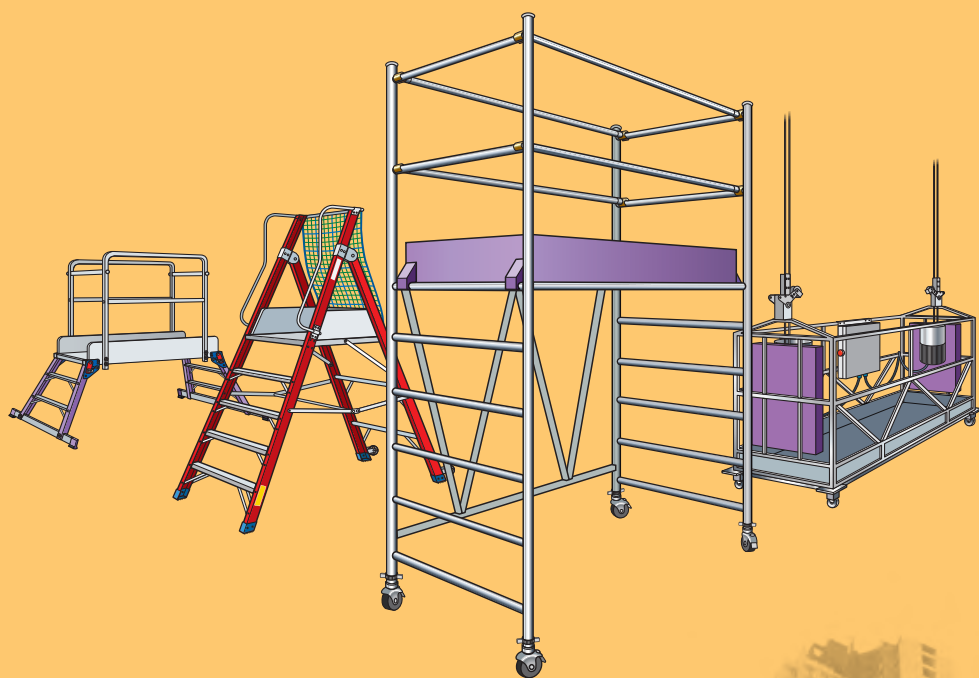




香港房屋委員會  
Hong Kong Housing Authority



# 工地安全手冊

## Site Safety Handbook

2017 Edition

上冊 | Volume 1

# 房委會項目邁向零意外 持續提升工地安全表現 應用創新科技和措施 確保工程重質又安全

**Strive for zero accident of all persons involved in HA projects**  
**Continuous improvement in site safety performance**  
**Persistent adoption of safety innovation**  
**Safety measures for both works quality and safety**

本手冊可從香港房屋委員會網站下載：

**[www.housingauthority.gov.hk/sitesafety](http://www.housingauthority.gov.hk/sitesafety)**

我們現已更新2008年出版的《工地安全手冊》。新版手冊增加了不少內容，包括最新的安全管理措施、新增或已修訂的工作守則、促進安全文化的優化措施等，以供在香港房屋委員會新工程建築項目進行工地作業時參考。

請注意，遵守本手冊的指引，並不會令任何人在法律上具有豁免權。工地的管理人員應根據其工地的實際環境和作業情況制訂工作指引、安全施工程序、安全管理制度和預防措施，並培訓和督導員工，確保工作團隊了解和遵從各項施工程序，以防止意外發生。

為編製本手冊，職業安全健康局已批准使用和複製有關資料，包括載於該局刊物內的插圖、照片及內容。歡迎複製本手冊用作一般參考，惟不得作批簽、廣告及商業用途。複製時請註明出處為「房屋署工地安全小組委員會刊物《工地安全手冊》」。

2008年12月 第一版

2017年2月 第二版

This handbook can be downloaded from Hong Kong Housing Authority Web Site:

**[www.housingauthority.gov.hk/sitesafety](http://www.housingauthority.gov.hk/sitesafety)**

This handbook is an updated version to the last edition in 2008 to include new safety management measures, new or revised codes, enhancement to foster safety culture, etc. for site operations in Hong Kong Housing Authority new works construction projects.

Readers should note that the compliance with this handbook does not confer immunity from legal obligations. The site management should develop their work instructions, safe working procedures as well as a safety management system according to the actual construction site environment and operations on their workplaces, formulate precautionary measures, provide training and supervision to workers for a full understanding and compliance with the works procedures to avoid accidents.

Occupational Safety and Health Council have granted permission for the use and reproduction of the information including illustrations, photos and contents contained in the their publications for the purpose of this handbook. This handbook may be freely reproduced for general reference except for endorsement, advertising and commercial purpose. Please acknowledge the source as “Site Safety Handbook” published by the Housing Department Site Safety Sub-committee.

First Edition December 2008

Second Edition February 2017



# 目錄 Contents

## 上冊 Volume 1

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### 前言 Foreword

1.	安全訊息 Safety Messages	4
2.	安全管理工具及在工地安全上應用資訊科技 Safety Management Tools and Use of Information Technology in Safety	14
3.	一般工地安全及工地整理 General Site Safety and Housekeeping	44
4.	安全使用機械設備 Safe Use of Plant	88
5.	在工地安全使用電力 Safe Use of Electricity on Site	126

---

## 下冊 Volume 2

6.	處理預製混凝土組件 Handling of Precast Concrete Elements	11.	密閉空間工作安全 Safety in Confined Space
7.	棚架、工作平台和高空工作 Scaffolding, Working Platform and Work at Height	12.	個人防護裝備 Personal Protective Equipment
8.	挖掘工程和道路工程 Excavation and Roadworks		索引 Index
9.	地基工程 Piling Works		鳴謝 Acknowledgements
10.	拆卸工程 Demolition Works		

# 前言 Foreword

「質素與安全，兩者相輔相成」。香港房屋委員會（房委會）以工地安全策略的各项措施為本，致力透過夥伴合作，推動工地安全。房委會要求承建商和承辦商確保工作間健康安全，持續提升安全表現。

房屋署工地安全小組委員會由各相關政府部門、法定團體、公共機構、服務供應商、承辦商及承辦商協會、工會的代表和房屋署人員組成。本手冊於2008年首次出版。我們按照房屋署工地安全小組委員會的指示修訂本手冊，更新安全標準、增加良好作業圖片及收錄新一輯安全座右銘。本手冊分為上、下兩冊，方便攜帶使用，而主要加入及更新之內容如下：

- 第二章 – 安全稽核制度、升降機及電梯指定分包合約安全稽核制度、突擊安全巡查計劃、工作安全行為計劃、關顧新人工作安全計劃、指差呼稱、演習、建築信息模擬、應用射頻識別技術、流動裝置應用程式。
- 第三章 – 突出鋼筋之保護、抗熱服、自動體外心臟去顫器、危險區域、升降機大堂安裝防墮扣、升降機槽安裝救生繩。
- 第四章 – 升降機槽內建築工地升降機、吊鉤之安全扣、吊運工字樁之特製吊具、射頻識別技術探測移動機械附近之工人。
- 第五至十二章 – 充電式手提工具、吊運警報系統、工夫樸及梯台、升降機槽工程、工作安全地帶、地基工程之吊運及高空工作安全措施、Y-型安全帽帶。

我們不時鼓勵房委會承建商在業內推廣安全文化；提高督導人員的安全意識；透過安全訓練和資訊，警惕工友在工作間進行高危工作時注意安全；擬備清晰周全的工作指示／程序，以防止人為錯誤；制訂安全施工方案和預防措施，以免意外發生。更重要的是，各承建商須透過生產和供應鏈貫徹執行妥善的工地管理、嚴格遵照安全標準、改善工地監督和鞏固團隊合作，確保有效實踐安全施工。

保障安全不僅是一項行動，也是一種習慣和文化，需要潛移默化和積極培育，承建商和全體工友人人有責。建立安全文化的進程，往往取決於團隊的參與和承擔。只要時刻注意工地安全，便能輕易締造一個安全的工作環境，保障工友的生命安全。房屋署致力灌輸安全文化，並透過強制要求承建商工地管理和督導人員接受培訓，定期舉辦安全工作坊和一年一度的工地安全研討會，進行獨立安全稽核及突擊安全巡查和推廣良好作業模式等工作，提高業界的安全意識。我們希望藉着更新本手冊，勉勵大家更關注安全問題，同心協力，共建工地安全文化。

祝各位身心康泰，安全健康！

房屋署工地安全小組委員會

2017年2月



“Safety and quality goes hand in hand”. Building on the initiatives of its Site Safety Strategy, the Hong Kong Housing Authority (HA) strives to promote site safety through partnership. HA requires its contractors and service providers to ensure that the workplace is healthy and safe, and that there is sustained improvement in safety performance.

The Housing Department Site Safety Sub-committee (HDSSSC) comprises members from various related government departments, statutory bodies, public organisations, service providers, contractor associations, trade unions and internal members of Housing Department. The handbook was first published in 2008. **Upon advice of HDSSSC, this 2016 Edition updates reference to safety standards and photos of good practices with a new set of safety mottos on header. It is published in Volume 1 and 2 for handy use and key new topics/information beefed up in the content include the following:**

- **Ch 2 – Safety Auditing System; Lift and Escalator Nominated Subcontracts Safety Auditing System; Surprise Safety Inspection Programme, Work Safe Behaviour Programme; caring programme for new workers; pointing and calling; regular drill; building information modelling; application of radio frequency identification; applications in mobile devices.**
- **Ch 3 – Protruded bars cover; anti-heat stress uniform; automated external defibrillator; danger zone; anchor bolt in lift lobby, lifeline in lift shaft.**
- **Ch 4 – Builders’ lift inside lift shaft; safety latch of lifting hook; tailor-designed lifting gear for H-pile; RFID system to detect workers near plant.**
- **Ch 5-12 – Cordless power tools; lifting alert system; hop-up and step platform, lift shaft works; safety zone in road works; safety precautions in lifting operations and work at height in piling; y-type chin strap for helmet.**

Contractors are encouraged from time to time to promote safety culture in the industry, to raise safety awareness among supervisory staff, to provide training and information to increase workers’ alertness for high risk activities in their workplace, to develop a full and clear set of the work instruction/procedures to prevent human mistakes, formulate safe method statement with precautionary measures to avoid accidents. More importantly all the contractors have to pursue good site management, strictly adhere to the safety standards, enhance site supervision of workers, reinforce teamwork throughout the production and supply chains in order to ensure safety in construction.

Safety is not merely an act, but also both a habit and culture that takes efforts to nurture. It is also the responsibility of the contractors and all workers on works site. Charting the progression of a safety culture is much dependent on team participation and commitment. With due attention to site safety of workers, safe working environment to safeguard workers’ lives can be achieved without difficulties. The HD is committed to inculcating the safety culture by enhancing the safety awareness through mandatory training requirements for contractor’s site management and supervisory staff, convening regular safety workshops and annual site safety forum, conducting independent safety audit and surprise safety inspection, and promoting best practice. Through this updated edition of the handbook, we wish all our readers to reinforce their safety passion in their heart in order to build up a site safety culture.

HDSSSC wishes you all the best!

The Housing Department Site Safety Sub-committee

February, 2017

## 引言 Introduction

建築工程易生意外，原因在於其本身的特點：多層分判；緊密的工作日程；工人流動性高；狹窄的工作環境；臨時的工作環境；涉及費力的工作；使用重型設備和機器；常受天氣影響；勞工不足；工人和設備老化、技術錯配；部分督導人員和前線工人的安全意識不足及對風險掉以輕心；涉及高處工作，吊運工序以及各類高危活動等。

根據職業安全健康局所作的一項研究，建築工業意外的最普遍因為：

- 工作環境不安全
- 行為不安全
- 安全健康管理不足夠
- 工地經驗不足

《職業安全及健康條例》第509章及其附屬法例規管工作間的安全和健康，而《工廠及工業經營條例》第59章及其附屬法例，特別是《建築地盤（安全）規例》，則規管工業經營（包括建築工地）的安全和健康。此外，尚有其他相關條例規管建築安全。

Construction works are accident-prone owing to its inherent characteristics: multi-layer subcontracting, tight working schedule, mobility of workers, limited working environment, transient working environment, strenuous work involved, use of heavy plant and machineries, work often affected by weather, constraint of labour supply, ageing of work force and plant, mismatch of skills, inadequacy of safety awareness and risk taking attitude of certain supervisory staff and frontline workers, work involving working at height, lifting operation, various kinds of high risk activities, etc.

According to a research undertaken by the Occupational Safety and Health Council (OSHC), the most common causes of industrial accidents in the construction industry are:

- Unsafe working environment
- Unsafe behaviour
- Inadequate safety and health management
- Inadequate site experience

The Occupational Safety and Health Ordinance (Cap. 509) and its subsidiary legislation govern the safety and health of workplaces, whereas the Factories and Industrial Undertakings Ordinance (Cap. 59) and its subsidiary legislation, in particular, the Construction Sites (Safety) Regulations govern the safety and health of industrial undertakings including construction sites. There are also other relevant ordinances governing construction safety.



## 僱主 Employers

根據《工廠及工業經營條例》第6A條，承建商和分包商身為僱主，對於建築地盤的工作健康和安​​全責無旁貸，並有責任向僱員提供安全和健康的工作環境：

- 在工作間提供和維持安全設備和安​​全工作系統。
- 在使用、處理、貯存或運送設備或物質方面作出適當安排，確保僱員的安全和健康。
- 向僱員提供足夠和合適的資料、指示、訓練和監督。
- 在工作間提供和保持安全的出入口。
- 提供和保持安全和健康的工作環境。



為確保工作環境安全和健康，僱主須採取以下一些基本措施：

僱主定時向僱員提供健康檢查  
Employer provides a regular health care check to employees

- 訂立安全和健康標準及程序。
- 委派安全主任監察工作環境的安全和健康情況，以及推行安全計劃和政策。
- 為工人提供個人防護裝備。

Contractors and Sub-contractors as the Employers have general duties under Section 6A of the Factories and Industrial Undertakings Ordinance with regard to the health and safety at work in construction sites and are responsible for providing a safe and healthy working environment to the employees including the following:

- Provide and maintain safe plant and safe systems of work in the work place;
- Make arrangement for ensuring safety and health in connection with the use, handling, storage or transport of articles or substances;
- Provide adequate and appropriate information, instruction, training and supervision to his employees;
- Provide and maintain safe access to and egress from the workplaces; and
- Provide and maintain a safe and healthy working environment.

# 1 安全訊息

## Safety Messages

Basic actions that the employers are required to take to safeguard safe and healthy working environment include the following:

- Set safety and health standards and procedures;
- Appoint safety officers to monitor safe and healthy working environment and implement safety plan and policy; and
- Provide workers with personal protective equipment.



管理層向僱員聽取意見的另一方法  
Management provides a channel to collect employees' views

## 僱員 Employees

僱員應與僱主和其他人士合作，遵守安全規例和指示。僱員應：

- 以安全的方式工作。
- 不要作任何危及自己和他人的行為。
- 按規定使用個人防護裝備，並在不使用時作適當的護理。
- 倘發現有不安全的活動，即時向主管或監管工作間的負責人員報告。
- 發生意外或出現危險情況時，即時向主管報告。



員工在例會向管理層提出意見及改良建議  
Feedback the needs / suggest safety improvement at regular meeting / forum

Employees should cooperate with their employers and other persons in complying with safety regulations and instructions. In particular, employees should:

- Work safely;
- Not do anything to endanger themselves and other persons;
- Use personal protective equipment as required and take reasonable care of them when they are not used;
- Report unsafe activities immediately to supervisors or the responsible person in control of the workplace; and
- Report all accidents and dangerous occurrences to the supervisors immediately upon occurrence.



## 給地盤工友的基本安全提示 Basic Safety Tips for Workers

### 開始

1. 認識和遵守所有安全標誌和指示。
2. 切實遵守安全守則及安全工作程序。

### 工地整理

3. 保持工作地方清潔整齊，盡快清理垃圾。
4. 小心樓洞和樓面邊緣，確保已有適當護欄保護或蓋好，並設有明顯的警告標示。
5. 提供充足的照明。

### 安全措施和作業

6. 如發現任何不安全的情況，應立即行動。
7. 如發覺有人以不安全的方法工作，須提醒他們及加以指正。
8. 遇有意外發生，無論是否有人受傷，均須報告。
9. 切勿操作自己不熟悉或未經授權操作的機器。
10. 切勿操作沒有護罩或保護系統的機器。
11. 正確使用適當的工具。
12. 工具用畢後應妥為安放。
13. 時常保持警覺，留意移動中的起重機、吊鉤、下墮物體或其他起重裝置。
14. 熟悉滅火設備的位置和使用方法。
15. 切勿把電線放在地面上或讓電線和水接觸。
16. 使用裝有電流式漏電斷路器或有雙重絕緣的電力工具，以作對地漏電保護。
17. 正確使用，處理及儲存化學品。
18. 切勿進入危險區域。
19. 如已實施工作許可證制度，取得有效的許可證才可開工。

### 個人安全

20. 使用適當的個人防護裝備，如頭盔、護目鏡、耳塞、呼吸器具等。
21. 注意個人衛生。
22. 工地內切勿嬉戲。
23. 工作時切勿飲酒和服用藥物。



在當眼處標貼安全標誌及告示，能吸引工友的注意  
Proper safety sign / precaution notice at prominent location to alert workers



整齊的工地環境可避免意外發生  
A tidy site environment can reduce site accident

# 1 安全訊息

## Safety Messages

### Getting start

1. Be familiar with all safety signs and directions and comply with them.
2. Comply fully with safety codes/safe working procedures.

### Housekeeping on site

3. Keep the workplace clean and tidy and remove refuse if any as soon as possible.
4. Beware of floor openings and edges and ensure that they are protected by proper guard-rails or securely covered with warning displayed prominently.
5. Provide sufficient lighting.



物料存放區應妥善圍封及把物料存放有序  
Area for materials is securely fenced off and stored in an orderly manner

### Safety measures and practices

6. Act immediately upon discovering any unsafe conditions.
7. Alert any colleagues performing work in an unsafe manner and advise them accordingly.
8. All accidents, whether injury is involved, must be reported.
9. Do not operate any machines you are not familiar with and/or unauthorized.
10. Do not operate any machines without the provision of protective guards or protection systems.
11. Use suitable tools in a correct manner.
12. Put the tools back in the proper place after use.
13. Keep vigilant at all times and watch out for moving cranes, hooks, falling objects or other lifting equipment.
14. Be familiar with the locations and the operation of fire-fighting equipment.
15. Avoid allowing electric cables lying on the ground or coming into contact with water.
16. Use electrical tools with earth leakage protection by residual current device or those with double-insulation protection.
17. Use, handle and store chemicals in a correct manner.
18. Stay out of danger zones.
19. If a permit-to-work system is in force, start work only after obtaining the permit and the permit remains valid.



在逃生路應張貼安全出路標示及火警逃生路線圖  
Post safe exit direction / fire evacuation plan at exit for use under emergency





## Personal Safety

20. Use suitable personal protective equipment such as helmet, goggles, ear plugs and breathing apparatus.
21. Pay attention to personal hygiene.
22. Do not play with colleagues in the works site.
23. Do not drink alcohol or take drugs while at work.



開工前應自行檢查個人防護裝備  
Self-checking on personal protective equipment before work

## 緊急事故 Emergency

遇有緊急事故，應確定是否需要啟動警鐘、逃生或疏散。如需要逃生或疏散，應循正確路線到達安全地方。

如有人受傷：

1. 保持鎮定並尋求協助。
2. 適當地協助救援。
3. 陪同傷者。
4. 告知管理小組和安全主任。
5. 召喚救護車、通知警方、勞工處和房屋署駐工地的監督人員。

In case of emergency, find out if it is necessary to trigger alarm, escape or evacuate. If escape or evacuation is required, follow the proper escape or evacuation route to a safe place.

In the event of injuries,

1. Keep calm and seek assistance.
2. Assist in rescue as appropriate.
3. Stay with the injured person.
4. Inform management team and safety officer.
5. Call ambulance, police, Labour Department and site staff of Housing Department.



告示板上貼上緊急聯絡人姓名和電話號碼  
Emergency contact name and phone numbers posted on prominent notice board

## 提升團隊士氣 Boosting Morale in the Workplace

僱主（即承建商、分包商）和僱員應互助互勉，互相扶持，令各方對工作有滿足感和成功感，從而締造和諧氣氛、加強團隊精神，促使工作團隊不斷改進、精益求精，並培養信念積極面對和解決問題，壓力自然能迎刃而解，有助貫徹執行安全施工程序，提高工作士氣。

給僱主或高級管理層的一些建議如下：

- 為員工或鼓勵員工訂立個人發展計劃。
- 提供安全及健康的工作環境及工作設備，並制訂安全的工作方法，指導員工採用。
- 制訂並切實執行公平的規則及合理的獎罰制度。
- 因應員工的能力及經驗，分配合適的工作及工作量。
- 提供足夠資源，包括人力、物力及技能訓練等，令員工有足夠能力應付獲派的工作。
- 清楚界定員工的角色及責任，並確保所有員工知道。
- 安排足夠的休息時間，並提供福利設施，如休息室、飲食設施、洗手間等。
- 提供足夠及合適的訓練，以培養員工在處理突發事故及難題方面的能力。
- 易地而處，互相體諒。
- 推廣健康訊息，安排身體檢查。
- 觀察員工及機構在以下方面的情况：
  - 員工的健康及行為
  - 機構內的文化及氣氛
- 分析各項指標及統計數字：
  - 意外及缺勤率
  - 生產力及施工／服務質素
  - 投訴
  - 醫療保險索償數字等



承建商於告示板展示各種安全及健康的資訊，讓員工貫徹執行

Safety and health information displayed by main contractor on the notice board for workers to follow



告示板展示工地安全統計數字

Site safety statistics displayed on prominent notice board





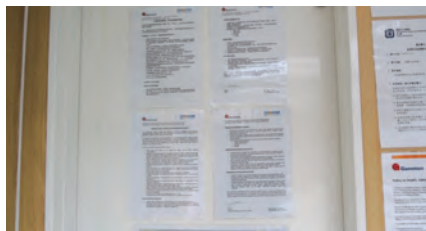


## Enlightening about work safety - A people-oriented approach

Employers (including contractors, subcontractors) and employees/workers should help and support one another, instill pride and job satisfaction, promote harmony and team spirit, stay focused on what actions one can take for improvement, develop a sense of trust that things will work out eventually and enforce Safe Working Cycle. All these could contribute to reducing stressors and building morale within the workforce.

Some suggestions for **employers** or **senior management** are as follows:

- Formulate or encourage employees to formulate personal development plan
- Provide a safe and healthy working environment and facilities, formulate and instruct the employees to adopt safe work practices
- Formulate fair rules and regulations and a reasonable merit and demerit system. Make sure these are implemented fully
- Distribute appropriate work and workload according to employees' capabilities and experience
- Provide sufficient resources including manpower, equipment and skills-training, so that employees are capable of carrying out work assigned to them
- Give employees clearly defined roles and responsibilities and make sure that staff are aware of them
- Arrange sufficient rest periods and provide welfare facilities such as rest room, canteen and toilets, etc.
- Provide sufficient and appropriate training to equip staff with the ability to solve problems and deal with emergencies
- Be considerate
- Promote health messages, arrange physical checkups
- Observe the performance in regard to:
  - employees' health and behaviour
  - culture and atmosphere within the organization
- Analyse various indicators and statistics:
  - rates of accidents and absenteeism
  - productivity and works/service quality
  - complaints
  - medical insurance claim figures, etc.



告示板上的安全政策聲明  
Statement of safety policy on notice board



簡單設施已提供到舒適休息間  
A simple set-up for a comfortable rest area for workers



# 1 安全訊息

## Safety Messages

給僱員的一些建議如下：

- 以建設性的態度向管理層反映意見，以消除或減少壓力來源，例如購買搬運工具、改善工作流程等。
- 制訂工作計劃、訂立工作的緩急次序、改善時間管理。
- 積極面對問題，跟同事與上司討論解決問題的方法。
- 常做運動，強健體魄。
- 均衡飲食，避免進食不健康的食物，如咖啡、酒精飲品。
- 戒煙。
- 充足睡眠，睡前摒除雜念。
- 練習鬆弛技巧。
- 與同事、家人、朋友建立良好關係，建立支援網絡。
- 接納別人的支持，及向有需要的同事伸出援手。
- 易地而處，互相體諒。
- 作息有序，安排工餘消閒活動，發展個人興趣。
- 遇到困擾時，向信賴的人傾訴，或找專業輔導人員或心理學家輔導。
- 如出現焦慮不安、抑鬱等症狀時，應向醫生求診。



Some suggestions for **employees** are as follows:

- Submit your views to the management on eliminating or reducing stressors in a constructive manner e.g. purchase tools, improve work flow, etc.
- Formulate work plans, prioritize work, improve time management
- Face problems positively, discuss with co-workers and superior ways to solve problems
- Exercise regularly to keep your body fit and healthy
- Maintain a balanced diet; avoid excessive unhealthy foods such as coffee and alcoholic drinks
- Quit smoking
- Ensure sufficient sleep, clear your mind of clutter before going to bed
- Learn relaxation techniques
- Build a good relationship with your co-workers, family and friends, establish a support network
- Accept support from others and give a helping hand to co-workers
- Be considerate
- Adopt a healthy way of living, arrange leisure activities, develop personal interests
- When experiencing anxieties, talk to people you can trust or seek counseling from professional counselors or psychologists
- If symptoms of anxieties, unease and depression persist, seek medical help





## 參考資料 References

### 相關法例和規例

- 《職業安全及健康條例》
- 《工廠及工業經營條例》
- 《建築地盤（安全）規例》
- 《工廠及工業經營（安全主任及安全督導員）規例》
- 《工廠及工業經營（安全管理）規例》

### 相關安全標準、工作守則、安全指引和指南

- 《工廠及工業經營（安全管理）規例指南》（勞工處）

### Relevant Ordinances and Regulations

- Occupational Safety and Health Ordinance.
- Factories and Industrial Undertakings Ordinance.
- Construction Sites (Safety) Regulations.
- Factories and Industrial Undertakings (Safety Officers and Safety Supervisors) Regulations.
- Factories and Industrial Undertakings (Safety Management) Regulation.

### Relevant Safety Standards, Codes of Practice, Guidance Notes and Guidelines

- A Guide to Factories and Industrial Undertakings (Safety Management) Regulation. (LD)

### 引言 Introduction

本章主要介紹安全管理工具，包括安全施工程序、安全氣候指數調查、工作安全行為計劃、房委會安全稽核制度、房委會升降機及電梯指定分包合約安全稽核制度和工地突擊巡查制度，並簡述在房委會新工程合約內，這些工具的特點和應用情況。

本章亦會簡述如何應用建築信息模擬系統、無線射頻識別系統和流動應用程式等資訊科技，以加強工地安全。

This chapter will mainly cover safety management tools including Safe Working Cycle, Safety Climate Index Survey, Work Safe Behaviour Programme, Housing Authority Safety Auditing System, Housing Authority Lift and Escalator Nominated Subcontracts Safety Auditing System and Surprise Safety Inspection Programme. Brief description on the key features of the functions and their application in Housing Authority New Works contracts is depicted.

A brief description of use of information technology including building information modeling, radio frequency identification and mobile applications in enhancing site safety is also covered.

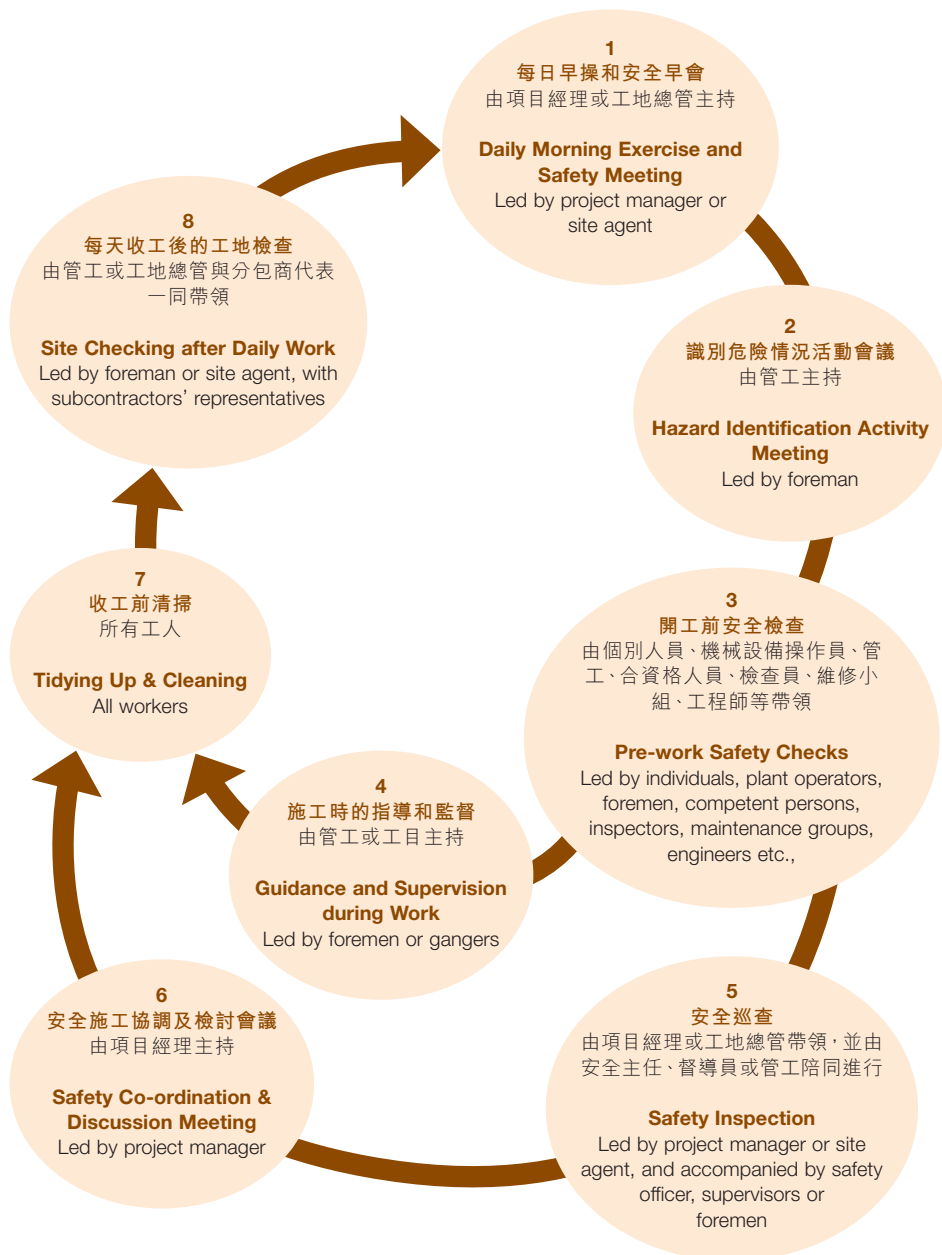
### 安全施工程序 Safe Working Cycle

#### 何謂「安全施工程序」？ What is “Safe Working Cycle”?

- 房委會轄下所有新工程建築工地均採用「安全施工程序」，以提高安全管理系統的成效。
- 程序由多項預定工作組成，旨在提高安全和健康意識，以防止意外和工傷。
- 程序把安全健康措施納入有系統的大綱內，強調以身作則和鼓勵參與。
- 程序按日、週、月分類。
- “Safe Working Cycle” is adopted in all HA new works construction sites to enhance effective implementation of safety management system.
- It comprises scheduled activities to heighten safety and health awareness and help prevent accidents or injuries.
- It integrates safety and health practices into a systematic framework by placing emphasis on leadership and promoting participation.
- Classified with daily, weekly and monthly cycles.



## 每日安全施工程序 Daily Safe Working Cycle



## 2 安全管理工具及在工地安全上應用資訊科技 Safety Management Tools and Use of Information Technology in Safety

### 每日安全施工程序 Daily Safe Working Cycle

#### (1) 每日早操和安全早會

- 由項目經理或工地總管主持，參加者為工人（包括分包商的工人）。
- 簡報工地的特別工程和活動、須注意的安全及健康事項，例如工地的危險區域和安全預防措施。
- 為施工作準備，提醒工人提高警覺及檢查個人防護裝備，注意各項安全規定。
- 培養團隊精神，有助加強各工種之間的協調。
- 於戶外或室內舉行，開工前進行早操或伸展運動。



有蓋的安全早會  
Indoor morning briefing



露天的安全早會  
Outdoor morning briefing



進行中的早操  
Morning exercise in progress



早會可培養團隊精神  
Morning briefing could promote team spirit

#### (1) Daily Morning Exercise and Safety Meeting

- To be led by project manager or site agent, with workers, including those workers from subcontractors.
- Brief on special site works and activities, prevailing safety and health concerns such as the site hazardous areas and safety precaution.
- Prepare for work, draw attention to safety rules, check personal protective equipment and raise vigilance.
- Promote team spirit for effective works co-ordination with other trades.
- To be conducted in an outdoor or indoor area and include morning exercise/stretching exercise before starting work.





## (2) 識別危險情況活動會議

- 由管工主持，參加者包括各個工種的工人，亦歡迎前線工人參與。
- 識別危險情況、認識風險和制定預防措施。
- 按照安全計劃，就危險工作實施安全工作系統。
- 確保工人了解工序、安全要求和措施。
- 訓斥多次施工不當或違規的工人。
- 在工地辦公室及／或工作間進行。
- 加強團隊精神。
- 加強安全施工程序和提高安全意識。



商討並制定預防措施  
Coming up with a control measures

## (2) Hazard Identification Activity Meeting

- To be led by foreman, with team members from each trade as participants, and participation of front line workers is welcome.
- Identify potential hazards, make aware of risks and come up with control measures.
- Implement safe system of work for hazardous works according to the Safety Plan.
- Ensure understanding of working process, safety requirement & measures by workers.
- Reprimand workers for repeated mal-practice/irregularities.
- To be conducted in site office and/or workplaces.
- Enhance team spirit.
- Reinforce safe working cycle and safety consciousness.



團隊在了解工序和安全措施  
Understanding of work process & safety measures



工作交流的集會可增加團隊精神  
Group activity meeting could enhance team spirit

## 2 安全管理工具及在工地安全上應用資訊科技 Safety Management Tools and Use of Information Technology in Safety

### (3) 開工前安全檢查

- 由個別人員、機械設備操作員、管工、合資格人員（即電工、機械技工、搭棚工）、檢查員、維修小組、工程師等帶領，參加者為全體工人。
- 指派負責人員在開工前檢查機械設備、裝備、棚架、工具、裝置、機器和物料，確保安全妥當。
- 檢查時如發現問題，須在糾正後才開工。
- 在工作間進行。
- 提高施工效率，有助減少意外。
- 確保遵照相關法例和規例施工。



對棚架進行安全檢查  
Safety check on scaffolding

### (3) Pre-work Safety Checks

- To be led by individuals, plant operators, foremen, competent persons (electricians, mechanics, scaffolders), inspectors, maintenance groups, engineers etc., with all workers as participants.
- Appoint person-in-charge for the inspection and checking plant, equipment, scaffolding, tools, installations, machineries and materials before work commencement to ensure these are in proper and safe condition.
- Identify and rectify the problem revealed from inspection before works commencement.
- To be carried out at the workplace.
- Enhance efficiency and help reduce accidents.
- Ensure compliance with laws and regulations.



開工前對工具進行安全檢查  
Safety check of tools before work



使用前應檢查機械設備的安全措施  
Checking plant for safe use



開工前檢查氣焊工具  
Checking gas welding equipment





#### (4) 施工時的指導和監督

- 由管工或工目主持。
- 檢查是否符合安全指示和程序。
- 確保已採取識別危險情況活動會議所建議的安全措施。
- 及時採取行動解決問題／糾正不安全的行為，以及進行協調。
- 在工作間進行，由各名管工／工目指導／負責。

#### (4) Guidance and Supervision during Work

- To be led by foremen or gangers.
- Check compliance with safety instructions and procedures.
- Ensure implementation of safety measures as suggested in the Hazard Identification Activity meeting.
- Timely action to settle problem/correct unsafe act and help coordination.
- To be conducted in the workplace under the direction/responsibility of each foreman/ganger.



工目現場監督施工情況  
Works supervision by ganger



指導工程小組  
Guidance given to works team

#### (5) 安全巡查

- 由項目經理或工地總管帶領，並由安全主任、督導員或管工陪同進行。
- 每天在施工範圍進行安全巡查至少一次。
- 檢查工程是否按照已計劃的程序進行，並識別／糾正危險情況。

## 2 安全管理工具及在工地安全上應用資訊科技 Safety Management Tools and Use of Information Technology in Safety

- 在巡查期間即時指示管工糾正危險活動／狀況。
- 展示機構對工地安全的承擔。
- 高層管理人員須參與其中。
- 藉此機會評估分包商的表現。

### (5) Safety Inspection

- To be led by project manager or site agent, accompanied by safety officer, supervisors or foreman.
- Carry out safety inspection of works area at least once every day.
- Check compliance of works activity with planned procedures and identify/rectify any potential hazards.
- Direct foremen to rectify dangerous activity/condition as identified in the inspection immediately.
- Demonstrate company's commitment towards safety.
- Participation of senior management.
- Provide an opportunity to assess the performance of subcontractors.



進行中的安全巡查／檢查  
Safety inspection/check



識別潛在危險  
Potential hazards identification

### (6) 安全施工協調及檢討會議

- 由項目經理主持，參加者為安全主任／分包商代表。
- 檢討當日的安全事宜，並就改善施工安全提出建議。
- 互相溝通，解決所遇到的問題。
- 檢查並確保所有施工資訊、物料和資源均已準備就緒，使下一個工作天的工程能順利進行。



#### (6) Safety Co-ordination & Discussion Meeting

- To be led by project manager with safety officer/sub-contractors as participants for site safety meeting.
- Review safety issues of the day and suggestions for any safety improvement.
- Communicate and resolve problems encountered.
- Check and ensure availability of all information, materials and resources for smooth works on the following working day.



現場商討解決所遇到的問題  
Resolving problems encountered

#### (7) 收工前清掃

- 離開工地前，所有工人均須進行清掃，並把工具、機械設備和裝備放置在正確地方，並須妥善貯存、分類或處置廢物，保持通道暢通無阻。
- 確保工作環境準備妥當，可供下一個工作天施工。
- 保持工作環境清潔，有助提高施工效率。



安全施工協調／檢討會議  
Safety co-ordination/discussion meeting

#### (7) Tidying Up & Cleaning

- Make sure that all workers need to tidy up, clean and place the tools, plant and equipment in the right position, properly store, sort or dispose of waste and keep the circulation path free of obstruction before leaving the site.
- Make the working environment ready for work on the following working day.
- Enhance efficiency by maintaining a tidy working environment.



每天收工前的清掃  
Tidying up works place



每天處置廢物  
Disposing waste daily

## 2 安全管理工具及在工地安全上應用資訊科技 Safety Management Tools and Use of Information Technology in Safety

### (8) 最後檢查

- 由管工或工地總管與分包商代表一同帶領。
- 進行最後檢查，防止火警、水浸、失竊、棚架倒塌、有人擅闖工地等。
- 防止意外和浪費能源。
- 可藉此評估工人整理工地的表現。
- 確保遵照相關法例和規例施工。



每天收工後的最後檢查  
Final checking after daily work

### (8) Final Check

- To be led by foremen or site agent, with subcontractors' representatives.
- Final check on fire hazard, water flooding, theft, collapse of scaffolding, entry of trespassers, etc.
- Prevent accidents and energy wastage.
- Assess workers' performance in housekeeping.
- Ensure compliance with laws and regulations.

## 每週安全施工程序 Weekly Safe Working Cycle

### (1) 每週安全巡查

- 由項目經理或工地總管帶領，參加者為安全主任和分包商代表。
- 聯合重點巡查位於高危地方／處於危險狀況的工作間、設施和裝置。
- 釐清承建商和各個分包商的責任。
- 加強各個工作單位之間的溝通和合作，以盡量減少安全問題。
- 強調高層管理人員的承擔。
- 在工地和周邊地方進行。



每週的工作間巡查  
Inspection on workplaces



## (1) Weekly Safety Inspection

- To be led by project manager or site agent, with safety officer, representatives of sub-contractors as participants.
- Joint weekly inspection with focus on workplaces and facilities, installations on high-risk places/potential unsafe conditions.
- Clarify the contractor and each sub-contractor's responsibilities.
- Strengthen communication and co-operation among parties concerned as to minimize any safety problems.
- Underline the commitment of senior management.
- To be conducted on site and surrounding areas.



安全巡查隊進行每週工地及周邊的檢視  
Safety inspection team conducts inspection on the workplace and surrounding areas

## (2) 每週檢查

- 由機械設備操作員／合資格人員（包括合資格電工和機械技工等）帶領。
- 由帶領檢查工作的組長擬備檢查清單。
- 檢查機器、裝備和設施是否有問題，並進行所需的修理。
- 及早進行維修或更換，以解決問題。
- 如發現機器、裝備和設施不符合安全標準，應暫停使用及／或暫時停工。
- 在工作間進行。



## 2 安全管理工具及在工地安全上應用資訊科技 Safety Management Tools and Use of Information Technology in Safety

### (2) Weekly Check

- To be led by plant operators/competent persons, including qualified electricians and mechanics, etc.
- Prepare works checklist by leaders.
- Check up machinery, equipment and facilities for abnormality and provide necessary maintenance.
- Resolve problems by timely repair or replacement.
- Suspend the use and/or stop the works when conditions drop below the safety standard.
- To be conducted at the workplaces.



每週都執行的檢查裝備／工具  
Weekly checking equipment/tools



### (3) 每週安全協調會議

- 由項目經理、工地總管或安全主任主持，參加者為工人和分包商代表。
- 檢討安全運作程序，識別危險區域，協調下週的施工程序。
- 在工地辦公室進行。



### (3) Weekly Safety Co-ordination Meeting

- To be led by project manager, site agent or safety officer, with worker and sub-contractors' representatives.
- Review of safe operation procedures, identify the hazardous areas, coordinate the works sequence for the following week.
- To be conducted in site office.



進行中的安全協調會議  
Safety co-ordination meeting



#### (4) 每週清掃和全面清潔

- 由管工帶領，參加者為所有工人。
- 徹底清掃和全面清潔工地，以為下週工作作好準備。
- 保持工地整潔，秩序井然。
- 使工作環境更安全，加強工人紀律和提高工作效率。
- 減少因危險情況而造成的意外。
- 在所有工作間進行。

#### (4) Weekly Tidying Up & Overall Cleaning

- To be led by foremen, with all workers as participants.
- Tidy up and clean the whole site to prepare for work next week.
- Keep the site in good working order and discipline.
- Enhance safety of working environment, discipline and efficiency of workers.
- Reduce accidents caused by risky conditions.
- To be conducted at all workplaces.



每週全面徹底清潔  
Weekly overall cleaning work

## 每月安全施工程序 Monthly Safe Working Cycle

#### (1) 每月安全大會

- 由項目經理或工地總管主持，所有人員均須出席。
- 與安全早會一起進行。
- 檢討上月的安全表現。
- 簡介安全推廣活動。
- 頒獎表揚安全表現出色的工人。



合併每天／每月安全大會  
Joint safety morning/monthly meeting

#### (1) Monthly Safety Meeting

- To be led by project manager or site agent and attended by all staff.
- Jointly held with safety morning assembly.
- Review safety performance in last month.
- Briefing on safety promotional campaign.
- Present awards to workers with outstanding safety performance.

## 2 安全管理工具及在工地安全上應用資訊科技 Safety Management Tools and Use of Information Technology in Safety



以頒獎形式鼓勵及表揚在安全表現出色的工人  
Present awards to workers with outstanding safety performance

### (2) 每月巡查

- 由總承建商和分包商的合資格人員（例如電工、機械技工）帶領，參加者為其他合資格人員。
- 深入巡查機械、裝備、工具和物料。
- 巡查的次數須符合指引／法例的規定。
- 確保設施和裝備經常保持可供使用的狀況，並在有需要時進行維修／更換。
- 提升生產力、施工質素和安全。



為確保機械能安全運作，需進行詳細檢查  
Detail inspection/checking of machines for a safe operation

### (2) Monthly Inspection

- To be led by qualified personnel of main contractor and subcontractors such as electrician and plant mechanic, with competent persons, etc. as participants.
- Regular in depth inspections on machines, equipment, tools and materials.
- The frequency of inspection to comply with legislation.
- Keep facilities and equipment in constant serviceable condition, making repair/replacement, if necessary.
- Improve productivity, quality and safety.



物料吊重機進行安全檢測  
Perform regular safety checking/inspection to material hoist





### (3) 每月安全訓練

- 由安全主任主持，參加者為工人。
- 提供安全訓練和意外／事故分析，採取預防措施。
- 加強安全意識和技術，培養積極的安全態度。
- 提供的安全訓練，不僅限於法例所規定。



工人參與工地的安全座談會  
Safety forum for site workers

### (3) Monthly Safety Training

- To be led by safety officer, with workers as participants.
- Provide safety training, analysis of accident/incident occurred and adopt control measures.
- Reinforce safety awareness, skills and foster positive attitude on safety.
- Provide safety trainings, not restricted to legislative requirement.



為操作員工安排正確安全使用機械的訓練  
Practical training on safe use of machinery/plants

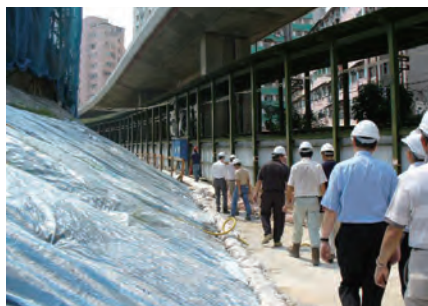
### (4) 每月安全委員會會議

- 由項目經理或工地總管主持，與會者包括安全主任、分包商代表、工地督導員，以及合約經理代表。
- 監察安全施工程序是否有效執行。
- 審閱意外統計數字，提出預防措施。
- 計劃未來幾個月的安全措施。
- 檢討工地安全表現。
- 審閱工地巡查報告。
- 監察所舉辦的安全訓練課程和內容。
- 發放安全健康資訊。
- 討論和安排安全推廣活動。

## 2 安全管理工具及在工地安全上應用資訊科技 Safety Management Tools and Use of Information Technology in Safety



在工地辦事處進口，張貼安全健康資訊  
Safety and health information on notice board at site office entrance



安全委員會成員視察工地環境  
Site inspection by safety committee

### (4) Monthly Safety Committee Meeting

- Chaired by project manager or site agent and attended by safety officer, representatives of subcontractors and supervisory site staff, contract manager's representative.
- Monitor effective implementation of Safe Working Cycle.
- Review accident statistics and provide preventative measures.
- Plan safety measures for the coming months.
- Review site safety performance.
- Review safety inspection reports.
- Monitor safety training courses conducted and their contents.
- Disseminate safety and health information.
- Discuss and organize safety promotion activities such as safety campaign.



每月例行的安全委員會會議  
Monthly safety committee meeting





## 安全氣候指數調查 Safety Climate Index (SCI) Survey

安全氣候指數是衡量前線人員對安全／健康的認知之一項量化指標。

安全氣候指數調查可作為量度工具，以具體了解前線員工（包括管理層、工地督導人員和工人）對工作安全的認知和認同。

工地的安全氣候水平可歸納為以下七項主要指標或影響因素，水平愈高，代表安全氣候愈正面：

- 機構和管理層的承擔；
- 為安全事宜提供資源和支援；
- 對冒險行為和風險的認識；
- 對安全規則和程序的認知；
- 個人在安全和健康事宜方面的參與；
- 安全工作態度；以及
- 安全推廣和溝通。

SCI as an indicator of frontline personnel's perception on safety/health.

SCI survey as a tool to gauge the safety perception and awareness from the perspectives of frontline personnel (including management staff, supervisors and workers).

The level of Safety Climate attained on site is represented by the following seven key indicators or contributing factors, and the higher the level, the more positive the safety climate:

- Corporate and Management Commitment;
- Safety Resources and Support;
- Awareness of Risk-taking Behaviour and Hazards;
- Perception of Safety Rules and Procedures;
- Personal Involvement in Safety and Health;
- Safe Working Attitude; and
- Safety Promotion and Communication.



在安全告示板上張貼安全守則  
Safety rules displayed on safety board

### 工作安全行為計劃 Work Safe Behaviour (WSB) Programme

- 人類的行為與他們在工作間的安全表現息息相關。為改善工作間的安全情況，我們對工人的表現進行行為研究，以找出工作安全行為。
- 工作安全行為計劃旨在透過觀察工人的行為、進行分析和找出問題所在，以協助擬訂行動計劃。
- 工作安全行為計劃的實施步驟：
  - a. 觀察和記錄危險行為。
  - b. 取得最高管理層的支持。
  - c. 從安全氣候指數、意外報告和關鍵行為清單中找出問題所在。
  - d. 設定目標和提供培訓。
  - e. 回饋、檢討、調查和分析。
  - f. 透過安全氣候指數進行監察，預測安全趨勢，建立新的觀察清單，以及提升質素。
- WSB Programme refers to the application of behavioural analysis methods to achieve continuous improvements in safety performance.
- WSB Programme aims to assist the preparation of action plans by observing workers' behaviours, analyzing and producing findings.
- Steps for WSB Programme implementation:
  - a. Observe and record the at-risk behaviours.
  - b. Get support from top management.
  - c. Identify problems by SCI/ accident reports and critical behaviour (checklist).
  - d. Set the goal and provide training.
  - e. Provide feedback, conduct review, investigation and analysis.
  - f. Monitor via SCI and predict the safety trend, new checklist and enhancement.



在安全資訊告示板上張貼主要高危工作  
Major high risk activities displayed on safety information board



## 房屋委員會安全稽核制度 Housing Authority Safety Auditing System (HASAS)

- 旨在：
  - a. 評估新工程項目的安全及健康表現。
  - b. 推廣安全管理概念和提升業界的安全標準。
- 新工程合約（即建築工程、清拆工程、地基工程和土木工程合約）須進行獨立安全稽核。
- 在工程合約開展後，委派職業安全健康局的認可安全稽核員進行安全稽核。
- 在整個建築階段，每三個月進行一次安全稽核。
- With the aim to:
  - a. evaluate the occupational safety and health performance of new works projects.
  - b. promote safety management concept and improve safety standards of the industry.
- An independent safety audit to be implemented for new works contracts (i.e. building, demolition, foundation and civil contracts).
- Appointing the Accredited Safety Auditor (ASA) of Occupational Safety and Health Council to carry out the safety audit after commencement of the works contract.
- The safety audit is to be conducted once every three months during the whole construction stage.



安全稽核制度包括工地巡查識別與物件下墮，高處工作，吊運作業，工地整理，供電系統，塔式起重機及流動式起重機有關的危害

The safety system audit comprises on site tour inspection to identify the job related hazard of falling objects, working at height, lifting operation, housekeeping, electricity, tower and mobile cranes

## 2 安全管理工具及在工地安全上應用資訊科技 Safety Management Tools and Use of Information Technology in Safety

- 安全稽核涵蓋兩個部份，包括A部及B部兩種：

### A. 安全及健康管理系統

1. 安全政策
2. 安全架構
3. 安全培訓
4. 內部安全規則
5. 安全委員會
6. 危險狀況視察計劃
7. 工作危險分析
8. 個人防護計劃
9. 意外／事故調查
10. 應急措施
11. 安全推廣
12. 健康保障計劃
13. 評估、挑選和管控分包商

- HASAS covers two parts (Part A and Part B), comprising:

### A. Safety and Health Management System

1. Safety Policy
2. Safety Organization
3. Safety Training
4. In-house Safety Rules
5. Safety Committee
6. Programme for Inspection of Hazardous Conditions
7. Job Hazard Analysis
8. Personal Protection Programme
9. Accident/Incident Investigation
10. Emergency Preparedness
11. Safety Promotion
12. Health Assurance Programme
13. Evaluation, Selection and Control of Sub-contractor

### B. 工序控制計劃

1. 工作間管理
2. 工作和作業管理
3. 機動機械設備和裝備的管理
4. 吊運物料和人的機械設備和裝備的管理
5. 機械設備和裝備的管理



吊人籠的標示提醒工友必須帶安全帶。

Clear signage to remind worker to wear safety harness when using man carrying cage

Summary of Periodic Verified Safety Audit/Inspection Scores (HASAS)

Form: HASAS-001 Rev. 01  
Project: (Name of Project) (Full Name of the Client) (Full Name of the Contractor)

Assessment period: \_\_\_\_\_  
Next verification date: \_\_\_\_\_

**A. Verified Scores of Elements 1 to 13**

Element	Maximum Score	Score	Percentage Score
1. Safety Policy	10	10	100%
2. Organization Safety Structure	10	10	100%
3. Safety Training	10	10	100%
4. In-house Safety Rules	10	10	100%
5. Safety Committee	10	10	100%
6. Programme for Inspection of Hazardous Conditions	10	10	100%
7. Job Hazard Analysis	10	10	100%
8. Personal Protection Programme	10	10	100%
9. Accident/Incident Investigation	10	10	100%
10. Emergency Preparedness	10	10	100%
11. Safety Promotion	10	10	100%
12. Health Assurance Programme	10	10	100%
13. Evaluation, Selection and Control of Sub-contractor	10	10	100%
<b>Total</b>	<b>130</b>	<b>130</b>	<b>100.00%</b>

**B. Verified Scores of Element 14**

Element	Score	Maximum Score	Percentage Score
14. Process Control Programme	100	100	100.00%
<b>Total</b>	<b>230</b>	<b>230</b>	<b>100.00%</b>

**C. Verified Overall Safety Audit (HASAS) Scores**

Verified Overall Safety Audit (HASAS) Score	Maximum Score	Score	Percentage Score
Verified Overall Safety Audit (HASAS) Score	230	230	100.00%

**D. Scores of Critical Part Items**

Critical Part Item	Score	Maximum Score	Percentage Score
1. Safety Policy	10	10	100%
2. Organization Safety Structure	10	10	100%
3. Safety Training	10	10	100%
4. In-house Safety Rules	10	10	100%
5. Safety Committee	10	10	100%
6. Programme for Inspection of Hazardous Conditions	10	10	100%
7. Job Hazard Analysis	10	10	100%
8. Personal Protection Programme	10	10	100%
9. Accident/Incident Investigation	10	10	100%
10. Emergency Preparedness	10	10	100%
11. Safety Promotion	10	10	100%
12. Health Assurance Programme	10	10	100%
13. Evaluation, Selection and Control of Sub-contractor	10	10	100%
<b>Total</b>	<b>130</b>	<b>130</b>	<b>100.00%</b>

房屋委員會安全稽核制度的特有記分表

A specified form used for recording the scores in the HASAS



為吊機提供已檢驗的吊運工具  
Examined lifting gears provided for lifting crane





## B. Process Control Programme

1. Management of Place of Work
2. Management of Tasks and Operations
3. Management of Powered Plant and Equipment
4. Management of Plant and Equipment for Lifting of Material and Persons
5. Management of Mechanical Plant and Equipment



於結尾時的會議檢閱安全稽核的調查結果  
A closing meeting to review the findings in the audit

房委會安全稽核制度亦涵蓋工作安全行為計劃、安全氣候指數調查、創新計劃和保健計劃（包括熱壓力和寒冷天氣保健）。

Work safe behaviour programme, safety climate index survey, innovation programme and health assurance (heat stress & cold weather) programme are also included in the HASAS.

