



拆卸結構建築物的風險管理

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安全及環保經理

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內容

1. 風險
2. 風險管理
3. 風險控制
4. 風險評估
5. 結構建築物拆卸方法
6. 危害鑑別
7. 安全措施

1. 風險

風險 = 嚴重性 x 可能性

Risk = Severity of Consequence x Probability/ Likelihood

- ❖ 可預期及接受的損失
(Expectation of Loss)
- ❖ 嚴重性及可能性的表達
(Expression of Severity and Likelihood)
- ❖ 長遠損失
(Long-term Rate of Loss i.e. Loss Rate Value)
- ❖ 受影響情況
(Affect Situation)

1. 風險

嚴重性

類別	意外	財政損失	工期	環境影響
災難 Catastrophic	死亡事故意外率 > 22	損失 > 20M	延誤 > 3個月	影響 > 5年
嚴重 Major	16.5 < 意外率 < 22	5M < 損失 < 20M	1個月 < 延誤 < 3個月	1年 < 影響 < 5年
重大 Moderate	11 < 意外率 < 16.5	1M < 損失 < 5M	7天 < 延誤 < 1個月	3個月 < 影響 < 1
輕微 Minor	意外率 < 11	損失 < 1M	延誤 < 7天	影響 < 3個月

1. 風險

可能性	
級別	描述
幾乎肯定 Almost Certain	Is expected to occur in most circumstances
可能 Likely	Will probably occur in most circumstances
有可能 Possible	Might occur at some time - moderate probability
不可能 Unlikely	Could occur at some time – low probability of occurrence

1. 風險

受影響情況

- 工人
- 公眾
- 資產
- 環境
- 業主
- 政客

2. 風險管理

風險級別	管理等級
極高 Critical	Immediate Board and Senior Management attentions are required to mitigate the risk
高 High	Senior Management attention is required to mitigate the risk
中 Moderate	Management responsibility must be specified to mitigate the risk
低 Low	The risk is managed by routine control procedures

Risk Reference Card

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3. 風險控制

- 設計改變
(Design Change)
- 安全工程設計
(Engineered Safety Features)
- 安全裝置
(Safety Devices)
- 警告裝置
(Warning Devices)
- 程序及訓練
(Procedures and Training)

最有效控制

有效控制

4. 風險評估



風險記錄 Risk Register

5. 結構建築物拆卸方法

- 從上而下 (Top Down-Manual)
- 從上而下 (Top Down-Machines)
- 切割 (Saw Cutting)
- 爆破 (Explosion)
- 迫爆 (Implosion)
- 沖擊錘 (Wrecking Ball)

6. 危害鑑別

結構倒塌



PI_Claims_News

個人傷害索償剪報

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折花籠 3 黑工跌死跌傷 索償案達協議

業主法團須負 35% 責任

【本報訊】六年前觀塘月華街月華樓天台單位進行清拆僭建花籠工程時，三名黑工疑因工序出錯，導致發生連人帶花籠墮地意外，釀成一死兩傷。傷者及死者家屬年前入稟向工程判頭，肇事單位前業主及業主立案法團索償，案件原定昨天在高等法院開審。惟與訟各方經商議 4 小時後達成和解，判頭須負三成責任，業主及法團各須負三成半。賠償額料一年內評審，相信涉款逾 1,000 萬元。

判頭承擔三成責任

三名原告包括易勝茂、鄭學發的妻子潘秀麗及死者賴享的遺產代理人陳桂連。被告為工程判頭黃錦標、肇事單位前業主郭曦、月華樓業主立案法團及僱員補償援助基金管理局。據原告代表資深大律師包華禮指，因黃錦標案發前無替三名原告買勞工保險，故僱員補償局才會介入負責賠款。

包華禮昨與被告在庭外商討近四小時後，獲主審暫委法官梅賢玉批准，按各方達成的和解方案頒令執行。包庭外透露，兩名於意外中受傷的原告尚未完全康復。黃錦標於 02 年承認三項僱用非法勞工罪，被判囚一年，已服刑完畢。

昨有近 20 名月華樓小業主到庭聽審。他們在同意賠償方案後，均大叫「唔公平」。法團主席利國偉指，業主違例僭建花籠，及後僱用黑工，理應獨自承擔責任，小業主及法團均為事件中的受害人。

肇事單位現任姓陳業主則指，他一家四口於去年以 100 萬元購入單位。前業主郭曦於買賣時口頭協議承擔官司責任，他現仍擔心受官司牽連。

案發 02 年 8 月 11 日，居於月華樓 12 樓的郭曦，因收到屋宇署要求清拆大廈 13 樓天台僭建外牆花籠通知，遂聘用黃錦標。黃聘了涉案三名黑工，三人疑因工序出錯，導致花籠倒塌，三人連同花籠飛墮地下，賴享身亡，易勝茂及鄭學發重傷。三名死傷者於 05 年入稟索償。上訴庭去年裁定僱主須就黑工工傷或身亡作出賠償，僱員補償局故上訴，但終審法院不受理。

