顧問合約編號
NEX/1049
尖沙咀站
加拿分道行人隧道

提交文件編號 2.1D 工程項目簡介

A 修訂版

2012 年 3 月

香港鐵路有限公司

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工程項目簡介

Mott MacDonald

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1. 基本資料

1.1 工程項目名稱

本工程項目名稱爲港鐵尖沙咀站加拿分道行人隧道及出入口修改工程（下稱“項目”）。

1.2 工程項目概述

爲了改善港鐵尖沙咀站 D1 和 D2 加拿分道出入口的外觀，並提供更舒適的步行環境，香港鐵路有限公司提出重建 D1 和 D2 出入口，並在 K11 購物藝術館地庫 B2 層興建新的 D3 出入口經行人隧道連接到尖沙咀站。行人隧道長約 80 米，由港鐵尖沙咀站 D1 和 D2 出入口經過加拿分道地下，沿著碧仙桃路到達 K11 購物藝術館地庫 B2 層(垂直高度在 -4.5mPD)，見**圖 1.1** 所示。

項目初步整體工程時間表爲 2013 年年中至 2015 年年中，而涉及明挖建築工作，即對交通影響最爲嚴重的初步時間表則爲 2013 年年中至 2015 年年中。

1.3 工程項目簡介所涵蓋的指定工程數目和類別

項目將涉及尖沙咀站兩個現有出入口的改善工程、隧道興建及通往 K11 的綜合出入口。擬建的隧道將會備有空氣調節，共長約 80 米（步行距離）連接至 K11。工程部分是從現有的尖沙咀站至 K11 購物藝術館界線，將根據鐵路條例刊登。

尖沙咀站在 1998 年 4 月 1 日《環境影響評估條例》生效之前已經投入服務，因此根據環境影響評估條例指南第 9(2)(g)條規定，此工程被確認爲受豁免的指定工程。由於擬建工程包括對現有港鐵站帶來實質變動及構成潛在環境影響，此工程可能被視爲獲豁免的《環境影響評估條例》附表 2 的指定工程項目。因此必須跟隨《環境影響評估條例》之程序，而此項目在施工和營運之前必須取得環境許可證。故此，本工程項目簡介旨在爲直接申請環境許可證提供最實用的資料。

1.4 項目倡議人

香港鐵路有限公司

香港九龍灣德福廣場總部大樓

1.5 工程項目地點

工程項目位於夾雜了商業及住宅發展的尖沙咀市區。擬建工程將沿加拿分道及彌敦道之間和碧仙桃路進行，交通非常繁忙。隧道的位置及工程界線如**圖 1.1** 所示。隧道規劃及立視圖如**圖 1.2** 所示。項目工地的過往用途是現有的地鐵出入口及加拿分道。

1.6 聯絡人姓名及電話號碼

所有有關此項目的疑問可以向以下人士提出：

關健恩先生　　環境經理
香港鐵路有限公司
電話：2993 2111
傳真：2993 7577
電郵： rkykwan@mtr.com.hk

1.7 擬議的增補、改良及修改

擬建工程將會在加拿分道地底興建新的行人隧道，連接港鐵尖沙咀站及 K11 購物藝術館地庫，並改善現有的 D1 及 D2 出入口，見**附表 I**。新的行人隧道連同 K11 購物藝術館的專用公共通道和現有麼地道及白蘭軒道交界的隧道，將會提供另一通往港鐵尖沙咀站至東鐵尖東站的路綫。新的行人隧道連接現有的行人隧道和改善後的出入口，將會爲行人和乘客提供一個更直接、更方便、更安全和更舒適的通道來往港鐵尖沙咀站，見**圖 1.2**。擬建工程包括：

- 興建:
  - 位於加拿分道地底一條約 80 米長的行人隧道；
  - 位於擬建行人隧道的西下方的機電房；及
  - 連接擬建行人隧道和 K11 購物藝術館的地庫 B2 層的地下出入口；
- 爲配合工程而進行的加拿分道 D1 及 D2 出入口改善工程；
- 其他相關的鐵路設施，包括通訊系統及機電設備；
- 重建受影響的現有道路，包括行車道和行人道；
- 土木及結構工程、電氣工程和機械工程；及
- 其他相關工程包括渠務、水務及景觀工程。

在工程完成後，所有道路和行人路將恢復原狀。現有的彌敦道和碧仙桃路在本項目中將不會有任何永久性改建、擴建或改善工程。

本項目將採用鑽挖式地底挖掘法，興建在加拿分道及碧仙桃路交界處下的隧道路段，以維持上述交界處及碧仙桃路至麼地道的交通暢順，減低對該處一帶交通的影響。

隧道的其他路段將以明挖回填式興建。此方法主要是由現有地面水平逐段挖開以建造隧道。項目將會首先沿擬建隧道走線安裝經結構工程師許可使用的板樁、管道或其他類型的臨時支撐結構，並在每個指定的水平安裝支撐及橫擋。

本項目將不會有爆破工程，在挖掘工程期間也不會使用爆炸品，因此，本項目沒有任何風險存在。

不是所有憲報刊登的地區都會有工程進行。工程界線已在**圖 1.1** 顯示，其相關的環境評估亦會在本工程項目簡介中討論。

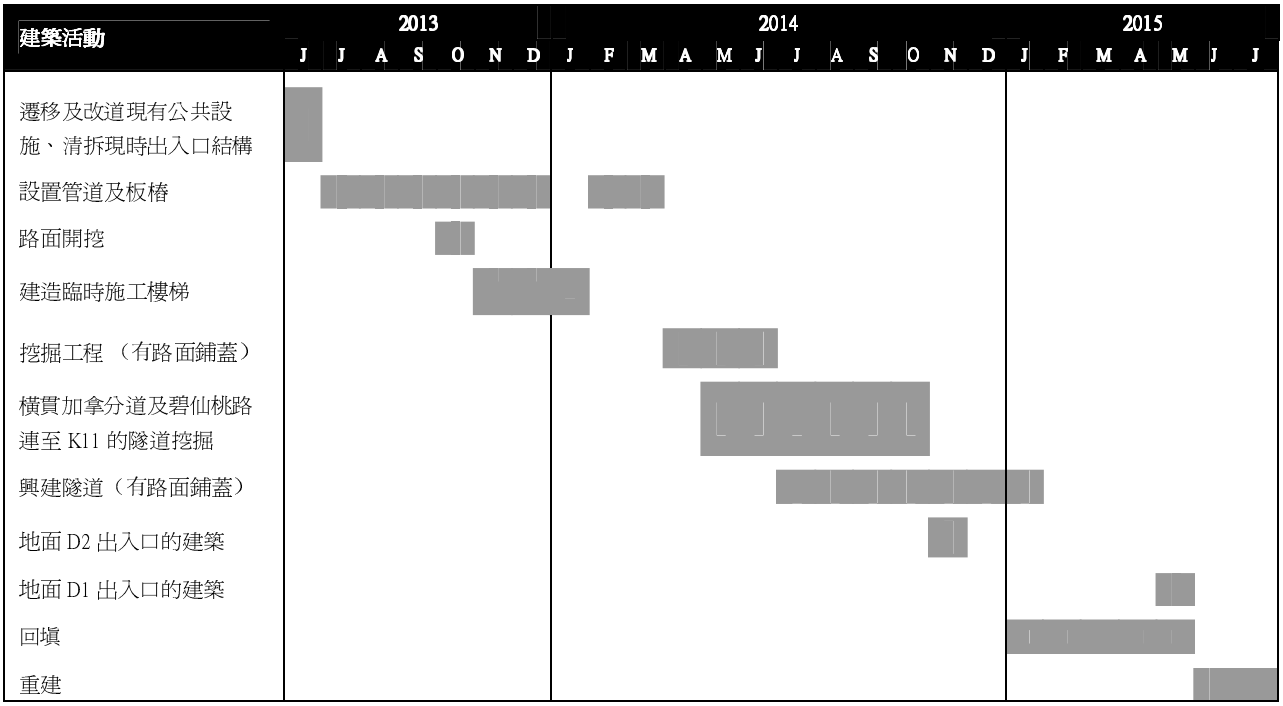
位於梳士巴利道架空道路下、尖沙咀香港日航酒店對面的一塊空地，將會用作施工期間的臨時貯存區，如**圖 1.3** 所示。

1.8 暫定工程項目時間表

港鐵公司爲項目倡議人，負責策劃、計劃、建築及營運。莫特麥克唐納香港有限公司獲委任爲工程及環境顧問。擬建工程由港鐵公司外聘承建商進行。

項目的設計定稿時間表已於 2011 年 4 月完成。整段合約期，包括工程合約的採納及施工期後的法定檢驗，預計於 2012 年年尾動工，在 2015 年中完成。隧道的建造工程，包括公用設施改道、明挖回填及隧道工程，將由 2013 年 6 月至 2015 年 6 月進行，爲期約 25 個月。暫定的施工時間表如下。行人隧道將於 2015 年中開始營運。

暫定工程項目時間表將會與尖沙咀站北行人隧道項目 A1 出入口改善工程於 2013 年 6 月至 2014 年 7 月期間同時進行，毗鄰的施工現場爲海防道地鐵站的 A1 出入口。尖沙咀站北行人隧道項目 A1 出入口改善工程所累積的環境影響將在本簡介的第二章中討論。



註： 1) 路面開挖工序完成後的 13 個月內將在明挖回填工序中提供路面鋪蓋。

2) 擬建的尖沙咀站北行人隧道項目 A1 出入口改善工程將會與本項目於 2013 年 6 月至 2014 年 7 月同時進行。

1.9 公衆諮詢

港鐵公司已展開公眾諮詢。項目建議方案已呈交油尖旺區議會交通及運輸委員會。諮詢會在初步及詳細設計和施工階段繼續進行。

2. 對環境可能造成的影響

2.1 周圍環境的主要元素

擬建項目位於尖沙咀加拿分道，附近道路交通繁忙，地下則有港鐵荃灣線的行車隧道。毗鄰爲一些商業大廈及商業/住宅混合大廈。

工程範圍以北，離地面約 30 米高的平台上建有兩座商業高樓大廈，分別爲金城商業中心及利嘉大廈。隧道西端建有一座名爲金冠大廈的商業/住宅混合高樓大廈，其街道層爲零售商鋪，首三層爲商業店鋪，第四層以上則是住宅。隧道東端則建有集友大廈，一座街道層爲零售商鋪的住宅大廈。

工程範圍以南建有美麗都大廈，是商業/住宅混合高樓大廈，其街道層爲零售商鋪，首三層爲商業店鋪，第四層以上則是住宅。

工程範圍的主要噪音來源爲彌敦道、碧仙桃路及加拿分道的道路交通噪音。現有的環境空氣質素也受工程範圍內及附近的高流量交通所影響。金冠大廈、集友大廈及美麗都大廈均確認爲本項目的現有敏感受體。在加拿分道上則沒有計劃的敏感受體。

2.2 施工期間的影響

2.2.1 噪音

所有施工活動在現階段不會被安排在早上 7 時至下午 7 時以外進行。倘因工程進度所需，施工活動需要在下午 7 時至早上 7 時進行，承建商必須事先申請建築噪音許可證，確保符合噪音管制條例的要求，方可在其他時間施工。除非工程師代表認爲是無可避免及有需要，所有施工活動均不能在下午 11 時至上午 7 時期間進行。

建築活動將包括公用設施的臨時保護及/或改動、現有出入口的清拆、挖掘及橫向支撐圍堰的建造、地層平整的挖掘、開挖隧道、隧道及地下附屬建築物的建造及地面出入口的重建。隧道的施工將分兩段同時進行，第一路段將採用明挖隨填的挖掘方法，第二路段則採用底挖法（如**圖 2.1** 所示）。每段均會配以一套機動設備以進行工程活動。

施工期間建築噪音對敏感受體造成的潛在影響主要來自機動設備的運作。本項目將會採用的機動設備包括發電機、空氣壓縮機、挖土機、卡車、起重機、混凝土泵、混凝土攪拌機、震動錘、鑽台、混凝土震動機、抽氣扇、圓型木鋸等等。每項工序的機動設備清單及其在沒有緩解措施下的聲功率級已列在**附件 I**。據此，**表 2.1** 總結了每項工序的最大聲功率級。

表 2.1: 各項工序的最大聲功率級（在沒有緩解措施下的情況）

工序	最大聲功率級 分貝(A)
第一路段	
沿彌敦道的公共設施工程	110
遷移及改道現有公共設施、清拆現時出入口結構	111
設置管道及板樁	110
路面挖掘	109
建造臨時施工樓梯	108
進一步挖掘（路面鋪蓋下的工序）	108
興建隧道（路面鋪蓋下的工序）	107
興建地面出入口	111
回填	109
重建	110
第二路段	
橫貫加拿分道及碧仙桃路連至K11的隧道挖掘	107

爲了評估本項目對研究範圍內的噪音敏感受體造成的噪音影響，研究按《環境影響評估程序的技術備忘錄》，在沿計劃邊界及在工程範圍毗鄰選定了七個具代表性的噪音敏感受體（包括 N1a, N1b, N1c, N2a, N2c, N2d 及 N3），並作出了相應的建築噪音影響評估。N2b 代表營運期間的固定設備的噪音敏感受體。N1b、N2c 及 N2d 代表公共設施施工的噪音敏感受體。此八個噪音敏感受體都列在**表 2.2**，並在**圖 2.2** 所示。

表 2.2: 具代表性的噪音敏感受體的說明

噪音敏感受體	說明	用途
N1a, N1b and N1c	金冠大廈	商業/住宅混合
N2a, N2b, N2c and N2d	美麗都大廈	商業/住宅混合
N3	集友大廈	住宅爲主

暫定工程項目時間表將會與尖沙咀站北行人隧道項目第一階段同時進行。尖沙咀站北行人隧道項目 A1 出入口改善工程計劃於 2012 年 4 月開始至 2014 年 7 月完成，預計將於 2013 年 6 月至 2014 年 7 月期間會有累積的建築噪音影響。預計沿彌敦道的所有敏感受體將會受到影響，因此，本簡介將包括尖沙咀站北行人隧道項目 A1 出入口改善工程所累積的建築噪音進行了評估。

累積建築噪音的評估是基於本簡介提交時獲得的最新資料。用於評估累積建築噪音的機動設備引用於尖沙咀站北行人隧道項目的環評報告（登記冊編號：AEIAR-127/2008），附錄 4.4 及 4.5。評估是假設該項目的機動設備已經採用所有在環評報告所提及的緩解措施，包括採用低噪音機動設備及所有隔音措施。評估是基於 A1 出入口發出的最大噪音施工情況下作假設。

研究是根據《管制建築工程噪音（撞擊式打樁除外）技術備忘錄》內列明的方法，評估了建築噪音對七個具代表性的噪音敏感受體的影響。詳細評估結果已概述在**附錄 III**。評估結果顯示在沒有緩解措施的情況下，噪音敏感受體因施工而受到的預計噪音水平，將高於日間噪音標準的 75 分貝(A)，見**表 2.3**。故項目需要實施噪音緩解措施，把噪音減至可接受水平。

表 2.3: 在具代表性的噪音敏感受體的預計噪音水平 – 沒有緩解措施的情況

噪音敏感受體	施工期間噪音水平預測 分貝(A)	環境影響評估程序的技術備忘錄 日間噪音評估標準 分貝(A)
N1a	**79 - 85**	75
N1b	71 - **82**	75
N1c	**76 - 82**	75
N2a[1]	**81 - 87**	75
N2c	**79 - 85**	75
N2d	68 - **84**	75
N3	**76 - 84**	75

註： 1) 由於 N2a 距離項目施工現場比 N2b 近，所以 N2a 作爲代表美麗都大廈在加拿分道的敏感受體。
2) **粗體**字代表超出有關噪音標準

2.2.2 空氣質素

部分隧道將會以開挖隧道的方法建造，預計此工序不會對空氣質素造成嚴重影響。雖然路面挖掘工程及在其餘工程範圍內的回填工作可能會產生建造工程塵埃，但由於工程開挖範圍有限，而在路面挖掘工程完成後會立即在路面鋪上蓋板，因此本項目所引起的建造工程塵埃將會是輕微，見**圖 2.1**。此外，本項目屬小型工程，所需機動設備的數目有限，所以廢氣排放將會是輕微。承建商需在施工期間嚴格遵守《空氣污染管制(建造工程塵埃)規例》的要求，實施塵埃管制措施，所以預計工程將不會對空氣質素造成影響。

根據第 1.8 章提及，暫定工程項目時間表將會與尖沙咀站北行人隧道項目 A1 出入口改善工程同時進行。由於尖沙咀站北行人隧道項目 A1 出入口改善工程及本項目屬小型工程，加上這兩個項目的路面開挖工程將不會同時進行，所以所引起的累積建造工程塵埃將會是輕微。承建商需在施工期間嚴格遵守《空氣污染管制(建造工程塵埃)規例》的要求，實施塵埃管制措施，所以預計工程將不會對累積空氣質素造成影響。