## 房委會升降機及電梯指定分包合約安全稽核制度 Housing Authority Lift and Escalator Nominated Subcontracts Safety Auditing System (HALENSAS)

- 旨在：
  - a. 為升降機和電梯裝置進行獨立的安全稽核，以提升稽核制度的成效。
  - b. 評估升降機及電梯承辦商在工序控制計劃及工地安全方面的表現。
- 委派認可安全稽核員，對指定承辦商進行安全稽核。
- 在升降機和電梯裝置建造期間，須對指定承辦商進行最多三次安全稽核。
- 稽核範圍包括工序控制計劃和工地核查，以加強監察安全表現。
- 安全稽核涵蓋兩部分，包括A部及B部：

A部：工序控制計劃 — 安全工作系統

1. 工序安全資訊
2. 工序危險分析
3. 找出安全施工方法
4. 實施安全施工方法
5. 進行監察

## 2 安全管理工具及在工地安全上應用資訊科技 Safety Management Tools and Use of Information Technology in Safety

- With the aim to:
  - a. enhance the effectiveness of audit system by providing an independent audit to the lift & escalator installations.
  - b. focus on lift and escalator nominated contractor's process control programme and site safety verification.
- Normally the Accredited Safety Auditor (ASA) appointed for the main contract will carry out the safety audit on Nominated Sub-Contractor.
- The safety audit for Lift and Escalator NSC is to be conducted maximum three times during the active installation period of the installation.
- Audit coverage includes Process Control Programme and Site Verification Check for strengthening the safety performance monitoring.
- Site safety audit covers two parts (Part A and Part B) comprising:

A: Process Control Programme — Safe System of Work

1. Process safety information
2. Process Hazard Analysis (PHA)
3. Defining of safe methods
4. Implementing
5. Monitoring

B部： 工地審查清單

1. 高處工作
2. 防止物件下墮
3. 工地整理
4. 吊運作業
5. 燒焊／切割作業和裝備
6. 砂輪
7. 手提工具
8. 電力工程
9. 危險品
10. 人力／機械搬運物料
11. 噪音
12. 密閉空間
13. 其他項目

**Summary of Project Verified Safety Audit Performance Scores (HALENSAS)**

Score: 100% 100  
Project title: Canton Road (P&C) - Construction of Public Street Draining Programme

Form of Hazardous Substances: (1.00 with Maximum Score Table)

Assessment date: 2014/04/01

Score verification date: 2014/04/01

Element	Score	Maximum Score	Score	Percentage
A1 Process Safety Information	10	10	100%	
A2 Process Hazard Analysis	10	10	100%	
A3 Safety of Work Verification	10	10	100%	
A4 Implementing	10	10	100%	
A5 Monitoring	10	10	100%	
<b>Total (Part A)</b>	<b>50</b>	<b>50</b>	<b>100%</b>	<b>100%</b>

Element	Score	Maximum Score	Score	Percentage
B1 Working at Height	10	10	100%	
B2 Preventing object falling offsite	10	10	100%	
B3 Clearing	10	10	100%	
B4 Safety of Work Verification	10	10	100%	
B5 Working Control System and Equipment	10	10	100%	
B6 Control of Work	10	10	100%	
B7 Portable Tools	10	10	100%	
B8 Electrical Work	10	10	100%	
B9 Equipment Maintenance	10	10	100%	
B10 Manual Handling and Mechanical Driveline Handling	10	10	100%	
B11 Noise	10	10	100%	
B12 Confined Space	10	10	100%	
B13 Miscellaneous	10	10	100%	
<b>Total (Part B)</b>	<b>100</b>	<b>100</b>	<b>100%</b>	<b>100%</b>

**C Overall Safety Audit (HALENSAS) Score:**

Overall Safety Audit (HALENSAS) Score: 100%

**D Safety Audit Score Summary table as required:**

Part A (Element A1-A5) Performance Score: 100% 100 ☒ 100% 100 ☒ 100% 100 ☒

Part B (Element B1-B13) Performance Score: 100% 100 ☒ 100% 100 ☒ 100% 100 ☒

房委會升降機及電梯指定分包合約安全稽核制度特有定記分表

A specified form used for recording the scoring results in the HALENSAS auditing



110V手持式燒焊機  
110V hand-held welding machine





- 審核承建商／分包商履行工地安全措施的情況。

B: Site Verification Checklist

1. Working at height
2. Protection against falling object
3. Housekeeping
4. Lifting operations
5. Welding/Cutting Operation and Equipment
6. Abrasive Wheels
7. Portable tools
8. Electrical Works
9. Dangerous Substances
10. Manual Handling and Mechanical Materials Handling
11. Noise
12. Confined Space
13. Miscellaneous

- Contractor/subcontractor's obligation to ensure site safety is audited.

## 突擊安全巡查計劃

### Surprise Safety Inspection Programme (SSIP)

旨在：

- a. 提升工程合約的職業安全健康標準。
- b. 加強監察／評估承建商的安全表現。
- c. 確保整個建築工程貫徹「安全第一」的基本原則。
- 由職業安全健康局的獨立安全巡查員，就工程合約（即建築工程、打樁工程和拆卸工程）進行突擊安全巡查。
- 在整個工程期間，可在無預先通知的情況下隨時進行突擊安全巡查（每三個月進行一次）。
- 巡查和遵行規定檢查涵蓋以下五種高危工作：
  - a. 高處工作
  - b. 防止物件下墮
  - c. 工地整理
  - d. 吊運作業
  - e. 供電系統
- 通常在半天內完成巡查。



獨立安全巡查隊進行突擊安全巡查涵蓋五種高危工作，並可在無預先通知的情況下進行  
An independent inspector team carry out a surprise site safety inspection based on the five high risk items without advance notice

## 2 安全管理工具及在工地安全上應用資訊科技 Safety Management Tools and Use of Information Technology in Safety

With the aim to:

- enhance the occupational safety and health standards for works contracts
  - strengthen the monitoring/assessment on Contractor's safety performance
  - achieve the fundamental principle of "Safety First" for the whole construction.
- An independent safety inspector of Occupational Safety & Health Council to conduct surprise safety inspection for works contracts (i.e. building, piling and demolition)
  - The surprise inspection to be conducted at any time without prior notice (once every three months) during the whole construction stage.
  - Inspection and compliance check on the five (5) high risk activities comprising:
    - Working at height
    - Prevention of falling object
    - Housekeeping
    - Lifting operation
    - Electrical supply system
  - Normally to be completed in less than a half day.



工作架上裝設安全網，減少人體下墜時所受的傷害

Provision of safety net at the falsework for relieving injury of falling from height

突擊安全巡查計劃的記分表

The form used for recording the scoring results in the SSIP

### 入職安全訓練 Safety Induction Training

- 安排安全主任為所有新到工地的工人提供一般和因應工地情況而設計的入職安全訓練課程，讓他們了解和熟習工地環境。
- 提醒新到工地的工人有關工地、工程或作業涉及的危險事宜，以及所須採取的預防措施。訓練課程的內容亦可涵蓋安全健康政策、僱主和僱員的一般責任、一般安全規則、福利設施、個人防護裝備、應急措施、急救或意外通報制度。
- 在僱員開工後兩個工作天內進行。
- 每六個月左右提供重溫訓練。



為新入職員工提供入職安全訓練  
Safety induction to new staff in a small group



- Arrange safety officers to provide general and site specific induction training course to all new comers to understand and get familiar with the site environment.
- Alert persons new to the site to know specific hazards related to the site or work nature and activities in operation, and necessary precautionary measures. The training course may also cover the safety and health policy, the general duties of employers and employees, general safety rules, welfare facilities, personal protective equipment, emergency preparedness and first aid/accident reporting.
- To be carried out within 2 working days of employee commencing work on the site.
- Provide refresher training at an interval of about 6 months.



對在職員工亦提供重溫安全訓練

A refresher safety training to employees in a large class

## 關顧新人工作安全計劃 Caring Programme for New Workers

- 引入導師／學員夥伴關係，實施關顧新人工作安全計劃。
- 委派導師指導實習工人有關在該工地工作的安全要點，關顧期至少三個月（導師與實習員的比例不高於一比四）。在三至六個月的關顧期完結後，倘若安全部確定該實習員已經建立了基本安全概念及能應用安全知識，以及融入地盤安全文化後，實習工人便可除去頭盔上的“P”字標籤。
- 新工人如已具備相關工作經驗，他們的頭盔上會附有“N”字標籤，在兩星期至一個月的關顧期完結後，倘若安全部確定該實習員能應用安全知識及融入地盤安全文化後，新工人便可除去頭盔上的“N”字標籤。



「P」字是英文「Probationer」的簡稱，意思為「實習員」，指從事建造業少於半年的工人。相關工人一般統稱為「P」牌工人  
“P” label refers to “Probationer”, which implies workers with less than half year of construction work experience



「N」字是英文「Newcomer」的簡稱，意思為「新力軍」，指從未到過該工地工作，而有建造業工作經驗的工人。相關工人一般統稱為「N」牌工人  
“N” label refers to “Newcomer”, which implies workers have never been working in a particular construction site but possess construction work experience

## 2 安全管理工具及在工地安全上應用資訊科技 Safety Management Tools and Use of Information Technology in Safety

- Implement the Caring Programme by introduction of Mentee/Mentor working partnership.
- Assign mentor (with a ratio of 1 mentor to not more than 4 mentees) to provide guidance to mentees on essential site safety aspects related to the site with a caring period not less than 3 months. The “P” label will be removed from safety helmet if the safety office confirms that the probationer has established basic safety concept and is able to apply safety knowledge and familiar with the safety culture of the site after the 3 to 6 months’ caring period.
- Provide “N” label on the helmets of new workers with relevant working experience with guidance on essential site safety aspects related to the site with a caring period not less than 2 weeks. The “N” label will be removed from safety helmet if the safety office confirms that the new worker is able to apply safety knowledge and familiar with the safety culture of the site after the 2 weeks to 1 month’s caring period.

### 工地座談會 Tool Box Talk

- 安排安全主任，按工地活動和當時的安全事宜擬備座談會內容。
- 安排曾受訓的安全督導員、管工或工目每週舉行座談會一次，參加者為在工地工作並從事與座談會主題有關活動的工人。
- 座談會內容涵蓋工地作業的潛在危險、針對工程和工種而制定的管制措施、因應惡劣天氣和乾燥季節而採取的預防措施，或有關建築意外的新聞剪報和 안전健康資訊。
- 妥為記錄座談會的出席人數、培訓員資料等。
- 以口頭或書面評估工人對座談會內容的理解程度。



由安全主任定期安排的工地座談會  
Regular tool box talk arranged by safety officer



## Following work process brings you safety and ease of mind

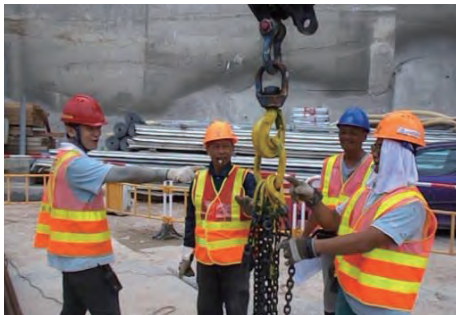
- Arrange safety officer to prepare the contents having regard to the current activities of the site and prevailing safety concerns.
- Arrange trained safety supervisor/foremen/gangers to conduct the talk once per week to workers on site and engaging in activities relevant to the topic of the tool box talk.
- Cover potential hazards of site activities, control measures specific to works and trades, precautionary measures in inclement weather or dry season, or newspaper cutting about construction work accidents, safety and health publications.
- Properly record the attendance and trainers, etc. of the talk.
- Assess the understanding of workers with respect to the contents of the tool box talk verbally or in writing.

### 指差呼稱 Pointing and Calling

為達到零意外，一項給業界借用之工具「指差呼稱」是透過眼，手，口及耳並用，使工作中工人能提高精神和專注集中一些高危工作，減少因疏忽及人為錯誤導致意外的產生，此四項感官，每項都有其特別功能如下：

- 眼：堅定注視要確認的目標
- 臂及手指：伸展手臂，用手指食指指向目標
- 口：高聲及清楚地讀出口號以作確認
- 耳：聆聽確認的口號

經指差呼稱，將可提高工人在高危工作時如吊運操作的警覺性及行動準確性，達到減少人為疏忽，錯誤或誤會而引致的意外。



“指差呼稱” — 減少因高風險的工序或人為失誤而發生的意外  
“Pointing and Calling” — Reduce accident in high risk activity or caused by human error



安全主任領著工友進行“指差呼稱”活動  
Safety officer to lead the workers to practise “Pointing and Calling”



## 2 安全管理工具及在工地安全上應用資訊科技 Safety Management Tools and Use of Information Technology in Safety

Pointing and calling is a tool for commitment of zero accident by employment of eyes, hands, mouth and ears to achieve the workers' concentration for risk operations, hence reduce the human error or negligence at work. These four components with their special function are as below:

- Eyes: stare at the confirmed target
- Arm and finger: stretch out an arm and point at the target with the index finger
- Mouth: call out the slogan loudly and clearly as confirmation
- Ears: listen to the confirmation slogan

Through the effective co-ordination of each individual's sense organs to enhance the accuracy of and vigilance for works as lifting operation, it would help to reduce accidents arising from high risk caused by human negligence or error.

### 定期練習／演習 Regular practice/drill

- 按照工地本身的要求，定期進行火警演習。
- 就特別裝備的使用提供訓練和練習機會。
- Conduct regularly the fire drills according to local requirement.
- Provide training for and practicing of the use of special equipment.



定期進行火警演習及示範如怎樣操作滅火器具  
Conduct fire drill to give a demonstration on how to use firefighting equipment

### 建築信息模擬技術 Building Information Modelling (BIM)

- 建築信息模擬技術以虛擬影像呈現建築工序，利用三維影像展示的方式能方便工地人員溝通。
- 建築信息模擬技術可作為一項多用途的訓練工具，把設計建築程序呈現在工人眼前，有助他們識別危險和所涉及的風險。
- 建築信息模擬技術有助找出結構組件和地下公用設施不相容之處。





利用建築信息模擬技術說明各類型預製單位的貯存和安裝情況，可示範預製組件的貯存、吊運和安裝工程

Demonstration of precast element storage, lifting and installation works by outlining the storage and installation of various types of precast units using BIM

- BIM provides a virtual image of the construction process and facilitates the communication among site personnel through 3-dimensional presentation.
- BIM serves as a versatile training tool to let workers visualize the designed construction sequence and identify the potential hazards and risks involved.
- BIM helps identify potential clashes of structure and underground utilities.

## 無線射頻識別技術 Radio Frequency Identification (RFID)

- 無線射頻識別系統由標籤、感應器和處理器組成，當物件移近某個地方時會發出警報。
- 利用機械裝置許可證上的無線射頻識別標籤，可快速查閱該流動機械、操作員和工人的最新資料。
- RFID tags, sensor and processor form a system to trigger alarm when an object is approaching an area.
- Plant permit with RFID chip provides accessibility to information of mobile plant, operators and workers. Updated information of plant can be checked easily.



無線射頻識別技術應用於限速範圍。在限速範圍的兩端安裝無線射頻識別感應器，並在機械裝置操作員的頭盔上貼上無線射頻識別標籤，便可利用兩點計算出機械裝置的速度。這個系統可即時向工地管理職員提供附有記錄和數據分析的超速訊息。RFID used in speed control area in which one pair of RFID sensors are set up on both sides, and RFID tag is attached to plant operator's helmet. The speed of the plant is calculated between the 2 points. The system provides a message of speeding with record and data analysis to the site management staff immediately



吊鉤上貼有無線射頻識別標籤，天線和處理器則設於吊運區內。天線對地面的指定範圍發出訊號，如無線射頻識別標籤進入該範圍，警號便會響起

RFID tag stuck on the hook whereas antennas and processors are provided in the lifting zones. Antenna emits signal to the designed coverage above ground. Alarm and buzzer will be triggered when RFID tag enters the coverage of the signal

## 2 安全管理工具及在工地安全上應用資訊科技 Safety Management Tools and Use of Information Technology in Safety



如有任何人員進入預設距離內的危險區域時，操作員便會接到警報  
Operator is alerted when any personnel enters zone within a preset distance



挖土機的兩側和後面裝上無線射頻識別感應器，而進入危險範圍工作的人員會獲發無線射頻識別標籤

RFID sensors installed on two lateral sides and the back of excavator and RFID tag is issued to personnel who enters the danger zone

### 流動裝置應用程式 Mobile Applications in Mobile Devices

- 透過即時通報和提交相片作實時記錄，方便溝通。
- 管控所有裝備和機械的記錄、證明書和牌照，並透過雲端科技即時核實裝備和機械裝置。
- 管理工人的訓練記錄，方便工人擷取安全預防措施參考。
- facilitate communication through instant reporting, submission of photos with real time record.
- control the record, certificates and licenses of all equipment and plant and enable instant validation of plant and equipment through cloud technology.
- manage the training record of workers and allow retrieval of safety precautionary measures for reference by workers.



利用流動裝置應用程式核實機械裝置  
Validation of plant using mobile apps



## 參考資料 References:

### 相關條例和規例

- 《工廠及工業經營條例》
- 《建築地盤（安全）規例》
- 《工廠及工業經營（安全主任及安全督導員）規例》
- 《工廠及工業經營（安全管理）規例》

### 相關安全標準、工作守則、安全指引和指南

- 《安全管理工作守則》（勞工處）
- 《工廠及工業經營（安全管理）規例指南》（勞工處）
- 《安全施工程序－「實踐安全行為」手冊》（職安局）
- 《安全氣候指數調查》（職安局）
- 《實施工作安全行為(WSB)計劃》（職安局）
- 《房屋委員會安全稽核制度獨立安全稽核計劃》
- 《房屋委員會升降機及電梯指定分包商安全稽核制度》
- 《房屋委員會工地突擊巡查計劃指引》
- 《關顧新人工作安全計劃》（建造業議會）
- 《實施「指差呼稱」減少人為失誤》（職安局）

### Relevant Ordinances and Regulations

- Factories and Industrial Undertakings Ordinance.
- Construction Sites (Safety) Regulations.
- Factories and Industrial Undertakings (Safety Officers and Safety Supervisors) Regulations.
- Factories and Industrial Undertakings (Safety Management) Regulation.

### Relevant Safety Standards, Codes of Practice, Guidance Notes and Guidelines

- Code of Practice on Safety Management (LD)
- A Guide to the Factories and Industrial Undertakings (Safety Management) Regulation. (LD)
- Safe Working Cycle Handbook (OSHC)
- Safety Climate Index Survey (OSHC)
- Implementing The Work Safe Behaviour (WSB) Programme (OSHC)
- Independent Safety Audit Scheme Housing Authority Safety Auditing System
- Housing Authority Lift and Escalator Nominated Subcontracts Safety Auditing System (HALENSAS)
- Guidelines on Surprise Safety Inspection Programme of the Housing Authority
- Caring Programme for New Workers (CIC)
- The Approach of Pointing and Calling Reduces Human Error (OSHC)

### 3 一般工地安全及工地整理 General Site Safety and Housekeeping

#### 危害識別 Hazards

- 在工地內發生的意外，多半與工地整理欠佳有關。  
這類意外包括：
  - 滑倒、絆倒或在同等高度跌倒；
  - 被移動物件或與移動物件碰撞；
  - 提舉或搬運物件時受傷；
  - 與固定或不動物件碰撞；
  - 觸及開動中的機器或觸及以機器製造中的物件；以及
  - 人體從高處墜下等。
- 優質的工地整理有助建立安全而健康的工作環境，從而提升產品質素、提高工作效率，以及減少事故／意外發生。
- 良好的工地整理包括保持工作環境整潔，制定有系統的施工程序，以及妥善存放機械設備和物料。
- Majority of accidents occurred on construction sites are related to poor housekeeping of working environment:
  - Slip, trip or fall on the same level;
  - Striking against or being struck by moving objects;
  - Being injured whilst lifting or carrying;
  - Striking against fixed or stationary object;
  - Contact with moving machinery or object being machined; and
  - Fall of person from height, etc.
- A high housekeeping standard contributes to a safe and healthy working environment which helps achieve better quality of end product, higher efficiency and reduction of incidents/accidents.
- Good housekeeping practice includes a clean and tidy working environment, systematic arrangement of work activities, and proper storage of plant and materials.



地盤內設置清晰的方向指示／標示  
A clear direction/indication within a construction site



工地通道暢通無阻  
No obstruction to circulation route on site



交通箭嘴標誌指引安全的行車路線  
Traffic arrow directing a safe vehicle flow



在適當地點設置安全行人過路處  
Suitable point assigned with a safe pedestrian crossing



在圍封範圍劃定安全的出入途徑  
Designated safe means of access to enclosed area





## 急救設備 First Aid Facilities

- 安全主任負責管理工地的急救箱。
  - 急救箱只可存放急救物品。
  - 工作時間內應常備急救箱。
- Safety officer should be in charge of the first aid boxes for a construction site.
  - Only first aid kit is allowed to be kept in the first aid box.
  - The first aid boxes should be available during working hours.



一般急救箱常見的急救用品  
Common items in a first aid box



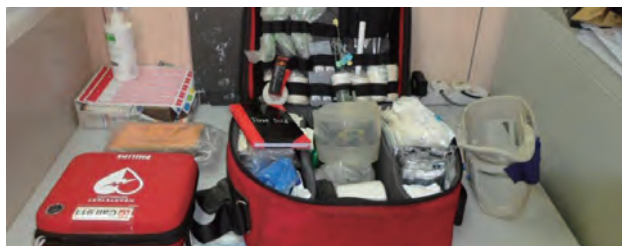
簡單的急救箱  
A simple first aid box



在地盤的一般急救站  
Typical first aid station of a construction site



擔架  
Stretcher



自動體外心臟去顫器  
Automated external defibrillator



工地提供的擔架  
Stretcher provided at workplace

## 3 一般工地安全及工地整理 General Site Safety and Housekeeping

### 工地平面圖 Site Layout Plan

- 平面圖應顯示走火通道及滅火設備的位置。
  - 平面圖應指明存放危險／易燃物料的地方為高危地點。
  - 平面圖應張貼於工地入口旁的圍板上。
  - 應方便緊急應變小組及／或救援人員前往肇事現場。
- 
- Show fire escape routes and location of fire-fighting equipment.
  - Indicate the storage area for dangerous/flammable materials as high risk spot.
  - Paste the layout plan prominently on hoarding adjacent to the site entrance.
  - Emergency team and/or rescue operation team can easily reach the spot/venue in case of emergency.



在入口 (左) 展示及告示板 (右) 張貼工地平面圖  
Site layout plan at entrance (left) and notice board (right)

### 硬地施工法 Hard Paved Construction

- 在工地的主要運料路、出入口及車輛清洗處、物料處理及貯存區等指定地點，鋪設平坦且去水良好的硬地面。
- 混凝土及碎石墊料、混凝土硬地物料、預製混凝土板和鋪面鋼板均可用鋪設硬地。
- 採用硬地施工法處理及貯存物料或配件，可更為安全有序。
- 取用時亦更方便，並可減少損壞和污染。
- 改善運料路能提高運輸安全，亦可更有效分隔行人和車輛。
- 無論在清理、整齊、塵埃控制、衛生、工地整理和環境管理方面，此項施工法均可改善工地的整體工作環境。



在硬地以重型圍欄分隔行人和車輛  
Heavy duty barrier to separate pedestrians and vehicles on a hard paved road





- Provide hard, levelled and well drained paving to specific areas on site: main haul road, exit points cum vehicle washing area, materials handling and storage areas.
- Use concrete and hard cores, concrete hard paved material, precast concrete slab and steel decking for hard paving.
- Enhance handling and storage of materials or components in a safe and orderly manner.
- Improve accessibility, minimize damage and reduce contamination.
- Provide a safer haul road for traffic manoeuvring and better separation of pedestrians and vehicles.
- Improve overall site working environment in terms of cleanliness, tidiness, dust control, hygiene, housekeeping and environmental management aspects.



在硬地以可摺合的圍欄分隔行人和車輛  
Folding type barrier to separate pedestrians and vehicles on a hard paved road



為車輛提供安全的運料路  
Provide a safe haul road for vehicle



改善工地環境，取用物料亦更為方便  
Better site environment, better accessibility



在鋪設硬地面的地方存放預製混凝土組件  
Hard paved areas for storage of precast concrete products





存放物料的地方整齊有序

Tidy and orderly storage of materials on a hard paved place



## 妥善的出入口 Proper Access and Egress

- 在可能情況下，提供穩固安全的進入或離開工作地點，斜坡，吊船的爬梯
- 設置適合爬梯的扶手，給工人一個方便安全的進出。
- Provide rigid staircase where possible for a safe access/egress to working area, slope and/or gondola, etc.
- To be fitted with railing for staircase to enhance safety.



利用樓梯為工地之高低台提供安全通道

Safe access to different levels by means of staircase



安全通道進入大型模板的工作平台

Safe access to working platform of large panel formwork



於梯級加裝鋼棒，有助防滑  
Additional steel rod on the staircase as anti-slip device



前往斜坡工作地點的安全通道  
Safe means of access for slope work



前往吊船的安全通道  
Safe means of access to gondola



安全通道進入深坑  
Safe access to deep excavation

## 在危險區域架設路障 Barricade to Dangerous Zone

- 在進行吊運操作或使用起重機械時，應使用圍欄圍封有關的工作範圍，以防止其他人士進入
- 起重機械任何可移動的部分與護欄、圍欄或其他設備之間，須留有一條至少600毫米闊、並無障碍物阻塞的通道。
- Fence off areas in which a lifting operation is carried out or a lifting appliance is in use by providing barrier to prevent persons from having access to such areas.
- An unobstructed passageway of not less than 600mm wide shall be maintained between any moving part of a lifting appliance liable to move and any nearby guard rail, fencing or other fixture.

### 3 一般工地安全及工地整理 General Site Safety and Housekeeping



圍欄用以阻止其他人等進入正在工作中的重型機械的範圍  
Fencing off the heavy machinery in use from persons' access

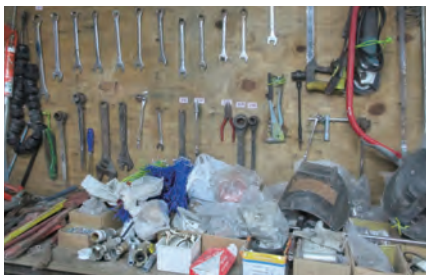


簡單圍欄可防止意外發生  
Fencing off lifing appliance to prevent accident

#### 5S工地整理 5S Housekeeping

5S概念源自日本，對工地整理非常有效。這個概念由以下五個元素組成：

- 1S整理 制定整理的標準，區別和處理要及不要的物品。
- 2S存放 考慮個別物品的使用次數有條理地存放。
- 3S清潔 清潔物品以保持其操作狀態，掃除及清理工作環境的雜物。
- 4S標準 以目視管理，制定相關標準及制度，把整理、存放及清潔標準化，使各種標示、標籤、指引、守則等均有標準。例如，每批滅火筒配以不同色碼，過期需要更換的滅火筒便可一目了然。
- 5S修養 養成整理、存放及清潔的良好習慣、依循所訂的標準自發地進行有關工作。



2S – 各項手工具放置井然有序  
2S – An orderly storage of hand tools

工地整理可依循1S→4S→5S；2S→4S→5S及3S→4S→5S的模式進行。經過反覆的計劃、實踐、檢討及改善，不斷地改進整個工地整理的制度，最後，所建立的良好工作習慣會變成一種修養，而工地整理文化也由此而生。





2S – 常用的吊具及起重裝置也應放置有序  
2S – An orderly storage of lifting facility/  
tools

為使工地整理的措施發揮作用，管理層和前線員工應透過以下途徑多作溝通及合作，共同改善工地整理的情況：

- 鼓勵員工就改善地盤整潔、通道安全等提出意見。
- 工序及工作計劃應列明存放各類物料、危險品、設備、運輸工具的地方及出入地盤的安全通道。
- 利用通告向各相關工作單位說明安全處理物料的程序，並在工程進行期間與工人商討，以不斷檢討有關程序。
- 與工程主管及各分包商召開定期會議以加強溝通。
- 舉行分享聚會，由表現較佳的員工現身說法和其他工人分享心得。
- 各地盤可以因應本身的工地環境、工程項目及其他特別情況靈活實施工地整理的措施，讓工人養成良好的工作習慣，從而建立工地整理的文化。

Originated in Japan, the concept of 5S is very useful for effective site housekeeping. It comprises 5 elements as follows:

**1S Organization (Seiri)** Set up organizational criteria for identifying and dealing with things that are and are not necessary for the job.

**2S Neatness (Seiton)** Devise a system for neat and orderly storage, taking into account how frequent individual items are used.

**3S Cleanliness (Seiso)** Clean things so that they are kept in working condition, and ensure the cleanliness of the working environment with all the junks wiped out.



2S – 工地材料放置整齊  
2S – An orderly storage of materials



2S – 提供指定地方堆放物料  
2S – Provision of designated area for stacking of materials

### 3 一般工地安全及工地整理 General Site Safety and Housekeeping

**4S Standardization (Seiketsu)** Manage visually and maintain organization, neatness and cleanliness by devising the relevant standards and systems. Standards and norms are set for various signs, labels, guidelines, and rules as appropriate. For example, every batch of fire extinguishers is given a different colour code so that outdated batches can easily be identified for replacement.



3S – 工地環境整齊清潔  
3S – A clean site environment

**5S Discipline (Shitsuke)** Instill the good habits of organization, neatness and cleanliness, follow the standards and norms so drawn up, and put them into practice.



3S-分包商在工地的辦公室整潔明亮  
3S-Subcontractor site offices are kept in neat condition with sufficient lighting

Site housekeeping may be carried out in the manner of 1S→4S→5S; 2S→4S→5S; and 3S→4S→5S. Through repeated planning, practising, reviews and modifications, the whole site housekeeping system can be further improved. Finally, discipline, i.e. the culture of housekeeping will be instilled through good working habits.

To achieve effective site housekeeping, communication and cooperation between the management and front-line workforce should be enhanced as follows:

- Employees should be encouraged to put forward their views and opinions on issues including site cleanliness, and access safety, etc.
- Locations for the storage of various materials, dangerous goods, equipment, conveyance tools, as well as safe passages for access to site, should be stipulated in the work procedures and work plans.
- How things are handled safely should be brought to the attention of the parties concerned by notice, and repeatedly reviewed during the course of works in consultation with the workforce.
- Regular meetings should be held with project supervisors and subcontractors to enhance communication.
- Sharing sessions should be held for employees of good performance to share their experience with other workmates.





- Flexible implementation of the measures of housekeeping to suit the working environment, works nature and other particular conditions of each individual construction site could help workers develop good working habits and build up housekeeping culture.



4S –劃一標示

4S – standardization of signs



展示5S的例子以培育工地整理文化

Display of 5S examples to instil culture of housekeeping

## 危險品的貯存 Dangerous Goods Store

- 危險品須貯存於消防處認可或發給牌照的危險品倉庫內並設有防雷系統，貯存量不得超過牌照所訂的上限。
- Dangerous goods are to be stored in a dangerous goods store with lightning protection system approved/licensed by Fire Services Department with quantity not exceeding the limit under the licence.



由消防處發出的牌照（危險品）  
Typical licence issued by FSD  
(dangerous goods)



危險品倉庫（供貯存易燃氣體用）  
Dangerous goods store (flammable  
gas)



危險品貯存倉  
Dangerous Goods Store

### 3 一般工地安全及工地整理 General Site Safety and Housekeeping

#### 防火措施

#### Fire Precaution and Measure

- 配備供水設施。
- 易燃物品應貯存於危險品倉庫內。
- 安裝合適的火警探测器和火警鐘，並為危險品倉庫和燒焊地點等其他工作範圍提供防火設備。
- 在危險品倉庫周圍張貼「危險品」和「不准吸煙」的警告告示，以提高警惕。
- 展示足夠的警告牌和「不准吸煙」標誌。
- 切勿遺留或堆放棉絨、機油或其他易燃物品。
- 切勿用水撲救電器引起的火警。如情況許可，救火前先截斷電器的電源。
- Provide water relaying facilities.
- Store flammable materials in Dangerous Goods (D.G.) Store.
- Install suitable fire detectors with associated fire alarms in place and provide fire protection measures for the D.G. Store and other working area, such as welding spot.
- Post “Dangerous Goods” and “No Smoking” warning notices in the vicinity of the D.G. Store to enhance safety awareness.
- Display sufficient warning signs and “No Smoking” signs.
- Do not leave or accumulate lint, grease, or other flammable materials.
- Do not use water on electrical equipment fires. When it is possible, de-energize electrical equipment before fire-fighting.



一般的不准吸煙標誌  
Typical no smoking sign



在貯存地點張貼不准生火／不准吸煙標誌  
No fire and smoking sign posted in storage area



火警鐘一般都是安裝於物料儲存處  
Fire alarm bell installed near the material storage area



為較遠工作／儲存位置可提供流動式手動火警鐘  
Portable manual fire alarm call point suitable for remote location



## 防火告示牌 Fire Warning Signs

- 張貼警告告示，提防火警和應採取的防火措施。
- 張貼告示和指示，說明不同種類的燃燒物料所應使用的滅火筒和滅火器具的操作方法。
- Post warning signs and precaution for the avoidance of fire and steps for prevention.
- Notice and instruction for suitable type of fire extinguisher for different types of combustion materials and fire-fighting equipment's operation instruction.



## 滅火設備 Fire Extinguishing Equipment

### 手提滅火器具

- 提供足夠數目的手提滅火器具（即滅火筒和沙桶），並善加保養。
- 焊接工程進行時，施工場地附近應設有適當的滅火設備。
- 學習及練習使用滅火筒。
- 定期檢查滅火筒，如有需要，作出更換。

### Provision of portable fire-fighting equipment

- Provide and properly maintain sufficient number of portable fire-fighting appliances (i.e. fire extinguisher and bucket of sand).
- During welding work, suitable fire-fighting equipment to be provided near the works area.
- Learn and practise the use of fire extinguishers.
- Inspect fire extinguishers regularly and replace as necessary.

Fire Extinguisher Chart

Extinguisher		Type of Fire				
Colour	Type	Solids (wood, paper, cloth, etc)	Flammable Liquids	Flammable Gases	Electrical Equipment	Cooking Oils & Fats
	Water	✓ Yes	✗ No	✗ No	✗ No	✗ No
	Foam	✓ Yes	✓ Yes	✗ No	✗ No	✓ Yes
	Dry Powder	✓ Yes	✓ Yes	✓ Yes	✓ Yes	✗ No
	Carbon Dioxide (CO2)	✗ No	✓ Yes	✗ No	✓ Yes	✓ Yes

張貼告示和指示及說明不同種類的滅火器具用於撲滅不同種類的失火事故  
Instruction / guideline on notice board and use correct type of fire extinguishers



在高危工作間提供滅火筒  
Provision of fire extinguisher adjacent to high-risk workplace



在標準樓層提供滅火筒和沙桶  
Provision of fire extinguisher and buckets of sand on typical floor



在重要位置提供滅火筒和沙桶  
Fire extinguisher and buckets of sand at strategic locations



在燒焊地點附近提供輕便的手提滅火筒  
A portable fire extinguisher provided near the welding spot

## 公眾安全 Public Safety

- 在行人道上架設雙層圍板，以策安全。
- 在行人通道上設置保護簷篷。
- 經常檢查保護簷篷並清除垃圾。

- Double deck hoarding to offer protection over pavement.
- Provide pedestrians access under protective canopy.
- Protective canopy needs to be inspected and cleared of debris regularly.



在行人道上架設雙層圍板  
Double-deck hoarding over pavement



以圍板覆蓋的安全行人道  
Safe walkway under hoarding

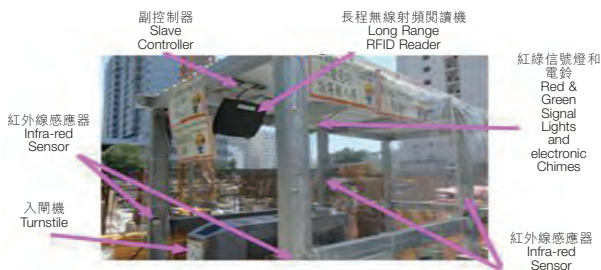




## 車輛及行人通道的管制 Vehicular and Pedestrian Access Control

- 利用無線射頻科技設置的非接觸式出入監控和記錄系統（包含一個長程無線射頻閱讀器和兩組紅外線感應器），可探測安全頭盔上的射頻識別標籤。
- 地盤的車輛出入口處設置橫向式閘門，控制車輛出入以保行人安全。

- RFID contactless access monitoring and recording system comprising a long range RFID reader and two sets of infra-red sensors is used to detect the RFID tags on the safety helmet.



電腦系統記錄實時數據，防止未獲授權者入內

The computer system records the real time data and prevents unauthorized access

- Horizontal operating gate is provided to control vehicular traffic for pedestrian safety at the sites vehicular ingress/egress point.

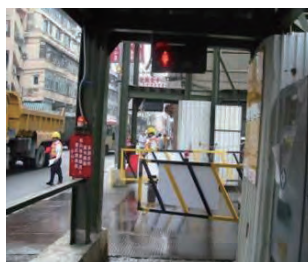
## 工地運料路及交通 Site Haul Road and Site Traffic

- 在車輛運料路上灑水，以免塵土飛揚。
- 在施工地點／工地內提供通道和設定機械設備移動範圍。
- 提供指定物料裝卸處。
- 在工地出口設置車輪清洗槽。
- 提供足夠的警告，提示該處有架空或地下公用設施。
- 在圍板或外部圍欄提供照明，保障公眾安全。
- 提供渠道和排污設施，並善加保養。
- 分隔車輛和行人。
- 遵守《建造業議會刊物：建築地盤車輛及流動機械的安全指引》。



閘門設有視聽式警告器，提醒行人留意進出車輛

Entrance gate equipped with visual and audio alarms to alert pedestrians of vehicular traffic



在靠近入口處，提供的車輪清洗設施

Provision of vehicle wheel-washing facilities at entrance

### 3 一般工地安全及工地整理 General Site Safety and Housekeeping

- Spray water onto vehicular haul road to control dust.
- Provide access roads and plant movement areas within the works area/site.
- Provide designated loading and unloading areas.
- Provide wheel-washing bay for vehicles at the exits of the site.
- Provide adequate warning to overhead or underground utilities.
- Provide lighting on hoarding or external fencing for public safety.
- Provide and maintain proper drainage and means of sewage disposal.
- Separate vehicular and pedestrian traffic.
- Observe the Publication "Construction Industry Council – Guidelines on Safety of Site Vehicles and Mobile Plant".



車輪清洗處的噴水器正在運作  
Operation of water-jet in a vehicle wheel – washing area



人車分隔  
Separate vehicular and pedestrian traffic



工作區指導員在地盤入口處指揮交通  
Traffic control at site entrance by banksman



灑水以免塵土飛揚  
Dust control with water spraying



### 公眾安全／臨時交通安排 Public Safety/Temporary Traffic Arrangement

- 用路障、圓錐筒和燈具妥善圍起施工地點。
- 路障兩端互相鉤連繫固，形成連續的路障。
- 在行車道工作時應穿着反光外衣。
- 設置楔形引入／引出路段，並提供行車指示牌。
- 在行車道上排列塑膠路障並附以一系列交通圓錐筒。
- 設置告示板。
- 沿行車道邊緣放置圓錐筒和燈具，相互距離不超過三米。
- 在天氣惡劣時須固定所有路障。
- 依從掘路許可證所列的條件。



為行車道上的工程採取臨時交通安排  
Temporary traffic arrangement for work carried out on carriageway





臨時行人過路安排·放置告示及路障·設定行人過路位置

Temporary pedestrian crossing arrangement by provision of signs and barriers to designate the pedestrian crossing location

- Fence off the works area with barriers, cones and lanterns properly.
- Link up and fasten at ends of barriers to form continuous barriers.
- Wear reflective jacket while working on carriageways.
- Provide approach/exit taper with signs to guide the vehicles.
- Provide plastic type barriers guarded by a line of traffic cones on carriageways.
- Provide a display board.
- Place cones and lanterns with spacing not more than 3m along the edge of traffic lanes.
- Stabilize the barriers under adverse weather conditions.
- Follow conditions imposed in Excavation Permit.



由指示牌引導車輛的臨時交通安排

Temporary traffic arrangement with signs to guide the vehicles



由接駁路障和指示牌組成的臨時行人通道

Temporary pedestrian route formed by connecting barriers and with direction signs

### 3 一般工地安全及工地整理 General Site Safety and Housekeeping



連接地盤入口處的路障，組成連續的路障  
Barriers linking up to form a continuous barrier at site entrance



在地盤範圍外提供工程資料展示板  
Provision of display board for works outside site boundary



由指示牌引導車輛的臨時交通安排  
Temporary traffic arrangement with signs to direct the vehicles

進行接駁地下公用設施至地盤的工程時，在行車道用圓錐筒／燈具圍起施工範圍  
Fencing off the works area with cones/lanterns at carriageway for underground utilities to be connected to the construction site

### 車輛清洗處 Vehicle Washing Bay

- 重型車輛在離開工地前必須以機械或人手清洗車輪。洗車水經沉澱處理後循環再用。
- Wheels of heavy duty vehicles to be washed mechanically or manually before leaving the site. Water to be re-circulated after sedimentation.



車輛清洗處正進行車輪清洗  
Wheels of a vehicle under cleaning in a washing bay



## 臨時垃圾槽

### Temporary Refuse Chute

- 臨時垃圾槽須通往位於地面的垃圾收集站。
- 各標準樓層的垃圾槽設有棄置口，並裝有活門，可安全快速地把建築廢料從高層送往地面。
- 當臨時垃圾槽不在使用時，垃圾槽的開口應關上並鎖好。
- Temporary refuse chute should be connected to a refuse collection point on G/F level.
- A refuse chute with shutter for dumping on typical floor for safe and prompt delivery of building debris from upper floors down to G/F level.
- The opening of refuse chute on each floor should be locked properly when not in use.



垃圾槽設有指示器，提醒其他使用者垃圾槽正在使用中

Refuse chute with indicator to alert other users that it is in use



垃圾槽閘門沒有鎖好

No locking of refuse chute doors



垃圾槽閘門沒有鎖好

No locking of refuse chute doors



給突出的鋼筋提供安全保護

Provide safe protection to the projected steel bar



沒有保護突出的鋼筋

Projecting re-bars without protection

## 垃圾收集站 Refuse Collection Point

- 只可短時間在站內堆放建築廢料、垃圾和建築物料。
- 實行廢物管理系統，將廢物循環再用或再造。
- 把垃圾和食物渣滓存放於有蓋垃圾桶內，並每天清理。把垃圾就地分類，以供再造或再用。
- 垃圾房內的垃圾桶灑水系統可防止塵土飛揚。



### 3 一般工地安全及工地整理 General Site Safety and Housekeeping



臨時垃圾箱・右邊是專供存放非惰性廢物的垃圾箱  
Container for temporary storage of waste, with non-inert waste specified on the right



廢物管理－循環再造  
Waste management – recycling



廢物管理－循環再用  
Waste management – reuse

- Keep accumulation of building debris, refuse and building materials only for a short time.
- Implementation of waste management system for reuse or recycling.
- Storage of refuse and foodstuff in covered rubbish bins for daily removal. On-site sorting of waste for recycling or reuse should be adopted.
- Water spray system in refuse store helps to prevent spread of dust.



臨時垃圾收集站需要鎖好  
Lock the temporary refuse collection point



廢物管理－分類  
Waste management – sorting





廢物管理—啡、藍、黃垃圾分類桶  
Waste management – brown, blue and yellow colour bins



大型垃圾櫃可收集更多廢料  
Large waste storage cabinet for bulky collection



地盤收集廚餘的處理機  
A typical food waste composting machine

## 樓洞和樓面邊緣

### Floor Opening and Floor Edges

- 樓洞應鋪上金屬或木板封蓋，以防滲水或人體或物品由洞口墜下。
- 在樓洞附近設置適當的警告牌，提醒工地人員。
- Metal or timber cover fixed over the floor opening to prevent seepage of water or falling of person or object through the floor opening to the space below.
- Proper sign to be fixed in the vicinity of floor opening as a warning signal to site personnel.



臨時以水泥封蓋好的樓洞  
Properly cover floor opening



封蓋好的樓洞需要貼上警告標示  
Cover to the floor opening securely fixed with warning notice



提示地盤工人的警告標示  
Warning sign to alert workers



### 3 一般工地安全及工地整理 General Site Safety and Housekeeping

#### 圍欄、欄杆及屏障

#### Fences, Rails and Barrier

- 樓洞四周、樓面邊緣和樓梯邊應設置無間斷的頂部欄杆（高度為900至1,150毫米）和中間欄杆（高度為450至600毫米）。
- 樓洞的邊緣和樓面邊緣應設有至少200毫米高的踢腳板。
- Continuous 900-1,150mm (H) top guard-rail and 450-600(H) intermediate guard-rails are required around floor openings, floor edges and along staircase.
- Minimum 200mm (H) toe board is needed along the edge of floor opening and floor edges.



樓梯設置  
Guard-rails along staircase



樓洞的邊緣設置圍欄  
Guard-rail around floor opening



樓邊位置安裝有適當的木製圍欄  
Proper timber guard rail along edges of working floor

#### 對突出金屬鋼枝所作的防護

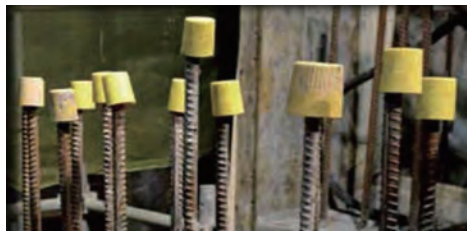
#### Protection to Protruded Metal Bar

- 視乎工人有可能墜下的高度，利用膠蓋或金屬槽覆蓋突出的鋼枝。
- Protruding steel bars are covered with plastic caps or metal troughs depending on the height of possible fall of person onto the bars.



以鋁槽和膠蓋覆蓋金屬枝  
Aluminium trough and plastic caps to cover the metal bars





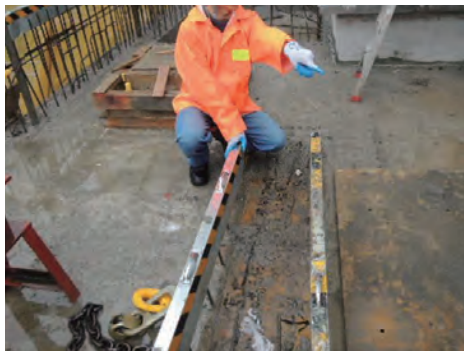
給突出鋼筋的臨時保護  
Provide temporary protection to protruding metal bars



附帶把手的金屬槽蓋  
Metal trough cover with handle



對突出的螺栓作好防護  
Protection for projecting bolts



## 升降機槽 Lift Shaft

- 升降機槽所有入口處均須設置全高度的臨時鋼欄柵（可隨時不需要鑰匙便能從升降機槽內開啟），以免人體或物品墮入升降機槽，危及在內工作的人員。
- 開始工作前，在升降機的所有層站、機房或入口張貼安全告示，提醒：
  - 升降機槽內有人工作，以及
  - 其他人切勿或盡量避免走近干擾，以免危害升降機工人的安全。
- 提供足夠照明。
- 經常鎖上升降機槽閘門。

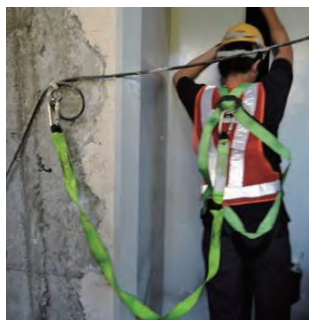


為升降機槽入口提供全高度的四頁鋼閘  
Provision of 4-leaf full height steel barrier to lift shaft opening

### 3 一般工地安全及工地整理 General Site Safety and Housekeeping



在閘門上張貼足夠的安全／警告告示  
Sufficient safety/warning notices and permit-to-work posted to barrier



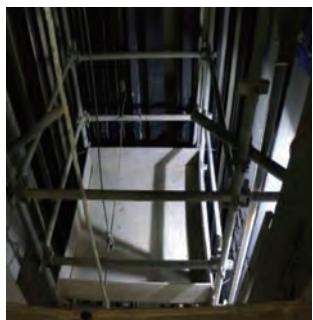
全身式安全帶要掛在升降機槽外的牢固點  
Safety harness attached to anchor point outside lift shaft opening



全身式安全帶要掛在升降機槽內的救生繩  
Safety harness attached to lifeline inside lift shaft



適用於升降機井道的金屬棚架  
Metal scaffold for working inside lift shaft



工作平台需設有高及中圍欄及踢腳板  
Working platform closely planked with top and mid rails and toe board



一共有三條救生繩，其中一條需靠近升降機槽入口處  
3 lifelines provided with one close to the lift opening

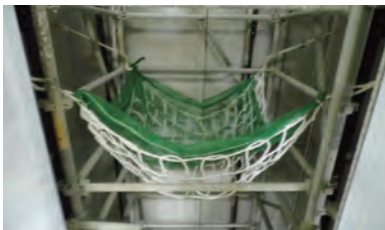


安全通道進入升降機槽的工作平台  
Proper access to working platform in lift shaft





- Provide secure temporary protective steel barrier of full height to all lift shaft openings (be readily openable from the inside of lift shafts at anytime without the need of separate key operations), to prevent fall of person and falling objects from endangering the workers working inside the lift shaft.
- Provide safety notices for all landings, machine room or the entrances to the lift shaft before commencing work for warning that:
  - lift installation work in progress, and
  - disturbance to the lift workers causing hazard to be avoided or at least kept to a minimum.
- Provide sufficient lighting.
- The metal barrier should be closed at all times.



提供安全網及尼龍網以保護工人高處下墮及高空墮物

Safety net and nylon mesh provided to protect against hazards of fall of persons and falling objects

- 遵守
  - 《升降機槽工程安全指引第1卷 – 施工期間直至移交予升降機安裝承建商前》（建造業議會）
  - 《升降機槽工程安全指引第2卷 – 升降機安裝期間直至獲發佔用許可證及交予發展商》（建造業議會）
  - 《升降機槽工程安全指引第3卷 – 整段樓宇佔用期間》（建造業議會）
  - 《升降機槽工程安全指引第4卷 – 升降機槽內的建築工地升降機》（建造業議會）



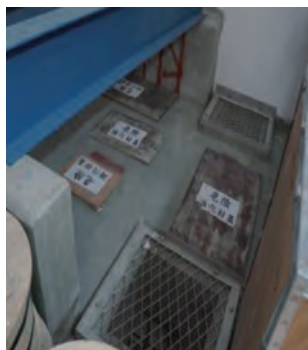
升降機頂上的工作台設有圍欄及踢腳板  
Working platform with railing and toe board on lift car top

- Observe
  - Guidelines on Safety of Lift Shaft Works: Volume 1 – During Construction Stage and Before Handing Over to Lift Installation Contractor (Construction Industry Council)
  - Guidelines on Safety of Lift Shaft Works: Volume 2 – During Lift Installation Stage until Issue of Occupation Permit and Handing Over to Developer (Construction Industry Council)
  - Guidelines on Safety of Lift Shaft Works: Volume 3 – Throughout the Occupation Stage of Buildings (Construction Industry Council)
  - Guidelines on Safety of Lift Shaft Works: Volume 4 – Builder's Lift within Lift Shaft (Construction Industry Council)

### 3 一般工地安全及工地整理 General Site Safety and Housekeeping



升降機槽中有充足的照明  
Sufficient lighting for works in the lift shaft



安全封蓋好的樓洞需貼上警告標示  
Cover to floor openings securely fixed with warning notice

## 噪音管制 Noise Control

- 使用機動設備進行的建築工程、模板或棚架架設或拆卸工程、建築物料的起卸或處理，或錘打工作，必須符合建築噪音許可證上所列條件，才可以在週日下午7時至上午7時或於公眾假日進行。
- 撞擊式打樁工程必須符合建築噪音許可證上所列條件，才可以在公眾假日以外日子的上午7時至下午7時的准許時限內進行。
- 工作環境嘈雜，令工人難以溝通，易生意外。
- 所有空氣壓縮機必須符合指定的噪音標準，並附有噪音標籤。

Form 2 (向環保署申請建築噪音許可證)  
Form 2 (Application for a Construction Noise Permit) from  
Environmental Protection Department

取得建築噪音許可證 (表格3—使用  
機動設備)後，方可使用列表上的設  
備  
Obtain construction noise permit  
(Form 3 – use of powered  
mechanical equipment) before  
using the noisy equipment





為建築地盤設置隔音屏  
Noise screen provided for construction site



設有吸音裝備的氣壓碎石機  
Pneumatic breaker equipped with noise absorber



進行岩石挖掘工程時設置隔音屏。  
A noise screen is provided during rock excavation.

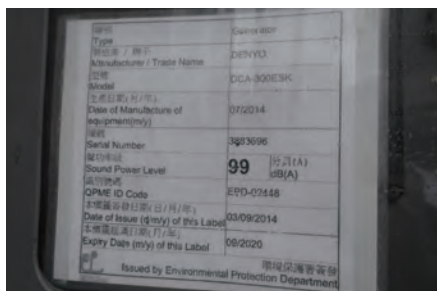
- Construction works involving powered machinery, or erection or dismantling of formwork or scaffolding, or loading, unloading or handling of construction material, or hammering activities between 7 p.m. and 7 a.m. on a weekday or anytime on a public holiday may only be carried out in accordance with the conditions as laid down in the construction noise permit.



在聽覺保護區張貼警告牌  
Warning sign posted at ear protection zone

### 3 一般工地安全及工地整理 General Site Safety and Housekeeping

- Percussive piling works may only be carried out during approved hours between 7 a.m. and 7 p.m. on a day other than a public holiday in accordance with the conditions as laid down in the construction noise permit.
- Noisy working environment renders it difficult to communicate leading to accident easily.
- Air compressors shall comply with the prescribed noise emission standard and fitted with a noise emission label.



由環保署發出的優質機動設備標籤  
Quality powered mechanical equipment (QPME)  
Label issued by Environmental Protection  
Department



為剷碟機安裝隔音和隔塵保護罩  
Sound insulation and dustproof protection guard  
provided to abrasive cutter

### 塵埃控制（隔塵網） Dust Control (Dust Screen)

- 建築工程產生的塵埃、機器和建築車輛排放的廢氣，以及化學品和易燃物料噴塗時散發的氣體，可刺激眼睛及呼吸系統。
- 拆卸工程揚起的石棉、粉末和塵埃可引致肺塵埃沉着病、肺癌和矽肺病。
- 採取有效措施控制塵埃產生及散播，例如硬地施工法，以水噴灑工地通道，在工地出入口清洗車輪，以不滲透的隔塵網覆蓋易生塵埃物料，以水噴灑或利用隔塵罩控制易生塵埃的工序，工人應佩戴呼吸器具、口罩及護目鏡等。
- Dust generated from construction work, exhaust from machinery and construction vehicles as well as gas from chemicals and combustible spraying will cause irritation to eye and respiratory system.
- Asbestos, powder and dust generated from demolition work may lead to pneumoconiosis, lung cancer and silicosis.



- Take effective measures to control generation and spread of dust, e.g. hard paved construction method, spraying water over haul road, wheel washing of construction vehicles at site entrance, covering dusty materials with dust-proof sheet, spraying water onto or using dust guard to control dust generating works procedure and use of breathing apparatus, masks and goggles etc. by workers.



防止塵埃四散的自動灑水系統  
Automatic water spraying system to control dust



在運料路上灑水，防止塵埃四散。  
Dust control by water spraying over the haul road



在地盤以人手灑水  
Manual water spraying on construction site

## 通氣 Ventilation

- 在密封工作間輸入鮮風或人工淨化空氣以循環換氣，每小時至少三次。
- Circulate fresh or artificially purified air at the rate of not less than 3 air changes per hour for enclosed workplaces.



天氣炎熱時，為大型樁帽內的工作間提供機械通風  
Mechanical ventilation is provided to a working area inside a large pile cap during hot weather

### 溫度 Temperature

- 各工作間應維持合適溫度及慎防中暑。
- 為工人提供遮陽設施。
- 遵守《建造業議會刊物：在炎熱天氣下工作的工地安全措施指引》。
- Maintain a reasonable temperature to every workplace and beware of heatstroke.
- Provide sunlight shelter to workers.
- Observe “Guidelines on Site Safety Measures for Working in Hot Weather” (Construction Industry Council)



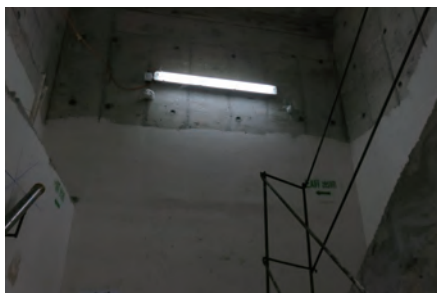
給工人提示的酷熱天氣警告訊息  
Hot weather warning sign for workers' alert



為工友提供擋陽設施  
Sunlight shelter for workers

### 照明 Lighting

- 確保採光的窗戶和天窗清潔和不受雜物阻擋。
- 所有照明系統的安裝方式以光線平均和不產生眩光為合。
- Ensure that windows and skylights used for lighting are kept clean and free from obstruction.
- Install all lighting systems in such a way as to ensure even distribution and absence of glare.



