 61.4 in 2008 to 28.7 in the first half of 2018. The total number of industrial accidents has not dropped in parallel only because the base figure (numbers of construction workers) has increased significantly. Fatality number per year ranged from the low 9 (2010) to a high 24(2012) averaged 19 over the ten years period and it was 15 in 2018. The facts are the accident rates are trending down and the yearly fatal cases relatively steady.

In addition to the OSHL penalties, **there are other very significant losses** (not obvious to the public) that main contractors had to suffer, in a case of serious accident, **both under contract and government contractors management procedures**, from poor rating in the Contractors' Performance Reports to total suspension from tendering public projects. These financial losses usually far outweigh the penalties applicable under the law and all main contractors, irrespective of the ordinance penalties, have absolutely no reason not to take reasonable care nor provide PPE for our valuable workforce.

The Labour Department shall not simply compared fine levels of other countries without considering prevailing circumstances and operation details of those countries such as import labours, quality of the workforce, trade splits and work practices, construction periods, complexity of design, concentration of workforce, roles of labour unions in managing work safety practices, and/or imposed responsibilities on design, safety precautions against property owners and design consultants, etc..

If the Department care to study the UK Construction (Design and Management) Regulations 2015 that, to our view, is a better approach to improve health and safety of the industry through:

1. sensibly plan the work so the risks involved are managed from start to finish
2. have the right people for the right job at the right time
3. cooperate and coordinate own work with others
4. have the right information about the risks and how they are being managed
5. communicate this information effectively to those who need to know
6. consult and engage with workers about the risks and how they are being managed

The Association take note that substantial numbers of past poor safety performance cases were related to improper workers' behaviours. Changing workers unsafe behaviours cannot solely rely on raising the penalties to punish the main contractors. We were very disappointed that Labour Department had been reluctant to prosecute those workers acting with unsafe behaviour. The judgements for attributable penalties clearly show how the court viewed the severity and relative contributions by main contractors. **Labour Department ought to always prosecute any worker who behaved unsafely, and such commitment would be a game changer to improve workers' safe working attitude.**

The Association members take great exception to the proposed linking of maximum fines for Indictable Offences with company turnover. This totally new "concept" – "the maximum fine levels be pegged to the turnover of convicted entities" will change the regulatory regime and change the business environment. ***How can the Labour Department justifiably propose penalties equivalent to calculating parking fines based on the value of the offending vehicle?*** This is **simply unfair and discriminating to the size of the business.**

Any main contractor being prosecuted for serious accident (who shall have its right to defend its case) would immediately result in their creditability status being weakened by the huge potential fines that threaten normal bank credits. The result would be detrimental to that main contractor and could lead to bankruptcy, redundancy and uncontrollable knock on potentially serious implications that affect the whole supply chain, workers and public at large. **Members had expressed that this level of penalty will result in many main contractors considering to withdraw business from Hong Kong.**

We noted LD drew reference to the UK laws as the basis of the proposal and wish to have your detailed explanation on how the UK penalties are calculated and said to be turnover linked without limit.

The proposed increase in imprisonment period together with the raise of penalties are totally disproportionate to the business return. Since the commencement of the legislation there has not been any case of immediate imprisonment for workers who breached the ordinance and offences concerning workers are seldom invoked by the Labour Department. We have yet to see any analysis regarding the effect of an increase in fine level on the accident rates in those overseas countries.

Hong Kong is already topping the world in its construction cost and the current

proposals by the government shall no doubt drive up costs. Our construction workers are already being paid high wages and they owe a duty to work in a safe manner.

In conclusion, we believe your proposal is only finding the easy way out to shovel responsibilities and public attentions to main contractors, for which we utterly reject. **We see the need to properly segregate responsibilities amongst industry stakeholders (as stated above) and develop enforcement mechanisms to ensure that each responsible parties carry their in-dischargeable responsibilities.** Not until stakeholders own their share of responsibilities, raising penalties to main contractors without changing the other factors only serve to damage the industry.

Yours sincerely,



Thomas Tse

Chief Executive

/ac

c.c. *Secretary for Labour and Welfare*

Secretary for Development

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Reference Materials

on Safety Roles and Responsibilities
of Key Stakeholders in the Hong
Kong Construction Industry

Disclaimer

Whilst reasonable efforts have been made to ensure the accuracy of the information contained in this publication, the CIC nevertheless would encourage readers to seek appropriate independent advice from their professional advisers where possible and readers should not treat or rely on this publication as a substitute for such professional advice for taking any relevant actions.

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Preface

The Construction Industry Council (CIC) is committed to seeking continuous improvement in all aspects of the construction industry in Hong Kong. To achieve this aim, the CIC forms Committees, Task Forces and other forums to review specific areas of work with the intention of producing Alerts, Reference Materials, Guidelines and Codes of Conduct to assist participants in the industry to strive for excellence. The CIC appreciates that some improvements and practices can be implemented immediately whilst others may take more time to adjust. It is for this reason that four separate categories of publication have been adopted, the purposes of which are as follows:

Alerts

Reminders in the form of brief leaflets produced quickly to draw the immediate attention of relevant stakeholders the need to follow some good practices or to implement some preventative measures in relation to the industry.

Reference Materials

Reference Materials for adopting standards or methodologies in such ways that are generally regarded by the industry as good practices. The CIC recommends the adoption of these Reference Materials by industry stakeholders where appropriate.

Guidelines

The CIC expects all industry participants to adopt the recommendations set out in such Guidelines and to adhere to such standards or procedures therein at all times. Industry participants are expected to be able to justify any course of action that deviates from those recommendations.

Codes of Conduct

Under the Construction Industry Council Ordinance (Cap 587), the CIC is tasked to formulate codes of conduct and enforce such codes. The Codes of Conduct issued by the CIC set out the principles that all relevant industry participants should follow. The CIC may take necessary actions to ensure compliance with the Codes. If you have attempted to follow this publication, we do encourage you to share your feedback with us. Please take a moment to fill out the Feedback Form attached to this publication in order that we can further enhance it for the benefit of all concerned. With our joint efforts, we believe our construction industry will develop further and will continue to prosper for years to come.