案件編號：HCPI_742/05



↑觀塘月華街月華樓（箭嘴示），02 年清拆僭建花籠時倒塌（小圖），三名黑工墮地一死兩傷。

來源：蘋果日報二〇〇八年九月廿三日

6. 危害鑑別

火警及爆炸



風煤樽漏氣噴烈燄

【本報訊】西環皇后大道西四百二十五號對開一處路邊渠務署工地，昨晨九時四十五分左右，一個風煤樽疑漏氣噴出火苗（小圖），工人無法控制致電報警。消防員到場射水戒備，至二十分鐘後待風煤樽內大部份氣體耗盡後，消防員即走近將風煤樽倒插進水桶中（圓），將火完全撲熄。事件中無人受傷。

胡惠宏攝

A large photograph showing several firefighters in full protective gear, including yellow helmets and blue uniforms, gathered around a leaking propane tank. They are using hoses and water to extinguish the fire. In the background, a white truck is parked on the street. Below this main photo are two smaller inset images: one showing a close-up of the leaking propane tank, and another showing a view of the scene with a building in the background.

6. 危害鑑別

- 觸及地底電纜/煤氣喉管

17:00 荔枝角

鑿爆電纜 兩工人燒傷

【本報訊】荔枝角收押所懲教署職員宿舍改善工程地盤，昨午五時許，工人操作風炮鑿地時，疑誤觸地底電纜發生爆炸，兩名分別姓曾（五十二歲）及姓黃（五十四歲）同被噴出的火球灼傷面及手部，工友將他們扶起報警，由救護車送院救治。黃傷勢較重，全身三成皮膚灼傷，情況穩定。