為樓梯／通道／出入口提供足夠照明  
Provide adequate lighting for staircase/access/egress





## 衛生設施 Hygiene Facilities

- 為工人提供廁所。
- 為工人提供流動臨時廁所。
- 為工人提供淋浴室。
- Toilet accommodations are provided for workers.
- Mobile temporary latrines are provided for workers.
- Shower rooms are provided for workers.



臨時廁所／淋浴室  
Temporary latrines/shower room



流動臨時廁所  
Mobile temporary latrines



建築地盤內提供可沖廁的廁所和洗滌設施  
Flush water toilets and washing facilities provided inside building floor



太陽能熱水系統（左圖）為淋浴室（右圖）提供熱水供應  
Solar water heating system (left) to provide hot water to shower room (right)



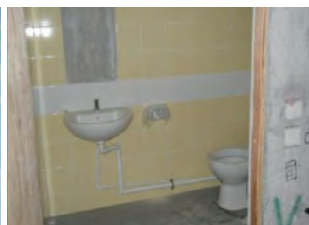
戶外劃設的洗手和洗鞋區  
Open hand-washing and shoes cleaning area



太陽能熱水器沖身室  
Solar heat shower room



太陽能熱水器沖身室的儲物櫃  
Solar heat shower room with locker



大樓每三層設洗手間設備  
Wet toilet at every 3 floors of domestic blocks



## 3 一般工地安全及工地整理 General Site Safety and Housekeeping

### 福利設施 Welfare Facilities

為工人提供休息室：

- 讓工人用膳和進食茶點；
- 用作工地管理人員和工人的集合地點，進行安全訓練（如入職訓練）、早操和舉辦工地座談會；以及
- 在天氣炎熱時供工人舒緩暑熱。

為工人提供洗衣房：

- 為工人提供乾淨制服保障健康；以及
- 整潔的制服可提升施工團隊的形象。

Rest room provided for workers:

- Let workers take meals and tea breaks;
- Serves as a gathering place for the site management team and workers to hold safety training such as induction training, morning exercise and tool box talks;
- Provides a relief for workers from the heat stress in hot weather.

Laundry facility provided for workers

- Let workers have clean uniform to enhance their well being at work;
- Tidy uniform upkeep the image of workforce.



簡單的洗衣房，裝有洗衣機設備，方便工人

A simple laundry area equipped with electric-washing machines



設備齊全的休息處

Well equipped workers' rest area



工人飲水設施  
Drinking facility



休憩區魚池  
Rest area



避暑亭  
Refreshing area



設置工人休息室  
Working resting room





## 物料貯存和清理 Storage and Removal of Materials

存放於戶外地點的物料均應蓋好：

- 以免雨天時積水和物料受損；
- 以防鬆散物料被強風吹散。
- 所有物料應以安全穩妥的方式堆放整齊。

Materials placed in external area should be properly covered to:

- Prevent water ponding and damage to the material in rainy days;
- Prevent spread of loose materials in windy days.
- All materials should be stacked neatly and in a safe manner.



存放於戶外的物料均應蓋好  
Properly cover materials in external area



在戶外有遮蔽的地方存放物料  
Sheltered external area for placing materials



妥善遮蓋／堆放物料  
Properly covered/stacked materials



## 危害健康物質的管制

## Control of Substances Hazardous to Health

- 盡量考慮以非腐蝕性物料取代腐蝕性物料。
- 該等物料的貯存室應附有警告標誌。
- 應提供安全的貯存室。
- 每個容器只可貯存同一類化學品。
- 工地安全主任應對每種化學品的使用方式進行風險評估。
- 只准合資格人士進入化學品貯存室。
- 只准合資格人士使用該等物料。
- 根據《工廠及工業經營（危險物質）規例》的規定，盛載化學品的容器應貼有分類化學品標籤。
- 必須制訂應變計劃和備有應急用品，並定期進行處理化學廢物泄漏演習。



貯存化學物料時應妥為標籤，並標明適當的類別。  
Storage of chemical materials properly labeled with appropriate sign of category



化學品標籤塑膠標貼  
PVC Sticker of Chemical Signs

- If possible, corrosive materials should be considered to be replaced with non-corrosive materials.
- Storage of materials should be labeled with warning sign.
- Safe storage facilities should be provided.
- Only same types of chemical materials are stored together within a container.
- Site safety officer should make risk assessment on usage of every type of chemical materials.



由合資格人士存取危險物料  
Access to dangerous materials by competent person.





- Only competent person is allowed to enter the chemical store.
- Only competent person can use the materials.
- Chemical signs need to be stuck to the containers containing different kinds of chemicals according to Factories and Industrial Undertakings (Dangerous Substances) Regulations.
- A contingency plan, emergency kit and regular drills for handling of chemical waste spillage incidents are required.



只有合資格人士才可進入化學品貯存室  
Only competent person allowed to enter the chemical store



化學廢物放置在妥為標識的容器中  
Properly labeled container for chemical waste

## 安全標誌 Safety Signage

- 善用顏色、形狀和圖像，讓工人容易明白安全指示。
- Make use of colour, shape and graphics to let workers easily understand the message.



塗上警告條紋的安全標誌  
Painted with warning strip



塗上警告條紋的安全標誌  
Painted with warning strip

### 3 一般工地安全及工地整理 General Site Safety and Housekeeping

#### 體力處理操作 Manual Handling

從事建造業，體力處理操作是不能避免的，而工作環境所潛在的危險也不少，督導人員和工人應小心處理各項工作：

- 入職前必須有適當訓練。
- 工作時佩戴合適的個人防護裝備。
- 重新安排需要搬運的物件。
- 盡量借助機械或輔助工具，以減少體力操作處理。
- 採取正確搬運姿勢。
- 工作時要確保工作環境妥善，避免出現鬆脫的鑽釘、未蓋好的地洞或建築物料碎屑等。
- 多做運動，強壯體能。

Construction works often involve manual handling and entail hazards in almost every operation. Supervisors and workers must carefully manage such work:

- All new workers should be properly trained.
- All workers should use appropriate personal protective equipment.
- Redesign the load.
- Use mechanical aids whenever possible to reduce the need for manual handling.
- Always use correct posture when lifting.
- Maintain good housekeeping and keep the work site free of loose nails, uncovered holes or scraps of building materials etc.
- Exercise regularly to stay in shape.



搬運大型圓形鐵罐時，應使用適合的輔助工具  
When moving metal drums, use a suitable handling aid



不要勉強搬運難以抓握之物件，容易使背部受傷  
Struggling with hard-to-control items might hurt the back



輔助運輸工具可減少體力處理操作時的危害  
Use of semi-automatic breaker rack to reduce manual handling operation





- 經常彎腰搬運重物，容易令背部受過大壓力而受傷。
- Bending at the waist to lift items might hurt your back.

- 提取重物時應屈膝保持背部挺直，或者向他人求助合力搬運。
- Bend at the knees and keep your back straight when you lift or ask someone's help to lift the item.



- 不要勉強搬運難以抓握之物件，可能會使背部受傷。
- Struggling with hard-to-control items might hurt your back.

- 搬運大型圓形鐵罐時，應使用適合的輔助工具。
- When moving metal drums, use a suitable handling aid.



- 不可勉強提舉形狀特殊或過大的物件，以免發生危險。
- Trying to carry awkward or bulky loads is dangerous.

- 處理大型物件如玻璃或木板時，應使用輔助工具或與他人合力搬運。
- When moving things like big panels or large panes of glass, use a cart or get someone to help.



- 獨力及彎腰搬運長鐵枝會使脊骨不勝負荷。
- Carry rebar by yourself would put too much strain on your back.

### 3 一般工地安全及工地整理 General Site Safety and Housekeeping

- 搬運長鐵枝宜二人合力搬運，提舉時亦應動作一致。
- Rebar should be handled by two people, both lifting in unison.



- 攜帶工具時應避免使背部負荷過重。
- When carrying your tools, be careful not to overload your back.

- 攜帶工具時可使用手推車和工具箱，既方便又安全。
- Using hand cart and sturdy box to carry your tools is easier and safer.



- 經常重覆彎腰可導致背部受傷。
- Frequent bending over can lead to back injury.

- 把物料放於方便拿取的位置。
- Arrange working materials so that they are within easy reach.



- 工地環境雜亂，容易引起危險。
- An untidy work site poses many hazards.

- 在地盤工作，必須確保工作環境安全及整理妥當，並於有危險的地方加設圍欄。
- Maintain good house-keeping and fence off hazardous areas.





## 在炎熱天氣下工作 Working in Hot Weather

### 工作安排

- 避免長時間在高溫或曝曬的環境下工作。
- 留意天氣報告。
- 盡量編排工作在較清涼的時間（如清晨）和較清涼的地方（如設有蔭棚／遮蔽處的地方）進行。
- 把必須穿戴個人防護裝備（例如呼吸器、圍裙、長袖手套）的工作，安排在較清涼的時間進行。
- 讓工人先行適應高溫環境，才執行全部工作。
- 提供輔助機械（例如油壓積機、鏟車、手推車、機械吊機）以減少人手工序，減低體力需求。



### Works Arrangement

- Avoid working in hot environment or under direct sunlight for prolonged periods of time;
- Take heed of weather report;
- Reschedule works to cooler periods (such as early morning) and cooler places (such as sheltered or shaded areas) as far as possible;
- Schedule works requiring use of personal protective equipment (PPE) such as breathing apparatus, apron, long sleeve gloves to cooler times of the day;
- Enable workers to adapt to the hot environment before taking on full workload;
- Reduce the physical demand on workers by minimizing manual work through use of mechanical aids (such as hydraulic jack, forklifts, trolley, and mechanical hoists).

## 作業－休息循環及降溫設備

### Work-Break Cycle and Cool Down Facilities

- 讓工人定時休息和在不同工種和地點之間輪流工作，使工人可以乘涼，並減少其曝露在酷熱環境下的時間。工人於下午有30分鐘小休。除此之外，從五月至九月的炎熱天氣下工作，也讓工人在上午工作時段有15分鐘小休，以遵守建造業議會發出的《在酷熱天氣下工作的工地安全指引》。
- 在酷熱時段，安排工人在清涼或有遮蔭的地方休息。
- 提供淋浴／洗滌設施供清洗和冷卻身體。
- 提供冷卻空氣設備，例如噴霧散熱風扇。



高容量的吹風機可使在工作間的工人更舒暢  
Large blower with high air flow rate to workplace

- Enable workers to cool down and reduce their exposure to hot environment through taking regular breaks and rotating duties and worksites; Observe the Construction Industry Council – Guidelines on Site Safety Measures for Working in Hot Weather, Version 2. On top of regular 30-minute rest period for workers in the afternoon, allow a 15-minute break for workers in the morning during summer months from May to September.
- Make arrangements for workers to take rest in cool or shady place during hot periods;
- Provide shower and washing facilities for washing and external cooling;
- Provide cooling devices such as cooling fans with atomized water spray.

### 飲料 Drinks

- 在方便的地點設置飲水站，提供足夠的清涼（攝氏10-15度）飲用水，讓工人隨時取用。
- 鼓勵工人多喝水，以補充因流汗而失去的體液和電解質（一般而言，於高溫環境下工作，每小時便應飲用最至少半公升水）。
- 不應飲用含酒精飲料，以免令身體脫水。
- 避免飲用含咖啡因的飲料，例如茶和咖啡。咖啡因有利尿作用，會增加水分流失。
- 充分飲水以補充身體水分，但不宜過多以免電解質失衡。



需提供充足飲用水給在悶熱的戶外工作工人  
Plenty of water provided near workplace

- Provide sufficient cool (10-15° C) drinking water at easily accessible drinking points;
- Encourage workers to take plenty of water to replenish the body fluid and electrolytes lost through sweating (in general, a worker will need to drink at least half a litre of water each hour while working under hot weather);
- Prohibit consumption of alcoholic drinks which could dehydrate the body;
- Avoid drinks containing caffeine (such as tea or coffee) which are diuretic and may aggravate loss of body fluids;
- Drink adequate but not excessive water to replace body fluids since excess can result in electrolytes imbalance.





## 衣服及防護裝備 Clothing and Protective Equipment

- 鼓勵工人穿着淺色、寬鬆、天然物料的衣服（以減少吸收熱能和增強散熱效果，加快汗水揮發），而長袖衣服可減低戶外工作時皮膚在陽光下曝曬的機會。然而，過分寬鬆的衣服或會被機器轉動部分纏繞，不應穿着。
- 鼓勵工人戴寬邊的頭盔，對面部、頸及背部有效佳的遮蔭保護。

- Encourage workers to keep their shirts on and to wear clothing that are light-coloured, loose-fitting, made of natural materials (to minimize heat absorption and enhance heat dissipation; to enhance perspiration) and long-sleeved (to minimize exposure of the skin to sunlight when working outdoors). Clothing that is too loose is not suitable because of the risk of entangling in the moving parts of machines.



提供有吸熱少和汗水揮發強之特性的新款工作服，適合在炎熱戶外工作的工人  
New type of clothing with less heat absorption and enhanced perspiration feature for workers under hot weather

- Encourage the use of helmet with broad brim to provide better shade to the face, neck and back.

## 在太陽直接照射的情況下工作 Working under Direct Sunlight

- 在地面及陽光直射的樓面工作時，盡可能提供蔭棚／遮蔽處。鼓勵工人穿着長袖和寬鬆的袖衫，以及要求工人在外露的皮膚上塗抹最少具太陽防護指數15的防曬油。



- Provide shade/shelter where possible on ground level or floors exposed to sunlight; encourage workers to wear long-sleeved, loose-fitting shirt or other top on; ask workers to apply sunscreen of sun protection factor not less than 15 on exposed skin.



工人戴上配有遮陽設備的安全帽在陽光下工作  
Worker with sunshade facility working under sunlight



安全帽下配上不合規格的遮陽巾  
Helmet on top of make shift sunshade (bad example)



### 3 一般工地安全及工地整理 General Site Safety and Housekeeping

#### 在通風差劣的情況下工作

#### Working in Areas with Poor Ventilation

- 讓工人與熱源保持距離。如無法隔離，則應以隔熱材料將熱源分隔，把發出的熱量減至最低。
- 用排氣管或其他合適設備把熱空氣排出工作地點。
- 使用風扇／吹風機保持空氣流通。



使用風扇／吹風機保持工作地點空氣流通  
Adequate ventilation for the works area by fans or blowers

- Keep workers away from heat sources or, where this is not possible, insulate the heat sources to minimize heat radiation;
- Remove hot air from the works area by exhaust pipes or other suitable means;
- Ventilate the works area by using fans or blowers.

#### 急救程序及設備

#### First Aid Procedures and Facilities

- 制定急救及緊急應變程序，並透過講座和定期演習，向工地監督人員及工人提供適當培訓。如有工人出現與高溫相關的失調徵狀，應即時施救。
- Develop first aid and emergency procedures and provide appropriate training on these to site supervisors and workers through talks and regular drills; and provide first aid immediately to any workers who show symptoms of heat-related disorders.



按照安全計劃書的內容，為可能發生的緊急事件提供合適的應變操作及訓練  
Provide appropriate training and practice on emergency matters according to the safety plan

#### 銀卡（深造級安全訓練）

#### Silver Card (Advanced Safety Training)

- 銀卡是新工程合約的其中一項要求，規定從事指定工種的工人必須修畢相關工種的深造級安全訓練課程。其目的是加強工人的安全作業意識及認識相關的防範措施。
- 指定工種的工人必須持有有效銀卡，才可以在房委會的地盤內工作。
- 現時，建造業議會提供以下銀卡課程：(1)髹漆裝飾工；(2)木模板工；(3)拆卸工（建築物）；(4)水喉匠；(5)鋼筋屈扎工；(6)批盪工和鋪瓦工；(7)竹棚工和金屬棚架工；(8)工地建材索具工；(9)幕牆工；(10)升降機技工；(11)塔式起重機組裝工（安裝、拆卸及升降）；(12)隧道工。



- Silver Card, which is a contractual requirement for all New Works contracts, is an accreditation for workers of specific trades who have satisfactorily completed advanced training courses on safety geared to specific trade practices in order to enhance their safety awareness and vigilance for accident prevention.
- Workers of specified trades on HA's sites must be the holders of valid Silver Cards.
- CIC provides Silver Card training for: (1) Painter and Decorator; (2) Carpenter; (3) Demolition Worker (Building); (4) Plumber; (5) Bar Bender and Fixer; (6) Plasterer and Tiler; (7) Bamboo and Metal Scaffolder; (8) Construction Materials Rigger; (9) Curtain Wall Installer; (10) Lift Mechanic; (11) Tower Crane Worker (Erecting, Dismantling, Telescoping and Climbing); and (12) Tunnel Worker.



銀卡証書  
Silver card

## 相關條例和規例

### Relevant Ordinances and Regulations

- 《空氣污染管制條例》及附屬規例
- 《工廠及工業經營條例》
- 《建築地盤（安全）規例》
- 《危險品條例》及附屬規例
- 《工廠及工業經營（易燃液體的噴塗）規例》
- 《工廠及工業經營（保護眼睛）規例》
- 《工廠及工業經營（危險物質）規例》
- 《工廠及工業經營（安全管理）規例》
- 《消防條例》
- 《氣體安全條例》及附屬規例
- 《噪音管制條例》及附屬規例
- 《職業安全及健康條例》
- 《輻射條例》及附屬規例
- 《廢物處置條例》及附屬規例

### 3 一般工地安全及工地整理

## General Site Safety and Housekeeping

- Air Pollution Control Ordinance and Regulations.
- Factories and Industrial Undertakings Ordinance.
- Construction Sites (Safety) Regulations.
- Dangerous Goods Ordinance and Regulations.
- Factories and Industrial Undertakings (Spraying of Flammable Liquids) Regulations.
- Factories and Industrial Undertakings (Protection of Eyes) Regulations.
- Factories and Industrial Undertakings (Dangerous Substances) Regulations.
- Factories and Industrial Undertakings (Safety Management) Regulation.
- Fire Services Ordinance.
- Gas Safety Ordinance and Regulations.
- Noise Control Ordinance and Regulations.
- Occupational Safety and Health Ordinance.
- Radiation Ordinance and Regulations.
- Waste Disposal Ordinance and Regulations.

### 相關安全標準、工作守則、安全指引和指南

## Relevant Safety Standards, Codes of Practice, Guidance Notes and Guidelines

- 《安全帽的揀選、使用及保養指引》（勞工處）
- 《建築物拆卸作業守則》（屋宇署）
- 《在酷熱天氣下工作的工地安全指引》（建造業議會）
- 《地盤車輛及流動機械安全指引》（建造業議會）
- 《處理、運送及處置石棉廢物的工作守則》（環境保護署）
- 《包裝、標籤及存放化學廢物的工作守則》（環境保護署）
- 《道路工程的照明、標誌及防護工作守則》（路政署）
- 《處理在建築物內的含石棉物料》（專業守則PN2/97）（環境保護署）
- 《化學品使用過程的危險及安全指南》（勞工處）
- 《建築活動發出的噪音—法定》（專業守則PN1/93）（環境保護署）
- 《建築活動發出的噪音—非法定》（專業守則PN2/93）（環境保護署）
- 《個人防護用具須知》（職業安全健康局）
- 《地盤工友安全手冊》（勞工處）
- 《小心使用手工具》（勞工處）
- 《建造業體力處理操作》（職業安全健康局）
- 《升降機槽工程安全指引：第1卷 - 施工期間直至移交予升降機安裝承建商前》（建造業議會）
- 《升降機槽工程安全指引：第2卷 - 升降機安裝期間直至發佔用許可證及交予發展商》（建造業議會）
- 《升降機槽工程安全指引：第3卷 - 整段樓宇佔用期間》（建造業議會）
- 《升降機槽工程安全指引：第4卷 - 升降機槽內的建築工地升降機》（建造業議會）



- Guidance Notes on the Selection, Use and Maintenance of Safety Helmets. (LD)
- Code of Practice for Demolition of Buildings. (BD)
- Construction Industry Council – Guidelines on Site Safety Measures for Working in Hot Weather. (CIC)
- Construction Industry Council – Guidelines on Safety of Site Vehicles and Mobile Plant. (CIC)
- Code of Practice on the Handling, Transportation and Disposal of Asbestos Waste. (EPD)
- Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. (EPD)
- Code of Practice on the Lighting, Signing and Guarding of Roadworks. (HyD)
- Handling of Asbestos Containing Materials in Buildings. (Practice Note PN2/97) (EPD)
- Hazards During Chemicals in Use and Safety Guidelines. (LD)
- Noise from Construction Activities – Statutory. (Practice Note PN 1/93) (EPD)
- Noise from Construction Activities – Non-Statutory. (Practice Note PN 2/93) (EPD)
- Guidelines for the use of Personal Protective Equipment. (OSHC)
- Safety Handbook for Construction Site Workers. (LD)
- Working Safely with Hand Tools. (LD)
- Construction Site Safe Manual Handling. (OSHC)
- Guidelines on Safety of Lift Shaft Works : Volume 1 – During Construction Stage and Before Handing Over to Lift Installation Contractor (CIC)
- Guidelines on Safety of Lift Shaft Works : Volume 2 – During Lift Installation Stage until Issue of Occupation Permit and Handing Over to Developer (CIC)
- Guidelines on Safety of Lift Shaft Works : Volume 3 – Throughout the Occupation Stage of Building (CIC)
- Guidelines on Safety of Lift Shaft Works : Volume 4 – Builders' Lift within Lift Shaft (CIC)

## 4 安全使用機械設備 Safe Use of Plant

### 危害識別 Hazards

- 流動起重機／機器翻側
- 吊臂／起重鋼纜折斷
- 吊臂觸及架空電纜，導致觸電
- 吊重物下墮（吊重物鬆脫、吊索損壞等）
- 撞倒工人或阻塞
- 機械設備／機器欠缺維修保養，引致危險事故
- 人體下墮
- 被機器或工具所傷
- 火警、燒傷
- 觸電
- 接觸危險物品
- 滑倒、絆倒或跌倒
- 體力處理操作時受傷
- 噪音



流動起重機翻倒  
Toppling of mobile crane

- Overturning of mobile crane/machine;
- Breakage of jib/lifting cable;
- Hitting overhead power cables by jib causing electrocution;
- Falling objects (from the material being lifted, slings breakage etc.);
- Striking person or obstruction;
- Dangerous occurrence due to mal-functioned or poorly maintained plant/machine;
- Fall of person;
- Being injured by machinery or tools;
- Fire, burning;
- Electrocution;
- Hazardous substance;
- Slip, trip and fall;
- Being injured (manual handling);
- Noise.

### 塔式起重機的架設、拆卸及升降

### Erecting and Dismantling, Telescoping and Climbing of Tower Crane

- 把塔式起重機運送到工地前，須由一名合資格機械工程師（檢驗員）發出：
  - 運送前配件核實報告；
  - 運送前配件檢查報告；
  - 錨固等塔式起重機主要和重要配件檢驗證書。
- 在架設／拆卸塔式起重機前，安全主任須諮詢註冊機械／結構工程師，以便進行風險評估。





- 由具備相關資歷、經驗和資格的工程師監督。
  - 工人／操作員必須按照風險評估報告（須備有中文版本）和塔式起重機製造商的指示進行有關工作。
  - 在架設塔式起重機時，必須把工作地點圍封。
  - 使用塔式起重機的工人／操作員須曾受相關訓練、具備足夠經驗／知識，以及懂得吊運手號，並由一名具備至少10年操作同型號塔式起重機經驗的合資格人士監督。
  - 遵守勞工處發出的《安全使用塔式起重機工作守則》及建造業議會發出的《塔式起重機安全指引》。
- 
- Before delivery of a tower crane to a site, a competent mechanical engineer (examiner) is required to issue
    - a report on pre-delivery verification of components;
    - a report on pre-delivery checking;
    - certification of tower crane main and critical parts such as anchorage, etc.
  - Before erecting/dismantling of a tower crane, safety officer should consult a registered mechanical/structural engineer to conduct a risk assessment.
  - To be supervised by an engineer with relevant qualification, experience & competence.
  - The workers/operators should work in accordance with the risk assessment report (available with Chinese Version) and the instruction of tower crane manufacturer.
  - During erection of a tower crane, the venue should be fenced off.
  - The crew of tower crane workers/operators should be trained, have sufficient experience/knowledge, understand the signal code and to be supervised by a competent person of at least 10 years of relevant experience in operating tower crane on the same model line.
  - Observe “Code of Practice for Safe Use of Tower Cranes” issued by the Labour Department and “Guidelines on Safety of Tower Cranes” issued by the Construction Industry Council.



架設中的塔式起重機  
Erection stage of tower crane
























重要部件檢查  
Critical Parts Inspection

## 4 安全使用機械設備 Safe Use of Plant

### 與安全吊運作業有關的人員

### Personnel Involved in Safe Lifting Operations

- 塔式起重機機主應委聘「合資格機械工程師」為起重機進行運送前檢驗，然後才把起重機運往建築工地架設。
- 總承建商應委聘「監督工程師」控制、監控和督導塔式起重機的操作。
- 「合資格檢驗員」負責定期進行起重機械或起重裝置的檢驗和測試。他們需要：
  - 由進行起重工序的東主或起重機械／起重裝置的擁有人指定；
  - 屬指定有關界別的註冊專業工程師；
  - 曾受適當的訓練及有實際經驗。
- 「合資格的人」負責定期進行起重機械或起重裝置的檢查。他們需要：
  - 由進行起重工序的東主或起重機械／起重裝置的擁有人指定；
  - 曾受相關訓練及有實際經驗。
- 「起重機操作員」負責正確及安全地操作起重機，並能夠利用手號與訊號員溝通。他們需要：
  - 年滿18歲及持有有效起重機操作證明書；
  - 身體及體格健全；
  - 熟識溝通訊號。
- 「吊索工」負責將荷物裝上及卸下起重機。他們需要：
  - 曾受基本安全吊重訓練；
  - 正確地選擇及使用起重裝置；
  - 與訊號員聯絡來指示起重機的安全移動。

1  緊急停止 Emergency stop	2  停止 Stop	3  準備驅動機械 Ready to move	4  驅離訊號員 Move away from the signaller	5  向訊號員驅進 Move towards the signaller	6  近距離慢行 Move slowly by indicating distance	7  機械轉向伸手方向移動 Move towards the hand stretched direction
8  機械轉向伸手方向移動 Move towards the hand stretched direction	9  旋轉朝向伸手方向移動 Swing towards the hand stretched direction	10  旋轉朝向伸手方向移動 Swing towards the hand stretched direction	11  提升吊臂 Raise the boom	12  慢動作提升吊臂 Raise the boom slowly	13  下降吊臂 Lower the boom	14  慢動作下降吊臂 Lower the boom slowly
15  提升吊臂下降吊物 Raise the boom and lower the load	16  下降吊臂提升吊物 Lower the boom and raise the load	17  吊臂伸出 Extend the boom	18  吊臂縮入 Retract the boom	19  使用主吊鉤 Use the main hoist	20  使用副吊鉤 Use whip line	21  吊鉤下降 Lower the hoist
22  吊鉤慢慢下降 Lower the hoist slowly	23  吊鉤上升 Raise the hoist	24  吊鉤慢慢上升 Raise the hoist slowly	25  停止所有操作 Stop everything			

訊號員使用的手號  
Signals used by signaller



- 「訊號員」負責利用手號將吊索工的訊號傳遞給起重機操作員。凡起重機操作員不能清晰地看見所運載的負荷物或起重機之吊鉤便須僱用訊號員。他們需要：
  - 曾受有關安全起重操作的適當訓練；
  - 能夠指示起重機及負荷物的移動。
- 「吊運督導人員」負責直接監督整個貨車式起重機吊運作業。他們需要：
  - 由進行起重工序的東主或起重機械／起重裝置的擁有人指定；
  - 在監管吊運操作上應曾接受適當訓練和擁有足夠經驗；
  - 向相關吊運人員解釋該次吊運計劃和操作；
  - 獲授權停止任何不安全吊運作業。
- The owner of a tower crane should engage a “Competent Mechanical Engineer” (CME) to conduct pre-delivery and pre-erection examination of tower crane.
- The contractor should appoint a “Supervising Engineer” to control, monitor and supervise operations on tower cranes.
- The “competent examiner” is responsible for regular examinations and tests of the lifting appliances or lifting gears, and shall be:
  - appointed by the employer or the owner of the lifting appliances/lifting gears;
  - a registered professional engineer within a relevant discipline;
  - properly trained with relevant practical experience.
- The “competent person” is responsible for regular inspections of lifting appliances or lifting gear, and shall be:
  - appointed by the employer or the owner of the lifting appliances/lifting gear;
  - properly trained with relevant practical experience.
- The “crane operator” is responsible for operating the crane correctly and safely, and can communicate with a signaller using hand signals, and shall:
  - be at least 18 years of age and hold a valid crane operation certificate;
  - be physically fit; and
  - be familiar with signal code for communication.
- The “slinger” is responsible for attaching and detaching the load to and from the crane, and shall:
  - have received appropriate training on general safe lifting operations;
  - be capable of selecting lifting gear suitable for the loads; and
  - liaise with the signaller for directing the movement of the crane safely.
- The “signaler” (banksman) is responsible for relaying the signal from the slinger to the crane operator. The signaller is required when the crane operator does not have a clear and unrestricted view of the load carried by the crane or the hook, and shall:
  - have received appropriate training on general safe lifting operations;
  - be able to direct the movement of the crane and loads.



訊號員利用無線電溝通，以確保工序安全進行  
Signaler using radio means for a safe lifting operation

## 4 安全使用機械設備 Safe Use of Plant

- The “lifting supervisor” is responsible for supervising the whole lifting operation of lorry-mounted crane, and shall:
  - be appointed by the employer or the owner of the lifting appliances / lifting gear;
  - have adequate training and experience on monitoring of lifting operation;
  - brief the lifting team members of the lifting plan and operation;
  - have authority to stop the lifting operation in case of abnormality.



### 塔式起重機吊運操作 Tower Crane Lifting

應做事項：

- 起重區域內的地面層須設置中英文警告標誌。
- 塔式起重機操作員須持有塔式起重機操作員證明書，並具備足夠經驗。
- 須定期詳細檢查、檢驗及測試塔式起重機。
- 必須備有塔式起重機操作員證明書和起重機核査表，方可進行起重操作。
- 塔式起重機操作員必須能清楚接收訊號員發出的訊號。
- 進行起重操作時，塔式起重機操作員必須能夠透過閉路電視觀看吊物。



標明安全操作負荷  
Indication of safe working load



閉路電視攝錄機設置在吊運區上方，協助塔式起重機操作員進行吊運操作  
CCTV camera with recording function positioned above lifting zone to assist tower crane operator to carry out the lifting



塔式起重機操作員藉閉路電視屏幕監察吊運區情況  
CCTV system helps the tower crane operator to monitor the situation of lifting area



- 進行起重操作時，最好由訊號員與塔式起重機操作員進行溝通。
- 除手號外，利用對講機或流動電話作為溝通工具是可取的。
- 確保安全負荷自動顯示器已安裝妥當。
- 提供安全的上落途徑。
- 確保吊運路線內不會碰撞任何障礙物。
- 避免在塔式起重機的吊運工作範圍互相重疊。
- 吊運時應盡量以較慢速度移動。
- 經常留意吊臂的操作高度及吊鉤距離。
- 當停止操作時，應將吊運車停放在最小的半徑距離內，並將吊鉤升至最高位置。
- 在颱風吹襲時，應將吊臂轉動到背向颱風方向及鬆開制動器讓吊臂自由搖動。

## DOs

- Warning signs in both Chinese and English posted to areas at ground level within lifting zone.
- Tower crane operator should possess tower crane operator certificate and with sufficient experience.
- The tower crane should be inspected, thoroughly examined and tested periodically.
- Tower crane operator certificate and inspection form of the tower crane are prerequisite to operation of the tower crane.
- The tower crane operator should be able to receive signal clearly from the signaller.



當塔式起重機吊鉤進入吊運區之預設高度，設於吊運區之便攜式警報系統便發出警號提醒附近工友  
Portable alarm system installed at lifting zone will emit alarm to alert workers in vicinity when the lifting hook encroaches a preset height of the lifting zone



利用有聲警號／可視警報提醒範圍內正進行吊運工作

Warning signs together with both audio and visual signals to alert workers if lifting is in progress



## 4 安全使用機械設備 Safe Use of Plant

- The tower crane operator should be able to view the scene of the lifting object through CCTV system during lifting operation.
- It is better for the signaler to communicate with the tower crane operator during the lifting operation.
- Besides signaling by hands, other means of communication such as walkie talkie or mobile phone are advantageous.
- Ensure the automatic safe load indicator has been installed.
- Provide safe means of access and egress.
- The lifting routes do not collide with any object.
- Eliminate overlapping or interference zones between two or more tower cranes.
- Travel speed to be as slow as possible.
- Be aware of the height of lifting, the length of the crane's trolley.
- When the tower crane is not in operation, the crane's trolley to be positioned near the tower at minimum radius, with the hook raised to its highest position.
- During typhoons, the jib to be set to the typhoon's leeward side with the brake released allowing the jib to swing freely.

### 「不可做」事項：

- 起重負荷不可超出安全上限。
- 吊運路線不可在任何建築物或人的上方經過或超出工地界線。
- 不可讓吊鉤過份下降而碰上地面或吊運物，否則懸掛吊鉤之吊索可能失去拉力而從滑輪鬆脫。
- 切勿在以下情況進行起重操作：
  - 超出安全起重負荷；
  - 訊號不清晰；
  - 吊物下面有人；
  - 有人在吊物上；
  - 吊物埋在地下；
  - 吊物以傾斜角度往上拉；
  - 吊物沒有繫緊；
  - 吊物由鬆脫部分組成；
  - 吊物的重量不明；及／或
  - 已懸掛強風信號。



雙重資料牌顯示其操作負荷  
Double layers information tags

### DON'Ts

- Lifting load not to exceed safe limit.
- Lifting routes should not come across any building or pass over any person or exceed the site boundary.
- Do not lower the lifting hook too low and touch the ground or the load otherwise the lifting wire will lose tension and easily come off the pulley.



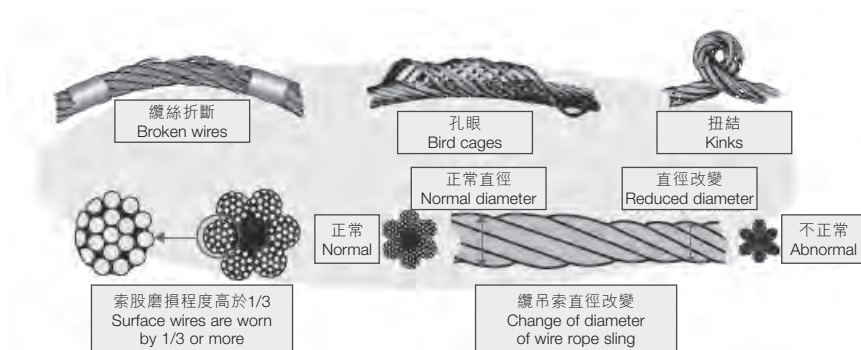
- Do not carry out lifting operations under the following circumstances:
  - safe working load is exceeded;
  - signaling is unclear;
  - there is a person below the object being lifted;
  - there is a person on the object being lifted;
  - the object being lifted is buried below ground;
  - the object being lifted is pulled up at an inclined angle;
  - the object being lifted is not securely tied up;
  - the object being lifted consists of loose parts;
  - the weight of objects being lifted is unknown; and/or
  - strong wind signal is hoisted.

## 起重裝置 Lifting Gear

- 起重裝置指鏈吊索、纜吊索、吊鉤、板鉗、鉤環、轉環或有眼螺栓。
- 起重裝置在吊重工序中不可缺少，其作用是將物件繫緊和懸掛在起重機上。所有吊重裝置須由合資格檢驗員進行測試及刻有安全操作負荷(SWL)。
- Lifting gear means a chain sling, rope sling, hook, plate clamp, shackle, swivel or eyebolt.
- Lifting gear play an important part in the lifting operation. The function is to tie the objects tightly and hang them on the crane. All lifting gear shall be tested by competent examiners and suitably marked with a Safe Working Load (SWL).

## 纜吊索 Wire Rope Slings

- 如發現以下情況，應停止使用及適當地棄置：
- The wire rope sling shall not be used and shall be disposed if they are:



## 4 安全使用機械設備 Safe Use of Plant

- 選擇合適的纜吊索。
- 切勿使用破損的纜吊索。
- 吊重時不可超出安全操作負荷。
- 須進行定期檢查。
- 不可突然提升。
- 如吊運時使用多於一條吊索，應注意吊索之間的角度。



- Use only suitable wire rope slings.
- Never use damaged wire rope slings.
- During lifting, the Safe Working Load must not be exceeded.
- Regular inspections shall be conducted.
- Sudden elevation is not allowed.
- If more than one wire rope sling is used in lifting, pay attention to the angle between the slings.



起重裝置 – 纜吊索及鏈吊索  
Lifting gear – rope sling & chain sling

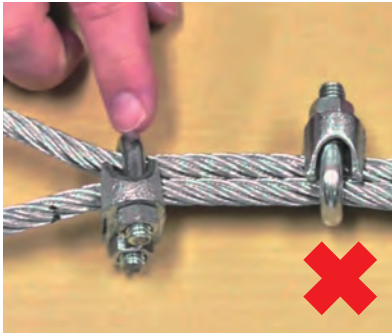
### 纜吊索 – 螺絲鋼碼扣 Wire Rope Slings – Cable Clip

鋼碼扣必須按以下方式妥善地安裝：

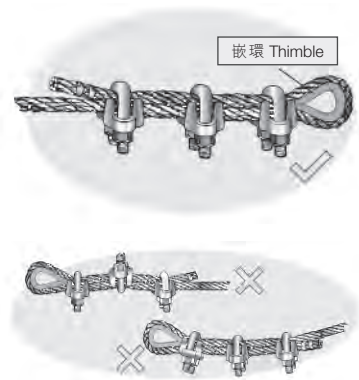
- 纜吊索須裝有嵌環。
- 最少有三個鋼碼扣。
- 安裝方向要正確。
- 鋼碼扣之間的距離須相同。

The cable clip shall be properly installed according to the following points:

- The wire rope sling to be equipped with thimble.
- A minimum of 3 cable clips.
- Correct direction of installation.
- Same distance between the cable clips.

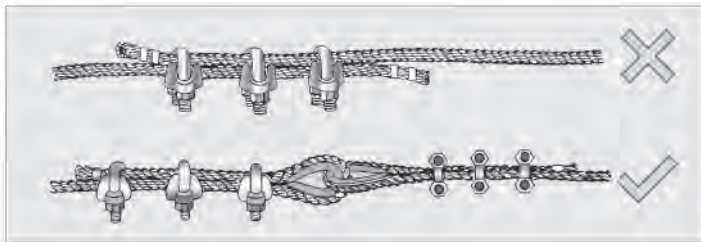


纜吊索安裝鋼碼扣方法不正確  
Rope sling with 3 cable clips wrongly installed



連接繩吊索方法：

Method of connecting the wire rope slings:



## 鏈吊索 Chain Slings

鏈吊索由合金製造，如其中一節出現問題會影響整條鏈吊索的安全性。已損壞的鏈吊索會突然折斷，不像纜吊索般容易察覺。因此，吊運時應盡量選用纜吊索。

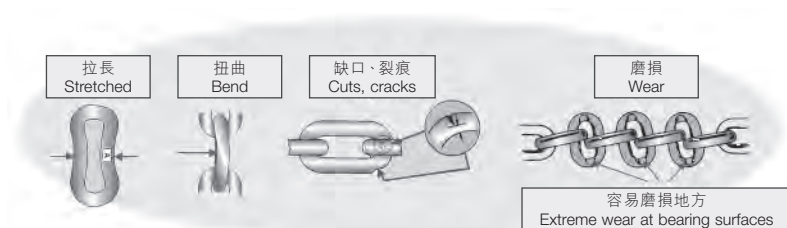
Chain slings are made of alloys. The entire chain becomes unsafe if problems arise in any section. A damaged chain sling will suddenly break and the damage is not as easily detectable as compared to wire rope slings. Therefore, a wire rope sling should be selected wherever possible for lifting.



應使用有顏色標示的鏈吊索  
Colour code applied for chain sling

## 4 安全使用機械設備 Safe Use of Plant

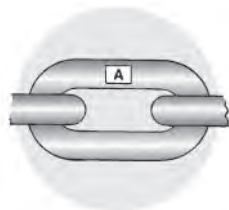
- 如遇以下情況，便應棄用。
- The chain sling shall not be used under the following conditions:



- 不可使用普通鏈吊索進行吊重工作。
- 不可超出安全操作負荷(SWL)。
- 不可打結或使用螺栓或其他工具縮短鏈吊索的長度。
- 鏈吊索沒有彈性，在吊運時應避免受到撞擊。
- 不應使用鏈擊打以圖令變形的鏈吊索回復原狀。
- 應選購刻有“A”字的鏈吊索，這是適合一般用途的最佳鏈吊索。
- 須進行定期檢查。



- No ordinary chains shall be used for lifting.
- The Safe Working Load (SWL) shall not be exceeded.
- No knots, bolts or other tools that shorten the chain length shall be used.
- Chain slings have no flexibility, so striking objects shall be avoided while lifting.
- Do not use hammers to reshape a deformed chain sling.
- When purchasing chain slings, those marked “A” shall be selected as they are of premium for normal use.
- Regular inspections shall be conducted.



### 鈎環（塞古） Shackle

- 不可用普通螺栓代替原有的鈎環杆。
- 確保螺栓杆完全鎖上。
- 不應使用螺栓杆類形的鈎環，因為吊物擺動時吊索可能令螺栓杆鬆脫。
- 在吊運時不可令鈎環側向一邊。
- 鈎環杆應經常扣在吊鈎上。
- 可使用金屬墊圈固定鈎環位置。

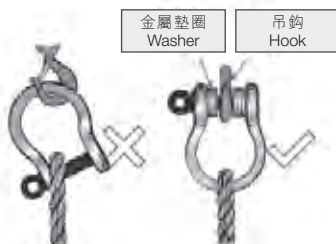


起重裝置 – 鈎環（塞古）  
Lifting gear – Shackle





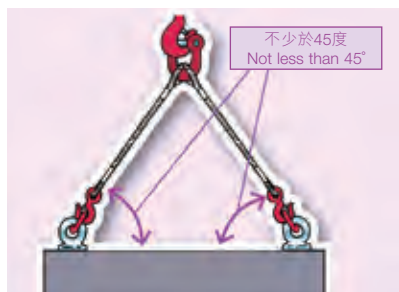
- Never replace the shackle pin with a bolt.
- Ensure the pin is totally locked.
- Do not use screw pin shackles because the sling might unscrew the pin arising from load shift.
- During lifting, shackles shall not lean to one side.
- Shackle pins must always be attached to the hook.
- Washers may be used to centre the shackle.



吊鉤與複式吊索支腳之間須使用鉤環  
Shackle is needed between the lifting hook and multiple sling legs

## 有眼螺栓 Eye Bolts

- 不可直接將吊鉤扣在有眼螺栓上。
- 普通的有眼螺栓只可用於垂直提升。
- 項圈有眼螺栓的提升角度不可小於45度。
- 應使用金屬墊圈固定有眼螺栓。
- 不可使用同一條吊索穿過兩個有眼螺栓。
- The hook shall not be directly fixed on to the eye bolt.
- Plain eye bolts only apply to vertical lifting.
- The angle of lifting of shoulder eye bolts should not be less than 45°.
- Washers may be used to ensure that the shoulder eye bolt is firmly in contact with the surface.
- Never use a sling through a pair of eye bolts.



## 4 安全使用機械設備 Safe Use of Plant

### 吊鉤 Hooks

- 吊鉤是吊運工序中不可缺少的起重裝置。吊鉤種類繁多，可配合不同的吊運用途。
- 所有吊鉤均應裝上安全扣（特別設計的吊鉤除外）。
- 裝有轉環的吊鉤適用於須讓負荷物轉動的吊運工作。
- 選用合適類型和大小的吊鉤。
- 不可縛上或除下安全扣。
- 吊運時應保持吊鉤垂直，如吊鉤側向一方，可影響吊鉤之安全操作負荷。



為吊鉤的安全扣加裝保險扣  
Additional safety lock is added to the safety latch of hook



吊鉤上的一般安全扣  
Normal safety latch of a hook

- Hooks are a vital part of lifting gear with variety for different lifting purposes.
- All hooks to be equipped with safety latches (other than the specially designed hooks).
- Hooks with swivels can allow loads to revolve during lifting operation.
- Select hooks of suitable type and right size for application.
- Do not tie or remove the safety latches.
- Maintain the hook in a vertical position. If the hook is eccentrically loaded, the Safe Working Load will be reduced.

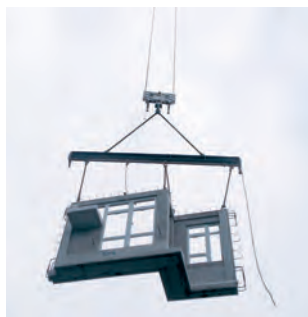


吊鉤及鈎環（塞古）妥善的存放  
Proper storage of hooks and shackle



## 吊樑 Spreader Beams

- 吊樑一般用於吊運較長的物件。
  - 吊運的重量須計算吊樑的重量。
  - 每個吊重連接點均不可超出安全操作負荷。
- Spreader beams are commonly used for lifting long loads.
  - The weight of spreader beams shall be included as part of the lifting load.
  - Each of the contacted points shall not exceed the SWL.



建築地盤常用的吊樑  
Commonly used spreader beams on construction site

## 為吊運工字樁特製的起重裝置 Tailor – designed Lifting Gear for H-pile

- 切勿超出裝置的安全操作負荷
  - 提供相關訓練並確保工人明白及掌握到安全的固定方法和吊運操作
  - 依從製造商的建議及規範作定期檢查及維修
- Never exceed the designed SWL
  - Provide user training and ensure that workers possess adequate knowledge and are competent for a safe fixing/lifting.
  - Periodic inspection and repair according to manufacturer's instruction/specification.



可扣緊工字樁末端的特製起重裝置  
Lifting gear tailor designed to clip the end of H-pile

## 色碼制度 Colour Coding System








- 使用色碼制度標示起重裝置已通過檢查，適合在指定期間安全使用。
- 鉤環按色碼髹上指定顏色。
- 吊索須附有護墊，以免輕易被吊物的鋒利邊緣損壞。
- 起重工字樑按色碼髹上指定顏色。
- 必須定期告知工人色碼的資料。



為方便工人，張貼關於色碼的通告於當眼處  
Posting of colour coding system for giving guidance to workers

## 4 安全使用機械設備 Safe Use of Plant

### 起重裝置辨色定期檢查表 Colour Code System on Lifting Gears

一月至三月 Jan - Mar	藍 BLUE	
四月至六月 Apr - Jun	黃 YELLOW	
七月至九月 Jul - Sept	綠 GREEN	
十月至十二月 Oct - Dec	橙 ORANGE	
不能再使用 待移離工地 To be removed from the site	紅 RED	
工具待驗 Equipment under quarantine	白 WHITE	
不可作吊重用途 Not used for lifting purpose	黑 BLACK	

本季檢查顏色為

The colour coding in this quarter is



附有色碼的起重裝置  
Lifting gear with colour code provided

- Colour code system to show that the lifting gear has been checked and can be used safely in the prescribed period.
- Shackles shall be coated with prescribed colour code.
- Slings need to be equipped with protective pad to avoid being damaged easily by sharp edge of the lifting materials.
- Lifting I-beam shall be coated with prescribed colour code.
- Workers should be informed regularly of the colour code system.

### 流動起重機 Mobile Crane

選擇合適的起重機時應考慮下列因素：

- 負荷物的重量和體積。
- 吊重高度和負荷物移動的距離及範圍。
- 吊重的次數及頻率。
- 所須使用的時間。
- 地面情況。
- 其他特別因素。
- 起重機的測試及檢驗均須由合資格檢驗員進行，而日常的檢查則須由合資格的人負責。所有測試、檢驗及檢查報告和證明書均須妥為保存。
- 吊運時不可超出安全操作負荷。
- 必須定期維修保養起重機，以維持機件的良好操作狀態。



吊運時不可超出安全操作負荷  
Lifting load not to exceed the SWL

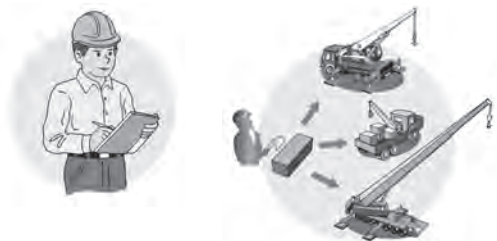


Consider the following factors in selection of cranes:

- Weights and dimensions of loads
- Height of lifting and distances/areas of the load movement
- Number and frequency of lifting.
- Period of time for the lifting operation.
- Ground conditions.
- Other special factors.
- Competent examiners test and examine the cranes and competent person regularly inspects the cranes. All testing, examination, inspection reports and certificates shall be properly kept.
- Do not exceed the Safe Working Load.
- Provide regular maintenance and keep the cranes in good operating conditions.



起重機上清楚標示安全操作負荷  
Safe working load clearly marked on the crane



裝設在履帶起重機的爬梯  
Access ladder installed at crawler crane

## 貨車式起重機 Mobile Crane (Lorry-mounted)

- 這類流動起重裝置既方便又安全。在移動起重機到其他地方使用時，除可省卻裝起重機上貨車和從貨車卸下的工作外，亦無須利用貨車拖行起重機，可減少運輸途中起重機移動／翻側／滑動的風險。
- 操作員須曾受相關訓練並由持有有效證明書。
- 每日使用前須由曾受訓人員詳細檢查，確保安全裝置操作正常，並把檢查結果紀錄於登記簿。每週須由合資格人士詳細檢查一次，並把檢查結果紀錄於Form 1。
- 起重機須由合資格檢驗員檢驗和測試。
- 如起重機易手或屬首次使用，須由合資格檢驗員測試和檢驗。
- 所有測試記錄及報告均須妥為保存。



## 4 安全使用機械設備 Safe Use of Plant

- Convenient and safe without the need for loading to or off-loading of the lifting appliance from or stowed by a lorry from one place to the other and to minimize the movement/tipping/sliding off of lifting appliance during the transportation.
- To be operated by a trained person with valid certificate.
- Check thoroughly the safety devices to confirm its good conditions daily by trained person with checking results recorded in log book and full inspection once per week shall be conducted by competent person with inspection result recorded in Form 1.
- Examine, test and verify the crane by competent examiner.
- Upon change of ownership or first use of the crane, test and thorough examination shall be conducted by competent examiner.
- Keep properly all tests records and reports as conducted.



起重墊板的面積不得小於支重腳撐板的三倍  
The lifting mat of area not less than 3 times of the float of the outrigger leg



當隨車式起重機運作前，其支重腳撐應完全伸展及其蹯板正確放在起重墊板上  
Lorry-mounted mobile crane under operation should fully extend the outrigger legs

### 流動式起重機操作 Mobile Crane Operations

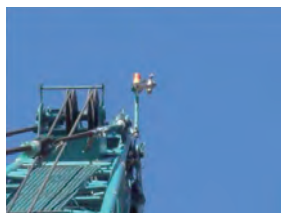
- 須在穩固和平坦的地面操作起重機。
- 在起吊前，應將支重腳撐完全伸展並確保穩固地架設在平坦的地面上。
- 吊運物件不可超出製造商訂明的安全操作負荷。
- 切勿突然擺動或急停起重機。
- 切勿在地面拖行負荷物。
- 以安全速度移動負荷物。
- 須熟識手號。
- 應適當地調較吊臂長度，確保起重機是處於安全操作半徑內。
- 當起重機上斜或下斜時，應適當地調較吊臂角度，以確保起重機是處於安全操作的狀態。
- 應圍封起重作業區，防止未經授權人士進入。
- 裝設探測器以提醒操作員是否仍有工人留在起重機操作範圍內。



流動起重機上需標示安全操作負荷  
Indication/markung of safe working load at mobile crane

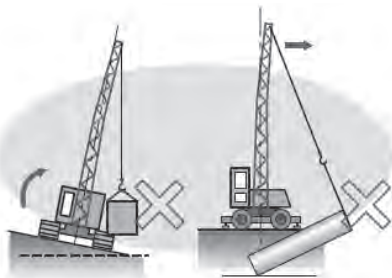


備有貨車式起重機的額定值降低圖，使安全操作負荷一目了然  
De-rating chart of lorry-mounted crane gives quick guide on safe loading capacity

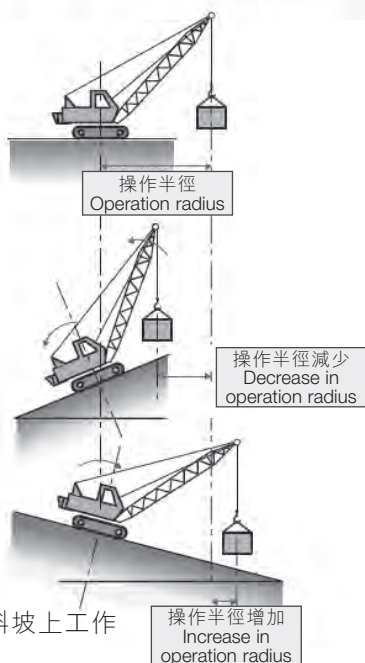


在起重機最高位置安裝風速儀，提升吊運安全水平  
Anemometer installed at the highest point of crane for safe lifting operations

- 起重機與圍欄之間須保持不少於600毫米闊的無阻通道。
- 在起吊前，埋碼員應確保吊運物並沒有與其他物料纏繞。
- 於吊運工序實行指差呼稱，消除人為失誤。



- a. 平路 Level Ground  
正確安全操作半徑。  
Correct operation radius.



- b. 上斜 Uphill position  
負荷物移向起重機，減少操作半徑令起重機向後翻倒。  
The load moves toward the crane and reduces the operation radius that may cause the crane to tip over backwards.
- c. 下斜 Downhill position  
負荷物遠離起重機，令起重機超越負荷，導致起重機向前翻倒。  
The load moves away from the crane and this may overload the crane and cause the crane to tip over forwards.

避免在斜坡上工作

## 4 安全使用機械設備 Safe Use of Plant

- Operate the mobile crane only on a firm and level ground.
- Before lifting, fully extend outriggers and ensure their stability on level ground.
- Never carry a load exceeding the Safe Working Load as specified by the manufacturer.
- Never abruptly swing or stop the crane.
- Never drag the loads on the ground.
- Move the load at a safe speed.
- Fully conversant with the signal code.
- Adjust the boom length to ensure the crane is operating within the extent of the safe operation radius.
- When moving uphill or downhill, the boom angle shall be adjusted to the safe working condition.
- Fence off the operation area to prevent unauthorized entry.
- Maintain an unobstructed passage of at least 600mm wide between the crane and the barrier.
- Install detector to alert the plant operator of any worker located within the operation area of the plant.
- Make sure the load to be lifted is not tangled with other materials before lifting operation is carried out.
- Apply pointing and calling practice as a confirmation tool to eliminate human errors in lifting operation.



