

## 建造業議會

### 申請大埔 33 區地作為設置戶外訓練場之建議

#### 目的

本文件概述由建造業議會申請大埔 33 區地作為設置戶外訓練場以用作搬遷議會現有的沙田及九龍區的訓練場之建議。

#### 背景

2. 建造業議會(CIC)是按建造業議會條例(第 587 章)於 2007 年 2 月 1 日成立,從後根據議會條例於 2008 年 1 月 1 日與前建造業訓練局合併。在議會之下,建造業議會訓練學院(訓練學院)繼而成立,提供建造業的訓練及測試。
3. 現時訓練學院共有 4 所訓練中心,分別位於九龍灣、上水、葵涌及香港仔。同時,為提供戶外的訓練及測試,另有 5 個訓練場,分別位於沙田石門、九龍灣常悅道、觀塘偉樂街、屯門 44 區及天水圍 112 區。
4. 訓練學院現時主要提供以下訓練及測試予公眾人士申請:
  - i) 全日制課程
    - 27 項成年人短期課程 – 適合 18 歲以上人士
    - 4 項監工/技術員課程 – 適合中五畢業生
    - 9 項基本工藝課程 – 適合完成初中學生

- ii) 兼讀課程-主要為建造安全訓練課程如(綠卡)及銀卡等,亦有提供其他技術提升及管理課程予業內有經驗人士。
- iii) 工藝測試-訓練學院共提供有關於建築及土木工程 60 項大工, 28 項中工測試及有關於機電工程 12 項大工及 12 項中工測試。此外,在訓練場則提供共 7 項起重機械操作測試。

5. 發展局根據各區的需要,在 2010 年向訓練學院表示,沙田、常悅道、偉樂街三個訓練場可能需要交還政府作其他用途,而發展局亦曾聯同規劃署和訓練學院視察多個地方,訓練學院考慮回去尋找合適場地以遷移有關訓練場。在 2011 年 1 月,發展局通知訓練學院一幅位於大埔 33 區的地可供使用,並要求訓練學院考慮有關場地是否適合用以替代上述三個將被遷移的訓練場。

#### 訓練學院考慮的因素

6. 為提供有效的服務,訓練場一定需要有公共交通服務。訓練場的建議選址位於大福街南端,公眾人士可於汀角路乘坐巴士前往沙田、北區,以及大埔墟鐵路站。整體而言,交通設施是十分適合。

7. 有見建議的訓練場位於大埔工業村及富善邨之間,訓練學院在設置訓練場時,會採取適當的措施,減少對周圍的影響。

8. 政府已落實十大基建項目,其中首先推行之各項土木工程,均需大量之起重機操作員協助施工,而在訓練場首先提供的流動式起重機操作訓練場,亦為成年人提供一個全日制短期課程,為有意成為合資格起重機操作員的人士提供有系統的訓練,加入蓬勃的建造行業。

9. 如訓練場更接近社區，如天水圍訓練場，更加可招攬就近的居民參加建造業。

### 未來訓練場的服務

10. 如訓練學院申請在大埔 33 區用地在 2011 年中獲得審批，計劃將分三個階段設立戶外訓練場（見附件一），首階段將在 A 區建設一個起重機操作測試場、一個建造業技能測試場及一個流動式起重機操作訓練場，訓練學院預計 A 區可在 2012 年初可提供服務。。

11. 按目前法例，由於起重機操作對工地安全及公眾影響重大，所有起重機操作員必須通過評核，確保其操作技術及安全意識達到一定水平，才能操作指定的起重機，而在此區建設的起重機操作測試場，正為業界 6 類不同起重機的操作員進行評核，讓擁有及格技術及安全意識的操作員取得認可資歷；另外在此區設立的建造業技能測試場，亦為 3 類不同工種的技術工人提供技能測試，工人取得及格成績後，可按「建造業工人註冊條例」註冊成為熟練技術工人或半熟練技術工人，為業界提供一個可靠的認證服務。

12. 至於設立戶外訓練場的第二及第三階段，主要是在 B 區及 C 區建設另一個建造業技能測試場及一個建造業技能訓練場。按臨時的收地時間表，B 區及 C 區分別可在 2013 年初及 2014 年底運作。在此區的建造業技能測試場，將為另外 11 類不同工種的技術工人提供技能測試，工人取得及格成績後，亦可註冊為熟練技術工人或半熟練技術工人。在此區設立的建造業技能訓練場，則會提供 6 個不同工種的技術訓練，其中更包括現時建造業非常缺乏的紮鐵工、模板工、金屬模板裝嵌工、地渠工、天秤組裝工及天秤操作員，為有意加入此類行業的成年人提供一免費而又有津貼之全日制短期課程。

13. 建造業議會預計，在整個大埔戶外訓練場的建設完成後，相信平均每日約有 240 人在此場內進行訓練或測試。

## 環境及安全風險評估

14. 訓練學院在 2011 年 1 月知悉大埔 33 區是位於潛在危險裝置諮詢區內，根據《香港規劃標準及準則》，須徵詢潛在危險設施土地使用規劃和管制協調委員會的審批。故在 3 月已聘用偉信顧問集團有限公司 (Scott Wilson Ltd.) 進行所需的可行性報告，初步結果見於附件二，主要的項目包括下列討論：-

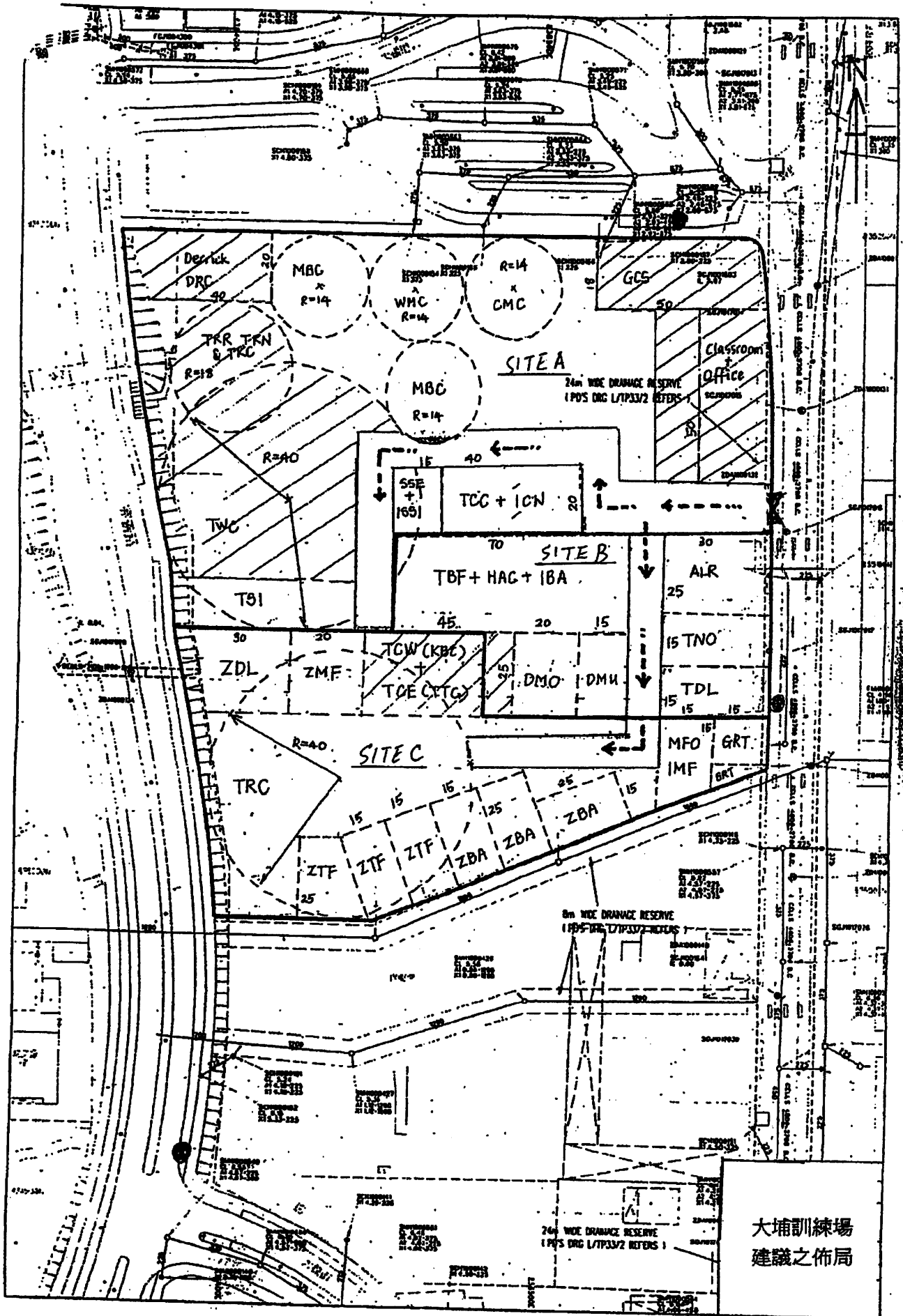
1. 噪音
  - 初步的噪音評估，如有需要訓練學院會採取一些緩減噪音的措施，以減少對一些敏感受體的可能影響。
2. 危害
  - 訓練學院正與兩所潛在危險裝置持有人進行緊密的聯繫以解決資料機密的問題，訓練學院將會聘請危險裝置持有人對他們的危險裝置行量化風險評估。這份量化風險評估需要交給潛在危險設施土地使用規劃和管制協調委員會批核。
3. 視覺
  - 訓練場對附近地區的視覺影響是輕微。
4. 其他方面
  - 考慮到工程項目對其它方面的影響包括空氣質量、交通、廢物產生、水質、生態及土地污染等。隨著實施標準的施工管理措施、在工地培訓時實施良好的工地和營運管理，預期該項目對周圍環境的影響很小。

## 建議

15. 訓練學院在獲得大埔區議會對訓練學院在大埔 33 區分期設置戶外訓練場的寶貴意見後，將會繼續與相關持份者詳細跟進相關事項，並在區議會 7 月份的會議向區議會匯報進展及尋求進一步意見。

建造業議會

2011 年 4 月



大埔訓練場  
建議之佈局

**URS**



CONSTRUCTION  
INDUSTRY COUNCIL  
建造業議會

---

# **Consultancy Services for Feasibility Study of Establishing a Training Centre in Tai Po Area 33**

Feasibility Report

Version 1

April 2011

**Scott Wilson Ltd**



## Table of Contents

<b>Executive Summary / 行政摘要</b>	<b>1</b>
<b>1. Background</b>	<b>7</b>
<b>2. Brief Project Description</b>	<b>7</b>
<b>3. Site Surroundings</b>	<b>8</b>
<b>4. Air Quality</b>	<b>11</b>
<b>5. Noise</b>	<b>12</b>
<b>6. Hazards</b>	<b>16</b>
<b>7. Visual Character</b>	<b>25</b>
<b>8. Water Quality</b>	<b>33</b>
<b>9. Waste Generation</b>	<b>34</b>
<b>10. Land Contamination</b>	<b>34</b>
<b>11. Ecology</b>	<b>35</b>
<b>12. Traffic</b>	<b>35</b>





Where inconsistencies are found between the Chinese and English versions, the English version shall prevail.

#### DISCLAIMER

This document has been prepared in accordance with the scope of Scott Wilson's appointment with its client and is subject to the terms of that appointment. It is addressed to and for the sole use and reliance of Scott Wilson's client. Scott Wilson accepts no liability for any use of this document other than by its client and only for the purposes, stated in the document, for which it was prepared and provided. No person other than the client may copy (in whole or in part) use or rely on the contents of this document, without the prior written permission of the Company Secretary of Scott Wilson Ltd. Any advice, opinions, or recommendations within this document should be read and relied upon only in the context of the document as a whole. The contents of this document are not to be construed as providing legal, business or tax advice or opinion.

© Scott Wilson Ltd 2010

## **EXECUTIVE SUMMARY / 行政摘要**

URS/Scott Wilson has been commissioned by the Construction Industry Council (CIC) for the Consultancy Services for the Feasibility Study of Establishing a Training Centre in Tai Po Area 33.

偉信顧問集團有限公司受到建造業議會的委托，對於一項在大埔第三十三區建立一個培訓中心的可行性研究進行諮詢服務。

This Draft Feasibility Study Report has been produced for the Tai Po District Council Meeting on 3 May 2011. Where necessary the Draft Feasibility Study Report will be developed to incorporate public, stakeholder and District Council's concerns.

此可行性研究報告的草案目的，在於二零一一年五月三日中的大埔區議會會議中發表。如有需要，本草案的可行性研究報告會將公眾、有關的利益相關者及區議會的關注一併納入作為研究範圍。

The Project is to be developed in three Stages. This report considers the fully developed Site and the future scenario.

本項目將分作三個階段發展興建，本報告是以項目的全面發展及未來情況作研究考慮。

The Site is surrounded on 3 sides by roads, and is adjacent to the Tai Po Industrial Estate to the east, a KMB bus depot to the north, residential and community uses to the west, and lorry / car parking to the south. Further to the south is the Tai Po Waterfront Park. Beyond Yuen Shin Road lie a number of housing developments, kindergarten / primary schools and colleges.

這項目的位置被三面道路包圍，它的東面毗鄰是大埔工業村；九巴車廠位於它的北面；西面主要是住宅和社區用地；至於貨車／汽車停車場就在它的南面。它的較遠南面是大埔海濱公園。在完善路的附近有數個住宅地區、幼兒園／小學和中學。

### **Noise / 噪音影響**

Existing noise surveys have been carried out at representative noise sensitive receivers in the vicinity of the Site. In addition to ensure the accuracy of the noise assessment, specific noise measurements have been carried out at existing CIC Training Grounds of CIC machinery. Current noise levels at the representative monitoring locations were dominated by the surrounding road network.

對於具有代表性的噪音敏感受體及其附近位置，本研究已經進行了有關的噪音調查。就調查結果所得，在本項目附近代表性的監測地點所量度的噪音主要源自周遭道路網絡。另外，現行應用於建造業議會培訓中心內的機動設備也進行了實地的噪音測量，並把結果納入本噪音評估中，以確保其準確性。

Noise from training course and trade testing activities will vary depending on the nature of training session (eg classroom based / hands-on demonstrations), and the concurrent activities on the Site. Initial noise assessments of the training activities on the Site indicate that noise levels at some receivers require CIC to carry out noise mitigation. CIC will apply, as far as practicable, Quiet Powered Mechanical Equipment (QPME) on the future training centre in order to minimise corresponding operational noise. In addition, CIC is investigating opportunities for the provision of mitigation on-site, such as relocation of training activities with comparatively higher operational noise levels to the area more remote from the nearby noise sensitive receivers within the Site, and provision of noise hoardings, to ensure the relevant noise requirements at the receivers are met. Results of noise assessment are summarised in attached Figure.