一名被燒傷工人躺臥地上等
待救援。

6. 危害鑑別

■ 壓縮氣樽（滅火筒）爆破



7. 安全措施

拆卸石綿

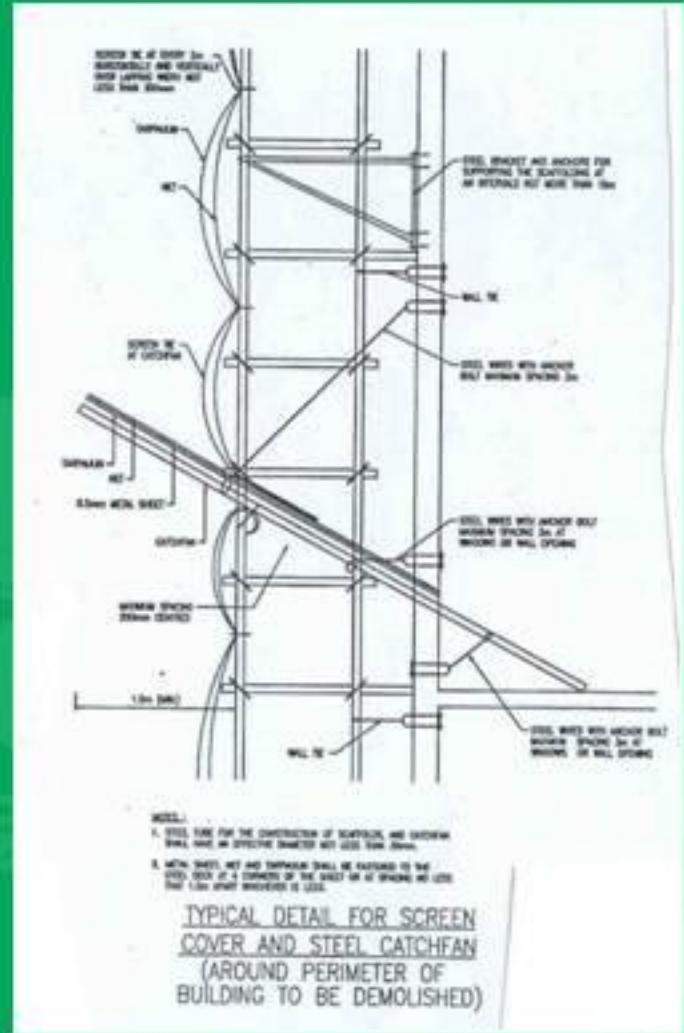