以圍欄設立一個可分隔的作業區  
Barrier set up to separate the works area



利用閉路電視顯示屏監察不同位置的操作情況  
CCTV monitor to have different views of the operation



裝設射頻識別儀器探測附近是否仍有工人  
RFID device installed to detect surrounding workers



## 建築工地升降機 Builders' Lift

### 一般要求

- 按照《建築工地升降機及塔式工作平台（安全）條例》的規定，只有曾接受相關訓練的合資格操作員才可操作建築工地升降機。合資格操作員須按照有關工作守則的規定，每天檢查設備。
- 機電工程署核准設計方案後才可安裝升降機。
- 所有建築工地升降機均必須由合資格工人安裝和拆卸，並在安裝／改裝／更改升降高度之後由註冊檢驗員測試／檢驗。
- 所有建築工地升降機必須具備有效的使用許可證，並由註冊承辦商進行維修保養檢查、清潔、添加機油及調校。
- 升降機的最高載重量和載人數目上限，必須在吊籠內的當眼處展示。
- 升降機吊籠必須於所有閘門和層門關上後，才可啟動或升降。
- 吊籠須設有至少兩米高的穩固閘門，並加以圍封。
- 各層站必須設有召喚按鈕，供有需要使用吊籠人士啟動裝於特定位置（通常在底座外籠或主出入口）的電鐘，並須設有充足照明。
- 在正常運作情況下，吊籠必須由動力驅動上升及下降，並須有直接和穩定的電力供應。
- 在正常運作情況下，不得利用交替啟動及釋放驅動機制動器或交替開關節流閥的方法，令升降機吊籠藉重力下降。
- 不得裝載易燃物品。
- 升降機不得超載，每個吊籠須裝有超載感應器，一旦超載或超速時便會清楚亮起警告燈號或發出警報。

### 於升降機槽內

- 在升降機吊錨架的上方設置防水保護平台。
- 於升降機的機廂頂上提供至少一支合適的滅火器。



升降機吊籠要有足夠圍封  
Substantial enclosure to builder's lift car cage



升降機槽內的建築工地升降機臨時機房  
Builders' lift cathead inside lift shaft



升降機槽內的建築工地升降機機廂  
Builders' lift car inside lift shaft



建築工地升降機裝有全高度的閘門  
Full height gate for a builder's lift



## 4 安全使用機械設備 Safe Use of Plant

### General Requirement

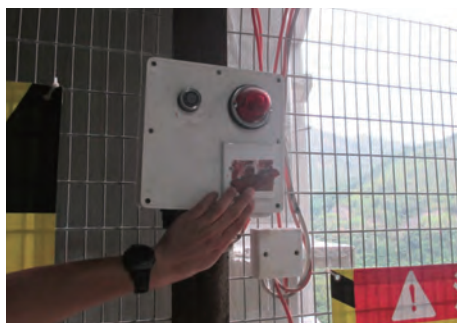
- Only competent operators who have undergone training as stipulated in the Builders' Lifts and Tower Working Platforms (Safety) Ordinance shall be allowed to operate builders' lifts. The competent operator shall carry out daily check of the equipment as specified in the relevant Code of Practice.
- Install the lift upon receiving the design approval from EMSD.
- All builder's lift shall be installed and dismantled by competent workers, tested/examined by registered examiner after installation/alteration/change of height of travel and also on a six-month basis.
- All builders' lifts shall have valid permit to use and be maintained, periodically checked, oiled and adjusted by registered contractor.
- The maximum weight and number of persons including operator shall be prominently displayed in the car cage.
- Never start or run the lift car unless all cage gates and landing doors are closed.
- Provide secure gate of minimum 2m high and protect the car with substantial enclosure.
- Provide every landing with a call button for the passenger to activate an electric bell located at a specified location (usually at the bottom enclosure or main access) when requesting for lift service, as well as adequate lighting.
- The car cage shall, during normal operation, be power driven upwards and downwards at all times via a direct and secure power supply.
- Never allow the car cage to descend under gravitational force by alternatively applying and releasing the driving machine brake or alternatively opening and closing the restrictor valve during normal operation.
- Never carry flammable materials.
- Never allow the lift car to be overloaded during operation and provide it with an overload sensing device to give a clear visual and audio warning signals in case of overloading and over movement.

### Within Lift Shaft

- Provide protection deck above the cathead of the lift.
- Provide at least one suitable fire extinguisher on the cathead of the lift.



建築工地升降機旁需有展示載人數目的告示  
Capacity displayed adjacent to entrance of a builder's lift



召喚升降機服務的按鈕·設於當眼處  
Call button for requesting lift service





## 物料吊重機 Material Hoist

- 只可用於運送物料。
- 吊重機只可從一個位置操作。
- 吊重機的升降槽必須圍封。
- 不得載人。
- 操作員須曾受相關訓練和符合資格。
- 不得超出訂明的安全操作荷載。
- 在所有上落貨區，升降槽鐵閘須安裝互鎖裝置。
- 物料吊重機和互鎖裝置必須接受定期調校測試、詳細檢驗和維修，確保狀況良好。
- 嚴禁任何未獲授權人士使用物料吊重機。
- 做好統籌工作，確保工人明白和遵守使用物料吊重機的安全程序。
- 由合資格檢驗員定期（每六個月）詳細測試／檢驗物料吊重機，確保機件保持良好狀況，可安全操作。



吊重機只供運載物料  
The hoist is only used for material delivery



張貼安全操作荷載及安全使用物料吊重機的告示  
Notice of safe working load and safety rules on material hoist

- To be used for material delivery only.
- Hoist must be operated from one position only.
- Shaft of hoist should be enclosed.
- Must not carry people.
- Operator should be trained and competent.
- Must not exceed the safe working load.
- The hoistway gates should be equipped with interlocking device at all loading/unloading areas.
- Material hoist and interlocking devices must be regularly adjusted, tested, thoroughly examined and maintained to ensure that they are always kept in a good working order.
- Prohibit unauthorized use of material hoists.
- Maintain coordination to ensure workers understand and follow safe procedures on use of material hoist.
- Thorough testing/examination of material hoist by a competent examiner at regular interval of not more than 6 months to ensure its safe working condition.

## 4 安全使用機械設備 Safe Use of Plant

### 搬土機械 Earth-moving Machinery

- 操作推土機時，任何人不得逗留在其移動路線上。
- 在搬土機械的操作地點周圍及機動設備可能擊中人的地方，須架設活動金屬圍欄或塑膠網欄，並設置中文和英文警告告示。
- 為挖土機或其他起重機械操作員安排訊號員，以確保操作地點視野清晰無阻和有關機械在該視野情況下安全操作。
- 機器與圍欄之間應相隔至少600毫米。
- 負荷物移動機器須由持有有效證明書的人士操作。
- 遵守勞工處發出的《安全使用挖土機工作守則》及《建造業議會：地盤車輛及流動機械安全指引》。
- No person should stand on the track during operation of bulldozer.
- Provide mobile metal barrier or PVC barrier fencing mesh with warning notices in both Chinese and English around the work areas of earth-moving machinery where persons are in danger of being struck by moving equipment.
- Provide a signaler for operator of excavator or other lifting appliance to effect a clear and unrestricted view of works area and view necessary for safe working of appliance.
- Maintain a minimum clear distance of 600mm between machinery and fencing.
- Loadshifting machinery can only be operated by a person who holds a valid certificate.
- Observe “Code of Practice for Safe Use of Excavators” issued by the Labour Department and “Construction Industry Council – Guidelines on Safety of Site Vehicles and Mobile Plant”.



操作員透過閉路電視可觀察四周情況  
Install CCTV system for operator to have a clear view of surrounding



在挖土機尾部安裝閉路電視攝影機  
CCTV installed at the rear part of Excavator



為挖土機操作員安排訊號員  
Signaler works with the excavator operator



機尾安裝防撞棒  
anti-collision rod at the rear of plant



## 鑽機 Drilling Rigs

- 妥當地圍起現場勘探工程的施工範圍。
- 在進行工地勘探前，必須詳細查核地下公用設施的記錄，並對地下管道進行偵測。
- 鑽機應架設在穩固的平台上，活動部分須裝有護罩。
- 岩芯管和鑽杆應堆疊在鋼架上。
- 施工前應由合資格人士檢查棚架，並在現場勘探工程進行期間，每隔兩個星期巡查一次。
- 鑽機須設有安全護罩，防止工人在鑽探操作期間觸及轉動中的機件。
- 工地內所有起重設備必須經過仔細檢查、檢驗和測試，並須取得相關的有效檢查證明書。工人必須穿着反光工作服和佩戴其他防護裝備。
- 使用化學品時須戴上手套和防護衣物，而使用氣壓噴射器時則須戴上護目鏡。
- 使用氣壓槍安裝錨柱時須佩戴安全頭盔、護目鏡和護耳罩，以及穿上安全鞋。



鑽機的活動部分必需設置護罩  
Moving part equipped with shield guard

- Properly fence off the works area for the ground investigation fieldworks.
- Prior to site investigation, thorough checking of underground utilities records and detection of underground services are required.
- The drilling rig should be supported on a stable platform and the moving part is fitted with shield guard.
- Stack core barrels and drill rods on steel frame trestles.
- Competent person to check the scaffolding before the commencement and carry out bi-weekly inspections in the course of the ground investigation fieldworks.
- Equip the drilling rig with shield guard to protect the workers from coming in contact with the rotary components during the drilling operation.
- All lifting equipment on site should be inspected, thoroughly examined and tested with valid certificates. The workers should wear reflective coating and other protective equipment.
- Put on gloves and protective coating when using chemicals. Wear goggles during the use of high pressure jets.
- Wear safety helmet, goggle, ear muffs and safety shoes when using cartridge operated tools to install anchor bolt.



岩芯管和鑽杆應放在鋼架上  
Stack core barrels and drill rods on steel frame trestles

## 4 安全使用機械設備 Safe Use of Plant

### 貨車和卸泥車 Trucks and Dumpers

- 須安排訊號員指揮車輛交通。
  - 承建商須進行風險評估，以找出工地車輛和流動機械設備所引致的風險。
  - 承建商須妥善地設計工地布局和行車路線。
  - 安裝倒車視像裝置或其他倒車安全裝置。
  - 覆蓋貨車上的鬆散物料，以防止物料從貨車跌出。
  - 貨車和卸泥車的操作員必須持有有效的操作證明書。
- 
- Arrange signaller to direct the vehicular traffic.
  - Contractor should conduct risk assessment to identify risk from site vehicles and mobile plant.
  - Contractor should properly design site layout and traffic circulation route.
  - Install reversing video device or other reversing safety devices.
  - Provide a cover to a truck to prevent spread of loose materials out from the truck.
  - The operator of truck and dumper should hold a valid certificate.



以膠布覆蓋卸泥貨車，以防易生塵埃的物料飛散  
Dump truck with PVC cover to prevent spread of dusty materials



卸泥貨車配備的左右延展翼，減低物料意外地飛脫車身  
Dump truck equipped with two covers to avoid debris accidentally coming out



安裝閉路電視及螢光幕讓駕駛員清楚看見車輛後面的交通情況  
Install CCTV and monitor for driver to have view of traffic at rear of vehicle



安排訊號員於狹窄通路指揮交通  
Signaller to control/direct the traffic in a narrow road





## 叉式起重車 Forklift Trucks

- 操作員須持有有效的叉式起重車操作證明書。
  - 須按製造商指示操作起重車。
  - 不得超出安全操作負荷。
  - 操作時，必須確保沒有其他人站在負荷物附近或在負荷物之下。
  - 遵守《建造業議會：地盤車輛及流動機械安全指引》。
- Operator of forklift truck should hold a valid certificate of forklift truck driver.
  - Operation of a forklift truck should be in accordance with the instruction from the truck manufacturer.
  - Never exceed the safe working load.
  - Ensure nobody close to or underneath the load when operating a forklift truck.
  - Observe the “Construction Industry Council – Guidelines on Safety of Site Vehicles and Mobile Plant”.



操作員須持有有效的操作證書

Operator should hold a valid certificate of forklift truck driver

## 壓土機和壓路機 Compacting Machines and Rollers

- 須按製造商指示操作壓土機和壓路機。
  - 須圍起壓土作業區。
  - 操作員須具操作壓土機／壓路機的有效證書。
  - 遵守《建造業議會：地盤車輛及流動機械安全指引》。
- Operation of the plant should be in accordance with the instruction from guideline of the manufacturer.
  - Zone of the compaction works should be fenced off.
  - Operator should have valid certificate for operating the compacting machine/roller.
  - Observe the “Construction Industry Council – Guidelines on Safety of Site Vehicles and Mobile Plant”.



操作員需接受足夠訓練後，才容許操作機械  
Operator should have received operation training for the compacting machine



整個工程範圍，應架設圍欄

Fencing should be set up for the compacting zone



## 4 安全使用機械設備 Safe Use of Plant

### 小型裝載搬土機 Mini Skid Loader

- 操作員須持有有效的小型裝載搬土機操作證明書。
  - 須按製造商指示操作小型裝載搬土機。
  - 不得超出安全操作負荷。
  - 操作時，必須確保沒有其他人站在負荷物附近或在負荷物之下。
  - 遵守《建造業議會：地盤車輛及流動機械安全指引》。
- Operator of mini skid loader should hold a valid certificate of mini skid loader driver.
  - Operation of a mini skid loader should be in accordance with the instruction from the mini skid loader manufacturer.
  - Never exceed the safe working load.
  - Ensure nobody close to or underneath the load when operating a mini skid loader.
  - Observe the “Construction Industry Council – Guidelines on Safety of Site Vehicles and Mobile Plant”.



在小型裝載搬土機安裝倒車攝影機  
Reverse camera installed to mini/skid loader

### 機器 Machinery

- 須由合資格人員操作。
  - 須定期檢查和保養維修。
  - 機器擁有人須按相關作業守則、法例等規定，僱用合資格人士檢驗機器。
  - 不得載客。
  - 須為活動部分安裝妥善的護罩。
- To be operated by qualified personnel.
  - To be inspected and maintained periodically.
  - To be examined by competent person employed by owner of the machinery, according to the CoP, ordinance, etc.
  - Not permitted to carry passengers.
  - Moving parts to be properly guarded.



升降機或電動絞車必需安裝護罩  
Guard provided for lift machines and electric winch





## 燃料 Fuels

- 添加燃料期間，附近不可有明火。
  - 添加燃料處附近須設置滅火筒。
  - 不得貯存過量燃料。
  - 應制訂措施，防止貯存地方滲漏燃料及保持貯存地方清潔。
  - 標貼適當的危險品及不准吸煙告示。
- 
- No naked flame in vicinity during refueling.
  - Provision of fire extinguisher near the spot of refueling.
  - No excessive storage of fuel.
  - Measures to prevent leakage of and cleaning to the fuel at the storage location.
  - With proper dangerous goods label and no smoking notice.

## 空氣壓縮機 Air Compressors

- 操作員須受過充分訓練，並熟知控制、啟動和關閉程序。
  - 須按製造商指示操作空氣壓縮機。
  - 機件須保持良好狀況。
- 
- Operator of an air compressor should be adequately trained and conversant with the control, start up and shutdown procedures.
  - Operation of the plant must be in accordance with the instruction of the manufacturer.
  - The plant must be maintained in good condition.



空氣壓縮機操作員須熟知操作程序  
Operator of air compressor should be familiar with operation procedure

## 手提氣壓碎石機 Handheld Pneumatic Breaker



個人防護裝備是在打鑿岩石期間不可缺少的裝置  
Personal protective equipment must be equipped during the rock breaking operation

- 重型手提氣壓碎石機的操作員須曾受相關訓練。
- 操作時，必須使用護耳罩、護目鏡和呼吸器等個人防護裝備。



在壓縮風喉加上套索  
Compressed air hose fitted with whip check device

- Operator of heavy duty handheld pneumatic breaker must be trained worker of the tool.
- During the operation, personal protective equipment such as earmuffs, goggles and respirator etc. must be worn by the operator of the tool.

## 4 安全使用機械設備 Safe Use of Plant

### 電弧焊接 Electric Arc Welding

- 焊接工作地點附近須設置滅火筒。
- 焊工須受過充分電弧焊接訓練。
- 焊接件需接地，回路電線應妥善緊接焊接件。
- 焊條電極夾，電線等應保持可操作狀態及無損傷。
- 安裝電路開路降壓裝置。
- 須為焊工提供由勞工處批核的手提護盾或護目鏡。如有需要，亦須提供適當的呼吸器。
- 焊工須穿上絕緣手套、圍裙、絕緣安全鞋、絕緣地蓆、深色長袖棉質或羊毛衣服，褲子不得塞進安全鞋內。
- 工作地點須保持乾爽。
- 分隔工作間的範圍。
- 焊工須穿上高筒鞋，以防火花掉進鞋內。
- 工作地點須有良好通風。
- 移走焊接工作地點附近的易燃物料，在高空焊接和火花朝下時尤須如此。
- 切勿讓電線圍繞身體。
- 完成焊接後須切斷電源，並確保沒有火警危險才可離開工地。
- 焊機須接地並設有漏電保護裝置。須為焊機另設電力開關，開關置於防水箱內。
- 遵從勞工處發出的《工作守則：手工電弧焊接工作的安全與健康》之安全方法及預防措施。



焊機殼必須接地（帶電部份需要有絕緣保護）  
Shield of welding machine - Earthed  
(Live conductor terminals should be insulated)



焊工穿上個人防護裝備方可進行焊接工作  
Welders with personal protective equipment during welding



- Provide fire extinguisher near welding workplace.
- Welders should be adequately trained in electric arc welding.
- Workpiece to be welded is to be properly earthed, and the welding return cable to be clamped to workpiece direct.
- Welding electrode holder, welding lead and return cables should be free from patent defect and properly maintained.
- Open-circuit voltage reducing device should be installed.
- They should be provided with eye protectors approved by Labour Department such as shields and goggles. Appropriate respirator should also be provided if necessary.
- Welders should wear electric insulating gloves, apron, insulating safety shoes, insulating mat, deep colour long sleeved cotton or wool clothing. The trousers should not be tucked into the safety shoes.
- The workplace should be in dry condition.
- Screen off the works area.
- Workers should wear high-top boots to prevent sparks from entering footwear.
- The workplace should be well ventilated.
- Remove combustible materials in vicinity of welding spot especially when welding is carried out at height and sparks falling down below.
- Never put electric cable around the body.
- After welding, cut off power supply and make sure there is no fire hazard before leaving the site.
- The welding machine should be earthed and with earth leakage protection. Provide separate power switch for welding machine with the switch housed in a waterproofing enclosure.
- Follow the safety measures and precautions recommended in the Code of Practice: Safety and Health at Work for Manual Electric Arc Welding issued by the Labour Department.



電弧焊接工須使用護盾、絕緣手套及圍裙  
Welders should wear insulating gloves, handheld shield and apron



## 4 安全使用機械設備 Safe Use of Plant

### 氣體焊接和火鋸切割 Gas Welding and Flame Cutting

- 在密閉空間進行焊接／切割，必須採用工作許可證制度，而氣瓶須放在密閉空間之外，並由其他工人看管。
- 焊工必須年滿18歲，具備所有有效焊工證書，並接受過充足的安全及健康訓練。
- 須為焊工提供由勞工處批核的手提護盾或護目鏡。如有需要，亦須提供適當的呼吸器。
- 焊工須穿上高筒鞋，以防火花掉進鞋內。
- 工作地點須通風，而且沒有障礙物。焊接工作地點附近須設置滅火筒。
- 乙炔氣瓶閥門須置於閥門桿上，以方便緊急關閉。
- 貯存和使用中的氣瓶均須保持垂直。
- 乙炔氣瓶和氧氣瓶均須設有防止回火安全掣。
- 止回閥應設於吹管每個氣體的入口，防止氧氣回流至燃氣供應、或燃氣至氧氣供應。
- 乙炔氣瓶和氧氣瓶須分開貯存在有良好通風的有蓋地方。用完的和滿載的氣瓶須加以註明，附近須設置滅火設備。
- 定期檢查氣瓶及氣喉，查看是否有泄漏迹象。
- 切勿將氣瓶放置在熱源或電力裝置附近，或暴露於有太陽熱力的地方。此外，距離火源至少10米。
- 以手推車運送氣瓶。
- 氧氣瓶使用藍色膠喉，乙炔氣瓶則使用紅色膠喉。此外，須更換老化的膠喉，以及不要把氣喉放在地上。
- 焊工須穿上皮手套、圍裙、安全鞋、深色長袖棉質或羊毛衣服。褲子不得塞進安全鞋內。
- 移走焊接或火焰切割作業範圍10米以內的易燃物料。在高空進行焊接時，須避免火花跌下。
- 須就氣體泄漏、氣喉／乙炔氣瓶內著火等情況制訂緊急程序。
- 遵從勞工處發出的《工作守則：氣體焊接及火焰切割工作的安全與健康》的安全方法及預防措施。



乙炔氣瓶和氧氣瓶須貯存在有良好通風的地方  
Store the acetylene and oxygen cylinders in a well ventilated area



乙炔氣和氧氣瓶須時存於通風的地方  
Store the acetylene and oxygen cylinders in well ventilated area

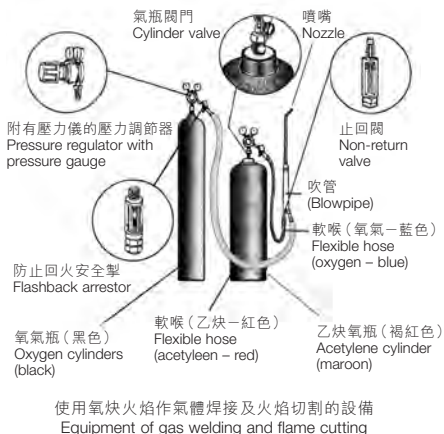


氣體焊接要注意的安全事項  
Safety measures about gas welding





- For welding/cutting in confined space, adopt a permit-to-work system and the gas cylinders should be placed outside and taken care by other workers.
- Welders should attain the age of 18 years, hold valid certificates and have adequate safety and health training.
- Welders should be provided with handheld shields or eye protectors approved by the Labour Department. Proper respirators should be provided if necessary.
- Welders to wear high-top boots to prevent sparks from entering footwear.
- The workplace should be ventilated and clear of obstruction. Provide fire extinguisher near welding workplace.
- Acetylene cylinder valve should be kept on the valve stem for emergency shut off purpose.
- Keep gas cylinders in a vertical position both in storage and use.
- Flashback arrestor should be installed to both acetylene and oxygen cylinders.
- Non-return valve at each gas inlet of the blowpipe to prevent back-feeding of oxidant gas to the fuel gas line and vice versa.
- Store the acetylene and oxygen cylinders separately in covered area with good ventilation. Empty and full cylinders should be indicated with notice and with fire-fighting equipment nearby.
- Periodic checking of the gas cylinder and the hose for any sign of gas leakage should be carried out.
- The gas cylinders should not be placed close to heat source or electrical equipment or exposed to heat of the sun; be placed at least at 10m away from fire source.
- Transport gas cylinders by trolley.
- Use blue plastic tube for oxygen and red tube for acetylene. Replace aging plastic tubing. Do not place the gas tubing on the floor.
- Welders should wear leather gloves, apron, safety shoes, deep colour long sleeved cotton or wool clothing. The trousers should not be tucked into the safety shoes.
- Remove combustible material within 10m of welding or flame cutting operation. Prevent sparks from dropping downwards during welding at height.
- Establish emergency procedure for cases on gas leakage, fire developed in hose/with acetylene cylinder, etc.
- Follow the safety measures and precautions recommended in the Code of Practice: Safety and Health at Work for Gas Welding and Flame Cutting issued by the Labour Department.



皮手套  
Leather gloves



面盾  
Shield

## 4 安全使用機械設備 Safe Use of Plant

### 圓鋸 Circular Saw

- 木工機器四周必須有足夠的工作空間。
- 必須適當地設置、安裝和使用在圓鋸上的護罩和鋸尾刀。
- 必須設置推木桿，以免手部觸及圓鋸的鋸片。
- 操作機器時須佩戴面罩和護耳罩。
- 木工機器須設有緊急停止掣。
- 圓鋸應提供抽排設備用以收集木糠及微塵至適當位置。
- 定時清除木糠減低火警危害。



盛載木屑之容器  
Receptacle below the cutting bench to receive sawdust

- Sufficient working spaces around woodworking machines must be provided.
- All guards such as crown guard and riving knives on circular saws must be properly provided, installed and used.
- A push stick must be provided to avoid the hands from touching the blade of a circular saw.
- A face mask and earmuffs to be worn during operation of the machine.
- An emergency stop button must be provided on woodworking machine.
- Exhaust extraction equipment should be provided for circular saws to convey chips and particles from cutters into a suitable receptacle.
- Remove sawdust regularly to minimise fire hazard.



風車／圓鋸應設有護罩和緊急停止掣  
Circular saw with guard and emergency stop



圓鋸上的護罩及鋸尾刀  
Guard and riving knife on circular saw

### 屈鋼筋機 Steel Bending Machine

- 操作員須受過適當訓練。
- 須設有等電位接駁裝置，以防觸電。
- 須設置護罩，以消除被夾傷的危險。
- 須妥善保護連接屈鋼筋機的帶電電線。
- 為切割和屈曲鋼筋工序預留足夠的工作空間。
- Operator of the machine should be properly trained.
- To be provided with equipotential bonding to avoid electrocution.
- To be provided with guard to eliminate the chance of trapping hazard.
- Live wire connected to the machine to be properly protected.
- Allow sufficient working space for cutting and bending steel bars.



為屈曲鋼筋機器設置護罩腳掣和互鎖裝置。如無落下護罩，會截斷電源，停止機器的運作  
Foot switch control and interlock guard on the bar bending machine. The device isolates the power supply to halt the operation, if guarding is removed



為紮鐵場提供伸縮性保護網  
Foldable net provided above bending yard



為紮鐵工地提供保護網  
Safety net provided above steel bending workplace



屈曲鋼筋機器需有足夠的工作空間  
A typical steel bending machine on site with adequate working space



屈曲鋼筋機器需設置的護罩  
Bar bending machine with guarding

## 砂輪 Abrasive Wheels

- 砂輪的安裝工作只可由東主以書面委任的合資格人士進行。
- 護罩在結構上須堅固，尺寸要正確，並應裝穩在機器架上。
- 切勿以砂輪的邊旁研磨。
- 作業時須佩戴可抵受猛力撞擊的護目鏡。
- 在工作間張貼「使用砂輪」的警告告示。
- 砂輪不應安裝在其速度超逾砂輪本身最高許可速度的機器上。



為砂輪機設置護罩和在當眼處張貼安全海報／告示  
Abrasive wheel with guarding and relevant notice/poster is posted at the location

## 4 安全使用機械設備 Safe Use of Plant

- All mountings shall only be done by competent persons appointed in writing by the proprietors.
- Guards must be of rigid construction, proper dimensions and securely anchored to the machine frame.
- Never use the side of an abrasive wheel for grinding.
- High impact resistant goggles should be worn during operation.
- Post “the use of abrasive wheels” warning notice in the workplace.
- Do not mount a wheel on a machine the speed of which exceeds the maximum permissible speed of the wheel.

### 槍彈推動打釘工具 Cartridge Operated Fixing Tools

- 所用的槍彈推動打釘工具須為勞工處認可的種類。
- 操作員須年滿18年歲，並持有操作槍彈推動打釘工具的合格證書。
- 操作員須佩戴可抵受猛力撞擊的護目鏡、安全頭盔和護耳罩。
- 開槍前須發出口頭警告。
- 切勿在梯具和有易燃氣體的空間操作槍彈推動打釘工具。
- 槍彈推動打釘工具在使用後必須妥為存放。



妥善存放槍彈推動打釘工具  
Properly store the cartridge  
operated fixing tool

- Cartridge operated fixing tools should be the approved type by Labour Department.
- Operator to be with age 18 or above and hold certificate of competency for operating the cartridge operated fixing tools.
- Operators should wear high impact resistant goggles, safety helmets and ear muffs.
- Verbal warning should be issued before firing.
- Never operate the tools on a ladder and in a space with flammable gas, etc.
- The cartridge operated fixing tools should be properly stored after use.





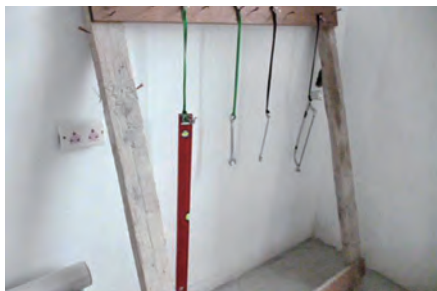
## 手提工具 Handheld Tools

- 每次使用前，須檢查工具是否有損壞。
- 切割工具如過鈍或變形，須妥善維修處理。
- 應使用適當的手提工具，錯誤使用可引致爆裂，發生危險。
- 高空作業時須以手帶連繫手提工具，以防止脫手滑下，凌空飛墮。
- 所有工具須妥為安放及貯存。
- 使用者須懂得如何使用有關工具。
- 如有需要，須為使用者提供有關訓練。
- 如使用手提工具工作時會產生碎片、微粒或噪音，應佩戴護目鏡、口罩或護耳罩等個人防護裝備。
- 須把應手提工具掛在工具腰包上或放於工具箱內或扣緊於個人身上之裝備。

- Examine the tools to check if they are free from defects every time before use.
- Blunt cutting edge or deformed working part should be redressed.
- Hand tools used should be correct for the purpose and misuse may lead to fracture, causing danger.
- Handheld tools for work should be fitted with the hand strap during operation at height and to prevent tools from slipping out and falling from height.
- All tools to be properly placed and stored in an orderly manner.
- Users of the tools should know how to use the tools.
- Training to be provided to users if need.
- Wear suitable personal protective equipment such as goggles, masks or ear muffs for protection against flying particles or noise during operation.
- Carry handheld tools in the waist gear or tool box or fix them to personal protective gear when they are not in use.



正確及安全使用手提工具進行安裝工作  
A typical safe and correct use of hand tools for a safe fixing work/installation



妥善放置手提工具  
Properly place the hand tools.



利用腰帶工具套穩妥地攜帶手提工具  
Carry handheld tools securely with waist gear





### 參考資料 References

#### 相關條例和規例

- 《建築工地升降機及塔式工作平台（安全）條例》
- 《工廠及工業經營條例》
- 《建築地盤（安全）規例》
- 《工廠及工業經營規例》
- 《工廠及工業經營（起重機械及起重裝置）規例》
- 《工廠及工業經營（安全管理）規例》
- 《工廠及工業經營（負荷物移動機械）規例》
- 《工廠及工業經營（砂輪）規例》
- 《工廠及工業經營（槍彈推動打釘工具）規例》
- 《工廠及工業經營（木工機械）規例》
- 《工廠及工業經營（氣體焊接及火焰切割）規例》
- 《工廠及工業經營（工作噪音）規例》
- 《工廠及工業經營（吊船）規例》
- 《工廠及工業經營（保護眼睛）規例》

#### Relevant Ordinances and Regulations

- Builders' Lifts and Tower Working Platforms (Safety) Ordinance.
- Factories and Industrial Undertakings Ordinance.
- Construction Sites (Safety) Regulations.
- Factories and Industrial Undertakings Regulations.
- Factories and Industrial Undertakings (Lifting Appliances and Lifting Gear) Regulations.
- Factories and Industrial Undertakings (Safety Management) Regulation.
- Factories and Industrial Undertakings (Loadshifting Machinery) Regulation.
- Factories and Industrial Undertakings (Abrasive Wheels) Regulations.
- Factories and Industrial Undertakings (Cartridge-Operated Fixing Tools) Regulations.
- Factories and Industrial Undertakings (Woodworking Machinery) Regulations.
- Factories and Industrial Undertakings (Gas Welding and Flame Cutting) Regulation.
- Factories and Industrial Undertakings (Noise at Work) Regulation.
- Factories and Industrial Undertakings (Suspended Working Platforms) Regulation.
- Factories and Industrial Undertakings (Protection of Eyes) Regulations.



## 相關安全標準、工作守則、安全指引和指商

### Relevant Safety Standards, Codes of Practice, Guidance Notes and Guidelines

- 《建築工地升降機設計及建造實務守則》（機電工程署）
- 《塔式工作平台設計及建造實務守則》（機電工程署）
- 《工作安全守則（升降機及自動梯）》（勞工處）
- 《安全使用流動式起重機工作守則》（勞工處）
- 《安全使用塔式起重機工作守則》（勞工處）
- 《安全使用和操作吊船工作守則》（勞工處）
- 《安全使用挖土機工作守則》（勞工處）
- 《有關在供電電纜附近工作的實務守則》（機電工程署）
- 《工作守則：手工電弧焊接工作的安全與健康》（勞工處）
- 《工作守則：氣體焊接及火焰切割工作的安全與健康》（勞工處）
- 《塔式起重機安全指引》（建造業議會）
- 《建築地盤車輛及流動機械的安全指引》（建造業議會）
- 《升降機槽工程安全指引：第4卷 – 升降機槽內的建築工地升降機》（建造業議會）
- 《砂輪的安全使用》（勞工處）
- 《手工具及動力手工具安全須知》（職業安全健康局）
- 安全健康提示編號55/2015, 海報 – 指差呼稱確認，消除人為失誤 – 吊運 – 職安局及房委會
- Code of Practice on the Design and Construction of Builders' Lifts. (EMSD)
- Code of Practice on the Design and Construction of Tower Working Platforms. (EMSD)
- Code of Practice for Safety at Work (Lift and Escalator). (LD)
- Code of Practice for Safe Use of Mobile Cranes. (LD)
- Code of Practice for Safe use of Tower Cranes. (LD)
- Code of Practice for Safe Use and Operation of Suspended Working Platforms. (LD)
- Code of Practice on Safe Use of Excavators. (LD)
- Code of Practice on Working Near Electricity Supply Lines. (EMSD)
- Code of Practice: Safety and Health at Work for Manual Electric Arc Welding. (LD)
- Code of Practice: Safety and Health at Work for Gas Welding and Flame Cutting. (LD)
- Guidelines on Safety of Tower Cranes. (CIC)
- Guidelines on Safety of Site Vehicles and Mobile Plant. (CIC)
- Guidelines on Safety of Lift Shaft Works: Volume 4 – Builders' Lift within Lift Shaft (CIC)
- Safety in the Use of Abrasive Wheels. (LD)
- Safety Guide for Hand Tools and Power Tools. (OSHC)
- Work Safety Alert no. 55/2015, Poster – Pointing and Calling as a Confirmation Tool to Eliminate Human Errors – Lifting – OSHC & HA

## 5 在工地安全使用電力 Safe Use of Electricity on Site

### 危害識別 Hazards

- 觸電
  - 灼傷
  - 觸電後從高處墜下
  - 觸電致死
- 
- Electric shock;
  - Burns;
  - Falling from height after electric shock;
  - Electrocuton

### 電纜接頭／電線連接

#### Cable Joint/Wiring Termination

##### 電纜接頭 Cable Joint

- 沿最終電路的電纜不得有任何一類電纜接頭。
- Cable joints of any type along cable runs in final circuits are not allowed.



最終電路不得有電纜接頭  
No cable joint in the final circuits



電線應妥善接駁，不得給帶電部分外露。  
Properly connected wiring (no exposure of live parts)

##### 插座電線的終接 Wiring Termination at Socket

- 妥善地終接電線，避免帶電導體外露。
- Proper termination of wiring to avoid exposure of live conductors.



插座內的電線應妥善接駁於接線座，電線不得外露



Properly connect wiring in the socket and no live conductor exposed from the termination block



## 電纜的顏色

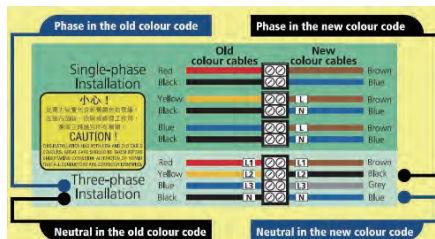
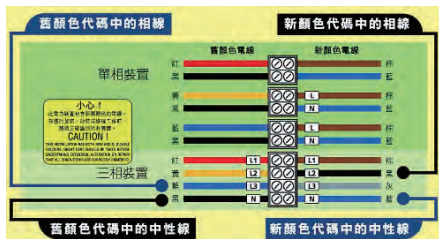
- 所有電纜要以正確的顏色代碼標示。

### Correct Cable Colour

- All wiring work shall follow the correct cable colour code.

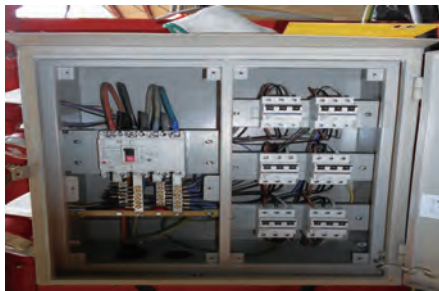
系統	相導體 (或帶電導體)			中性導體	接地導體
單相系統	棕			藍	綠/黃
三相系統	棕	黑	灰	藍	綠/黃

Systems	Phase (or line)			Neutral	Earth
1-phase system	brown			blue	green/yellow
3-phase system	brown	black	grey	blue	green/yellow



顏色代碼表及新舊顏色代碼表 (舊顏色代碼只供參考用)

Table of new and new/old cable colour code (old cable colour code for reference only)



安裝電線時，應採用最新的顏色代碼標示。如三相電路 (左)，單相電路 (右)

Adopt new cable color code for cable installation (a three phase circuit- LHS, single phase circuit - RHS)

## 5 在工地安全使用電力 Safe Use of Electricity on Site

防止直接觸及帶電部分的保護裝置

- 使用適當的絕緣或保護裝置，防止有人直接接觸帶電部分(IP3X)。

### Protection against “direct contact”

- Properly insulate or protect installation against direct contact with the live parts (IP3X).



使用適當的絕緣或保護，防止意外觸及帶電部份，而間隙則需要填封達 IP3X 的標準  
Live parts should be insulated and protected from direct contact and gap of the enclosure should be filled-up to IP3X standard

## 安裝電纜 Cable Fixing

電纜的保護

- 電纜須至少以聚氯乙烯／聚氯乙烯護套保護，所有電線接頭須妥善接駁。
- 如電纜有可能被損毀，應採用導管／線槽系統或裝甲電纜。

### Protection of Cable

- Minimum protection of cables shall be PVC/PVC sheath and all electrical joints are properly made.
- When damage is likely, use conduit/trunking system or armoured cable.



電線應有如金屬線槽等保護  
Protection of cable by metallic enclosure







## 電纜安裝

- 把電纜穩妥地安裝在高處，以減少受破損機會。

### Fixing of Cable

- Properly fix the cable at high level to avoid damages.



室外電線，應在高位掛定  
Fixing the outdoor cable at high level

一般電線，如在走廊或樓梯應在高位掛定  
Fixing the cable at high level in corridor, staircase

## 配電箱 Distribution Board

### 位置

- 除非配電箱屬於防水類型，否則不應裝設在潮濕和露天地方。

### Location

- Arrange the installations away from wet and humid areas and do not expose the installations to weather unless they are of waterproof type.



在消除故障後，只有註冊電工方可重設配電箱內的開關  
Only Registered Electrical Worker allowed to reset the switch of distribution board after fault rectification

## 5 在工地安全使用電力 Safe Use of Electricity on Site

### 清晰的電路標籤

- 在輸入和輸出電路上張貼電路標籤，並在配電箱上張貼警告告示／標籤。

### Clear Circuit Identification

- Provide circuit label to all incoming and outgoing circuits, and warning notice/label in the Chinese and English of the treatment of persons receiving electric shock on distribution boards.



配電箱需貼上清晰的電路圖及中英文的觸電急救告示

Distribution board should attach with a clear circuit diagram and poster for treatment from electric shock

### 有效接地

- 所有電路的接地線／外露非帶電部分均須妥善接駁至總接地終端，並且保持操作正常。

### Effective Earthing

- Properly connect the earth conductor of all circuits/exposed conductive parts to the main earth terminal and ensure the maintenance of its soundness.

### 電路保護裝置

- 為總掣裝設漏電斷路器。
- 裝設以30毫安培操作的漏電斷路器，以保護電源插座。
- 使用合適的插頭接駁電源插座，為手提裝備取電。



所有接地線應掛上適當標籤及妥善接駁至總接地終端後，並連接到接地棒。

Earthing cables should be properly labeled / connected at main earth terminal and to the earth rod



### Circuit Protective Device

- Provide main switch with residual current device (RCD).
- Provide socket outlets by a residual current device operating at 30mA.
- Connect portable equipment with appropriate plug for power from socket outlet.



典型配電箱（屏）都裝置電路保護器如MCB/RCD  
Typical distribution board with circuit protection device as MCB, RCD



金屬可導電部份如門，須由等位電線接地，並掛上標籤牌（安全接地終端 - 切勿移去）  
Bonding conductor should be connected to the metal door with warning label "safety electrical connection - do not remove"

### 臨時照明裝置／輕便的手提工具

### Temporary Lighting/Portable Hand-held Tools

#### 110伏特供電

- 應利用降壓隔離變壓器以110伏特或以下的電壓供交流電，其次級繞組的中心抽頭必須接地。

#### 110 V Power Supply

- Power supply at a voltage of 110V a.c. or less from a stepdown isolating transformer having the centre tap of the secondary winding earthed.



降壓變電器將高壓電降低至110伏特，適合一般手提電動工具使用  
Step-down transformer provides 110V power supply source for use by hand-held tools



## 5 在工地安全使用電力 Safe Use of Electricity on Site

### 穩固地安裝

- 穩固地安裝所有電線和照明裝置（一般安裝於離地面至少兩米的高度）

### Secure Fixing

- Securely fix all wiring and lighting fitting. (To be mounted at a height not less than 2m above floor level generally).



電力裝置（例如照明裝置和電線）盡安裝於離地面至少兩米高處  
Electrical installations such as lighting & wiring to be mounted/fixed at high level ( $\geq 2\text{m}$ )

### 位置

- 不應把照明裝置安裝在潮濕地方。
- 除非照明裝置屬防水類型，否則不應安裝在露天地方。

### Location

- Locate lighting fittings away from wet and humid areas.
- Avoid exposure of the installation to weather unless waterproof type is used.



在室外安裝的照明裝置，需選用有防水功能的型號  
Waterproof lighting at external area

### 防止直接觸及帶電部分的保護裝置

- 使用適當的絕緣和保護裝置，防止有人直接接觸帶電部分(IP3X)。

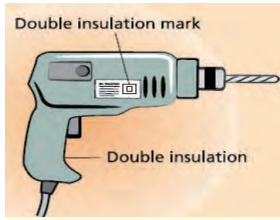
### Protection against Direct Contact

- Properly insulate and protect installation against direct contact with the live parts (IP3X).



裝置需有保護帶電的部分，防止意外被觸及  
Live parts protected/insulated





雙重絕緣標誌的手提電工具例子  
Example of double insulation mark for hand-held tool



常用的雙重絕緣手提電工具  
Double insulated hand-held tools commonly used for site works

### 雙重絕緣／妥為接地的手提工具

- 使用已雙重絕緣／妥為接地的手提工具。

### Double insulated/properly earthed Hand-held Tools

- Use double insulated or properly earthed hand-held electrical tools.

### 充電式手提工具

- 無須處理安裝電線的問題，有助改進工地整理。
- 地台上或水窪裏沒有電線，可避免觸電或絆倒之危險。

### Cordless Portable Hand-held Power Tools

- Improve housekeeping as there is no need to tackle the fixing of wiring.
- Avoid electric shock or trip, slip or fall as there is no trailing cable on water ponds or floor level.

### 電力變壓房／電掣房／發電機機房 Transformer Room/Switch-room/ Generator Room

#### 方便出入

- 電力變壓房、電掣房和發電機機房須隨時方便出入，以供維修保養和操作房內的電力設備。
- 電力變壓房、電掣房和發電機機房所有入口均應保持暢通無阻。

### Free Access

- Provide free and ready access for the maintenance and operation of the electrical equipment installed in transformer room, switch room or generator room.
- Every entrance of transformer room, switch room or generator room should be kept free of any obstruction.



充電式手提螺絲起子無需電線，方便使用

Cordless electric screwdriver does not need cable cord and is convenient to use



有通暢及方便出入通道的變壓器房／臨時電掣房

Free access to transformer/temporary switch room



## 5 在工地安全使用電力 Safe Use of Electricity on Site



發電機裝置旁，應放置滅火器具

Fire fighting appliance to be provided next to generator with railing to restrict unauthorised access

### 防火

- 在存放燃料的地方和電掣房／發電機機房提供適當類型的手提滅火器具（即滅火筒和沙桶）。

### Fire Fighting

- Provide correct type of portable fire fighting appliances at fuel storage area and switch/generator room (i.e. fire extinguisher and bucket of sand).



「不准吸煙」警告告示

“No Smoking” warning notice

### 警告告示

- 在存放燃料的地方和電掣房／發電機機房張貼中文和英文告示，標明「不准吸煙」。

### Warning Notice

- Provide warning notice “No Smoking” in both English and Chinese at fuel storage area and adjacent to generator set.

## 低壓電掣板 Low Voltage Switchboard

### 工作空間

- 電掣房內所有低壓電掣板均應有充足照明和工作空間。
- 清理電掣房內所有多餘物料／碎屑。

### Working space

- Provide adequate lighting for and working space to the low voltage switchboard inside switch room.
- Clear away all redundant materials/debris from the switch room.



電掣房內應有充足照明和工作空間

Adequate lighting and working space should be available inside switch room



## 安全隔離電源，後進行電力工作

### Safe Isolation of Electricity Source before carrying out Electrical Works

- 關上供電電源掣，如許可把電源掣與電源徹底隔離。
- 關上／隔離其他無關及／或遠端連接的電路。
- 檢查該電力裝置／電路確定安全且不帶電，如需要應為其放電。
- 檢查供電電源掣是否安全不帶電，或給帶電部份提供保護並遮蓋。
- 為電源掣上鎖，並掛上適當警告牌，實行上鎖掛牌的程序。
- 如許可，用指差呼稱確認，消除可能人為的失誤及執行電力工程許可證制度。
- 最後檢測電力裝置／電路確實安全，方可進行電力安裝，改裝或維修工作。
- 只有在某些極端情況下才可進行帶電電力工程，進行時並須符合下列條件：
  - － 由具備相關經驗的合資格人士進行；
  - － 事先進行風險評估；
  - － 採取充足的安全措施，例如提供個人防護裝備等；以及
  - － 盡量減少帶電工作的時間及範圍。



一套齊全的工地電力上鎖系統  
A well equipped padlock system of a construction site

- Switch off the incoming power supply switchgear, isolate/rack-out the switchgear from the service position, if possible.
- Isolate/switch-off all non-related outgoing and/or far end connected circuit(s).
- Check the installation/circuit if it is dead and if needed discharge any electricity energy stored in the circuits.
- Check the incoming power supply if it is completely dead or provided with proper protection to the live part of the switchgear.
- Padlock the switchgear and affix with proper warning tag to the switchgear/panel. Implement lockout tagout procedure.
- Apply pointing and calling practice to reduce possible human error and adopt permit-to-work system where possible.
- Measure and confirm there is no volt or residual voltage in the installation/circuit before commencement of any installation/alteration/maintenance works.

## 5 在工地安全使用電力 Safe Use of Electricity on Site



上鎖掛牌等安全措施適用於電力安裝、改裝或維修工程  
A padlock with affixed warning tag to the switchgear panel for a safe installation / alteration or maintenance works

執行電力工程許可證的例子  
Example of implementation of permit-to-work (see also change in description LHS as attached)

- Never carry out live electrical works unless under extreme situations; works can only be carried out:
  - by experienced and competent person,
  - after completion of risk assessment,
  - with adequate precautions provided such as personal protective equipment, etc..
  - with works duration and extent to be kept to a minimum.

### 橫跨道路的電纜應置放於足夠高度 Cable Crossing Traffic Road at Adequate Height

- 架空電纜如橫跨公共道路，應離地面至少5.8米；如在其他位置，則須離地面至少5.2米。
- Hang overhead cables not lower than 5.8m from the ground across public road and 5.2m at other locations.



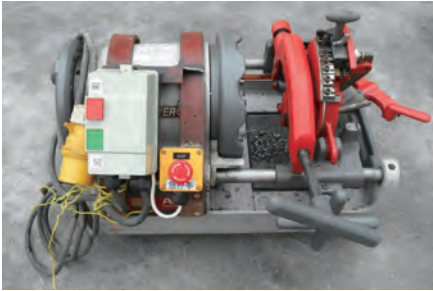
警告告示：此工地的運料路高度限制為5.8米  
Warning notice – height limit of 5.8m across haul road





## 緊急開關 Emergency Switching

- 在電動機器旁邊安裝緊急停機掣。
- Provide emergency stop switch adjacent to motor driven machines.



電動機器旁，應設有緊急停機掣  
Emergency stop switch should be easily accessible



## 發電機機組裝置 Generator Set Installation

- 在機身貼上操作告示，並只許由合資格人士檢查發電機。
- 在使用蓄電池的地點張貼告示一檢查前須移除身上的金屬物件；添加電池水時，須穿戴手套、圍裙、面罩等。
- 電力裝置上須張貼以下告示：
  - 「危險—帶電電線。未經授權，不得內進」；
  - 維修期間張貼「危險—在修理中」告示。
- 張貼為觸電者進行急救的告示／程序。



展示如何為觸電者進行急救的中英文告示  
Notice of first aid for electrical shock in both English & Chinese



設置欄杆以防止有人容易地闖進低電壓設備的範圍  
Railing to restrict unauthorized access to working zone of low voltage equipment.

## 5 在工地安全使用電力 Safe Use of Electricity on Site

- Post a notice of operation on the plant body, examine the set by qualified personnel only.
- Post notice at location using rechargeable battery – remove metallic accessories from body before carrying out inspection. Wear gloves, apron, mask etc. when replenishing electrolyte.
- Post warning notice for electrical installation:
  - “Danger Live Wires – Unauthorized Entry Prohibited”,
  - “Danger under Repair” during repair period.
- Post notice/procedure for first aid to electric shock.



於電力裝置張貼足夠及合適的安全告示  
Adequate notice should be posted to the electrical installation

### 個人防護裝備

- 進行電力工程前，穿上裝有絕緣鞋底的安全鞋和佩戴絕緣手套，並在適當情況下使用絕緣蓆。

### Personal Protective Equipment

- Wear safety shoes with electrical resistant soles, insulating gloves, and use of insulating mat where applicable prior to carrying out electrical works.



電工適用的絕緣手套  
An example of insulating gloves



電力工作適用的絕緣蓆  
An example of insulating mat





## 參考資料

### 相關條例和規例

- 《工廠及工業經營條例》
- 《建築地盤（安全）規例》
- 《工廠及工業經營規例》
- 《工廠及工業經營（電力）規例》
- 《職業安全及健康條例》
- 《電力條例》
- 《電力（線路）規例》
- 《供電電纜（保護）規例》

### 相關安全標準、工作守則、安全指引和指南

- 《電力（線路）規例工作守則》（機電工程署）
- 《有關在供電電纜附近工作的實務守則》（機電工程署）
- 《工作守則—手工電弧焊接工作的安全與健康》（勞工處）
- 《工作安全指引—手工電弧焊的觸電危險》（勞工處）
- 《電氣產品（安全）規例指南》（機電工程署）
- 《保養低壓電開關設備的安全工作指引》（勞工處）

## References

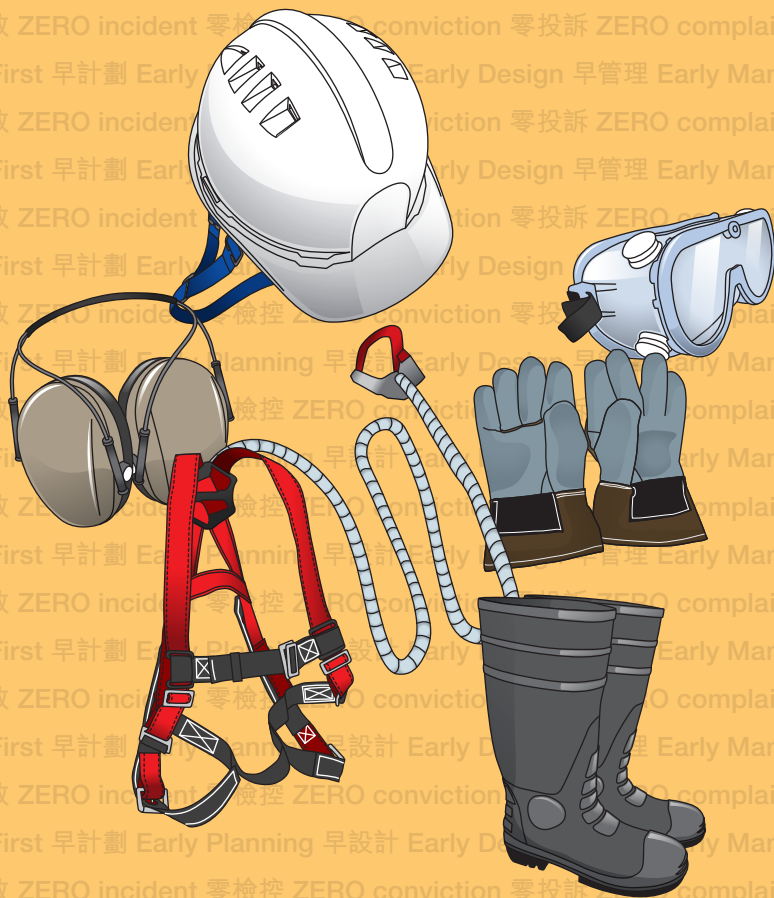
### Relevant Ordinances and Regulations

- Factories and Industrial Undertakings Ordinance.
- Construction Sites (Safety) Regulations.
- Factories and Industrial Undertakings Regulations.
- Factories and Industrial Undertakings (Electricity) Regulations.
- Occupational Safety and Health Ordinance.
- Electricity Ordinance.
- Electricity (Wiring) Regulations.
- Electricity Supply Lines (Protection) Regulation.

### Relevant Safety Standards, Codes of Practice, Guidance Notes and Guidelines

- Code of Practice for the Electricity (Wiring) Regulations. (EMSD)
- Code of Practice on Working Near Electricity Supply Lines. (EMSD)
- Code of Practice: Safety and Health at Work for Manual Electric Arc Welding. (LD)
- Guide for Safety at Work – Electric Shock Hazard of Manual Electric Arc Welding Work. (LD)
- Guidance Notes for the Electrical Products (Safety) Regulation. (EMSD)
- Guidance Notes on Safety at Work for Maintenance of Low Voltage Electrical Switchgears. (LD)





工地安全手冊

**Site Safety Handbook**

房屋署工地安全小組委員會

**The Housing Department Site Safety Sub-committee**

<http://www.housingauthority.gov.hk>

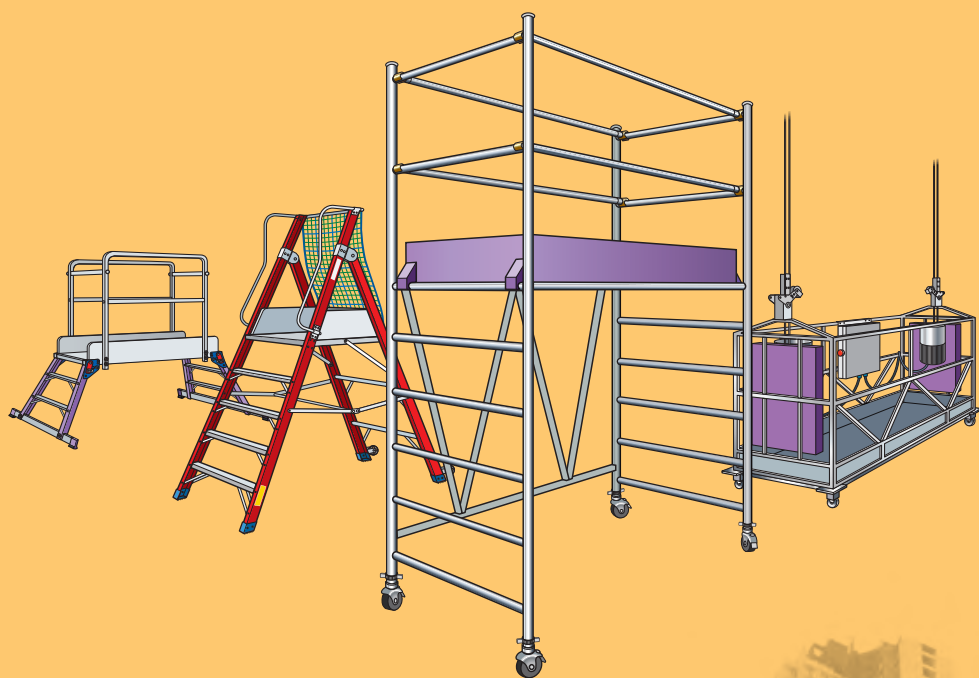


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香港房屋委員會  
Hong Kong Housing Authority



# 工地安全手冊

## Site Safety Handbook

2017 Edition

下冊 | Volume 2

# 房委會項目邁向零意外 持續提升工地安全表現 應用創新科技和措施 確保工程重質又安全

**Strive for zero accident of all persons involved in HA projects**  
**Continuous improvement in site safety performance**  
**Persistent adoption of safety innovation**  
**Safety measures for both works quality and safety**

本手冊可從香港房屋委員會網站下載：

**[www.housingauthority.gov.hk/sitesafety](http://www.housingauthority.gov.hk/sitesafety)**

我們現已更新2008年出版的《工地安全手冊》。新版手冊增加了不少內容，包括最新的安全管理措施、新增或已修訂的工作守則、促進安全文化的優化措施等，以供在香港房屋委員會新工程建築項目進行工地作業時參考。

請注意，遵守本手冊的指引，並不會令任何人在法律上具有豁免權。工地的管理人員應根據其工地的實際環境和作業情況制訂工作指引、安全施工程序、安全管理制度和預防措施，並培訓和督導員工，確保工作團隊了解和遵從各項施工程序，以防止意外發生。

為編製本手冊，職業安全健康局已批准使用和複製有關資料，包括載於該局刊物內的插圖、照片及內容。歡迎複製本手冊用作一般參考，惟不得作批簽、廣告及商業用途。複製時請註明出處為「房屋署工地安全小組委員會刊物《工地安全手冊》」。

2008年12月          第一版  
2017年2月          第二版

This handbook can be downloaded from Hong Kong Housing Authority Web Site:  
**[www.housingauthority.gov.hk/sitesafety](http://www.housingauthority.gov.hk/sitesafety)**

This handbook is an updated version to the last edition in 2008 to include new safety management measures, new or revised codes, enhancement to foster safety culture, etc. for site operations in Hong Kong Housing Authority new works construction projects.