2.2.3 水質

施工期間的潛在水質污染來源主要是來自工地徑流的排放、降低地下水位活動以及實施抑制塵埃措施及工作人員所產生的污水。承建商必須執行《專業人士環保事務諮詢委員會專業守則第 1/94 號－建築工地排水》及《建議給建築合約的防污條款》內所列載的良好工地作業守則，及實施恰當的緩解措施，故預期工程將不會對水質帶來影響。

2.2.4 廢物管理

施工期間主要產生的固體廢物包括挖掘物料、拆建廢物、化學廢料及垃圾，估計項目會產生約 12,600 立方米的拆建物料。由於工地條件限制，再用挖掘物料的機會有限。一經土木工程拓展署同意，大部分廢物將轉運至所指定的公眾填土區作最後棄置。可供處置地點爲將軍澳第 137 區的填料庫。承建商應先考慮公眾填料是否可用在其他的建築項目才作最後棄置。

建造工程期間所產生的其他廢物如化學廢料及一般垃圾只屬小量，只要適當地處理、貯存、盡量將物料循環再用，及按照良好廢物管理守則及《廢物處置條例》內有關規例及要求處置，預計施工期間所生的廢物將不會對環境造成影響。

2.2.5 景觀及視覺

沒有景觀資源在工程範圍內或在加拿分道附近。因此，預計在施工範圍內不會對景觀造成影響。

除了在加拿分道的施工範圍，一個臨時貯存區將建議設在梳士巴利道（見**圖 1.3**）。這個臨時貯存區將涵蓋現有梳士巴利道架空道路下面一部分的種植面積。在受影響的範圍內沒有種植樹木。在該範圍內的植物包括常見的觀賞灌木及覆蓋地面的草本植物假連翹(*Duranta erecta*)、美人蕉(*Canna indica*)及蚌花(*Tradescantia spathacea*)。這些美化市容的植物需要在施工期間被暫時移除，騰出空間作臨時貯存區，但是將會在竣工後恢復植物。考慮到臨時貯存區所佔的空間少以及其暫時性質和可復原性，預計沒有不良的景觀影響。

加拿分道附近的居民及商業/住宅混合建築物的員工會看到施工現場、機動設備及設施，對他們造成潛在的視覺影響。由於尖沙咀區的道路交通繁忙及人流眾多，所以現有的視覺質量並不高。考慮到現有的視覺質量不高，加上影響屬暫時性質，故預計施工期間帶來的視覺影響是可接受的。

由於梳士巴利道的美化市容種植將改作臨時貯存區，香港日航酒店、香港海景嘉福酒店及尖沙咀東部海濱花園的用戶將會受到輕微的視覺影響。然而，由於臨時貯存區佔地少，加上這些酒店有其他廣闊的景觀可供用戶選擇，所以其影響是輕微的。事實上在施工期間，臨時貯存區的視線範圍將會被豎立於梳士巴利道的圍板阻擋，因此視覺影響是輕微的。

2.2.6 生態

由於工程範圍現有的土地用途及設置已高度城市化，並沒有自然棲息地，所以預計擬建工程活動在該地區沒有造成任何生態影響。因此，預計沒有生態的影響。

2.2.7 文化遺產

在擬建工程的 300 米範圍內沒有歷史建築物，所以預計沒有文化遺產的影響。

2.3 營運期的影響

2.3.1 噪音

擬建連接尖沙咀港鐵站及 K11 的新隧道將位於地面以下。排氣管及兩個新鮮空氣進氣口將會安裝於 D2 出入口，見**圖 2.3**。排氣管是用作排煙。固定機動設備所產生的營運噪音對敏感受體的影響是根據《噪音管制條例》和《非住用所、非公眾地方或非建築地盤噪音技術備忘錄》來評估。每個噪音敏感受體和擬建的通風設施的最短水平距離在**表 2.4** 所示。

表 2.4: 擬建進出氣口與噪音敏感受體的距離

進出氣口編號	源頭位置	進出氣口的方向	與敏感受體的最短水平距離（米）		
			N1a	N2b	N3
L1	進氣口 (新鮮空氣)	南面	19	5	27
L2	進氣口 (新鮮空氣)	北面	17	9	25
L3	出氣口 (排氣管)	北面	11	12	32

固定機動設備例如通風設施的噪音應符合《非住用所、非公眾地方或非建築地盤噪音技術備忘錄》內可接受的噪音聲級。根據《環境影響評估程序的技術備忘錄》中附件 5 所提及，固定噪音的規劃用途噪音標準應該是(a) 低於可接受噪音聲級 5 分貝(A) 或 (b) 現有背景噪音聲級（適用於比可接受的噪音聲級低 5 分貝(A)的低

噪音地方）。《非住用所、非公眾地方或非建築地盤噪音技術備忘錄》內根據地區對噪音感應程度的級別而定的可接受噪音聲級見**表 2.5**。

表 2.5: 可接受的噪音聲級

時間	地區對噪音感應程度的級別		
	A	B	C
日間(0700 至 1900 小時)	60 分貝(A)	65 分貝(A)	70 分貝(A)
傍晚(1900 至 2300 小時)			
晚間(2300 至 0700 小時)	50 分貝(A)	55 分貝(A)	60 分貝(A)

《非住用所、非公眾地方或非建築地盤噪音技術備忘錄》中界定當道路的年平均每日交通流量超過 30,000，主要道路是一個影響因素。敏感受體 N2a 至 N2d 位於彌敦道及加拿分道交界，根據 2010 年運輸署的每年交通調查，該交界的年平均每日交通流量爲 27,600。因此，噪音敏感受體附近的道路不被視爲影響因素。

根據《非住用所、非公眾地方或非建築地盤噪音技術備忘錄》中的地區界定，本項目應列爲市區。由於本項目的敏感受體不會受影響因素所影響，噪音敏感受體之地區對噪音感應程度的級別應爲”B”級。根據 2011 年 5 月的實地視察，發現現有的環境噪音主要是來自道路交通噪音。預計該區的背景噪音聲級不會低於可接受的噪音聲級 5 分貝(A)，所以敏感受體的固定噪音評估標準將會採用低於《非住用所、非公眾地方或非建築地盤噪音技術備忘錄》所示可接受的噪音聲級 5 分貝(A)。故此，用於日間和傍晚 (0700 至 2300 小時)的噪音評估標準是 60 分貝(A)，而晚間(2300 至 0700 小時)是 50 分貝(A)。

在沒有任何詳細資料和擬建固定機動設備的噪音規範情況下，評估是以最大允許噪音排放來設計擬建固定機動設備的噪音水平。以下的假設將採用在本評估中：

- 所有的進出氣口都在運作；
- 不包括周圍的大廈/建築物的噪音修改；
- 如進出氣口沒在有直接視線的範圍內，會減 10 分貝(A)來計算。

如果其中一個敏感受體超過噪音標準，主要源頭的最初聲功率級會逐漸降至該敏感受體可接受的噪音聲級。此過程會反復使用在其他超標的敏感受體中，直至所有已更改的聲音率級符合噪音標準。

按照上述的方法，固定機動設備在”B”級地區對噪音感應程度的噪音評估列在**表 2.6** 中。詳細的評估計算在**附錄 IV** 所示。

表 2.6: 固定設備的最大可容許的聲功率級

源頭號	說明	最大可容許的聲功率級, 分貝(A)	
		日間和傍晚	晚間
L1	新鮮空氣進氣口	82	72
L2	新鮮空氣進氣口	86	76
L3	排氣管	86	76

根據上述結果，如果擬建的固定機動設備是根據上述的聲音率級來設計及實施減低噪音措施，預計沒有不良的剩餘噪音影響。

2.3.2 空氣質素和水質

由於隧道僅供行人使用，本項目在營運期間沒有空氣排放污染。所以，預計在營運階段沒有空氣質素的影響。

在項目營運的過程中， 沒有污水的產生。所以，預計在營運階段沒有水質污染的影響。

2.3.3 廢物

在隧道營運期間，除了行人棄置的垃圾外，一般不會產生其他廢物。這些垃圾將會由廢物收集商每天收集及清理，以減低臭味、蟲害及垃圾的滋擾。故此，預計不會構成廢物方面的影響。

2.3.4 景觀及視覺

在營運階段，加拿分道沒有景觀資源會受到擬建工程的影響，也沒有興建額外的地面建築物。梳士巴利道的臨時貯存區在項目施工完成後，將會恢復種植面積。因此，沒有不可接受的不良景觀影響。

在加拿分道商業/住宅混合建築物的居民和員工將會見到兩個新的出入口和其他重建的基礎設施，包括鋪平的道路和行人路。所以，預計沒有視覺影響。

在梳士巴利道的種植面積恢復後，在營運期間沒有視覺的影響。

2.3.5 生態

由於工程範圍現有的土地用途及設置已高度城市化，並不是自然棲息地，所以預計沒有生態的影響。

2.3.6 文化遺產

在擬建的工程的 300 米範圍內沒有歷史建築物，所以預計沒有文化遺產的影響。

3. 緩解措施的詳情

3.1 建築噪音

爲減低項目施工期間的噪音，建議執行以下的緩解措施：

- 採用低噪音機動設備及施工方法；及
- 加置活動隔音屏障、隔音罩及隔音墊。

採用低噪音機動設備

採用低噪音機動設備以減低源頭噪音，是減少建築噪音影響的最有效措施。**表 3.1** 詳列於本項目的建築噪音評估採用的機動設備清單，根據《管制建築工程噪音(撞擊式打樁除外)技術備忘錄》這些機動設備比標準型號較少噪音的。

表 3.1: 低噪音機動設備一覽

低噪音機動設備	參考	聲功率級, 分貝(A)
起重機	EPD-1158[1]	102
挖土機	EPD-00773[1]	103
發電機 (超低噪音型)	EPD-00668[1]	79
道路滾壓機	EPD-000222[1]	99

註： 1) 參考環保署文件《品質機動設備》清單

加置隔音罩及活動隔音屏障

爲了盡量減低建築噪音的影響，應採用隔音罩及活動隔音屏障，阻止噪音由源頭傳至噪音敏感受體。活動隔音屏障及隔音罩分別顯示在**圖 3.1** 和**圖 3.2**。各項機動設備的緩解措施詳列於**表 3.2**。一般活動隔音屏障能減低可移動機動設備的噪音達 5 分貝(A)，而減低固定機動設備的噪音達 10 分貝(A)，隔音罩則可減低機動設備的噪音達 15 分貝(A)。資料來自環境評估條例的指南編號 9/2010 中的《編制施工噪音影響評估》。活動隔音屏障及隔音罩應根據機動設備的尺寸及敏感受體和機動設備之間的攔截視線的要求來設計。

表 3.2: 對各種機動設備使用的緩解措施

機動設備	建議緩解措施	隔聲修正系數，分貝(A)
空氣壓縮機	隔音罩	15
發電機	隔音罩	15
切割機	活動隔音屏障	10
破碎機	活動隔音屏障	10
混凝土泵裝在貨車上	活動隔音屏障	10
混凝土攪拌車	活動隔音屏障	10
鑽台	活動隔音屏障	10
灌漿機	活動隔音屏障	10
震動機	活動隔音屏障	10
低噪音打樁機	活動隔音屏障	10
起重機	活動隔音屏障	5
貨車	活動隔音屏障	5
挖土機	活動隔音屏障	5

本項目將採用的屏障爲典型的直立式／懸臂式鋼框設計，屏障將設置在機動設備發出噪音部分的附近。爲達到最大的隔音效果，隔音屏障需要用表面質量多於 7 千克/平方米的材料（而隔音罩則用表面質量不少於 10 千克/平方米的材料）。隔音屏障的長度一般最少是其高度的 5 倍，而隔音屏障的最低高度應使噪音敏感受體看不到噪音源任何一部分。

剩餘建築噪音評估

在實施建議的緩解措施後，每一項建築活動的最大聲功率級和七個噪音敏感受體的剩餘建築噪音已依照《管制建築工程噪音（撞擊式打樁除外）技術備忘錄》指定的方法作出評估，如**表 3.3 及 3.4** 所示。評估結果顯示施工期的建築噪音介乎 59 分貝(A)至 75 分貝(A)。低噪音機動設備的清單及詳細的評估計算分別在**附錄 V** 及**附錄 VI** 顯示。

表 3.3: 每項建築活動的最大聲功率級 (實施緩解措施的情況)

建築活動	最大聲功率級，分貝(A)
第一部分	
沿彌敦道的公共設施工程	97
遷移及改道現有公共設施、清拆現時出入口結構	101
設置管道及板樁	98
路面開挖	97
建造臨時施工樓梯	97
進一步挖掘（路面鋪蓋下的工序）	99
興建隧道結構（路面鋪蓋下的工序）	98
興建地面出入口	98
回填	98
修復路面	100
第二部分	
興建隧道由加拿分道及碧仙桃路交界至K11商場	99

噪音敏感受體	預測施工期噪音水平, 分貝(A)	參照環境影響評估程序技術備忘錄的日間噪音標準, 分貝(A)
N1a	69 - 73	75
N1b	62 - 71	75
N1c	67 - 71	75
N2a[1]	71 - 75	75
N2c	70 - 74	75
N2d	59 - 71	75
N3	66 - 74	75

註： 1) 由於 N2a 距離項目施工現場比 N2b 近，所以 N2a 作爲代表美麗都大廈在加拿分道的敏感受體。

一般建築噪音管理措施

預計採用建議的緩解措施後，工程不會構成剩餘建築噪音影響。但爲減低工程進行期間的噪音影響，承建商應該遵守以下的建築噪音管理措施：

- 遵守環保署出版的「防止違反《噪音管制條例》(第 400 章)良好管理業務守則(供建造業界使用)」；
- 符合法定及非法定的要求和指引；
- 在任何工作開始前，承建商應提交準備在工地使用的工作方法、機器和噪音緩解措施，以取得工程師代表的認可；
- 應策劃和實行有效消減噪音的方法，以減少對周圍噪音敏感受體的噪音影響，以及提供有經驗及曾受訓練的人員以確保這些方法得以實施；
- 高噪音機器和活動應盡可能遠離對噪音敏感受體；
- 關掉閒置的設備；
- 減少運作中的機動設備數量，盡可能避免同時間使用高噪音設備或機器；
- 定期檢查及維修所有機器和設備；及
- 在可行的情況下，有效地利用貯存物料和其他結構作噪音隔音屏障。

3.2 空氣質素

雖然大部分的工序在地底進行，但是仍須實施《空氣污染管制(建造工程塵埃)規例》內的塵埃緩解措施，以控制塵埃排放。建議主要的塵埃管制措施如下：

- 路面開挖工序完成後的 13 個月內將在明挖回填工序中提供路面鋪蓋，見**圖 2.1**。
- 在工地所有露天地方定期灑水，特別是在乾燥天氣期間，以減少塵埃排放；
- 在多塵的建築範圍及鄰近敏感受體的地方增加灑水次數；
- 使用防水的物料遮蓋所有挖掘或堆存的易生塵埃物料，或在表面灑水維持濕潤；
- 在工地出口處提供車輛清洗設施；及
- 車輛離開工地時，應以防水物料遮蓋車上運載的易生塵埃物料。

3.3 水質

承建商必須遵守《水污染管制條例》及其法規，有效地管制工地的污水排放，以確保施工不會構成任何影響。建議主要的管制措施如下：

- 承建商須按照《專業人士環保事務諮詢委員會專業守則第 1/94 號－建築工地排水》及《建議給建築合約的防污條款》內所載的地盤運作守則，設計及實行緩解措施；
- 適當地收集及處理工地的徑流，確保所有排放均達至《水污染管制條例》的標準。提供淤泥收集器和集油器，在廢水排入公共雨水疏導系統前，清除所有油、潤滑劑、油脂、淤泥、砂礫、碎屑等，並定期清理和維修淤泥收集器及集油器；
- 除非承建商獲得《水污染管制條例》的污水排放證，否則所有污水不能排入公共污水管或雨水疏導渠；及
- 如工地上設有洗手間，應確保污水接駁到污水管內，否則必須採用化學式洗手間。

3.4 廢物管理

本項目屬於小型工程，須運出工地處置的拆建物料量很少。適當利用廢物管理策略，包括避免、減少、再用、循環再用四種方式，能有效減少廢物的產生及施工期對環境的影響。然而承建商須遵守《廢物處置條例》及其法規，實施必須的廢物管理措施。建議的管制措施如下：

- 盡量在工地上再用挖掘物料，以減少須運出棄置的數量，而廢棄的金屬或器具亦應盡可能循環再用；
- 盡量減少產生廢物，並應採取恰當的處理、運送及處置方法；
- 承建商運送拆建物料到指定的公眾填土區或堆填處置時，應採用「運載紀錄」系統。獨立審核人員及駐工地人員須進行監察，以保證廢物的運送及處置過程恰當；
- 處理化學廢物時必須執行《包裝、標識及存放化學廢物的工作守則》的要求；及
- 確保所有垃圾存放於有蓋垃圾箱或密封箱內，並提供廢物分隔設施，分開收集廢紙、鋁罐及膠樽等，盡量使廢物可循環再用及得到適當的處置。