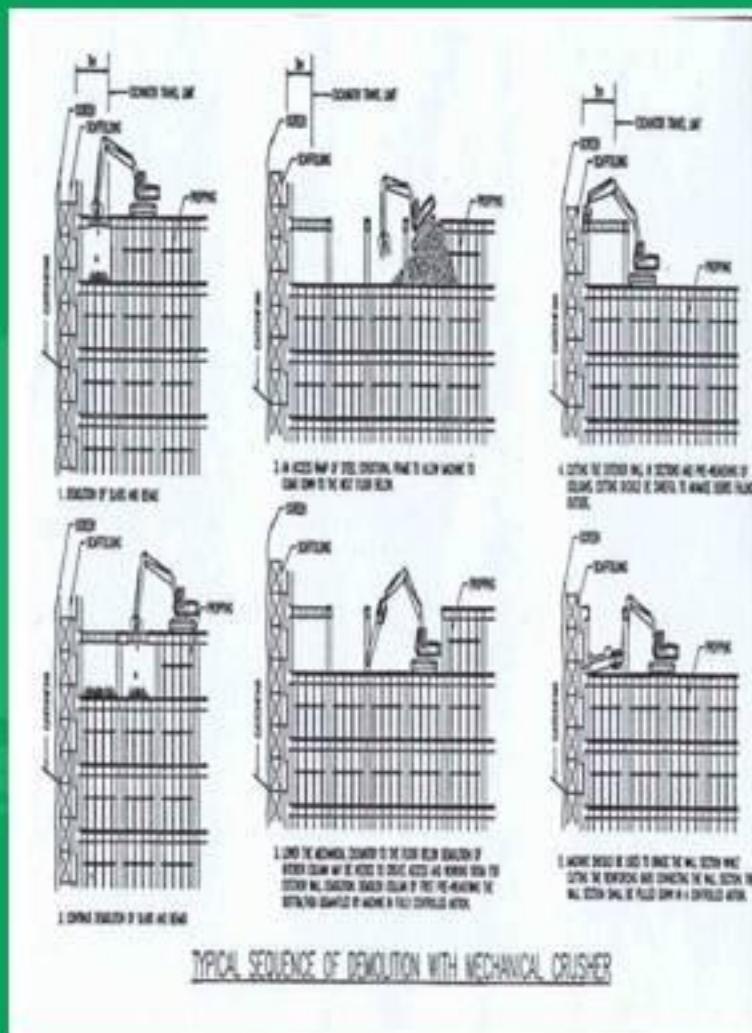
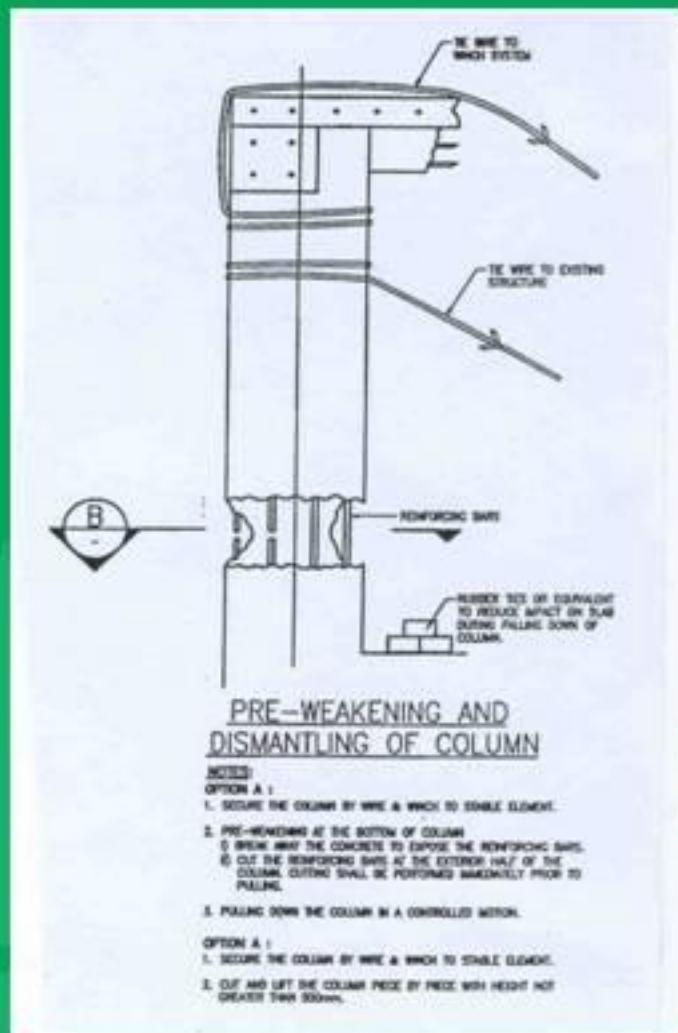