Purpose

These reference materials are intended to revitalize a renowned maxim “Safety is Everybody Business” by defining the roles and responsibilities of different levels of stakeholders helping to reduce behavioral-based errors at work. To achieve this, a human performance-based model called “Stakeholder Model” is developed to provide reference for relevant stakeholders at respective levels of their responsibilities in fulfillment of their possible legal duties which may be implicit in nature. This “Stakeholder Model” provides duties in general of different stakeholders at respective levels for the protection of workers at work.

The readers may read alone this “Reference Materials” to acquire a general understanding of the duties imposed by laws and may also read in conjunction with another publication “Practical Reference Guidance” of same series by CIC which is a supplementary reference on the specific processes that has been identified by the consultant to suit their needs.

Acronyms

CIC	Construction Industry Council
RSS	Resident site staff
BD	Buildings Department

Definitions

In this document, unless the context otherwise stated, the following definitions apply:

Term	Definition
Client / Developer	A project controller to oversee the overall performance of the entire project development.
Client's representative	A designated person or office acting on behalf of the client under a lease or contract with obligations to protect the interests of the client
Designer	A professional body by applying collective expertise in matter of their professional knowledge to give advice to client, who may be developer, contractor of any tier, depending on the scopes of work.
Main contractor	A person or firm engaged in carrying out construction work in pursuant to a contract directly from client / developer
Subcontractor	A person or firm engaged in carrying out specific tasks of contraction work pursuant to a contract derive from main contractor or upper tier of subcontractor

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Executive Summary

The high accident toll in Hong Kong is really frustrating. Losses behind the scene are suffered by families, industries and society at large and are always immense. Safety and health legislation aim to prescribe standards of performance for the protection of workmen while at work.

Safety is everybody business. To let more industrial stakeholders know more about their own safety responsibilities in prevention of accident at work, a “Stakeholder Model” is promoted in this publication to achieve the objective of such. In this model, stakeholders are distinguished by their respective roles in a project organization. In a construction project, there are different groups of people playing different interests in respect of their distinctive business roles. A client or developer who is a project controller has the ultimate objective to have the project completed timely and smoothly in the perspective of quality, safety and environmental issues. Sometimes, a client or developer may delegate her roles to a client’s representative who acts on behalf of the client under a lease or contract to ensure that client’s business goal and objectives are achieved. During project design, client or developer or even contractor undertaking the project may have the need for advice from a designer who by applying collective expertise in matter of their professional knowledge to give advice to client, developer or contractor depending on the scope of work, on the design and execution of the project or operation of a process. The designer, depending on his scope of work, can be an architect, engineer, surveyor or interior designer as accorded in “*Guidance Notes of Design for Safety*” (DevB, 2013). In project management, a main contractor is a person or firm entered into a contract with the client or developer to carry out construction work in pursuant to a contract. Normally, a main contractor plays the roles of project management while the physical works are undertaken by a subcontractor who is a person or firm engaged in carrying out specific task of construction work pursuant to a contract from upstream clients who can be a main contractor or a subcontractor.

Bearing different roles, every stakeholder should have an organizational structure established for implementation of the company policies. This organizational structure can be broadly distinguished into four levels while each level should perform different function to accomplish distinctive objectives. They are:

1. **Strategic level** – person holding a senior position in an organization, with a function to make high level decision at policy level.

2. **Tactical level** – persons in line management with function to develop systems, programs, procedures, rules and any other means including their coordination and communication between parties to accomplish the goals and objectives.
3. **Operational level** – persons in line management with supervisory function to monitor the system implementation and provide feedback for review to accomplish the goals and objectives
4. **Behavioral level** – persons in line management with executive function to comply with work procedures, rules and any other means to accomplish the goals and objectives

Having the stakeholders at respective levels identified, a thorough research and study has been conducted on current legislative instruments such as safety and health legislation, codes of practice, guidance notes and contract specifications that are currently practicing in construction industry. These instruments prescribed standards as the responsibilities of respective stakeholders for their compliance. The “Stakeholder Model” is therefore developed under this protocol for reference by the industrial stakeholders for the purpose of achieving the axiom of “Safety is Everybody Business”.

To let industrial stakeholders understand more about “Stakeholder Model”, at the end of this reference material, a case was introduced to illustrate the applicability of “Stakeholder Model”. The reader will find that since the stakeholder model is a human performance-based model which emphasizes on performance of specific responsibilities by a specific stakeholder at a specific level, therefore this model can be applied to any event for achieving a specific outcome. In case if there is a failure to meet a specific outcome, the model can assist to identify the shortfalls on respective stakeholders at respective levels and respective responsibilities. The results are not faults finding but a source of information for review of policies and procedures to achieve the business goals and objectives.

1. Introduction and Backgrounds

Facing the high accident toll in construction industry (see Table 1), Construction Industry Council (CIC) has engaged a consultant at the end of November 2018 to conduct a research on the root causes that lead to the undesirable outcomes in performance of the construction industry in Hong Kong.

Industrial Accidents in Construction Industry (2009 - 2018)
建造業之工業意外數字 (2009 - 2018)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
No. of Accidents 意外數目	2 755	2 884	3 112	3 160	3 232	3 467	3 723	3 720	3 902	3 541
No. of Fatalities 致命意外數目	19	9	23	24	22	20	19	10	22	14
Employment Size 受僱人數	50 501	55 341	62 635	71 295	79 303	82 795	95 103	107 799	118 674	111 849
Acc. rate/1 000 Workers 每1 000工人計的意外率	54.6	52.1	49.7	44.3	40.8	41.9	39.1	34.5	32.9	31.7
Fatality rate/1 000 Workers 每1 000工人計的致命意外率	0.376	0.163	0.367	0.337	0.277	0.242	0.200	0.093	0.185	0.125

Notes:

1. The statistics are compiled based on the Hong Kong Standard Industrial Classification Version 2.0.
2. Figures of employment size only covers manual workers on construction sites.
3. Figures of employment size for calculating the accident rate per 1 000 workers are based on the Quarterly Report of Employment and Vacancies Statistics published by the Census and Statistics Department.