3.5 景觀及視覺

雖然預計沒有不良景觀和視覺影響，仍建議保護措施如下：

施工期間：

- 施工範圍用顏色不顯眼的圍板/隔音屏障圍繞。

營運期間：

- 工程完成後，恢復梳士巴利道的種植面積。

3.6 生態及文化遺產

因爲預計沒有生態及文化遺產的影響，所以沒有需要實施緩解措施。

3.7 環境監察及審核要求

施工期間的環境影響只屬短暫性，預計當建議的緩解措施實行後，將不會對環境構成任何不良影響。然而，項目倡議人仍承諾在施工期間實行監察及審核計劃，以監察緩解措施落實的情況。

本簡介建議環境監察及審核計劃應包括定期監測建築噪音和塵埃水平。噪音監測站將設於美麗都大廈作每週的監測，而空氣監測站亦將設於美麗都大廈進行 24 小時監測。承建商須實施環境監察及審核計劃，該計劃考慮所有環境問題，同時承建商亦須進行實地審查。有關監察的程序、方法、補救行動以及投訴處理程序，將會參考先前批准之「尖沙咀站北行人隧道工程環境影響評估」的環境監察及審核計劃的內容。環境監察及審核計劃的詳細資料見**附錄 VII**。

3.8 工程實施時間表

工程實施時間表包括所有建議的環境緩解措施在**附錄 VIII**。每個主要的環境問題的所有建議緩解措施、位置、時間及各個負責實施的人員已包括在實施時間表內。

4. 使用先前批准的環境影響評估報告

本簡介亦參考了港鐵公司其它規模相若的項目並通過了直接申請環境許可證的批准，資料如下：

- 地鐵荔枝角站長荔街行人隧道及出入口建造項目（登記冊編號：DIR-132/2005)
- 太子站行人隧道延展及出入口修改工程（登記冊編號：DIR-124/2005)
- 旺角地鐵站出口 C3 及 C4 改善工程（登記冊編號：DIR-078/2003)

上述項目與本項目的規模及工程相若，並已經成功通過了直接申請環境許可證的批准。

本簡介亦參考了根據《環境影響評估條例》於 2008 年 12 月 31 日批准的「尖沙咀站北行人隧道工程環境影響評估」(登記冊編號：AEIAR-127/2008)所載之低噪音機動設備的聲功率級、監察程序的詳情、方法、補救行動以及投訴處理程序。

5. 總結

擬建的行人隧道會改動現時的港鐵尖沙咀站，根據《環境影響評估條例》本項目屬實質改變獲豁免指定工程，因此本簡介是根據《環境影響評估條例》提交足夠資料，爲項目直接申請環境許可證。

本簡介已探討工程對環境可能造成的影響，其中包括空氣質素、噪音、水質、廢物管理、景觀及視覺、生態和文化遺產。由於大部分工序都安排在臨時地台下進行，預計當實施所有建議的緩解措施和工地管制後，施工期均不會對環境構成任何不良影響。本項目在營運期間也預計沒有環境影響。

本簡介建議項目在施工期間執行環境監察及審核計劃，除了可確保所有緩解措施能落實進行外，更可定期監測附近地區的環境影響。

附圖

圖例：
LEGEND：

明坑回填工程（有路面鋪蓋）
CUT AND COVER WITH DECKING

底挖工程
MINED TUNNELLING

現有地面出入口 (D1 與 D2)
EXISTING ABOVE GROUND ENTRANCE (D1 AND D2)

擬建地下出入口 (D3)
PROPOSED UNDERGROUND ENTRANCE (D3)

工程界線
WORKS BOUNDARY

擬建加拿分道行人隧道
PROPOSED CARNARVON ROAD SUBWAY

加拿分道 CARNARVON ROAD

D1

D2

D3

K11 發展項目
K11 DEVELOPMENT
WIP Nov 2007

需要遷移或改道的公共設施
UTILITY DIVERSION WORKS ALONG NATHAN ROAD

CAMERON ROAD
NATHAN ROAD
CARNARVON ROAD
HUMPHREYS AVENUE
HAIPHONG ROAD
HANOI ROAD
BRISTOL AVENUE
MODY ROAD 麼地道
MINDEN AVENUE 棉登徑
BLENHEIM AVENUE 藍塘道
HART AVENUE 赫德道
PRAT AVENUE 寶勒巷
LOCK ROAD

KOWLOON MOSQUE AND ISLAMIC CENTRE
MANSON HOUSE
HAI PHONG MANSION
TSIM SHA TSUI MANSION
HARILELA MANSION
MIRADOR MANSION
金冠大廈 GOLDEN CROWN COURT
金城商業中心 KINCHENG COMMERCIAL CENTRE
利嘉大廈 LEE KAR BUILDING
集友大廈 FRIENDS HOUSE
Holiday Inn Golden Mile Hotel
Peninsula Apartments
Lyton Building
Ocean View Court
Hotel Panorama 麗景酒店
Empress
Minden Apartments
The Pinnacle
The Minden
CFC Tower
Ivanho Architect Ltd
ERM Hong Kong Ltd

WIP Jul 2007
WIP Dec 2007

0 5 10 15 20 25
METRES
1 : 500

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CADD REF. FIG 1-1A.dgn

TITLE
CONSULTANCY AGREEMENT NO. NEX/1049
DETAILED DESIGN FOR CARNARVON ROAD SUBWAY
SITE LOCATION PLAN
施工位置圖

SCALE 1:500 (A1)
DRAWING NO. FIGURE 圖 1.1
REV. A

PLOT DRV:
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FILENAME: J:\27299-KN\PROJECT PROFILE\N0224\FIG 1-1A.dgn
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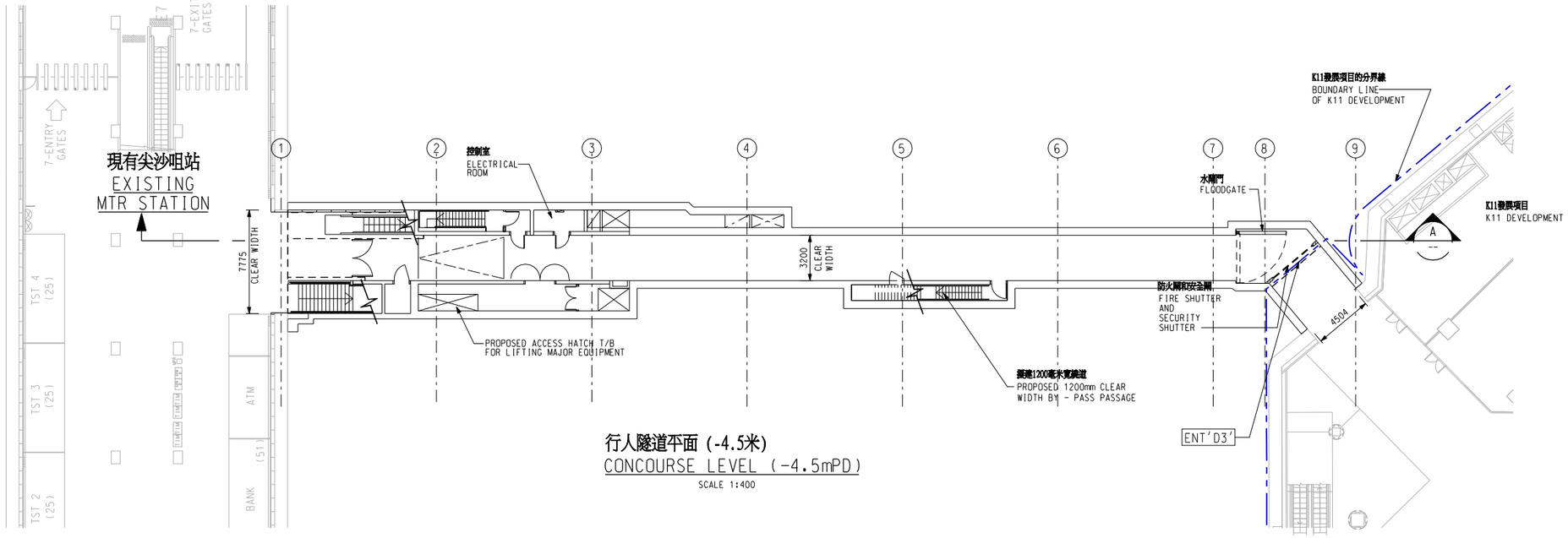
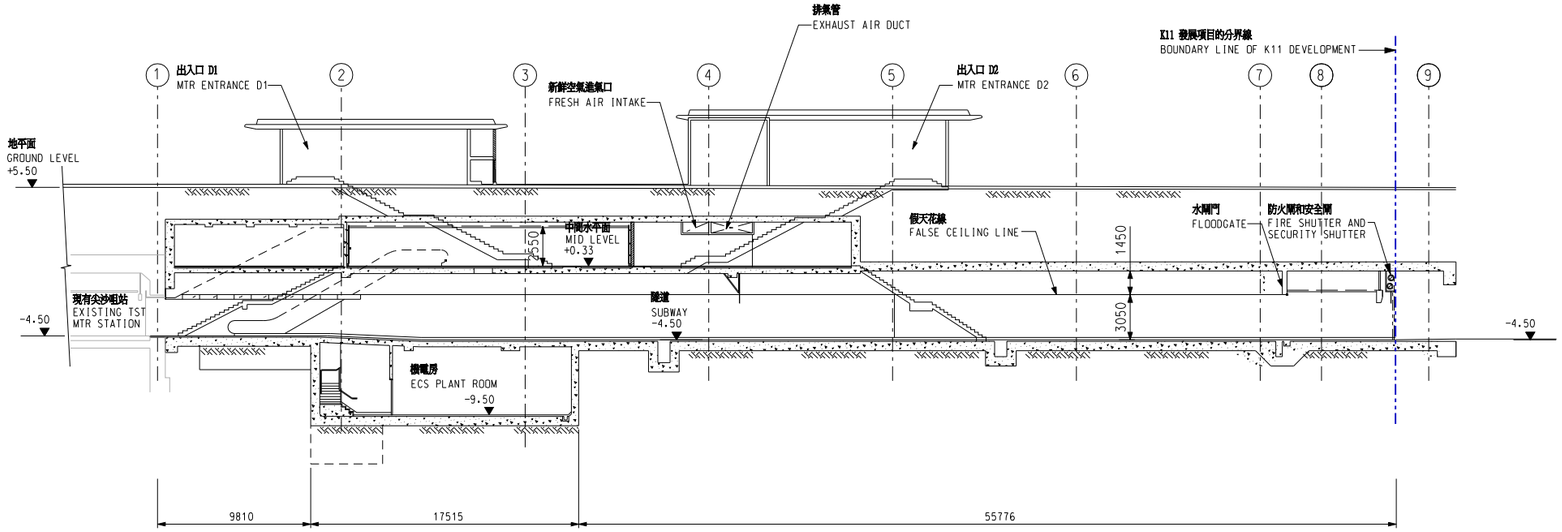


行人隧道平面 (-4.5米)
CONCOURSE LEVEL (-4.5mPD)
SCALE 1:400



立面圖
SECTION A
SCALE 1:400

0 4 8 12 16 20
METRES
1 : 400

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CADD REF.
FIG 1-2A.dgn

TITLE
CONSULTANCY AGREEMENT NO. NEX/1049
DETAILED DESIGN FOR CARNARVON ROAD SUBWAY
SUBWAY PLAN AND ELEVATION
行人隧道平面及立面圖

SCALE 1:400 (A3)
DRAWING NO. FIGURE 圖 1.2
REV. A

PLOT DRV: J:\CAD_ADMIN\Microstation\Plotdrv\MTR.PDF.BW.COL.300DPI.pltPRINTED BY: hos5494 09/07/202 10:55:28
MODELNAME: Default
FILENAME: J:\27299-KH\PROJECT PROFILE\00224KH\FIG 1-2A.dgn

圖例：
LEGEND：

臨時儲存範圍
TEMPORARY STORAGE AREA

擬建儲存範圍
PROPOSED STORAGE AREA

現有架空路墩
EXISTING PIER OF ELEVATED ROAD

香港日航酒店
HOTEL NIKKO HONG KONG

海景嘉福酒店
INTERCONTINENTAL GRAND STANFORD

嘉士伯道 SALISBURY ROAD

MODY ROAD

慶地道花園
Mody Road Garden

市政局百週年紀念花園
Urban Council Centenary Garden

南洋中心
South Seas Centre

帝國中心
Empire Centre

國際郵政中心郵政局
International Mail Centre Post Office

空調機樓
Ventilation Building

海底隧道
CROSS HARBOUR TUNNEL

海堤
Seawall

高架道路
Elevated Road

0 5 10 15 20 25
METRES
1 : 500

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APPROVED	--
DATE	--

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CADD REF. FIG 1-3A.dgn

TITLE
CONSULTANCY AGREEMENT NO. NEX/1049
DETAILED DESIGN FOR CARNARVON ROAD SUBWAY
TEMPORARY STORAGE AREA
臨時儲存範圍

SCALE 1:500 (A1)

DRAWING NO. FIGURE 圖 1.3

REV. A

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圖例：
LEGEND：

明挖回填工程 (有路面鋪蓋)
CUT AND COVER WITH DECKING

底挖工程
MINED TUNNELLING

尖沙咀站北行人隧道項目A1出入口改善工程界線
(其他工程項目)
ENTRANCE A1 ENHANCEMENT WORKS BOUNDARY UNDER TSIM SHA TSUI STATION NORTHERN SUBWAY (WORKS BY OTHERS)

尖沙咀站北行人隧道項目A1出入口改善工程
(明坑回填) (其他工程項目)
ENTRANCE A1 ENHANCEMENT WORKS - CUT AND COVER EXCAVATION UNDER TSIM SHA TSUI STATION NORTHERN SUBWAY (WORKS BY OTHERS)

金冠大廈
GOLDEN CROWN COURT

金城商業中心
KINCHENG COMMERCIAL CENTRE

利嘉大廈
LEE KAR BUILDING

集友大廈
FRIENDS HOUSE

加拿分道

K11 發展項目
K11 DEVELOPMENT
WIP Nov 2007

第二部份
SECTION 2

第一部份
SECTION 1

美麗都大廈
MIRADOR MANSION

需要遷移或改道的公共設施
UTILITY DIVERSION WORKS ALONG NATHAN ROAD

WIP Jul 2007

METRES
0 5 10 15 20 25
1 : 500

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CADD REF. FIG 2-1A.dgn

TITLE
CONSULTANCY AGREEMENT NO. NEX/1049
DETAILED DESIGN FOR CARNARVON ROAD SUBWAY
LAYOUT PLAN FOR CONSTRUCTION NOISE ASSESSMENT
施工噪音評估平面圖

SCALE 1:500 (A1)
DRAWING NO. FIGURE 圖 2.1
REV. A

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FILE NAME: J:\27299-KN\PROJECT PROFILE\K0224\FIG 2-1A.dgn
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圖例：
LEGEND：

噪音敏感受體
NOISE SENSITIVE RECEIVER (N1 TO N3)

臨時路面鋪蓋範圍
TEMPORARY DECKING AREA

尖沙咀站北行人隧道項目A1出入口改善工程界線
(其他工程項目)
ENTRANCE A1 ENHANCEMENT WORKS BOUNDARY UNDER TSIM SHA TSUI STATION NORTHERN SUBWAY (WORKS BY OTHERS)

尖沙咀站北行人隧道項目A1出入口改善工程
(明坑回填) (其他工程項目)
ENTRANCE A1 ENHANCEMENT WORKS - CUT AND COVER EXCAVATION UNDER TSIM SHA TSUI STATION NORTHERN SUBWAY (WORKS BY OTHERS)

N1a
N1b
N1c
N2a
N2b
N2c
N2d
N3

擬建加拿分道行人隧道
PROPOSED CARNARVON ROAD SUBWAY

需要遷移或改道的公共設施
UTILITY DIVERSION WORKS ALONG NATHAN ROAD

金冠大廈 GOLDEN CROWN COURT
金城商業中心 KINCHENG COMMERCIAL CENTRE
利嘉大廈 LEE KAR BUILDING
集友大廈 FRIENDS HOUSE
美麗都大廈 MIRADOR MANSION
金域假日酒店 HOLIDAY INN GOLDEN MILE HOTEL
I SQUARE
WIP Jul 2007
K11 發展項目 K11 DEVELOPMENT
WIP Nov 2007