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7. 安全措施

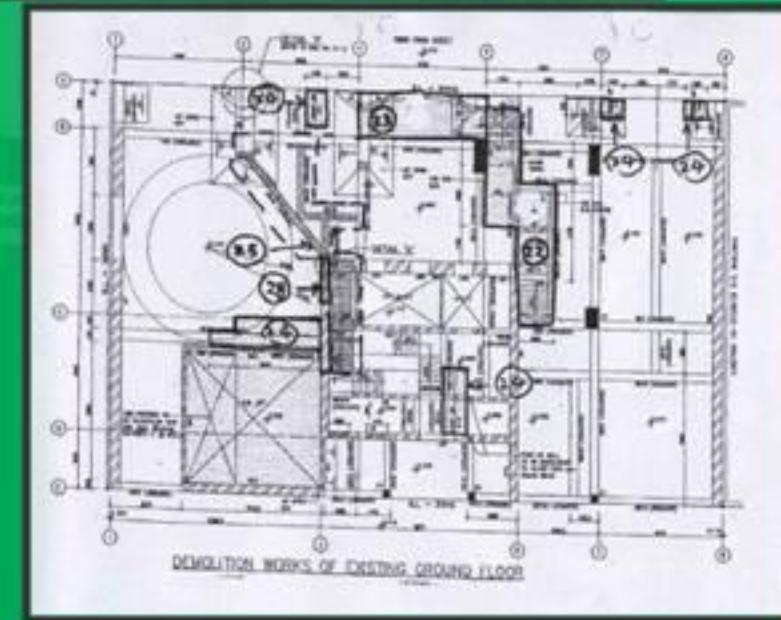
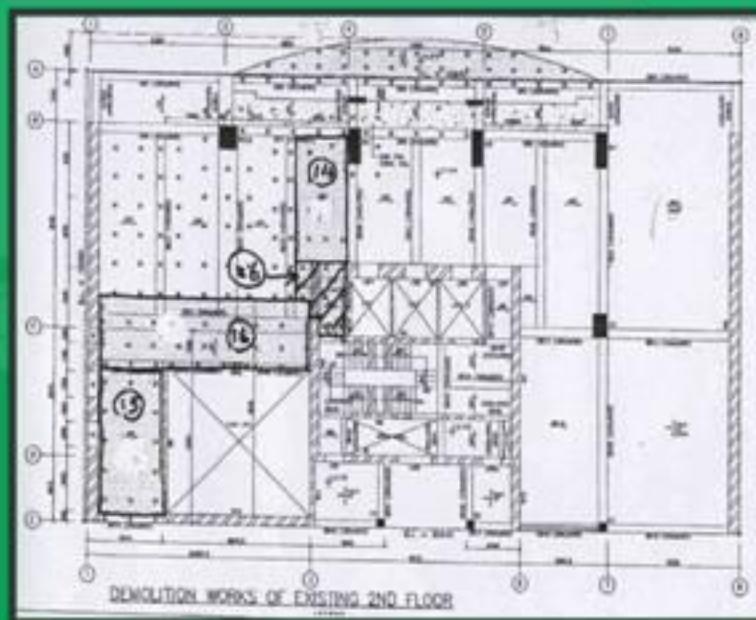
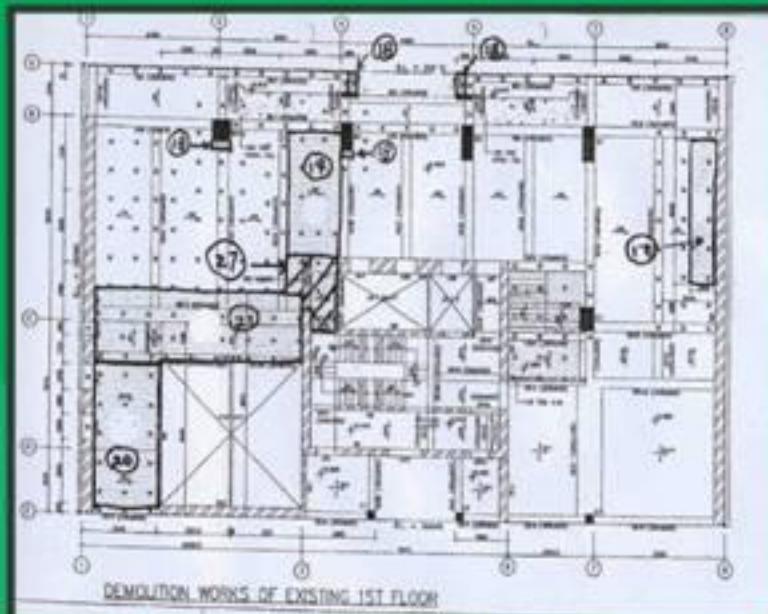
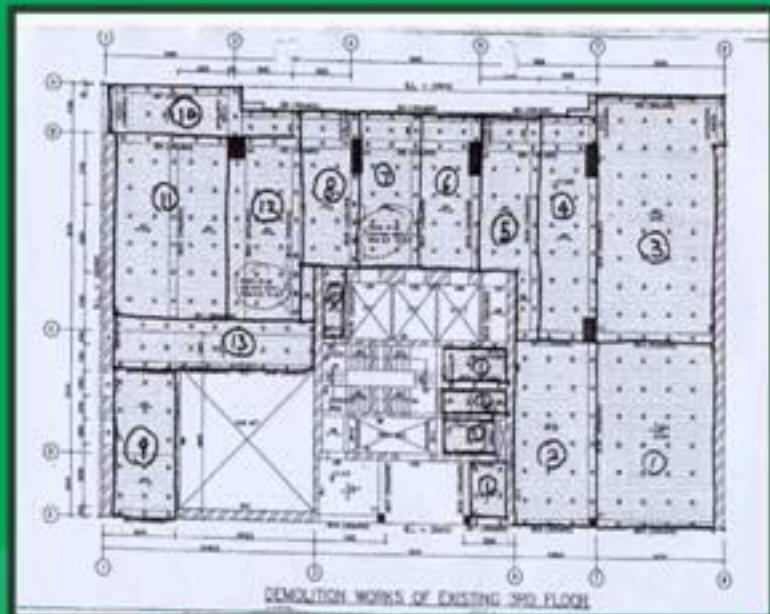
安全拆卸施工步驟