Readers should note that the compliance with this handbook does not confer immunity from legal obligations. The site management should develop their work instructions, safe working procedures as well as a safety management system according to the actual construction site environment and operations on their workplaces, formulate precautionary measures, provide training and supervision to workers for a full understanding and compliance with the works procedures to avoid accidents.

Occupational Safety and Health Council have granted permission for the use and reproduction of the information including illustrations, photos and contents contained in the their publications for the purpose of this handbook. This handbook may be freely reproduced for general reference except for endorsement, advertising and commercial purpose. Please acknowledge the source as “Site Safety Handbook” published by the Housing Department Site Safety Sub-committee.

First Edition          December 2008  
Second Edition      February 2017





# 目錄 Contents

上冊  
Volume 1

前言  
Foreword

- |    |   |    |  |
|----|---|----|--|
| 1. | 安全訊息<br>Safety Messages   | 4. | 安全使用機械設備<br>Safe Use of Plant                |
| 2. | 安全管理工具及在工地安全上<br>應用資訊科技<br>Safety Management Tools and Use of<br>Information Technology in Safety | 5. | 在工地安全使用電力<br>Safe Use of Electricity on Site |
| 3. | 一般工地安全及工地整理<br>General Site Safety and Housekeeping   |    |  |

## 下冊 Volume 2

- |     |  |     |
|-----|--|-----|
| 6.  | 處理預製混凝土組件<br>Handling of Precast Concrete Elements               | 142 |
| 7.  | 棚架、工作平台和高空工作<br>Scaffolding, Working Platform and Work at Height | 150 |
| 8.  | 挖掘工程和道路工程<br>Excavation and Roadworks                            | 178 |
| 9.  | 地基工程<br>Piling Works   | 190 |
| 10. | 拆卸工程<br>Demolition Works   | 202 |
| 11. | 密閉空間工作安全<br>Safety in Confined Space                             | 218 |
| 12. | 個人防護裝備<br>Personal Protective Equipment                          | 230 |
|     | 索引<br>Index  | 254 |
|     | 鳴謝<br>Acknowledgements   | 272 |

## 6 處理預製混凝土組件 Handling of Precast Concrete Elements

### 危害識別 Hazards

- 被下墮或移動中的物件擊中
- 被傾覆的混凝土組件擊中
- Being struck by falling or moving object;
- Being struck by overturning of concrete elements.

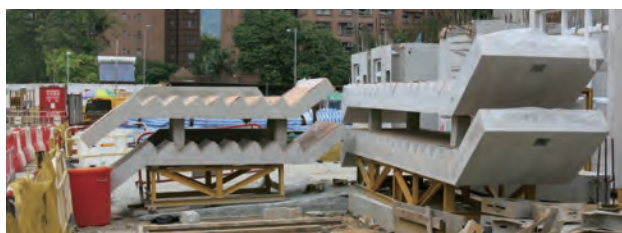
### 貯存地方

- 應提供和指定貯存地方，並以圍欄圍封。
- 貯存地方應為不受水浸影響的堅硬平地。
- 展示警告標示，禁止未經授權人士進入該範圍。
- 設置已獲核准的鋼架，以穩固地承托預製混凝土組件。



須圍封貯存預製組件的地方

Fence off the storage area for precast elements



預製組件應妥善放置在堅硬的平地上

Precast elements properly placed on hard solid level ground



在貯存地方，應展示適當的警告標示

Adequate warning signs at storage area



以鋼架穩固地承托預製組件

Steel racks for safely holding the precast elements





## Storage Area

- A designated storage area should be allocated, designed and fenced off.
- The area should be hard solid level ground without any flooding hazards.
- Display warning labels/notice to allow only the authorized person to enter the area.
- Provide approved steel racks for holding precast concrete elements securely.



妥善放置貯存及圍封預製組件  
Precast concrete unit properly stored



妥善放置貯存及圍封預製樓梯  
Precast concrete staircases properly stored/fenced off

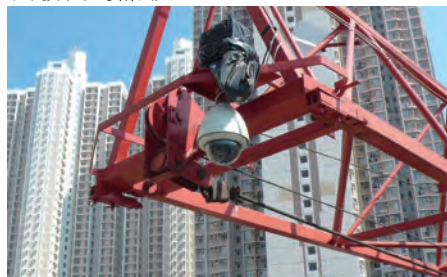


妥善圍封未下架的預製樓面板  
Loaded precast concrete slabs are properly fenced off

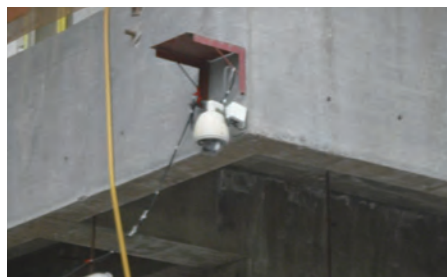
## 6 處理預製混凝土組件 Handling of Precast Concrete Elements

### 吊運預製混凝土組件 Lifting Precast Concrete Elements

- 在開始起重作業前，委派合資格人員進行風險評估。
- 塔式起重機操作員須經過充足訓練，持有有效操作證書，並能以訊號或無線電與訊號員溝通。
- 起重作業的訊號員須經過全面訓練，並能向操作員發出清晰訊號。
- 訊號員須與塔式起重機操作員保持溝通，避免起重裝置過於接近地面，使套在起重裝置滑輪上的纜吊索鬆脫。
- 索具工在進行起重作業前須檢查纜吊索。
- 索具工須確保吊重不超出纜吊索的安全操作負荷。
- 塔式起重機應設有安全負荷自動顯示器。
- 進行起重作業時，切勿超出安全操作負荷，並須注意安全負荷自動顯示器有否發出警號。
- 安全地緊縛所有預製混凝土組件，以防組件移動或移位。
- 使用工字起重樑吊運預製混凝土外牆，而吊運立體預製浴室則應使用吊架。
- 起重裝置（例如工字起重樑和吊架）應採用顏色代碼系統，以免錯誤使用裝備。
- 吊索和起重樑須由合資格檢驗員於使用前六個月內檢驗一次，並於每次使用前由合資格人士進行檢查。
- 檢查吊索和起重樑以確保狀況良好，而有關設備須貯存在指定地點。
- 細小的預製混凝土組件應放在鋼籠或鋼桶內吊運，以防在過程中墜下。
- 嚴格遵從核准的起重程序。
- 塔式起重機操作員須能夠清楚接收訊號員發出的訊號。
- 在整個起重作業過程中，塔式起重機操作員必須能清楚觀看吊運物。
- 吊運作業的路線應保持在工地範圍之內。
- 吊運預製混凝土組件的路線應保持在工人作業區域以外。
- 吊運預製組件的作業應遠離架空帶電電線。
- 在所有起重裝備上貼上適當的測試和檢驗證明書，例如表格2、表格3、表格5等。
- 確保起重機械和裝置具有效證書。



在塔式起重機吊臂上裝設附有錄影功能的閉路電視系統  
Tower crane equipped with CCTV camera at horizontal jib



吊運區域低層裝設附有錄影功能的閉路電視系統，可供操作員監察吊運作業過程  
CCTV camera installed at low level of lifting zone for operator to monitor the lifting operation process





- Competent person to conduct task-specific risk assessment before starting the lifting operation.
- Operator should have received adequate training on tower crane operation and with a valid certificate and communicate with the signaler via signal code/radio.
- Signaler of the lifting operation should be fully trained and can give signal clearly to the operator.
- Signaler should communicate with the tower crane operator so that the lifting gears are not lowered too low to prevent the wire rope slings from becoming loose and dislodged from the pulley of the lifting gear.
- Rigger should inspect wire rope slings before the lifting operation.
- Rigger should ensure the lifting load within the safe working load of the slings.
- Tower crane should be equipped with automatic safe load indicator.
- Never exceed the safe working load during the lifting operation and be aware of any warning signal from the automatic safe load indicator.
- Tie all precast concrete elements safely and securely to prevent any movement or dislodgment.
- Hoisting I-beam and lifting frame should be used during lifting precast concrete façades and volumetric precast bathrooms respectively.
- Adopt colour code system for lifting gear such as hoisting I-beam and lifting frame to avoid wrong use of equipment.
- The slings and lifting beam shall be thoroughly examined by a competent examiner in the proceeding six months before it is used and shall be inspected before use on each occasion by a competent person.
- Check the slings and lifting beam to ensure that they are sound for use and properly stored in a designated location.
- Place small precast concrete elements inside a steel cage or steel bucket to prevent from falling during the lifting.
- Follow strictly the approved lifting procedure.
- Tower crane operator should be able to receive signal clearly from the signaler.
- The tower crane operator should be able to view clearly the object being lifted during the whole lifting operation.
- The route of the lifting operation should be kept inside the site boundary.
- Route of lifting precast concrete elements should be kept clear from works area of workers.
- Lifting the precast elements should be away from the overhead live wires.
- Attach appropriate test & examination certificates to all lifting equipment such as Forms 2, 3 and 5 etc.
- Ensure all lifting appliance and lifting gear provided with relevant certificate.



安全負重顯示器自動將不安全載荷的吊運作業發出警號  
Automatic safe load indicator to alert unsafe lifting



安全吊運大型預製組件  
Lifting volumetric precast concrete unit with lifting frame



## 6 處理預製混凝土組件 Handling of Precast Concrete Elements

### 吊運和固定預製混凝土外牆 Lifting and Fixing Precast Concrete Facades

- 塔式起重機必須具有足夠的承重能力，起重時須利用有足夠支持點的金屬樑。
  - 為預製混凝土外牆安裝支撐托架。
  - 提供設有扶手的梯台或踏腳架，方便工人把起重樑的吊鉤繫穩在預製混凝土外牆的有眼螺栓上。梯具只能供上落之用，不得用於高處工作。
  - 在硬地承托和支撐混凝土組件。
- Lifting with the use of a metal beam with adequate supporting points by a tower crane of adequate loading capacity.
  - Install supporting bracket for precast concrete facade.
  - Provide platform ladder or step platform with railing to facilitate the worker to anchor the lifting hook of the lifting beam onto the eye bolt of the precast concrete façade.
- Ladder can only be used for access but not for working at height.
- Support and brace the concrete elements on solid ground.



為外牆安裝支撐托架  
Install supporting bracket for facade



使用有足夠支持點的工字起重樑給預製外牆固定後，才進行吊運  
Hoisting I-beam with supporting points to lift precast concrete facades



### 吊運和固定預製混凝土樓板 Lifting and Fixing Precast Concrete Slab

- 塔式起重機必須具有足夠的承重能力，起重時須利用足夠吊鉤繫穩混凝土樓面板。
  - 必須穩妥地吊運載荷物。
- Lifting with adequate anchor points to the concrete slab by a tower crane of adequate loading capacity.
  - The load should be securely suspended.



在吊運預製樓面板時，須正確安全地穩繫吊鉤於吊架上，才進行吊運  
Fix properly anchor points of precast concrete slab to lifting frame



## 吊運和固定預製混凝土橫樑

### Lifting and Fixing Precast Concrete Beam

- 為工人提供安全的工作平台。(參考第7章)
  - 工人須佩戴安全頭盔，把Y型下頷索帶索緊和穿上安全鞋。如未能提供安全工作平台，工人便須同時佩戴防墮裝置／個人防護裝備，包括全身式安全帶，其獨立救生繩須繫穩於結構構件上。
  - 訊號員必須在場，向塔式起重機操作員發出訊號，協助索具工吊運和裝嵌預製混凝土橫樑。
  - 應提供臨時鋼料托架，以便安裝預製混凝土橫樑。
- Provide a safe working platform for workers. (refer to Chapter 7)
  - The workers should wear safety helmets with chin straps fastened and safety shoes. In abeyance of safe working platform provision, the workers must also wear fall arrest/personal protective equipment including safety harnesses, with independent life lines anchored to structural elements.



提供一個安全的工作平台上進行固定預製混凝土橫樑後，才進行吊運

Working platform for fixing precast concrete beams



提供鋼料托架，方便安裝橫樑

Temporary bracket for fixing precast beam



索具工吊運固定好的預製橫樑

Lifting and fixing precast concrete beams by rigger

## 6 處理預製混凝土組件 Handling of Precast Concrete Elements

- Signaler should be present to communicate with the tower crane operator during the lifting and fixing precast concrete beam by rigger.
- Temporary supporting bracket fixed to wall should be provided for fixing the precast concrete beam.



穿上反光工作服、配合安全頭盔及手套等才可進行工作  
Reflective clothing, safety helmet, gloves, etc. in place for lifting works at height

### 天秤吊運警報系統 Tower Crane Lifting Alert System

- 當吊鉤下降至進入指定高度的範圍，高度檢測裝置將觸發警報裝置。
- 此系統有效減低吊運工序的風險。
- Alarm lights and buzzer will be triggered when the hook is descended to a prescribed height and detected by the sensor.
- It helps to reduce the risk of lifting operation.

### 個人防護裝備 Personal Protective Equipment

- 佩戴安全頭盔，把Y型下頷索帶索緊和穿上安全鞋。
- 因應情況需要穿著反光工作服、佩戴全身式安全帶、獨立救生繩、護耳罩、手套、面罩和護目鏡。
- Wear safety helmet with chin strap fastened and safety shoes.
- Wear reflective clothing, safety harness, independent life line, ear muffs, gloves, mask and goggles as need arises.



## 參考資料

### 相關條例和規例

- 《工廠及工業經營條例》
- 《建築地盤（安全）規例》
- 《工廠及工業經營規例》
- 《工廠及工業經營（起重機械及起重裝置）規例》
- 《工廠及工業經營（安全管理）規例》
- 《工廠及工業經營（負荷物移動機械）規例》

### 相關安全標準、工作守則、安全指引和指南

- 《安全使用流動式起重機工作守則》（勞工處）
- 《安全使用塔式起重機工作守則》（勞工處）
- 《建造業議會刊物：塔式起重機安全指引》（建造業議會）
- 《起重機械及起重裝置的檢查、檢驗和測試指南》（勞工處）

## References

### Relevant Ordinances and Regulations

- Factories and Industrial Undertakings Ordinance.
- Construction Sites (Safety) Regulations.
- Factories and Industrial Undertakings Regulations.
- Factories and Industrial Undertakings (Lifting Appliances and Lifting Gear) Regulations.
- Factories and Industrial Undertakings (Safety Management) Regulation.
- Factories and Industrial Undertakings (Loadshifting Machinery) Regulation.

### Relevant Safety Standards, Codes of Practice, Guidance Notes and Guidelines

- Code of Practice for Safe Use of Mobile Cranes. (LD)
- Code of Practice for Safe use of Tower Cranes. (LD)
- Construction Industry Council – Guidelines on Safety of Tower Cranes. (CIC)
- Guidance Notes on Inspection, Thorough Examination and Testing of Lifting Appliances and Lifting Gear. (LD)

## 7 棚架、工作平台和高處工作 Scaffolding, Working Platform and Work at Height

### 危害識別 Hazards

- 人體從高處墜下
- 被下墮的物件擊中
- 被困於倒塌的棚架
- 在進行體力操作處理時受傷
- 中暑（炎熱天氣）
- Fall of person from height;
- Being struck by falling object;
- Being trapped by collapsed scaffolding;
- Injured during manual handling;
- Heat stroke (hot weather).



沒有合適圍欄造成人體從高處墜下風險  
Risk of fall of person from height due to missing proper guard rail

### 高逾15米的竹棚架 Bamboo Scaffold Greater than 15m in Height

- 高逾15米的竹棚架須由專業工程師設計和核准。
- 連牆器的鋼條須具有足夠強度，把竹棚架繫於建築物上。
- Bamboo scaffolding greater than 15m in height should be designed and certified by a professional engineer.
- Steel tie rods should be sufficiently strong to tie the bamboo scaffolding to the building.

### 棚架上的工作平台

#### Working Platform on a Scaffolding

- 供在棚架上工作的工人使用。
- 棚架平台至少闊400毫米，鋪設橋板路的木板之闊度不得小於200毫米，而厚度不得小於25毫米；如木板之厚度逾50毫米，闊度則不得小於150毫米；木板須擱在至少於3個支持物上；兩邊踢腳板至少高200毫米，而踢腳板應該是堅硬的木板或金屬板。工作平台亦可以金屬板鋪密或由有孔隙的金屬物組成，而任何孔隙面積均不得超逾4,000平方毫米。
- 如棚架同時供工人走過和運輸物料，則闊度至少為650毫米。
- 頂部護欄和中間護欄須分別距離平台面900至1,150毫米和450至600毫米。



工作平台應設有踢腳板、頂部護欄和中間護欄  
Working platform with toe board, top and intermediate guard-rails

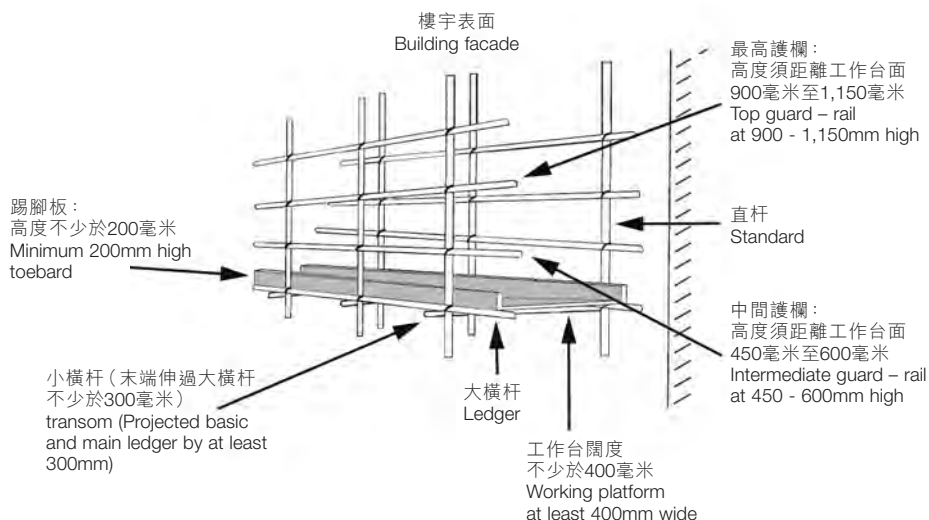




- Required for workers working on the scaffolding.
- Construction of a scaffolding working platform: at least 400mm wide; with closely packed timber plank each of not less than 200mm in width and not less than 25mm in thickness or not less than 150mm in width when the board or plank exceeds 50mm in thickness; each plank shall rest on at least 3 supports; and with at least 200mm high rigid toe board of timber or metal on both sides. The working platform can also be plated or of open metal work without any interstice exceeding 4,000mm<sup>2</sup>.
- The scaffolding platform shall be 650mm wide if it is to allow people and materials to pass through.
- The top and intermediate guard-rails should be at 900 – 1,150mm and 450 – 600mm high from the platform level respectively.



棚架上的工作平台須由踢腳板、中及高欄和密鋪的橋板路組成  
Intermediate and top guard-rails with toe board plus closely planking form a working platform on scaffolding



## 7 棚架、工作平台和高處工作 Scaffolding, Working Platform and Work at Height

### 搭建竹棚架 Construction of a Bamboo Scaffolding

- 架設、更改和拆卸竹棚架的工作須由曾受訓練的工人在合資格人士直接監督下進行。有關工人必須完成正式竹棚工作訓練，或已在建造業議會舉辦的竹棚工中級工藝測試中取得合格的成績，以及具備一年或以上的竹棚架工作經驗。
  - 架設棚架的工序應由下而上、由內而外。
  - 每條「X」形斜杆跨距不得超逾9米，角度從水平面起計不得超逾60度。
  - 竹棚架如高逾7米，便須穩固地繫於建築物上。連牆器的橫向間距不得超逾7米，垂直間距不得超逾4米。
  - 竹棚架不得超出負荷。
  - 竹杆的實際直徑，橫杆不得少於40毫米（第一個棚層的橫杆不得少於75毫米），直杆不得少於75毫米。
  - 竹杆的重疊部分，直杆不得少於1.5至2米，橫杆、斜杆及斜撐則不得少於2米。
  - 安裝拉棚鐵（俗稱「拉撻」），而拉棚鐵之間的水平間距不得超過3米。在離地面高度少於100米的位置，拉棚鐵之間的垂直間距不得超過6.3米；在離地面高度100米或以上的位置，拉棚鐵之間的垂直間距不得超過4.2米。
  - 拆卸竹棚架前，應檢查棚架是否穩固。按照工程計劃拆卸棚架，一般次序為由上而下、由外而內。
  - 每日由工地監督人員檢查棚架狀況。
- Erection, alteration and dismantling of bamboo scaffolding should be conducted by trained workmen under the immediate supervision of a competent person. The trained workmen must have satisfactorily completed a formal training in bamboo scaffolding works or passed the intermediate trade test for bamboo scaffolder of the Construction Industry Council and possess at least 1 year of experience in bamboo scaffolding work.
  - Erection should commence from the bottom to top level and from the interior to external part.
  - Span of each cross-bracing bamboo should not be more than 9m and should not be erected at more than 60° from the horizontal.
  - For bamboo scaffolding higher than 7m, it should be tied to the building securely. Spacing of the tie should not be more than 7m horizontally and 4m vertically.
  - Never overload the bamboo scaffolding.



棚架須要合資格人員檢查，並須把填妥的表格5貼於棚架顯眼的位置  
A scaffold should be inspected by competent person with a duly signed Form 5 posted on a conspicuous space



## Control the risk at source effectively will improve work performance at height

- Effective diameter of bamboo members should not be less than 40mm for a ledger (except the first lift which should not be less than 75mm) and 75mm for a standard.
- For overlapping of two bamboo members, a minimum overlap length from 1.5m to 2m for standards and at least 2m for ledgers and bracing/rackers is required.
- Provide putlogs at a horizontal spacing not greater than 3.0m. At a height of less than 100m above ground, the vertical spacing of putlogs should not be greater than 6.3m while at height of 100m or more, the vertical spacing should not be greater than 4.2m.
- Before dismantling the bamboo scaffolding, the scaffold strength should be checked to be sound, and the works should be proceeded according to the plan, normally from the upper level to lower level, from exterior to interior.
- Arrange site supervisory staff to check the condition of bamboo scaffolding every day.

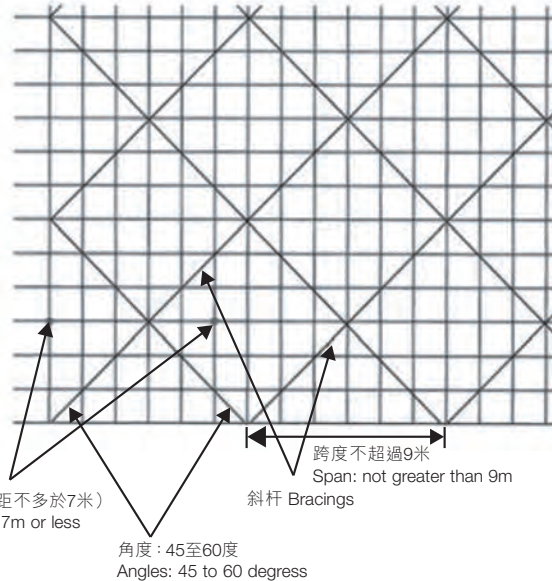
備註:

- 圖中並沒有顯示小橫杆之位置
- 高度超過7米之棚架須裝連牆器

Note:

- positions of transoms are not shown
- ties should be fitted for bamboo scaffold of height greater than 7m

連牆器 tie  
(每隔垂直距不多於4米及橫距不多於7米)  
(for every 4m or less rise and 7m or less apart horizontally)



竹棚架連牆器及斜杆的位置

Positions of ties and bracings for bamboo scaffold

## 7 棚架、工作平台和高處工作 Scaffolding, Working Platform and Work at Height

### 搭建金屬棚架 Construction of a Metal Scaffolding

- 架設、更改和拆卸金屬棚架的工作須由曾受訓練的工人在合資格人士直接監督下進行。
  - 鋪設棚架工作平台的木板至少闊200毫米，厚25毫米。如木板厚度超過50毫米，闊度則至少為150毫米。
  - 金屬棚架不得超出負荷。
  - 斜杆應由棚架底部伸延至頂部。
  - 棚架須有足夠的直杆、橫杆和斜撐繫緊，以保持穩固。
  - 為搭棚工和使用棚架的工人提供合適的進出通道。
  - 為安全起見，應為搭棚工提供安全網和全身式安全帶。安全網或全身式安全帶應繫於固定的獨立錨固點或獨立救生繩上，切勿繫於棚架上。
- 
- Erection, alteration and dismantling of metal scaffolding should be conducted by trained workmen under the immediate supervision of a competent person.
  - The board forming the working platform on the scaffold should not be less than 200mm in width and not less than 25mm in thickness or not less than 150mm in width when the board exceeds 50mm in thickness.
  - Never overload the metal scaffolding.
  - Bracing should be extended from the base to the top of the scaffold.
  - Scaffold should be braced vertically, horizontally and diagonally to ensure stability.
  - Provide proper access and egress for scaffolders and users of scaffold.
  - Provide safety nets and full body safety harnesses for protection of scaffolders. Attach the safety net or safety harness to a secure independent anchorage point or an independent lifeline instead of the scaffolding member.



安全網完全覆蓋整個棚架  
Entire metal scaffolding is covered with safety net



設有金屬橋板、金屬踢腳板、頂部護欄和中間護欄的工作平台。  
Working platform with metal plate, metallic toe board, and top and intermediate guard-rails



## 保護幕 Protective Screen

- 進行上層結構工程時，為防止物件從高處下墮，建築物外牆應以保護幕覆蓋。
- 保護幕應穩固繫於棚架外面。
- 保護幕不得有縫隙、孔洞，或有碎屑積聚。
- 保護幕應由遲延燃燒物料造成符合英國標準BS 5867-2:2008 (Type B performance requirements)或其他等同的國家或國際標準或規定。



保護幕應覆蓋整個受工程影響的外牆  
The affected façade of metal scaffolding for works should be covered with protective screen

- In order to prevent falling object at height during superstructure works, building façade should be covered with protective screen.
- Protective screen to be provided on the façade should be securely fixed to the outer face of scaffolding.
- The protective screen should be free of gap, hole or accumulated debris.
- Protective screen should be made of fire retardant material meeting BS 5867-2:2008 (Type B performance requirements) or other equivalent national / international standards or provisions.



保護幕應覆蓋整個外牆棚架  
Entire bamboo scaffolds should be covered with protective screen

## 斜柵 Catch-fan

- 斜柵的斜面應由木板和一層鍍鋅鐵片組成，並有適當承托。斜柵底部或指明位置應設有至少400毫米x200毫米的坑槽。
- 每隔不超過15米的垂直高度裝置斜柵。
- 斜柵須由外棚向外伸出的跨度不得少於1500毫米。
- Sloping catch-fan should consist of timber boarding and a layer of galvanized metal sheeting and should be adequately supported. A minimum of 400 x 200 mm channel is required at the bottom of the catch fan or the equivalent to be provided where specified.
- Catch-fan should be provided at not more than 15m vertical intervals.
- The catch-fan should be projected 1500mm minimum horizontally beyond the outer face of the scaffolding.



斜柵應從建築物外棚向外伸延1,500毫米  
Catch-fan projected at least 1,500mm horizontally from the scaffolding



## 7 棚架、工作平台和高處工作 Scaffolding, Working Platform and Work at Height

### 法定檢查表格

#### Statutory Inspection Form

- 在下列情況下，合資格人士須檢查棚架並填寫《建築地盤（安全）規例》表格五：在棚架首次使用前；定期在緊接每次使用前的14天內；棚架在經過相當程度上的擴建後或其中部分經過拆卸後，或經過其他更改後，以及經歷相當可能會影響其強度或穩固性的天氣情況之後。



填妥的《建築地盤（安全）規例》表格五

Typically completed Form 5 – Construction Sites (Safety) Regulations

- Competent person to check scaffolding and complete Form 5 of Construction Sites (Safety) Regulations after inspection of the scaffold before use for the first time and at regular intervals not exceeding 14 days immediately preceding each use, after substantial addition, partial dismantling or other alteration, or exposure to weather likely to have affected its strength or stability.

### 臨時保護篷 Protective Canopy

- 在完成大廈第七層樓層的樓板前，須於一樓圍繞大廈設置臨時保護篷，以便為工人提供安全的進出通道。
- Complete temporary protective canopy at first floor around the building block for workers with a safe access to and egress from the building before the 7th floor slab has been cast.



設置臨時保護篷，為工人提供安全的進出通道

Temporary protective canopy for workers with a safe access/egress



在大廈的第七層樓板工作尚未展開前，應完成設置大廈的臨時保護篷

The erection of protective canopy should be completed before the 7th floor slab is cast



## 流動工作平台

- 流動金屬工作平台應由曾受訓練的工人在合資格人士的直接監督下架設、更改或拆卸。
- 流動工作平台的每個輪子均須設有鎖定裝置。
- 移動工作平台時，任何人均不得留在平台上。
- 室外使用的工作平台，其高度與底部最小邊長的比例不得超逾3:1，而室內使用的工作平台則為3.5:1。
- 工作平台的四邊須設置200毫米高的踢腳板。頂部護欄和中間護欄須分別距離平台面900至1,150毫米和450至600毫米。
- 如工作平台裝有外伸支架，須完全伸展，而底座須置於堅硬的平地上。
- 按照製造商的指示架設和操作工作平台。
- 架設、維修保養和拆卸工作平台的工作，須由曾受訓練的工人在合資格人員的直接監督下按製造商指示進行。
- 切勿在強風、暴雨等惡劣天氣下或危險區域（例如架空電纜）附近使用工作平台。
- 委派曾受適當訓練的人員在每兩星期及在每次使用前檢查工作平台，並定期按照製造商的指示進行維修保養和檢查。檢查和維修保養的記錄須妥為保存。



設有輪子鎖定裝置的流動工作平台  
Mobile working platform fitted with castors locking device



流動工作平台  
Mobile Working Platform

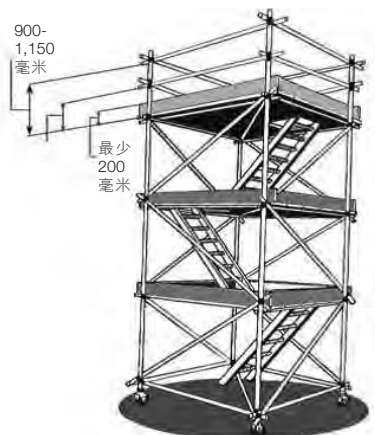


裝有踢腳板，頂部及中間護欄的工作平台  
Mobile working platform with toe board, top & intermediate railing

## 7 棚架、工作平台和高處工作 Scaffolding, Working Platform and Work at Height

### Mobile Working Platform

- Mobile metal working platform should be erected, altered and dismantled by a trained workman and under the immediate supervision of a competent person.
- Every castor of a mobile working platform should be fitted with a locking device.
- No person is allowed to stay on the platform during its movement.
- The ratio of height to the smallest base dimension should never exceed 3:1 and 3.5:1 for external and internal use respectively.
- 200mm high toe board required for all sides, the top and intermediate railings to be erected at 900 – 1,150mm and 450 – 600mm high from the platform level respectively.
- When fitted with outriggers, all of them should be fully extended and their bases to be firmly rested on solid level ground.
- Method of erection and operation to be in accordance with manufacturer's instruction.
- To be erected, maintained and dismantled in accordance with the manufacturer's instruction by trained workmen under the immediate supervision of a competent person.
- Never use the platform under severe weather (i.e. strong wind, storms, etc.) or near hazardous areas (i.e. overhead power line, etc.)
- Conduct inspection each time biweekly and before use, carry out regular maintenance/check by properly trained persons according to manufacturer's instruction and keep the relevant records.



流動工作台的護欄  
Fencing in mobile working platform

### 踏腳架（工夫橈）Hop-up Platform

- 若離地工作涉及不多於900毫米下墮的風險，可使用踏腳架，而圍欄並不是必要的。
- 若離地工作涉及超過900毫米但少於2米下墮的風險，可使用裝設圍欄的踏腳架。
- For working involving a possible fall of less than or equal to 900mm, a hop-up platform with or without guard-rails may be used.
- For working involving a possible fall of less than 2m but more than 900mm, a hop-up platform with guard-rails may be used.



使用裝設圍欄的踏腳架  
Use of hop-up platform with railing



## 梯台 Step Platform

- 若離地工作涉及不多於900毫米下墮的風險，可使用梯台，而圍欄並不是必要的。
- 若離地工作涉及超過900毫米但少於2米下墮的風險，應使用裝設圍欄的梯台。
- For working involving a possible fall of less than or equal to 900mm, a step platform with or without guard-rails may be used.
- For working involving a possible fall of less than 2m but more than 900mm, a step platform with guard-rails should be used.



安全梯台於兩旁設置扶手  
Step platform with handrails on both sides



使用裝設圍欄的梯台  
Use of step platform with railing

## 動力操作升降工作平台 Mobile Elevating Work Platform

- 動力操作升降工作平台須由合資格檢驗員進行檢驗／測試。
- 動力操作升降工作平台須由曾受適當訓練的人員按照製造商的說明書／指示操作。
- 在操作非自行式或車身安嵌式的動力操作工作平台行駛時，任何人均不得留在平台上。
- 工作平台的四邊須設置200毫米高的踢腳板。頂部護欄和中間護欄須分別距離平台面900至1,150毫米和450至600毫米。
- 按照製造商的指示操作工作平台。
- 切勿在強風、暴雨等惡劣天氣下或危險區域（例如架空電纜）附近使用／操作工作平台。
- 委派曾受適當訓練的人員在每次使用前檢查工作平台，並定期按照製造商的指示進行維修保養和檢查。檢查和維修保養的記錄須妥為保存。
- Mobile elevating work platform to be examined/tested by competent examiner.
- Mobile elevating work platform to be operated by a properly trained person according to manufacturer's manuals/instruction.



工人操作及使用動力操作升降工作平台時，須穿上全身式安全帶並繫穩於工作平台上指定的牢固點上  
Worker needs to wear safety harness attached to a designated anchor point of the mobile elevating work platform when the platform in operation.



動力操作升降工作平台四邊裝設護欄，避免工人發生意外而受傷  
Mobile elevating work platform fitted with guard on four sides for protection of workers from accident



## 7 棚架、工作平台和高處工作 Scaffolding, Working Platform and Work at Height

- No person is allowed to stay on the non self-propelled or chassis-mounted mobile elevating work platform when the work platform is travelling.
- 200mm high toe board is required for all sides, the top and intermediate railings to be at 900 – 1,150mm and 450 – 600mm high from platform level respectively.
- Method of operation to be in accordance with manufacturer's instruction.
- Never use/operate the platform under severe weather (i.e. strong wind, storms, etc.) or near hazardous areas (i.e. overhead power line, etc.)
- Provide pre-operation inspection each time before use, carry out regular maintenance/check by properly trained persons according to manufacturer's instruction and keep the relevant records.

### 外間開口 External Opening

- 如工作間的外間開口比毗鄰平面高出兩米或以上，便須在現場設置900至1,150毫米高的頂部護欄、450至600毫米高的中間護欄和200毫米高的踢腳板。
- For external opening of a workplace where a fall of 2 metres or more exists, top guardrails of height between 900-1,150mm and an intermediate one between 450-600mm from floor level, and 200mm high toe board should be provided to the scene.



設有防護圍欄的外間開口  
External opening provided with protective barrier

### 懸空式棚架 Truss-out Scaffold

- 鋼料托架須經註冊結構工程師核准。
- 每個鋼料托架須使用至少三顆錨栓固定在以足夠強度物料建成的外部結構上。
- 不得橫向安裝托架。
- 確保棚架及其所有部分：
  - 狀況良好；
  - 以堅固質佳的物料製造；
  - 沒有明顯瑕疵；
  - 由具備足夠實際經驗的合資格人士架設、維修保養、更改和拆卸。
- 傾斜承重管（即斜撐）的垂直角度不得超逾30度。
- 工人應佩戴附有防墮裝置和連繫獨立救生繩的全身式安全帶。
- 棚架不得超出負荷。
- The steel bracket should be approved by registered structural engineer.
- Minimum three nos. of anchor bolts to be provided for each bracket attached to external structure with adequate material strength.



鋼料托架必須有足夠強度和按照註冊結構工程師核准的施工說明書安裝  
Steel bracket with adequate strength installed according to the method statement approved by registered structural engineer





## Control the risk at source effectively will improve work performance at height

- The bracket should not be installed horizontally.
- Ensure that the scaffold and every part of it are:
  - in good conditions;
  - made of strong and sound materials;
  - free from patent defects;
  - erected, maintained, altered and dismantled by competent person with adequate practical experience.
- Angle of the inclined load bearing tube, i.e. the raker, should not exceed 30° from vertical.
- Worker should wear safety harness, fitted with arrestor and attached to independent lifeline.
- Never overload the scaffold.



在工作平台邊緣安裝護欄  
Guard-rails installed to perimeter of large steel formwork

### 大型鋼料模板的工作平台 Platform of Large Steel Formwork

- 應在大型鋼料模板上提供合適的工作平台。
- 工作平台須設有距離平台面900至1,150毫米高的頂部護欄、450至600毫米高的中間護欄和200毫米高的踢腳板。平台上的橋板須鋪密。
- 吊運時不得有人留在模板上。
- 工作平台須由合資格人士檢查。
- 不得在工作平台上擺放物料或設備。
- Large steel formwork should be provided with proper working platform.
- Working platform should be provided with top guardrails of height between 900 – 1,150mm and an intermediate one between 450 – 600mm high from platform level and a 200mm high toe board. The platform should be closely boarded.
- No person is allowed on the formwork during lifting.
- The working platform should be inspected by a competent person.
- No material or plant is allowed to be placed on the working platform.



工作平台護欄以金屬絲網圍封  
Parapet wall of a working platform is fenced with wire mesh

## 7 棚架、工作平台和高處工作 Scaffolding, Working Platform and Work at Height

### 高空工作台（吊船）

- 吊船由四條鋼絲纜索懸吊而當中的兩條安全纜索則配備自動安全裝置。
- 吊船須設有距離工作平台面900至1,150毫米高的頂部護欄、450至600毫米高的中間護欄及200毫米高的踢腳板。
- 使用吊船前，應由合資格檢驗員徹底檢驗和進行負載測試，並取得認可證明書（表格2—緊接使用前的六個月內；或表格3—緊接使用前的12個月內），確保吊船可安全操作。
- 每天工作前和緊接使用前七天內，應由合資格人員檢查吊船，並取得認可證明（表格1），確保可安全操作。
- 吊船操作員和吊船上的工人須年滿18歲，並持有認可訓練證明書。
- 吊船上的所有人必須佩戴全身式安全帶和獨立救生繩，而獨立救生繩應繫穩在獨立於懸吊系統的結構構件上。
- 吊船上必須標明安全操作負荷（包括每次可載的最高人數和其他負載物），並有可清楚辨別該吊船的適當標記。
- 展示顯眼的中英文告示：「每日開工前須檢查所有吊索」和「吊船上的人員須佩戴安全帶；安全帶須繫於獨立救生繩上或穩固的繫穩物上」。
- 開工前，在吊索末端加上重物，確保所有吊索均已拉緊。
- 切勿在惡劣天氣（例如強風、下雨或雷暴）下使用吊船。
- 應圍封吊船正下方的地面範圍，避免高空墮物的風險。切勿在吊船邊緣放置物料或工具，以防物件墜下。
- 因應不同的工作性質，吊船上應採取相應的安全措施，例如工人在吊船上使用易燃物品，須帶備合適的滅火筒。



天台上的吊船設備。救生繩以布料、塑膠套管或類似的方法保護，以免被尖角損壞。  
Facilities of gondola at roof. The lifeline is protected with fabric material, plastic tube or similar means to prevent damage by sharp corner.

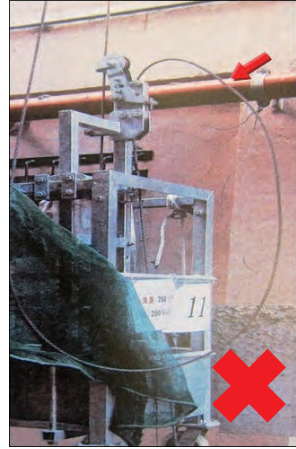


為吊船加上遲延燃燒物料造成的保護幕，以避免物料從高處下墜  
Gondola provided with fire retardant protection screen to avoid falling of debris



## Suspended Working Platform (Gondola)

- To be hung by 4 suspension wire ropes with 2 wire ropes fitted with automatic safety devices.
- The gondola should be provided with top guardrails of height between 900-1,150mm and an intermediate one at between 450-600mm high from platform level and a 200mm high toe board.
- To be thoroughly examined and load tested by competent examiner before its use (provided with Form 2 in the immediate preceding 6 months and Form 3 in the immediate preceding 12 months) to ensure that it is in safe working order.
- Inspected by a competent person before commencement of daily work and in the immediate preceding 7 days before its use (provided with Form 1) to ensure that it is in safe working order.
- Operator or workers on the suspended working platform should be at least 18 years old and have a recognized training certificate.
- Every person on a suspended working platform should wear a safety harness with independent lifeline anchored to structural member separated from the suspension system.
- Safe working load inclusive of maximum number of persons and other loads required on a suspended working platform should be shown with an appropriate mark to distinguish it from others.
- Display notice in English and Chinese prominently: "All wire ropes shall be inspected prior to commencement of daily work" and "Every person riding on a suspended working platform shall wear a safety harness properly attached to an independent lifeline or an appropriate anchorage."
- Add a weight at the end of the wire ropes to make sure all the wire ropes are in taut condition before works commencement.
- Never use the platform under adverse weather conditions: strong wind, raining, thunder or storm.
- The area underneath a suspended working platform must be fenced off to avoid risk of falling objects. Never place materials or tools near the edge of the platform to prevent falling object.
- Appropriate safety measures are required for different work nature. e.g. fire extinguisher of appropriate type is required if working on a suspended working platform involves the use of inflammable substances.



懸吊纜索及安全纜索在任何時間都應保持垂直，可考慮於吊纜末端加上重物，以確保纜索沒有鬆弛狀況。

The suspension and safety rope should at all times be kept vertical, possibly by means of adding a weight at the end of the suspension rope, so as to ensure no slacking of the ropes above the safety devices

## 7 棚架、工作平台和高處工作 Scaffolding, Working Platform and Work at Height

### 安全頭盔、安全鞋、全身式安全帶和獨立救生繩

#### Safety Helmet, Safety Shoes, Safety Harnesses and Independent Lifelines

- 應為在吊船上工作的工人提供獨立救生繩，並把救生繩繫在繫穩物上。
- 在吊船上工作時，工人應佩戴安全頭盔，把Y型下額索帶索緊和配備防墮裝置的全身式安全帶，並把安全帶繫上獨立救生繩。
- Independent lifeline with anchorage should be provided to each worker when they are working on a gondola.
- Worker should wear safety helmet with chin strap fastened and safety harness with fall arrestor attached to an independent lifeline during working on the gondola.



工人在吊船上工作時應佩戴適當的個人防護裝備

Workers with suitable personal protective equipment (PPE) during working on the gondola

### 出入口 Access

- 在最低樓層提供適當、安全的通道前往工作平台、棚架和吊船。
- Provide proper safe access to egress from working platform, scaffolding and gondola at the lowest floor to be reached by the working platform, scaffolding and gondola.



提供工人進入吊船的安全通道  
Safe access to gondola

### 梯具

- 梯具應堅固完好，並穩妥地放置或設置。
- 梯具一般作上落之用。如工人使用梯具工作時可能會從兩米或以上高度墜下，便不應使用梯具。
- 在一些特別工作間（如受環境限制）進行簡單工程而工作平台並不可行時，需提供合適的踏腳架或梯台。
- 如未能使用其他工具，而梯具是唯一可行辦法，則需由合資格人士進行的詳細風險評估，訂立使用梯具的所有安全措施及簽發出工作許可證並配合防墮裝置使用，而防墮裝置須繫在堅固的錨固點上。





以下必需的安全措施，包括：

- 工人不得站在或坐在梯具的頂部工作，應站在一個在失去平衡時能抓緊梯子的位置。
- 使用直梯時，擺放直梯的高度與底部的比例不得超逾4:1。
- 上落梯具時應面向梯具及與梯具保持3點接觸。
- 梯具兩旁應設有扶手，扶手高度應為1.1米。
- 進行電力工程時應使用不導電梯具，例如玻璃纖維增強塑料梯具。
- 使用的梯具應符合以下安全要求：
  - BS EN131標準，適用於木梯、金屬爬梯和玻璃纖維增強塑料梯具；
  - BS 2037標準，適用於金屬爬梯；
  - EATS13/1標準，適用於玻璃纖維增強塑料梯具；以及
  - BS EN14183標準，適用於踏腳架。



兩旁設有扶手的固定式鋼梯  
A steel ladder (fixed type) with handrail on both sides.



梯子級面加上金屬杆，增強防滑效果  
Access staircase with additional steel rod as anti-slip device



兩旁設有扶手的移動式鋼梯  
A steel ladder (easy movable type) with handrail on both sides



## 7 棚架、工作平台和高處工作 Scaffolding, Working Platform and Work at Height

### Ladder

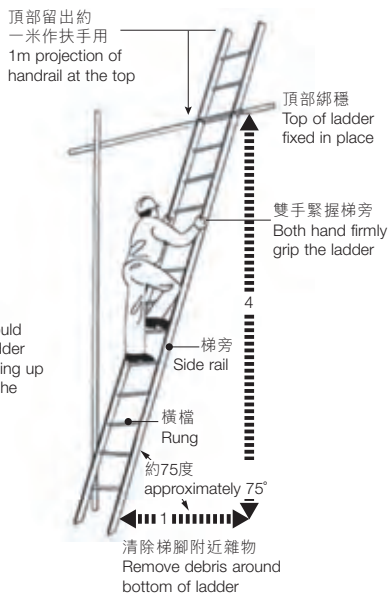
- The ladder should be structurally sound and securely rested/fixed in place.
- Ladder is normally adopted as a means for access and egress and it should not be used for works with a risk of falling for 2 meters or more.
- For light duty work to be carried out in work environment (for example, with restrictive space) where a suitable working platform cannot be erected, provide and ensure the use of suitable step platforms or hop-up platforms as appropriate.
- When it is found practically impossible to use other tools and ladder is the only feasible means, issue a permit-to-work for use of ladder by a competent person with a thorough risk assessment conducted and all necessary safety measures related to use of ladder taken, including adopting a fall arresting system and attaching it to a rigid anchor point.



應使用符合國際標準的梯具  
Ladder should comply with international standard

Necessary safety measures related to use of ladder include:

- Worker should never stand or sit on the top of a ladder during work. He should stand on a position that he can grab the ladder in case he loses his balance.
- Ratio of height and base for erection of straight ladder should be not more than 4:1.
- User of ladder should face a ladder when he climbs up or down on the ladder and should maintain 3-point contact with the ladder.
- Railing should be provided to ladder on both sides and the railing should be extended 1.1 m above the ladder.
- Non-conductive ladder such as ladder made of glass-fibre reinforced plastic should be used for electrical work.
- Ladders for use shall comply the safety requirements as below:
  - BS EN131 for timber, metal and glass-fibre reinforced plastic ladder
  - BS 2037 for metal ladder;
  - EATS13/1 for glass-fibre reinforced plastic ladder
  - BS EN14183 for hop-up platform

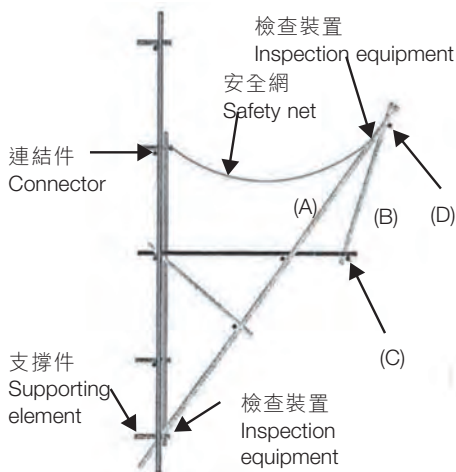


使用梯子的安全要點  
Safety practice when using ladder



## 安全網

- 可承托從高處墜下的工人。
- 並非防墮裝置。
- 應考慮其他防止人體從高處墜下的措施，如無其他選擇才使用安全網。安全網是最後的方法。
- 可能下墜的高度愈高，安全網的面積應愈大。
- 安全網與工作位置之間的垂直距離應少於六米。
- 根據英國標準，安全網的闊度應在至少3米與4.5米之間。
- 須由具備相關經驗的合資格人士按照製造商的指示安裝。
- 使用以符合英國／國際標準的防火物料製造的安全網。
- 按照製造商的指示維修保養、檢查和測試安全網，並把情況妥為記錄。
- 為安全網提供安全的出入通道，例如工作平台。
- 操作／維修保養須知：
  - 避免安全網被化學品破壞，或在物料上受損；
  - 不得在安全網上存放物品；
  - 避免在安全網附近進行產生熱力的工序，以及避免有雜物掉進網內；
  - 定期清理網上的雜物和尖銳物件；
  - 由曾受訓練的人員按照製造商的指示維修保養安全網。



由棚架向外伸展的安全網之示意圖

- 安全網及其支承構架繫於棚架結構上，而棚架結構則穩固地繫於建築物上，這個布置方式也適用於直接繫於建築物上的安全網及其支承構架。
- 如工程師證明構件(A)已有足夠的強度，則可以略去構件(B)、(C)和(D)。

Diagram showing a safety net extending from a scaffolding

- The safety net and its supporting framework are tied to the scaffolding structure which is secured tightly onto the building. This configuration is also applicable to a safety net and its supporting framework that are tied directly onto the buildings.
- Components (B), (C) and (D) can be omitted if it has been certified by an engineer that component (A) is of adequate strength.

## Safety Net

- Being capable of receiving a worker falling from height.
- It is not a fall arrest system.
- Consider other measures to prevent person falling from height before adopting safety net – it is considered the last measure.
- Area of the net increases with falling height of person.
- Maximum vertical falling height to the net from a working area should be set less than 6m.
- Allow the net with catching width of minimum 3 meters to 4.5 meters to meet the BS standards.
- To be installed by experienced and qualified personnel according to instruction of manufacturer.

## 7 棚架、工作平台和高處工作 Scaffolding, Working Platform and Work at Height

- Use fire retardant material conforming to BS/international standard for safety net.
- To be maintained, checked and tested according to instruction of manufacturer and properly recorded.
- Provide safe access to/egress along the edge of the net, for example, working platform.
- Considerations of operation/maintenance: –
  - avoid chemical or physical damage;
  - no storage of things on the net;
  - avoid heating procedure nearby or falling of debris onto the net;
  - remove debris, sharp objects regularly;
  - repair by trained person under manufacturer's instruction.

### 升降機槽工程 Lift Shaft Works

- 應遵照已核准的安全計劃進行安裝工程。
- 為升降機安裝工程進行風險評估。
- 按照工作許可證制度保管鑰匙和批准進入升降機槽。升降機槽內不得同時進行不同工種的工作。
- 避免在升降機槽內進行產生熱力的工作和電弧焊接工程。
- 除非屬核准的類型，否則各類手提和臨時電力裝置必須接地。
- 為所有升降機安裝工程提供110伏特低壓供電及防水插座。
- 所有升降機工程必須有足夠照明、通風和良好通訊方式。
- 升降機槽內須設置至少三條緊扣的獨立救生繩。
- 升降機槽內須設置以防火物料製造的安全網。
- 確保升降機槽壁與安全網之間沒有縫隙。
- 定期清理安全網上的雜物。



只有獲許可並持有鑰匙的人方可打開閘門進入升降機槽。閘門無需鑰匙便可從內側打開。

Only the permitted person with key can unlock the gate to access the lift shaft. The gate can be opened from inside the lift shaft without use of key.



- 在升降機槽最低層的開口設置錨固點，工人將全身式安全帶的繩索緊緊繫在該錨固點後才進入槽底工作。
- 進入升降機槽工作前，佩戴合適的全身式安全帶並連接上防墮裝置，和個人防護裝備。
- Adhere to the endorsed/approved safety plan for installation.
- Carry out risk assessment for lift installation works.
- Adopt permit-to-work system for key custody and permitting entry to the lift shaft, and no work shall be conducted by different trades simultaneously inside the lift shaft.
- Avoid hot work and electric arc welding inside lift shaft.
- Earth all electric appliances for portable or temporary fixed types unless they are the approved type.
- Provide temporary power supply of 110V with circuits equipped with waterproof sockets for lift installation.



安裝全高度四扇金屬閘門，防止工人擅闖升降機槽。  
Full height 4-leaf metallic gate to restrict unauthorized access to lift shaft



在升降機槽出入閘口張貼的警告告示  
Warning notices posted at lift shaft access gate



當需要進入升降機槽或井底工作時，工人必需將隨帶吊繩緊固於獨立救生繩  
Worker should attach the lanyard to the independent lifeline before making access to lift pit/shaft



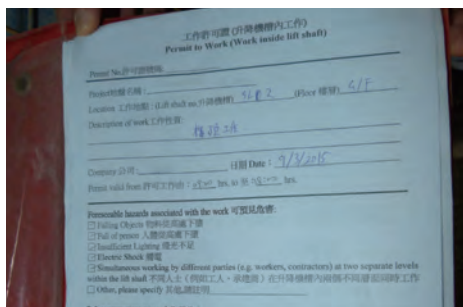
在升降機槽口附近設置錨固點，以供繫上防墮裝置／全身式安全帶。  
Provide anchorage near lift shaft opening for anchoring fall arrestor/safety harness



應使用低壓電力手提工具  
Use low voltage portable tools

## 7 棚架、工作平台和高處工作 Scaffolding, Working Platform and Work at Height

- Provide adequate illumination, ventilation and good communication system for all the lift works.
- Provide a minimum 3 nos. of independent lifeline securely anchored inside the lift shaft.
- Provide safety nets made of fire resistant materials inside lift shaft.
- Make sure no gap between the lift shaft walls and the nets.
- Clean and remove the collected debris from safety net regularly.
- Provide anchorage at the lowest landing floor with lift shaft opening for worker to attach lanyard of safety harness before making access to the lift pit.
- Put on suitable safety harnesses, attaching to fall arrestors, and with suitable personal protective equipment provided before making access to lift shaft for works.