METRES 0 5 10 15 20 25
1 : 500

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CADD REF. FIG 2-2A.dgn

TITLE
CONSULTANCY AGREEMENT NO. NEX/1049
DETAILED DESIGN FOR CARNARVON ROAD SUBWAY
LOCATIONS OF NOISE SENSITIVE RECEIVERS
噪音敏感受體位置圖

SCALE 1:500 (A1)
DRAWING NO. FIGURE 圖 2.2
REV. A

PLOT DRV: C:\MTRC_A3.BW.COL.plt
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FILENAME: J:\27299-K\PROJECT PROFILE\20070701\FIG 2-2A.dgn
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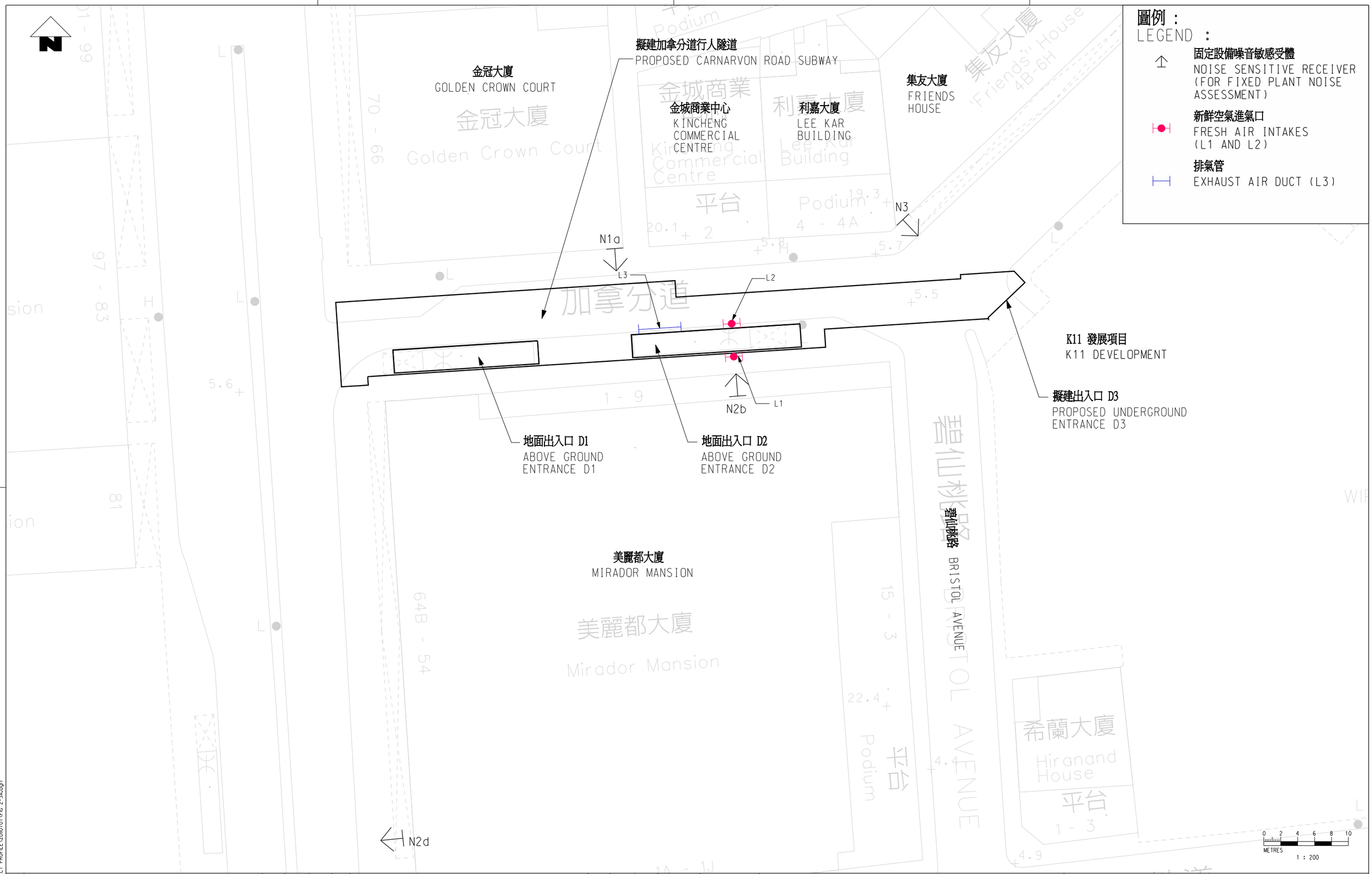

圖例 :
LEGEND :

- 固定設備噪音敏感受體
  NOISE SENSITIVE RECEIVER (FOR FIXED PLANT NOISE ASSESSMENT)
- 新鮮空氣進氣口
  FRESH AIR INTAKES (L1 AND L2)
- 排氣管
  EXHAUST AIR DUCT (L3)

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CADD REF. FIG 2-3A.dgn

TITLE
CONSULTANCY AGREEMENT NO. NEX/1049
DETAILED DESIGN FOR CARNARVON ROAD SUBWAY
LOCATIONS OF FRESH AIR INTAKE AND EXHAUST AIR DUCT AT ENTRANCE D2
出入口 D2 新鮮空氣進口及排氣口位置

SCALE 1:200 (A1)
DRAWING NO. FIGURE 圖 2.3
REV. A

PLOT DRV: d:\CAD_ADMIN\Microstation\Plotdrv\MTR.PDF.BW.COL.300DPI.pltPRINTED BY: NG5749A 06/07/2012 15d256
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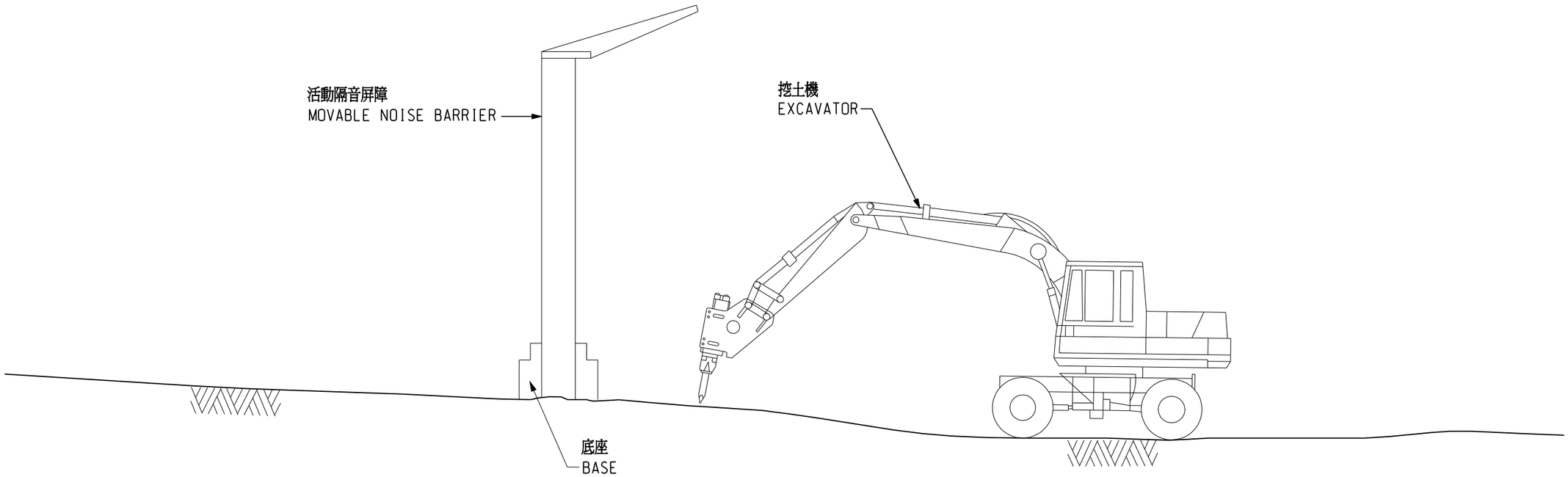

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CADD REF. FIG 3-1A.dgn

TITLE

CONSULTANCY AGREEMENT NO. NEX/1049
DETAILED DESIGN FOR CARNARVON ROAD SUBWAY
SCHEMATIC CONFIGURATION OF MOVABLE NOISE BARRIER
活動隔音屏障結構圖

SCALE	DRAWING NO.	REV.
N.T.S.	FIGURE 圖 3.1	A

進氣
AIR FLOW

機動設備
PME

出氣
AIR FLOW

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MODELNAME: Default
FILENAME: J:\27293\KIL\PROJECT PROFILE\NOI224\FIG 3-2A.dgn
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CADD REF. FIG 3-2A.dgn

TITLE

CONSULTANCY AGREEMENT NO. NEX/1049
DETAILED DESIGN FOR CARNARVON ROAD SUBWAY
SCHEMATIC CONFIGURATION OF FULL NOISE ENCLOSURE FOR PME
機動設備隔音罩結構圖

SCALE N.T.S.

DRAWING NO. FIGURE 圖 3.2

REV. A

圖例：
LEGEND：

建議噪音監察站
PROPOSED NOISE MONITORING STATION

建議空氣監察站
PROPOSED AIR MONITORING STATION

臨時路面鋪蓋範圍
TEMPORARY DECKING AREA

尖沙咀站北行人隧道項目A1出入口改善工程界線
(其他工程項目)
ENTRANCE A1 ENHANCEMENT WORKS BOUNDARY UNDER TSIM SHA TSUI STATION NORTHERN SUBWAY (WORKS BY OTHERS)

尖沙咀站北行人隧道項目A1出入口改善工程
(明坑回填) (其他工程項目)
ENTRANCE A1 ENHANCEMENT WORKS - CUT AND COVER EXCAVATION UNDER TSIM SHA TSUI STATION NORTHERN SUBWAY (WORKS BY OTHERS)

需要遷移或改道的公共設施
UTILITY DIVERSION WORKS ALONG NATHAN ROAD

K11 發展項目
K11 DEVELOPMENT
WIP Nov 2007

KOWLOON MOSQUE AND ISLAMIC CENTRE
MANSON HOUSE
HAIPHONG ROAD
NATHAN ROAD
CAMERON ROAD
CARNARVON ROAD
HUMPHREYS AVENUE
HART AVENUE
HANOI ROAD
加拿分道
BRISTOL AVENUE
MODY ROAD
MINDEN AVENUE
LOCK ROAD
金冠大廈 GOLDEN CROWN COURT
金城商業中心 KINCHENG COMMERCIAL BUILDING
利嘉大廈 LEE KAR BUILDING
集友大廈 FRIENDS HOUSE
HAI PHONG MANSION
TSIM SHA TSUI MANSION
喜利大廈 HARILELA MANSION
美麗都大廈 MIRADOR MANSION
WIP Jul 2007
WIP Dec 2007

REV	DESCRIPTION	BY	DATE	APPROVED
A	PROJECT PROFILE	HO	--	--

DRAWN	HO
DESIGNED	--
CHECKED	--
APPROVED	--
DATE	--

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MTR
TST STATION CARNARVON ROAD SUBWAY

ORIGINATOR
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In associated with Ivanho Architect Ltd, ERM Hong Kong Ltd

CADD REF. FIG 3-3A.dgn

TITLE
CONSULTANCY AGREEMENT NO. NEX/1049
DETAILED DESIGN FOR CARNARVON ROAD SUBWAY
AIR AND NOISE MONITORING LOCATIONS
空氣及噪音監察站位置圖

SCALE 1:500 (A1)
DRAWING NO. FIGURE 圖 3.3
REV. A

METRES 0 5 10 15 20 25
1 : 500

PLOT DRV: C:\MTRC_A3.BW_COL.pltr
MODELNAME: D6 FOUR
FILENAME: J:\27299-KN\PROJECT PROFILE\N0224\FIG 3-3A.dgn
PRINTED BY: hc57494 08/02/2
14:48:2

附錄 I. 未來港鐵尖沙咀站 D1 及 D2 出入口

Appendix I

Future MTR Tsim Sha Tsui Station Entrance D1 and D2

Future MTR Tsim Sha Tsui Station Entrance D1

Future MTR Tsim Sha Tsui Station Entrance D2

附錄 II. 建築活動的機動設備清單（沒有緩解措施的情況）

Appendix II
Plant Inventory for Various Construction Activities - Unmitigated Scenario

Consultancy Agreement No. NEX/1049 Tsim Sha Tsui Station Carnarvon Road Subway Project Profile

PME	TM or other reference	No. of PME	SWL, dB(A)/ unit	% on time	Mitigation measures	Reduction dB(A)	Total SWL, dB(A)
Carnarvon Road (Section 1)							
Activities							
Utilities Diversion along Nathan Road*							
Air compressor, air flow > 10m3/min and <= 30m3/min	CNP 002	1	102	80%	-	0	101
Excavator/ loader, wheeled/ tracked	CNP 081	1	112	40%	-	0	108
Breaker, hand-held, mass > 10kg and < 20kg	CNP 024	1	108	30%	-	0	103
Generator, silenced, 75 dB(A) at 7 m	CNP 102	1	100	80%	-	0	99
						Total	**110**
Utilities Diversion and Demolition of Entrances (##Case 1: Use of Excavator)*							
Air compressor, air flow > 10m3/min and <= 30m3/min	CNP 002	1	102	80%	-	0	101
Lorry with crane	[1]	1	112	30%	-	0	107
Excavator/ loader, wheeled/ tracked	CNP 081	1	112	40%	-	0	108
Generator, silenced, 75 dB(A) at 7 m	CNP 102	1	100	80%	-	0	99
Lorry (<38t)	[1]	1	105	30%	-	0	100
						Total	**111**
Utilities Diversion and Demolition of Entrances (##Case 2: Use of Breaker)*							
Air compressor, air flow > 10m3/min and <= 30m3/min	CNP 002	1	102	80%	-	0	101
Lorry with crane	[1]	1	112	30%	-	0	107
Breaker, hand-held, mass > 10kg and < 20kg	CNP 024	1	108	30%	-	0	103
Generator, silenced, 75 dB(A) at 7 m	CNP 102	1	100	80%	-	0	99
Lorry (<38t)	[1]	1	105	30%	-	0	100
						Total	**110**
Installation of Pipepile and Sheet Pile							
Lorry with crane	[1]	1	112	30%	-	0	107
Generator, silenced, 75 dB(A) at 7 m	CNP 102	1	100	100%	-	0	100
Grout mixer	[1]	1	90	100%	-	0	90
Drill rig, rotary type (diesel)	[1]	1	110	50%	-	0	107
Silent Piler Machine	GIKEN **	1	94	100%	-	0	94
						Total	**110**
Surface Excavation							
Excavator/ loader, wheeled/ tracked	CNP 081	1	112	40%	-	0	108
Dump truck	[1]	1	105	30%	-	0	100
						Total	**109**
Construction of Temporary Staircase							
Concrete lorry mixer	CNP 044	1	109	30%	-	0	104
Concrete pump, stationary/ lorry mounted	CNP 047	1	109	30%	-	0	104
Poker, vibratory, hand-held (electric)	[1]	1	102	30%	-	0	97
Generator, silenced, 75 dB(A) at 7 m	CNP 102	1	100	100%	-	0	100
						Total	**108**
Further Excavation (Works under Road Decking)							
Breaker, hand-held, mass > 35kg	CNP 026	1	114	50%	#Underground Work	20	91
Lorry with crane	[1]	1	112	30%	-	0	107
Excavator/ loader, wheeled/ tracked	CNP 081	1	112	100%	#Underground Work	20	92
Generator, silenced, 75 dB(A) at 7 m	CNP 102	1	100	100%	#Underground Work	20	80
Dump truck	[1]	1	105	30%	-	0	100
Water pump (petrol)	CNP 282	2	103	100%	#Underground Work	20	86
Ventilation fan	CNP 241	2	108	100%	#Underground Work	20	91
						Total	**108**
Construction of Subway (Works under Road Decking)							
Air compressor, air flow > 10m3/min and <= 30m3/min	CNP 002	1	102	100%	#Underground Work	20	82
Saw, circular, wood	CNP 201	1	108	50%	#Underground Work	20	85
Concrete lorry mixer	CNP 044	1	109	30%	-	0	104
Concrete pump, stationary/ lorry mounted	CNP 047	1	109	30%	-	0	104
Generator, silenced, 75 dB(A) at 7 m	CNP 102	1	100	100%	#Underground Work	20	80
Ventilation fan	CNP 241	2	108	100%	#Underground Work	20	91
						Total	**107**
Construction of Above Ground Entrance							
Saw, circular, wood	CNP 201	1	108	30%	-	0	103
Concrete lorry mixer	CNP 044	1	109	30%	-	0	104
Concrete pump, stationary/ lorry mounted	CNP 047	1	109	30%	-	0	104
Lorry with crane	[1]	1	112	30%	-	0	107
Generator, silenced, 75 dB(A) at 7 m	CNP 102	1	100	50%	-	0	97
						Total	**111**
Backfill							
Excavator/ loader, wheeled/ tracked	CNP 081	1	112	50%	-	0	109
Dump truck	[1]	1	105	30%	-	0	100
						Total	**109**
Reinstatement							
Concrete lorry mixer	CNP 044	1	109	30%	-	0	104
Poker, vibratory, hand-held	CNP 170	1	113	30%	-	0	108
Road roller	CNP 185	1	108	30%	-	0	103
						Total	**110**

Remark:

* Since the ultilites diversion works along Nathan Road and Carnarvon Road will not be overlapped, therefore, the worst case scenerio (highest sound power level to the nearest NSR) is assumed for the construction noise assessment in the first month.