Table 1: Accident statistics in construction industry (2009-2018)

The consultant in his research revealed that many academic studies in accident causation have concluded that accidents were results of people who did what they should not do, they failed to do what they should do or simply they did not know what they should do.

Safety and health legislation prescribes safety standards for duty holders to follow so as to eliminate or reduce the risk of injuries at work. However, since the legislatures are neither the one who creates the risk nor the one who works with the risk, the safety standards prescribed in laws because of their prescriptive nature cannot cover fully every dangerous situation resulting “loopholes” under the laws. To overcome this shortcoming, our Government has introduced general duty of employer, and employees under Section 6A and 6B of Factories and Industrial Undertaking Ordinance, Cap.59 in 1989 and subsequently extended to occupier under section 7 of Occupational Safety and Health Ordinance, Cap. 509. They are those performance-based type legislation which are flexible to cover all work tasks but without prescribing

standards of performance fully i.e. these legislation only tell what you should do but not how. This type of performance-based legislation requires the duty holders to conduct risk assessment to identify the hazards inherent in the task and the control measures needed to be taken.

Furthermore, this type of legislation is written in a strict liability that the one who holds the ultimate control of the workplace or work should be held liable for such offence in law. In context of enforcement, it may be effective to hold someone account for the prime responsibility. However, in context of accident prevention, it is not effective in the sense that there may be faults either intentionally or unintentionally conducted by any person or persons along the line management. These persons are scattered at whatever levels such as strategic, tactical, operational and behavioral levels as discussed in this report.

Hence this is the purpose of CIC to publish this Reference Materials to assist the stakeholders in Hong Kong construction industry to dispel the myth within the trade. This Reference Materials distinguishes the safety roles and responsibilities of respective stakeholders at different functional levels for the purpose of accident prevention hoping to revitalize our maxim "Safety is Everybody Business" in bettering our future.

2. Usage of Reference Materials

The Stakeholder Model developed in this Reference Materials is a human performance-based model which prescribes the responsibilities in detail stakeholders in respective levels that they should perform in minimizing the happening of accident in construction industry. It is a collection of all current legislation, codes of practices, guidance notes and contract specifications related to construction works. Therefore it is specially prepared for those who need to plan for project organization in the pre-construction phase and also for review of the project organization for effective project management. The users of this Reference Materials are suggested to bring to the attention of those stakeholders spell out in the Stakeholder Model for their information of their respective roles and responsibilities to accomplish the objectives of "Safety is Everybody Business".

The Stakeholder Model provides only reference to the industrial stakeholders and is not a legal instrument to replace any laws, codes of practice, guidance notes etc. It is in fact a supplementary document providing reference for consideration by project management in planning their safety organization ahead taking into consideration of their respective political, economic, social and organizational aspects for making final decision. Therefore, the Stakeholder Model is not legally bound to be followed by the industrial stakeholders but a good practice to reduce errors in the perspective of human behaviors that may cause accident in the course of work.

The Stakeholder Model has a wide scope of application. It can apply to all work planning and procedures which heavily rely on human performance such as those high risk works that require stringent monitoring e.g. permit-to-work. The specific roles and responsibilities proposed in the stakeholder model can reassure all the legal requirements and current standards and practices are properly handled by designated persons during organizational planning which is well before the construction phase where risks commence to emerge.

3. The Stakeholder Model

3.1 Basic Concept of Stakeholder

Everybody owes a duty of care to his neighbor (*Donoghue v Stevenson (1932) UKHL 100*). He must take reasonable care to avoid acts or omissions which he can reasonable foresee would be likely to injure his neighbor. In context of safety and health, there is an indisputable conclusion that accidents are caused by unsafe conducts of someone that has not been done to an acceptable standard resulting to harm of human bodies. That comes to questions:

1. Is there an element of negligence find on someone if harms are being induced on his neighbors who are being affected by his acts or omissions?
2. Does the negligence constitute an element of criminal offence or just an element of tort or both?
3. Does someone mean a person or a class of persons? and,
4. How should we describe this person or class of person?

In this report, CIC defined this person or class of person as "Stakeholders". To narrow down the scope of this publication, CIC adopted the definition of stakeholder in accordance with Stanford Research Institute (1963) as "those group of people without whose support the organization would cease to exist" in order to confine this publication to be used by construction industry of Hong Kong.

3.2 Roles, Levels and Responsibilities of

Stakeholders

Roles, levels and responsibilities are interrelated and each has their own definition. Role means a function or part that play in a particular operation or process. Level means a position in a project organization structure bearing a specific role to ensure the effective functioning of a particular operation or process. Responsibilities are the obligations designated to a specific stakeholder with a specific role at a specific level. Their relationship is illustrated as figure below.

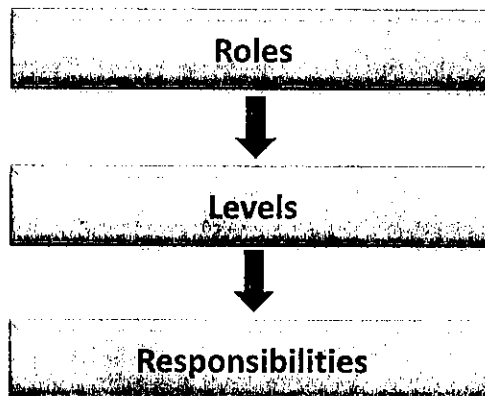


Figure 1: Inter-relationship between roles, levels and responsibilities

3.3.1 Roles

In project organizational structure, there are different stakeholders involved and are given with different office titles. They may be client, client's representative, designer, main contractor, subcontractor and worker in general. Their roles can be distinguished by interests of their business or employment.