訓練課程及技能測試活動所製造的噪音將取決於培訓活動的性質（例如課室為主 / 動手示範等），並涉及項目範圍內同期舉行的活動。初步的噪音評估指出一些敏感受體的噪音水平需要建造業議會採取一些緩減噪音的措施。在可行的情況下，建造業議會在培訓中心內將會儘量採用靜音機械設備，以減低運作時發出的噪音。另外，建造業議會亦正研究其他有效的噪音緩減措施的可行性，例如將會發出較高噪音的培訓活動移至遠離鄰近對噪音敏感的住戶及學校，與及運用噪音圍板等，以確保噪音水平能夠滿足相關的法定標準。附圖扼要地展示了噪音水平評估的結果。

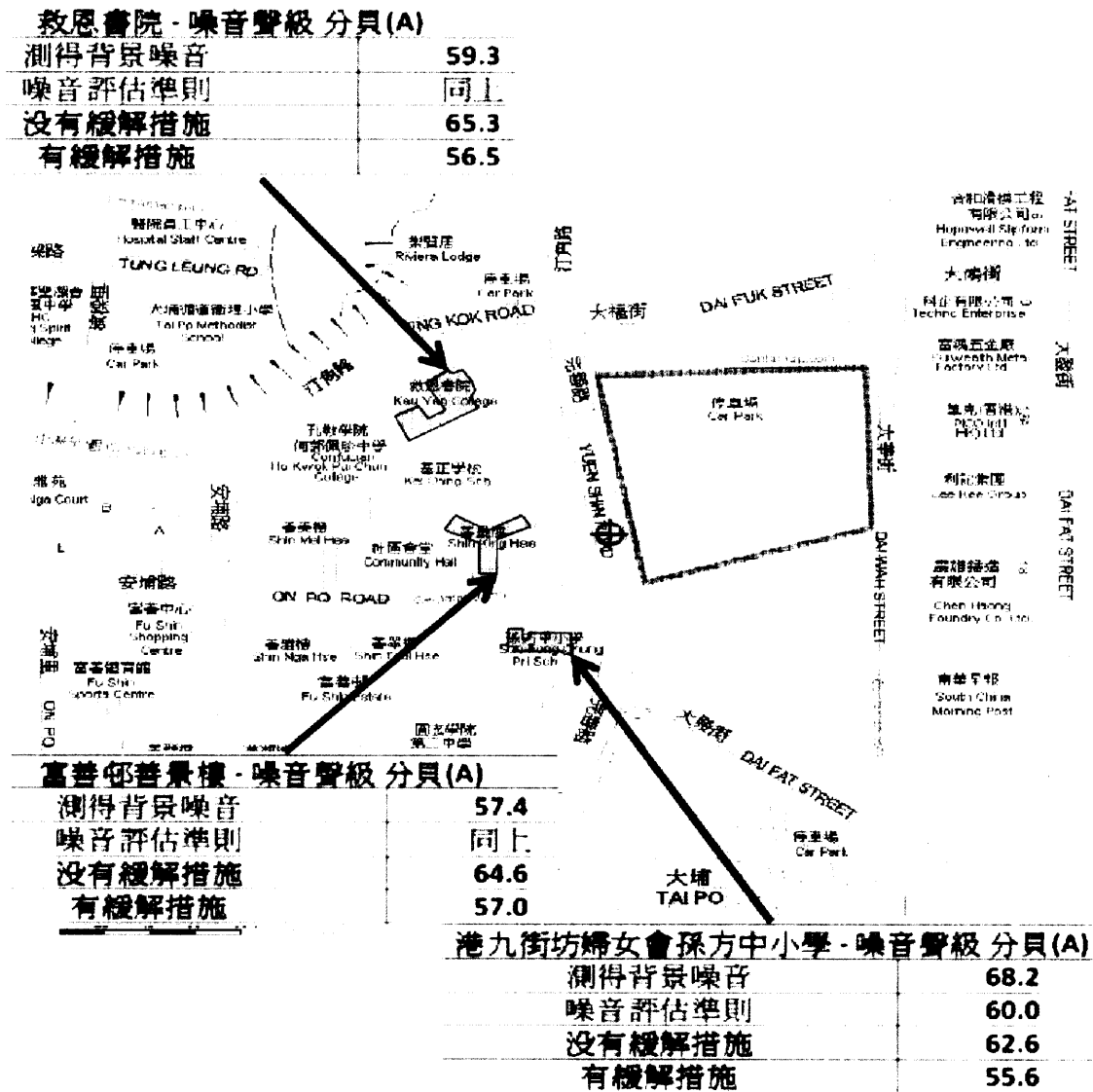


Figure 附圖

### Hazards / 生命危害

The Site is located within two Potentially Hazardous Installation (PHI) Consultation Zones. Consequentially it will be necessary to ensure that the Project is not exposed to undue risk levels from these facilities, and vice versa.

本工程項目的選址座落於兩個潛在危險裝置(PHI)的諮詢區域內，故此本初步環境研究有必要確定本項目不會受到這些危險裝置的過度風險水平的影響，反之亦然。

CIC is already in discussions with EMSD, the Government Advisor for the PHI installations, regarding the hazard risks at the Site. A Quantitative Risk Assessment (QRA) has been identified as necessary for the two installations and these will be carried out by CIC to ensure that the level of risk to/from the Project is not at an “unacceptable level”, in accordance with the Hong Kong Government’s Risk Guidelines in the Hong Kong Planning Standards and Guidelines, Chapter 12.

建造業議會與大埔煤氣廠及液化石油氣裝置的政府顧問，即機電工程署，已經就本項目與及附近兩個潛在危險裝置的相互風險問題進行過討論。討論結果是認為本項目及兩個潛在危險裝置設施是有必要進行詳細的量化風險評估。按照香港政府的風險評估指引，即香港規劃標準與準則的第十二章，建造業議會將會進行有關的評估以確保本項目的風險程度不在“不可以接受”的水平內。

CIC is aware of the previous issues relating to lack of information from PHI owners to inform previous QRAs. This is due to the PHI owner’s confidentiality requirements for their installations. CIC is liaising closely with the PHI owners to overcome these issues of confidentiality. CIC is in discussion to engage the PHI owners to carry out a QRA for the Project, enabling maximum information use as well as the strictest confidentiality, and ensuring approval by the Co-ordinating Committee on Land-use Planning and Control relating to Potentially Hazardous Installations (CCPHI) prior to the Project commencing on-site.

建造業議會已意識到這兩個潛在危險裝置持有人不願意發放有關較早前的量化風險評估資料，以致本報告缺乏有關的資料作為研究。這是由於潛在危險裝置持有人對於其設施資料執行保密的原故。建造業議會正與潛在危險裝置持有人進行緊密的聯繫以解決這些保密性的問題，並正協調聘請危險裝置的持有人，對它們的危險裝置行量化風險評估，從而盡可能獲得最多的資料，並同時對它們的資料執行嚴格的保密。此量化風險評估需要在工程項目進行前，提交給潛在危險設施土地使用規劃和管制協調委員會與以批核。

### **Visual Character / 視覺特徵及影響**

The Site sits within a green corridor between the high-rise residences of Fu Shin Estate and the Tai Po Industrial Estate. In the wider area lie the hills of the Pat Sin Leng Country Park to the north; and Tolo Harbour to the south, as well as the hills beyond.

本項目座落於高層住宅富善邨及大埔工業村間中間的綠色走廊。它的北面為廣闊的八仙嶺郊野公園，南面為吐露港以及其後的山區。

The impact on views from representative viewpoints varies. In general, long distance views of the Site will only be impacted by the introduction of crane training activities. It is expected that the skyline will not be significantly impacted from these views. Views from the lower level floors of nearby residences facing the Site will not be impacted significantly by the activities at ground level on the Site, often due to the low angle of view and belts of trees blocking views. However, the use of cranes for training purposes will introduce an active raised element to the views that will impact on the skyline and views to the Industrial Estate and beyond, to the east. Viewers from the higher residential floors in adjacent dwellings looking towards the Site will be able to see all the activities on the Site, which will be of a similar nature to some of the existing uses. In addition the crane activities will introduce a raised active element, however, this is expected to have less impact on views to the Industrial Estate and more distant views.

視覺影響會在處於不同的觀察地點上產生不同的效果。在一般情況下，在較遠的距離瞭望工地只會被起重機的培訓活動所影響。從這些角度來看，天際線預期不會被遮蔽。若由附近住宅的較低層瞭望，視覺不會被擬議工地於地面的活動造成不良的影響，而它只會因為受到較小的視線角度及周遭的樹木帶所遮蔽。然而，起重機之操作會因為其升高的不同物件而影響到天際線及瞭望至大埔工業村及其東面以外的視野，但是這預期不會影響到遠望至大埔工業村及更遙遠的視線。另一方面，瞭望者從高處住宅旁瞭望至擬建工地，亦能夠看到工地上的所有活動，這會與沒有這擬建工地的現實情況相似。

Where operationally feasible, vegetation coverage of the CIC site will be maintained and enhanced. In additional operational procedures to minimise the duration of time that retractable and moveable cranes remain aloft at maximum heights will be developed. If necessary options for neutralising the colour of the cranes will also be considered.

若在運作上可行，在本項目範圍內的植被將會儘量保留及加以培植，以加強項目的綠地性。額外的運作程序也可能需要建立，以減少可伸縮及可移動式起重機在空中抬高物件的持續時間。如有需要，起重機亦會儘可能選擇漆上較中和的顏色。

Considering the current views of the Site; the current uses of the Site for construction compounds and car/lorry parks; the already industrial nature of views from residences towards the east into the Tai Po Industrial Estate; the permeable, thin structure of cranes; the potential mitigation opportunities to be considered by CIC; and the sensitivity to change, it is considered that the overall impact of the Project on the visual character on the locality will be negligible to slight.

考慮到目前工地的現有視野、現有工地上的建築群組和汽車 / 貨車停車場、現有居民瞭望至東面大埔工業村的自然景觀、起重機的結構、建造業議會對緩減措施的考慮、及對景觀改變的敏感性，本項目對周圍地區的視覺影響將會是輕微的。

### **Air Quality / 空氣質素影響**

Considering that the future ground surface within the Site will be well paved with wearing course, fugitive dust generation during the operation is expected to be minimal. In addition, with the good maintenance practices adopted to the equipment, potential adverse impact associated with the black smoke emission is not anticipated.

考慮將來培訓中心地面會以道路面層物料良好鋪設，中心在運作期間所產生的塵埃將會是非常輕微的。而就著對機械設備維持良好的日常保養，由其運作所產生的黑煙亦將會是極輕微的，不會預期為周圍環境的空氣質素帶來影響。

### **Other Aspects / 其它方面**

Other aspects have been considered within this Draft Feasibility Study Report, including traffic, waste generation, water quality, ecology, and land contamination. With the implementation of standard good construction management measures, and good site and operational management during training activities, the Project is expected to have minimal impact on the surroundings.

這份草案亦已經考慮到工程項目對其它方面的環境影響，交通、廢物產生、水質、生態及土地污染等。隨著實施一般的良好施工管理措施、在工地培訓時實施良好的工地和營運管理，預期本項目對周圍環境的整體的影響將會是很輕微的。

## 1. BACKGROUND

### 1.1 Introduction

- 1.1.1 URS/Scott Wilson has been commissioned by Construction Industry Council (CIC) for the Consultancy Services for the Feasibility Study of Establishing a Training Centre in Tai Po Area 33.
- 1.1.2 CIC is to return three of their existing Temporary Training Grounds (Shatin, Sheung Yuet Road and Wai Lok Street) to the Government, as land is required to meet the needs of the districts. An area of land has been identified in Tai Po Area 33 which is available for CIC's consideration for relocation of the three temporary Training Grounds.
- 1.1.3 This Draft Report discusses the existing Site and surroundings, and carries out a preliminary assessment based on initial study findings and professional judgement, to inform the Tai Po District Council Meeting on 3 May 2011. These assessments will continue to be developed and, where feasible, mitigation will be incorporated within the CIC Training Ground proposals to ensure that any environmental impacts are resolved to minimise the Project's impacts on the local community and surrounding environment.

## 2. BRIEF PROJECT DESCRIPTION

- 2.1.1 The construction of the Site is likely to require site clearance, provision of hardstanding, and excavation works for installation of footings and foundations to the two tower cranes; the classroom/office; and any utilities provisioning, where necessary. Due to the nature of the facilities to be constructed the construction duration for each phase of the Site is expected to be minimal.
- 2.1.2 Operations of the Training Ground will include the provision of training and trade tests for a number of construction operations, which are detailed earlier. Throughout the operation of the Training Ground the CIC will be providing training on good practice construction techniques and these will be reflected in the operation of the Project to minimise nuisance to the surrounding areas.
- 2.1.3 The 35,700m<sup>2</sup> Site is to be developed in three Stages, according to the availability of the land, see Table 2.1 and Figure 2.1.

**Table 2.1 Project Stages**

Site	Site Area (m <sup>2</sup> )	Available Date	Current Use
A	19,100	1 Sept 2010	Vacant, ex-car/lorry park
B	6,110	1 July 2012	Construction Compound for Drainage Services Department, Tai Po Tai Wo Road Sewage Pumping Station and Rising Mains Project
C	10,500	2 May 2014	Construction Compound for Highways Department, Contact No. HY/2008/09 Widening of Tolo Highway /Fanling Highway between Island House Interchange and Fanling (Stage 1 – between Island House Interchange and Ma Wo)



- 2.1.4 Whilst the Project will be developed in 3 Stages this Feasibility Study considers the fully developed Site as the future scenario, ie when all three Stages of the Project are complete.

### 3. SITE SURROUNDINGS

- 3.1.1 The Project Site is located within the Draft Tai Po Outline Zoning Plan No. S/TP/22 and is designated for Government, Institution or Community Use. Currently the Tai Po Area 33 is a combination of a vacant parking lot and construction compounds for a variety of operators, including Highways Department and Drainage Services Department.
- 3.1.2 The Site is located to the west of Tai Po Industrial Estate and is surrounded on 3 sides with roads, including the Yuen Shin Road to the west, Dai Kuk Street to the north, and Dai Wah Street to the east. To the south lies a plot of land currently used for lorry parking and Drainage Services Department and Highways Department Major Project Construction Management Compounds. The KMB bus depot lies further to the north beyond Dai Kuk Street.
- 3.1.3 As shown in Figure 3.1, below, beyond Yuen Shin Road lie a number of housing developments, primary schools and colleges. These include Fu Shin Estate (富善邨), Rivera Lodge (樂賢居), Yue Kok Village (魚角村), Kau Yan College (救恩書院), Confucian Ho Kwak Pui Chun College (孔教學院何郭佩珍中學), H.K. & Kln. Kaifong Women's Association Sun Fong Chung Primary School (港九街坊婦女會孫方中小學), and Hong Kong Taoist Association the Yuen Institute No.2 Secondary School (香港道教聯合會圓玄學院第二中學). A number of kindergartens are located on the ground floor of some of the Fu Shin Estate blocks.
- 3.1.4 To the south is Tai Po Waterfront Park which is a popular green leisure and recreation area. North-west of the Site, beyond the major road junction of Yuen Shin Road and Ting Kok Road, lies the Alice Ho Miu Long Nethersole Hospital.