Since either excavator or breaker will be used for the ultilites diversion works along Carnarvon Road and demolition of entrances, the two plants will not be overlapped, therefore, as calculated above, the highest total SWL is used for assessment.

[1] Extracted from EPD document namely, "Sound Power Levels of Other Commonly Used PME" http://www.epd.gov.hk/epd/english/application_for_licences/guidance/files/OtherSWLe.pdf

\# Reference was made to Tsim Sha Tsui Station Northern Subway Environmental Impact Assessment.

Appendix II
Plant Inventory for Various Construction Activities - Unmitigated Scenario

Consultancy Agreement No. NEX/1049 Tsim Sha Tsui Station Carnarvon Road Subway Project Profile

PME	TM or other reference	No. of PME	SWL, dB(A)/ unit	% on time	Mitigation measures	Reduction dB(A)	Total SWL, dB(A)
Carnarvon Road (Section 2)							
Activities							
Tunnelling across Junction of Carnarvon Road and Bristol Avenue and Breakthrough to K11							
Air compressor, air flow > 10m3/min and <= 30m3/min	CNP 002	1	102	100%	#Underground Work	20	82
Saw, circular, wood	CNP 201	1	108	50%	#Underground Work	20	85
Concrete lorry mixer	CNP 044	1	109	30%	-	0	104
Concrete pump, stationary/ lorry mounted	CNP 047	1	109	30%	-	0	104
Drill rig, rotary type (diesel)	[1]	1	110	100%	#Underground Work	20	90
Excavator/ loader, wheeled/ tracked	CNP 081	1	112	80%	#Underground Work	20	91
Generator, silenced, 75 dB(A) at 7 m	CNP 102	1	100	100%	#Underground Work	20	80
Grout mixer	[1]	1	90	70%	-	0	88
Ventilation fan	CNP 241	1	108	100%	#Underground Work	20	88
						Total	**107**

Remark:
[1] Extracted from EPD document namely, "Sound Power Levels of Other Commonly Used PME"
http://www.epd.gov.hk/epd/english/application_for_licences/guidance/files/OtherSWLe.pdf
Reference was made to Tsim Sha Tsui Station Northern Subway Environmental Impact Assessment.

附錄 III. 對具代表性噪音敏感受體的建築噪音評估（沒有緩解措施的情況）

Appendix III
Construction Noise Assessment for Representative NSR - Unmitigated Scenario

Consultancy Agreement No. NEX/1049 Tsim Sha Tsui Station Carnarvon Road Subway Project Profile

Noise Sensitive Receiver						2013							2014												2015						
N1a - Golden Crown Court	**SWL**	**Dist.(m)[1]**	**DC[2]**	**FC[3]**	**CNL**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Section 1																															
Utilities Diversion and Demolition of Entrances	111	14	31	3	83	83																									
Installation of Pipepile and Sheet Pile	110	14	31	3	82		82	82	82	82	82	82		82	82																
Surface Excavation	109	14	31	3	81					81																					
Construction of Temporary Staircase	108	14	31	3	80						80	80	80																		
Further Excavation (Works under Road Decking)	108	14	31	3	80											80	80	80													
Construction of Subway (Works under Road Decking)	107	14	31	3	79														79	79	79	79	79	79	79						
Construction of Above Ground Entrance	111	14	31	3	83																		83						83		
Backfill	109	14	31	3	81																				81	81	81	81	81		
Reinstatement	110	14	31	3	82																									82	82
Section 2																															
Tunnelling across Junction of Carnarvon Road and Bristol Avenue and Breakthrough to K11	107	37	39	3	71													71	71	71	71	71	71								
					Total	83	82	82	82	85	84	84	80	82	82	80	80	80	80	80	80	80	84	79	83	81	81	81	85	82	82

Remarks:
1. Slant distance is adopted for the construction noise assessment
2. Distance correction in dB(A)
3. Facade correction in dB(A)

Appendix III
Construction Noise Assessment for Representative NSR - Unmitigated Scenario

Consultancy Agreement No. NEX/1049 Tsim Sha Tsui Station Carnarvon Road Subway Project Profile

Noise Sensitive Receiver						2013							2014												2015						
N1b - Golden Crown Court	**SWL**	**Dist.(m)[1]**	**DC[2]**	**FC[3]**	**CNL**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Section 1																															
Utilities Diversion along Nathan Road[4]	110	13	31	3	82	82																									
Utilities Diversion and Demolition of Entrances[4]	111	35	39	3	75																										
Installation of Pipepile and Sheet Pile	110	35	39	3	74		74	74	74	74	74	74		74	74																
Surface Excavation	109	35	39	3	73					73																					
Construction of Temporary Staircase	108	35	39	3	72						72	72	72																		
Further Excavation (Works under Road Decking)	108	35	39	3	72											72	72	72													
Construction of Subway (Works under Road Decking)	107	35	39	3	71														71	71	71	71	71	71	71						
Construction of Above Ground Entrance	111	35	39	3	75																		75						75		
Backfill	109	35	39	3	73																				73	73	73	73	73		
Reinstatement	110	35	39	3	74																									74	74
Entrance A1 Enhancement Works under Tsim Sha Tsui Station Northern Subway																															
Enhancement Works at Entrance A1[5]	107	53	42	3	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68												
					Total	82	75	75	75	77	77	77	73	75	75	73	73	73	73	71	71	71	76	71	75	73	73	73	77	74	74

Remarks:
1. Slant distance is adopted for the construction noise assessment
2. Distance correction in dB(A)
3. Facade correction in dB(A)
4. Since the ultilites diversion works along Nathan Road and Carnarvon Road will not be overlapped, therefore, the worst case scenerio (highest sound power level to the nearest NSR) is assumed for the construction noise assessment in the first month.
5. Reference was made to Appendix 4.4 and 4.5 of Tsim Sha Tsui Station Northern Subway EIA report (AEIAR-127/2008).

Appendix III
Construction Noise Assessment for Representative NSR - Unmitigated Scenario

Consultancy Agreement No. NEX/1049 Tsim Sha Tsui Station Carnarvon Road Subway Project Profile

Noise Sensitive Receiver						2013							2014											2015						
N1c - Golden Crown Court	**SWL**	**Dist.(m)[1]**	**DC[2]**	**FC[3]**	**CNL**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Section 1																															
Utilities Diversion along Nathan Road[4]	110	20	34	3	79																										
Utilities Diversion and Demolition of Entrances[4]	111	20	34	3	80	80																									
Installation of Pipepile and Sheet Pile	110	20	34	3	79		79	79	79	79	79	79		79	79																
Surface Excavation	109	20	34	3	78					78																					
Construction of Temporary Staircase	108	20	34	3	77						77	77	77																		
Further Excavation (Works under Road Decking)	108	20	34	3	77											77	77	77													
Construction of Subway (Works under Road Decking)	107	20	34	3	76														76	76	76	76	76	76	76						
Construction of Above Ground Entrance	111	20	34	3	80																		80						80		
Backfill	109	20	34	3	78																				78	78	78	78	78		
Reinstatement	110	20	34	3	79																									79	79
Section 2																															
Tunnelling across Junction of Carnarvon Road and Bristol Avenue and Breakthrough to K11	107	64	44	3	66													66	66	66	66	66	66								
Entrance A1 Enhancement Works under Tsim Sha Tsui Station Northern Subway																															
Enhancement Works at Entrance A1[5]	107	74	45	3	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65												
					Total	81	80	80	80	82	81	81	77	80	80	77	77	77	77	76	76	76	81	76	80	78	78	78	82	79	79

Remarks:
1. Slant distance is adopted for the construction noise assessment
2. Distance correction in dB(A)
3. Facade correction in dB(A)
4. Since the ultilites diversion works along Nathan Road and Carnarvon Road will not be overlapped, therefore, the worst case scenerio (highest sound power level to the nearest NSR) is assumed for the construction noise assessment in the first month.
5. Reference was made to Appendix 4.4 and 4.5 of Tsim Sha Tsui Station Northern Subway EIA report (AEIAR-127/2008).

Appendix III
Construction Noise Assessment for Representative NSR - Unmitigated Scenario

Consultancy Agreement No. NEX/1049 Tsim Sha Tsui Station Carnarvon Road Subway Project Profile

Noise Sensitive Receiver						2013							2014											2015						
N2a - Mirador Mansion	**SWL**	**Dist.(m)[1]**	**DC[2]**	**FC[3]**	**CNL**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Section 1																															
Utilities Diversion and Demolition of Entrances	111	12	29	3	85	85																								
Installation of Pipepile and Sheet Pile	110	12	29	3	84		84	84	84	84	84	84		84	84															
Surface Excavation	109	12	29	3	83					83																				
Construction of Temporary Staircase	108	12	29	3	82						82	82	82																		
Further Excavation (Works under Road Decking)	108	12	29	3	82											82	82	82													
Construction of Subway (Works under Road Decking)	107	12	29	3	81														81	81	81	81	81	81	81						
Construction of Above Ground Entrance	111	12	29	3	85																		85						85		
Backfill	109	12	29	3	83																				83	83	83	83	83		
Reinstatement	110	12	29	3	84																									84	84
Section 2																															
Tunnelling across Junction of Carnarvon Road and Bristol Avenue and Breakthrough to K11	107	35	39	3	71													71	71	71	71	71	71								
					Total	85	84	84	84	87	86	86	82	84	84	82	82	82	81	81	81	81	86	81	85	83	83	83	87	84	84

Remarks:
1. Slant distance is adopted for the construction noise assessment
2. Distance correction in dB(A)
3. Facade correction in dB(A)

Appendix III
Construction Noise Assessment for Representative NSR - Unmitigated Scenario

Consultancy Agreement No. NEX/1049 Tsim Sha Tsui Station Carnarvon Road Subway Project Profile

Noise Sensitive Receiver						2013							2014											2015						
N2c - Mirador Mansion	**SWL**	**Dist.(m)[1]**	**DC[2]**	**FC[3]**	**CNL**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Section 1																															
Utilities Diversion along Nathan Road[4]	110	11	29	3	84																										
Utilities Diversion and Demolition of Entrances[4]	111	14	31	3	83	83																									
Installation of Pipepile and Sheet Pile	110	14	31	3	82		82	82	82	82	82	82		82	82																
Surface Excavation	109	14	31	3	81					81																					
Construction of Temporary Staircase	108	14	31	3	80						80	80	80																		
Further Excavation (Works under Road Decking)	108	14	31	3	80											80	80	80													
Construction of Subway (Works under Road Decking)	107	14	31	3	79														79	79	79	79	79	79	79						
Construction of Above Ground Entrance	111	14	31	3	83																		83						83		
Backfill	109	14	31	3	81																				81	81	81	81	81		
Reinstatement	110	14	31	3	82																									82	82
Entrance A1 Enhancement Works under Tsim Sha Tsui Station Northern Subway																															
Enhancement Works at Entrance A1[5]	107	93	47	3	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63												
					Total	84	82	82	82	85	84	84	80	82	82	80	80	80	79	79	79	79	84	79	83	81	81	81	85	82	82

Remarks:

1. Slant distance is adopted for the construction noise assessment
2. Distance correction in dB(A)
3. Facade correction in dB(A)
4. Since the ultilites diversion works along Nathan Road and Carnarvon Road will not be overlapped, therefore, the worst case scenerio (highest sound power level to the nearest NSR) is assumed for the construction noise assessment in the first month.
5. Reference was made to Appendix 4.4 and 4.5 of Tsim Sha Tsui Station Northern Subway EIA report (AEIAR-127/2008).

Appendix III
Construction Noise Assessment for Representative NSR - Unmitigated Scenario

Consultancy Agreement No. NEX/1049 Tsim Sha Tsui Station Carnarvon Road Subway Project Profile

Noise Sensitive Receiver						2013							2014												2015						
N2d - Mirador Mansion	**SWL**	**Dist.(m)[1]**	**DC[2]**	**FC[3]**	**CNL**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Section 1																															
Utilities Diversion along Nathan Road[4]	110	11	29	3	84	84																									
Utilities Diversion and Demolition of Entrances[4]	111	51	42	3	72																										
Installation of Pipepile and Sheet Pile	110	51	42	3	71		71	71	71	71	71	71		71	71																
Surface Excavation	109	51	42	3	70					70																					
Construction of Temporary Staircase	108	51	42	3	69						69	69	69																		
Further Excavation (Works under Road Decking)	108	51	42	3	69											69	69	69													
Construction of Subway (Works under Road Decking)	107	51	42	3	68														68	68	68	68	68	68	68						
Construction of Above Ground Entrance	111	51	42	3	72																		72						72		
Backfill	109	51	42	3	70																				70	70	70	70	70		
Reinstatement	110	51	42	3	71																									71	71
Entrance A1 Enhancement Works under Tsim Sha Tsui Station Northern Subway																															
Enhancement Works at Entrance A1[5]	107	132	50	3	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60												
					Total	84	72	72	72	74	74	74	69	72	72	69	69	69	69	68	68	68	73	68	72	70	70	70	74	71	71

Remarks:

1. Slant distance is adopted for the construction noise assessment
2. Distance correction in dB(A)
3. Facade correction in dB(A)
4. Since the ultilites diversion works along Nathan Road and Carnarvon Road will not be overlapped, therefore, the worst case scenerio (highest sound power level to the nearest NSR) is assumed for the construction noise assessment in the first month.
5. Reference was made to Appendix 4.4 and 4.5 of Tsim Sha Tsui Station Northern Subway EIA report (AEIAR-127/2008).

Appendix III
Construction Noise Assessment for Representative NSR - Unmitigated Scenario

Consultancy Agreement No. NEX/1049 Tsim Sha Tsui Station Carnarvon Road Subway Project Profile

Noise Sensitive Receiver						2013							2014											2015						
N3 - Friends' House	**SWL**	**Dist.(m)[1]**	**DC[2]**	**FC[3]**	**CNL**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Section 1																															
Utilities Diversion and Demolition of Entrances	111	21	34	3	80	80																								
Installation of Pipepile and Sheet Pile	110	21	34	3	79		79	79	79	79	79	79		79	79															
Surface Excavation	109	21	34	3	78					78																				
Construction of Temporary Staircase	108	21	34	3	77						77	77	77																	
Further Excavation (Works under Road Decking)	108	21	34	3	77											77	77	77												
Construction of Subway (Works under Road Decking)	107	21	34	3	76														76	76	76	76	76	76	76						
Construction of Above Ground Entrance	111	21	34	3	80																		80					80		
Backfill	109	21	34	3	78																				78	78	78	78	78		
Reinstatement	110	21	34	3	79																								79	79
Section 2																															
Tunnelling across Junction of Carnarvon Road and Bristol Avenue and Breakthrough to K11	107	11	29	3	81													81	81	81	81	81	81								
					Total	80	79	79	79	82	81	81	77	79	79	77	77	83	82	82	82	82	84	76	80	78	78	78	82	79	79

Remarks:
1. Slant distance is adopted for the construction noise assessment
2. Distance correction in dB(A)
3. Facade correction in dB(A)

附錄 IV. 固定設備噪音評估

Fixed Plant Noise Assessment (Day time and Evening Time)

NSR ID	Description	Plant Inventory	Source ID	Source Height (mPD)	SWL, dB(A)	Receiver Height (mPD)	Horizontal Distance (m)	Slant Distance (m)	Distance Attenuation dB(A)	Tonality Correction dB(A)	#Screening Correction dB(A)	Facade Correction dB(A)	SPL, $L_{eq(30min)}$, dB(A)	Resultant SPL, $L_{eq(30min)}$, dB(A)	Noise Criteria, dB(A) (Day time and Evening Time)
N1a	Golden Crown Court (Commercial/Residential Mixed)	Louver of TST Station	L1	9.3	82	18.1	19	21	-35	0	-10	3	40		
			L2	9.3	86	18.1	17	19	-34	0	0	3	55		
			L3	9.3	86	18.1	11	14	-31	0	0	3	58	60	60
N2b	Mirador Mansion (Commercial/Residential Mixed)	Louver of TST Station	L1	9.3	82	15.3	5	8	-26	0	0	3	59		
			L2	9.3	86	15.3	9	11	-29	0	-10	3	50		
			L3	9.3	86	15.3	12	14	-31	0	-10	3	48	60	60
N3	Friends' House (Mainly Residential)	Louver of TST Station	L1	9.3	82	12.5	27	27	-37	0	-10	3	38		
			L2	9.3	86	12.5	25	25	-36	0	0	3	53		
			L3	9.3	86	12.5	32	32	-38	0	0	3	51	55	60

(#) While the sources fall within the view angle of the NSR but with no direct line of sight to the opening, a 10 dB(A) attenuation would be applied.