工人需得到工作許可証，方可進行升降機頂工作

Worker should have obtained a permit-to-work certificate prior to any works at the lift car top



全身式安全帶需穩固繫於升降機槽內的獨立救生繩後，方可進入工作台

Full body harness should be securely anchored to the independent lifeline prior to access to the working platform





## 高空工作的檢查表 Checklist of Working of Height

機構名稱 \_\_\_\_\_ 日期 \_\_\_\_\_  
Name of Organization \_\_\_\_\_ Date \_\_\_\_\_

工作地點 \_\_\_\_\_  
Location of Site \_\_\_\_\_

檢查員姓名 \_\_\_\_\_ 時間 \_\_\_\_\_  
Name of Inspector \_\_\_\_\_ Time \_\_\_\_\_

項目 Item	妥善 Good	須改善 Need Improvement	須即時改善 Need Immediate Improvement	不適用 N/A	備註 Remarks
<b>1) 棚架 Scaffolding</b>					
a) 棚架的搭建、加建或更改工程是否由受過訓練及具足夠經驗人士在合資格人士直接監督下進行? Has the construction, addition and alteration works of the scaffold been conducted by trained and experienced workers under the direct supervision of a competent person?					
b) 棚架是否有效地向縱、橫及對角穩繫以防止塌下? Is the scaffold secure from collapse by being effectively fastened vertically, horizontally and diagonally?					
c) 棚架是否搭建於適當地面或地基上? Is the scaffold standing on suitable ground surface or foundation?					
d) 是否為使用棚架的人士提供安全進出途徑? Is there any safe access available to the scaffold users?					
e) 棚架是否由合資格人士在使用前及最少每十四天內檢查一次及將結果填報於法定表格內? Was the scaffold inspected by a competent person before use and at least once every 14 days with the findings duly recorded in the statutory inspection form?					
f) 棚架是否在經過擴建或更改後或於暴露於惡劣天氣情況後再由合資格人士檢查及將結果填報於法定表格內? Was the scaffold inspected again by a competent person after it had been extended or altered or exposed to adverse weather conditions with the findings duly recorded in the statutory inspection form?					

# 7 棚架、工作平台和高處工作 Scaffolding, Working Platform and Work at Height

項目 Item	妥善 Good	須改善 Need Improvement	須即時改善 Need Immediate Improvement	不適用 N/A	備註 Remarks
g) 塔式通架的高度與最小底邊長度比率是否符合安全要求(室內限於3.5，室外限於3)? Does the ratio of the height of the tubular tower to its smallest base length meet the safety requirement (i.e. indoor: 3.5; outdoor: 3)?					
h) 流動式塔式通架腳部之滑輪是否裝上緊鎖系統及保持良好效能? Are the base wheels of the mobile tubular tower equipped with an effective locking system?					
<b>2) 工作台 Working Platform</b>					
a) 工作台的木板、夾板或金屬板是否結構良好及有足夠厚度? Are the wooden or plywood boards or metal plates of the working platform structurally sound and of adequate thickness?					
b) 工作台的木板、夾板或金屬板是否緊密地鋪上? Is the working platform tightly decked with wooden or plywood boards or metal plates?					
c) 工作台的木板、夾板或金屬板是否排列妥當或妥為繫緊以防止翻倒? Is the working platform suitably decked or fixed with wooden or plywood boards or metal plates to avoid overturning?					
d) 工作台上的物料是否平均分佈及沒有超荷? Are materials evenly placed on the working platform and causing no overloading?					
e) 高於兩米的工作台，是否每邊均有適當圍欄和踢腳板? Is the working platform operating at a height of more than 2 metres equipped with guard-rails and toe-board on each side?					
f) 工作台是否有足夠闊度讓行人及物料通過? Is the working platform wide enough for people and materials to pass through?					
<b>3) 樓邊、電梯邊、升降機槽口及樓面洞口 Floor edges, staircase edges, lift shafts and floor openings</b>					
a) 高於兩米的樓邊、梯邊、升降機槽口或其他危險地方是否設有適當的圍欄和踢腳板? Are floor edges, staircase edges, lift shafts or other dangerous places at a height of not less than 2 metres equipped with suitable guard-rails and toe-boards?					
b) 圍欄是否有足夠強度及繫穩在堅固的樓面或地台上，以防止人體墜下? Are the guard-rails of adequate strength and fixed tightly on secure floor slabs to prevent people from falling off?					



# Control the risk at source effectively will improve work performance at height

項目 Item	妥善 Good	須改善 Need Improvement	須即時改善 Need Immediate Improvement	不適用 N/A	備註 Remarks
c) 所有樓面洞口、地洞或其他危險地方是否設有適當構造的覆蓋物，及穩固於正確位置上？ Do all floor openings, holes in ground or other dangerous places have coverings of the suitable structure which are fixed tightly at correct places?					
d) 該等覆蓋物是否以粗體字清晰地標明，以顯示其用途？ Are the coverings marked with bold characters to indicate clearly their use?					
<b>4) 梯子 Ladders</b>					
a) 梯子是否只用在不能搭建棚架的工作地方？ Are ladders used only where circumstances do not permit scaffolding?					
b) 所有梯子部份例如梯邊、梯級及防滑梯腳踏是否結構良好？ Do ladders have all their parts such as side rails, rungs and anti-slip foot-pads in good conditions?					
c) 所有梯子頂部是否繫穩或若切實不可行時，有沒有在靠近梯子的底部予以穩固？ Are ladders fastened up at the top or, if this is not practicable, fixed securely at the part near their bottom?					
d) 所有梯子是否豎立於平穩及堅固的立足處？ Are all ladders standing on level and firm base?					
e) 所有梯子是否高於其頂部落腳點最少1米？ Do all ladders extend at least 1 metre above the landing level?					
<b>5. 防止人體墜下措施 Preventive measures against people from falling</b>					
a) 在不能搭建安全工作台的情況下，是否有提供適當的安全網、安全帶或其他類似設備以防止任何人士因墜下而受傷？ Where circumstances do not permit the erection of a safe working platform, is there any provision of suitable safety nets, safety harness or other similar equipment to prevent people from falling down and hence injuries?					
b) 若使用安全帶，是否有提供適當的牢固點例如獨立救生繩及適當的裝配？ If safety harnesses are being used, is there any provision of proper anchor points such as independent lifelines and suitable equipment?					
c) 所有安全網及安全帶等，是否均維修妥當？ Are all safety nets and safety harnesses kept under proper maintenance?					

## 7 棚架、工作平台和高處工作 Scaffolding, Working Platform and Work at Height

項目 Item	妥善 Good	須改善 Need Improvement	須即時改善 Need Immediate Improvement	不適用 N/A	備註 Remarks
d) 有沒有確保安全網裝置接近建築物? Are steps being taken to ensure that the safety net installation is close to the building?					
e) 在安裝安全網時，是否確保網身沒有過度拉緊而應略為下垂? Are safety nets installed in the manner that the nets are not overstretched and should be allowed to sag slightly?					
f) 所有獨立救生繩及穩固點，是否經由「註冊專業工程師」檢驗合格? Are all independent lifelines and anchor points examined and accepted by registered professional engineer?					
<b>6) 防止物料墜下措施 Preventive measures against materials from falling</b>					
a) 是否已採取所需的預防措施，以防止工人遭墜下的物料或物體所擊中? Are the necessary precautions being taken to prevent workers from being struck by falling materials or objects?					
b) 工作地點對下的位置是否已被圍封以避免物料墜下? Is the area underneath a work being carried out at height fenced off to avoid risk of falling objects?					
c) 是否採取步驟以防止棚架物料、工具或其他物料從高處擲下、傾倒或投下? Are steps being taken to prevent scaffolding materials, tools or other materials from being thrown, dumped or dropped from height?					
d) 工友高空工作而存在工具下墜的風險時，是否工友已使用手繩以固定手工具? Are the hand tools secured by workers with hand straps when they are working at height and there is a risk of falling objects?					
e) 是否利用起重機械或起重裝置，以安全的方式妥善地卸降棚架物料、工具或其他物料? Are lifting appliances or lifting gears being used for the safe and proper lowering of scaffolding materials, tools or other objects?					
<b>7) 吊船 Suspended Working Platform</b>					
a) 吊船是否由「註冊專業工程師」設計、檢驗及測試，以確保能承載足夠重量? Has the suspended working platform been designed, inspected and examined by registered professional engineer to ascertain the safe working load?					



項目 Item	妥善 Good	須改善 Need Improvement	須即時改善 Need Immediate Improvement	不適用 N/A	備註 Remarks
b) 吊船的搭建、更改或拆卸工程是否由受過訓練及具足夠經驗人士在「合資格人士」直接監督下進行？ Has the erection, alteration and dismantling of suspended working platform been executed by trained and experienced personnel under the supervision of competent person?					
c) 吊船是否由年滿18歲受過訓練、具足夠經驗及持有認可的吊船安全操作證明書的人士操作？ Are the operator or persons working on a suspended working platform at least 18 years old and do they possess a recognized training certificate and relevant working experience?					
d) 吊船是否由「合資格人士」在使用前及最少每星期進行檢查及填報 (SWP表格一)，並由「註冊專業工程師」於使用前6個月及12個月分別簽發有效的 (SWP表格二) 及 (SWP表格三)？ Has the suspended working platform been inspected by competent person before commencement of daily work and in the intermediate preceding 7 days before its use with the SWP Form 1 duly completed and signing of SWP Form 2 in the preceding 6 months and SWP Form 3 in the preceding 12 months before its use by a competent examiner (registered professional engineer)?					
e) 吊船是否在經過更改後或於暴露於惡劣天氣情況後再由「合資格人士」檢查及將結果填報於法定表格內？ Has the suspended working platform been inspected by competent person with completion of statutory form after it was altered or exposed to adverse weather condition?					
<b>8) 其他事項 Other Items</b>					

檢查員簽名 \_\_\_\_\_ 時間 \_\_\_\_\_  
Signature of Inspector \_\_\_\_\_ Time \_\_\_\_\_



## 7 棚架、工作平台和高處工作 Scaffolding, Working Platform and Work at Height

### 參考資料

#### 相關條例和規例

- 《工廠及工業經營條例》
- 《建築地盤（安全）規例》
- 《工廠及工業經營規例》
- 《工廠及工業經營（吊船）規例》
- 《工廠及工業經營（安全管理）規例》
- 《建築工地升降機及塔式工作平台（安全）條例》

#### 相關安全標準、工作守則、安全指引和指南

- 《竹棚架工作安全守則》（勞工處）
- 《金屬棚架工作安全守則》（勞工處）
- 《安全使用和操作吊船工作守則》（勞工處）
- 《建築工地升降機設計及建造實務守則》（機電工程署）
- 《塔式工作平台設計及建造實務守則》（機電工程署）
- 《吊船的檢查、檢驗和測試指南》（勞工處）
- 《竹棚架設計及搭建指引》（屋宇署）
- 《安全使用動力操作升降工作台指引》（勞工處）
- 《工作指南－工作安全（臨時支架－防止倒塌）》（勞工處）
- 《升降機槽工程安全指引：第1卷－施工期間直至移交予升降機安裝承建商前》（建造業議會）
- 《升降機槽工程安全指引：第2卷－升降機安裝期間直至獲發佔用許可證及交予發展商》（建造業議會）
- 《升降機槽工程安全指引：第3卷－整段樓宇佔用期間》（建造業議會）
- 《升降機槽工程安全指引：第4卷－升降機槽內的建築工地升降機》（建造業議會）
- 《離地工作的安全指引》（建造業議會）
- 《工作安全守則（升降機及自動梯）》（勞工處）
- 《竹棚架工作平台安排指引》（建造業議會）



## References

### Relevant Ordinances and Regulations

- Factories and Industrial Undertakings Ordinance.
- Construction Sites (Safety) Regulations.
- Factories and Industrial Undertakings Regulations.
- Factories and Industrial Undertakings (Suspended Working Platforms) Regulation.
- Factories and Industrial Undertakings (Safety Management) Regulation.
- Builders' Lifts and Tower Working Platforms (Safety) Ordinance.

### Relevant Safety Standards, Codes of Practice, Guidance Notes and Guidelines

- Code of Practice for Bamboo Scaffolding Safety. (LD)
- Code of Practice for Metal Scaffolding Safety. (LD)
- Code of Practice for Safe Use and Operation of Suspended Working Platforms. (LD)
- Code of Practice on the Design and Construction of Builders' Lifts (EMSD)
- Code of Practice for the Design and Construction of Tower Working Platforms. (EMSD)
- Guidance Notes on the Inspection, Thorough Examination and Testing of Suspended Working Platforms. (LD)
- Guidelines on the Design and Construction of Bamboo Scaffolds. (BD)
- Guidance Notes on Safe Use of Power-operated Elevating Work Platforms (LD)
- Guidance Notes: Safety at Work (Falsework – Prevention of Collapse). (LD)
- Guidelines on Safety of Lift Shaft Works: Volume 1 – During Construction Stage and Before Handing Over to Lift Installation Contractor (CIC)
- Guidelines on Safety of Lift Shaft Works: Volume 2 – During Lift Installation Stage until Issue of Occupation Permit and Handing Over to Developer (CIC)
- Guidelines on Safety of Lift Shaft Works: Volume 3 – Throughout the Occupation Stage of Building (CIC)
- Guidelines on Safety of Lift Shaft Works : Volume 4 – Builders' Lift within Lift Shaft (CIC)
- Guidelines on Work-Above-Ground Safety (CIC)
- Code of Practice for Safety at Work (Lift and Escalator) (LD)
- Guidelines on Planking Arrangement for Providing Working Platforms on Bamboo Scaffolds (CIC)

## 8 挖掘工程和道路工程 Excavation and Roadworks

### 危害識別 Hazards

- 泥土傾瀉
  - 觸電、火警、因地下公用設施損壞而發生爆炸
  - 窒息
  - 遇溺
  - 絆倒、滑倒或跌倒
  - 工人墜下坑穴／溝槽／高空墜下
  - 遭墜下坑穴／溝槽的物件擊中
  - 遭移動的物件撞擊
  - 挖土機／機械翻側
  - 中暑（酷熱天氣）
  - 噪音
  - 塵埃
- 
- Collapse of soil;
  - Electrocution, fire, explosion due to damage to underground utilities;
  - Suffocation;
  - Drowning;
  - Trip, slip or fall;
  - Fall of person into pit/trench/from height;
  - Being struck by object falling into pit/trench;
  - Being struck by moving object;
  - Overturning of excavator/machine;
  - Heat stroke (hot weather);
  - Noise;
  - Dust.



遭墜下溝槽的物件擊中的危害  
Hazard of being struck by materials falling into trench



未有於泥坑提供安全進出通道引致工人墜下泥坑的危害  
Hazard of fall of person into excavation due to unsafe access



## 挖掘溝槽和坑穴 Trench and Pit Excavation

- 在挖掘工程邊緣或傾斜地面停泊的車輛，應放置楔子。
- 透過核對施工記錄圖、利用合適的儀器探測，以及在地面標記走線等方法，確定現有地下設施的位置。
- 利用手提工具挖掘探井，可更安全地確定地下設施的位置。
- 地下公用設施及其外露部分必須有適當的支撐和防護，並張貼警告告示，加以提醒。
- 在煤氣管和堆填區附近挖掘時，須使用氣體探測器確定是否有易燃或有毒氣體存在，以及確定有否足夠氧氣。



以手提探測器檢測地下公共設施的走線及其位置  
Hand-held detector to check routing and locate for underground utilities

- Wedges should be provided for vehicles near edge of excavation or on sloping ground.
- Underground existing services identification by checking record drawings, detection by suitable apparatus, and marking the routing on ground surface.
- Ascertain the location of underground services by hand-dug trial pits.
- Expose and protect underground utilities/services with suitable support, and post warning notices for alertness.
- When excavating in the vicinity of gas mains and landfill areas, use gas detection device to identify presence of inflammable or poisonous gas and the adequacy of oxygen.



以探測器和量度工具等去確定地下公用設施的位置  
On site identification for existing underground utilities with detector and measuring instrument

## 8 挖掘工程和道路工程 Excavation and Roadworks

### 工作安全地帶 Work Safety Zone

- 在馬路上進行工程，必須安排適當交通標誌或擺設工程車輛，並劃出工作安全地帶，以保護工人。使用適當防護路障，確保工作地帶安全。
- 在工作安全地帶前端設定緩衝區，讓駕車人士有足夠時間作出反應和減低車速。
- 遵守路政署發出的《道路工程的照明、標誌及防護工作守則》內的要求。
- 於快速公路進行流動作業時，必須使用護航車輛。
- 於快速公路封閉車線時，必須在施工地區前最少600米設置預先警告標誌，並在道路開始臨時改道的位置設置閃爍箭咀指示燈號。
- For work on carriageway, provide traffic signs, construction vehicle and demarcate work safety zone for protection of workers. Use suitable protection barriers to be used to ensure work zone safety.
- Provide buffer area at the front end of work safety zone for vehicles to react and decelerate.
- Comply with the requirements as stipulated in the Code of Practice for the Lighting, Signing and Guarding of Road Works issued by the Highways Department.
- Use shadow vehicle for mobile operations on expressways.
- For lane closure on an expressway, display advance working signs at 600 metres in advance of works area and flashing arrow signs where temporary diversion begins.



使用防護圍欄，劃出一個安全的工作地帶  
Protection barriers used to ensure a safety working zone



以重型建築機械及圍欄確定出安全工作地帶  
Work safety zone demarcated by construction machine and barrier



利用正式公告告知施工期  
Proper notice to public indicating the works duration



為行車道上的工程採取臨時交通安排  
Temporary traffic arrangement for work carried out on carriageway





## 在進行挖掘工程時保護公用設施 Protection to Utilities in Excavation

- 在開始任何挖掘工程前，須核對公用設施的平面圖。
  - 在使用機械挖掘前，應先用手用工具挖掘探洞，以確定現有公用設施的確實位置和深度。
  - 在公用設施附近挖掘時，應採用人手挖掘的方法。
  - 由地面懸掛吊架或在地下安裝支柱，以支撐現有公用設施。
  - 穩固地支撐與溝槽平行或橫跨其上的現有公用設施。
  - 如挖掘的溝槽深度超過1.2米，應在兩旁提供支撐物。
  - 若工程需要支撐水管，應使用工字樑／軋製鋼樑代替鋼絲纜。
- 
- Check the utilities layout plan before starting any excavation.
  - Dig trial holes by hand tools to ascertain the exact positions and depths of existing utilities before using mechanical plant for excavation work.
  - Use hand digging method when excavating close to the utilities.
  - Support the existing utilities by hangers suspended from ground surface or propping from underneath.
  - Support properly the existing utilities running parallel to or across the trench.
  - Shoring support should be provided to sides of the trench excavation with depth greater than 1.2m.
  - Use I beam/rolled steel joist (R.S.J.) instead of steel wire ropes to support water pipes.



為深度超過1.2米的挖掘溝槽提供支撐設施  
Shoring support to excavation with depth greater than 1.2m



在挖掘工程中使用工字樑支撐水管  
Water pipe supported by I-beam in excavation



工人以人手挖掘，以免意外損毀公用設施。  
Hand digging to avoid accidental damage to utility

## 8 挖掘工程和道路工程 Excavation and Roadworks

### 圍欄 Fencing

在大型挖掘工程，斜坡、泥堆、溝槽、坑穴，如

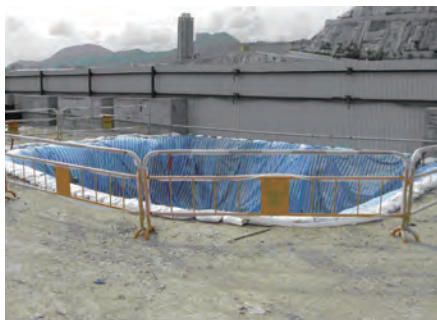
- a. 不少於2米高度或深度
  - 圍欄要牢固安裝及圍繞整個工程範圍
  - 在圍欄設置合適的警告標誌
  - 圍欄的頂部和中間欄杆須分別距離地面900毫米至1,150毫米和450毫米至600毫米
  - 在工程範圍、通道、圍欄和交通標誌處提供足夠照明
  - 雨季時，須在挖掘工程周圍放置土堤、沙包或相類的保護裝置
- b. 高度或深度在1.2米至少於2米
  - 圍欄可採用可移動的金屬型或堅固塑料型並給予整個工地範圍設置
  - 若地盤環境不許可，可考慮採用警告帶
  - 設置警告標誌於適當位置



在挖掘工程邊緣設置的圍欄和土堤並掛上的警告標誌  
Barrier with warning sign and earth bund along the edge of the excavation



在挖掘工程邊緣設置的另一款圍欄，並掛上的警告標誌  
Warning sign affixed to fencing along the edge of the excavation



深坑的斜面蓋上塑膠布料，以免受天氣影響  
Profile of slope of a deep excavation is protected from weather with PVC sheet





Fencing for mass excavation/slope/stockpile/trench/pit

- a. not less than 2m in height or depth
  - fencing to be rigid securely supported and fixed around the affected area
  - provide warning signs at appropriate locations of the fencing
  - provide top railings at a height of 900mm to 1,150mm and intermediate railings at height 450mm to 600mm above the ground
  - with adequate lighting for the works areas, passages, traffic signs, etc.
  - provide earth bunds or sand bags or similar protection along sides of the affected area during wet seasons
- b. between 1.2m to less than 2m in height or depth
  - fencing may be of mobile metal/plastic rigid type for the affected areas
  - warning ribbons might be adopted if the above is impractical due to site constraint
  - provide warning signs at appropriate positions/locations

## 穩固程度 Stability

- 穩固地支撐所有大型挖掘工程、斜坡或高逾1.2米的泥堆。
- 須按照設計計算結果進行安全挖掘或把泥坑挖掘至安全的斜度，以確保穩固。
- 每日視察挖掘工程，而每星期亦由合資格人員徹底檢查一次。
- 如挖掘工程深逾1.2米，須在指定表格（《建築地盤（安全）規例》的表格四）上報告檢查的詳情。
- 確定挖掘工程邊緣沒有放置重金屬物料或荷載；以及沒有重型車輛或機械裝置。
- 在挖掘工程邊緣停泊的車輛須放置楔子。
- 每星期由合資格人士填寫法定檢查報告（《建築地盤（安全）規例》的表格四）；在惡劣天氣後動工前亦須填寫有關報告。

在建築地盤(安全)規例的表格四上報告檢查挖掘工程的情況  
Report the stability of excavation on Form 4 under the CS(S)R



挖泥區放置圍欄及警告告示  
Barrier with warning notice to excavation

## 8 挖掘工程和道路工程 Excavation and Roadworks

- Securely support all mass excavations, slopes or stockpiles exceeding 1.2m high.
- Stability to be substantiated by design calculation forming the excavation to a safe profile.
- Excavations to be inspected daily and thoroughly examined by a competent person weekly.
- Report on the prescribed form (Form 4 under the Construction Sites (Safety) Regulations) for excavations exceeding 1.2m deep.
- Ensure no heavy metal material or load is placed; and no heavy vehicle or plant moves or are placed near the edge of the excavation.
- Provide wedges for vehicles near the edge of the excavations.
- Statutory inspection report needed to be completed (Form 4 under the Construction Sites (Safety) Regulations) weekly by competent person and after inclement weather prior to work commencement.

### 挖掘物料 Excavated materials

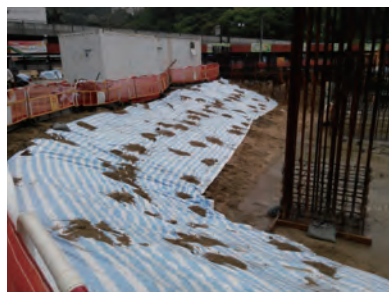
- 除非設計上容許，否則不得在大型挖掘工程、斜坡、溝槽、坑穴或高逾1.2米的泥堆邊緣的1.5米範圍內堆放挖掘物料。
- Do not store excavated materials within 1.5m of the top edge of mass excavation, slope, trench, pit or stockpile exceeding 1.2m high unless allowed for in the design.



挖掘的物料應妥善遮蓋及圍封  
Excavated material should be properly covered and fenced off

### 地面水徑流 Surface Water Run-off

- 雨季時（四月至十月），在所有挖掘工程、斜坡或高逾兩米的泥堆周圍放置土堤、沙包或相類的保護裝置。
- 乾燥季節（十一月至三月）時，在所有外露超過三星期的挖掘工程、斜坡或高逾兩米的泥堆周圍放置土堤、沙包或相類的保護裝置。



在挖掘工程的斜面蓋上有防水功能的塑膠布料  
PVC sheeting covers to profile of slope of excavation



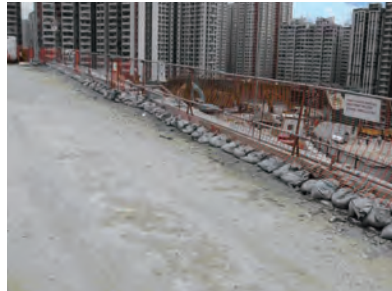
- Wet season (April to October) – provide all excavations, slopes or stockpiles exceeding 2m high, with earth bunds, sand bags or similar protection.
- Dry season (November to March) – provide all excavations, slopes or stockpiles exceeding 2m high, which remain exposed for more than 3 weeks, with earth bunds, sand bags or similar protection.



為免大量地面水流進土坑，挖掘工程的邊緣應放有土堤或沙包等  
Provide earth bund or sand bags along edge of excavation to curb surface water run off

### 提供新鮮空氣 **Fresh Air Supply**

- 在挖掘地點內或其三米範圍內不得有任何燃燒燃料的機械、設備或車輛。
- 在煤氣管和堆填區附近挖掘時，須使用氣體探測器確定是否有氣體積累的情況，以及確定有否足夠氧氣。
- No fuel burning plant, equipment or vehicle to be placed inside or within 3m of excavation.
- When excavating in the vicinity to gas mains and landfill areas, use gas detection device to identify presence of any inflammable or poisonous gas and the adequacy of oxygen.



挖掘的地點或其3米範圍內不許有燃燒燃料的設備  
No fuel burning plant, equipment or vehicle situated within 3m of excavation site



## 8 挖掘工程和道路工程 Excavation and Roadworks

### 出入口 Access and Egress

- 為工人和建築車輛提供安全的出入口（包括緊急逃生途徑），以進出大型挖掘工地／斜坡／高逾1.2米的泥堆（例如，斜度不超過1:6的斜路；兩旁設有扶手並穩妥地安裝的臨時樓梯或梯具）。於梯具末端的扶手應高於地面水平一米以上。
- Provide a safe means of access to and egress from (including emergency escape) mass excavation/slope/stockpiles exceeding 1.2m high, for workers and construction vehicles (e.g. properly formed ramps not exceeding 1:6 gradient; properly fixed temporary staircase or ladder with hand railing on two sides). The ladder should project at 1m above ground level.



為大型挖掘工地提供適當的出入口  
Adequate access and egress from mass excavation



提供臨時樓梯，以供安全進出挖掘工地  
Temporary staircase for a safe access/egress from excavation



提供樓梯方便進出挖掘工地／斜坡  
Provide staircase for access to and egress from mass excavation/slope





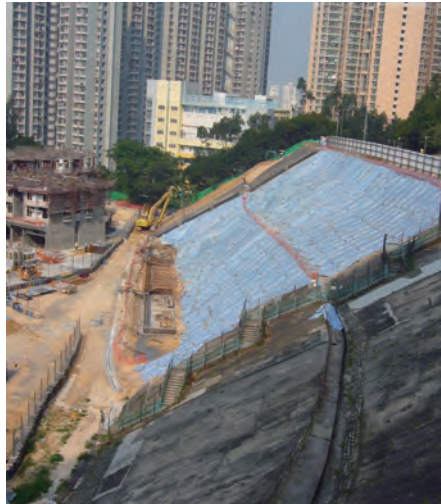
## 在水上或水邊工作

### Work over or near Water

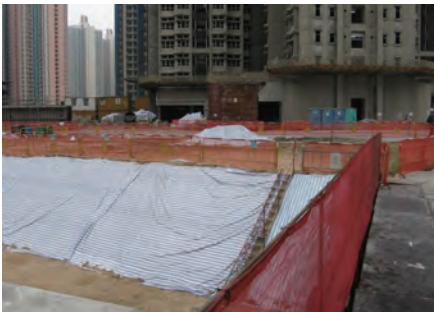
- 確保出入通道足夠和穩固，並備有應付水浸的措施。
  - 工友若於水面上或水邊工作而有下墮／遇溺風險，要確保為工友提供合適的工作台。
  - 必須設置隨時可供使用的拯救遇溺者設備。
- 
- Ensure that the means of access/egress is sufficient and secure and that arrangement is in place to deal with flooding.
  - Ensure proper working platform is provided for workers working over or near water where there is a risk of falling from height/drowning.
  - Equipment for rescue from drowning should be readily available for use.

## 在斜坡上工作 Work on Slope

- 進行挖掘時，利用防水布為斜坡提供適當的保護。
- 進行挖掘時，須清除積水。
- 在斜坡底部設置U形排水渠，以收集地面水。
- 堆存的挖掘物料不應高逾兩米，並應妥善地覆蓋。



用防水布為斜坡提供適當的保護  
Protect slope with tarpaulin cover



用防水布覆蓋泥堆  
Cover stockpile with tarpaulin



## 8 挖掘工程和道路工程 Excavation and Roadworks

- Provide proper slope protection by covering with tarpaulin during excavation.
- Remove ponding water during excavation.
- U-channel provided at toe of cutting for the collection of surface water.
- Stockpiling of excavated material should not be more than 2m high and should be properly covered.



在斜坡底設 U 形排水道，並用防水布保護斜坡面  
Provide U-channel at toe of cutting and cover slope surface with tarpaulin



### 個人防護裝備 Personal Protective Equipment

- 佩戴安全頭盔，把 Y 型下頷索帶索緊和穿上安全鞋。
- 在有需要時穿上反光工作服、佩戴安全帶、救生繩、護耳罩、手套、口罩和護目鏡。
- Wear safety helmet with Y-type chin straps fastened and safety shoes.
- Wear reflective clothing, safety harness, lifeline, ear muff, gloves, mask and goggles as necessary.



使用手提氣動碎石機時佩戴全套個人防護裝備，例如護耳罩、安全鞋、頭盔、眼罩、手套、口罩等。  
Full personal protective equipment such as ear muff, safety shoes, safety helmet, goggles, gloves, mask, etc. for using handheld pneumatic breaker



## 參考資料

### 相關法例和規例

- 《工廠及工業經營條例》
- 《建築地盤（安全）規例》
- 《工廠及工業經營（密閉空間）規例》
- 《工廠及工業經營（保護眼睛）規例》
- 《工廠及工業經營（工作噪音）規例》
- 《工廠及工業經營（安全管理）規例》
- 《職業安全及健康條例》

### 相關安全標準、工作守則、安全指引和指南

- 《防止石礦及建築工人患上矽肺病的指引》（勞工處）
- 《工作守則－密閉空間工作的安全與健康》（勞工處）
- 《工作守則－氣體焊接及火焰切割工作的安全與健康》（勞工處）
- 《安全使用挖土機工作守則》（勞工處）
- 《道路工程的照明、標誌及防護工作守則》（路政署）
- 安全健康通訊第37/2015號－「近岸及海上建築工程安全指南（勞工處及海事處）」
- 有關「船上及水上建造工程工作安全」的海報（建造業議會）

## References

### Relevant Ordinances and Regulations

- Factories and Industries Undertakings Ordinance.
- Construction Sites (Safety) Regulations.
- Factories and Industrial Undertakings (Confined Spaces) Regulations.
- Factories and Industrial Undertakings (Protection of Eyes) Regulations.
- Factories and Industrial Undertakings (Noise at Work) Regulation.
- Factories and Industries Undertakings (Safety Management) Regulation.
- Occupational Safety and Health Ordinance.

### Relevant Safety Standards, Codes of Practice, Guidance Notes and Guidelines

- Guidance Notes on Protection of Quarry and Construction Workers from Silicosis. (LD)
- Code of Practice: Safety and Health at Work in Confined Spaces. (LD)
- Code of Practice: Safety and Health at Work for Gas Welding and Flame Cutting. (LD)
- Code of Practice on Safe Use of Excavators. (LD)
- Code of Practice for the Lighting, Signing and Guarding of Road Works. (HyD)
- Safety & Health Circular No. 37/2015 “Safety in Construction Works over/near Water (LD& Marine Department)”
- Poster “Work Safety on Vessels and Construction Over Water” (CIC)



## 9 地基工程 Piling Works

### 危害識別 Hazards

- 人體從高處墜下
  - 地下公用設施損毀引致觸電、火警或爆炸
  - 因接觸無適當保護的電器用具而觸電
  - 遇溺
  - 遭移動物件撞擊
  - 機器翻側
  - 遭墜下物件擊中
  - 在體力處理操作時受傷
  - 絆倒、滑倒或跌倒
  - 中暑（酷熱天氣）
  - 燒焊產生的危險氣體或煙霧
  - 噪音
  - 腐蝕性物質
  - 皮膚病
- 
- Fall of person from height;
  - Electric shock, fire or explosion due to damage to underground utilities;
  - Electrocutation due to contact with unprotected electric appliances;
  - Drowning;
  - Being struck by moving object;
  - Overturning of machines;
  - Being struck by falling object;
  - Injury during manual handling;
  - Trip, slip or fall;
  - Heat stroke (hot weather);
  - Dangerous gas or fumes from welding;
  - Noise;
  - Corrosive substances;
  - Skin diseases.



為大口徑鑽樁工程進行高空工作的操作員／  
工人應有安全措施提防從高處墜下  
Large diameter bored pile with operators /  
workers working at height-to be cautious of  
hazard of falling from height



工人沒有適當保護引致人體從高處墜下的  
風險  
Hazard of fall of person from height due to  
lack of fall protection measure





## 高空工作 Working at Height

- 應提供安全樓梯通往工作平台。
  - 應為高空工作的工人提供適當的工作平台或防墮裝置。工作平台須設有從地板起計高度為900至1,150毫米的頂部欄杆和高度為450至600毫米的中間欄杆，並設有至少200毫米高的踢腳板。
  - 為大口徑鑽孔樁工作台上的工人提供防墮系統，工人須將安全帶尾繩扣於指定位置。
  - 為避免需要以吊籠運載工人至高空進行鋼板樁互鎖工作，應減低露出地面水平的鋼板樁高度，以及使用流動工作平台或高架平台。
- Provide and maintain stairway to working platform.
  - Provide workers working at height with a proper working platform or fall arrestor. Top railing at 900-1,150mm and middle railing at 450-600mm from the floor level plus a 200mm high toe-board are required on a working platform.
  - Provide fall arrest system for workers working on the working platform of large diameter bored piling and workers need to anchor their lanyard onto designated anchorage point on the working platform.
  - Avoid use of hanging cage to carry workers to carry out locking of sheet piling at a height by reducing height of sheet piling projecting above ground level, use of mobile working platform or work elevating platform.



提供有扶手的樓梯往返工作平台  
Provide staircase to working platform



為工作平台提供的護欄和踢腳板  
Provide barrier and toe-board to working platform



另一設置扶手的樓梯，供通往工作平台  
Provide handrails to staircase leading to working platform



穿上防墮裝置的工人在設有護欄的工作平台上操作機械  
Barrier and fall arrest system for workers working at height



設有護欄的工作平台  
Working platform with railings for workers working at height

## 9 地基工程 Piling Works

### 鑽孔圍欄 Barrier to Hole

- 在降下鑽孔時，應確保放置於工作平台上面的鐵筒維持足夠高度，仍可用作鑽孔的圍欄。
- During dipping of bored hole, ensure that an adequate height of casing above the working platform is maintained as a barrier to the hole.



維持一個適當高出工作平台的鐵筒可防止意外下墮  
Maintain a suitable height of casing above the working platform

### 地下公用設施 Underground Utilities

- 保護地下公用設施，需透過查核圖則記錄，使用適當的器具和手工具挖掘探井進行探測，以確定現有地下公用設施的資料和作所需的處理方法。
- 一旦發現不明的地下公用設施，立即停止工作。
- Identify and handle underground existing services by checking record drawings, detection using suitable apparatus, making hand-dug trial pits and finally protect underground services.
- Cease work immediately upon discovery of unknown underground utilities.



在懷疑有地下公用設施地點進行挖掘，應以手工具協助  
Only hand-dug method allowed to locate the exact underground services

### 機械設備 Plant

- 機械設備應由持有有效證書的人員操作，由合資格人士檢查，並由身為香港工程師學會註冊專業工程師的合資格檢驗員定期進行測試和檢驗。
- 依從香港房屋委員會新工程合約規格中訂明的檢修要求。
- 不可超逾香港房屋委員會新工程合約規格中訂明的機械設備操作年限。
- 機械設備應放在平坦的地面操作。
- 不可超逾機械設備的最大荷載量。
- 應於大型的圓形鋼套管底部放置楔子。



在大型圓形鋼套管底部放置楔子  
Provide proper wedges at bottom of large circular steel casing



- 機械設備操作員應留意附近的障礙物和地面情況。在需要時，應由具經驗的訊號員協助。
- Plant should be operated by qualified personnel with valid certificate, inspected by competent person, tested and examined periodically by competent examiner who is a registered professional engineer in the registry of professional engineer of the Hong Kong Institution of Engineers.
- Observe the overhaul requirement laid down in the Hong Kong Housing Authority's new works contract specification.
- Do not exceed the maximum service age of plant laid down in the Hong Kong Housing Authority's new works contract specification.
- Plant should rest on level ground for operation.
- Do not exceed the maximum loading capacity of plant.
- Proper wedges should be provided at bottom of large circular steel casing.
- Plant operators should pay attention to nearby obstructions and ground surface condition and should be assisted by experienced signalers where necessary.



在平地上操作小口徑鑽樁機  
Piling machine operated on level ground



大口徑鑽孔樁一般涉及的機械  
Plant and equipment used in large diameter bored pile construction



專為吊運字H字板樁用途的吊具  
Tailor-made lifting gear for H-beam



## 9 地基工程 Piling Works

### 起重操作 Lifting

- 每件起重機械均應標明安全荷載量。
- 機械設備操作員應知悉吊運物料的總重量和起重裝置的荷載量。
- 每次起重操作，應有一名訊號員。
- 吊索或鐵鏈等起重裝置應妥為貯存，遠離腐蝕性化學品，以免被侵蝕。
- 索具工應確保吊運的物品沒有拉扯到附近其他物件，才可向訊號員發出已準備好吊運的訊號。
- 應圍封起正進行吊運工作或機械設備正在移動的危險區域及設立警示牌，未獲授權人士不得入內。
- 為舊式吊重機/打樁機提供標記，讓起重機操作員瞭解吊索下降的距離，從而得知大口徑鑽孔樁內泥夾的位置。

- Safe working load should be clearly marked on each lifting appliance.
- Plant operators should know the total weight of materials to be lifted and the capacity of lifting gears.
- There should be a signaller engaged for lifting operation.
- The lifting gears such as wire or chain sling should be properly stored and not subject to attack by corrosive chemicals.
- Rigger should make sure the load to be lifted is not clung to other objects in vicinity before giving signal to the signaller that the load is ready for lifting.
- Fence off the danger zone in which lifting operation is in progress or plant is manoeuvring and display warning notices. No unauthorized entry of any person is allowed.
- Crawler crane (older type)/piling rig should be provided with an indicator/markings so that the operator can know the dropping distance of the sling and therefore the position of the grab for operation inside a large diameter bored pile.



訊號員手持電子通訊儀器，確保吊運過程順利／安全。

Signaller with electronic equipment to ensure a smooth/safe lifting operation



索具工手持引導繩，確保吊運過程安全。

Rigger with guiding rope to ensure a safe lifting operation



加設吊索以提升安全度（樁錘頭）

Additional sling to enhance safety (hammer head)

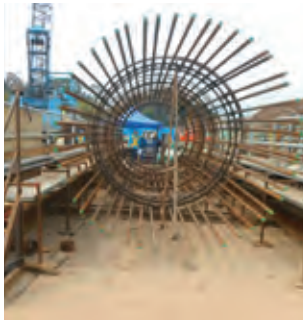


## 鋼筋籠 Reinforcement Casing

- 工人應明白以體力處理操作方式搬運鋼筋的安全方法，並予以實行。
- 紮鋼筋籠的鐵線尾端應朝籠內方向。
- 應按照建造業議會發出的《扎結鑽樁鐵籠指引》，在平地紮結鋼筋籠。
- Ensure workers understand and carry out manual handling of reinforcement in a safe manner.
- End portion of steel wire for erection/tying reinforcement casing should point to inside of casing.
- Erect the reinforcement cage on level ground with reference to the Construction Industry Council Guidelines on Fabrication of Reinforcement Cages of Bored Piles.



紮結鋼筋籠的鐵線應朝籠內方向  
Tying wire to reinforcement casing  
arranged to point inside



為安全紮結鋼筋籠提供工作平台  
Working platform provided for safe  
erection/tying of reinforcement  
casing



為安全紮結鋼筋籠提供弧型結構支  
架底座  
Arc-shaped fabrication frame  
provided for a safe erection/tying of  
reinforcement casing

## 架空電纜 Overhead Cables

- 除非得到許可，否則切勿在架空電纜附近操作打樁機或起重機械。
- 在架空電纜附近操作機械設備時，須採取適當的防護措施，例如使用龍門架。
- Do not operate piling or lifting appliance near overhead cables unless with permission.
- Appropriate precautionary measures such as portal frame should be needed for plant operation near overhead cables.



在一般情況下，不得在架空電纜附  
近進行吊運工作  
Under normal circumstances, no  
crane operation allowed adjacent to  
overhead cables



## 9 地基工程 Piling Works

### 工地整理 Housekeeping

- 為地盤做好排水和清除地面積水，避免工人誤踏地面的洞穴或孔口。
- Proper site drainage and clearance of water ponds to prevent risk of tramping into holes or cavities in ground.



圍封工作地區及為移動機械安裝防撞棒  
Fence off works area and provide warning rod on moving plant



圍起施工範圍防止工人意外墮入洞穴  
Fencing off works area to prevent accidental fall into holes

### 電弧焊接、氣體焊接和火焰切割

### Electric Arc Welding, Gas Welding and Flame Cutting

- 電弧焊接的工作，必須由合資格電焊工進行。
- 圍封工作範圍。
- 氣體焊接和火焰切割的工作，只可由接受過強制性安全健康訓練並持有效經《工廠及工業經營（氣體焊接及火焰切割）規例》發出証書的人員進行。
- 定期檢查火焰切割器具有否漏氣迹象。
- 乙炔氣瓶和氧氣瓶均須裝上防止回火安全掣。
- 止回閥應設於吹管每個氣體入口，防止氧氣回流至燃氣供應，或燃氣至氧氣供應。
- 焊接機電線須有足夠負荷量，所有電路均有適當的地線。



曾受訓練的焊工在進行火焰切割／電弧焊接時佩戴個人防護裝備，例如護目鏡、面罩、手套等。

Trained welder carrying out flame cutting/arc welding with personal protective equipment such as goggle, mask, glove



- 工人應配戴合適個人防護裝備，如認可護眼用具，眼罩，手提護盾，圍裙及燒焊手套等。
- 須以火焰切割的高身物件應使用起重機或其他設施吊在適當位置，以免倒下。
- Electric arc welding work should be conducted by competent welding worker.
- Screen off the works area.
- Gas welding and flame cutting work should only be performed by a person who has completed a mandatory safety and health training and possessed a valid certificate under the Factories and Industrial Undertakings (Gas Welding and Flame Cutting) Regulation.
- Periodic checking of flame cutting apparatus for sign of gas leakage.
- Flashback arrestor should be installed to both acetylene and oxygen cylinders.
- Non-return valve at each gas inlet of the blowpipe to prevent back-feeding of oxidant gas to the fuel gas line and vice versa.
- Adequate loading capacity of electrical cables of welding machine and proper earthing of electrical circuitry.
- All welders should wear proper personal protective equipment such as approved eye protectors, hand shield, aprons and gloves, etc.
- Tall object to be flamed cut should be hung in place by crane or other device to prevent the object from falling down.

## 噪音 Noise

- 在噪音環境下工作須戴上認可的護耳罩。
- 經常潤滑機械的活動部分，把機器的「生口板」關上，以及定期進行檢查和維修保養，以減少噪音。
- Wear approved ear protector in noisy working environment.
- Lubrication of moving parts of machine, closing access cover or inspection panel of machines and periodic inspection and maintenance to reduce noise generated.



在噪音環境下工作應佩戴合適的護耳罩或耳塞  
Suitable ear muff or ear plugs adopted in a noisy working environment

## 9 地基工程 Piling Works



整個打樁過程須使用膠墊以減少噪音  
Plastic cushion to reduce noise generated during the course of piling



利用隔音罩減少噪音  
Reduce noise by means of noise barrier



利用震鎚減少打閉板樁產生的噪音  
Noise attenuation using vibration hammer during sheet piling installation



### 處理廢氣 Exhaust Control

- 為機器安裝廢氣淨化器以減少廢氣排放。
- Reduce emission of exhaust gas by installing exhaust – cleaning equipment to plant.



廢氣須經廢氣淨化器過濾後才可排放到大氣中  
Exhaust gas filtered by exhaust-cleaning equipment before discharging to atmosphere



## 危險物質 Dangerous Material

- 在打樁工程中最常接觸到的危險物質為水泥和塵埃，這些物質可引致皮膚病或其他疾病。
- 為危險物料加上適當的標籤，防止因誤用而引起意外。
- 適當使用個人防護裝備，適當貯存危險物料，以及清楚知道在緊急情況下的應變計劃。



應為危險物料貼上標籤，及妥善存放於訂明的地方  
Dangerous materials should be properly labeled and stored in designated area

- Cement and dust are common dangerous material encountered during piling works and could cause skin disease or other health issues.
- Proper label of dangerous materials can prevent inadvertent use and avoid accident.
- Proper use of personal protective equipment, proper storage of dangerous material, and good knowledge of contingency plan in case of emergency should be observed.

## 個人防護裝備 Personal Protective Equipment

- 戴上配有Y型下頷索帶的透氣安全頭盔和穿著安全鞋。
- 高空工作時佩戴連接獨立救生繩或穩固繫穩物的全身式安全帶。
- 穿著反光衣。
- 酷熱天氣下工作時穿著建造業工人抗熱工作服。
- 燒焊工人應佩戴認可護目鏡、手提護盾，並在需要時戴上呼吸器具。
- 在噪音環境下工作時，戴上認可護耳罩。
- 處理有毒或刺激性物質時，戴上隔熱手套／圍裙和呼吸器具。



開工前，工人需要配戴合適的個人防護裝備  
Workers should put on appropriate personal protective equipment before works commencement



工作時選擇和佩戴適當的個人防護裝備  
Select and wear suitable personal protective equipment for works



## 9 地基工程 Piling Works

- Wear ventilated safety helmet with y-type chin strap and safety shoes.
- Wear safety harness linked to independent lifeline or a fixed and secure anchor when working at height.
- Wear reflective clothing.
- Wear anti-heat stress construction uniform in hot weather.
- Welders should wear approved eye protector, hand held shield and respiratory apparatus if necessary.
- Wear approved ear protector in noisy environment.
- Wear heat insulated gloves/apron and respiratory apparatus when handling poisonous or irritating substances.

### 貯存物料 Storage of Materials

- 所有物料應以安全的方式整齊堆放。
- All materials should be stacked neatly and in a safe manner.



在指定並圍起的範圍內整齊堆放物料  
Materials stacked neatly in a designated and fenced area



鋼筋籠底部放置楔子  
Proper wedges to be provided at bottom of reinforcement casing



在指定並圍起的安全範圍內整齊堆放物料  
Materials stacked neatly in a safe fenced and designated area





## 參考資料

### 相關法例和規例

- 《工廠及工業經營條例》
- 《建築地盤（安全）規例》
- 《工廠及工業經營規例》
- 《工廠及工業經營（噴砂打磨）特別規例》
- 《工廠及工業經營（職業病呈報）規例》
- 《工廠及工業經營（在壓縮空氣中工作）規例》
- 《工廠及工業經營（保護眼睛）規例》
- 《工廠及工業經營（工作噪音）規例》
- 《工廠及工業經營（安全管理）規例》
- 《工廠及工業經營（起重機械及起重裝置）規例》
- 《工廠及工業經營（氣體焊接及火焰切割）規例》
- 《工廠及工業經營（負荷物移動機械）規例》
- 《職業安全及健康條例》

### 相關安全標準、工作守則、安全指引和指南

- 《工廠及工業經營（工作噪音）規例簡介》（勞工處）
- 《安全使用挖土機工作守則》（勞工處）
- 《扎結鐵籠指引》（建造業議會）
- 《工作安全指引—手工電弧焊的觸電危險》（勞工處）

## References

### Relevant Ordinances and Regulations

- Factories and Industrial Undertakings Ordinance.
- Construction Sites (Safety) Regulations.
- Factories and Industrial Undertakings Regulations.
- Factories and Industrial Undertakings (Blasting by Abrasives) Special Regulations.
- Factories and Industrial Undertakings (Notification of Occupational Diseases) Regulations.
- Factories and Industrial Undertakings (Work in Compressed Air) Regulations.
- Factories and Industrial Undertakings (Protection of Eyes) Regulations.
- Factories and Industrial Undertakings (Noise at Work) Regulation.
- Factories and Industrial Undertakings (Safety Management) Regulation.
- Factories and Industrial Undertakings (Lifting Appliances and Lifting Gear) Regulations.
- Factories and Industrial Undertakings (Gas Welding and Flame Cutting) Regulation.
- Factories and Industrial Undertakings (Loadshifting Machinery) Regulation.
- Occupational Safety and Health Ordinance.

### Relevant Safety Standards, Codes of Practice, Guidance Notes and Guidelines

- A Guide to the Factories and Industrial Undertakings (Noise at Work) Regulation. (LD)
- Code of Practice on Safe Use of Excavators. (LD)
- Guidelines on Fabrication of Reinforcement Cages of Bored Piles. (CIC)
- Guide for Safety at Work – Electric Shock Hazard of Manual Electric Arc Welding Work. (LD)

# 10 拆卸工程 Demolition Works

## 危害識別 Hazards

- 對公眾安全和鄰近環境構成危險
- 高空墮物
- 人體從高處下墮
- 被困於倒塌的建築物內
- 被下墮物件擊中
- 腐蝕性物質
- 肺塵埃沉着病（由石棉、鉛、灰塵等引起）
- 噪音
- 爆炸／火警／觸電（損壞水管、渠道、電線、煤氣管、易燃物品、光纖、電話、電訊、電台及電視纜線等）



有害物料如石棉要妥善儲存及放置在恰當地方

Harmful substances such as asbestos must be stored / placed properly

- Endangering public safety and adjacent environment;
- Fall of object from height;
- Fall of person from height;
- Being trapped in collapsed building;
- Being struck by falling object;
- Corrosive substances;
- Pneumoconiosis (e.g. asbestos, lead, dust);
- Noise;
- Explosion/fire/electric shock (damage to live water pipes, drainage, electricity, gas, flammable substance, optical fibre, phone telecommunication, radio and TV lines)

## 拆卸計劃 Demolition Plan

- 現場勘察：結構圖（改動、現狀）、鄰近建築物、易燃物品、有害物質和現有的屋宇裝備等。
- 制訂拆卸計劃，列明拆卸工序、施工方案、安全預防措施和應變措施，供各有關當局核准。拆卸計劃須：
  - 顯示攝錄鏡頭的位置；

Table 1: Daily Demolition Work Inspection Checklist for Demolition Works (DDW-F01)

Table 2: Daily Demolition Work Inspection Checklist for Demolition Works (DDW-F02)

Table 3: Daily Demolition Work Inspection Checklist for Demolition Works (DDW-F03)

每日檢查清單用以識別拆卸工程的潛在危害

Daily inspection checklist helps to identify potential hazards of the demolition works



## Follow the process control programme to keep a safe work site

- 列明對已識別危害所採取的預防措施；
- 備有工地安全監督計劃；
- 取得各級人員的共識，並一致遵行；
- 如有需要，因應不能預知的危害修訂拆卸計劃，並讓各工作單位知悉各項變動。
- 安排安全訓練。
- 提供急救設施。
- 備存勘察資料、安全訓練記錄和檢查報告，供隨時查閱。



拆卸機械通過斜道駛至下一層

Demolition plant descend a ramp to a lower level

- On-site surveys: structural plan (alteration, existing condition), adjacent buildings, flammable substance, substances hazardous to health and existing building services etc.
- Demolition plan approved by relevant authorities, with sequence, method statements, safety precautions and contingency measures:
  - showing location of video camera.
  - with precautions to combat identified hazards.
  - provide site safety supervision plan.
  - to be agreed and observed by all levels of staff.
  - if necessary, to be revised to cope with unforeseeable hazards and inform all parties of any changes.
- Safety training.
- First-aid facilities.
- Information of surveys, safety training records and inspection reports should be documented and readily accessible.

## 10 拆卸工程 Demolition Works

### 截斷公用設施裝置 Disconnection of Services

- 開始拆卸工程前，必須截斷所有公用設施裝置的管道。
- Disconnect all services connections before commencement of demolition works.



拆卸工程前，要求電力公司必需把主供電截斷  
Prior to demolition, the main power supply must be dead and disconnected by Power Company

### 圍板和棚架 Hoarding and Scaffolding

- 架設圍板和棚架圍封拆卸工程範圍。
- 所用圍板和棚架必須以不可燃燒物料製造。
- Provide hoarding and scaffolding to enclose demolition works area.
- All materials used to be non-combustible.



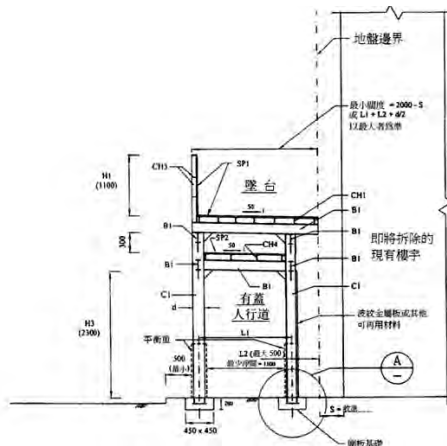
在圍板和有蓋行人路提供臨時照明，以方便行人。  
Hoarding and covered walkway with adequate temporary lighting for pedestrian



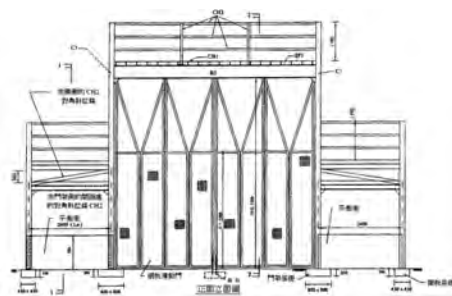
利用保護幕和以塑膠或柏油帆布製造的隔塵網，圍封整幢須拆卸的建築物，再搭建中層斜棚。  
Building to be demolished to be fully enclosed by protective screen and dust screens of plastic or tarpaulin sheet, with intermediate catch-fans



沿地盤界線的圍板和有蓋行人路設置墜台，以保護行人。  
Hoarding and covered walkway with catch platform along the site boundary to protect pedestrian



根據屋宇署《認可人士及註冊結構工程師作業備考APP-21》所示的樣本，墜台和有蓋行人道屬不同的結構構件  
Catch platform and covered walkway are 2 separate elements as shown on PNAP APP-21 of BD



屋宇署《認可人士及註冊結構工程師作業備考APP-21》所示的門架樣本  
Example of gantry from PNAP APP-21 of BD



## 10 拆卸工程 Demolition Works

### 污染 Contamination

- 如建築物被化學品或有毒物質污染，須清除污染物，或向工地人員提供防護裝備。
- In case of building contaminated by chemical or poisonous material, remove the contamination or provide protective equipment to site personnel.