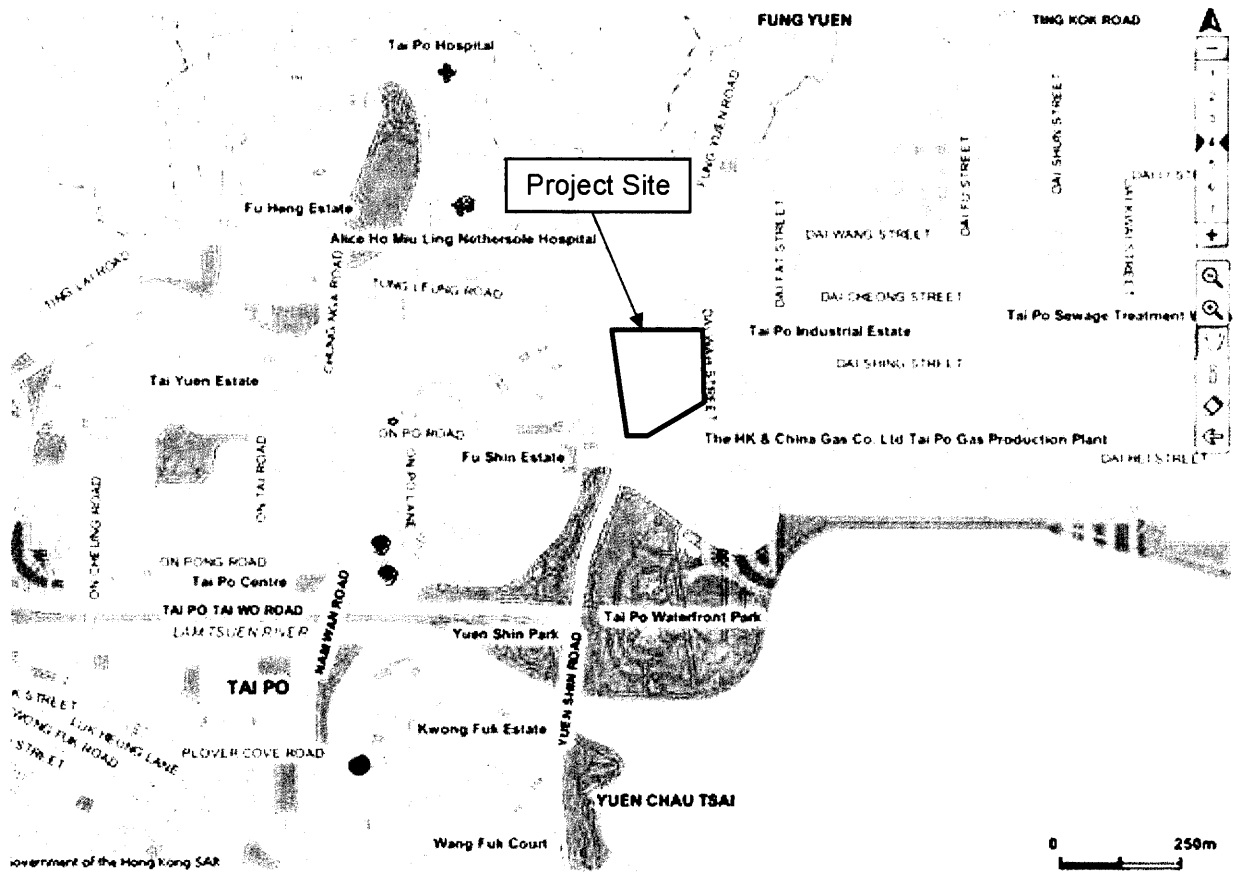
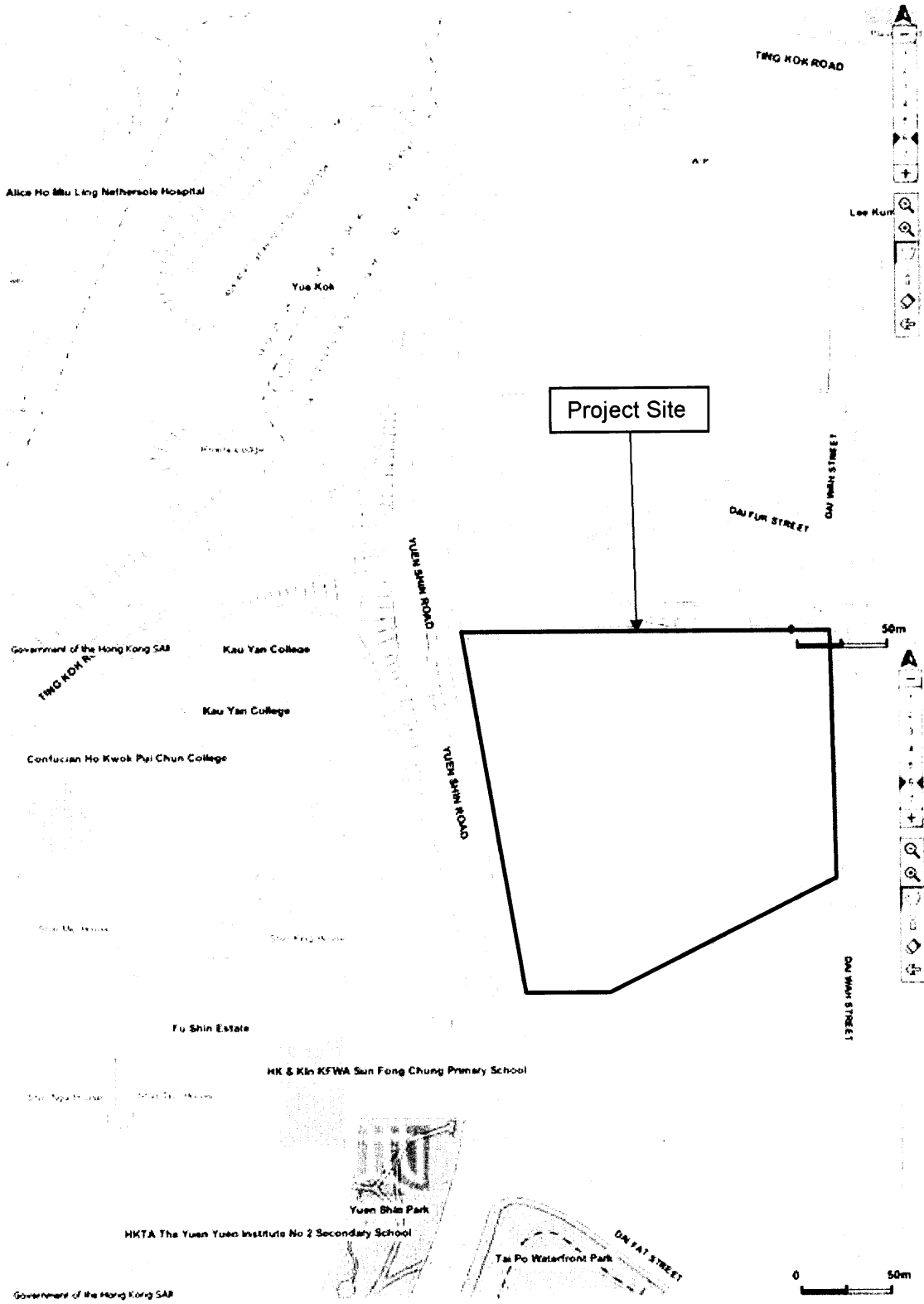


Figure 3.1a Project Site Location Map – Tai Po



**Figure 3.1b Project Site Location Map – Tai Po Area 33**

Source: <http://www.map.gov.hk> (Lands Department)

## **4. AIR QUALITY**

### **4.1 Construction**

4.1.1 During the construction phase, construction dust will be expected to be generated from the temporary construction activities including site clearance, ground excavation, and concreting work. However, the current Site is predominantly covered by hardstanding already, due to this and the scale of the Project, it is expected that impacts from any fugitive dust, and the use of diesel powered equipment, will be localised and are considered insignificant.

4.1.2 Implementation of dust control measures recommended in the Air Pollution Control (Construction Dust) Regulation will be implemented where applicable. Typical relevant dust control measures include:

- Restricting heights from which materials are to be dropped, as far as practicable, to minimise the fugitive dust arising from unloading / loading;
- Where applicable, all vehicles shall be washed to remove any dusty materials from its body and wheels before leaving the Site;
- Where applicable, vehicles arriving / leaving the Site loaded with dusty materials shall be covered entirely by clean impervious sheeting to ensure that the dusty materials remain within the vehicles;
- Erection of hoarding of not less than 2.4m high from ground level along site works;
- Covering or water spraying construction and demolition wastes generated from demolition by tarpaulin sheet to prevent dust generation;
- Works area for site clearance shall be sprayed with water before, during and after the clearance so as to maintain the entire surface wet;
- Any stockpile of dusty materials shall be covered entirely by impervious sheeting; and / or placed in an area sheltered on the top and 4 sides;
- All dusty materials shall be sprayed with water immediately prior to any loading, unloading or transfer operation so as to keep the dusty materials wet; and
- All spraying of materials and surfaces should avoid excessive water usage.

4.1.3 In addition, all plant will be regularly maintained to minimise gaseous emissions.

4.1.4 With the provision of the above dust control measures, no adverse air quality impacts during the construction stage are anticipated.

### **4.2 Operation**

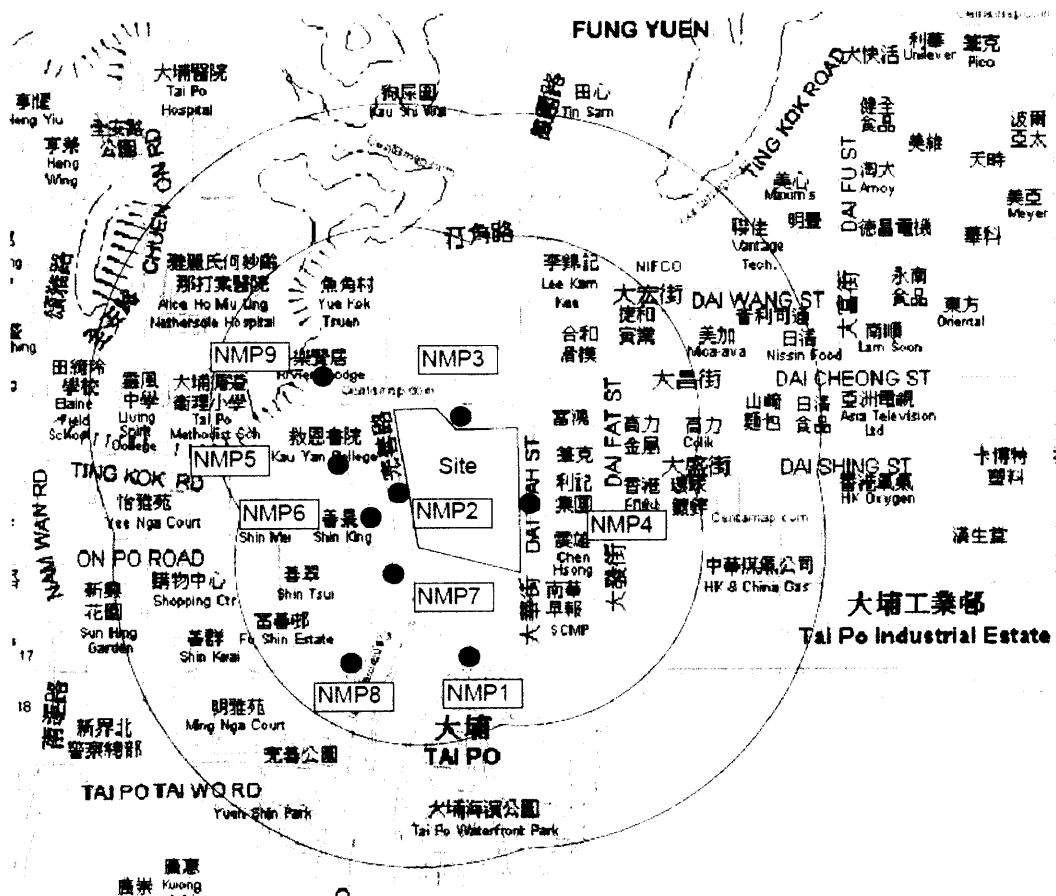
4.2.1 The Site is located adjacent to the Tai Po Industrial Estate, which contains many chimney emissions sources. The different types of factories in the industrial estate include aluminium works, food production centres, gas production, as well as metal manufacturing. The Training Ground will predominantly be an open area, however will predominantly be used by trainees and candidates, these individuals are likely to access the Site only once every few years. There will be approximately 30 staff members at the Site. It is suggested that the small number of staff and infrequent use by each individual candidate will minimise the impact on health from the nearby chimneys.

- 4.2.2 The Yuen Shin Road to the west of the Site is a Primary Distributor road, and the surrounding roads are regularly used by heavy goods vehicles, these and expected a significant source of vehicular emissions.
- 4.2.3 During operation of the Training Ground there will be a number of diesel powered equipment and plant in operation at various times throughout the operational day. The Hong Kong Observatory identifies the prevailing wind direction as north-easterly. All plant will be regularly maintained to minimise gaseous emissions. In addition, the CIC are currently in a programme of replacing their current equipment with the latest models, this vehicle and equipment upgrade will ensure continued improvements in reducing vehicle emissions from the Site. As such air quality impacts from the operation of the Training Ground is anticipated to be low. Air quality impacts will be further assessed, where deemed necessary.
- 4.2.4 Stockpiling of materials is expected to be necessary for demonstration of construction techniques. Where applicable, relevant good practice dust control measures will be carried out throughout the training and operations on the Site, see above. All air quality legislation will be met.

## 5. NOISE

### 5.1 Baseline Noise

- 5.1.1 A baseline noise survey has been carried out on 15 April 2011 at the Tai Po Area 33 Site and at representative noise sensitive receivers, see Figure 5.1 and Table 5.1:



**Figure 5.1 Representative Noise Monitoring Locations**

Source: <http://www.centamap.com>, Lands Department

**Table 5.1 Representative Noise Monitoring Data**

ID	Noise Monitoring Point	Type	Noise Sensitive Receiver	Nearest Approx. Distance to Project Site (m)	Existing Noise Level <sup>[1]</sup> - dB(A)	
					L <sub>Aeq</sub>	
					AM	PM
NMP1	Dai Fat Street	Road	No	180	70.6	71.0
NMP2	Yuen Shin Road	Road	No	4	66.3	64.7
NMP3	Dai Kuk Street	Road	No	5	59.9	58.5
NMP4	Dai Wah Street	Road	No	2	65.3	63.1
NMP5	Confucian Ho Kwak Pui Chun College (孔教學院何郭佩珍中學)	School	Yes	95	59.3	57.8
NMP6	Shin King House, Fu Shin Estate	Residential	Yes	78	57.4	58.2
NMP7	H.K. & Kln. Kaifong Women's Association Sun Fong Chung Primary School (港九街坊婦女會孫方中小學)	School	Yes	70	68.2	67.8
NMP8	Hong Kong Taoist Association the Yuen Institute No.2 Secondary School (香港道教聯合會圓玄學院第二中學)	School	Yes	187	59.2	59.3
NMP9	Rivera Lodge	Residential	Yes	156	62.5	62.2

Note:

[1] Façade correction applied to measurements taken at free-field condition at NMP7 and NMP9 in accordance with "Technical Memorandum for the assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites"

5.1.2 Current noise levels at the representative monitoring locations were dominated by the surrounding road network.

5.1.3 In addition to ensure the accuracy of the noise assessment, specific noise measurements have been carried out at existing CIC Training Grounds of CIC machinery.