Fixed Plant Noise Assessment (Night Time)

NSR ID	Description	Plant Inventory	Source ID	Source Height (mPD)	SWL, dB(A)	Receiver Height (mPD)	Horizontal Distance (m)	Slant Distance (m)	Distance Attenuation dB(A)	Tonality Correction dB(A)	#Screening Correction dB(A)	Facade Correction dB(A)	SPL, $L_{eq(30min)}$, dB(A)	Resultant SPL, $L_{eq(30min)}$, dB(A)	Noise Criteria, dB(A) (Night Time)
N1a	Golden Crown Court (Commercial/Residential Mixed)	Louver of TST Station	L1	9.3	72	18.1	19	21	-35	0	-10	3	30		
			L2	9.3	76	18.1	17	19	-34	0	0	3	45		
			L3	9.3	76	18.1	11	14	-31	0	0	3	48	50	50
N2b	Mirador Mansion (Commercial/Residential Mixed)	Louver of TST Station	L1	9.3	72	15.3	5	8	-26	0	0	3	49		
			L2	9.3	76	15.3	9	11	-29	0	-10	3	40		
			L3	9.3	76	15.3	12	14	-31	0	-10	3	38	50	50
N3	Friends' House (Mainly Residential)	Louver of TST Station	L1	9.3	72	12.5	27	27	-37	0	-10	3	28		
			L2	9.3	76	12.5	25	25	-36	0	0	3	43		
			L3	9.3	76	12.5	32	32	-38	0	0	3	41	45	50

(#) While the sources fall within the view angle of the NSR but with no direct line of sight to the opening, a 10 dB(A) attenuation would be applied.

附錄 V. 建築活動的機動設備清單（實施緩解措施的情況）

Appendix V
Plant Inventory for Various Construction Activities - Mitigated Scenario

Consultancy Agreement No. NEX/1049 Tsim Sha Tsui Station Carnarvon Road Subway Project Profile

PME	TM or other reference	No. of PME	SWL, dB(A)/ unit	% on time	Mitigation measures	Reduction dB(A)	Total SWL, dB(A)
Carnarvon Road (Section 1)							
Activities							
Utilities Diversion along Nathan Road*							
Air compressor, air flow > 10m3/min and <= 30m3/min	CNP 002	1	102	80%	Noise Enclosure	15	86
Excavator, wheeled/tracked	EPD 00773	1	103	40%	Movable Barrier	5	94
Breaker, hand-held, mass > 10kg and < 20kg	CNP 024	1	108	30%	Movable Barrier	10	93
Generator	EPD 00668	1	79	80%	Noise Enclosure	15	63
						Total	**97**
Utilities Diversion and Demolition of Entrances (##Case 1: Use of Excavator)*							
Air compressor, air flow > 10m3/min and <= 30m3/min	CNP 002	1	102	80%	Noise Enclosure	15	86
Crane, mobile	EPD 1158	1	102	30%	Movable Barrier	5	92
Excavator, wheeled/tracked	EPD 00773	1	103	40%	Movable Barrier	5	94
Generator	EPD 00668	1	79	80%	Noise Enclosure	15	63
Lorry (<38t)	[1]	1	105	30%	-	0	100
						Total	**101**
Utilities Diversion and Demolition of Entrances (##Case 2: Use of Breaker)*							
Air compressor, air flow > 10m3/min and <= 30m3/min	CNP 002	1	102	80%	Noise Enclosure	15	86
Crane, mobile	EPD 1158	1	102	30%	Movable Barrier	5	92
Breaker, hand-held, mass > 10kg and < 20kg	CNP 024	1	108	30%	Movable Barrier	10	93
Generator	EPD 00668	1	79	80%	Noise Enclosure	15	63
Lorry (<38t)	[1]	1	105	30%	-	0	100
						Total	**101**
Installation of Pipepile and Sheet Pile							
Crane, mobile	EPD 1158	1	102	30%	Movable Barrier	5	92
Generator	EPD 00668	1	79	100%	Noise Enclosure	15	64
Grout mixer	[1]	1	90	100%	Movable Barrier	10	80
Drill rig, rotary type (diesel)	[1]	1	110	50%	Movable Barrier	10	97
Silent Piler Machine	GIKEN **	1	94	100%	Movable Barrier	10	84
						Total	**98**
Surface Excavation							
Excavator, wheeled/tracked	EPD 00773	1	103	40%	Movable Barrier	5	94
Dump truck	[1]	1	105	30%	Movable Barrier	5	95
						Total	**97**
Construction of Temporary Staircase							
Concrete lorry mixer	CNP 044	1	109	30%	Movable Barrier	10	94
Concrete pump, stationary/ lorry mounted	CNP 047	1	109	30%	Movable Barrier	10	94
Poker, vibratory, hand-held (electric)	[1]	1	102	30%	Movable Barrier	10	87
Generator	EPD 00668	1	79	100%	Noise Enclosure	15	64
						Total	**97**
Further Excavation (Works under Road Decking)							
Breaker, hand-held, mass > 35kg	CNP 026	1	114	50%	#Underground Work	20	91
Crane, mobile	EPD 1158	1	102	30%	Movable Barrier	5	92
Excavator, wheeled/tracked	EPD 00773	1	103	100%	#Underground Work	20	83
Generator	EPD 00668	1	79	100%	#Underground Work	20	59
Dump truck	[1]	1	105	30%	Movable Barrier	5	95
Water pump (petrol)	CNP 282	2	103	100%	#Underground Work	20	86
Ventilation fan	CNP 241	2	108	100%	#Underground Work	20	91
						Total	**99**
Construction of Subway (Works under Road Decking)							
Air compressor, air flow > 10m3/min and <= 30m3/min	CNP 002	1	102	100%	#Underground Work	20	82
Saw, circular, wood	CNP 201	1	108	50%	#Underground Work	20	85
Concrete lorry mixer	CNP 044	1	109	30%	Movable Barrier	10	94
Concrete pump, stationary/ lorry mounted	CNP 047	1	109	30%	Movable Barrier	10	94
Generator	EPD 00668	1	79	100%	#Underground Work	20	59
Ventilation fan	CNP 241	2	108	100%	#Underground Work	20	91
						Total	**98**
Construction of Above Ground Entrance							
Bar bender and cutter (electric)	CNP 021	1	90	30%	Movable Barrier	10	75
Concrete lorry mixer	CNP 044	1	109	30%	Movable Barrier	10	94
Concrete pump, stationary/ lorry mounted	CNP 047	1	109	30%	Movable Barrier	10	94
Crane, mobile	EPD 1158	1	102	30%	Movable Barrier	5	92
Generator	EPD 00668	1	79	50%	Noise Enclosure	15	61
						Total	**98**
Backfill							
Excavator, wheeled/tracked	EPD 00773	1	103	50%	Movable Barrier	5	95
Dump truck	[1]	1	105	30%	Movable Barrier	5	95
						Total	**98**
Reinstatement							
Concrete lorry mixer	CNP 044	1	109	30%	Movable Barrier	10	94
Poker, vibratory, hand-held	CNP 170	1	113	30%	Movable Barrier	10	98
Road Roller	EPD 00222	1	99	30%	-	0	94
						Total	**100**

Remark:

* Since the ultilites diversion works along Nathan Road and Carnarvon Road will not be overlapped, therefore, the worst case scenerio (highest sound power level to the nearest NSR) is assumed for the construction noise assessment in the first month.

Since either excavator or breaker will be used for the ultilites diversion works along Carnarvon Road and demolition of entrances, the two plants will not be overlapped, therefore, as calculated above, the total SWL for both cases is 101 dB(A).

[1] Extracted from EPD document namely, "Sound Power Levels of Other Commonly Used PME" http://www.epd.gov.hk/epd/english/application_for_licences/guidance/files/OtherSWLe.pdf

** Reference was made to quiet plant for sheet piling work (Giken silent piler system) from the Tsim Sha Tsui Station Northern Subway EIA report, Appendix 4.4.

\# Reference was made to Tsim Sha Tsui Station Northern Subway Environmental Impact Assessment.

Appendix V
Plant Inventory for Various Construction Activities - Mitigated Scenario

Consultancy Agreement No. NEX/1049 Tsim Sha Tsui Station Carnarvon Road Subway Project Profile

PME	TM or other reference	No. of PME	SWL, dB(A)/ unit	% on time	Mitigation measures	Reduction dB(A)	Total SWL, dB(A)
Carnarvon Road (Section 2)							
Activities							
Tunnelling across Junction of Carnarvon Road and Bristol Avenue and Breakthrough to K11							
Air compressor, air flow > 10m3/min and <= 30m3/min	CNP 002	1	102	100%	#Underground Work	20	82
Saw, circular, wood	CNP 201	1	108	50%	#Underground Work	20	85
Concrete lorry mixer	CNP 044	1	109	30%	Movable Barrier	10	94
Concrete pump, stationary/ lorry mounted	CNP 047	1	109	30%	Movable Barrier	10	94
Drill rig, rotary type (diesel)	[1]	1	110	100%	#Underground Work	20	90
Excavator, wheeled/tracked	EPD 00773	1	103	80%	#Underground Work	20	82
Generator	EPD 00668	1	79	100%	#Underground Work	20	59
Grout mixer	[1]	1	90	70%	Movable Barrier	10	78
Ventilation fan	CNP 241	1	108	100%	#Underground Work	20	88
						Total	**99**

Remark:
[1] Extracted from EPD document namely, "Sound Power Levels of Other Commonly Used PME"
http://www.epd.gov.hk/epd/english/application_for_licences/guidance/files/OtherSWLe.pdf
Reference was made to Tsim Sha Tsui Station Northern Subway Environmental Impact Assessment.

附錄 VI. 對具代表性噪音敏感受體的建築噪音評估（實施緩解措施的情況）

Appendix VI
Construction Noise Assessment for Representative NSR - Mitigated Scenario

Consultancy Agreement No. NEX/1049 Tsim Sha Tsui Station Carnarvon Road Subway Project Profile

Noise Sensitive Receiver						2013							2014											2015						
N1a - Golden Crown Court	**SWL**	**Dist.(m)[1]**	**DC[2]**	**FC[3]**	**CNL**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Section 1																															
Utilities Diversion and Demolition of Entrances	101	14	31	3	73	73																									
Installation of Pipepile and Sheet Pile	98	14	31	3	70		70	70	70	70	70	70		70	70																
Surface Excavation	97	14	31	3	69					69																					
Construction of Temporary Staircase	97	14	31	3	69						69	69	69																		
Further Excavation (Works under Road Decking)	99	14	31	3	71											71	71	71													
Construction of Subway (Works under Road Decking)	98	14	31	3	70														70	70	70	70	70	70	70						
Construction of Above Ground Entrance	98	14	31	3	70																		70						70		
Backfill	98	14	31	3	70																				70	70	70	70	70		
Reinstatement	100	14	31	3	72																									72	72
Section 2																															
Tunnelling across Junction of Carnarvon Road and Bristol Avenue and Breakthrough to K11	99	37	39	3	63													63	63	63	63	63	63								
					Total	73	70	70	70	73	73	73	69	70	70	71	71	71	71	71	71	71	73	70	73	70	70	70	73	72	72

Remarks:
1. Slant distance is adopted for the construction noise assessment
2. Distance correction in dB(A)
3. Facade correction in dB(A)

Appendix VI
Construction Noise Assessment for Representative NSR - Mitigated Scenario

Consultancy Agreement No. NEX/1049 Tsim Sha Tsui Station Carnarvon Road Subway Project Profile

Noise Sensitive Receiver						2013							2014												2015						
N1b - Golden Crown Court	**SWL**	**Dist.(m)[1]**	**DC[2]**	**FC[3]**	**CNL**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Section 1																															
Utilities Diversion along Nathan Road[4]	97	13	31	3	69	69																									
Utilities Diversion and Demolition of Entrances[4]	101	35	39	3	65																										
Installation of Pipepile and Sheet Pile	98	35	39	3	62		62	62	62	62	62	62		62	62																
Surface Excavation	97	35	39	3	61					61																					
Construction of Temporary Staircase	97	35	39	3	61						61	61	61																		
Further Excavation (Works under Road Decking)	99	35	39	3	63											63	63	63													
Construction of Subway (Works under Road Decking)	98	35	39	3	62														62	62	62	62	62	62	62						
Construction of Above Ground Entrance	98	35	39	3	62																		62						62		
Backfill	98	35	39	3	62																				62	62	62	62	62		
Reinstatement	100	35	39	3	64																									64	64
Entrance A1 Enhancement Works under Tsim Sha Tsui Station Northern Subway																															
Enhancement Works at Entrance A1[5]	107	53	42	3	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68												
					Total	71	69	69	69	69	69	69	68	69	69	69	69	69	69	62	62	62	65	62	65	62	62	62	65	64	64

Remarks:

1. Slant distance is adopted for the construction noise assessment
2. Distance correction in dB(A)
3. Facade correction in dB(A)
4. Since the ultilites diversion works along Nathan Road and Carnarvon Road will not be overlapped, therefore, the worst case scenerio (highest sound power level to the nearest NSR) is assumed for the construction noise assessment in the first month.
5. Reference was made to Appendix 4.4 and 4.5 of Tsim Sha Tsui Station Northern Subway EIA report (AEIAR-127/2008).

Appendix VI
Construction Noise Assessment for Representative NSR - Mitigated Scenario

Consultancy Agreement No. NEX/1049 Tsim Sha Tsui Station Carnarvon Road Subway Project Profile

Noise Sensitive Receiver						2013								2014											2015						
N1c - Golden Crown Court	**SWL**	**Dist.(m)[1]**	**DC[2]**	**FC[3]**	**CNL**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Section 1																															
Utilities Diversion along Nathan Road[4]	97	20	34	3	66																										
Utilities Diversion and Demolition of Entrances[4]	101	20	34	3	70	70																									
Installation of Pipepile and Sheet Pile	98	20	34	3	67		67	67	67	67	67	67		67	67																
Surface Excavation	97	20	34	3	66					66																					
Construction of Temporary Staircase	97	20	34	3	66						66	66	66																		
Further Excavation (Works under Road Decking)	99	20	34	3	68											68	68	68													
Construction of Subway (Works under Road Decking)	98	20	34	3	67														67	67	67	67	67	67	67						
Construction of Above Ground Entrance	98	20	34	3	67																		67						67		
Backfill	98	20	34	3	67																				67	67	67	67	67		
Reinstatement	100	20	34	3	69																									69	69
Section 2																															
Tunnelling across Junction of Carnarvon Road and Bristol Avenue and Breakthrough to K11	99	64	44	3	58													58	58	58	58	58	58								
Entrance A1 Enhancement Works under Tsim Sha Tsui Station Northern Subway																															
Enhancement Works at Entrance A1[5]	107	74	45	3	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65												
					Total	71	69	69	69	71	71	71	68	69	69	69	69	70	69	68	68	68	70	67	70	67	67	67	70	69	69

Remarks:
1. Slant distance is adopted for the construction noise assessment
2. Distance correction in dB(A)
3. Facade correction in dB(A)
4. Since the ultilites diversion works along Nathan Road and Carnarvon Road will not be overlapped, therefore, the worst case scenerio (highest sound power level to the nearest NSR) is assumed for the construction noise assessment in the first month.
5. Reference was made to Appendix 4.4 and 4.5 of Tsim Sha Tsui Station Northern Subway EIA report (AEIAR-127/2008).