拆卸工程前，應取樣檢驗懷疑受污染的土壤：受污染的物质必須被移離  
Prior to demolition, soil sample should be collected/ tested and the contaminated soil must be removed

### 作好準備 Preparation

- 每日早上展開拆卸工程前，所有適任技術人員和安全主任須巡查各項預防和安全措施。
- 按照拆卸計劃提供足夠的支撐物／支柱，防止建築物在工程期間倒塌或損壞附近物業。
- Morning walk by all technical competent persons (TCPs) and safety officer to check all precautionary and safety measures every day prior to starting demolition works.
- Sufficient shoring and propping according to demolition plan to prevent the structure from collapse or causing damage to adjacent property during the course of demolition.



適任技術人員和安全主任須確保已採取足夠的預防和安全措施  
Checking by TCPs and safety officer to ensure adequate precautionary and safety measures provided



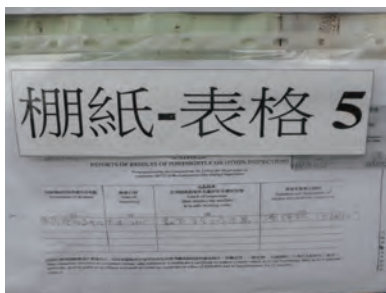
提供支撐和支柱承托須拆卸的建築物  
Shoring and propping for buildings to be demolished



## 高空工作

### Working at Height

- 提供合適的工作平台／棚架。
- 提供合適的護欄、踢腳板和工作平台通道。
- 合資格人員須對工作平台進行使用前檢查和定期檢查，並填報及貼上由建築地盤（安全）規例要求的表格5。
- 如提供工作平台並不可行，便須採取其他安全措施，例如提供防墮裝置，以防止從高處墜下。



於顯眼位置，掛上已批核的表格5  
Duly signed Form 5 displayed on conspicuous space

- Provide suitable working platform/scaffolding.
- Provide proper guard-rails, toe-board and access to working platform.
- Working platform needs to be inspected by competent personnel before use and periodically. Display Form 5 (under the Construction Sites (Safety) Regulations) which has been duly signed.
- In case provision of working platform is not feasible, provide other safety measures such as fall arrest system to prevent falling from height.

## 使用重型機械

### Use of Heavy Machinery

- 使用挖掘機、搬土機等重型機械前，須先進行評估和加固樓宇結構，以確保建築物能承受重型機械和拆卸物料的重量。
- 劃定機械的安全活動範圍。
- 機械操作員必須完成適當的樓宇拆卸訓練課程並取得屋宇署認可的相關證書。
- 監督安全拆卸施工程序的執行情況。
- 依從合約對大型建築機械裝置的規格所訂明的檢修要求和使用年限。



使用合適的重型機械進行拆卸工程  
Suitable heavy machinery for demolition works

- Before using heavy machinery such as excavator or earth moving machine, carry out assessment and strengthen the building structure so that it can withstand the weight of machinery used and debris resulting from demolition.
- Delineate the working zone of machinery.
- Plant operator must complete an appropriate building demolition training course and obtain relevant certificate accepted by BD.
- Supervise the implementation of safe demolition working procedures.
- Observe the overhaul requirements and age limit of major construction plant mentioned in specification.

## 10 拆卸工程 Demolition Works

### 塵埃管理 Dust Control

- 評估產生塵埃（例如石棉塵、鉛塵、矽塵埃等）的風險。
  - 石棉塵必須由註冊石棉承辦商處理。
  - 採取防塵措施，例如灑水和架設隔塵網。
  - 佩戴合適的護目鏡、口罩等。
  - 工人應注意個人衛生，飲食前先洗手和洗臉。
- 
- Assess the risk of generation of dust such as asbestos dust, lead dust and silica dust.
  - Asbestos dust must be handled by registered asbestos contractor.
  - Take precautionary measures to control dust, e.g. water spraying and dust-proof net.
  - Use and wear appropriate goggles, masks, etc.
  - Workers should pay attention to personal hygiene: wash their hands and faces before eating and drinking.



在工地灑水以減少塵埃飄散  
Spraying water to reduce the risk of spreading dust from the works site

### 噪音和震盪 Noise and Vibration

- 使用較寧靜的機械或工具。
  - 評估工作區的噪音水平。
  - 在高噪音的機器上貼上警告標示，提醒在附近工作的工人。
  - 確保聽覺保護區內所有人員均佩戴認可的聽覺保護器。
  - 使用風鑽和風炮時須穿戴防護手套，避免因震盪而受傷。
- 
- Use machinery or tools of lower noise level.
  - Assess noise exposure levels of workers.



為拆卸工程範圍提供隔音屏障  
Noise screen provided for demolition works



## Follow the process control programme to keep a safe work site

- Post warning sign on noisy machinery to remind workers working in the vicinity.
- Ensure all personnel to wear approved ear protector within the hearing protection zone.
- Wear protective gloves to avoid injury arising from vibration when using pneumatic drills and breakers.



使用隔音屏阻隔產生的噪音  
Noise shelter to screen the noise generated



使用低噪音油壓器械進行拆卸工作  
Low noise hydraulic breaker for demolition works

### 拆卸樓宇結構／臨時結構

### Demolition of Building/Temporary Structure

- 依從已核准的拆卸施工程序和採取相關的安全措施。
- 確保已切實採取穩定拆卸物的安全措施。
- Observe approved working procedures of demolition and related safety measures.
- Ensure implementation of safety measures to stabilize the building being demolished.



遵守拆卸施工步驟  
Observe approved working procedure of demolition



正確執行施工步驟／程序，確保拆卸工程安全進行。  
Proper working steps/procedures to enhance safety for demolition works



## 10 拆卸工程 Demolition Works

### 火焰切割工作的安全措施 Safety of Flame Cutting

- 把所有易燃物品移離火焰切割工作範圍。
- 火焰切割工作範圍下面的地方亦不應擺放任何易燃物品。
- 確保工地空氣流通，或使用機械通風裝置，以防止金屬煙霧積聚。
- 燒焊工人需持有效經《工廠及工業經營（氣體焊接及火焰切割）規例》發出的証書及佩戴個人防護裝備，例如設有Y型下頷索帶的安全頭盔、認可護目鏡、手套、呼吸器、圍裙、安全鞋等。
- 清理燒焊後遺留的火屑，提供滅火器具和在工程範圍禁止吸煙。

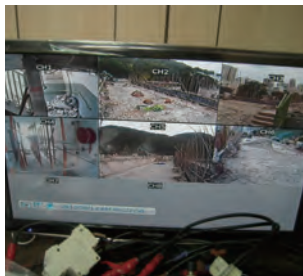


在火焰切割工作時，焊接工人應佩戴合適的個人防護裝備  
Welder should put on adequate personal protective equipment during the course of flame cutting works

- Remove all combustible materials away from work areas for flame cutting.
- The area below the work areas for flame cutting should also be cleared of all combustible materials.
- Ensure good ventilation or use mechanical ventilation so that no metallic vapours accumulate.
- Welder should possess valid certificate under (Factories and Industrial Undertakings (Gas Welding and Flame Cutting) Regulation) and wear suitable personal protective equipment such as safety helmet with Y-type chin strap, approved eye protector, gloves, respirator, apron, safety shoes etc.
- Remove burns left after welding, provide fire-fighting equipment and prohibit smoking in works area.

### 攝錄鏡頭和視像記錄 Video Camera and Record

- 在適當位置安裝攝錄鏡頭，拍攝整個拆卸工地。
- 拆卸計劃圖則須展示攝錄鏡頭的位置。
- 攝錄鏡頭須在工作樓面的拆卸工程完工後才拆除。
- 記錄整個拆卸過程，以供日後參考和檢討。
- 視像記錄須至少保存60天。



安裝閉路電視系統監察拆卸工地的各個區域。  
CCTV system to monitor various areas of the demolition site.



- Video cameras installed at strategic locations to cover the entire demolition works area.
- Video camera locations to be shown in demolition plan.
- Cameras to be dismantled upon completion of the demolition work of the working floor.
- Record the entire demolition process for reference and review purposes.
- Video records to be kept for at least 60 days.





## 紅旗 Red Flags

- 用紅旗標示拆卸機械的作業範圍，限制出入。
- Red flags for demarcating the restricted area for operation of demolition plant.



移動拆卸機械在紅旗標示的範圍內，可安全進行作業  
Red flags set up to demarcate the restricted area for safe operation of moving machinery

## 保持通道暢通無阻 Clear Access

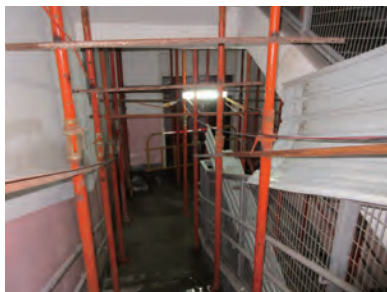
- 檢查臨時出入口、通道、梯級及其平台，以及逃生路線，確保其結構穩固，並經常保持暢通無阻。
- 分隔工人和工程車輛的通道。
- 清晰地標示已拆卸或廢棄的範圍。
- Inspect temporary access, passages, staircases, landing and means of escape to ensure access ways are stable, maintained clear and unobstructed at all times.
- Separate access for workers and works vehicles.
- Clear signs for dismantled or abolished areas.



保持暢通無阻的通道  
Clear/clean access

## 照明 Lighting

- 緊急通道和逃生路線應經常維持充足的照明。
- Sufficient lighting for emergency access & escape route at all time.



出入口應保持充足照明  
Adequate temporary lighting for access and egress

## 10 拆卸工程 Demolition Works

### 消防裝置和走火通道 Fire Services Installation & Fire Escape

- 在每幢樓宇指定的樓梯平台放置滅火筒和滅火沙桶。
- Fire extinguisher and sand pack at selected staircase landings in every block.



在梯間適當的位置提供滅火筒／滅火沙桶  
Fire extinguisher/sand pack at staircase

### 惡劣天氣 Inclement Weather

- 在惡劣天氣下不得進行拆卸工程。
- No demolition work in inclement weather.



雷暴警告  
Thunderstorm  
warning



暴雨警告  
Rainstorm  
warnings



熱帶氣旋警告  
Tropical  
cyclone

惡劣天氣下不得進行拆卸工程  
No work during inclement weather

### 消滅污染 Pollution Abatement

- 採取消滅噪音和空氣污染的措施。
- Take measures to abate noise and air pollution.

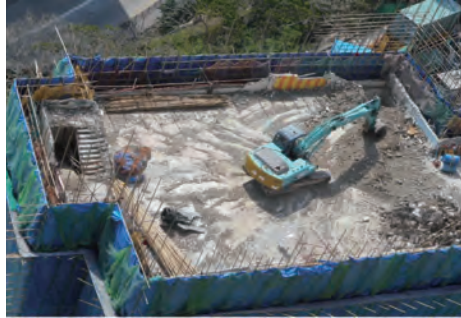


妥善處理有污染的物料  
Proper handling of pollution materials



## 不可超出負荷 No Overloading

- 瓦礫、機器和廢物的重量不可超出樓宇結構的負荷。如有需要，應為工人提供安全帶和獨立救生繩。
- Do not overload the building structure or scaffolding due to debris, machinery and waste. If necessary, provide safety harness and independent lifeline for workers.



拆卸下的廢料，應及時移除，以免超出負荷  
Debris on the demolishing floor must be removed/cleared regularly to avoid overload to the structure

## 物件下墮 Falling Object

- 為免物件下墮，切勿在牆洞和地洞附近放置任何物品。
- 妥善貯存瓦礫、工具和裝備，以免物件下墮。
- 使用工具袋和工具繩，縛好容易鬆脫的部件。
- 現有樓宇內原本以繩索或吊索懸吊物件（例如升降機機廂和對重裝置）應加以固定，以待日後拆除。
- 在外牆設置保護幕。
- 豎設圍欄分隔拆卸工程範圍與路人。
- 工地內所有人士均應佩戴設有Y型下頷索帶的安全頭盔和安全鞋。



在樓面地台開口位置，應豎設圍欄防止物料下墮  
Hole/opening on the demolishing floor should be protected with fencing from falling object

- To prevent falling object, do not place materials near openings on walls and floors.
- Properly store demolition debris materials, tools and equipment to prevent falling object.
- Properly fix all loose parts with bags and strings.
- Objects which are originally hung by ropes or wires in existing building need to be fixed in position for removal, e.g. the counterweight and lift car.
- Provide protective screen on external walls.
- Provide fencing to separate the public from the demolition works area.
- All people on the site should wear safety helmets with y-type chin straps and safety shoes.

## 10 拆卸工程 Demolition Works

### 拆除石棉 Asbestos Removal

- 按照環境保護署的規定安排收集和處置石棉廢物，以免石棉纖維漏出。
- 確保所有石棉拆除工作由認可專門承辦商按照勞工處的要求以保障工人的安全及健康。
- Arrange collection and disposal of asbestos waste in accordance with the requirements of Environment Protection Department to avoid leakage of asbestos fibers.
- Ensure all asbestos removal works are conducted by approved specialist contractor in accordance with the requirements of the Labour Department to ensure the safety and health of workers.



為處理石棉的工人提供的全身防護衣物  
Full protective clothing for workers handling asbestos



以帆布完全圍封石棉工程範圍  
Full enclosure of asbestos work zone by canvas sheet



方便工人脫除防護衣物的洗衣場  
Equipped laundry for workers to remove protective clothing



為工人提供防護衣物和呼吸器  
Provide protective clothing and respirator for all workers



貯存石棉廢物於容器內，並加上標籤  
Containers for asbestos waste and stuck with label







## 個人防護裝備 Personal Protective Equipment

- 佩戴設有Y型下頷索帶的安全頭盔和安全鞋。
- 按需要配備反光衣物、安全帶、獨立救生繩、護耳罩、手套、口罩、面罩、護目鏡。
- Wear safety helmet with y-type chin strap and safety shoes.
- Wear reflective clothing, safety harness, independent lifeline, ear muff, gloves, mask, face shield and goggles as need arises.

## 不當的作業模式 Bad Practice

- 違反安全工作程序，容易導致工業意外。
- Violation of safe working procedure will easily lead to industrial accidents.



缺乏支撐的橫樑  
No support to beam



阻塞通道  
Obstruction to circulation route



往返工作樓層的通道給廢料阻塞  
Obstructed access/egress



泥石堆積和可能掉落泥石  
Accumulation of debris



棚架損毀  
Damage of scaffolding



沒有妥善圍封／承托拆卸工程範圍  
No proper fencing/support to demolition areas



撐桿之間未有以繫條聯繫  
No tie to props



撐桿未有貼緊樓底  
Props do not support the bottom of ceiling



棚架倒塌  
Collapse of scaffolding



## 參考資料

### 相關條例和規例

- 《工廠及工業經營條例》
- 《建築地盤（安全）規例》
- 《工廠及工業經營規例》
- 《工廠及工業經營（起重機械及起重裝置）規例》
- 《工廠及工業經營（氣體焊接及火焰切割）規例》
- 《工廠及工業經營（保護眼睛）規例》
- 《工廠及工業經營（工作噪音）規例》
- 《工廠及工業經營（石棉）規例》
- 《工廠及工業經營（危險物質）規例》
- 《工廠及工業經營（吊船）規例》
- 《工廠及工業經營（安全管理）規例》
- 《職業安全及健康條例》
- 《空氣污染管制條例》
- 《廢物處置（化學廢物）（一般）規例》

### 相關安全標準、工作守則、安全指引和指南

- 《工作守則：石棉工作的安全與健康》（勞工處）
- 《工作守則：氣體焊接及火焰切割工作的安全與健康》（勞工處）
- 《建築物拆卸作業守則》（屋宇署）
- 《地盤監督作業守則》（屋宇署）
- 《工廠及工業經營（工作噪音）規例簡介》（勞工處）
- 《安全使用挖土機工作守則》（勞工處）
- 《拆卸樓宇安全工作指引》（職業安全健康局）
- 《石棉管制的工作守則》（環境保護署）
- 《處理、運送及處置石棉廢物的工作守則》（環境保護署）
- 《認可人士及註冊結構工程師作業備考APP-21》（屋宇署）
- 《專業人士環保事務諮詢委員會專業守則第2/97號》（環境保護署）
- 《Handling of Asbestos Containing Materials in Buildings》（只有英文版本）（環境保護署）
- 《安全處理少量完整石棉波紋水泥瓦片的指引》（環境保護署）



## References

### Relevant Ordinances and Regulations

- Factories and Industries Undertakings Ordinance.
- Construction Sites (Safety) Regulations.
- Factories and Industrial Undertakings Regulations.
- Factories and Industrial Undertakings (Lifting Appliances and Lifting Gear) Regulations.
- Factories and Industrial Undertakings (Gas Welding and Flame Cutting) Regulation.
- Factories and Industrial Undertakings (Protection of Eyes) Regulations.
- Factories and Industrial Undertakings (Noise at Work) Regulation.
- Factories and Industrial Undertakings (Asbestos) Regulation.
- Factories and Industrial Undertakings (Dangerous Substances) Regulations.
- Factories and Industrial Undertakings (Suspended Working Platforms) Regulation.
- Factories and Industrial Undertakings (Safety Management) Regulation.
- Occupational Safety and Health Ordinance.
- The Air Pollution Control Ordinance.
- The Waste Disposal (Chemical Waste) (General) Regulation.

### Relevant Safety Standards, Code of Practice, Guidance Notes and Guidelines


- Code of Practice: Safety and Health at Work with Asbestos. (LD)
- Code of Practice: Safety and Health at Work for Gas Welding and Flame Cutting. (LD)
- Code of Practice for Demolition of Buildings. (BD)
- Code of Practice for Site Supervision. (BD)
- A Guide to the Factories and Industrial Undertakings (Noise at Work) Regulation. (LD)
- Code of Practice on Safe Use of Excavators. (LD)
- Safety Guidelines for Demolition of Building Structures. (OSHC)
- Code of Practice on Asbestos Control (EPD)
- Code of Practice on the Handling, Transportation and Disposal Asbestos Waste. (EPD)
- Practice Note for Authorised Persons and Registered Structural Engineers (PNAP APP-21). (BD)
- Practice Note for Professional Persons (ProPECC Note 2/97). (EPD)
- Handling of Asbestos Containing Materials in Buildings. (EPD)
- Guidance Note on Safe Handling of Small Quantities of Intact Corrugated Asbestos Cement Sheet. (EPD)

## 11 密閉空間工作安全 Safety in Confined Space

### 危害識別 Hazards

- 火警、爆炸
  - 因吸入有毒氣體、缺氧或體溫上升而失去知覺
  - 窒息
  - 遇溺
  - 被腐蝕性物質灼傷
  - 觸電
  - 絆倒、滑倒或跌倒
- 
- Fire, explosion;
  - Unconsciousness due to toxic gases, lack of oxygen, rise in body temperature;
  - Suffocation;
  - Drowning;
  - Burns by corrosive substances;
  - Electric shock;
  - Trip, slip or fall.

### 密閉空間 Confined Space

- 「密閉空間」指任何被圍封的地方，而基於其被圍封的性質，會產生可合理預見的指明危險，在不局限上文的一般性的原則下，「密閉空間」包括任何會產生該等危險的沙井、密室、貯槽、下桶、坑槽、井、污水渠、隧道、喉管、煙道、鍋爐、壓力受器、艙口、沉箱、豎井或筒倉等。
- 
- 典型的地下密閉空間  
A typical confined space
- “Confined space” means any place in which, by virtue of its enclosed nature, there arises a reasonably foreseeable specified risk, and without limiting the generality of the foregoing, includes any manhole, chamber, tank, vat, pit, well, sewer, tunnel, pipe, flue, boiler, pressure receiver, hatch, caisson, shaft or silo in which such risk arises.



## 風險評估 Risk Assessment

- 在容許核准工人進入密閉空間前，必須先由合資格人士進行風險評估和發出工作許可證。
- 可參考對進入密閉空間工作的工人發出許可證的流程表。
- Risk assessment of a confined space should be conducted by a competent person and permit-to-work certificate should be obtained before certified workers are allowed to enter a confined space.
- Refer to flow chart for processing the permit-to-work before entering a confined space to carry out works.

密閉空間的風險評估應由合資格人士進行  
Risk assessment (confined space) should be completed by a competent person



清楚標示未經授權，不得進入密閉空間  
No authorized entry to confined space



在密閉空間外的當眼處應展示風險評估報告、工作許可證、安全設施檢查清單和核准工人／合資格人士證明書  
Risk assessment report, permit-to-work certificate, safety facilities checklist and certificate of certified worker/competent person displayed in a conspicuous location outside a confined space



核准工人應持有根據《工廠及工業經營（密閉空間）規例》第4(1)條發出的有效證書  
Certified workers should hold a valid certificate issued under Section 4(1) of the Factories and Industrial Undertakings (Confined Spaces) Regulations

# 11 密閉空間工作安全 Safety in Confined Space

## 工作同伴和救援行動

### Co-worker and Rescue Operation

- 提高警覺，並在發現不尋常情況時發出警號／亮起閃燈。
- 如沒有配備適當的呼吸器具、全身式安全帶、救生繩等設備，不得進入密閉空間進行救援。
- 把傷者抬離現場，到達安全地方後才進行急救。
- Be vigilant and emit siren/flash light in case of abnormality.
- No entry to a confined space for rescue operation without appropriate breathing apparatus, safety harness, lifeline, etc.
- Remove victim from the scene to a safe location before carrying out first aid.



工作同伴協助核准工人進入密閉空間  
Co-workers assist a certified worker to enter a confined space



在密閉空間入口附近設置的急救箱和滅火器具  
Provision of first aid box & fire-fighting apparatus near the entrance of a confined space

## 員工訓練 Training to Staff

- 進入密閉空間工作的工人、在外面守候的工作同伴和緊急救援人員須在以下各方面接受適當的訓練：
  - 安全工作程序；
  - 撤離程序；
  - 緊急救援行動；
  - 呼吸器具等救援裝備的應用；
  - 多種氣體探測器、緊急照明和無線通訊器材的應用；
  - 急救；
  - 對潛在風險的認識。



由安全主任和合資格人士為準備進入密閉空間的核准工人提供實地講解訓練  
On-site training given by a safety officer and competent person to a certified worker ready to enter a confined space





## Strictly follow work procedures to prevent accident

- All workers inside and co-workers outside a confined space and the emergency rescue team should have received proper training of
  - safe working procedure;
  - evacuation procedure;
  - emergency rescue operation;
  - use of rescue equipment including breathing apparatus;
  - use of multi-gas detector, emergency lighting, wireless communication equipment;
  - first aid;
  - knowledge of potential risk.



對進入密閉空間工作的人員和一起工作的員工給予訓練

Provide training to personnel required to enter confined space and to their co-workers

## 通風 Ventilation

- 如密閉空間可能有有毒氣體、蒸氣、塵埃，又或有氧氣供應不足或高溫的風險，便應提供機械通風設備。
- 空氣入口和排氣口必須分開。
- 機械設備的排氣口須遠離密閉空間入口。
- Provide mechanical ventilation for confined space, where there is a risk of poisonous gases, steam, dust, insufficient oxygen supply or high temperature.
- The air inlet and exhaust should be separated.
- Locate exhaust pipe of plant away from the opening of a confined space.



吹風機為密閉空間提供鮮風的主要機械

An air blower provided for mechanical ventilation of confined space

## 11 密閉空間工作安全 Safety in Confined Space



在密閉空間入口提供機械通風／救生繩  
Mechanical ventilation/lifeline provided at the entrance fo confined space



為深井提供機械通風系統  
Deep well provided with mechanical ventilation



機械通風系統需為密閉空間抽入足夠的鮮風  
Fresh air supply via mechanical ventilation system to a confined space



### 沙井 Manhole

- 在容許核准工人進入沙井前，必須先由合資格人士進行風險評估和發出工作許可證。
- 救生繩的一端，應穩妥地繫在進入密閉空間工作的核准工人的全身式安全帶上，而另一端則由在密閉空間外守候和監察的工作同伴手持着。



使用經過校準的氣體探測器量度密閉空間內有毒／易燃氣體的濃度



A calibrated gas detector used to measure the concentration of poisonous/flammable gases inside a confined space



- 每更開始前，合資格人士必須使用經過校準的氣體探測器測試密閉空間不同位置的空氣，確保適合呼吸才可讓工人入內工作。例如，在早更已進行空氣測試，午飯後便須再測試空氣，方可讓工人入內工作。由於午飯時間關掉密閉空間的機械通風，因此兩更的空氣質素或會改變。
- Risk assessment of a manhole should be conducted by a competent person and a permit-to-work certificate is required for certified workers before being allowed to enter a confined space.
- A lifeline should be tied securely to the safety harness of the certified worker entering a confined space and the other end should be held and monitored by a co-worker outside the confined space.
- Before every shift in which workers enter a confined space, a competent person needs to conduct air-testing in various areas of the confined space with calibrated gas detector to make sure that the air is fit for breathing. For example, after the air test in the morning session, another air test should be conducted after lunch before workers enter the confined space in the afternoon. The air quality may have changed between the morning and afternoon shifts when the mechanical ventilation of the confined space is switched off.



在密閉空間工作時，工人的救生繩需繫穩在密閉空間外  
The lifeline of the worker working inside the confined space is tied securely outside a confined space



安全主任以氣體探測器測試密閉空間內的空氣成份  
Safety officer uses multi-gas detector to conduct air-testing of the confined space



安全主任應在工作許可證上記錄空氣測試結果  
Safety officer records the results of air test of a confined space in the certificate

# 11 密閉空間工作安全 Safety in Confined Space

## 火警和爆炸風險 Fire Risk and Explosion

- 如密閉空間存在火警或爆炸風險，所有電器必須防火和防爆。
- 所有連接至密閉空間的管道和線槽均須切斷隔離。
- 所有電器均須接地，並須採用低壓電力裝備以防止觸電。

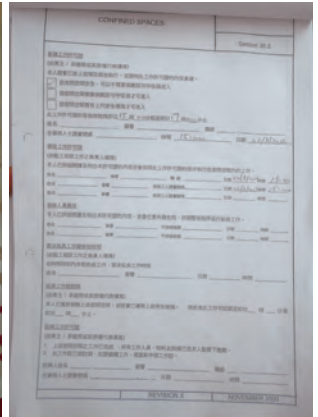


在密閉空間附近設置滅火器具  
Provision of fire-fighting apparatus near a confined space

- Where there is a risk of fire or explosion in a confined space, all electrical appliances adopted should be fireproof and explosion-proof.
- Isolate/shut off all pipelines and ducts connected to the confined space.
- Earth all electrical apparatus and use low voltage equipment to avoid risk of electric shock.

## 工作許可證 Permit-to-work

- 沒有工作許可證，不得進入密閉空間。
- 如許可證上規定的時間已過，任何人均不得繼續留在或進入該密閉空間。
- 工作許可證和風險評估報告必須張貼於密閉空間外的當眼處。



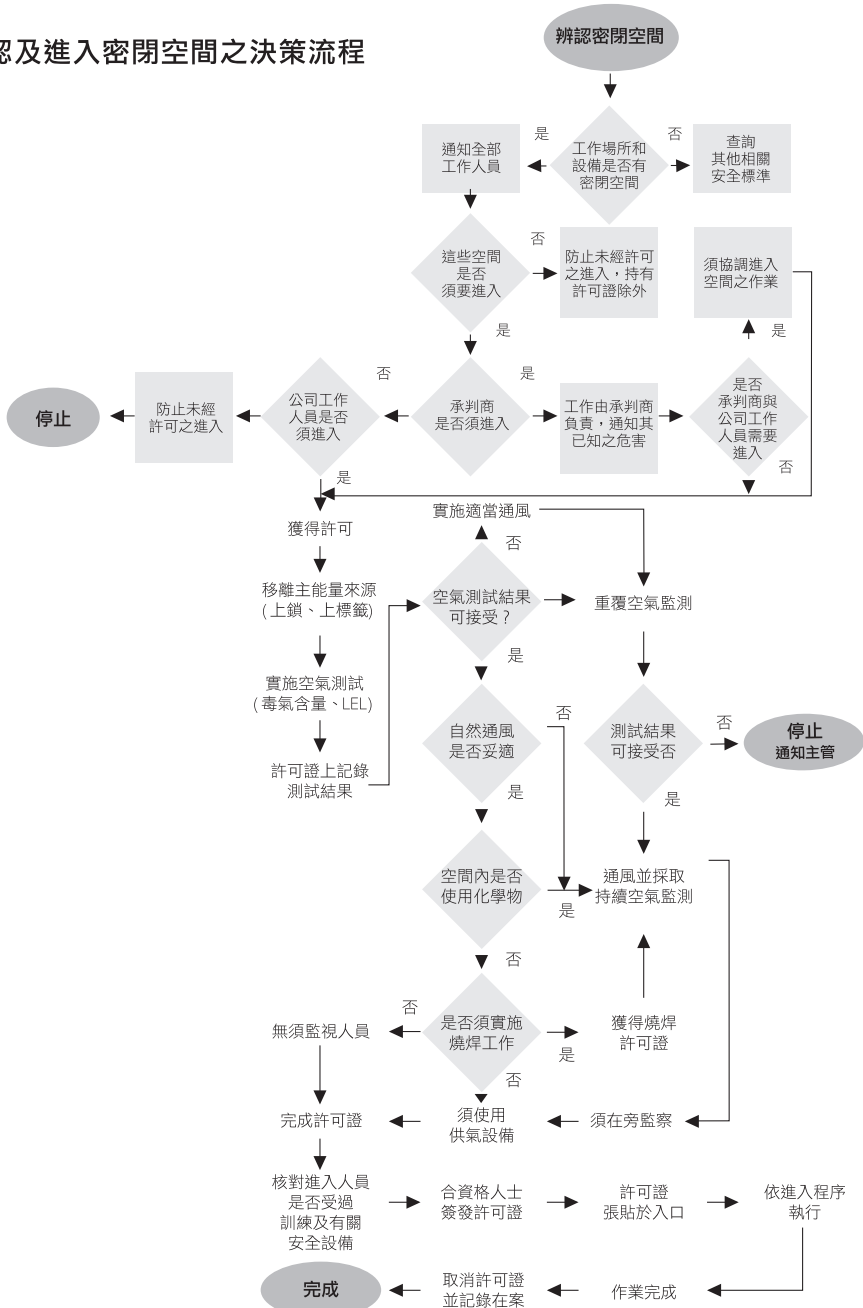
由合資格人士發出，准許進入密閉空間的工作許可證。  
Permit-to-work certificate obtained from competent person for entering a confined space

- No entry to a confined space without a permit-to-work certificate.
- No people should stay in or be allowed to enter a confined space when the permit-to-work certificate expires.
- Post the permit-to-work certificate and risk assessment report at a conspicuous location outside the confined space.



## 辨認和進入密閉空間的決策流程 Procedure for Identifying and Entry into Confined Space

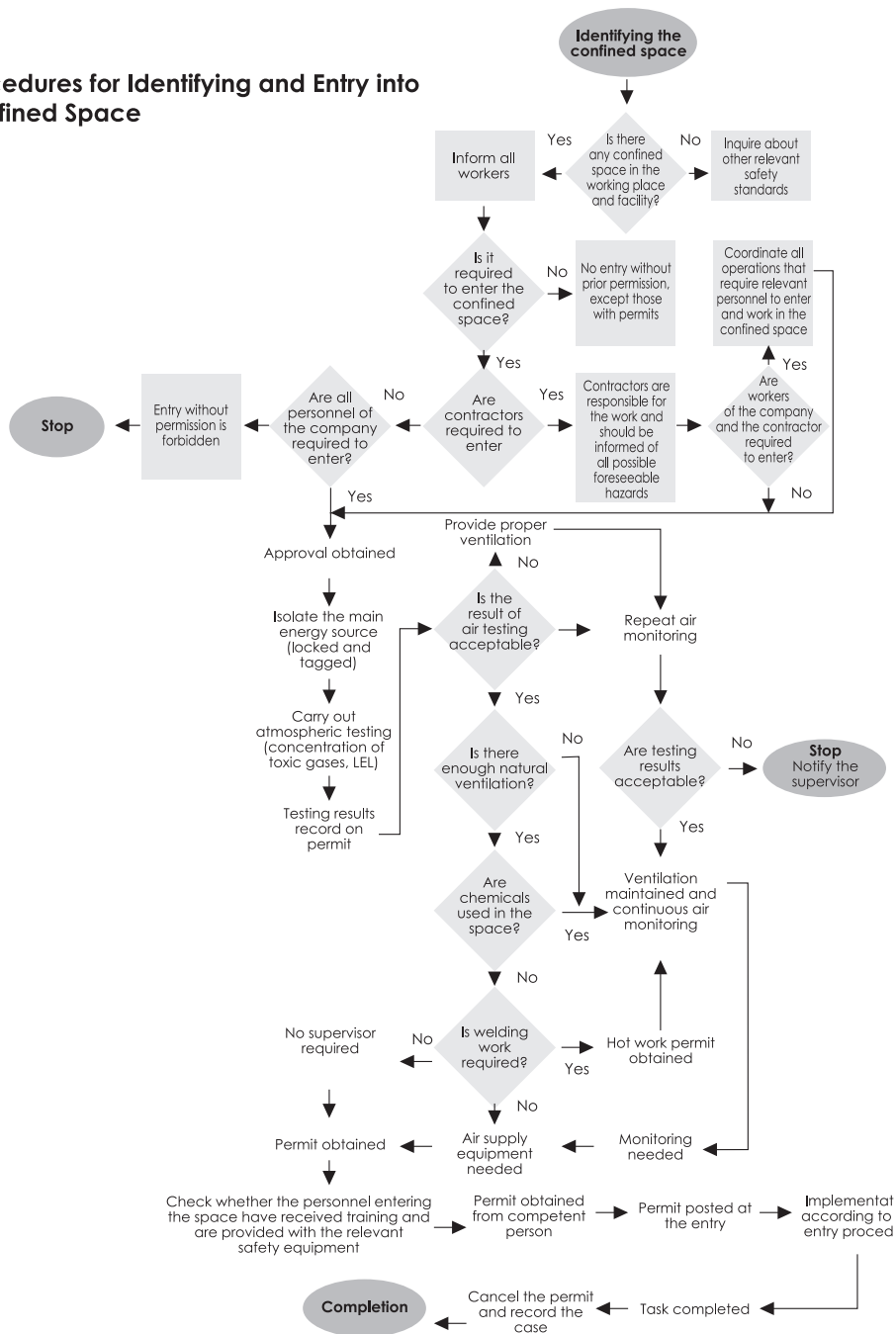
### 辨認及進入密閉空間之決策流程





# 11 密閉空間工作安全 Safety in Confined Space

## Procedures for Identifying and Entry into Confined Space

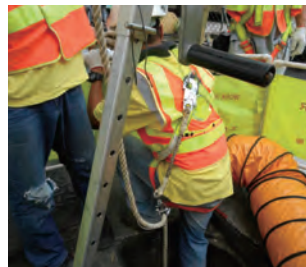




## 應急計劃

### Emergency Plan

- 制訂應急計劃／救援程序和步驟／要求當區政府部門（例如消防處）提供緊急服務的情況。
- 成立應急隊伍。
- 定期進行演習，熟習救援行動和救援裝備的應用。



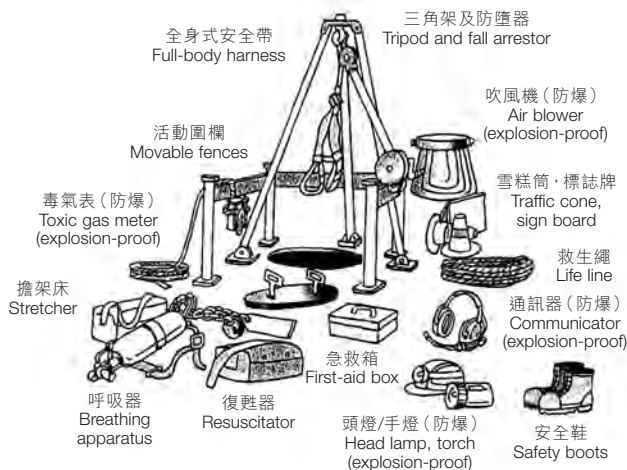
經進行演習，可熟習救援裝備的應用和核實救援程序是否正確。

Drills to practice the use of rescue equipment and validate the procedures

- Formulate an emergency plan/rescue procedure and steps/conditions to request for an emergency service from local government departments, such as Fire Services Department.
- Form a contingency team.
- Conduct drills on the rescue operation and practicing the use of rescue equipment regularly.

## 救援裝備 Equipment for Rescue

- 所有進入密閉空間的人員均須佩戴繫上救生繩的全身式安全帶。其他所需裝備如圖所示。
- All personnel entering a confined space should wear safety harness with lifeline. Other necessary equipment are shown in the attached figure.



密閉空間安全設備  
Safety equipment for confined spaces

# 11 密閉空間工作安全

## Safety in Confined Space

### 利用救生繩發出訊號 Signaling through Lifeline

- 佩戴呼吸器具時，仍然可以利用救生繩發出以下訊號：
  - 拉繩一次：需要更多氧氣。
  - 拉繩兩次：放鬆供氣喉管和救生繩。
  - 拉繩三次：求救。
- When equipped with respiratory apparatus, signal may still be sent by pulling the lifeline in the following ways –
  - pulling once: require more oxygen.
  - pulling twice: release air duct and lifeline.
  - pulling thrice: help.

### 個人防護裝備 Personal Protective Equipment

- 佩戴繫上救生繩的全身式安全帶、索緊了Y型下鎖索帶之安全頭盔及安全鞋。視乎情況，戴上護目鏡、手套、保護衣物和核准呼吸器具。
- Wear safety harness with lifeline, safety helmet with Y-type chin strap fastened and safety shoes. If necessary, put on goggles, gloves, protective clothing and approved breathing apparatus.



工人進入密閉空間前，應配備合適的個人防護裝備。  
Worker should be equipped with suitable personal protective equipment before entering a confined space



工人進入密閉空間前，應把全身式安全帶和救生繩繫穩。  
Full-body harness and lifeline securely fixed before entering a confined space



## 參考資料

### 相關條例和規例

- 《工廠及工業經營條例》
- 《建築地盤（安全）規例》
- 《工廠及工業經營規例》
- 《工廠及工業經營（密閉空間）規例》
- 《職業安全及健康條例》

### 相關安全標準、工作守則、安全指引和指南

- 《工作守則－密閉空間工作的安全與健康》（勞工處）
- 《防止石礦及建築工人患上矽肺病的指引》（勞工處）
- 《密閉空間安全須知》（職業安全健康局）

## References

### Relevant Ordinances and Regulations

- Factories and Industries Undertakings Ordinance.
- Construction Sites (Safety) Regulations.
- Factories and Industrial Undertakings Regulations.
- Factories and Industries Undertakings (Confined Spaces) Regulation.
- Occupational Safety and Health Ordinance.

### Relevant Safety Standards, Codes of Practice, Guidance Notes and Guidelines

- Code of Practice for Safety and Health at Work in Confined Spaces. (LD)
- Guidance Notes on Protection of Quarry and Construction Workers from Silicosis. (LD)
- Working in Confined Spaces. (OSHC)

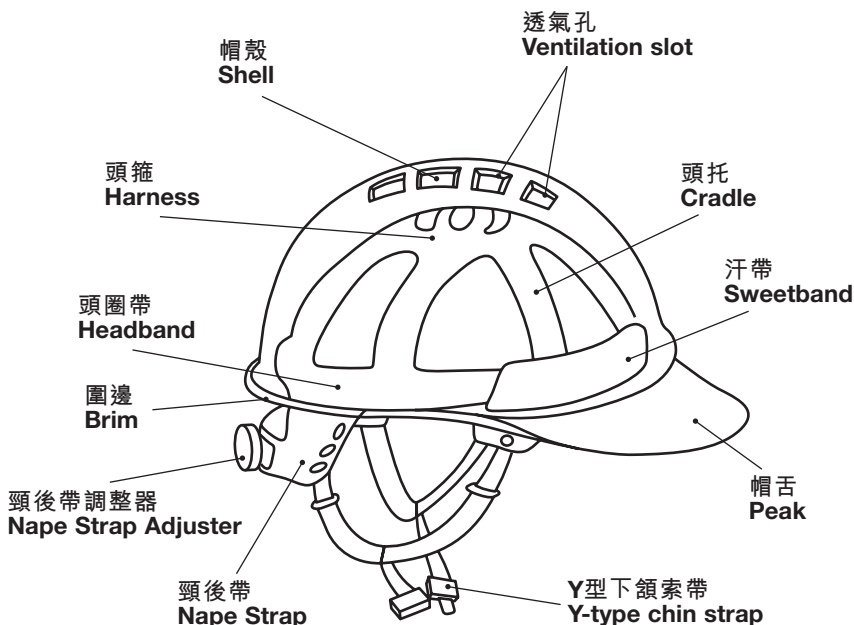
## 12 個人防護裝備 Personal Protective Equipment

### 頭盔 Helmet

- 任何人士必須佩戴適當頭盔，方可進入工地。
- 安全頭盔必須鑄有透氣孔和配備Y型下頷索帶，若有遮陽配件、耳塞、吸震頭托和哨子則更佳。
- No person is allowed to enter a construction site unless he is wearing a suitable safety helmet.
- Safety helmet to be cast with ventilation vents, equipped with Y-type chin straps and better with sunshade accessories, ear plugs, vibration absorber and whistle.



經核准的安全頭盔  
Typical safety helmets







## 國際／國家安全頭盔標準 International/National Standards of Safety Helmets



中國標準  
People's Republic of  
China Standard

GB2811安全帽  
GB2811 Safety helmets



國際標準  
International Standard

ISO3873工業用安全帽  
ISO3873 Industrial safety helmets



新加坡標準  
Singapore Standard

SS98工業用安全帽之規格  
SS98 Specification for  
industrial safety helmet



美國標準  
American Standard

ANSI Z89.1工業用安全帽  
ANSI Z89.1 Standard for  
Industrial Head Protection



澳洲／新西蘭標準  
Australian /  
New Zealand Standard

AS/NZS1801職業用安全帽  
AS/NZS1801  
Occupational Protective Helmets



歐盟標準  
European Standard

EN397工業用安全帽之規格  
EN397 Specification for  
Industrial Safety Helmets



日本標準  
Japanese Industrial  
Standard

JIS T8131產業用安全帽  
JIS T8131 Industrial safety helmets



加拿大標準  
Canadian Standard

CSA Z94.1安全帽  
CSA Z94.1 Safety helmets

## 12 個人防護裝備 Personal Protective Equipment

- 頭盔應存放於工地入口的鐵籠內，方便工人在進入地盤前佩戴。

安全頭盔應附有適當的標記，以顯示所符合的國際／國家標準，並鑄上或壓上標記，以顯示下列資料：

- 標準編號；
- 製造商的商號或識別標記；
- 製造年份和月份；
- 安全頭盔的種類（由製造商定名）一標記在帽殼和頭箍上；
- 大小或尺碼範圍（以毫米為單位）一標記在帽殼和頭箍上。

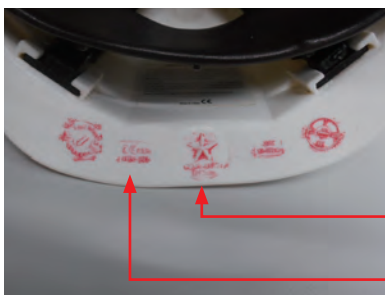


地盤入口處供存放安全頭盔的鐵籠  
Metal cages for storing safety helmets located at site entrance

- Safety helmets should be stored into cages at an entrance of a construction site for workers to put them on before entering the construction site.

A safety helmet should bear appropriate marking for conformity to certain international/national standards, and shall carry impressed marking for:

- the number of standard;
- the name or identification mark of the manufacturer;
- the year and month of manufacture;
- the type of helmet (named by manufacturer) – marked on shell and harness;
- the size or size range (measured in mm) – marked on shell and harness.



製造商的商號及標準編號標記在帽殼上  
Name of manufacturer and number of standard cast on the shell of helmet

製造商的商號  
Name of  
Manufacturer  
標準編號  
Number of  
Standard



## 有關安全頭盔的建議 Recommendations on Safety Helmets

- 市面上有多種可供建築行業採用的安全頭盔標準，但使用最廣泛的標準是ISO 3873—1977和相應的英國標準協會(BSI)標準。
- 職安局曾對安全頭盔進行研究，並在結論中提出下列意見／建議：
  - 雖然行內均以ISO 3873為標準，但有些標準在更換周期和安全性檢查方面的要求較為嚴格，使用者在選購安全頭盔時應考慮這些規格。
  - 使用者在選擇安全頭盔時，除了要求安全頭盔外殼能承受50焦耳的衝擊能量外，安全系數亦不應低於2。
  - 天氣對由硬質塑膠製造的安全頭盔外殼影響極大。強烈紫外線、高溫、高濕度引致塑膠材料變脆，從而使受衝擊強度降低，因此地盤管工及工人應因應安全頭盔的製造材料而定期更換。
  - 在沒有損壞的情況下，地盤使用的安全頭盔一般兩、三年要更換一次；經過兩至三年的使用，一般安全頭盔的受衝擊強度明顯下降，難以為使用者提供預期的保護。
  - 除非安全頭盔的安全認證指明更長的使用期，否則硬質塑膠安全頭盔的使用期限不得超過兩年，這項建議比勞工處的指南和GB標準（中國國標）所提出的三年及兩年半略為嚴格。
  - 使用者在每次使用前應小心檢查安全頭盔外殼及帽箍。
- Among a myriad of available standards for the construction industry, ISO 3873-1977 and the corresponding BSI are the standards commonly used for safety helmets.
- Advice/suggestions on safety helmet from a survey results by OSHC as follows:
  - Although the ISO 3873 standard is universally accepted, some standards may be stricter than others in terms of replacement cycle and safety inspection; users should consider these specifications when choosing safety helmets.
  - Users should consider a safety factor of helmets of not less than 2 on top of the standard 50J impact energy in the selection of safety helmet.
  - Weathering conditions, such as strong UV light, high temperature and high humidity, have remarkable influence on plastic hard hats, making them brittle and hence reducing their impact strength. Site foremen and workers should keep in mind the manufacturing materials of the helmets and replace used helmets regularly.
  - Under no damage condition, helmets used in construction sites should be replaced every 2 to 3 years. The impact strength of the hard hats generally declines significantly after 2-3 years of service, and will not be able to provide the level of protection as expected.
  - Unless there is a longer life span in the safety certificate of safety helmet, it is recommended that the maximum service time of plastic hard hats should not exceed 2 years, which is more stringent than the 3 years or 2-1/2 years as stipulated in Labour Department's guidance notes or the GB standards.
  - Users should check the hard shell and suspension harness every time before use.

## 12 個人防護裝備 Personal Protective Equipment

### 安全頭盔使用期限的檢查 Checking on Expiry Date of Helmet

以下是鑄在安全頭盔上的常用標記和製造日期格式，方便使用者檢查：

Common example of impressed marking on helmet with manufacturing date for easy checking:



CE : 代表已通過有關的歐盟標準  
08 : 代表於2008年製造  
圓點 : 一個圓點表示一季，兩個圓點即表示於第二季製造。

解讀 : 此安全頭盔符合歐盟標準，於2008年第二季製造。

CE: denotes it has passed the relevant EN standard  
08: manufactured in year 2008  
Dot: a dot denotes a quarter, 2 dots denotes manufactured in 2nd quarter

Decoding: this helmet has passed the EN standard and was manufactured in 2nd quarter of 2008



08 : 代表於2008年製造  
箭咀 : 箭咀指向12代表於12月製造  
解讀 : 此安全頭盔於2008年12月製造

08: manufactured in year 2008  
Arrow: the arrow pointing at 12 denotes manufactured in December

Decoding: this helmet was manufactured in 2nd quarter of 2008

安全頭盔必須：

- 定期用適當的清潔劑（例如清水）清潔；
- 每兩年更換，或按照製造商建議的使用期限更換；
- 調校至適合佩戴者頭部的鬆緊程度；
- 保持帽殼與頭頂有足夠緩衝距離；
- 檢查頭盔有否出現裂紋、變形及是否適宜使用；
- 屬已核准的型號／類別；
- 配有透氣孔；
- 配有EN397 認證的Y型下頷索帶；以及
- 配有遮陽配件以供在光線刺眼的戶外環境中使用。

Safety helmets must:

- be cleaned regularly with appropriate agent such as water,
- be replaced every two years or according to the lifetime suggested by the manufacturer,
- be adjusted to fit the head correctly,
- have a buffer between the head and the shell,
- be checked for crack, distortion and sound for use,
- be of approved model/type,
- be fitted with ventilation slots,



- be equipped with Y-type chin strap certified in compliance with EN397
- be fitted with sunshade accessories for shiny outdoor condition

安全頭盔須適當保養，不要出現以下情況：

- 用有機溶劑清洗；
- 在其上鑽孔；
- 塗上或噴上油漆；
- 有損壞時仍然使用；
- 將其拋擲或敲擊；
- 在安全頭盔內再戴上其他帽子；以及
- 存放／放置在陽光下、炎熱或潮濕的環境中。

Safety helmets require proper maintenance. The following should not be done:

- Clean them with organic solvents
- Drill holes in them
- Paint or spray them
- Use them when they are damaged
- Throw or strike them
- Wear any other hat under the safety helmet
- Store/place them under sunlight, hot or humid environment



用有機溶劑清洗  
Clean them with organic solvents



在其上鑽孔  
Drill holes in them



塗上或噴上油漆  
Paint or spray them



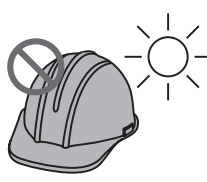
有損壞時仍然使用  
Use them when they are damaged



拋擲或敲擊  
Throw or strike them



在安全帽內再戴上其他帽子  
Wear any other hat under the safety helmet



存於於陽光下  
Store under sunlight



## 12 個人防護裝備 Personal Protective Equipment

### 安全鞋履 Safety Footwear

- 若作業地方的地面濕滑、凹凸不平、有尖銳或下墮物件等，容易使腳部受傷，工人便應穿著安全鞋。
- 安全鞋應裝有鋼鞋頭，以保護腳底和腳趾，並有吸震鞋墊，防刺穿及防滑鞋底。
- Wear suitable safety shoes when working area is at high risk of foot injuries from slippery or uneven ground, sharp objects, falling objects etc.
- Safety shoes should feature steel head to provide protection to sole and toes. It should be penetration resistant, slip resistant and with vibration absorber.

### 國際／國家安全鞋標準 International/National Standards of Safety Shoes

- 美國國家標準 (ASTM F2412及F2413)；
- 澳洲／新西蘭標準 (AS/NZS 2210.2)；
- 歐盟標準 (ENISO20345, ENISO20346, EN ISO 20347)；
- 日本工業標準 (JIS T8101)；以及
- 加拿大標準 (CSA Z195-M92)。
- American National Standard (ASTM F2412 and F2413);
- Australian/New Zealand Standard (AS/NZS 2210.2);
- European Standard (EN ISO 20345, EN ISO 20346, EN ISO 20347);
- Japanese Industrial Standard (JIS T8101);
- Canadian Standard (CSA Z195-M92)



安全鞋旨在用於保護足部，免受外物撞擊及穿透弄傷

Safety shoes to protect against impact/penetration to foot



安全靴旨在用於爛泥多的地方，用以保護足部及足踝

Safety boots to protect the foot and ankle in muddy area



安全水鞋旨在用於被水淹的地方

Safety rain boots to protect the legs against water in flooding area



## 防墮措施 Fall Protection

- 防止地盤內的工人從高處墜下。
- 在任何情況下，均應盡量提供安全工作平台。
- To prevent any person on a construction site from falling at height.
- In all circumstances, safe working platforms shall be provided as far as practicable.



在離地高於2米的地方工作，必需使用工作平台  
Use working platform for working at height of 2 meters or above

## 國際／國家安全帶標準 International/National Standards of Safety Harness

- 美國國家標準協會 (ANSI-A10.32: 2012) ;
- 澳洲／新西蘭標準 (AS/NZS1891.1: 2007) ;
- 歐盟標準 (EN 361: 2002) ;
- 中華人民共和國國家標準 (GB 6095-2009) ; 以及
- 日本工業標準 (JIS T8165: 2012) 。
- American National Standard Institute (ANSI-A10.32: 2012);
- Australian/New Zealand Standard (AS/NZS 1891.1: 2007);
- European Standard (EN 361: 2002);
- People's Republic of China National Standard (GB 6095-2009); and
- Japanese Industrial Standard (JIS T8165: 2012)

## 安全帶（全身式安全帶） Safety Harness

- 安全帶是最後的安全防線，當設置工作平台、護欄及棚架並非切實可行的情況下，才應使用。但使用吊船時，工友就必須使用安全帶並繫穩於救生繩。
- 將安全帶與獨立救生繩／錨固點／防墮裝置繫穩，才可開始工作（包括進出工作間的安全通道）。
- 應選用為使用者提供全身支撐的全身式安全帶。

## 12 個人防護裝備 Personal Protective Equipment

- 依循安全帶製造商指示的程序裝配、調校、使用、貯存和保養安全帶。
- 使用前應檢查安全帶設備，如有損壞，不應使用。
- 為使用安全帶的人員提供訓練，並妥善保存訓練紀錄。經常檢討訓練內容以作更新，並定期開辦複修訓練課程。
- 高空工作時，職業安全規例要求僱主採取的基本安全措施，包括提供適合的工作平台、安全出入口及架設適當護欄。惟有此等安全措施並不切實可行，才使用安全帶。
- 全身式安全帶應與連接器、隨帶吊繩、能量吸收器及防墮緩衝一起使用。
- 由合資格人士定期檢查／檢驗安全帶的狀況。
- 為工作種類選用適當的安全帶。



工作前應將隨帶吊繩繫於牢固點  
Tie the lanyard to anchorage point securely before works commencement



全身式安全帶 (背面)  
Back view of a full-body safety harness



全身式安全帶 (正面)  
Front view of a full-body safety harness



- Safety harness is the last resort of defence and shall be used when the provisions of working platform, guard-rails and scaffolds, etc. are not practicable. For the use of suspended working platform, worker must wear safety harness attached to independent lifeline.
- Tie safety harness to independent lifeline/fixed anchorage/fall arrestor securely before working (including making access to and egress from the place of work).



全身式(降傘式)安全帶是防墮裝置系統的一部份  
A full-body safety harness form part of a fall arrest system

- Use safety harness to provide support to the whole body of the user.
- Follow manufacturer's instruction of safety harness on fixing, adjustment, usage, storage and maintenance process.
- Inspect the safety harness equipment before use and do not use in case of damage.
- Provide training to users of safety harness and keep proper record of training. Review scope of training for any updating and provide re-fresher training users at regular intervals.
- For working at height, the occupational safety regulations require employers to adopt basic safety precautions including the provision of suitable working platforms, safe access and egress and the erection of suitable guardrails, etc. If these safety precautions are not feasible, safety harness can then be used.
- Safety harness should be used together with connector, lanyard, energy absorber and fall arrest device.
- Check/examine the working condition by competent person regularly.
- Select suitable type of safety harness for works.

## 高空工作的防墮系統

### Fall protection system for working at height

- 為高空工作設置整套防墮系統時，除了安全帶外，還須考慮工作地點周圍的情況，以免在下墮時撞擊附近的結構物，亦要注意環境因素，避免高溫、煙塵或強風影響系統內各項組件的性能。

## 12 個人防護裝備 Personal Protective Equipment

- In addition to a safety harness, the entire fall protection system for working at height must also be considered together with the area surrounding the worksite so as to, for example, prevent striking against nearby structures in the event of a fall. Environmental factors should also be taken into account so as to avoid high temperatures, smoke or strong wind affecting the performance of each of the components of the fall protection system.

### 防墮裝置 Fall Arrestor

- 一套有效的防墮系統由獨立救生繩／固定錨固點、防墮裝置及全身式安全帶組成。
  - 必須為在吊船工作或攀登固定爬梯的工人提供防墮裝置。
- An independent lifeline/fixed anchorage, a fall arrestor and a full-body harness form a fall arresting system.
  - A person working on a gondola or climbing permanent ladders should be provided with a fall arresting system.