## 5.2 Construction Noise

5.2.1 Construction noise may arise from the use of Power Mechanical Equipments (PME) for site clearance, site formation and any foundation works on the Site. Construction works will be carried out between 07:00 and 19:00 hours on working days except Sundays and public holidays. No piling is expected to be required.

- 5.2.2 Construction of the Site will follow ProPECC PN 2/93 “Noise from Construction Activities – Non-statutory Controls” The noise assessment criteria for Dwellings is 75dB(A) and for Schools are 70dB(A) (65dB(A)) during examinations).
- 5.2.3 The nearest NSR to the proposed Site is H.K. & Kln. Kaifong Women's Association Sun Fong Chung Primary School (港九街坊婦女會孫方中小學) which is about 70m from site boundary. In order to comply with the assessment criteria, the maximum Sound Pressure Level (SPL) measured at site boundary during construction is 101dB(A) during school examinations and 106 dB(A) during normal school days.
- 5.2.4 Typical relevant good practice construction noise control measures, as mentioned in ProPECC PN 2/93 are recommended and to be incorporated into construction contract. These include:
- Proper scheduling of works and siting of Powered Mechanical Equipments
  - Use of Quiet Powered Mechanical Equipment (QPME); and
  - Use of temporary acoustic barriers and enclosures wherever necessary.
- 5.2.5 With the implementation of the recommended mitigation measures, the noise levels at representative noise sensitive receivers are not expected to exceed stipulated criteria.

### 5.3 Operational Noise

- 5.3.1 Due to the nature of the training activities and trade testing on-site and the demonstration and classroom teaching of construction-related techniques the operational time and number of machinery and equipment on the Site will be limited within the 8 hour working day (between 0700 to 1900 hours during days excluding public holidays and Sundays). The initial assessment has considered these operational times as well as frequency of equipment usage.
- 5.3.2 The initial draft assessment of unmitigated noise at the closest sensitive receiver, has predicted an exceedance of relevant noise criteria by 6-7 dB(A) at Fu Shin Estate. As such it is expected that predicted noise levels at some receivers require CIC to carry out noise mitigation. CIC is investigating opportunities for the provision of mitigation on-site, such as relocation of “noisy” training activities within the Site, and provision of acoustic barriers, to ensure the relevant noise requirements at the receivers are met.
- 5.3.3 CIC is to move the most “noisy” training activities, such as piling to other sites outside Tai Po to limit the impacts on the surrounding environment and community.
- 5.3.4 The predicted noise levels with the proposed relocation of training activities and provision of noise barriers are provided in Table 5.2 below:

**Table 5.2 Predicted noise levels with proposed mitigation measures**

Assessment Point of Noise Sensitive Receiver	Baseline Noise Level dB(A)	Acceptable Noise Level (ANL) <sup>[1]</sup>	Assessment Criteria <sup>[2]</sup> dB(A)	Elevation relative to site (m)	Corrected Noise Level dB(A)
Yue Kok Tsuen 1A	62.5	65	60	0	53.7
				10	53.7
				15	53.7
				20	53.7
				25	53.8
Riviera Lodge	62.5	65	60	0	53.5
				10	53.5



Assessment Point of Noise Sensitive Receiver	Baseline Noise Level dB(A)	Acceptable Noise Level (ANL) <sup>[1]</sup>	Assessment Criteria <sup>[2]</sup> dB(A)	Elevation relative to site (m)	Corrected Noise Level dB(A)
				30	53.6
				60	53.6
				100	53.6
Kau Yan College (Northeast façade)	59.3	65	59.3	0	55.7
				5	55.7
				10	55.6
				20	55.6
				40	55.6
Kau Yan College (Southeast façade)	59.3	65	59.3	0	56.5
				5	56.5
				10	56.5
				20	56.5
				40	56.4
CCC Kei Ching Primary School (Northeast façade) <sup>[3]</sup>	59.3	65	59.3	0	56.4
				5	56.4
				10	56.4
				20	56.4
				40	56.4
CCC Kei Ching Primary School (Southeast façade) <sup>[3]</sup>	59.3	65	59.3	0	56.3
				5	56.3
				10	56.3
				20	56.3
				40	56.3
Sin King House (Northwest façade)	57.4	65	57.4	0	56.9
				10	56.9
				30	56.9
				60	56.7
				100	56.6
Sin King House (Northeast façade)	57.4	65	57.4	0	57.0
				10	57.0
				30	57.0
				60	56.9
				100	56.7
Sin King House (Southeast façade)	57.4	65	57.4	0	56.9
				10	56.9
				30	57.0
				60	56.8
				100	56.7
Sun Fong Chung Primary School (North façade)	68.2	65	60	0	55.4
				5	55.4
				10	55.4
				20	55.4
				40	55.4
Sun Fong Chung Primary School (East façade)	68.2	65	60	0	55.6
				5	55.6
				10	55.6
				20	55.6
				40	55.6





Notes:

- [1] ASR of B is considered for the NSRs for located within 100m to 250m distance to Industrial Estate in accordance with the Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites.
- [2] Assessment criteria assigned as the lower of ANL-5dB(A) or Baseline Noise Level in accordance with the Hong Kong Planning Standards and Guidelines (HKPSG).
- [3] Kei Ching Primary School is currently not in EMB's "Choice of Schools List for Central Allocation (Primary One Admission 2011)" and is vacant according to site observations.

5.3.5 As provided in Table 5.2 above, predicted noise levels complies with the Technical Memorandum stipulated assessment criteria with proposed mitigation measures including layout plan under review and acoustic barriers.

5.3.6 Additional road traffic is expected to be insignificant result from the development, with trainees and candidates being required to use public transport to the Site, and few staff car parking spaces being provided. In addition, regular weekly deliveries to the Site of demonstration materials will be minimal, therefore the additional road traffic noise resulting from the Project is anticipated to be insignificant and within designed road capacity. Detailed discussion on traffic impact would be provided in traffic section

## 6. HAZARDS

### 6.1 Introduction

6.1.1 The Site is located within two Potentially Hazardous Installation (PHI) Consultation Zones. Consequently it will be necessary to ensure that the redevelopment is not exposed to undue risk levels from these facilities, and vice versa. This section of the Feasibility Study presents a qualitative

6.1.2 CIC is already in discussions with EMSD, the Government Advisor for the Town Gas and LPG installations, regarding the hazard risks at the Site. A Quantitative Risk Assessment (QRA) has been identified as necessary for the two installations and these will be carried out by CIC to ensure that the level of risk to/from the Project is at an acceptable level, in accordance with the Hong Kong Government's Risk Guidelines in the Hong Kong Planning Standards and Guidelines, Chapter 12.

6.1.3 CIC is aware of the previous issues relating to lack of information from PHI owners to inform previous QRAs. This is due to the PHI owner's confidentiality requirements for their installations. CIC is liaising closely with the PHI owners to overcome these issues of confidentiality. CIC is in discussion to engage the PHI owners to carry out a QRA for the Project, enabling maximum information use as well as the strictest confidentiality, and ensuring approval by the Co-ordinating Committee on Land-use Planning and Control relating to Potentially Hazardous Installations (CCPHI) prior to the Project commencing on-site.

6.1.4 A number of QRAs have been carried out in the past, either for the Tai Po Area 33 (by Leisure and Cultural Services Department, Hong Kong Government), the Fu Shin Estate Housing Development (by Housing Authority, Hong Kong Government), or for the regular assessment of the TPGPP (by Town Gas).

6.1.5 CIC are aware of the hazard issues surrounding development on the Tai Po Area 33 and will work closely with the PHI owners, EMSD, CCPHI and other PHI stakeholders to ensure that the risks to individuals and society are reduced to at least "As Low As Reasonably Practicable, ALARP"; to enable the key training activities of the CIC for the construction industry and Hong Kong are able to carry on, and that as many socio-economic benefits as possible from the use of the Site by CIC are achieved for Tai Po and the local community.



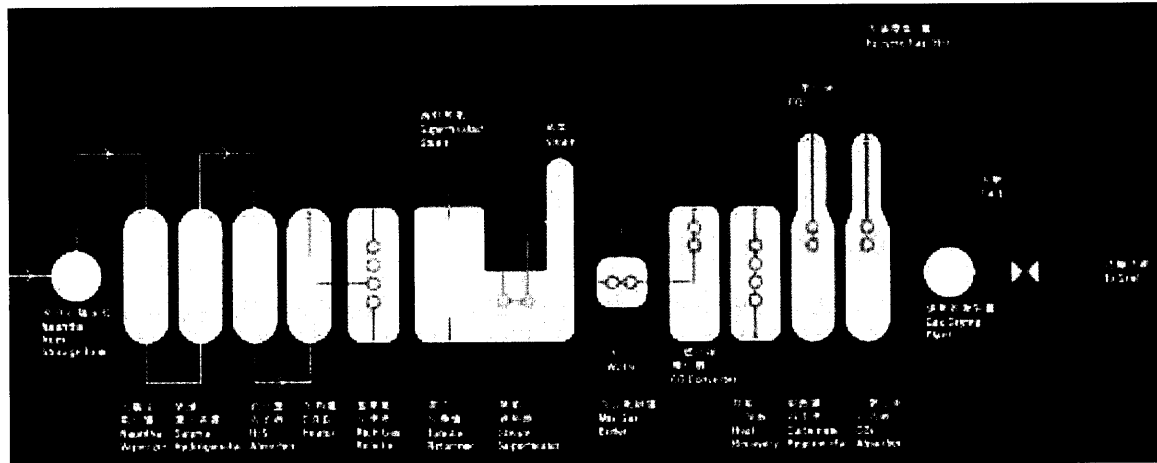
- 6.1.6 The QRA will use the latest software and modelling techniques to assess the hazard risks, implementing the latest mitigation measures available.
- 6.1.7 The following is a qualitative assessment of hazards associated with the Project related to the two PHI sites. As discussed earlier it is known that a full QRA for each site is necessary for CCPHI approval, CIC are developing this requirement. The following sets the context for the QRA.

## 6.2 Tai Po Gas Production Plant

- 6.2.1 The Tai Po Gas Production Plant (TPGPP) is located in Tai Po Industrial Estate and has a total area of 11.7 hectares. The second phase of the facility was completed in 1992, and further modifications were made in 2003 and 2006 to maximise production to meet customer demand.
- 6.2.2 TPGPP is a designated PHI with storage of 80,000 tonnes of naphtha and 24,000 tonnes of Town gas. The PHI has a Consultation Zone (CZ) of 1000m radius from the centre of the naphtha storage area. The CZ covers the whole Project Site.
- 6.2.3 Town gas uses naphtha as a feedstock during the gas production process, replacing coal and heavy oil, which results in low emissions of sulphur dioxide, a key component of acid rain.
- 6.2.4 Natural Gas was introduced as a feedstock to produce town gas. This natural gas is piped from the liquefied natural gas receiving terminal at Dapeng, Shenzhen to the Tai Po Plant via a pair of 34km high-pressure submarine pipelines laid across Tolo Harbour seabed.

### *Production Process from Naphtha*

- 6.2.5 The TPGPP uses 8 gas-making trains which use Catalytic Rich Gas (CRG) to produce town gas. CRG is a continuous, high-pressure process which begins with the conversion of naphtha (a light petroleum distillate) into a methane-rich gas through low temperature steam reforming. Part of this rich gas is then passed into a catalytic tubular reformer where it reacts further with additional steam at a high temperature, producing lean gas. The resulting lean gas is then mixed with the rich gas in accordance with a fixed ratio to achieve the required calorific value to town gas.
- 6.2.6 The carbon monoxide present in the reformed gas product is reduced by the shift reaction in a high-temperature converter, increasing the content of hydrogen.
- 6.2.7 To achieve the specific gravity of town gas, the content of carbon dioxide is reduced by a hot potassium carbonate solution. Part of the converted gas is then cooled, and carbon dioxide content is lowered to 1 percent before the gas is mixed with the rest of the converted gas. The gas is then cooled and dried, and an odorant is added to the gas to give town gas a distinctive smell before the town gas production cycle is complete.

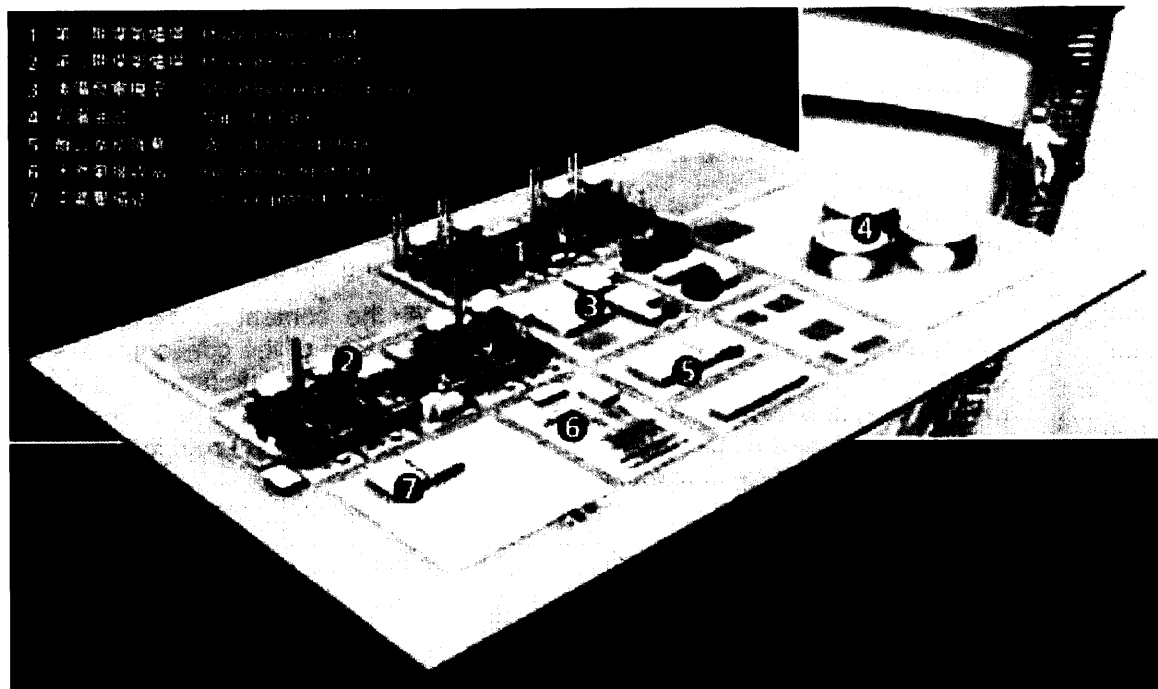


**Figure 6.1 Tai Po Plant – Catalytic Rich Gas (CRG) Process**

Source: <http://www.towngas.com/files/Tai%20Po%20Plant%20Leaflet.pdf>

*Production Process from Natural Gas*

- 6.2.8 Naphtha is converted into a methane-rich gas through low-temperature steam reforming. Natural gas is delivered to a catalytic tubular reformer in which it reacts with steam at a high temperature, becoming a lean gas. The resulting lean gas is mixed with rich gas in a fixed ratio to achieve the required calorific value of town gas. The rest of the process is similar to the pure naphtha production process except that there is no need to reduce the carbon dioxide content.
- 6.2.9 Town gas is distributed at a maximum pressure of 3,450 kilopascals (kPa) as a clean, gaseous fuel that is about half the density of air.