Appendix VI
Construction Noise Assessment for Representative NSR - Mitigated Scenario

Consultancy Agreement No. NEX/1049 Tsim Sha Tsui Station Carnarvon Road Subway Project Profile

Noise Sensitive Receiver						2013							2014											2015						
N2a - Mirador Mansion	**SWL**	**Dist.(m)[1]**	**DC[2]**	**FC[3]**	**CNL**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Section 1																															
Utilities Diversion and Demolition of Entrances	101	12	29	3	75	75																									
Installation of Pipepile and Sheet Pile	98	12	29	3	72		72	72	72	72	72	72		72	72																
Surface Excavation	97	12	29	3	71					71																					
Construction of Temporary Staircase	97	12	29	3	71						71	71	71																		
Further Excavation (Works under Road Decking)	99	12	29	3	73											73	73	73													
Construction of Subway (Works under Road Decking)	98	12	29	3	72														72	72	72	72	72	72	72						
Construction of Above Ground Entrance	98	12	29	3	72																		72						72		
Backfill	98	12	29	3	72																				72	72	72	72	72		
Reinstatement	100	12	29	3	74																									74	74
Section 2																															
Tunnelling across Junction of Carnarvon Road and Bristol Avenue and Breakthrough to K11	99	35	39	3	63													63	63	63	63	63	63								
					Total	75	72	72	72	75	75	75	71	72	72	73	73	73	73	73	73	73	75	72	75	72	72	72	75	74	74

Remarks:
1. Slant distance is adopted for the construction noise assessment
2. Distance correction in dB(A)
3. Facade correction in dB(A)

Appendix VI
Construction Noise Assessment for Representative NSR - Mitigated Scenario

Consultancy Agreement No. NEX/1049 Tsim Sha Tsui Station Carnarvon Road Subway Project Profile

Noise Sensitive Receiver						2013							2014											2015						
N2c - Mirador Mansion	**SWL**	**Dist.(m)[1]**	**DC[2]**	**FC[3]**	**CNL**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Section 1																															
Utilities Diversion along Nathan Road[4]	97	11	29	3	71																										
Utilities Diversion and Demolition of Entrances[4]	101	14	31	3	73	73																									
Installation of Pipepile and Sheet Pile	98	14	31	3	70		70	70	70	70	70	70		70	70																
Surface Excavation	97	14	31	3	69					69																					
Construction of Temporary Staircase	97	14	31	3	69						69	69	69																		
Further Excavation (Works under Road Decking)	99	14	31	3	71											71	71	71													
Construction of Subway (Works under Road Decking)	98	14	31	3	70														70	70	70	70	70	70	70						
Construction of Above Ground Entrance	98	14	31	3	70																		70						70		
Backfill	98	14	31	3	70																				70	70	70	70	70		
Reinstatement	100	14	31	3	72																									72	72
Entrance A1 Enhancement Works under Tsim Sha Tsui Station Northern Subway																															
Enhancement Works at Entrance A1[5]	107	93	47	3	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63												
					Total	74	71	71	71	73	73	73	70	71	71	71	71	71	71	70	70	70	73	70	73	70	70	70	73	72	72

Remarks:

1. Slant distance is adopted for the construction noise assessment
2. Distance correction in dB(A)
3. Facade correction in dB(A)
4. Since the ultilites diversion works along Nathan Road and Carnarvon Road will not be overlapped, therefore, the worst case scenerio (highest sound power level to the nearest NSR) is assumed for the construction noise assessment in the first month.
5. Reference was made to Appendix 4.4 and 4.5 of Tsim Sha Tsui Station Northern Subway EIA report (AEIAR-127/2008).

Appendix VI
Construction Noise Assessment for Representative NSR - Mitigated Scenario

Consultancy Agreement No. NEX/1049 Tsim Sha Tsui Station Carnarvon Road Subway Project Profile

Noise Sensitive Receiver						2013							2014												2015						
N2d - Mirador Mansion	**SWL**	**Dist.(m)[1]**	**DC[2]**	**FC[3]**	**CNL**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Section 1																															
Utilities Diversion along Nathan Road[4]	97	11	29	3	71	71																									
Utilities Diversion and Demolition of Entrances[4]	101	51	42	3	62																										
Installation of Pipepile and Sheet Pile	98	51	42	3	59		59	59	59	59	59	59		59	59																
Surface Excavation	97	51	42	3	58					58																					
Construction of Temporary Staircase	97	51	42	3	58						58	58	58																		
Further Excavation (Works under Road Decking)	99	51	42	3	60											60	60	60													
Construction of Subway (Works under Road Decking)	98	51	42	3	59														59	59	59	59	59	59	59						
Construction of Above Ground Entrance	98	51	42	3	59																		59						59		
Backfill	98	51	42	3	59																				59	59	59	59	59		
Reinstatement	100	51	42	3	61																									61	61
Entrance A1 Enhancement Works under Tsim Sha Tsui Station Northern Subway																															
Enhancement Works at Entrance A1[5]	107	132	50	3	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60												
					Total	71	62	62	62	64	64	64	62	62	62	63	63	63	62	59	59	59	62	59	62	59	59	59	62	61	61

Remarks:

1. Slant distance is adopted for the construction noise assessment
2. Distance correction in dB(A)
3. Facade correction in dB(A)
4. Since the ultilites diversion works along Nathan Road and Carnarvon Road will not be overlapped, therefore, the worst case scenerio (highest sound power level to the nearest NSR) is assumed for the construction noise assessment in the first month.
5. Reference was made to Appendix 4.4 and 4.5 of Tsim Sha Tsui Station Northern Subway EIA report (AEIAR-127/2008).

Appendix VI
Construction Noise Assessment for Representative NSR - Mitigated Scenario

Consultancy Agreement No. NEX/1049 Tsim Sha Tsui Station Carnarvon Road Subway Project Profile

Noise Sensitive Receiver						2013							2014											2015						
N3 - Friends' House	**SWL**	**Dist.(m)[1]**	**DC[2]**	**FC[3]**	**CNL**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Section 1																															
Utilities Diversion and Demolition of Entrances	101	21	34	3	70	70																								
Installation of Pipepile and Sheet Pile	98	21	34	3	67		67	67	67	67	67	67		67	67															
Surface Excavation	97	21	34	3	66					66																				
Construction of Temporary Staircase	97	21	34	3	66						66	66	66																	
Further Excavation (Works under Road Decking)	99	21	34	3	68											68	68	68												
Construction of Subway (Works under Road Decking)	98	21	34	3	67														67	67	67	67	67	67	67						
Construction of Above Ground Entrance	98	21	34	3	67																		67						67		
Backfill	98	21	34	3	67																				67	67	67	67	67		
Reinstatement	100	21	34	3	69																									69	69
Section 2																															
Tunnelling across Junction of Carnarvon Road and Bristol Avenue and Breakthrough to K11	99	11	29	3	73													73	73	73	73	73	73								
					Total	70	67	67	67	70	70	70	66	67	67	68	68	74	74	74	74	74	74	67	70	67	67	67	70	69	69

Remarks:
1. Slant distance is adopted for the construction noise assessment
2. Distance correction in dB(A)
3. Facade correction in dB(A)

附錄 VII. 環境監察及審核計劃

Appendix VII

Environmental Monitoring and Audit Plan

1. Introduction

1.1 Purpose of EM&A Plan

According to EPD's EM&A Guidelines for Development Projects in Hong Kong, an EM&A plan is required for projects which have a potential of causing construction noise impacts to the sensitive receivers close to the proposed work areas if the recommended mitigation measures are not properly implemented.

1.2 Project Background

It is indicated that noise impact is predicted during the construction phase at Golden Crown Court, Mirador Mansion and Friends' House, hence the mitigation measures stated in this Report are recommended to be implemented in order to reduce the noise impact to the nearby NSRs. The monitoring programme should be carried out by the ET.

The recommended noise mitigation measures are presented in Section 3 of the Project Profile (PP). The monitoring requirements and methodology for monitoring of noise impacts are provided below.

Although no adverse air quality impact is anticipated in this Project, 24-hour monitoring of air quality is recommended to be conducted during construction phase. The monitoring requirement and methodology for 24-hour air quality monitoring are provided below.

1.3 Project Organisation

An organisation consisting of Engineer's Representative (ER), Contractor, Independent Environmental Checker (IEC), and Environmental Team (ET) should be formed to take the responsibilities of the environmental protection matters. MTRC should appoint the IEC and establish the ET for compliance with the EP requirements. The responsibilities of respective parties are detailed in the following:

<u>The Engineer or the Engineer's Representative (ER)</u>

The ER is responsible for overseeing the construction works and for ensuring that the works are undertaken by the Contractor in accordance with the specification and contract requirements. The duties and responsibilities of the ER with respect to EM&A are:

- Monitor the Contractor's compliance with Contract Specifications, including the effective implementation and operation of the environmental mitigation measures;
- Inform the Contractor when action is required to reduce impacts in accordance with the Event and Action Plans;
- Participate in site inspections undertaken by the ET; and
- Co-operate with the ET in providing all the necessary information and assistance for completion of the complaint investigation works.

Independent Environmental Checker (IEC)

The IEC should advise the ET and ER on environmental issues related to the project. The IEC should audit from an independent viewpoint on the environmental performance during the construction of the project. The IEC should be a person who has relevant professional qualifications in environmental control and at least 7 years experience in EM&A and environmental management. The duties and responsibilities of the IEC are:

- Review and audit in an independent, objective and professional manner in all aspects of the EM&A programme;
- Validate and confirm the accuracy of monitoring results, appropriateness of monitoring equipment, monitoring locations with reference to the locations of the nearby sensitive receivers, and monitoring procedures;
- Carry out random sample check and audit on monitoring data and sampling procedures, etc;
- Conduct random site inspection;
- Review the effectiveness of environmental mitigation measures and project environmental performance;
- On an as-need basis, verify and certify the environmental acceptability of the construction methodology (both temporary and permanent works), relevant design plans and submissions under the environmental permit. Where necessary, the IEC should agree in consultation with the ET and the Contractor least impact alternative;
- Check complaint cases and the effectiveness of corrective measures;
- Verify EM&A report certified by the ET Leader; and
- Feedback audit results to ER/ET according to the Event/Action Plan.

The Environmental Team (ET)

The ET should conduct the EM&A programme and ensure the Contractor's compliance with the project's environmental performance requirements during construction. The ET should plan, organise and manage the implementation of the EM&A programme and ensure that the EM&A works are undertaken to the required standard.

The ET should be led and managed by the ET Leader. The ET Leader should have relevant professional qualifications in environmental control and possess at least 7 years experience in EM&A. The ET Leader should be responsible for the implementation of the EM&A programmes in accordance with the EM&A requirements. The duties and responsibilities of the ET include:

- Sampling, analysis and statistical evaluation of monitoring parameters;
- Environmental site surveillance;
- Inspection and audit of compliance with environmental protection, and pollution prevention and control regulations;

- Assess the effectiveness of the environmental mitigation measures implemented;
- Monitor compliance with the environmental protection clauses/specifications in the Contract;
- Review construction programme and comment as necessary;
- Review work methodologies which may affect the extent of environmental impact during the construction phase and comment as necessary;
- Complaint investigation, evaluation and identification of corrective measures;
- Liaison with the IEC on all environmental performance matters, and timely submission of all relevant EM&A proforma for IEC's approval; and
- Advice to the Contractor on environmental improvement, awareness and enhancement matters, etc.

The Contractor

The Contractor should report to the ER. The duties and responsibilities of the Contractor are:

- Comply with the relevant contract conditions and specifications on environmental protection
- Participate in the site inspections undertaken by the ET;
- Provide assistance to ET to carry out monitoring;
- Provide requested information to the ET in the event of any exceedance in the environmental criteria (Action/Limit levels);
- Submit proposals on mitigation measures in case of exceedance of Action and Limit levels in accordance with the Event/Action Plans; and
- Cooperate with the ET in providing all the necessary information and assistance for completion of the complaint investigation works. If mitigation measures are required following the investigation, the Contractor should promptly carry out these measures.

2. Construction Noise Impact

2.1 Monitoring Requirements

The construction noise level should be measured in terms of the A-weighted equivalent continuous sound pressure level (L_{eq}). $L_{eq(30\ minutes)}$ should be used as the monitoring parameter for the time period between 0700-1900 hours on normal weekdays.

2.2 Monitoring Equipment

With reference to the Technical Memorandum (TM) issued under the Noise Control Ordinance (NCO), sound level metres in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications should be used for carrying out the noise monitoring. The calibration of the sound level meters and their

respective calibrators should be carried out in accordance with the manufacturer's requirements.

Noise measurements should not be made in the presence of fog, rain, wind with a steady speed exceeding 5 ms^{-1} or wind with gusts exceeding 10 ms^{-1}.

The ET is responsible for the provision and maintenance of the monitoring equipment. The ET should ensure that sufficient noise measuring equipment and associated instrumentation are available for carrying out the baseline monitoring, regular impact monitoring and ad hoc monitoring. All the equipment and associated instrumentation should be clearly labelled.

2.3 Monitoring Locations

The noise monitoring location will be set up at Mirador Mansion (Refer to **Figures 3.3**).

The monitoring station should normally be at a point 1m from the exterior of the sensitive receivers building facade and be at a position 1.2m above the ground. If there is a problem with access to the normal monitoring position, an alternative nearby position may be chosen, and a correction to the measurements should be made. For reference, a correction of +3dB(A) should be made to the free field measurements. The ET should agree with the EPD on the correction adopted.

2.4 Baseline Monitoring

The ET should carry out baseline noise monitoring prior to the commencement of the construction works. There should not be any construction activities in the vicinity of the stations during the baseline monitoring.

Baseline noise monitoring for the A-weighted levels LA_{eq}, LA_{10} and LA_{90} should be carried out daily for a period of at least two weeks at a minimum logging interval of 30 minutes between 0700 and 1900.

In exceptional case, when insufficient baseline monitoring data or questionable results are obtained, the ET should liaise with the Contractor to agree on an appropriate set of data to be used as a baseline reference.

2.5 Impact Monitoring

During normal construction working hour (0700-1900 Monday to Saturday), monitoring of $LA_{eq,\ 30min}$ noise levels should be carried out at the agreed monitoring locations once every week in accordance with the methodology in the TM.

Other noise sources such as road traffic may make a significant contribution to the overall noise environment. Therefore, the results of noise monitoring activities would take into account such influencing factors, which may not be presented during the baseline monitoring period.

General construction work carried out during restricted hours is controlled by Construction Noise Permit (CNP) under the NCO.

In case of non-compliance with the construction noise criteria, more frequent monitoring as specified in the Event and Action Plan in **Table 1.2** should be carried out. This additional

monitoring should be continued until the recorded noise levels are rectified or proved to be irrelevant to the construction activities.

2.6 Event and Action Plan

The Action and Limit (AL) Levels for construction noise are defined in **Table 2.1**. Should non-compliance of the criteria occurs, action in accordance with the Event and Action Plan in **Table 2.2**, should be carried out.

Table 2.1 : Typical Action and Limit Levels for Construction Noise

Time Period	Action	Limit
0700-1900 hrs on normal weekdays	When one valid documented complaint is received.	75* dB(A)

Note: *70 dB(A) for schools and 65 dB(A) during school examination periods.

If works are to be carried out during restricted hours, the conditions stipulated in the Construction Noise Permit (CNP) issued by the Noise Control Authority have to be followed.

Table 2.2: Event and Action Plan for Construction Noise

Event	ET	IEC	ER	Action Contractor
Action Level	1. Notify IEC and Contractor. 2. Carry out investigation. 3. Report the results of investigation to the IEC and Contractor. 4. Discuss with the Contractor and formulate remedial measures 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review the analyzed result submitted by ET. 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly. 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of exceedance 2. Notify Contractor 3. Require Contractor to propose remedial measures for the analysed noise problem 4. Ensure remedial measures are properly implemented.	1. Submit noise mitigation proposals to IEC 2. Implement noise mitigation proposals
Limit Level	1. Notify IEC, ER, EPD and Contractor, and follow other actions 2. Identify source 3. Repeat measurement to confirm findings 4. Increase monitoring frequency 5. Check Contractor's working procedures to determine possible mitigation to be implemented 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD,	1. Discuss amongst ER, ET and Contractor on the potential remedial actions 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ET accordingly 3. Supervise the implementation of remedial measures	1. Confirm receipt of notification of exceedances 2. Notify Contractor 3. Require Contractor to propose remedial measures 4. Ensure remedial measures are properly implemented 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is	1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to IEC within 3 working days of notifications 3. Implement the agreed proposals 4. Revise and resubmit proposals if problem still not under control 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated

Event	ET	IEC	ER	Action Contractor
	ER informed of the results 8. If exceedance stops, cease additional monitoring		abated.	

2.7 Construction Noise Mitigation Measures

To minimize the noise emissions during construction phase, appropriate mitigation measures and good site practices are recommended to be implemented. The proposed mitigation measures are summarized below:

- Use quieter plants and working methods;
- Use of movable noise barrier;
- Use of noise enclosure;
- Use of noise reduction fabric; and
- Implementation of general construction noise control measures.

3. Construction Air Impact

3.1 Monitoring Requirement

Monitoring and audit of the Total Suspended Particulate (TSP) levels should be carried out by the ET to ensure that any deterioration in air quality could be readily detected and timely actions taken to rectify the situation.

1-hour or 24-hour TSP levels should be measured to indicate the impacts of construction dust on air quality. The TSP levels can be measured by following the standard high volume sampling method as set out in the Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B or be measured by direct reading methods which are capable of producing comparable results to that of the high volume sampling method.

All relevant data including temperature, pressure, wind speed and direction, weather conditions, elapsed-time meter reading for the start and stop of the sampler, identification and weight of the filter paper, other local atmospheric factors affecting or affected by site conditions and work progress of the concerned site, etc. should be recorded in detail. A sample data record sheet is shown below. The ET may develop project specific data record sheet to suit this EM&A programme.