高空工作的個人抗墜防護系統  
Fall protection system for working at height



獨立救生繩／錨固點、防墮裝置、隨帶吊繩及全身式安全帶組成一套防墜系統，配備防墜裝置的工人在吊船上可安全地工作

The independent lifeline/fixed anchorage, fall arrestor and a safety harness with lanyard form a fall arresting system. Worker with fall arresting system working in a gondola.





## 防護衣物 Protective Clothing

- 在處理可能會滲入皮膚的鉛及鉛製品（包括含鉛油漆）以及其他有害化學品時，應穿著不滲透的防護工作服、手套及佩戴防塵帽。
  - 在道路上或移動的機械設備附近工作時，應穿著符合EN20471標準之反光衣物。
  - 在燒焊期間應穿著隔熱圍裙。
- Wear impermeable protective overalls, gloves and dust caps when handling lead and lead based products including lead paint and other harmful chemicals which may be absorbed through skin.
  - Wear reflective clothing to EN20471 when working on roads or near moving plant.
  - Wear heat insulating apron during welding process.



工人應根據危害類別及其風險選擇合適的防護衣物  
Worker should put on appropriate protective clothing taking into account the hazards and risk involved



基本個人防護裝備  
A basic personal protective equipment for workers



常見的反光衣  
Common type or reflective vest

## 12 個人防護裝備 Personal Protective Equipment

防護工作服可按危害類別，分為下列幾種：

The following types of protective clothing to be adopted for protection from different kind of hazards:



- (1) 一般用途防護衣物 — 包括雨衣  
General purpose protective clothing  
including raincoats



- (2) 耐熱工作服／圍裙 — 適用於  
燒焊工序，以防止火屑或熔金  
屬飛射所引起的燒傷  
Heat-resistant work clothing/  
aprons for welding to prevent  
burns from sparks, fragments  
and flying molten metals



- (3) 高溫作業工作服 — 適  
用於在熔爐或焗爐等附  
近工作的工人  
High-temperature work  
clothing, for working  
around smelting  
furnaces, oven, etc.



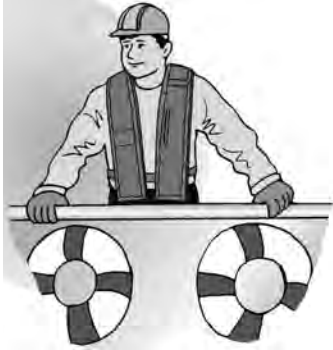
- (4) 低溫保暖工作服 — 適  
用於長時期在冷藏庫  
工作的工人  
Low-temperature work  
clothing, for working in  
a refrigerated area for  
a long duration



- (5) 防靜電工作服 — 適用於易燃物品  
的處理場所或若產生靜電或會影響  
電子產品質素的生產場所  
Anti-electrostatic work clothing, for  
workplaces where highly flammable  
materials are handled or where  
static charges might affect the  
quality of electronic products



- (6) 不滲透性工作服 — 適用於化學  
品洩漏處理、石棉處理等工作  
Impermeable work clothing, for  
protection against chemicals  
spilling and asbestos handling,  
etc.



- (7) 反光衣 — 在交通繁忙的道路上／經常有車輛移動的地方工作時，色彩鮮明的反光衣能令工人更顯眼，減低被車輛或機械碰撞的機會  
Reflective clothing, for working in busy traffic/frequent vehicle movement location, brightly coloured reflective clothing could increase the visibility of workers and reduce their chances of being struck by vehicles or machinery



- (8) 救生衣 — 減低工人跌進水中時遇溺的風險  
Life jackets, for safeguarding the risk of drowning when worker falls into water



- (9) 防切割的工作服 — 適用於操作鋒利刀具或機器的工人  
Work clothing to prevent cuts, for workers operating sharp blades and machines

## 護目鏡 Goggle

- 在工地從事可能損害眼睛的工作人員，均應佩戴護目鏡。選用的護目鏡必須符合英國標準BS 2092(一般用途)或其他相關安全標準／規格(EN166：一般規格；EN169：焊接)。
- 在燒焊、切割磚石、鑽孔和操作槍彈推動打釘工具時，必須佩戴適當的護眼用具。
- 使用砂輪或一些會產生碎屑的手用工具時，應佩戴護目鏡。
- 燒焊時，應佩戴防紫外線的護目鏡。
- 操作槍彈推動打釘工具時，應使用可抵受猛力撞擊的護目鏡。
- Worker should wear goggle for site activities when there is foreseeable risk of eye injury. The goggle selected shall comply with BS 2092 general purpose or other relevant safety standard/specifications (EN 166: general, EN 169: welding)



護目鏡於工作時保護眼睛對抗外來物體，如瓦礫  
Goggles offer protection for eyes against foreign matters such as debris during works



防眩光的護目鏡  
Anti-glare goggle for works under glare

## 12 個人防護裝備 Personal Protective Equipment

- Wear appropriate goggles during welding, masonry cutting, drilling and bolt anchoring using cartridge operated fixing tools.
- Wear goggles when using abrasive wheels or hand tools involving production of small debris.
- Wear UV-proof goggles during welding.
- Wear high impact resistant goggles during operation of cartridge operated fixing tools.

各式眼睛防護設備介紹：

### Introduction to various kinds of eye protection equipment:

#### A) 防護式眼罩 Protective goggles

適合用於阻隔塵埃、微粒、飛屑、化學品濺液及煙霧。

Suitable for protection from dust, particles, flying chips, chemical splattering and smoke



(附透氣孔，不適合腐液及煙霧)  
(Goggles with direct vents are not suitable for protection from chemical splattering or smoke)



(附間接透氣孔)  
(Fitted with indirect vents)

#### (B) 安全眼鏡 Safety glasses

適合用於阻隔微粒、飛屑、碎片衝擊。

Suitable for protection from particles, flying chips and the impact of fragments.



(正面保護)  
(Frontal protection)



(有側翼保護)  
(Fitted with side protection)



電焊用的面罩  
Face shield for electric arc welding



- (C) 眩光、氣焊、熔爐用的護目鏡適用於熔爐作業（另加護面罩）、眩光、金屬溶液、強光及氣焊等情況。

Goggles for protection from glare, gas welding and smelting furnaces – Suitable for smelting furnace work (with an added face shield), glare, molten metal, strong light and gas welding.



- (D) 電焊用頭罩、面罩適合用於電焊、電火花、強烈紫外光照射（可與安全眼鏡並用）等情況。

Electric arc welding helmets and face shields/suitable for protection from electric arc welding, electric sparks and strong UV-radiation (can be used together with safety goggles), etc.



## 耳塞 Ear Plugs

- 在無須大幅減低噪音的環境，可使用耳塞。  
可再用的軟膠耳塞一般能令噪音減低18至25分貝。
- Wear ear plugs where the attenuation demand is not excessive. The attenuation of some soft plastic re-usable ear plugs ranges from 18 to 25 dB(A).



膠耳塞一般能降低噪音水平由18至25分貝  
Plastic ear plugs attenuates the noise level normally in the range of 18 to 25 dB(A)



## 12 個人防護裝備 Personal Protective Equipment

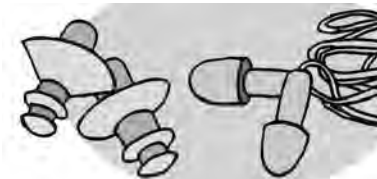
### 護耳罩 Ear Muff

- 如須減低多達40分貝的噪音，可使用護耳罩。應確保護耳罩的軟墊能覆蓋和完全封閉耳朵。
  - 在聽覺保護區內或高噪音機器附近工作，又或使用槍彈推動打釘工具時，應佩戴護耳罩。
  - 應佩戴勞工處認可的護耳罩。
- Wear ear muff where a large attenuation of up to 40 dB(A) is demanded. Ensure that the cushion can wrap around the whole ear and provide a good seal.
  - Wear ear muff when working within hearing protection zone or in the vicinity of noisy equipment or during use of cartridge operated fixing tools.
  - Wear ear protectors that have been approved by the Commissioner for Labour.

個人保護聽覺用具種類：

#### Different types of ear protectors:

- (1) 彈性耳塞  
Elastic earplugs



可清洗多次使用。  
Cleanable, reuseable earplugs.

- (2) 發泡耳塞  
Foam earplugs

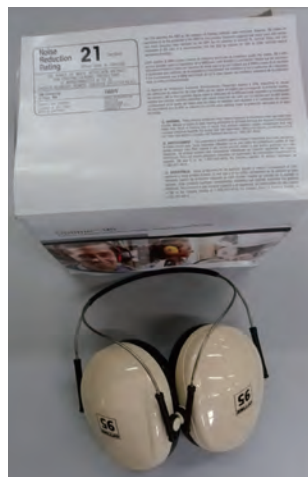


壓縮放進耳道自動回復原狀。  
When compressed and inserted into ear cavity, they expand to completely fill the ear cavity.

- (3) 耳塞  
Ear muffs



耳罩隔音量高，適合高度噪音，可與安全帽配合。  
Ear muffs offer a high level of sound reduction and are suitable for high noise levels. They can be used in combination with a safety helmet.



在高噪音環境，護耳罩可將噪音水平降低達40分貝  
Ear muff attenuates the noise level of up to 40 dB(A) suitable in a noisy environment



### 正確佩戴耳塞的方法

#### The correct use of earplugs

以左手繞過後腦，輕提右耳頂端，使耳道張闊，將耳塞放入耳道，輕壓並鑽入。

Pass your left hand behind your head and lift up the top of your right ear to open the ear cavity. Insert the earplug into the ear cavity, pressing and turning lightly.



### 用完即棄口罩 Disposable Respirator

- 進行打磨木器及磨光、噴漆、用蒸氣進行潔淨工作時，應佩戴口罩。如空氣中含有害或有毒塵埃或氣體，工作地點為密閉空間，又或進行引起大量塵埃的拆卸工程時，亦應佩戴口罩。
- 採取充足措施以確保口罩緊貼面部。
- 只可在氧氣充足的環境使用口罩。



用完即棄口罩  
Disposable respirator

- Wear respirator when sanding and rubbing down wood; spraying paint; steam cleaning; the atmosphere contains harmful or toxic dusts or gases; when working in a confined space or carrying out demolition work giving rise to lot of dust.
- Adequate steps should be taken to ensure good fitness between the face of wear and the tight-fitting facepiece.
- The respirator can only be used in environment with sufficient supply of oxygen.

### 呼吸器 Breathing Apparatus

- 在沙井等氧氣不足的環境下，呼吸器最能保護使用者免受有毒氣體侵害。
- It offers the most effective protection against toxic gases, especially in an oxygen deficient environment such as manholes.



使用呼吸器須為經核准類別  
Breathing apparatus to be of an approved type

## 12 個人防護裝備 Personal Protective Equipment

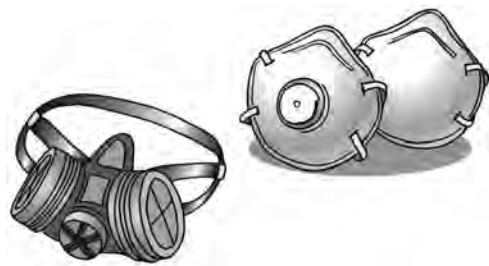
### 呼吸防護用具種類

#### Different types of respirators

預防上述各類危害的呼吸防護用具，基本上可分為三類：

There are basically three kinds of respirators for protection from the above-mentioned hazards:

- (1) 防塵口罩 Dust respirators  
(缺氧環境絕不適用)  
(Not suitable for oxygen deficient environments)



- (2) 防毒面罩 Cartridge or canister  
配有可更換濾毒劑 (缺氧環境絕不適用)  
(Not suitable for oxygen deficient environments)



- (3) 供氧式呼吸器 Breathing apparatus
- (a) 備有可攜帶氣樽的自供空氣式 — 供氣時間有限制 (即15分鐘) ;  
Self-contained Breathing apparatus – with air supply last for a certain time limit (i.e. 15 minutes),
- (b) 與供氣系統接上的自供空氣式 — 由外部設備／大氣無限量供氣。  
Linked to an air supply system – to supply free air (uncontained) from external source/atmosphere



## 手套 Gloves

- 處理有鋒利邊緣和尖角的金屬片和其他物件，或進行燒焊和切割時，應佩戴合適的手套。
- 佩戴棉手套可吸收汗水，有助牢固地抓緊物件。
- 處理化學品時，應佩戴防化學品手套。
- 處理灼熱物件或進行燒焊時，應佩戴隔熱手套。
- 處理鋼筋或尖銳物件時，應佩戴皮手套。
- 處理電器和進行電焊時，應佩戴絕緣手套。
- 操作震動式機器時，應佩戴防震手套。



建築工業常用的防護手套(由左至右)：耐熱用手套，處理化學物品用手套，紮鐵用皮革手套，一般作業用棉質手套

Common protective gloves (from left to right) adopt in building industry: heat-resistant gloves, chemical-proof gloves, leather gloves for handling re-bar, cotton gloves for common task

- Wear suitable gloves when handling sheet metal and other objects, with sharp edges and corners or during welding and cutting.
- Wear cotton gloves to facilitate better grip of the object by absorbing sweat.
- Wear chemical-proof gloves when handling chemicals.
- Wear heat insulating gloves when handling hot objects or welding.
- Wear leather gloves when handling steel reinforcement or sharp objects.
- Wear electric insulating gloves when handling electric appliances and electric welding.
- Wear anti-shock gloves when operating vibrating machines.



處理化學物品用的強韌手套

Gloves with property of high mechanical strength and chemical resistance

### 常見的防護手套：Common protective gloves:

#### (1) 一般作業用手套（棉質／皮革）

Gloves for common tasks (cotton/leather)



#### (2) 處理化學物品用手套

Gloves for handling chemicals



## 12 個人防護裝備 Personal Protective Equipment

- (3) 耐熱用手套  
Heat-resistant gloves



- (4) 耐寒用手套  
Cold-resistant gloves



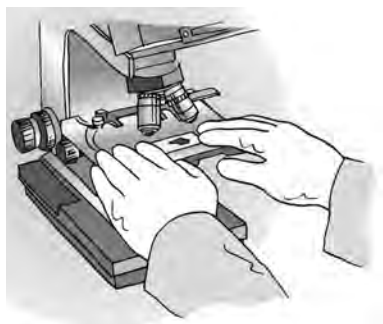
- (5) 防切割用手套  
Cut-resistant gloves



- (6) 防震用手套  
Anti-shock gloves



- (7) 即棄用手套  
Disposable gloves



- (8) 電氣用手套  
Gloves for electrical work







一般作業用手套  
General purpose gloves



防切割及微震適用手套  
Cut-resistant & anti-shock gloves



一次過使用可棄手套  
Disposable gloves



電氣用手套  
Gloves for electrical work



耐寒用手套  
Cold-resistant gloves



耐熱用手套  
Heat-resistant gloves



一般作業用手套（棉質）  
Cotton Gloves for common tasks



一般作業用手套（皮革）  
Leather Gloves for common tasks

## 12 個人防護裝備 Personal Protective Equipment

### 參考資料

#### 相關法例和規例

- 《工廠及工業經營條例》
- 《建築地盤（安全）規例》
- 《工廠及工業經營規例》
- 《工廠及工業經營（密閉空間）規例》
- 《工廠及工業經營（噴砂打磨）特別規例》
- 《工廠及工業經營（木工機械）規例》
- 《工廠及工業經營（砂輪）規例》
- 《工廠及工業經營（在壓縮空氣中工作）規例》
- 《工廠及工業經營（易燃液體的噴塗）規例》
- 《工廠及工業經營（槍彈推動打釘工具）規例》
- 《工廠及工業經營（保護眼睛）規例》
- 《工廠及工業經營（工作噪音）規例》
- 《工廠及工業經營（安全主任及安全督導員）規例》
- 《工廠及工業經營（可致癌物質）規例》
- 《工廠及工業經營（危險物質）規例》
- 《工廠及工業經營（安全管理）規例》
- 《職業安全及健康條例》

#### 相關安全標準、工作守則、安全指引和指南

- 《電器產品（安全）規例指引》（機電工程署）
- 《安全帽的揀選、使用及保養指南》（勞工處）
- 《安全帶及其繫穩系統的分類與使用指引》（勞工處）
- 《香港建築地盤使用安全帽現狀調查及安全帽防護功能的評估》（職業安全健康局）
- 《個人防護用具須知》（職業安全健康局）



## References

### Relevant Ordinances and Regulations

- Factories and Industrial Undertakings Ordinance.
- Construction Sites (Safety) Regulations.
- Factories and Industrial Undertakings Regulations.
- Factories and Industrial Undertakings (Confined Spaces) Regulations.
- Factories and Industrial Undertakings (Blasting by Abrasives) Special Regulations.
- Factories and Industrial Undertakings (Woodworking Machinery) Regulations.
- Factories and Industrial Undertakings (Abrasive Wheels) Regulations.
- Factories and Industrial Undertakings (Work in Compressed Air) Regulations.
- Factories and Industrial Undertakings (Spraying of Flammable Liquids) Regulations.
- Factories and Industrial Undertakings (Cartridge-Operated Fixing Tools) Regulations.
- Factories and Industrial Undertakings (Protection of Eyes) Regulations.
- Factories and Industrial Undertakings (Noise at Work) Regulation.
- Factories and Industrial Undertakings (Safety Officers and Safety Supervisors) Regulations.
- Factories and Industrial Undertakings (Carcinogenic Substances) Regulations.
- Factories and Industrial Undertakings (Dangerous Substances) Regulations.
- Factories and Industrial Undertakings (Safety Management) Regulation.
- Occupational Safety and Health Ordinance.

### Relevant Safety Standards, Codes of Practice, Guidance Notes and Guidelines

- Guidance Notes for the Electrical Products (Safety) Regulation. (EMSD)
- Guidance Notes on the Selection, Use and Maintenance of Safety Helmets. (LD)
- Guidance Notes on Classification and Use of Safety Belts and their Anchorage Systems. (LD)
- A survey on the usage of Hard Hats in Hong Kong Construction Site. (OSHC)
- Guidelines for the use of Personal Protective Equipment. (OSHC)

## Abbreviation

### 簡稱

#### A

<b>Abrasive wheels</b>	35, 121, 122, 124, 125, 244, 253	<b>砂輪</b>	34, 121, 124, 125, 243, 252
<b>Access and egress</b>	05, 48, 72, 94, 154, 186, 211, 239	<b>出入口</b>	05, 47, 48, 70, 72, 186, 211, 238
<b>Accredited Safety Auditor (ASA)</b>	31, 34	<b>認可安全稽核員</b>	31, 33
<b>Acetylene cylinder</b>	119, 197	<b>乙炔氣瓶</b>	118, 196
<b>Air compressor</b>	70, 115	<b>空氣壓縮機</b>	68, 115
<b>Asbestos</b>	70, 87, 202, 208, 214, 216, 217, 242	<b>石棉</b>	70, 86, 202, 208, 214, 216, 242

#### B

<b>Bamboo scaffolding</b>	150, 152, 153, 177	<b>竹棚架</b>	150, 152, 153, 176
<b>Barrier</b>	46, 47, 59, 60, 106, 110, 160, 180, 182, 183, 191, 192	<b>路障；圍欄；屏障</b>	46, 47, 49, 59, 60, 106, 110, 180, 182, 183, 192
<b>Basic safety tips</b>	07	<b>基本安全提示</b>	07
<b>Boosting morale</b>	10	<b>提升團隊士氣</b>	10
<b>Breathing/Respiratory apparatus</b>	09, 71, 81, 200, 220, 221, 227, 247, 248	<b>呼吸器具；呼吸器</b>	07, 70, 81, 199, 220, 227, 247, 248
<b>Builder's lift</b>	107, 108, 124, 125, 177	<b>建築工地升降機</b>	107, 124, 125, 176
<b>Building Information Modelling (BIM)</b>	14, 40, 41	<b>建築信息模擬</b>	14, 40, 41

#### C

<b>Cable clip</b>	96, 97	<b>螺絲鋼碼扣</b>	96, 97
<b>Cable colour</b>	127	<b>電纜顏色</b>	127
<b>Cable fixing</b>	128	<b>安裝電纜</b>	128
<b>Cable joint</b>	126	<b>電纜接頭</b>	126
<b>Cables</b>	88, 126, 127-129, 136, 195	<b>電纜</b>	88, 125, 126, 127-129, 136, 195
<b>Caring Programme for new workers</b>	37, 43	<b>關顧新人工作安全計劃</b>	37, 43



Cartridge operated fixing tools	122, 124, 244, 246, 253	槍彈推動打釘工具	122, 124, 243, 246, 252
Catch-fan	155, 204	斜柵 (棚)	155, 204
CCTV	92, 94, 106, 110, 112, 144, 210	閉路電視	92, 106, 110, 112, 144, 210
Chain sling	95-98, 194	鏈吊索	95-98, 194
Checklist of working at height	171	高空工作的檢查表	171
Chin strap	147, 148, 164, 188, 200, 210, 213, 215, 228, 230, 235	下頷索帶	147, 148, 164, 188, 199, 210, 213, 215, 228, 230, 234
Circuit identification	130	電路標籤	130
Circuit Protective Device	131	電路保護裝置	130
Circular saw	120	圓鋸	120
Co-worker	12, 220, 221, 223	工作同伴/同事	12, 220, 221, 222
Code of Practice	13, 43, 87, 89, 108, 110, 117, 119, 125, 139, 149, 177, 180, 189, 201, 217, 229	工作守則/實務守則	13, 43, 86, 89, 107, 110, 116, 118, 125, 139, 149, 176, 180, 189, 201, 216, 229
Colour coding	101, 102	顏色標示	97, 101, 102
Combustible materials	117, 210	易燃物料	116, 210
Common causes of industrial accident	04	工業意外一般原因	04
Compacting machine	113	壓土機/機械	113
Competent examiner	91, 95, 103, 104, 109, 145, 159, 163, 175, 193	合資格檢驗員	90, 95, 102, 103, 109, 144, 159, 162, 192
Competent person	15, 18, 24, 26, 76, 77, 89, 91, 103, 104, 111, 114, 122, 136, 145, 152, 154, 156, 158, 161, 163, 166, 171, 175, 184, 193, 219, 220, 223, 224, 239	合資格人士	15, 18, 24, 26, 76, 77, 89, 91, 102, 103, 111, 114, 121, 135, 144, 152, 154, 156, 157, 160, 161, 162, 164, 171, 175, 183, 192, 219, 220, 222-224, 238
Confined space	35, 119, 189, 218-229, 247, 253	密閉空間	34, 118, 189, 218-229, 247, 252



Contamination	47, 206, 212	污染	46, 206, 212
Contractor	05, 10, 11, 23, 26, 35, 36, 67, 87, 91, 108, 112, 177	承建商	05, 10, 22, 26, 35, 67, 86, 90, 107, 112, 176
Control of substances hazardous to health	76	危害健康物質的管制	76

## D

Daily safe working cycle	15, 16	每日安全施工程序	15, 16
Dangerous goods	35, 52, 53, 54, 86, 115	危險品	34, 51, 53, 54, 85, 115
Dangerous material	76, 199	危險物質	76, 199, 216
Dangerous zone	08, 49, 194	危險區域	07, 42, 49, 194
Demolition	31, 36, 70, 85, 87, 202-204, 206-213, 215-217, 247	拆卸	31, 35, 70, 84, 86, 202-204, 206-213, 215, 216, 247
Demolition plan	202, 203, 206, 210	拆卸計劃	202, 203, 206, 210
Disconnection of services	204	截斷公共設施	204
Disposable respirator	247	用完即棄口罩	247
Distribution board	129, 130, 131	配電箱	129, 130, 131
Drill	40, 77, 84, 227	演習	40, 76, 84, 227
Drilling rigs	111	鑽機	111
Dumper	112	卸泥車	112
Dust	47, 58, 62, 70, 71, 178, 199, 202, 208, 221, 244, 247	塵埃	46, 57, 70, 71, 112, 178, 199, 202, 208, 221, 244, 247
Dust control	47, 58, 70	塵埃控制	46, 70
Dust screen	70	隔塵網	70

## E

Ear muff	111, 115, 120, 122, 123, 148, 188, 197, 215, 246	護耳罩	111, 115, 120, 122, 123, 148, 188, 197, 199, 215, 246
Ear plug	09, 197, 230, 245, 246, 247	耳塞	07, 197, 230, 245, 246, 247
Earth-moving machinery	110	搬土機械	110



Earthing/earthed	116, 130, 131, 133, 169, 197, 224	地線；接地	116, 130, 131, 133, 168, 196, 224
Electric arc welding	116, 117, 125, 139, 169, 196, 197, 201	電弧焊接	116, 117, 125, 139, 168, 196
Electric shock/ Electrocution	88, 120, 126, 130, 138, 139, 190, 201, 202, 218, 224	觸電	88, 120, 126, 130, 137, 139, 178, 190, 201, 202, 218, 224
Electrician	18, 24, 26, 129, 138	電工	18, 23, 26, 129, 138
Electricity	126, 128, 130, 132, 134, 135, 136, 138, 139	電力	126, 128, 130, 132, 134, 135, 136, 138, 139
Emergency	08, 09, 46, 84, 199	緊急事故	08, 09, 84
Emergency plan	227	緊急計劃行動	227
Emergency switching	137	緊急開關	137
Emergency team	46	緊急應變小組	46
Employee	05, 06, 11, 12, 37, 52	員工	05, 06, 10, 12, 36, 37, 51
Employer	05, 06, 11, 37, 239	僱主	05, 06, 10, 36, 238
Equipment for rescue	187, 227	救援設備	187, 227
Equipotential bonding	120	等電位接駁裝置	120
Erection, dismantling, telescoping and climbing of tower cranes	88	塔式起重機的架設、拆卸及升降	88
Excavated materials	184, 188	挖掘物料	184, 187
Excavation	69, 178-186, 188	挖掘工程	69, 178-186, 188
Exhaust control	198	處理廢氣	198
Explosion	178, 190, 202, 218, 224	爆炸	178, 190, 202, 218, 224
External opening	160	外間開口	160
Eye bolt	95, 99, 146	有眼螺栓	95, 99, 146

## F

Fall arrestor	147, 160, 164, 169, 170, 191, 207, 227, 239, 240	防墮裝置	147, 160, 164, 167, 169, 191, 207, 227, 237, 239, 240
---------------	--	------	---

<b>Fall protection</b>	237	<b>防墮措施</b>	237
<b>Falling object</b>	08, 31, 35, 36, 155, 163, 174, 190, 202, 213, 236	<b>下墮物件</b>	08, 31, 34, 35, 155, 162, 190, 202, 213, 236
<b>Fences, fencing</b>	49, 50, 58, 64, 110, 113, 182, 183, 213, 215, 227	<b>圍欄；欄杆</b>	49, 50, 57, 64, 110, 113, 142, 182, 183, 213, 227
<b>Final check</b>	22	<b>最後檢查</b>	22
<b>Fire escape routes</b>	46	<b>走火通道</b>	46
<b>Fire extinguishing equipment</b>	55	<b>滅火設備</b>	55
<b>Fire fighting</b>	08, 40, 46, 55, 119, 134, 210, 220, 224	<b>滅火</b>	07, 40, 46, 55, 118, 134, 210, 220, 224
<b>Fire precaution and measures</b>	54	<b>防火措施</b>	54
<b>Fire risk</b>	224	<b>火警風險</b>	224
<b>Fire warning signs</b>	55	<b>防火告示牌</b>	55
<b>First aid box</b>	45, 220, 227	<b>急救箱</b>	45, 220, 227
<b>First aid facilities</b>	45, 203	<b>急救設備</b>	45, 203
<b>Flame cutting</b>	118, 119, 124, 125, 189, 196, 197, 201, 210, 217	<b>火焰切割</b>	118, 119, 124, 125, 189, 196, 197, 201, 210, 216
<b>Floor opening</b>	08, 63, 64, 68, 172, 173	<b>地洞</b>	08, 63, 64, 68, 172, 173
<b>Foreman</b>	15, 17-20, 22, 25, 39	<b>管工</b>	15, 17-20, 22, 25, 38
<b>Forklift trucks</b>	113	<b>叉式起重車</b>	113
<b>Fresh air supply</b>	185, 222	<b>新鮮空氣之 供應</b>	185
<b>Front line workers</b>	04, 17	<b>前線工人</b>	04, 17
<b>Fuel</b>	115, 134, 185	<b>燃料</b>	115, 134, 185
<b>Full body harness/ Safety harness</b>	66, 147, 148, 154, 160, 163, 169, 170, 200, 220, 223, 227, 228, 237, 239, 240	<b>全身式安全帶； 降傘式安全 帶；背套式安 全帶</b>	66, 147, 148, 154, 159, 160, 162, 169, 170, 199, 220, 222, 227, 228, 237, 238, 240



## G

Gas welding	18, 118, 119, 124, 125, 189, 196, 197, 201, 210, 217, 245	氣體焊接	18, 118, 119, 124, 125, 189, 196, 201, 210, 216, 245
General duties	05, 37	一般責任	36
Generator	137	發電機	133, 134, 137
Generator room	133, 134	發電機機房	133, 134
Getting start	08, 145, 181	開始	07, 144, 181
Gloves	81, 111, 117, 119, 138, 148, 188, 196, 197, 200, 209, 210, 215, 228, 241, 249, 250, 251	手套	81, 111, 116-118, 137, 138, 148, 188, 196, 197, 199, 208, 210, 215, 228, 241, 249, 250, 251
Gondola	48, 49, 162, 163, 164, 240	吊船	48, 49, 124, 125, 162, 164, 240
Goggle	09, 71, 111, 115, 117, 122, 123, 148, 188, 196, 208, 215, 228, 243, 244, 245	護目鏡	07, 70, 111, 115, 116, 121, 122, 123, 148, 188, 196, 208, 215, 228, 243, 245
Guidance and supervision during work	15, 19	施工時的指導和監督	15, 19

## H

Handheld pneumatic breaker	115, 188	手提氣動碎石機	115, 188
Handheld tools/Portable tools	35, 123, 131, 133, 169, 179	手提工具	34, 123, 131, 133, 169
Hard cores	47	碎石墊料	46
Hard hat	57, 111, 122, 147, 148, 164, 188, 199, 210, 213, 215, 228, 230-235, 253	安全頭盔	57, 111, 122, 147, 148, 164, 188, 199, 210, 213, 215, 228, 230-235, 253
Hard paved construction	46, 71	硬地施工法	46, 70
Hazard	15, 17, 19, 20, 31, 32, 34, 37, 39, 41, 44, 88, 126, 142, 150, 178, 190, 202, 203, 218, 241, 242	危險情況；危害識別	15, 17, 19, 31-33, 36, 38, 40, 44, 88, 126, 142, 150, 178, 190, 202, 203, 218, 241, 242

Hazard identification activity	15, 17, 19	識別危險情況活動	15, 17, 19
Helmet	38, 41, 57, 83, 87, 111, 122, 147, 148, 164, 188, 200, 210, 213, 215, 228, 230-235, 246, 253	頭盔/安全帽	07, 37, 41, 57, 83, 86, 111, 122, 147, 148, 164, 188, 199, 210, 213, 215, 228, 230-235, 246, 253
Hoarding	46, 56, 58, 204	圍板	46, 56, 57, 204
Hong Kong Housing Authority/ Housing Authority	03, 14, 31, 33, 43, 193	香港房屋委員會/ 房委會	02, 14, 31, 33, 43, 192
Hook	08, 41, 91, 93, 94, 95, 99, 100, 146	吊鉤	07, 41, 90, 91, 93, 94, 95, 99, 100, 146
Hop-up platform	158, 166	工夫橈	164, 166
Hot weather	71, 72, 74, 81, 83, 87, 150, 178, 190, 200	炎熱/酷熱天氣	71, 72, 74, 81, 83, 87, 150, 178, 190, 199
Housekeeping	08, 22, 31, 35, 36, 44, 46-48, 50-54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 196	工地整理	07, 22, 31, 34, 35, 44, 46, 48, 50-54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 196
Housekeeping (5S)	50-53	工地整理(5S)	50-53
Housing Authority Lift and Escalator Nominated Subcontracts Safety Auditing System (HALENSAS)	14, 33, 34, 43	房委會升降機及電梯指定分包商合約安全稽核制度	14, 33, 34, 43
Housing Authority Safety Auditing System (HASAS)	31-33, 43	房屋委員會安全稽核制度	31-33, 43
Hygiene facilities	73	衛生設施	73
I-beam	102, 145, 146, 181	工字樑	101, 181
Inclement weather	39, 158, 160, 163, 171, 175, 184, 212	惡劣天氣	38, 157, 159, 162, 171, 175, 183, 212





<b>Independent lifelines</b>	147, 148, 154, 161, 163, 164, 170, 173, 174, 200, 213, 215, 239, 240	<b>獨立救生繩</b>	147, 148, 154, 160, 162, 164, 168-170, 173, 174, 199, 213, 215, 237, 240
<b>Information Technology</b>	14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42	<b>資訊科技</b>	14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42
<b>Insulation</b>	08, 116, 117, 128, 132, 133, 138, 249	<b>絕緣</b>	07, 116, 117, 128, 132, 133, 138, 249

## J

<b>Jib</b>	88, 93, 94, 144	<b>吊臂</b>	88, 93, 144
------------	-----------------	-----------	-------------

## K

<b>Kicking board/ toe-board</b>	64, 191	<b>踢腳板</b>	64, 191
---------------------------------	---------	------------	---------

## L

<b>Ladder</b>	103, 122, 146, 166, 173, 186, 240	<b>梯具；爬梯</b>	103, 122, 146, 164, 165, 173, 186, 240
<b>Lanyard</b>	169, 238, 239, 240	<b>隨帶吊繩</b>	169, 238, 240
<b>Large steel formwork</b>	161	<b>大型鋼料模板</b>	161
<b>Lifting</b>	08, 31, 51, 88, 92, 94, 102, 111, 144-146, 194	<b>起重；起重操作</b>	07, 31, 88, 101, 111, 144, 146, 194
<b>Lifting appliance</b>	49, 91, 92, 104, 110, 124, 145, 149, 174, 194, 195, 201, 217	<b>起重機械</b>	49, 90, 91, 103, 110, 124, 144, 149, 174, 194, 195, 201, 216
<b>Lifting frame</b>	145, 146	<b>吊架</b>	144, 146, 181
<b>Lifting gear</b>	32, 91, 92, 95, 96, 98, 100, 101, 102, 124, 145, 149, 174, 193, 194, 201, 217	<b>起重裝置/吊運工具</b>	90, 91, 95, 96, 98, 100, 101, 124, 144, 149, 174, 194, 201, 216
<b>Lift shaft</b>	65-68, 87, 168-170, 172, 177	<b>升降機槽</b>	65-68, 86, 168-170, 172, 176

Lighting	08, 58, 67, 68, 72, 87, 108, 131, 132, 134, 180, 183, 189, 204, 211, 221	照明	07, 57, 65, 68, 72, 107, 131, 132, 134, 180, 182, 189, 204, 211, 220
Live wire	120, 138, 144	帶電電線	120, 137, 145
Lockout Tagout	135	上鎖掛牌	135, 136
Lorry-mounted mobile crane	92, 103, 105	貨車式起重機	91, 103, 105
Low voltage switchboard	134	低壓電掣板	134

## M

Machinery	04, 07, 18, 24, 44, 70, 88, 110, 114, 208, 209, 213, 243	機器	04, 07, 18, 23, 44, 70, 88, 110, 114, 208, 213, 243
Manhole	218, 222, 223, 247	沙井	218, 222, 247
Manual handling	78, 87, 88, 150, 190, 195	體力處理操作	78, 86, 88, 150, 190, 195
Mask	120, 138, 148, 196, 215	面罩	120, 137, 148, 196, 215
Material hoist	26, 109	物料吊重機	26, 109
Maximum loading capacity	193	安全荷載 (最大)	192, 194
Means of access and egress	94	上落途徑	93
Mechanical engineer	89, 91	機械工程師	88, 90
Metal scaffolding	66, 154, 177	金屬棚架	66, 154, 176
Mini Skid Loader	114	小型裝載 搬土機	114
Mobile Applications in Mobile Devices	42	流動裝置應用 程式	42
Mobile crane	31, 88, 104, 105, 125, 149	流動式起重機	31, 88, 104, 105, 125, 149
Mobile elevating work platform	159, 160, 177	動力操作升降 工作平台	159, 176
Mobile working platform	157, 158, 191	流動工作平台	157, 158, 191
Monthly inspection	26	每月巡查	26



Monthly safe working cycle	25	每月安全施工程序	25
Monthly safety committee meeting	28	每月安全委員會會議	27
Monthly safety meeting	25	每月安全大會	25
Monthly safety training	27	每月安全訓練	27
Morning walk	206	早上巡查	206
Multi-layer subcontracting	04	多層分判	04

## N

“N” label	37, 38	“N”字標籤	37
National standards	155, 231, 232, 236, 237	國家標準	155, 231, 232, 236, 237
Noise	35, 68, 70, 86-88, 123, 124, 178, 189, 190, 197, 198, 201, 202, 208, 209, 212, 217, 245, 246, 253	噪音	34, 68, 85, 86, 88, 123, 124, 178, 189, 190, 197, 198, 199, 201, 202, 208, 209, 212, 216, 245, 246, 252
Noise control	68, 86	噪音管制	68, 85

## O

Occupational Safety and Health Council (OSHC)	04, 31, 36, 43, 87, 125, 217, 229, 253	職業安全健康局	04, 31, 35, 43, 86, 125, 216, 229, 252
Overhead cables	88, 136, 195	架空電纜	88, 136, 195
Overloading	108, 152, 154, 161, 172, 213	超出負荷	152, 154, 160, 172, 213

## P

“P” label	37, 38	“P”字標籤	37
Permit-to-work	08, 119, 135, 136, 166, 169, 170, 219, 223, 224	工作/工程許可證	07, 118, 135, 136, 164, 168, 170, 219, 222, 224

<b>Personal protective equipment</b>	06, 09, 16, 37, 78, 81, 87, 115, 116, 123, 136, 147, 148, 164, 170, 188, 196, 197, 199, 210, 215, 228, 230, 232, 234, 236, 238, 240, 241, 242, 244, 246, 248, 250, 252, 253	<b>個人防護裝備</b>	05, 06, 07, 09, 16, 36, 78, 81, 115, 116, 123, 135, 147, 148, 164, 169, 188, 196, 197, 199, 210, 215, 228, 230, 232, 234, 236, 238, 240, 241, 242, 244, 246, 248, 250, 252
<b>Personal safety</b>	09	<b>個人安全</b>	07
<b>Piling</b>	36, 70, 190, 192, 194, 195, 196, 198-200	<b>地基/打樁</b>	36, 68, 190, 192, 194, 196, 198, 200
<b>Pit excavation</b>	179	<b>挖掘坑穴</b>	179
<b>Plant</b>	21, 33, 41, 42, 44, 58, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 195, 221, 241	<b>機械設備</b>	21, 32, 42, 44, 57, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 195, 221, 241
<b>Plant operators</b>	15, 18, 24, 41, 193, 194	<b>機械設備 操作員</b>	15, 18, 23, 41, 193, 194
<b>Platform</b>	111, 150, 151, 191	<b>平台</b>	111, 150, 191
<b>Pneumatic breaker</b>	69, 115, 188	<b>氣壓碎石機</b>	69, 115, 188
<b>Pointing and Calling</b>	39, 40, 43, 106, 125, 135	<b>指差呼稱</b>	39, 43, 105, 125, 135
<b>Pollution abatement</b>	212	<b>消滅污染</b>	212
<b>Potential hazards</b>	20, 39, 202	<b>潛在危險</b>	20, 38, 202
<b>Power supply</b>	108, 117, 120, 131, 135, 169, 204	<b>供電；電源</b>	107, 116, 120, 131, 135, 168, 204
<b>Precast concrete beam</b>	147, 148	<b>預製混凝土橫樑</b>	147
<b>Precast concrete elements</b>	142-146, 148	<b>預製混凝土組件</b>	142, 144, 146, 148
<b>Precast concrete facade</b>	145, 146	<b>預製混凝土外牆</b>	144, 146



Precast concrete slab	47, 143, 146	預製混凝土板/ 樓面板	46, 143, 146
Pre-work safety check	15, 18	開工前安全檢查	15, 18
Procedure for identifying and entry into confined space	225, 226	辨認及/和進入 密閉空間之 決策流程	225
Project manager	15, 16, 20, 21, 23, 24, 25, 28	項目經理	15, 16, 19, 20, 22, 24, 25, 27
Propping	181, 206	支柱	181, 206
Proprietor	122	東主	121
Protection to utilities	181	保護公用設施	181
Protective canopy	56, 156	保護簷篷	56, 156
Protective clothing	111, 214, 228, 241, 242	防護衣物	111, 214, 228, 241, 242
Protective screen	155, 162, 204, 213	保護幕	155, 162, 204, 213
Protruded metal bar	64	突出金屬鋼枝	64
Public safety	56, 58, 202	公眾安全	56, 57, 58, 202

## Q

Qualified personnel	114, 138, 167	合資格人員/士	114, 137, 167
---------------------	---------------	---------	---------------

## R

Radio Frequency Identification (RFID)	14, 41, 42, 57, 106	無線射頻識別	14, 41, 42, 57, 106
Railings	66, 67, 150, 158, 191	圍欄	66, 67, 150, 158
Refuse collection point	61, 62	垃圾收集站	61, 62
Reinforcement casing	195, 200	鋼筋籠	195, 200
Rescue operation	220, 221, 227	救援行動	220, 227
Respirator	115, 117, 119, 200, 210, 214, 228, 248	呼吸器	115, 116, 118, 199, 210, 214, 228, 248
Rigger	85, 145, 147, 194	索具工	84, 144, 147, 194
Risk Assessment	76, 89, 112, 136, 145, 166, 169, 179, 181, 183, 185, 187, 189, 219, 223, 224	風險評估	76, 88, 89, 112, 135, 144, 164, 168, 179, 181, 183, 185, 187, 189, 219, 222, 224
Roadwork	87, 178-189	道路工程	86, 178, 180, 182, 184, 186, 188, 189



Roller 113  
RSE 160, 217

壓路機 113  
註冊結構工程師 160, 216

## S

Safe Climate Index (SCI) Survey 14, 29, 30, 33, 43  
Safe Isolation of Electricity Source 135  
Safe use of electricity 126, 128, 130, 132, 134-136, 138  
Safe working cycle 11, 14-17, 22, 25, 28, 43  
Safe working load (SWL) 93, 95, 96, 98, 100-106, 113, 114, 145, 163  
Safety at confined space 228  
Safety belts 253  
Safety committee 28, 32  
Safety consciousness/awareness 17, 27  
Safety coordination and discussion 15, 21  
Safety footwear/shoes 236  
Safety harness, Full body harness 66, 147, 148, 154, 159, 161, 163, 164, 169, 170, 200, 220, 223, 227, 228, 237, 238, 239, 240  
Safety helmet 57, 87, 111, 122, 147, 148, 164, 188, 200, 210, 213, 215, 228, 230-235, 246, 253  
Safety induction training 36  
Safety inspection 15, 20, 23  
Safety net 36, 67, 121, 154, 167, 168, 170, 173, 174

安全氣候指數調查 14, 29, 30, 33, 43  
安全隔離電源 135  
安全使用電力 126, 128, 130, 132, 134-136, 138  
安全施工程序 10, 14-17, 22, 25, 27, 43  
安全操作負荷 92, 95, 96, 98, 100-105, 113, 114, 144, 162  
密閉空間安全 228  
安全帶 252  
安全委員會 27, 28, 32  
安全意識 17, 27  
安全施工協調及檢討 15, 20  
安全鞋履 236  
全身式安全帶；降傘式安全帶；背套式安全帶 66, 147, 148, 154, 159, 160, 162, 164, 169, 170, 199, 220, 222, 227, 228, 237, 238, 240  
安全頭盔 57, 86, 111, 122, 147, 148, 164, 188, 199, 210, 213, 215, 228, 230-235, 246, 252  
入職安全訓練 36  
安全巡查 15, 19, 20, 22, 23  
安全網/保護網 36, 67, 121, 154, 167, 168, 173, 174



<b>Safety officer</b>	06, 09, 13, 15, 20, 21, 23, 24, 27, 28, 37, 38, 39, 43, 45, 76, 89, 206, 220, 223, 253	<b>安全主任</b>	05, 09, 13, 15, 19, 20, 22, 24, 27, 36, 38, 39, 43, 45, 76, 88, 206, 220, 223, 252
<b>Safety shoes</b>	111, 117, 119, 138, 147, 148, 164, 188, 200, 210, 213, 215, 228, 236	<b>安全鞋</b>	111, 116, 118, 138, 147, 148, 164, 188, 199, 210, 213, 215, 227, 228, 236
<b>Safety signage</b>	07, 77	<b>安全標誌</b>	07, 77
<b>Safety standards</b>	13, 24, 31, 43, 86, 125, 139, 149, 177, 189, 201, 217, 229, 243, 253	<b>安全標準</b>	13, 23, 31, 43, 86, 125, 139, 149, 176, 189, 201, 216, 229, 243, 252
<b>Scaffolding/Scaffold</b>	18, 22, 69, 111, 150-156, 158, 160, 162, 164, 166, 168, 170-172, 174, 176, 177, 204, 207, 215, 239	<b>棚架</b>	18, 22, 68, 111, 150-156, 158, 160, 162, 164, 168, 170-172, 176, 204, 207, 215, 237
<b>Shackles</b>	95, 98-100, 102	<b>鈎環（塞古）</b>	95, 98-101
<b>Shoring</b>	181, 206	<b>支撐物</b>	181, 206
<b>Signaler</b>	90, 91, 93, 94, 110, 112, 145, 148, 193, 194	<b>訊號員</b>	90-93, 110, 112, 144, 147, 193, 194
<b>Signaling</b>	228	<b>發出訊號</b>	228
<b>Silver Card</b>	84, 85	<b>銀卡</b>	84, 85
<b>Silver Card (Advanced Safety Training)</b>	84	<b>銀卡（深造級安全訓練）</b>	84
<b>Site activities</b>	39	<b>工地作業</b>	38
<b>Site agent</b>	15, 16, 20, 22-25, 28	<b>工地總管</b>	15, 16, 19, 22, 24, 25, 27
<b>Site haul road</b>	57	<b>工地運料路</b>	57
<b>Site layout</b>	46, 112	<b>工地平面圖；工地布局</b>	46, 112
<b>Site layout plan</b>	46	<b>工地平面圖</b>	46
<b>Site safety</b>	44-87	<b>工地安全</b>	44-87
<b>Site traffic</b>	57	<b>工地交通</b>	57

# 索引 Index

Slings	88, 96, 98, 102, 145, 194	吊索	88, 96, 99, 101, 144, 194
Socket	126, 131, 169	插座	126, 130, 168
Spreader beam	101	吊樑	101
Stability	106, 154, 156, 183, 184	穩固程度；穩固	104, 154, 156, 183
Steel bending machine	120, 121	屈鋼筋機	120, 121
Step platform	146, 159	梯台	146, 159
Stockpiling	188	堆存	188
Storage and removal of materials	75	物料貯存和清理	75
Storage area	47, 54, 115, 142, 143	貯存地方/區	47, 54, 115, 142
Storage of material	47, 48, 76, 200	貯存物料	46, 48, 76, 200
Subcontractor (SC)	11, 15, 16, 20, 22, 24, 26, 28, 32, 35, 52	分判商；分包商	10, 15, 16, 20, 22, 24, 26, 27, 32, 35, 51, 52
Sunshade	83	蔭棚	83
Surface water run-off	184	地面水徑流	184
Surprise Safety Inspection Programme (SSIP)	14, 35, 36	突擊安全巡查計劃	14, 35, 36
Suspended working platform (Gondola)	124, 125, 163, 174, 175, 177, 217, 239	高空工作台（吊船）	124, 125, 162, 174-176, 216, 237
Switch room	133, 134	電掣房	133, 134

## T

Temperature	72	溫度	72
Temporary lighting	131, 204	臨時照明	131, 204
Temporary refuse chute	61	臨時垃圾槽	61
Temporary traffic arrangement	58-60, 180	臨時交通安排	58-60, 180
Tidying up	15, 21, 25	清掃	15, 21, 25
Toe board	64, 66, 67, 150, 151, 154, 157, 158, 160, 161, 163, 172, 191, 207	踢腳板	64, 66, 67, 150, 151, 154, 157, 159-162, 172, 191, 207
Tool Box Talk	38, 39, 74	工地座談會	38, 74



<b>Tower crane</b>	31, 85, 88, 89, 91-94, 125, 144-146, 148-149	<b>塔式起重機</b>	31, 84, 88-90, 92-93, 125, 144, 146, 147, 149
<b>Training</b>	05, 11, 27, 28, 36, 37, 40, 41, 43, 74, 84, 85, 91, 92, 101, 108, 113, 119, 123, 145, 152, 163, 197, 203, 207, 220, 221, 239	<b>訓練</b>	05, 10, 27, 36, 37, 40, 42, 74, 84, 90, 91, 101, 107, 113, 118, 123, 144, 152, 162, 196, 203, 207, 220, 221, 238
<b>Transformer room</b>	133	<b>電力變壓房</b>	133
<b>Trench</b>	178, 179, 181, 183, 184	<b>溝槽</b>	178, 179, 181, 182, 184
<b>Truck</b>	112	<b>貨車</b>	112
<b>Truss-out scaffold</b>	160	<b>懸空式棚架</b>	160

## U

<b>U-channel</b>	188	<b>U形排水渠</b>	187
<b>Underground utilities</b>	58, 60, 111, 178, 179, 190, 192	<b>地下公用設施</b>	57, 60, 111, 178, 179, 190, 192
<b>Utilities</b>	58, 60, 111, 178, 179, 181, 190, 192	<b>公用設施</b>	57, 60, 111, 178, 179, 181, 190, 192

## V

<b>Vehicle washing bay/ area</b>	46, 60	<b>車輛清洗處</b>	46, 60
<b>Vehicular and pedestrian access control</b>	57	<b>車輛及行人通道的管制</b>	57
<b>Ventilation</b>	71, 84, 119, 170, 210, 221, 222, 223	<b>通風</b>	71, 84, 118, 168, 210, 221, 222, 223
<b>Ventilation vent</b>	230	<b>透氣孔</b>	230
<b>Vibration</b>	208, 209	<b>震盪</b>	208

## W

<b>Warning notice</b>	54, 63, 66, 68, 110, 122, 130, 134, 169, 179, 183	<b>警告告示/標示</b>	54, 63, 66, 68, 110, 121, 130, 134, 169, 179, 183
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<b>Weather</b>	04, 33, 39, 59, 71, 72, 74, 81, 82, 150, 156, 158, 160, 163, 171, 175, 178, 182, 184, 190, 200, 212, 233	<b>天氣</b>	04, 33, 38, 58, 71, 72, 74, 81, 150, 156, 157, 159, 162, 171, 178, 182, 183, 190, 199, 212, 233
<b>Weekly check</b>	24	<b>每週巡查</b>	23
<b>Weekly safe working cycle</b>	22	<b>每週安全施工程序</b>	22
<b>Weekly safety coordination</b>	24	<b>每週安全協調</b>	24
<b>Weekly safety inspection</b>	23	<b>每週安全巡查</b>	23
<b>Weekly tidying up</b>	25	<b>每週清掃</b>	25
<b>Welding</b>	55, 116, 117, 118, 119, 124, 125, 139, 169, 189, 196, 197, 201, 210, 217, 243	<b>焊接</b>	55, 116-119, 124, 125, 139, 168, 189, 196, 201, 210, 216, 243
<b>Welfare facilities</b>	11, 37, 74	<b>福利設施</b>	10, 36, 74
<b>Wire rope sling</b>	95-97, 145	<b>纜吊索</b>	95-97, 144
<b>Work on slope</b>	105, 187	<b>在斜坡上工作</b>	105, 187
<b>Work over or near water</b>	187	<b>在水上或水邊工作</b>	187
<b>Work Safe Behaviour Programme (WSB)</b>	14, 30, 33	<b>工作安全行為計劃</b>	14, 30, 33
<b>Work safety zone</b>	180	<b>工作安全地帶</b>	180
<b>Working at height</b>	04, 31, 35, 36, 146, 171, 174, 190, 191, 200, 207, 239, 240	<b>高空工作</b>	04, 31, 34, 35, 146, 171, 174, 190, 191, 199, 207, 238, 239, 240
<b>Working cycle</b>	11, 14, 15, 16, 17, 22, 25, 28, 43	<b>施工程序</b>	10, 14, 15, 16, 17, 22, 25, 27, 43
<b>Working in hot weather</b>	72, 81	<b>在炎熱天氣下工作</b>	72, 81





<b>Working platform</b>	48, 66, 67, 108, 124, 125, 147, 150-152, 154, 156-164, 166, 168, 170, 172, 174, 176, 177, 187, 191, 192, 195, 207, 237, 239	<b>工作平台</b>	48, 66, 67, 107, 124, 125, 147, 150-152, 154, 164, 166, 168, 170, 172, 174, 176, 187, 191, 192, 195, 207, 237, 238
<b>Workplace, Workplaces</b>	04-06, 17-19, 22-25, 55, 71, 72, 81, 117, 122, 160	<b>工作間</b>	04-06, 17-19, 22- 23, 25, 55, 71-72, 81, 116, 121, 160

## Y

<b>Y-type chin strap</b>	147, 148, 164, 188, 200, 210, 213, 215, 228, 230, 235	<b>Y型下頷索帶</b>	147, 148, 164, 188, 199, 210, 213, 215, 228, 230, 234
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本手冊於2008年首次出版，而本手冊第二版由房屋署發展及建築處安全及健康小組負責更新及編製，並得到署內的工地督導和督察人員提供協助。手冊能成為業界的一本實用安全工具書，端賴各有關方面的鼎力支持和寶貴意見，我們特此衷心感謝房屋署工地安全小組委員會各位委員，以及下列機構：

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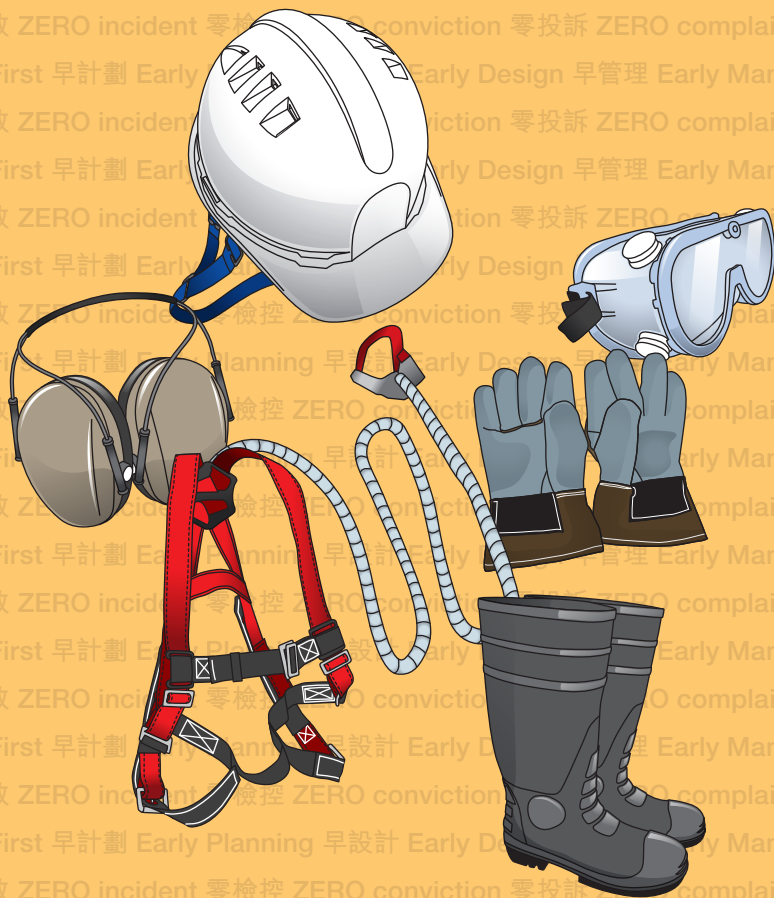


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