**Figure 6.2 Tai Po Plant – Production Facilities**

Source: <http://www.towngas.com/files/Tai%20Po%20Plant%20Leaflet.pdf>

6.2.10 Major flammable material in TPGPP include:

**Table 6.1 Potential Major Flammable Material in TPGPP**

Material	Storage Type	Number	Design Capacity
Naphtha	External floating roof tank	3 tanks	80,000 tonnes
Natural Gas	Gas receiver station	1 station	330,000 tonnes / year
Town gas	Production process and distribution facility	8 trains	9,660,000 std m <sup>3</sup> / day

6.2.11 Typical safety measures likely to be installed at the TPGPP, as with other as production plants, include:

- Gas / smoke detection and alarm systems;
- Automatic and manual fire alarm systems;
- Low pressure alarm, activating shutdown valves at gas receiver stations;
- Deluge fire sprinkler systems;
- Fire ring main water spray system;
- Foam pourer for naphtha tanks, rim seal and remote control foam monitor;
- Fire fighting system for DG store and electrical switch rooms;
- Hydrant hose reels; and
- Siren systems.

6.2.12 The properties of naphtha and natural gas include:

**Table 6.2 Naphtha Properties**

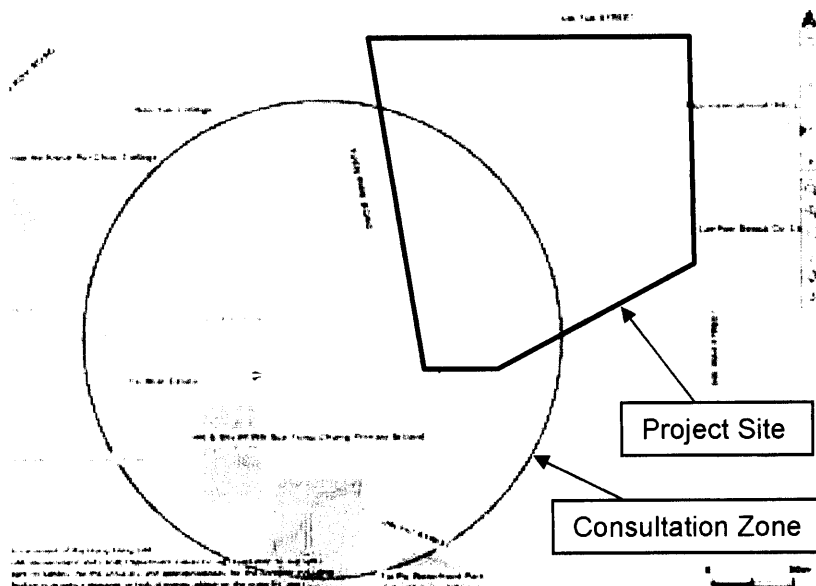
Characteristic	Properties
Flammable	Flammable
Automatic ignition temperature	>220°C
Flash point	-20°C
Flammable limit in air	1.1% (lower) – 5.9% (upper)
Specific gravity	0.67 (water = 1)
Vapour pressure	0.6 kPa (@20°C)
Vapour density	4 (air = 1)

**Table 6.3 Natural Gas Properties**

Characteristic	Properties
Composition	>90% methane, ethane, propane, butane
Flammable	Flammable
Automatic ignition temperature	54°C
Boiling point	-161.5°C
Flash point	Not relevant
Flammable limit in air	5% (lower) – 15% (upper)
Density	0.55 kg/m <sup>3</sup> (@ 1 atm)

### 6.3 Fu Shin Estate LPG Compound

- 6.3.1 The LPG Compound at Fu Shin Estate serves the supply needs of the residences within the complex. The site is approximately 50m<sup>2</sup>.
- 6.3.2 The Fu Shin Estate LPG Compound is a designated PHI with storage capacity of 25 tonnes of LPG (equating to restricted storage of 12.5 tonnes in each of the 2 storage vessels). The LPG vessels themselves has a total capacity of 41.7 tonnes. The LPG vessels are located underground. The PHI has a Consultation Zone (CZ) of 150m radius from centre of the store. The CZ covers part of the south-western portion of the Project Site.



**Figure 6.3 Approximate Boundary of LPG Compound PHI Consultation Zone (150m radius)**

- 6.3.3 The LPG is replenished six times a week. Each delivery is 9 tonnes per delivery. Loading time takes 90 minutes. Loading is carried out only during the day-time.
- 6.3.4 The properties of LPG include:

**Table 6.4 LPG Properties**

Characteristic	Properties
Composition	Butane: Propane (7:3)
Flammable	Flammable
Automatic ignition temperature	>410°C
Flash point	-40°C
Flammable limit in air	2% (lower) – 9% (upper)
Specific gravity	0.56 (water = 1)
Vapour pressure	482-690 kPa (@37.8°C)
Vapour density	2 (air = 1)

- 6.3.5 Typical safety measures likely to be installed at the LPG Compound, as with other such sites, include:
- Sprinklers;
  - Explosion proof vapourisers;

- Concrete grille boundary wall; and
- LPG vessels are buried underground.

## 6.4 Background Information

- 6.4.1 The full QRAs for the two Sites will necessarily have to provide their assumptions against background information.
- 6.4.2 Meteorological information for the Tai Po area will be analysed and used in the QRA to determine the prevailing meteorological conditions. This will assist in determining the likelihood of exposure to different population locations during a hazardous event.
- 6.4.3 Population data for the area is essential to understand the existing risk levels and the likely future risks to future residents and workers within the vicinity. Census population data, schools population data, recreational area population assumptions, building population data, road population data, employee population data, and bike population assumptions will be used in determining the current and future populations in the area.

## 6.5 Population Scenarios

- 6.5.1 The QRAs will consider the hazard risks for a variety of scenarios for populations within the Consultation Zone of the PHIs, including:
- The current time (baseline);
  - During construction; and
  - During operation.
- 6.5.2 Of particular relevance to the hazard assessment is the population of the Site, the number of indoor / outdoor population, and the operational times of the Site.
- 6.5.3 CIC is able to estimate the population number for the Site based on their previous experience of operating the same training courses elsewhere in Hong Kong. On average 200 to 250 candidates / trainees and staff will be on the Site carrying out training activities, trade tests, examinations and administration.
- 6.5.4 Due to the nature of the training requirements the majority of population is expected to be outside. However, a proportion of training activities will include classroom sessions. At least 60 persons will be within the classroom.
- 6.5.5 To meet the demand of the construction industry's training requirements the following operational times are necessary: Training Courses will be from 08:20 to 16:20 for week days; and Trade Tests will be 08:20 to 16:20 week days and Sundays. Therefore the majority of the population of the Site will be on-site over only 8 hours in a 24 hour period.
- 6.5.6 Due to the nature of hazard risks, varying degrees of risks is attributed to a population dependent on the indoor / outdoor ratio. For example, the following could be initially assumed for the Tai Po area and the Project.

**Table 6.4 Possible Indoor / Outdoor Population Assumptions**

Indoor / Outdoor Population	Indoor Ratio
Residential	0.95
Schools	0.95
Parks	0.00

Roads	0.00
Commercial / Industrial	0.95
Construction Site	0.00
Training Ground	0.25

- 6.5.7 Where populations are inside buildings the risk reduction factor can be up to 90%.
- 6.5.8 Where populations are on site for only 8 hours of a 24 hour the level of risk will be reduced to one third of the risk level where they on site of 24 hours.
- 6.5.9 There is also temporary changes in population, due to natural changes in activities throughout the day. For example, the following could be initially assumed for the Tai Po area and the Project:

**Table 6.5 Possible Temporary Population Assumptions**

	Residential	Shopping Centre	Commercial / Industrial	School	Recreation
Rush Hour (7-9am, 5-7pm Mon to Fri) (7-9am, 1-3pm Sat)	30%	50%	100%	0%	50%
Night (7pm-7am Mon to Fri)	100%	0%	10%	0%	0%
Weekday day (9am-5pm Mon to Fri) (9am-1pm Sat)	30%	50%	100%	100%	50%
Weekend day (3-7pm Sat) (7am-7pm Sun)	100%	100%	100%	10%	100%

## 6.6 Ignition Sources

- 6.6.1 An initial review of the limited information for the PHI facilities has identified the following potential ignition sources:

### *TPGPP*

- Naphtha vapourisers
- CRG heaters
- Tubular steam reformers
- Mixed gas boilers

### *LPG Compound*

- LPG vapours
- Road vehicles
- Production plant / facilities within Tai Po Industrial Estate
- Surrounding population

## 6.7 Hazard Scenarios

- 6.7.1 The QRA will carry out a review of the potential hazard events and the likelihood of their occurrence. Information on historical major hazardous incidents will be used to inform the QRA.
- 6.7.2 Hazard scenarios for the two PHIs could include, but not limited to ruptures / leaks / failures / pipeline disconnection of naphtha, natural gas, naphtha vapours, carbon monoxide, LPG and LPG vapours from a variety of locations, including: storage tanks, pipelines, gas production trains, gas receiver stations, gas reactors, missed gas boilers, carbon monoxide converters, gas distribution lines, LPG vessels, LPG road tankers.
- 6.7.3 The QRA will identify the potential release frequency per year for each hazard scenario and will consider the ignition and explosion probability.
- 6.7.4 Subsequently the Consequences will be assessed in the QRA through modelling and event trees.
- 6.7.5 A number of fire scenarios have the potential to result from various hazard scenarios.
- Jet Fire – When a pressurised flammable gas or superheater / pressurised liquid is released and ignited, a jet fire will occur. The momentum of the release carries the flammable substance forward in a long plume, giving a flammable mixture by entraining air. Combustion in a jet fire occurs in the form of a strong turbulent diffusion flame, which is heavily influenced by the momentum of the release.
  - Flash Fire – Following a flammable liquid release, a part of it will evaporate immediately to form a flammable gas cloud, initially located around the release point. If this cloud does not get ignited immediately, it will move in the downwind direction and become more diluted as a result of air entrainment. If the dispersing cloud reaches an ignition source when the concentration of the flammable gas is still within its flammable limits, the cloud will ignite and result in a flash fire.
  - Vapour Cloud Explosion (VCE) – When there is a large amount of flammable liquid vapourising, or pressurised gas is rapidly released to the atmosphere from a pressurised tank / pipe, a vapour cloud will be formed, dispersed and mixed with the surrounding air. If the vapour cloud is passing through a confined / semi-confined environment and gets ignited, the confinement will limit the direction of expansion of the flame front and create an overpressure. This type of explosion is called a vapour cloud explosion.
  - Pool Fire – When a flammable liquid is spilt into the ground and ignited, a pool fire will occur. A liquid pool formed from the release will initially spread due to the gravitational and surface tension forces acting on it. As it gets ignited, the pool will continue to spread until it reaches equilibrium, when the flowrate of flammable liquid feeding the pool is balanced by the rate of combustion of the pool
  - Bund Fire – A bund fire can result from release of flammable liquid from a tank and contained area inside the bund area caused by catastrophic failure, overfilling or pipe failures together with a subsequent ignition of the released fuel. The fire developed will be contained within the bund area.



- Fireball / BLEVE – Upon immediate ignition of an instantaneous gas release a fireball will form. Fireballs are most likely to result from immediate ignition from vessels or tankers due to cold catastrophic failure. A fireball results in a hemispherical shape where heat is evolved by radiation, where the hazard is from thermal radiation. Fireballs are not influenced by the weather, wind direction, or source of ignition, because of its intensity. BLEVE is a sudden rupture resulting from fire impingement of vessels containing liquefied flammable gas under pressure.

6.7.6 Natural gas and town gas are lighter than air, and therefore will rise after a certain distance.

6.7.7 LPG is heavier than air and therefore travels on the ground after release.

6.7.8 The extent of a fireballs resulting from an ignition at the LPG compound is expected to be approximately 80m.

6.7.9 The Hong Kong Observatory identifies the prevailing wind direction as north-easterly, which would drive vapour clouds and gas leaks from the PHI sites away from the Project Site. Other conditions will be considered in the QRA.

## 6.8 CIC Training Ground Activities

6.8.1 The likely construction requirements of the Training Ground, and its subsequent use for construction-related training activities, is considered in this report to equate to similar activities, as such general construction activities have been considered.

6.8.2 Use of tower, and other, cranes at the Site is not considered to cause a threat to the PHIs.

6.8.3 No activity on the Site requires storage or use of large volumes of high pressure flammable fuels which could cause flame impingement at both PHIs. Up to 2,400L of diesel fuel will be stored on-site, however this volume of fuel is not considered a Dangerous Good under Hong Kong legislation. In this initial assessment storage of this fuel is not considered to cause a significant risk.

6.8.4 The training activities on the Site are limited in scale and nature to small demonstration and practical activities, thereby limiting the risk of projectiles and debris from the Project. Good site practices will be applied throughout the Site. It is therefore not foreseen that the Training Ground will generate high speed fragments which will hit the PHIs. The LPG Compound is surrounded by 2m high concrete grille fence wall and the LPG vessels are buried underground. The South China Morning Post, Chen Hsong Logistics Service, Lee Kee Group, Pico International and Fulwealth Metal Factory buildings to the east of the Project Site, separate the Site from the TPGPP, therefore it is deemed that the risk of projectiles and debris originating from the Site impacting the TPGPP is negligible.

6.8.5 The activities on the Site during both the construction and operation of the Training Ground are not expected to create excessive vibrations or cause ground movement / settlement. It is considered at this stage that vibration monitoring at the Site could be necessary as a proactive warning measure.