Stakeholder	Roles
Client / Developer	A project controller to oversee the overall performance of the entire project development and smooth operations in the perspective of quality, safety and environment issues in accordance with contract specifications

Stakeholder	Roles
Client representative	A designated person or office acting on behalf of the client under a lease or contract with obligations to protect the interests of the client to ensure the overall compliance of contract specifications
Designer	A professional body by applying collective expertise in matter of their professional knowledge to give advice to client, who may be developer or contractor, depending on the scopes of work, on the design and execution of the project / operation. Scopes of work may include the initial design of a project development, the design of a temporary work or structure in construction phase and as well the design of electrical circuit basing on the need of the work. The "designer" as spelled out in " <i>Guidance Notes of Design for Safety</i> " that they can be the architects/engineers/surveyors/interior designers and others who specify or alter a design or specify a particular method of work or material.
Main contractor	A person or firm engaged in carrying out construction work pursuant to a contract directly from client/developer
subcontractor	A person or firm engaged in carrying out specific tasks of construction work pursuant to a contract directly from main contractor
Workers in general	A person employed either by main contractor or subcontractor in carrying out designated tasks of construction work

Table 2: Roles of stakeholders

3.3.2 Levels

In a project organization, people are designated with respective posts to perform specific functions according to their competence. It is best fit to differentiate their functions in different levels because of its deliverables. They are broadly divided into strategic level, tactical level, operational level and behavioral level (Reason, 1993).

Level	Functions
Strategic level	persons holding senior positions in an organization, with a function to make high level decision at policy level in setting goals and objectives and have the authorities in allocation of resources and setting of criteria for appointment of competent contractors.
Tactical level	Persons in line management with function to develop systems, programs, procedures, rules and any other means including the co-ordination and communication between parties to accomplish the goals and objectives.
Operational level	Persons in line management with supervisory function to monitor the system implementation and providing feedback for review to accomplish the goals and objectives.
Behavioral level	Persons in line management with executive function to comply work procedures, rules and any other means to accomplish the goals and objectives.

Table 3: Levels in an organizational structure

At each level, because of different parties having their own roles in a project organization, there is a combination of stakeholders from different parties at same level. For example, stakeholders at strategic level may include persons from client or developer, client's representative, designers and main contractor at corporate level responsible to make high level decision. Stakeholders at tactical level may include persons from client's representative, main contractor and subcontractor who are responsible for overall planning at project level. Stakeholders at operational level may include persons from client's representative, main contractor and subcontractor monitoring and supervising workforce at project level. Stakeholders at behavioral level may include workers and operatives responsible for carrying out any tasks of construction work at project level.

Multi-functions at different levels

Due to the emerging complex organizational structure and high division of work, it is not uncommon that a person with specific role may be assigned with different functions at different levels. For example, a resident site staff (RSS) of client's representative, having the role to protect the interests of his client, may be assigned with functions at tactical level to participate in development of safe work procedures and as well at operational level to monitor the adherence of the front lines on the safe work procedures etc.

Shared functions in same level

There are also situations that same function at same level may be shared by persons having different roles from different parties. For example, an RSS of client's representative, a safety officer or safety supervisor of main contractor or subcontractor, they all have the function to monitor the adherence of the safe work procedures by the front lines. Each person must comply with that duty even if other stakeholders have the same one. However, such duty can be discharged to the extent that the person has the capacity to influence and control the matter. The reason is that a person cannot delegate his duties to others, but can make arrangements with them to do the things that will meet the duties on his behalf.

Post titles at different level

To capture all post titles in modern working environment would be extremely difficult in current complex organizational structure. Their titles are differing and never exhaustive in the trade. Instead of defining their titles for a specific function, it is best fit to differentiate vice versa, ie by their functions rather than the titles they are holding. For example, a designer can be an architect, an engineer, a surveyor, an internal designer (DevB, 2013). In project design, a designer can be an architect at strategic level to give professional advice to client or developer. In structural design, a designer can be an engineer at tactical level to prepare a temporary work for structural support. Even for minor work design, a designer can be a registered electrical worker at tactical level to prepare a wiring diagram for a switch room. Hence, at different levels, different stakeholders may have different titles designated depending on the functions that they need to perform.

3.3.3 Responsibilities

Laws are standards for compliance and are the responsibility that the duty holders should follow. To assist the industry to detail the responsibilities that stipulated under the laws, CIC has conducted a comprehensive research on all related legal instruments such as safety and health legislation, codes of practice, guidance notes and relevant contractual specifications that are currently practicing by the industry nowadays. The responsibilities are consolidated in a holistic rather than a task specific approach for the purpose of attaining greater applications across various activities undertaken within the industry.

To further assist the stakeholders by their roles, levels and responsibilities, CIC has developed a "Stakeholder Model" that has listed out the safety responsibilities of respective stakeholders according to their roles and levels of functioning in a project organization. Their safety responsibilities are listed out in Tables below.

Table 4: Responsibilities of Stakeholders at Strategic Level

Strategic Level	
A. Client	
<i>Examples of Stakeholders: Developer, Works Departments or other persons holding similar office/function</i>	
Types of responsibility	Description
A1. Pre-tendering consideration	A1.1 Formulate policy for project development
	A1.2 Establish performance targets
	A1.3 Specify "Design for Safety" during planning and allocate sufficient resources and time
	A1.4 Specify safety requirements for contractors
A2. Tendering consideration	A2.1 Select and appoint competent main contractors and nominated subcontractors
A3. Construction stage consideration	A3.1 Maintain performance database of contractors
	A3.2 Review time impact due to subsequent changes in design
	A3.3 Take regulating actions against poor performer
B. Designer	
<i>Examples of Stakeholders: Architect, Engineer or other persons holding similar office/function</i>	
Types of responsibility	Description
B1. Pre-tendering consideration	B1.1 Plan and manage pre-construction design and arrangement
	B1.2 Design out risk for the entire project life cycle, including