7. 安全措施



安全拆卸施工步驟



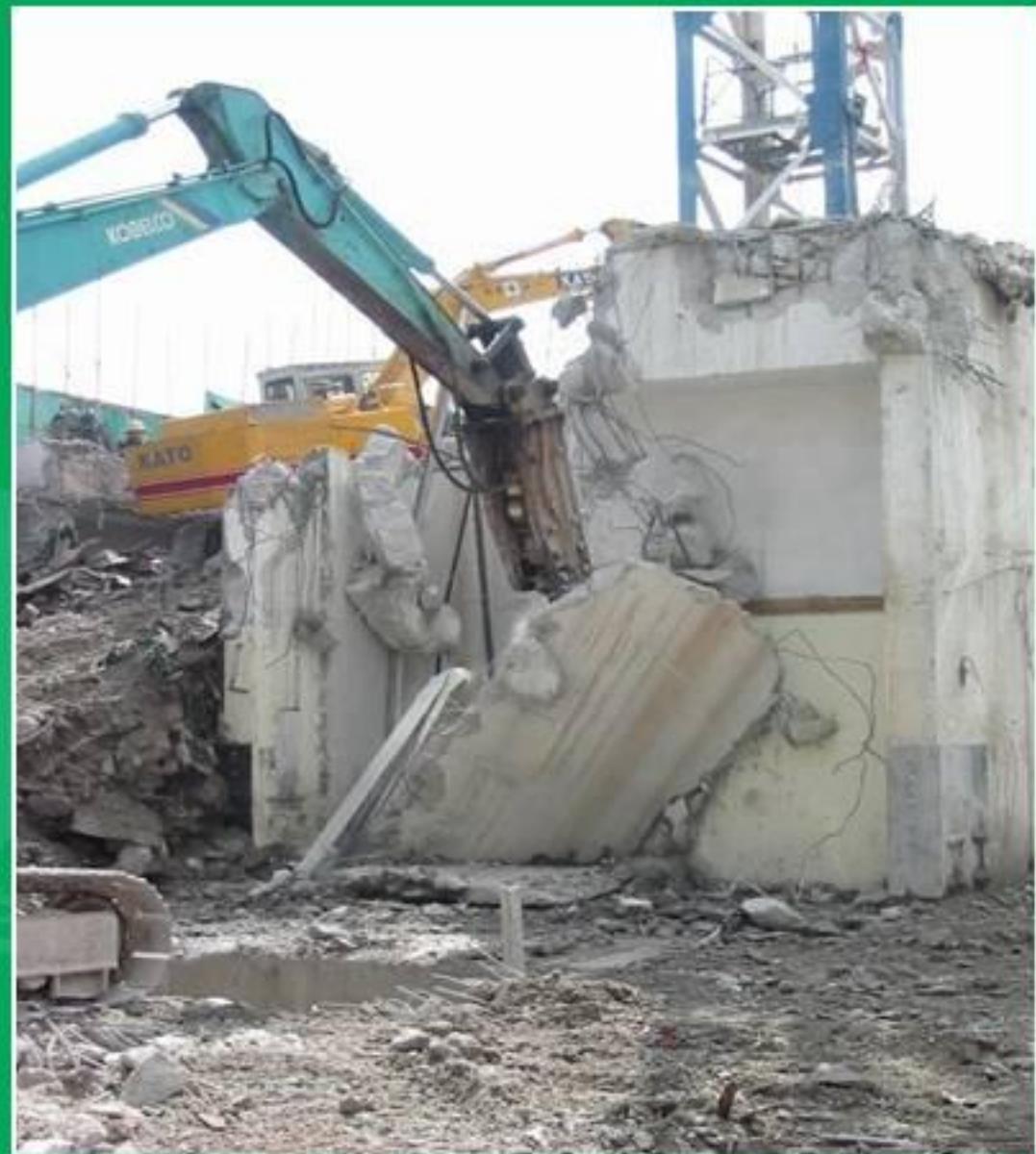
7. 安全措施

临时結構支撑



7. 安全措施

安全拆卸施工步驟



7. 安全措施

安全拆卸施工步驟



7. 安全措施

安全拆卸施工步驟



7. 安全措施

防止物料下墜



7. 安全措施

竹棚架安全



7. 安全措施

防止樓面超荷載



7. 安全措施

升降機槽口安全措施



7. 安全措施

防止人體下墜



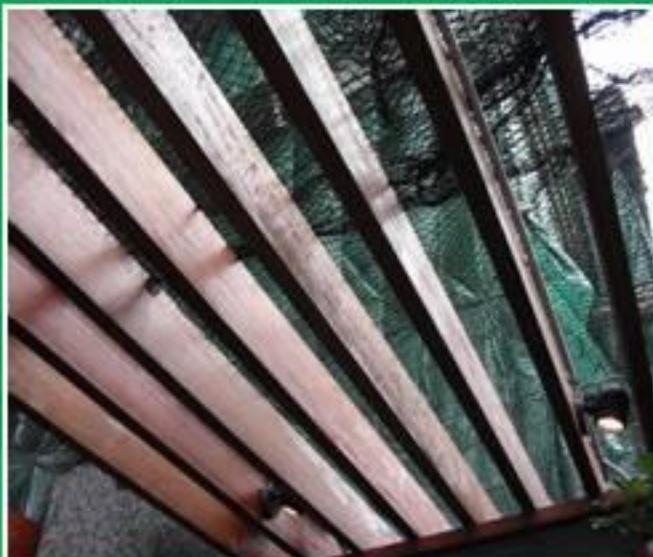
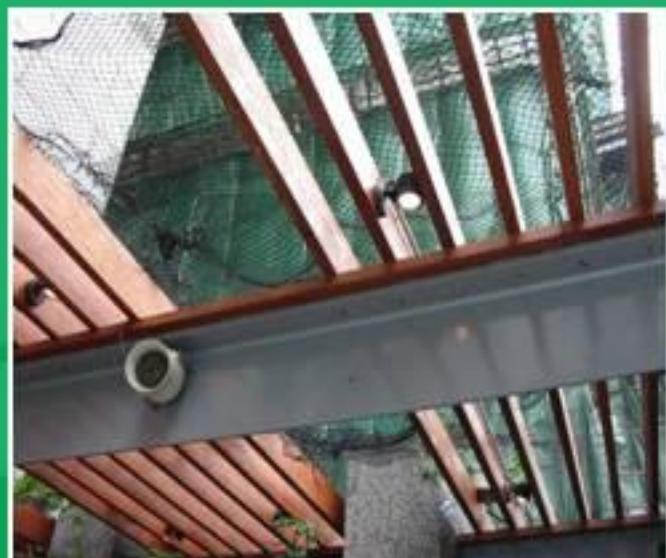
7. 安全措施