## 6.9 Potential Mitigation Measures

6.9.1 Depending on the results of the QRA, CIC may be required to carry out mitigation measures on-site to ensure risks to individuals and society are acceptable. Typical on-site mitigation for sites within CZs of similar PHIs include, but are not limited to:

- Hoarding and protective meshes around building blocks during construction to prevent projectile / debris escape;
- Alert and action limits at the Site, where construction / activities will stop if vibration / ground settlement exceed action limits. Operations should only proceed if the problem is rectified;
- Reporting systems, close liaison and coordination between CIC and PHI owners;
- Emergency evacuation procedures if major leaks are detected. Populations should gather inside buildings / refuge areas;
- Buildings with windowless reinforced concrete walls facing the PHI sites to avoid direct gas ingress through the windows. Reinforced concrete provides fire protection;
- Air intake should not be from areas facing the PHI sites;
- Air intakes should have automatically and manually closable louvers and gas detection for closure of intakes;
- Site design should not encourage large crowds;
- Access arrangements for the site should not be in close proximity to PHI sites;
- Walls of non-flammable material on site boundaries facing PHI sites, without any openings may also provide protection to sites from non-catastrophic events;
- Relocation of activities within the Site away from vulnerable CZ.

## 7. VISUAL CHARACTER

7.1.1 The Site sits adjacent to the Tai Po Industrial Estate to the east which contains a variety of large-scale industries and industrial processes. Numerous chimneys are scattered across the views from the high rise residential developments in the west. The roads in the area form linear elements within the foreground of some viewpoints in the area. In the wider views lie the hills of Pat Sin Leng Country Park to the north; and Tolo Harbour to the south, and the hills beyond. Tai Po Area 33 sits with a corridor between the high-rise residential areas to the east and the industrial estate to the east. Trees and natural vegetation dominate ground level views within this corridor. Views above ground level provide an interesting mix of natural green and urban/industrial contexts, whether looking towards the north, south, east or west.

7.1.2 Selected representative viewpoints have been identified within the local surroundings and long distance views in order to ascertain the level of impact of the Project on the near and far views within the mixed visual context. The representative viewpoints have been selected based on the following principles to enable consideration of the impact of the Project:

- Key public / open space areas;
- Representative residential views; and
- Key popular vantage points.

7.1.3 The following views are represented:

- Lookout Tower within Tai Po Waterfront Park;
- Yue Kok Village; and
- 8th, 23rd and 32nd Floors of the Shin King House within Fu Shin Estate.

**Table 7.1 Selected Representative Viewpoints**

ID	Sensitive Receiver	Type of Use	Description of Existing View towards the Site	Visual Sensitivity
VP1	View from Tai Po Waterfront Park Lookout Tower	Park / Garden	The urban park contains many trees which block low-level views of the Site. From the Lookout Tower views of the Site are blocked by the tree-line. Views towards the Site represent a green corridor towards the hills of the Pat Sin Leng Country Park, dividing the Tai Po Industrial Estate to the east and the high-rise residential area of Fu Shin Estate to the west.	Low - medium
VP2	View from Yue Kok Village	Residential	Views from the higher village houses are provided with views across the Site towards Tai Po Waterfront Park and the hills in the background. Similar to views from VP1 the views towards the Site are of a central green corridor (with a few noticeable man-made structures). The Industrial Estate and high-rise residential buildings of Fu Shin Estate dominate the edges of the view.	Low
VP3	View from Fu Shin Estate, Shin King House, 8 <sup>th</sup> Floor	Residential	Views towards the Site from this elevated viewpoint provide a mix of visual elements. In the foreground lies green trees which block views of Yuen Shin Road and the nearer southern portion of the Site. Site existing Site is visible as a discontinuous strip of hardstanding and temporary buildings and construction stockpiles and parked cars / lorries. Beyond the Site lie the buildings of the Industrial Estate. Views of the distant hills of Pat Sin Leng Country Park to the east complete the view.	Low - medium
VP4	View from Fu Shin Estate, Shin King House, 23 <sup>rd</sup> Floor	Residential	Views towards the Site from this viewpoint are predominantly urban/industrial in nature. The Site is in the foreground of the view and is covered by hardstanding, car / lorry parking and construction compounds. The Industrial Estate	Low - medium



ID	Sensitive Receiver	Type of Use	Description of Existing View towards the Site	Visual Sensitivity
			and distant views of Tolo Harbour to the south and hills of Pat Sin Leng Country Park to the east are in the background, and complete the view.	
VP5	View from Fu Shin Estate, Shin King House, 32 <sup>nd</sup> Floor	Residential	As VP4, above.	Low - medium

7.1.4 The Project will be located on a site that has in the recent past been a car/lorry park, and which is now vacant. Other areas of the Site are currently used by the Drainage Services Department and Highways Department as Major Project Construction Storage and Management Compounds. Within these existing Construction Compounds lie a variety of temporary two storey construction offices, car parking, storage containers, construction material stockpiles, and construction vehicles.

## 7.2 Construction

7.2.1 During the construction phase, the Project will remove the existing uses of temporary two storey construction offices and the construction stockpiles from the Site. A small (approximately 1,500m<sup>2</sup>) one storey office/classrooms will be installed on the Site. In addition, where necessary, further hardstanding will be provided to ensure solid grounding for the various training activities. The representative viewpoints in which the construction activities associated with the Training Ground will be noticeable will be those elevated views from VP3 to 5, in Fu Shin Estate. The low-level construction activities are likely to be shielded from ground level views and distant views by the existing tree-line. Installation and use of the cranes on the training site are discussed below in Section 7.3.

7.2.2 Considering the current uses of the Site, and the surroundings, these construction activities are not expected to result in significant alterations of the existing views. With implementation of good construction site management, the sensitivity to change of the views into the construction site in the mixed urban environment is considered to be "low":

### *Hoarding and screening:*

- Where practical the site offices areas, construction yards and storage areas shall be screened around the peripheries of the works area during the construction phase. Screen plantings shall also be adopted to minimize the visual impact during operation phase, where appropriate.

### *Construction plant and building material:*

- Excess materials shall be removed from site as soon as practical.

### *Construction light:*

- To be oriented away from key views; and
- All lighting facing sensitive receiver shall have frosted diffusers and reflective covers.

*Preservation:*

- No tree shall be transplanted or felled without prior approval by relevant Government departments. Approval of the felling or transplanting proposal should be granted by District Lands Office (DLO); Agricultural, Fisheries and Conservation Department (AFCD); and Leisure and Cultural Services Department (LCSD) or the tree maintenance departments as appropriate; and
- All trees that are marked for retention shall be fenced off with a 1.2m high fence around the dripline of trees or larger area as far as feasible.

### 7.3 Operation

7.3.1 Considering the Project Site's current uses, the Project will have a similar range of activities, which will be expanded across the Site. The numerous temporary buildings and stockpiles associated with the existing vacant plot and construction compounds will be removed from the viewshed. The Site will remain predominantly open in nature, with formal, regular designated areas developed for a variety of key training requirements that must be met in the wider Hong Kong society to enable the training and certification of construction workers in a variety of technical fields.

7.3.2 The Project will add a number of training activities of a similar nature to the current construction-related views, which are set within the wider context of the Tai Po Industrial Estate. CIC as the leader in construction training in Hong Kong will train candidates / trainees regarding good practices within the industry, therefore the Training Ground will necessarily be kept to the highest good practice standards as a demonstration to the candidates / trainees. The Site will remain clean of debris and waste.

7.3.3 The cranes, which are required on the Site to enable the vital training and certification of candidates, to ensure sufficient supply of qualified crane operators are available within Hong Kong, add a vertical element to the Site which differ from current views. There are a variety of crane types at the Site depending on the crane certification required, in numerous cases the cranes are of limited height, and retractable, such that when necessary during the training and examination periods they are likely to be temporarily visible above the tree-line for ground level and distant views of the Site. Two tower cranes are required on the Project Site to enable the facility to provide training in all crane types and meet the Hong Kong crane training requirements. For clarity Table 7.2 below identifies the cranes likely to be on the Project Site, their maximum heights and approximate height in storeys.

**Table 7.2 Crane Heights**

Item No.	Machine Type	Max. height (ie, lifting height) in m	Approx. Storey height
1	Hydraulic Crawler Crane - IHI	38	13
2	Hydraulic Crawler KH-1803	22	7
3	Hydraulic Crawler Crane- Kobelco	22	7
4	Mini Crawler Crane- Kato	10	3

Item No.	Machine Type	Max. height (ie, lifting height) in m	Approx. Storey height
5	Rough Terrain Crane- Tadano GR300	36	12
6	Hydraulic Truck Crane- Kato 7T	15	5
7	Rough Terrain Crane- Kato KR300	38	13
8	Hydraulic Truck Crane- Tadano 250E	41	14
9	Chasis Cab Diesel Truck- Isuzu FT8676	16	6
10	Classic Cab Diesel Truck- Isuzu FW5281	8.5	3
11	Brand New Diesel Truck JG291	11.2	4
12	Electric Gantry Crane	10	3
13	Reconditioned & Repainted Potain Tower Crane	24.6 to hook; approx. 28.6 total**	8 to hook; approx. 10 total
14	Brand New Derrick Crane	21	7
15	Tower Crane- YongMao	35**	12

Notes:

\* - where 1 storey is typically equal to approximately 3 m

\*\* - permanent height, other cranes are retractable, or have moveable booms

7.3.4 The photomontages in Appendix A depict the existing Site and provide an indication of the likely future views into the developed Site from the selected representative viewpoints with and without possible mitigation in place.

7.3.5 Table 7.3 considers the impacts of the operational Project on the selected representative viewpoints.

**Table 7.3 Visual Impacts on Representative Viewpoints**

ID	Sensitive Receiver	Visual Composition	Visual Obstruction	Effect on Public Viewers	Effect on Visual Resources	Magnitude of Change
VP1	View from Tai Po Waterfront Park Lookout Tower	The mixed view of central green space bounded by high-rise residential properties to the west and Industrial Estate to the east remains during operation of the Project.	The existing vista will not change. The maximum height of the cranes will be 14 storeys, these will be just above the tree-line from this view.  The skyline will not be impacted.	Negligible.	Tops of some tall cranes will be visible when at full height.  Only tower cranes will be permanently visible, just above the tree line.	Negligible.
VP2	View from Yue Kok Village	The central view towards Tai Po Waterfront Park remains with the introduction of the Project, ground level structures and activities will not be visible from this view. The Project will remove a number of the existing construction offices which are partially visible within the view. Two tower cranes will be introduced into the middle distance. In addition other cranes will be visible, when training for these cranes is conducted at heights above the existing tree-line. These other cranes are retractable and moveable, and therefore will only be visible during such training activities.	Views of the ground level activities will be blocked by existing vegetation.  A number of crane structures (at least 2 tower cranes) will be visible depending on the training be conducted at the facility. This will break up the continuous central view to the Waterfront Park and hills in the background.  The skyline is not expected to be impacted by the operation of the Training Ground.	Slight.  Perceived visual permeability may be reduced.	Overall vegetation cover in the view will not change, the industrial and high-rise residential contexts at the edges of the view will remain. The introduction of moving cranes into the landscapes middle distance will add an active, but permeable element above the tree-line but not above the skyline.	Negligible.

ID	Sensitive Receiver	Visual Composition	Visual Obstruction	Effect on Public Viewers	Effect on Visual Resources	Magnitude of Change
VP3	View from Fu Shin Estate, Shin King House, 8 <sup>th</sup> Floor	The Project will remove a number of construction offices from this view and add some activities at ground level. The introduction of cranes to the Site will add an active visual element to the middle distance in front of the industrial estate.	<p>From this view training activities will be visible in the northern portion of the Site. However, the low angle of the view limits the overall proportion of the view which is impacted.</p> <p>The introduction of numerous cranes into the view will hinder views towards the Industrial Estate, and more distant views to the hills in the background. The majority of the cranes will be relatively thin permeable structures, and / or retractable and moveable such that they may be lowered to reduce the impact on viewers when not used for training purposes.</p> <p>The skyline in the middle distance will be impacted.</p>	Moderate.	The introduction of cranes of a range of heights, when operational, will add an active, but permeable element to the view as well as impact on views to the Industrial Estate. The vegetation coverage in the view will not change.	Moderate.
VP4	View from Fu Shin Estate, Shin King House, 23 <sup>rd</sup> Floor	The ground operations will be fully visible from this viewpoint. The construction stockpiles and offices will be replaced with a variety of essential training activities. Movement on the Site will be from trainees / candidates, as well as a few plant within designated areas to enable	<p>It is expected that the cranes will not impact on the skyline from this view, due to their restricted height.</p> <p>The cranes will not significantly hinder views of the Industrial Estate, nor the more distant views of the hills or Tolo Harbour.</p> <p>Views in the foreground will</p>	Slight to Moderate.	<p>The introduction of cranes of a range of heights, when operational, will add an active, but permeable element to the view, however will not impact views of the Industrial Estate or more distant views.</p> <p>The activities on the Site</p>	Slight.





ID	Sensitive Receiver	Visual Composition	Visual Obstruction	Effect on Public Viewers	Effect on Visual Resources	Magnitude of Change
		<p>sufficient training requirements. The training will take place in designated areas and will be low rise. The Site should appear less cluttered than some portions of the existing views. Similar construction-related activities to those on portions of the existing Site will enacted during training at the facility.</p> <p>The cranes will add a raised active element to the view.</p>	<p>change and will be of a similar nature to existing uses.</p>		<p>will be fully visible.</p> <p>The vegetation coverage in the view will not change, where the Site is predominantly hardstanding.</p>	
VP5	View from Fu Shin Estate, Shin King House, 32 <sup>nd</sup> Floor	As VP4 above.	As VP4 above.	As VP4 above.	As VP4 above.	As VP4 above.

- 7.3.6 The impact on views from representative viewpoints varies. In general, long distance views of the Site will only be impacted by the introduction of crane training activities. It is expected that the skyline will not be significantly impacted from these views. Views from the lower level floors of nearby residences facing the Site will not be impacted significantly by the activities at ground level on the Site, often due to the low angle of view and belts of trees blocking views. However, the use of cranes for training purposes will introduce an active raised element to the views that will impact on the skyline and views to the Industrial Estate and beyond, to the east. Viewers from the higher residential floors in adjacent dwellings looking towards the Site will be able to see all the activities on the Site, which will be of a similar nature to some of the existing uses. In addition the crane activities will introduce a raised active element, however this is not expected to impact on views to the Industrial Estate and more distant views. Vegetation coverage within the area will remain.
- 7.3.7 To minimise the impacts of the Site, where possible, and operationally feasible, the CIC will consider options to improve the visual character of the Site. For example, providing greening measures, such as maintaining and enhancing trees on-site, providing planters etc. Such measures are already carried out by CIC at their existing sites. CIC will also consider options for further reducing the visual effect of the cranes on Site, for example, through operational requirements to lower and retract cranes (where possible) when not in use. Other measures to alter the colour of the cranes to more neutral colours, which will assist in blending them into the surrounding vista, will be investigated. In addition operational times of the Site for training will be limited to daytime. To meet the demand of the construction industry's training requirements the following operational times are necessary: Training Courses will be from 08:20 to 16:20 for week days; and Trade Tests will be 08:20 to 16:20 week days and Sundays.
- 7.3.8 Considering the current views of the Site; the current uses of the Site for construction compounds and car/lorry parks; the already industrial nature of views from residences to the east into the Tai Po Industrial Estate; the permeable, thin structure of cranes; the potential mitigation opportunities to be considered by CIC; and the sensitivity to change, it is considered that the overall impact of the Project on the visual character of the locality will be negligible to slight.