	construction, maintenance and demolition stage
B2. Tendering consideration	B2.1 Advise on selection and appointment of main contractors and nominated subcontractors
B3. Construction stage consideration	B3.1 Inform client and main contractor about significant risks in design
	B3.2 Advise client on time impact due to subsequent changes in design
C. Client's Representatives <i>Examples of Stakeholders: Consultant, Principal Resident Engineer, Chief Resident Engineer or other persons holding similar office/function</i>	
Types of responsibility	Description
C1. Pre-tendering considerations	C1.1 Participate in "Design for Safety" process
	C1.2 Advise on instructions, requirements and standards set in contract
C2. Tendering considerations	C2.1 Advise on selection and appointment of main contractors and nominated subcontractors
C3. Construction stage considerations (Monitoring and Communication)	C3.1 Overall control of work and safety
	C3.2 Monitor and appraise contractor's safety performance
	C3.3 Communicate with client and designer on work progress
D. Main Contractor <i>Examples of Stakeholders: Director, Chief Executive Officer (CEO), Project Director, Contract Manager or other persons holding similar office/function</i>	
Types of responsibility	Description
D1. Policy and Directives	D1.1 Formulate company safety policy and standards
	D1.2 Define standards for safety performance
D2. Accountability and Authority	D2.1 Set up and implement accountability system
D3. Support and resources	D3.1 Provide sufficient support and resources

Table 5: Responsibilities of Stakeholders at TACTICAL Level

Tactical Level	
E. Client's Representatives	
<i>Examples of Stakeholders: Resident Engineer or other persons holding similar office/function</i>	
Types of responsibility	Description
E1. Overall project planning	E1.1 Formulate Project wide safety system
	E1.2 Setup Project wide accountability system
E2. Monitoring and supervision	E2.1 Suspend works that can cause imminent danger/ situation
	E2.2 Supervise and direct the execution of works
	E2.3 Monitor works are adhered to requirements and standards set in contract
	E2.4 Monitor works are carried out according to endorsed safe work procedures and design
	E2.5 Monitor adequacy of safety training
	E2.6 Conduct safety inspection and monitor corrective actions
E3. Review and Scrutiny	E3.1 Review and approve safety plan, safe work procedures, temporary works design and material submission
E4. Reporting	E4.1 Compile statistics and report contractor's safety performance
F. Main Contractor	
<i>Examples of Stakeholders: Project Manager, Construction Manager, Site agent, Engineer or other persons holding similar office/function</i>	
Types of responsibility	Description
F1. Overall planning and establish safety program	F1.1 Establish system to ensure safe and healthy workplace
	F1.2 Incorporate inputs from client, designer, architect and safety officer in project safety plan
	F1.3 Allocate sufficient and adequate resources for safe execution of works, such as manpower, PPE, plant and equipment
	F1.4 Prepare safety plan and working procedures
	F1.5 Prepare temporary works design
	F1.6 Define imminent danger/ situation and empower respective site staff for suspension of work
	F1.7 Develop incentive policy to encourage workers and subcontractors to follow safe work procedures
	F1.8 Develop disciplinary policy to penalize workers and subcontractors for not following safe work procedures

F2. Standards of compliance	F2.1	Establish system to identify hazards and develop controls
	F2.2	Ensure safety in-house rules, procedures and methods are developed, maintained and reviewed
F3. Selection and evaluation of subcontractors	F3.1	Develop pre-qualification criteria for new subcontractor
	F3.2	Select and appoint competent subcontractors
F4. Monitoring and overall supervision	F4.1	Suspend works that can cause imminent danger/ situation
	F4.2	Setup accountability system for contractor and subcontractor
	F4.3	Continue to review safety plan and working procedures
	F4.4	Ensure proper execution of temporary works design
	F4.5	Ensure works are carried out according to endorsed safe work procedures and design
	F4.6	Conduct safety inspection and follow up corrective actions
	F4.7	Ensure reported hazards are promptly responded and rectified
F5. Communication and coordination	F5.1	Ensure works are properly planned, coordinated and monitored among project teams and subcontractors
	F5.2	Ensure safe work procedures down reach to operational level
	F5.3	Ensure subcontractors understand requirements and hazards of works
F6. Training for competence	F6.1	Train up site staff for necessary competence
	F6.2	Ensure the competence of workforce of subcontractors
G. Main Contractor – Safety Personnel		
<i>Examples of Stakeholders: Safety Manager, Safety Officer or other persons holding similar office/function</i>		
Types of responsibility	Description	
G1. Planning and implementation of safety system	G1.1	Assist development and implementation of safety program
G2. Monitoring	G2.1	Suspend works that can cause imminent danger/ situation
	G2.2	Report irregularities on safety system
	G2.3	Assist to identify hazards and recommend controls
	G2.4	Conduct safety inspection & recommend corrective actions
	G2.5	Investigate incident and suggest remedial actions
	G2.6	Monitor behaviours of workers and foremen
G3. Communication	G3.1	Communicate workplace hazards to affected workers
	G3.2	Report contractor's and subcontractors' safety performance