鑑定地底公用設施



7. 安全措施

睦鄰



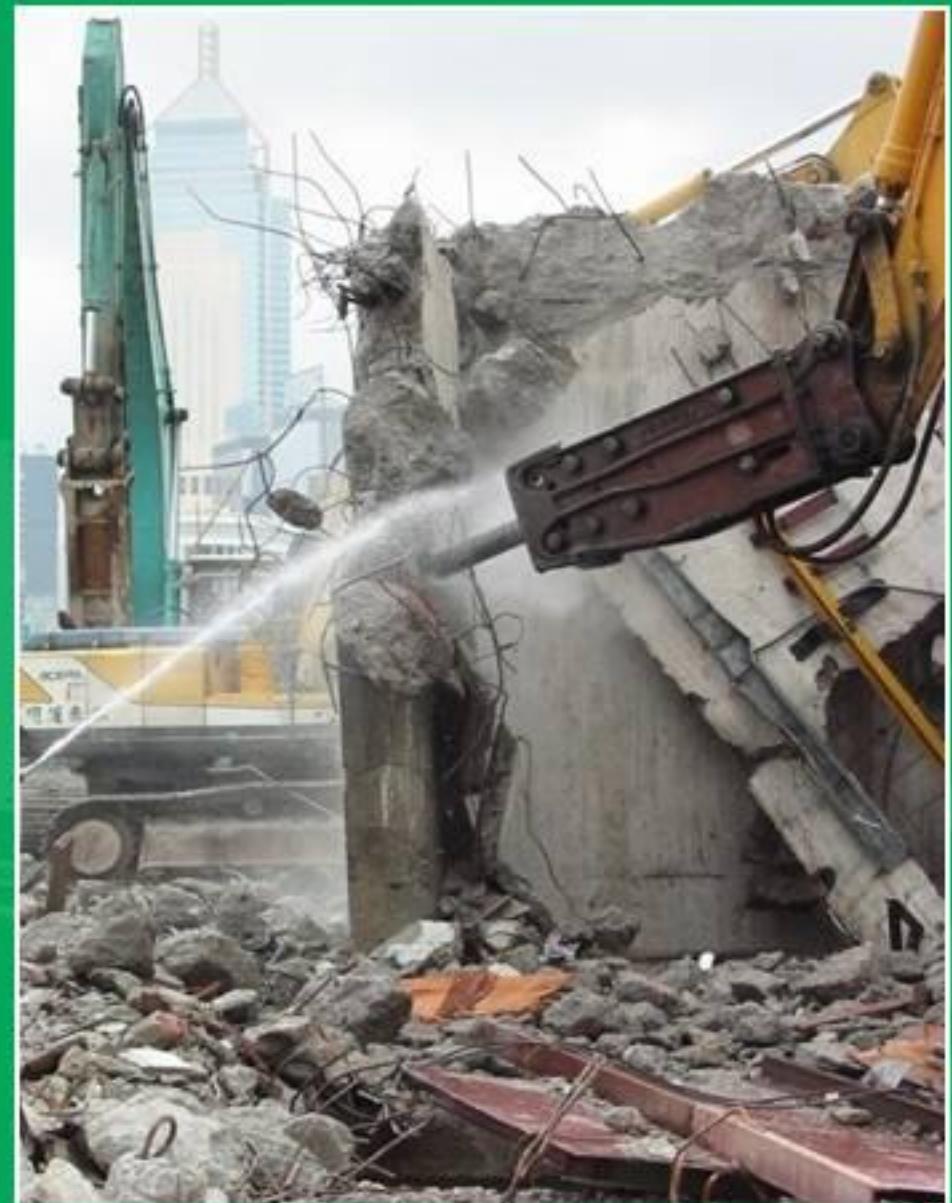
7. 安全措施

街道封闭及指示



7. 安全措施

防塵



7. 安全措施

清理排水管道



•Thank You!!

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PYE - Risk assessment reference card

KEY TERMS AND DEFINITIONS

Risk Assessment	Identification and assessment of significant risks that prevent the achievement of PYE's objectives.
Risk	The possibility that an event will occur and adversely affect the achievement of PYE's objectives.
Inherent Risk	The possibility that events or circumstances will prevent PYE's from achieving its objectives before the consideration of controls.
Controls	Controls are the policies and procedures, which may or may not be put in place, that help provide assurance that the risks are reduced to an acceptable level. The controls are implemented, to either reduce, transfer, or avoid the risks associated with the process and its objectives. Management may choose to accept the risk by not implementing any specific controls.
Residual Risk	The remaining risk after considering the effect of controls implemented by the management.

RISK – CONSEQUENCE OF OCCURRING

	Minor	Moderate	Major	Catastrophic
Profit from operations ¹¹	Less than HK\$1 million (i.e. 0%-1% impact on profit)	HK\$1-5 million (i.e. 1%-5% impact on profit)	HK\$5-20 million (i.e. 5%-20% impact on profit)	Above HK\$20 million (i.e. above 20% impact on profit)
Reputation and market shares	Minor potential impact on market share and brand value	Market share and/or brand value will be affected in the short term	Serious diminution in brand value and market share and with adverse publicity	Loss of brand value where the cost of future brand investment outweighs the recovery
Safety	Accident rate below 11	Accident rate 11-16.5	Accident rate 16.5-22	Accident rate above 22 or fatal accident happened
Level of management attention	Delegated to middle management to resolve	Require senior and middle management intervention	Require senior management and top management attention	Requires ongoing crises management and direction by the CEO/COO/CFO or the Board
Impact on business	Impact on internal business only	Significant impact on the business – would affect client/ consultant	Major impact on business – serious damage to PYE's ability	Severe damages on business may cast serious doubt on PYE's survival
Build quality	Minor repairs/ rectification	Major repairs/ rectification – including structural	Substantial re-build	Total replacement

¹¹ Profit from operations is based on consolidated income statement for the year ended 31 March 2006.

¹² Accident rate represents the number of reportable accidents per 1000 workers per year.

RISKS – LIKELIHOOD OF OCCURRING				
DESCRIPTOR	EXAMPLE OF DETAILED DESCRIPTION			
Almost Certain	Is expected to occur in most circumstances.			
Likely	Will probably occur in most circumstances			
Possible	Might occur at some time – moderate probability			
Unlikely	Could occur at some time – low probability of occurrence			