## **8. WATER QUALITY**

### **8.1 Construction**

- 8.1.1 Site runoff may be generated from construction activities, especially during the rainy season. Washwater from vehicles and equipments; silts from on-site stockpiles; spillage of fuels; oil and lubricants from construction vehicles and plants; as well as sewage effluent from on-site chemical toilets, could cause potential water quality impacts.
- 8.1.2 Whilst there is no water body of high ecological value near the Site, where necessary appropriate water pollution control measures will be implemented on-site to control the runoff generated from construction activities and direct the runoff to the drainage system. Good practices for dealing with the construction site discharges will be implemented in accordance with ProPECC PN 1/94 "Construction Site Drainage". With good practice mitigation in place construction impacts on water quality will be negligible.

## **8.2 Operation**

8.2.1 Effluent and all other wastewater arising from the office/classroom and toilet facilities will be connected to a sewer system. Site drainage will be established to collect washdown water and similar site runoff prior to discharge to the drainage system. Oil and sediment interceptors will be implemented at the Site. Due to the scale and operation of the Project no adverse water quality or sewerage impact is anticipated. All water quality and discharge regulations and licensing will be met.

## **9. WASTE GENERATION**

### **9.1 Construction**

9.1.1 There are currently no significant structures on the Project Site. Good practice construction waste management will be implemented on-site. Where necessary, construction and demolition materials will be segregated on-site into inert and non-inert wastes. Inert wastes cannot be decomposed, and include debris, rubble, earth and concrete, which is suitable for land reclamation and site formation. They will be treated as public fill and taken to a public fill reception facility. Non-inert wastes, on the other hand, include bamboo, timber, vegetation and packaging waste, which are not suitable for land reclamation and site formation, and therefore will be disposed of at a landfill.

9.1.2 Construction and demolition materials will be stored on-site before re-use or disposal where possible. As far as practicable, the construction and demolition materials will be re-used in order to minimise waste generation. All waste management regulations and licensing requirements will be met during construction.

### **9.2 Operation**

9.2.1 Due to the scale of the Project, negligible general refuse wastes will be generated. No chemical or hazardous waste is anticipated. Wastes generated will be collected and disposed of on a regular basis. Recycling of wastes generated from the Site will be encouraged.

9.2.2 Waste materials from the training activities will be collected and disposed of in an appropriate manner by licensed operator to official disposal facilities. Where possible these wastes will be re-used or recycled. With strict implementation of good site practices, good management and controls to reduce the generation of waste amounts, adverse impacts due to waste management is not anticipated.

## **10. LAND CONTAMINATION**

10.1.1 The Tai Po Industrial Estate, including Area 33, was reclaimed from the sea in 1974. The Tai Po Industrial Estate was designated for developing large-scale industries. In 1978, manufacturers of heavy equipment, food, beverage, auto parts, construction materials and electronics operated in Tai Po Industrial Estate. It has been possible to establish through historical aerial photographs available through the Lands Department and GoogleEarth imagery that the Site has had varying uses, in at least the last decade the imagery depicts a car/lorry park at the northern portion of the Project Site with the southern half covered by a variety of open space and construction compounds.

- 10.1.2 At the current time the Site is predominately paved with hard standing, and with little excavation proposed for the Project's construction, contaminated land is determined unlikely to be an issue. If necessary, remedial measures will be developed in accordance with good practice. In any case, CIC propose that excavated material remains on site to minimise any off-site impacts.

## 11. ECOLOGY

- 11.1.1 The Project Site is located on a brownfield site (ie a site that has been previously developed). The Site is currently covered by hardstanding and temporary construction compounds. There are a number (approximately 15) trees located within the current Site boundary. These trees have been identified as common tree species in Hong Kong, no Old or Valuable Trees are located within the Site, or immediate surroundings. As with other CIC Training Grounds, see Figure 11.1, CIC will, where possible, maintain and enhance the number of trees on the Project Site. If tree felling is necessary, compensatory tree planting will be scheduled to compensate the tree loss in accordance with ETWB TCW No. 3/2006 on Tree Preservation.



Figure 11.1 Trees within Existing CIC Training Grounds

- 11.1.2 Other vegetation on the existing Site has been planted within the construction compounds by Drainage Service Department and Highways Department contractors. No flora or fauna of importance or interest is expected to be located on the Site, due to the current land uses.
- 11.1.3 The boundary of the Site along Yuen Shin Road, the main transport corridor near the Site, is vegetated with trees and shrubs. These vegetated areas are outside the boundary of the Site and provide screening to the Site and its current and future activities.

## 12. TRAFFIC

- 12.1.1 Tai Po CIC Training Ground is surrounded by Yuen Shin Road, Dai Fuk Street, Dai Fat Street and Dai Wah Street. Yuen Shin Road is classified as Primary Distributor and the remaining roads are classified as Local Distributor. The Annual Average Daily Total (AADT) of Yuen Shin Road is 28,190 and 28,400 for 2008 and 2009 respectively.

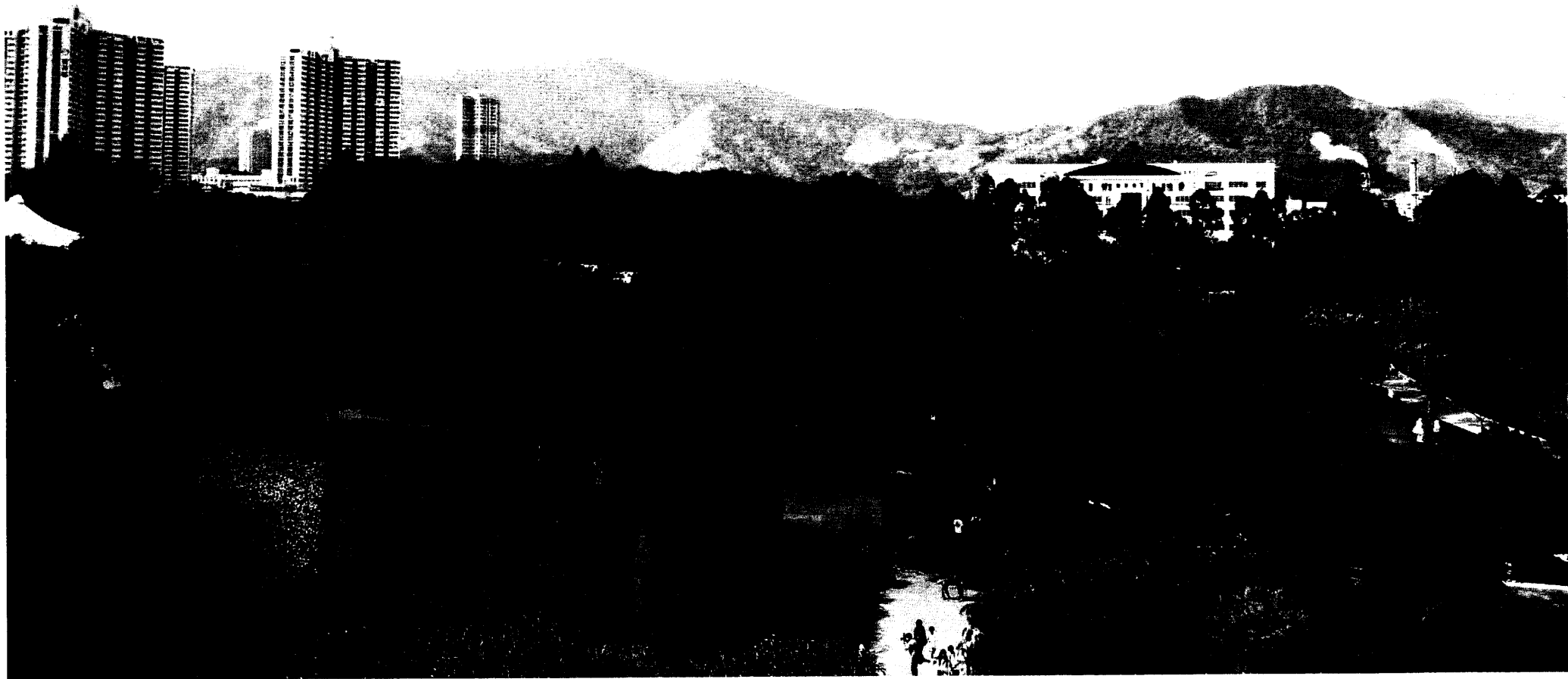


- 12.1.2 The vehicular access of Tai Po Training Ground, which is approved by Transport Department, is located at Dai Wah Street. 6 parking lots will be provided for Staff use. From the observation of the existing training sites in Sha Tin, Kowloon Bay and Cha Kwo Ling, the vehicular access is very few. It is deduced that the traffic impact of the Tai Po Training Ground will also be insignificant.
- 12.1.3 Currently, trainees and candidates studying at the existing Sha Tin, Kowloon Bay and Cha Kwo Ling training sites commute by public transport. Similarly, they will be required to use public transport to access the Tai Po Training Ground. There are numerous GMB and KMB routes passing Ting Kok Road, which will serve the students of Tai Po Training Ground.



# APPENDIX A

## PHOTOMONTAGES



Viewpoint 1 - View from Tai Po Waterfront Park Lookout Tower  
觀點一：由大埔海濱公園香港回歸紀念塔瞭望

- B - Rough Terrain Crane (max. height 38m, approx. 13storeys )  
越野吊機(最高高度38米,約13層樓)
  - C - Hydraulic Truck Crane (max. height 41m,14storeys)  
輪胎式吊機(最高高度41米,約14層樓)
  - F - Tower Crane (height approx. 35m, approx. 12 storeys)  
塔式起重機(約54米高,18層樓)
  - G - Rough Terrain Crane (max. height 36m, 12 storeys )  
越野吊機(最高高度36米,約12層樓)
  - H - Hydraulic Crawler Clamshell (max. height 38m, 13 storeys)  
履帶式\*殼挖泥機(最高高度38米,約13層樓)
- Photomontage represents worst-case, i.e. with all cranes operating at maximum height all at once. This case is not expected to occur.  
集成照片表示最壞情況, 即是所有吊機都在最高高度下同時運作。這情況預期不會發生。
  - 1 Storey= approx.3m  
一層大樓有3米。



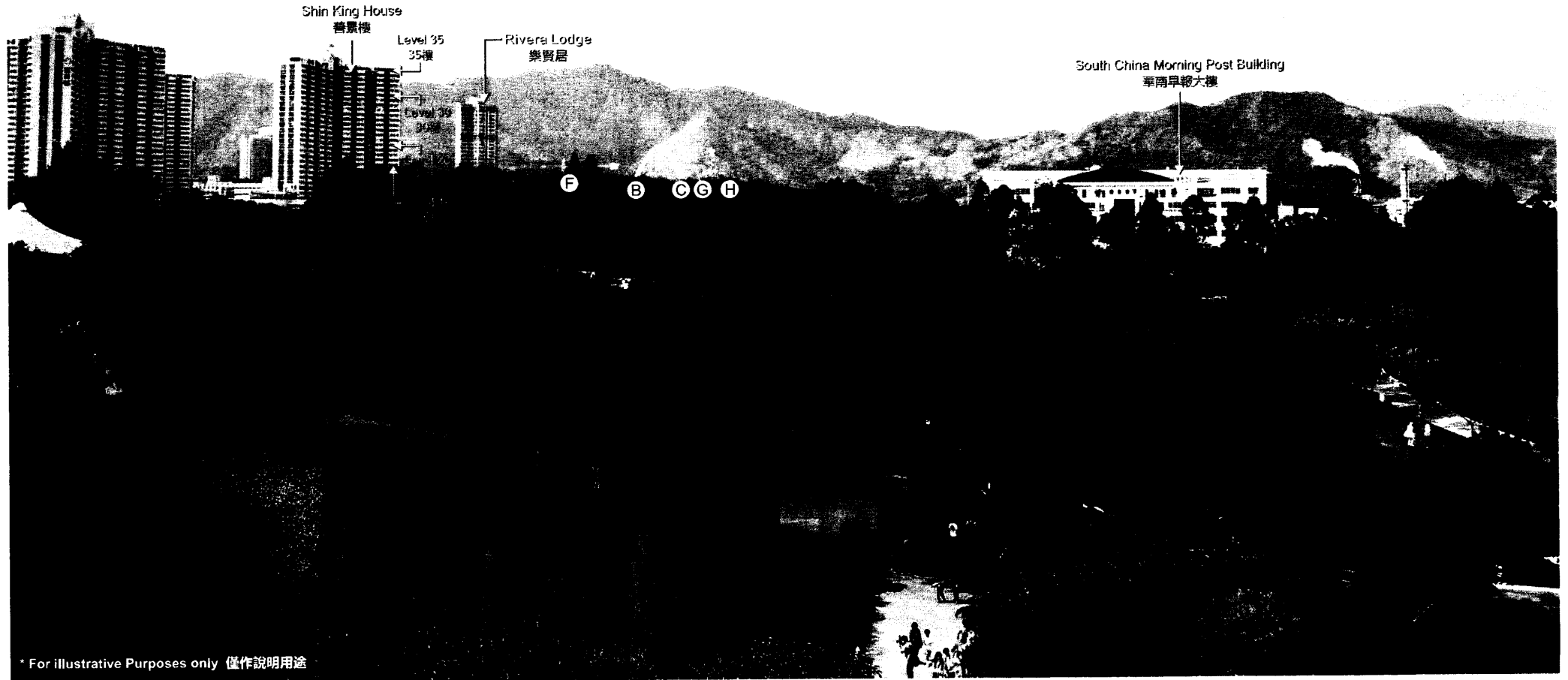
\* For illustrative Purposes only 僅作說明用途

**Viewpoint 1 - View from Tai Po Waterfront Park Lookout Tower with Proposed Project (without mitigation)**  
**觀點一：由大埔海濱公園香港回歸紀念塔瞭望提议的工程项目位置(没有缓減措施)**



- B - Rough Terrain Crane (max. height 38m, approx. 13storeys )  
越野吊機(最高高度38米,約13層樓)
- C - Hydraulic Truck Crane (max. height 41m,14storeys)  
輪胎式吊機(最高高度41米,約14層樓)
- F - Tower Crane (height approx. 35m, approx. 12 storeys)  
塔式起重機(約54米高,18層樓)
- G - Rough Terrain Crane (max. height 36m, 12 storeys )  
越野吊機(最高高度36米,約12層樓)
- H - Hydraulic Crawler Clamshell (max. height 38m, 13 storeys)  
履帶式\*殼挖泥機(最高高度38米,約13層樓)

- Photomontage represents worst-case, i.e. with all cranes operating at maximum height all at once. This case is not expected to occur.  
集成照片表示最壞情況,即是所有吊機都在最高高度下同時運作。這情況預期不會發生。
- 1 Storey= approx.3m  
一層大樓有3米。