G4. Training	G4.1 Organize safety training for staff, workers and subcontractors
H. Subcontractor of any tiers	
<i>Examples of Stakeholders: Site Agent, Engineer or other persons holding similar office/function</i>	
Types of responsibility	Description
H1. Communication with main contractor	H1.1 Secure prior approval from main contractor before commencement of work
	H1.2 Maintain coordination and communication with main contractor
	H1.3 Comply with all in-house safety rules
H2. Overall planning and monitoring	H2.1 Provide site specific safety plan
	H2.2 Ensure works are carried out according to endorsed safe work procedures, design and statutory requirements
H3. Overall supervision and delegation of power	H3.1 Ensure proper supervision of work
	H3.2 Suspend works that can cause imminent danger/ situation
	H3.3 Ensure reported hazards are promptly responded and rectified
	H3.4 Delegate power to operational level to remove workers from site who repeatedly violate safety of works
H4. Provision of resources	H4.1 Ensure the provision of necessary PPE
	H4.2 Ensure provision of safe plant and equipment
H5. Assurance of competence	H5.1 Provide necessary training to own staff for competence at work
I. Subcontractor of any tiers – Safety Personnel	
<i>Examples of Stakeholders: Safety Officer or other persons holding similar office/function</i>	
Types of responsibility	Description
I1. Planning and implementation of safety system	I1.1 Assist development and implementation of safety program
I2. Monitoring	I2.1 Suspend works that can cause imminent danger/ situation
	I2.2 Assist to identify hazards and recommend controls
	I2.3 Conduct safety inspection & recommend corrective actions
	I2.4 Investigate incident and suggest remedial actions
	I2.5 Monitor behaviours of workers and foremen
I3. Communication	I3.1 Communicate workplace hazards to affected workers
	I3.2 Report workers' safety performance to subcontractor
I4. Training	I4.1 Organize safety training for staff and workers of subcontractors

Table 6: Responsibilities of Stakeholders at OPERATIONAL Level

Operational Level	
J. Client's Representatives	
<i>Examples of Stakeholders: Inspectorates, Work Supervisors or other persons holding similar office/function</i>	
Types of responsibility	Description
J1. Monitoring and inspection	J1.1 Suspend works that can cause imminent danger/ situation
	J1.2 Require contractor and subcontractor for prompt rectification
	J1.3 Supervise and inspect project work
	J1.4 Ensure works are carried out according to specification, drawings and contract and statutory requirements
J2. Report site safety performance	J2.1 Check, coordinate and report safety matters to line management
	J2.2 Monitor safety performance of contractor and subcontractors
K. Main contractor	
<i>Examples of Stakeholders: Foreman, Safety Supervisor, Competent Person (CP), Independent Checking Engineer (ICE), Registered Professional Engineer (RPE) or other persons holding similar office/function</i>	
Types of responsibility	Description
K1. Assurance of safe workplace and equipment	K1.1 Ensure understanding of and adherence to approved safe work procedures
	K1.2 Prompt rectification of unsafe condition
	K1.3 Suspend works that can cause imminent danger/ situation
	K1.4 Ensure unsafe plant & equipment are not used
K2. Supervision of subcontractors and workers	K2.1 Follow safe working procedures
	K2.2 Remove workers from site who repeatedly violate safe work procedures
	K2.3 Ensure proper use of PPE
K3. Communication with subcontractors and workers	K3.1 Ensure subcontractors and workers understand requirements of hazards of works

L. Subcontractor of any tiers	
<i>Examples of Stakeholders: Foreman, Safety Supervisor, CP, RPE or other persons holding similar office/function</i>	
Types of responsibility	Description
L1. Assurance of safe workplace and equipment	L1.1 Ensure understanding of and adherence to approved safe work procedures
	L1.2 Prompt rectification of unsafe condition
	L1.3 Suspend works that can cause imminent danger/ situation
	L1.4 Ensure unsafe plant & equipment are not used
L2. Supervision of subcontractors and workers	L2.1 Follow safe working procedures
	L2.2 Remove workers from site who repeatedly violate safe work procedures
	L2.3 Ensure proper use of PPE
L3. Communication with workers	L3.1 Ensure workers understand requirements of hazards of works

Table 7: Responsibilities of Stakeholders at BEHAVIOURAL Level

Behavioural Level	
M. Main contractor / Subcontractor of any tiers	
<i>Examples of Stakeholders: Workers, Operatives or other persons holding similar office/function</i>	
Types of responsibility	Description
M1. Compliance of rules and instructions	M1.1 Adhere to safe work procedures, instructions, training materials and rules
	M1.2 Cooperate with employer
M2. Participation of safety training	M2.1 Participate in safety training
M3. Communication with supervisors and co-workers	M3.1 Report accident/ incident/ DO to supervisor
	M3.2 Report hazards to supervisor and warn co-workers
	M3.3 Make suggestions to improve safety
	M3.4 Give feedback on control measures
M4. Use of Personal Protective Equipment	M4.1 Wear PPE whenever necessary
M5. Caring of himself and others	M5.1 Refuse to carry out work at unsafe environment or when others could be jeopardized

4. Case Study

4.1 The Incident

ABC House is a block of building comprising of both residential and commercial units built in 1973. It was built with a concrete canopy on the 1st floor which was a cantilever structure projecting out from the external wall of ABC House.

In August 1994, the whole of the concrete canopy along Ping On Street side of the building collapsed and fell onto the pavement below. As a result of this collapse, 1 pedestrian was killed and 7 were injured.

4.2 Background

In November 1984, the landlord of 1/F entered into a tenancy agreement with Good Taste Restaurant Limited (hereinafter "Good Taste") for a term of 10 years. Sometime between October to December 1984, when renovation work was being carried out to prepare for the opening of Good Taste, a fish tank was constructed, partly standing on the concrete canopy over Ping On Street at the 1/F and partly standing inside the premises of Good Taste. If we can turn the clock back to November 1984, the construction of this fish tank partly on the canopy must be an issue for discussion by the respective stakeholders in this renovation project on their respective safety roles and responsibilities to prevent any possibility to collapse.

4.3 Findings by Buildings Department

Immediate after the collapse of the canopy, the Buildings Department (hereinafter "BD") carried out a full investigation into the causes of the collapse. It came out with a final report on the matter in October 1994. The following findings were accepted as agreed facts by the parties in a High Court Personal Injury Action:

- Building plans for ABC House indicated a concrete canopy projecting at 1/F level. This canopy was to be constructed with 0.75 inch cement rendering with two layers of asphalt to be applied to the top surface.