ASSESSMENT OF INHERENT AND RESIDUAL RISK BY ITS CONSEQUENCE AND LIKELIHOOD																								
DETERMINATION OF OVERALL RESIDUAL RISK																								
Consequence				Inherent Risk																				
<table border="1"> <tr> <td>Catastrophic</td> <td>M</td> <td>H</td> <td>C</td> <td>C</td> </tr> <tr> <td>Major</td> <td>L</td> <td>M</td> <td>H</td> <td>C</td> </tr> <tr> <td>Moderate</td> <td>L</td> <td>M</td> <td>M</td> <td>H</td> </tr> <tr> <td>Minor</td> <td>L</td> <td>L</td> <td>L</td> <td>M</td> </tr> </table>				Catastrophic	M	H	C	C	Major	L	M	H	C	Moderate	L	M	M	H	Minor	L	L	L	M	Critical
Catastrophic	M	H	C	C																				
Major	L	M	H	C																				
Moderate	L	M	M	H																				
Minor	L	L	L	M																				
Likelihood				High																				
<table border="1"> <tr> <td>Catastrophic</td> <td>M</td> <td>M</td> <td>C</td> <td>H</td> </tr> <tr> <td>Major</td> <td>H</td> <td>H</td> <td>M</td> <td>M</td> </tr> <tr> <td>Moderate</td> <td>M</td> <td>M</td> <td>M</td> <td>L</td> </tr> <tr> <td>Minor</td> <td>L</td> <td>L</td> <td>L</td> <td>L</td> </tr> </table>				Catastrophic	M	M	C	H	Major	H	H	M	M	Moderate	M	M	M	L	Minor	L	L	L	L	Moderate
Catastrophic	M	M	C	H																				
Major	H	H	M	M																				
Moderate	M	M	M	L																				
Minor	L	L	L	L																				
Control Effectiveness				Low																				
ASSESSMENT OF SIGNIFICANCE OF RISKS (RISK RATING)																								
KEY	DESCRIPTOR	LEVEL OF ATTENTION REQUIRED																						
C	Critical	Immediate board and senior management attentions are required to mitigate the risks																						
H	High	Senior management attention is required to mitigate the risk																						
M	Moderate	Management responsibility must be specified to mitigate the risk																						
L	Low	The risk is managed by routine control procedures																						
ASSESSMENT OF OPERATING CONTROL EFFECTIVENESS																								
DESCRIPTOR	EXAMPLE OF DETAILED DESCRIPTION																							
Satisfactory	Controls are strong and operating properly, providing a reasonable level of assurance that objectives are being achieved.																							
Minor Weaknesses	Minor control weaknesses/inefficiencies have been identified. Although these are not considered to be significant, improvements are required to provide reasonable assurance that objectives will be achieved.																							
Some Weaknesses	Some control weaknesses/inefficiencies have been identified. Although these are not considered to present a serious risk exposure, improvements are required to provide reasonable assurance that objectives will be achieved.																							
Weak	Controls do not meet an acceptable standard as many weaknesses/inefficiencies exist. Tremendous improvements are required immediately to provide reasonable assurance that objectives will be achieved.																							

4.9 Safety & Environment – Construction Group

Process	Sub-Process	Risk no.	Risks	Inherent Risk Rating	Residual Risk Rating	Control no.	Existing Controls of PYE	Potential Improvement Opportunities
Safety & Environment	Safety, Health and Environment	SE-R01	Management awareness and emphasis on SHE may not be sufficient.	MA PO M	MO PO M	SE-C01	QSE Management Committee Meetings are held quarterly. The QSE Management Committee consists of the Executive Directors, Directors, Project Directors, Quality Senior Manager, Safety & Environment Manager, General Manager (E&M), Contracts Manager (IC), Contracts Managers, Assistant Safety Manager and Assistant Environmental Manager. The Safety & Environment Manager reports the performance of the Parent Company and its subsidiaries including safety and environmental incidents, accident statistic, audit results with improvement opportunities, safety and environmental management programmes and etc. during the QSE Management Committee	Department Heads of functional departments shall be invited to participate the meeting at ad hoc basis to develop a positive safety culture throughout the Company.
Safety & Environment	Safety, Health and Environment	SE-R02	Safety, health and environmental measures may not be properly implemented at sites.	MA PO M	MO PO M	SE-C02	The PIC is accountable to the safety and environmental performance of the sites and responsible for monitoring the safety performance of the sites. Daily morning briefings are conducted by the PIC or his delegate, including safety and environmental topics.	The PIC or his delegate shall chair site safety and environmental committee meeting which is held at monthly basis to review and monitor safety, health and environmental measures are properly implemented to full compliance with statutory and contractual requirements.
						SE-C03	PIC leads to carry out site safety and environmental inspections at weekly intervals.	
						SE-C04	Sub-contractors are fined a penalty fee for any breaches of safety and environmental regulations as set in the sub-contractor contract agreement.	
Safety & Environment	Safety, Health and Environment	SE-R03	Employees and labourers / subcontractor supervisors' safety and environmental protection awareness may not be adequate.	MA LI H	MA PO M	SE-C05	Safety and environmental induction trainings are provided by the Safety and Environment Department to the employees and labourers / subcontractor supervisors.	07/08 PJO: Site staff from PIC to front-line supervisor shall attend induction safety and environmental training.

FIU(SO&SS)R The Factories and Industrial Undertakings (Safety Officers and Safety Supervisors) Regulations

HKCA Hong Kong Construction Association

H&S Health and Safety

ISO International Organisation for Standardisation

PIC Project-in-charge

PYE Paul Y. Engineering Group Limited

QSHE Quality, Safety, Health and Environment

Risk Rating Abbreviations

Risk Consequence

CA Catastrophic

MA Major

MO Moderate

Risk Likelihood

AC

LI

PO

Almost Certain

Likely

Possible

Inherent/Residual Risk Rating = Risk Consequence x Risk Likelihood

C Critical

H High

M Moderate