\* For illustrative Purposes only 僅作說明用途

Viewpoint 1 - View from Tai Po Waterfront Park Lookout Tower with Proposed Project (with possible mitigation)  
 觀點一：由大埔海濱公園香港回歸紀念塔瞭望提议的工程项目位置(有可能的緩減措施)



Viewpoint 2 - View from Yue Kok Village  
觀點二：從魚角村瞭望

- A - Hydraulic Crawler Clamshell (max. height 22m, approx. 7 storeys)  
履帶式\*殼挖泥機(最高高度22米,約7層樓)
- B - Rough Terrain Crane (max. height 38m, approx. 13storeys )  
越野吊機(最高高度38米,約13層樓)
- C - Hydraulic Truck Crane (max. height 41m,14storeys)  
輪胎式吊機 (最高高度41米,約14層樓)
- D - Tower Crane (height approx. 28m, approx. 10 storeys)  
塔式起重機(約28米高,約18層樓)
- E - Derrick Crane (max. height 21m, approx. 7 storeys )  
牽索式人字吊臂起重機(最高高度21米,約7層樓)
- F - Tower Crane (height approx. 35m, approx. 12 storeys)  
塔式起重機(約54米高,18層樓)
- G - Rough Terrain Crane (max. height 36m, 12 storeys )  
越野吊機(最高高度36米,約12層樓)
- H - Hydraulic Crawler Clamshell (max. height 38m, 13 storeys)  
履帶式\*殼挖泥機(最高高度38米,約13層樓)

- Photomontage represents worst-case, i.e. with all cranes operating at maximum height all at once. This case is not expected to occur.  
集成照片表示最壞情況,即是所有吊機都在最高高度下同時運作。這情況預期不會發生。
- 1 Storey= approx.3m  
一層大樓有3米。



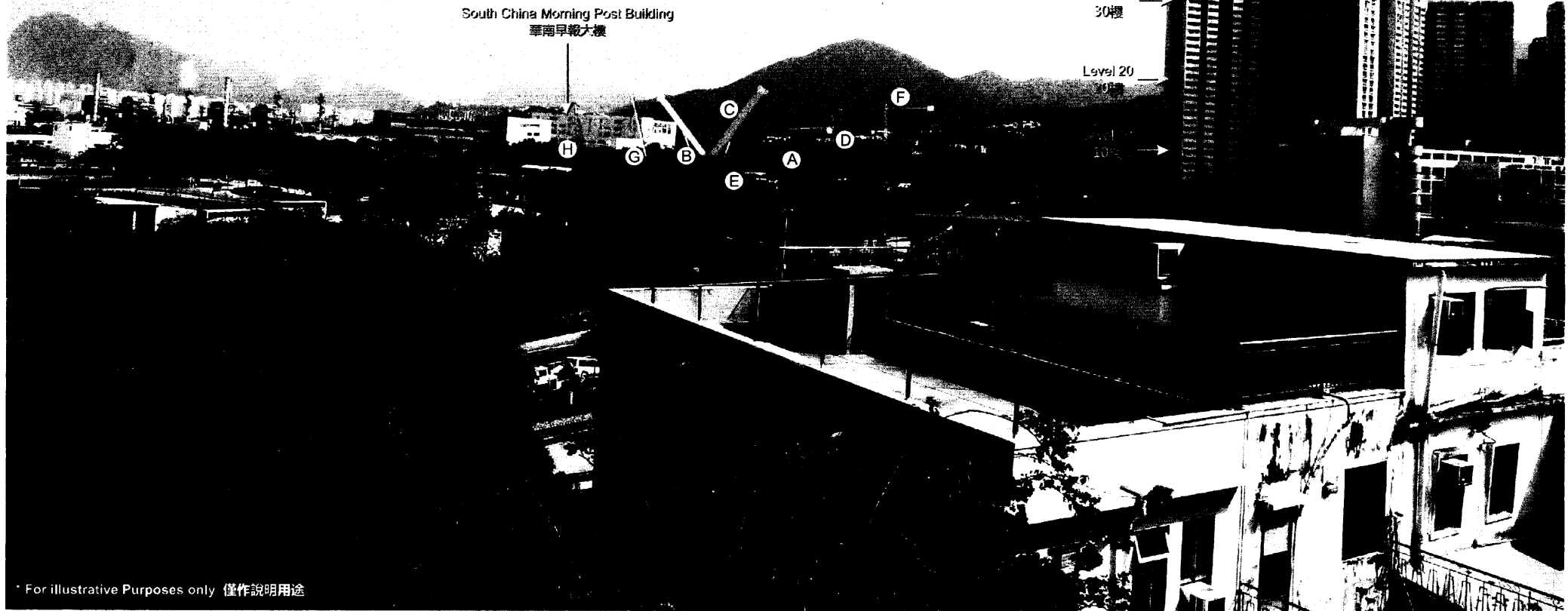
\* For illustrative Purposes only 僅作說明用途

Viewpoint 2 - View from Yue Kok Village with Proposed Project (without mitigation)

觀點二: 從魚角村瞭望提議的工程項目位置(沒有緩減措施)

- A - Hydraulic Crawler Clamshell (max. height 22m, approx. 7 storeys)  
履帶式\*殼挖泥機(最高高度22米,約7層樓)
- B - Rough Terrain Crane (max. height 38m, approx. 13storeys )  
越野吊機(最高高度38米,約13層樓)
- C - Hydraulic Truck Crane (max. height 41m,14storeys)  
輪胎式吊機 (最高高度41米,約14層樓)
- D - Tower Crane (height approx. 28m, approx. 10 storeys)  
塔式起重機(約28米高,約10層樓)
- E - Derrick Crane (max. height 21m, approx. 7 storeys )  
牽索式人字吊臂起重機(最高高度21米,約7層樓)
- F - Tower Crane (height approx. 35m, approx. 12 storeys)  
塔式起重機(約35米高,12層樓)
- G - Rough Terrain Crane (max. height 36m, 12 storeys )  
越野吊機(最高高度36米,約12層樓)
- H - Hydraulic Crawler Clamshell (max. height 38m, 13 storeys)  
履帶式\*殼挖泥機(最高高度38米,約13層樓)

- Photomontage represents worst-case, i.e. with all cranes operating at maximum height all at once. This case is not expected to occur.  
集成照片表示最壞情況, 即是所有吊機都在最高高度下同時運作。這情況預期不會發生。
- 1 Storey= approx.3m  
一層大樓有3米。



\* For illustrative Purposes only 僅作說明用途

Viewpoint 2 - View from Yue Kok Village with Proposed Project (with possible mitigation)  
觀點二: 從魚角村瞻望提議的工程項目位置(有可能的緩減措施)



Viewpoint 3 - View from Fu Shin Estate, Shin King House, 8th Floor

觀點三：從富善村善景樓8樓瞭望

- A - Hydraulic Crawler Clamshell (max. height 22m, approx. 7 storeys)  
履帶式\*殼挖泥機(最高高度22米,約7層樓)
  - B - Rough Terrain Crane (max. height 38m, approx. 13storeys)  
越野吊機(最高高度38米,約13層樓)
  - C - Hydraulic Truck Crane (max. height 41m, 14storeys)  
輪胎式吊機(最高高度41米,約14層樓)
  - D - Tower Crane (height approx. 28m, approx. 10 storeys)  
塔式起重機(約28米高,約10層樓)
  - F - Tower Crane (height approx. 35m, approx. 12 storeys)  
塔式起重機(約35米高,12層樓)
  - H - Hydraulic Crawler Clamshell (max. height 38m, 13 storeys)  
履帶式\*殼挖泥機(最高高度38米,約13層樓)
- Photomontage represents worst-case, i.e. with all cranes operating at maximum height all at once. This case is not expected to occur.  
集成照片表示最壞情況, 即是所有吊機都在最高高度下同時運作。這情況預期不會發生。
  - 1 Storey= approx.3m  
一層大樓有3米。



\* For illustrative Purposes only 僅作說明用途

Viewpoint 3 - View from Fu Shin Estate, Shin King House, 8th Floor with Proposed Project (without mitigation)  
觀點三: 從富善村善景樓8樓瞭望提議的工程項目位置(沒有緩減措施)

- A - Hydraulic Crawler Clamshell (max. height 22m, approx. 7 storeys)  
履帶式\*殼挖泥機(最高高度22米,約7層樓)
- B - Rough Terrain Crane (max. height 38m, approx. 13storeys )  
越野吊機(最高高度38米,約13層樓)
- C - Hydraulic Truck Crane (max. height 41m,14storeys)  
輪胎式吊機 ( 最高高度41米,約14層樓 )
- D - Tower Crane (height approx. 28m, approx. 10 storeys)  
塔式起重機(約28米高,約10層樓)
- F - Tower Crane (height approx. 35m, approx. 12 storeys)  
塔式起重機(約35米高,12層樓)
- H - Hydraulic Crawler Clamshell (max. height 38m, 13 storeys)  
履帶式\*殼挖泥機(最高高度38米,約13層樓)

- Photomontage represents worst-case, i.e. with all cranes operating at maximum height all at once. This case is not expected to occur.  
集成照片表示最壞情況, 即是所有吊機都在最高高度下同時運作。這情況預期不會發生。
- 1 Storey= approx.3m  
一層大樓有3米。



\* For illustrative Purposes only 僅作說明用途

Viewpoint 3 - View from Fu Shin Estate, Shin King House, 8th Floor with Proposed Project (with possible mitigation)

觀點三: 從富善村善景樓8樓瞭望提議的工程項目位置(有可能的緩減措施)



Viewpoint 4 - View from Fu Shin Estate, Shin King House, 23rd Floor with Proposed Project

觀點四: 從富善村善景樓23樓瞭望提議的工程項目位置



- A - Hydraulic Crawler Clamshell (max. height 22m, approx. 7 storeys)  
履帶式\*殼挖泥機(最高高度22米,約7層樓)
  - B - Rough Terrain Crane (max. height 38m, approx. 13storeys )  
越野吊機(最高高度38米,約13層樓)
  - C - Hydraulic Truck Crane (max. height 41m,14storeys)  
輪胎式吊機 (最高高度41米,約14層樓)
  - D - Tower Crane (height approx. 28m, approx. 10 storeys)  
塔式起重機(約28米高,約18層樓)
  - F - Tower Crane (height approx. 35m, approx. 12 storeys)  
塔式起重機(約54米高,18層樓)
  - H - Hydraulic Crawler Clamshell (max. height 38m, 13 storeys)  
履帶式\*殼挖泥機(最高高度38米,約13層樓)
- Photomontage represents worst-case, i.e. with all cranes operating at maximum height all at once. This case is not expected to occur.  
集成照片表示最壞情況,即是所有吊機都在最高高度下同時運作。這情況預期不會發生。
  - 1 Storey= approx.3m  
一層大樓有3米。



\* For illustrative Purposes only 僅作說明用途

Viewpoint 4 - View from Fu Shin Estate, Shin King House, 23rd Floor with Proposed Project (without mitigation)

觀點四: 從富善村善景樓23樓瞭望提議的工程項目位置(沒有緩減措施)

- A - Hydraulic Crawler Clamshell (max. height 22m, approx. 7 storeys)  
履帶式\*殼挖泥機(最高高度22米,約7層樓)
- B - Rough Terrain Crane (max. height 38m, approx. 13storeys )  
越野吊機(最高高度38米,約13層樓)
- C - Hydraulic Truck Crane (max. height 41m,14storeys)  
輪胎式吊機 (最高高度41米,約14層樓)
- D - Tower Crane (height approx. 28m, approx. 10 storeys)  
塔式起重機(約28米高,約18層樓)
- F - Tower Crane (height approx. 35m, approx. 12 storeys)  
塔式起重機(約54米高,18層樓)
- H - Hydraulic Crawler Clamshell (max. height 38m, 13 storeys)  
履帶式\*殼挖泥機(最高高度38米,約13層樓)

- Photomontage represents worst-case, i.e. with all cranes operating at maximum height all at once. This case is not expected to occur.  
集成照片表示最壞情況, 即是所有吊機都在最高高度下同時運作。這情況預期不會發生。
- 1 Storey= approx.3m  
一層大樓有3米。



\* For illustrative Purposes only 僅作說明用途

Viewpoint 4 - View from Fu Shin Estate, Shin King House, 23rd Floor with Proposed Project (with possible mitigation)

觀點四: 從富善村善景樓23樓瞭望提議的工程項目位置(有可能的緩減措施)



Viewpoint 5 - View from Fu Shin Estate, Shin King House, 32nd Floor  
觀點五: 從富善村善景樓32樓瞭望

Draft  
草稿

- A - Hydraulic Crawler Clamshell (max. height 22m, approx. 7 storeys)  
履帶式\*殼挖泥機(最高高度22米,約7層樓)
  - B - Rough Terrain Crane (max. height 38m, approx. 13storeys )  
越野吊機(最高高度38米,約13層樓)
  - D - Tower Crane (height approx. 28m, approx. 10 storeys)  
塔式起重機(約28米高,約10層樓)
  - F - Tower Crane (height approx. 35m, approx. 12 storeys)  
塔式起重機(約54米高,18層樓)
  - H - Hydraulic Crawler Clamshell (max. height 38m, 13 storeys)  
履帶式\*殼挖泥機(最高高度38米,約13層樓)
- Photomontage represents worst-case, i.e. with all cranes operating at maximum height all at once. This case is not expected to occur.  
集成照片表示最壞情況, 即是所有吊機都在最高高度下同時運作。這情況預期不會發生。
  - 1 Storey= approx.3m  
一層大樓有3米。



\* For illustrative Purposes only 僅作說明用途

Viewpoint 5 - View from Fu Shin Estate, Shin King House, 32nd Floor with Proposed Project (without mitigation)  
觀點五: 從富善村善景樓32樓瞭望提議的工程項目位置(沒有緩減措施)

- A - Hydraulic Crawler Clamshell (max. height 22m, approx. 7 storeys)  
履帶式\*殼挖泥機(最高高度22米,約7層樓)
- B - Rough Terrain Crane (max. height 38m, approx. 13storeys )  
越野吊機(最高高度38米,約13層樓)
- D - Tower Crane (height approx. 28m, approx. 10 storeys)  
塔式起重機(約28米高,約10層樓)
- F - Tower Crane (height approx. 35m, approx. 12 storeys)  
塔式起重機(約35米高,約12層樓)
- H - Hydraulic Crawler Clamshell (max. height 38m, 13 storeys)  
履帶式\*殼挖泥機(最高高度38米,約13層樓)

- Photomontage represents worst-case, i.e. with all cranes operating at maximum height all at once. This case is not expected to occur.  
集成照片表示最壞情況, 即是所有吊機都在最高高度下同時運作。這情況預期不會發生。
- 1 Storey= approx.3m  
一層大樓有3米。



\* For illustrative Purposes only 僅作說明用途

Viewpoint 5 - View from Fu Shin Estate, Shin King House, 32nd Floor with Proposed Project (with possible mitigation)

觀點五: 從富善村善景樓32樓瞭望提議的工程項目位置(有可能的緩減措施)