- Examination by BD discovered that the reinforcing steel bars showed deviations largely from approved structural plans. They were irregularly spaced and, more importantly, they, instead of being spaced 0.5 inch from the top surface of the canopy, were set more towards the middle and bottom part of the canopy slab.
- Condition of those reinforcing steel bars of the collapsed canopy had rusted at the interface between the canopy slab and the 1/F beam
- Corrosion had penetrated through the entire diameter of almost all the reinforcing steel bars such that no fresh steel was visible at the breakpoint of the bars.
- The rusting or corrosion did not extend along the length of these reinforcing steel bars but was only at the interface of the canopy slab with the 1/F beam
- The collapsed canopy had two concrete toppings varying from between 35 mm to 40 mm thick, but with no asphalt layers as indicated in the approved plans
- On top of this, there were two layers of additional screeding. Each layer of screeding varied between 25 mm to 30 mm in thickness
- In the area around the fish tank, the screeding had also been increased in thickness to form a base of approximately 40 mm to 50 mm
- The fish tank construction was first indicated on plans submitted to BD in March 1985. The proposal was considered by BD as structurally unsuitable in general and approval was not given
- Further referrals in June and July 1988 again indicated the fish tank construction. Inspection by BD confirmed the fish tank and objections were therefore raised by BD
- On 21 November 1988, Good Taste engaged an authorized person and a structural engineer to submit calculations to BD justifying the adequacy of the canopy to support the fish tank.
- Such calculations based on the assumption that the reinforcing steel bars were 0.375 inch in diameter and 4.5 inches spacing. By that assumption, the calculations were considered acceptable by BD
- However, it turned out that the reinforcing steel bars were spaced 7 inches apart
- Despite BD accepted the calculations, BD indicated that the fish tank, inter alia, was an unauthorized structure contravening the Building Ordinance and that action might be taken under the Building Ordinance to remove the unauthorized works.
- Furthermore, there was an advertising sign for Good Taste of one storey high which was assumed that one-third of its weight would be on the canopy in the final report by BD
- BD carried out a structural evaluation of the canopy slab based on the original

approved plans as well as the “as built” condition of the canopy. Result found that the original design of the canopy had a satisfactory safety factor to retain the fish tank and the advertising sign. But as to the “as built” condition, the addition of the extra screeding alone had already overstressed the safety factor, not to mention the fish tank and the sign board.

4.4 Causes of the Collapse

1. The canopy was designed to be non-load bearing.
2. Construction deviated from the approved plans had led to overstressing of steel bars and the thence the concrete slab resulting in cracking in concrete at the point where it jointed the main building.
3. The additional weight of the screeding, the fish tank and the sign board had further aggravated the cracking at the interface.
4. Rainwater and perhaps sea water from the fish tank found their way into the cracks and corroded the reinforcing steel bars at the interface.
5. Vibrations induced by the dismantling of the fish tank an hour before the accident had further propagated failure.

4.5 Applications of the Stakeholder Model

The Stakeholder Model is a generic model that can be applied to any stage of construction. From the information available, the mishap happened in August 1994. Yet the onset of the incident can be traced back to the construction phase of Albert House in 1973. The chain of events that finally led to the incident can be linked up from construction phase in 1973 to the renovation phase in 1984 and finally to the demolition phase in 1994. Due to the long lapse of time, only scanty information was available for analysis. The following case studies were based on the available facts and inferences deduced from them. The application of the model in this case is just for a case study. It does not indicate nor imply nor attempt to indicate or imply any liabilities on any parties involved in this incident. CIC (and any of their respective directors or officers) shall not be liable for any losses or damages of any nature to anyone which may arise from any information or inference drawn from this study.

4.5.1 The Construction Phase

In 1973 when Albert House was constructed, the approved plans indicated a concrete canopy projecting at 1/F level. This canopy was to be constructed with 0.75 inch cement rendering with two layers of asphalt to be apply to the top surface. These two layers of asphalt were somehow not being laid according to approved plans. More importantly, these reinforcing steel bars were spaced irregularly and instead of spaced half inch from the top surface of the canopy, set more towards the middle and bottom part of the canopy slab. This layout deviated largely from approved structural plans. Obviously, the misconduct of the contractor foreshadowed the underlying cause that led to collapse of the canopy on 1 August 1994.

Application of Stakeholder Model at construction phase to break the chain of incident

Level	Role	Actions to break the chain
Strategic	Developer	<ul style="list-style-type: none"> Select and appoint competent contractor to undertake out the construction project Appoint client's representatives to take up monitoring on site if developer is not knowledgeable
	Designer	<ul style="list-style-type: none"> Plan and manage the pre-construction design and arrangement Advise selection of competent contractor in respect of her design
	Main Contractor	<ul style="list-style-type: none"> Ensure set up of accountability and its implementation on site
Tactical	Main Contractor	<ul style="list-style-type: none"> Set up accountability system for enforcement Ensure competence of subcontractor Ensure works are properly planned, coordinated and monitored among subcontractors Conduct inspection and follow up corrective actions
	Subcontractor	<ul style="list-style-type: none"> Ensure proper site supervision of work Provide necessary training to own staff

Level	Role	Actions to break the chain
Operational	Main contractor	<ul style="list-style-type: none"> • Ensure safe work procedures are followed • Ensure subcontractor understand requirements of work
	Subcontractor	<ul style="list-style-type: none"> • Ensure adherence of safe work procedures • Ensure workers understand requirements of work
Behavioral	Main contractor and subcontractor	<ul style="list-style-type: none"> • Adhere safe work procedures • Cooperate with employer

Table 8: Actions to break the chain of accident in construction phase

4.5.2 The Renovation Phase

When the renovation commenced in October 1984, as deduced from the information, New Best has engaged an interior designer who might also take up the role as a renovation contractor in the same project to carry out the renovation work. There was no information to show that Good Taste has engaged a client’s representative to monitor the renovation work for her. Despite an authorized person a structural engineer was engaged by Good Taste in March 1988 to submit plans to BD for justifying the adequacy of the canopy to support the fish tank. No remedies had been physically undertaken by any parties until the outbreak of the incident in 1994.

Application of Stakeholder Model at renovation phase to break the chain of incident

Level	Role	Actions to break the chain
Strategic	Client	<ul style="list-style-type: none"> • Select and appoint competent contractor to undertake the renovation project • Specify design for safety during planning of the renovation work • Appoint client’s representatives to take up monitoring on site if client is not knowledgeable

Level	Role	Actions to break the chain
Strategic	Authorized person and structural engineer engaged in 1988	<ul style="list-style-type: none"> Plan and manage the construction design and arrangement by investigating the 'as built' condition against the original approved plans (not to mention the deviation of reinforcing bars embedded in the concrete, the absence of two asphalt layers and presence of two additional screeding should be a patent sign of deviation) Design out risk by suggesting additional structural supports for the fish tank, screeding and sign board to BD instead of assuming on original approved plans
	Internal designer cum contractor engaged in 1984	<ul style="list-style-type: none"> Plan and manage the pre-construction design and arrangement by seeking advice from authorized person or structural engineer on the effect of loading on canopy by the fish tank, screeding and the sign board. Design out risk the entire renovation project Inform client about the significant risk in design
Tactical	Designer cum Contractor	<ul style="list-style-type: none"> Establish system to identify hazards and develop controls by holding pre-work meetings with subcontractor Select and appoint competent subcontract who is knowledgeable in carrying out alteration and additional work to building Conduct inspection to identify hazardous situations Ensure reported hazards are promptly handled and seek advice from professionals if necessary
	Subcontractor	<ul style="list-style-type: none"> Maintain communication with main contractor to report hazardous conditions Suspend work that can cause imminent situation and seek advice from main contractor Ensure hazardous situations identified are promptly responded by main contractor

Level	Role	Actions to break the chain
Operational	Main contractor	<ul style="list-style-type: none"> Suspend works that can cause imminent situation and report to employer for advice
	subcontractor	<ul style="list-style-type: none"> Suspend works that can cause imminent situation and report to main contractor for advice
Behavioral	Main contractor and subcontractor	<ul style="list-style-type: none"> Report hazardous situation to supervisor and seek advice from employer

Table 9: Actions to break the chain of accident in renovation phase

4.5.3 The Demolition Phase

When the demolition commenced in August 1994, construction deviated from the approved plans had led to overstressing of steel bars and thence created cracks in concrete at the point where it jointed the main building. Without the protection of the asphalt layers, rainwater found their way into the cracks and corroded the reinforcing steel bars at the interface. The degradation of the canopy progressed further in Dec 1984 when additional weight of the screeding, the fish tank and the advertising sign board had further aggravated the cracking at the interface. Finally in August 1994, corrosion had penetrated through the entire diameter of almost all the reinforcing steel bars such that no fresh steel was visible at the breakpoint of the bars. The use of hammering machine to dismantle the fish tank at the canopy became the straw that broke the camel's back. The canopy finally collapsed resulting the mishap.

Application of Stakeholder Model at demolition phase to break the chain of incident

Level	Role	Actions to break the chain
Strategic	Client	<ul style="list-style-type: none"> Select and appoint competent contractor to undertake the renovation project Specify design for safety during planning of the demolition work Appoint client's representatives to take up monitoring on site if client is not knowledgeable

Strategic	Demolition contractor	<ul style="list-style-type: none"> Plan and manage the demolition project by seeking advice from structural engineer on the physical strength of the canopy for support of the demolition process Design out risk the entire demolition project Inform client about the significant risk in demolition
	A design structural engineer	<ul style="list-style-type: none"> Plan and manage the demolition process by investigating physical strength of the canopy for support of the demolition process Design out risk by suggesting temporary work for support of the demolition process
Tactical	Demolition contractor	<ul style="list-style-type: none"> Incorporate inputs from client, structural engineer Allocate sufficient and adequate resources for safe execution of work in providing temporary work for support of the canopy Prepare temporary works design Select and appoint competent subcontract who is knowledgeable in carrying out demolition work Establish system to identify hazards and develop controls by holding pre-demolition meetings with subcontractor Ensure rules, procedures are developed, maintained and reviewed Select and appoint competent subcontractor Ensure proper execution of temporary works design Conduct inspection to identify hazardous situations Suspend work that can cause imminent situation and seek advice from main contractor Ensure reported hazards are promptly handled Ensure work procedures down reach to operational level Ensure subcontractor understand requirements

Tactical	Subcontractor	<ul style="list-style-type: none"> • Maintain communication with main contractor to report hazardous conditions • Ensure works are carried out according to work procedures and design • Suspend work that can cause imminent situation and seek advice from main contractor • Ensure hazardous situations identified are promptly responded by main contractor
Operational	Structural engineer or independent checking engineer	<ul style="list-style-type: none"> • Ensure unsafe temporary work design are not used
	Main contractor	<ul style="list-style-type: none"> • Suspend works that can cause imminent situation and report to employer for advice • Ensure understanding and adherence of work procedures
	subcontractor	<ul style="list-style-type: none"> • Suspend works that can cause imminent situation and report to main contractor for advice • Ensure understanding and adherence of work procedures
Behavioral	Main contractor and subcontractor	<ul style="list-style-type: none"> • Adhere to work procedures • Report hazardous situation to supervisor and seek advice from employer • Feedback on control measures

Table 10: Actions to break the chain of accident in demolition phase

5. Conclusions

The stakeholder model is a human performance-based model which emphasizes and judges on the performance of specific responsibilities by a specific stakeholder at a specific level to achieve specific finding of the cause of matter, therefore this model can be applied generally to any human group activities. In case if there is a failure to make such a finding, the model would be able to assist to identify the shortfalls in the system, such as whether the respective stakeholders, their respective levels and/or their respective responsibilities are non-conclusive, unclear or not properly defined. These results are not faults finding but to provide an effective source of information for future review of policies and procedures to achieve the business goals and objectives.