3.2 Monitoring Equipment

The ET is responsible for provision of the monitoring equipment. The ET should provide a sufficient number of high volume sampler (HVS) and/or direct reading dust meters with appropriate calibration available for carrying out the baseline monitoring, regular impact monitoring and ad hoc monitoring. The HVSs should be equipped with an electronic mass

flow controller and be calibrated against a traceable standard at regular intervals. All the equipment should be clearly labelled.

Calibration of dust monitoring equipment should be conducted as specified by the manufacturer. The calibration data should be properly documented for future reference. All the data should be converted into standard temperature and pressure condition.

HVS in compliance with the following specifications should be used for carrying out the 24-hour TSP monitoring:

- 0.6 – 1.7 m^3/min (20 – 60 standard cubic feet per minute) adjustable flow range;
- Equipped with a timing/control device for 24 hours operation;
- Installed with elapsed-time meter with +/- 5 minutes accuracy for 24 hours operation;
- Capable of providing a minimum exposed area of 406cm^2 (63 in^2);
- Flow control accuracy: +/- 2.5% deviation over 24-hour sampling period;
- Incorporated with an electronic mass flow rate controller or other equivalent devices;
- Equipped with a flow recorder for continues monitoring;
- Provided with a peaked roof inlet;
- Incorporated with manometer;
- Able to hold and seal the filter paper to the sampler housing at horizontal position;
- Easy to change the filter, and
- Capable of operating continuously for 24-hour period.

Calibration of dust monitoring equipment should be conducted as specified by the manufacturer. Initial calibration of the dust monitoring equipment should be conducted upon installation and thereafter at bi-monthly intervals. The transfer standard should be traceable to the internationally recognized primary standard and be calibrated annually. The calibration data should be properly documented for future reference. All data should be converted into standard temperature and pressure condition.

The ET should obtain representative wind data near the dust monitoring locations for reference.

3.3 Laboratory Measurement / Analysis

Filter paper should be labelled before sampling. It should be a clean filter paper with no pinholes, and should be conditioned in a humidity-controlled chamber for over 24-hour and be pre-weighed before use for the sampling.

After sampling, the filter paper loaded with dust should be kept in a clean and tight sealed bag. The filter paper should then be returned to the laboratory for reconditioning in the

humidity-controlled chamber followed by accurate weighing by an electronic balance. The balance should be regularly calibrated against a traceable standard.

All the collected samples should be kept in a good condition for 6 months before disposal.

3.4 Monitoring Locations

The air monitoring location will be set up at Mirador Mansion (Refer to **Figure 3.3**).

When alternative monitoring locations are proposed, approval from the ER and agreement from the IEC is required. The following criteria, as far as practicable, should be followed:

- at the project area boundary or such locations close to the major dust emission source;
- close to the sensitive receivers;
- proper position/sitting and orientation of the monitoring equipment; and
- take into account the prevailing meteorological conditions.

When positioning the samplers, the following points should be noted:

- a horizontal platform with appropriate support to secure the samplers against gusty wind shall be provided;
- no two samples should be placed less than 2m apart;
- the distance between the sampler and an obstacle, such as buildings, must be at least twice the height that the obstacle protrudes above the sampler where possible;
- a minimum of 2m of separation from walls, parapets and penthouses is required for rooftops samplers;
- a minimum of 2m of separation from any supporting structure, measured horizontally is required;
- no furnace or incinerator flue or building vent is nearby;
- airflow around the sampler is unrestricted;
- the sampler is more than 20m from the dripline;
- any wire fence and gate, to protect the sampler, should not cause any obstruction during monitoring;
- permission must be obtained to set up the samplers and to obtain access to the monitoring stations; and
- a secured supply of electricity is needed to operate the samplers.

3.5 Baseline Monitoring

Baseline monitoring should be carried out to determine the ambient 1-hour and 24-hour TSP levels at the monitoring locations prior to the commencement of the Project work. During the baseline monitoring, there should not be any construction or dust generation activities in the vicinity of the monitoring stations. The baseline monitoring will provide data for the determination of the appropriate Action levels with the Limit levels set against statutory or otherwise agreed limits.

Baseline monitoring should be carried out at each designated monitoring location for a continuous period of at least 14 days prior to the commissioning of the construction works to

obtain daily 24-hour TSP samples. 1-hour sampling should also be done at least 3 times per day. Baseline monitoring should be carried out under typical weather conditions. General metrological conditions (wind speed, direction and precipitation) and notes regarding any significant adjacent dust producing sources should also be recorded throughout the baseline monitoring period.

In case the baseline monitoring cannot be carried out at the designated monitoring location during the baseline monitoring period, the ET should carry out the monitoring at an alternative location that can effectively represent the baseline conditions at the impact monitoring location. The alternative baseline monitoring location should be approved by the ER and agreed with IEC.

In exceptional cases, when insufficient baseline monitoring data or questionable results are obtained, the ET should liaise with IEC and EPD to agree on an appropriate set of data to be used as a baseline reference.

If the ET considers that significant changes in the ambient conditions have arisen, a repeat of the baseline monitoring may be carried out to update the baseline levels. The monitoring should be at times when the Contractor's activities are not generating dust. The revised baseline levels and air quality criteria should be agreed with IEC and EPD.

3.6 Impact Monitoring

The ET is responsible for impact monitoring during the course of the Works. For regular impact monitoring, 24-hour TSP monitoring should be in the sampling frequency of at least once every week.

In case of non-compliance with the air quality criteria, a more frequent monitoring exercise adopting 1-hr TSP monitoring undertaken when the highest dust impact occurs, as specified in the Event and Action Plan in **Table 3.2**, should be conducted within 24 hours after the result is obtained. This additional monitoring should be continued until the excessive dust emission or the deterioration in air quality is rectified.

3.7 Event and Action Plan

The baseline monitoring results form the basis for determining the air quality criteria for the impact monitoring. The ET should compare the impact monitoring results with air quality criteria set up for 24-hour TSP level. **Table 3.1** shows the air quality criteria, namely Action and Limit (AL) Levels to be used. Should non-compliance of the air quality criteria occur, actions in accordance with the Event and Action Plan in **Table 3.2** should be carried out.

Table 3.1 : Typical Action and Limit Levels for Air Quality

Parameters	Action	Limit
24-hour TSP Level in $\mu g/m^3$	For baseline level ≤200 $\mu g/m^3$, Action level = (130% of baseline level + Limit level)/2 For baseline level > 200 $\mu g/m^3$, Action level = Limit level	260
1-hour TSP Level in $\mu g/m^3$	For baseline level ≤ 384 $\mu g/m^3$, Action level = (130% of baseline level + Limit level)/2 For baseline level > 384 $\mu g/m^3$, Action level = Limit Level	500

Table 3.2: Event and Action Plan for Air Quality

Event	ET	IEC	ER	Action Contractor
Action Level				
Exceedance for one sample	1. Identify source; 2. If valid, inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate
Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IEC and EPD; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency to daily; 5. Discuss with IEC and Contractor on remedial action required; 6. If exceedance continues, arrange meeting with IEC and ER; 7. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervisor implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measure properly implemented.	1. Submit proposals for remedial action to IEC within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.
Limit Level				
Exceedance for one sample	1. Identify source; 2. Inform ER and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and the Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
Exceedance for two or more consecutive samples	1. Notify IEC, ER, Contractor and EPD; 2. Identify sources; 3. Repeat measurement to confirm findings; 4. Increase monitoring	1. Discuss amongst ER, ET and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consultation with IEC, agree with the Contractor on	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of

Event	ET	IEC	ER	Action Contractor
	frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	necessary to assure their effectiveness and advise the ET accordingly. 3. Supervise the implementation of remedial measures.	the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

3.8 Mitigation Measure of Air Quality

Although most of the construction works would be carried out underground, appropriate dust mitigation measures stipulated in the Air Pollution Control (Construction Dust) Regulation should be implemented to control fugitive dust emission. The following key dust suppression measures are recommended:

- Decking over the excavation areas at the Entrance D1 and D2;
- Regular watering to reduce dust emissions from all exposed site surface, particularly during dry weather;
- Frequent watering for particularly dusty construction areas and areas close to air sensitive receivers;
- Cover all excavated or stockpiles of dusty material by impervious sheeting or spraying with water to maintain the entire surface wet;
- Provision of vehicle washing facilities at the exit points of the site; and
- Provision of tarpaulin covering for any dusty materials on a vehicle leaving the site.

4. Environmental Audit

4.1 Site Inspection

Site inspections provide a direct means to trigger and enforce the specified environmental protection and pollution control measures. They should be undertaken routinely by the ET to inspect the construction activities in order to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented. With well defined

pollution control and mitigation specifications and a well established site inspection, deficiency and action reporting system, the site inspection is one of the most effective tools to enforce the environmental protection requirements on the construction site.

The ET is responsible for formulating the environmental site inspection, deficiency and action reporting system, and for carrying out the site inspection works. The ET should in consultation with the IEC, prepare a procedure for site inspection, deficiency and action reporting requirement; and submit to the Contractor for agreement.

Regular site inspections at least once a week should be led by the ET. The areas of inspection should not be limited to the pollution control and mitigation measures within the site; the environmental situation outside the site area which is likely to be affected, directly or indirectly by the site activities should be reviewed. The ET should make reference to the following information in conducting the inspection:

- EM&A recommendations on environmental protection and pollution control mitigation measures;
- Works progress and programme;
- Individual works methodology proposals (which should include proposal on associated pollution control measures);
- Contract specifications on environmental protection
- Relevant environmental protection and pollution control laws; and
- Previous site inspection results.

The Contractor should update the ET with all relevant information on the construction contract necessary for him to carry out the site inspections. Inspection results and associated recommendations for improvements to the environmental protection and pollution control works should be passed to the IEC, ER and the Contractor, for reference and for taking immediate action. The Contractor should follow the procedures and time-frame as stipulated in the environmental site inspection, deficiency and action reporting system formulated by the ET to report on any remedial measures subsequent to the site inspections.

Ad hoc site inspections should be carried out by the ET and / or IEC if significant environmental problems are identified. Inspections may also be required subsequent to receipt of an environmental complaint, or as part of the investigation work, as specified in the Action Plan for environmental monitoring and audit.

4.2 Compliance with Legal and Contractual Requirement

There are environmental protection and pollution control laws in Hong Kong, which the construction activities should comply with.

In order to comply with the contractual requirements, all works method statements submitted by the Contractor to the ER for approval should be sent to the ET for vetting, to see whether sufficient environmental protection and pollution control measures have been included. The implementation schedule of mitigation measures is summarized in **Appendix VII**.

The ET should also review the progress and programme of the works to check that relevant environmental laws have not been violated, and that any foreseeable potential for violating the laws can be prevented.

The Contractor should regularly copy relevant documents to the ET so that the checking work can be carried out. The document should at least include the updated Work Progress Reports, the updated Works Programme, the application letters for different licence/permits under the environmental protection laws, and all valid licences/permits. The site diary should also be available for the ET's inspection upon his request.

After reviewing the document, the ET should advise the ER and the Contractor of any non-compliance with the legislative requirements on environmental protection and pollution control for them to take follow-up actions. If the ET's review concludes that the current status on license/permit application and any environmental protection and pollution control preparation works may not cope with the works programme or may result in potential violation of environmental protection and pollution control requirements by the works, the ET will advise the Contractor and the ER accordingly.

Upon receipt of the advice, the Contractor should undertake immediate actions to rectify the situation. The ET should follow up to ensure that appropriate action has been taken by the Contractor such that the environmental protection and pollution control requirements are fulfilled.

4.3 Environmental Complaints

Complaints should be referred to the ET for action. The ET should undertake the following procedures upon receipt of any valid compliant:

- Investigate the complaint to determine its validity, and assess whether the source of the problem is due to works activities;
- Log complaint and date of receipt onto the complaint database and inform the ER and IEC if valid;
- Identify mitigation measures if a compliant is valid and due to the works of the Project;
- Advise the Contractor if mitigation measures are required;
- Review the Contractor's response to identified mitigation measures, and the updated situation;
- Undertake additional monitoring and audit to verify the situation if necessary, and review that circumstances leading to the complaint do not recur;
- If the complaint is referred by EPD, keep EPD informed on the status of the complaint investigation and follow-up action and report to EPD upon completion of the investigation; and
- Report the investigation results and the subsequent actions to the complainant (If the source of complaint is identified through EPD, the results should be reported within the time frame assigned by EPD);

- Record the compliant, investigation, the subsequent actions and the results in the monthly EM&A reports.

During the complaint investigation work, the Contractor and ER should cooperate with the ET in providing all necessary information and assistance for completion of the investigation. If mitigation measures are identified in the investigation, the Contractor should promptly carry out the mitigation. The ER should ensure that the measures have been carried out by the Contractor. A flow chart of complaint response procedure is enclosed in this EM&A plan.

5. Reporting Requirement

5.1 Introduction

The reporting requirements of EM&A are based upon a paper-documented approach. However, the same information can be provided in an electronic medium upon agreeing the format with the IEC, the ER and EPD (for construction phase), and with the Environmental Consultant and EPD (for operation phase). This would enable a transition from a paper / historic and reactive approach to an electronic / real time proactive approach.

For construction phase of EM&A, the types of reports that the ET should prepare and submit include baseline monitoring report, monthly EM&A report, quarterly EM&A summary report and final EM&A review report. In accordance with Annex 21 of the EIAO-TM, a copy of the monthly, quarterly summary and final review EM&A reports shall be submitted to the Director of Environmental Protection. The exact details of the frequency, distribution and time frame for submission shall be agreed with the IEC, the ER and EPD prior to commencement of works

5.2 Baseline Monitoring Report

The ET should prepare and submit to EPD a Baseline Environmental Monitoring Report two weeks prior to the commencement of construction or otherwise as specified by EPD. The baseline monitoring report shall include at least the following:

(i) Executive summary;

(ii) Brief project background information;

(iii) Drawings showing locations of the baseline monitoring stations;

(iv) An updated construction programme with milestones of environmental protection/mitigation activities annotated;

(v) Monitoring results (in both hard and diskette copies) together with the following information:

- monitoring methodology;
- name of laboratory and types of equipment used and calibration dates;
- parameters monitored;
- monitoring locations (and depth);
- monitoring date, time, frequency and duration;
- QA/QC results and detection limits.

(v) Details of influencing factors, including:

- major activities, if any, being carried out on the site during the period;
- weather conditions during the period;
- other factors which might affect the results.

(vi) Determination of the Action and Limit Levels (AL levels) for each monitoring parameter and statistical analysis of the baseline data. The analysis should conclude if there is any significant difference between control and impact stations for the parameters monitored;

(vii) Revisions for inclusion in the EM&A Manual; and

(viii) Comments and conclusions.

5.3 Monthly EM&A Reports

The results and findings of all construction phase EM&A work required in the Manual should be recorded in the monthly EM&A reports prepared by the ET. The EM&A report should be endorsed by IEC and submitted within 10 working days from the end of each reporting period, with the first report due one month after construction commences. Copies of each monthly EM&A report should be submitted to the Contractor, IEC, ER and EPD.

5.4 First Monthly EM&A Report

The first monthly EM&A report shall include at least but not be limited to the following:

(i) Executive summary:

- breaches of Action and Limit levels;
- complaint log;
- notifications of any summons and status of prosecutions;
- reporting changes; and
- future key issues.

(ii) Basic project information:

- project organisation including key personnel contact names and telephone numbers;
- construction programme with fine tuning of construction activities showing the inter-relationship with environmental protection/mitigation measures for the month;
- management structure; and
- works undertaken during the month.

(iii) Environmental status:

- works undertaken during the month with illustrations (such as location of works, daily dredging/filling rates, percentage fines in the fill material used); and
- drawing showing the project area, any key environmental sensitive receivers and the locations of the monitoring and control stations.

(iv) A brief summary of EM&A requirements:

- all monitoring parameters;
- environmental quality performance limits (Action and Limit levels);
- event-Action Plans;
- environmental mitigation measures; and
- environmental requirements in contract documents.

(v) Monitoring results:

- monitoring methodology;
- name of laboratory and types of equipment used and calibration dates;
- parameters monitored;
- monitoring locations (and depth);
- monitoring date, time, frequency and duration;
- weather conditions during the period;
- graphical plots of monitored parameters in the month annotated;
  - the major activities being carried out on site during the period;
  - weather conditions that may affect the results; and
  - any factors which might affect the monitoring results.
- .QA/QC results and detection limits.

(vi) Report on non-compliance, complaints, notifications of summons and successful prosecutions:

- record of all non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels);
- record of complaints received, including locations and nature of complaints, investigation, liaison and consultation undertaken, actions and follow-up procedures taken, results and summary;
- record of all notification of summons and successful prosecutions for breaches of current environmental protection / pollution control legislation, including locations and nature of the breaches, investigation, follow-up actions taken, results and summary;
- review of reasons for and the implications of non-compliance, complaints, summons and prosecutions including review of pollution sources and working procedures; and
- description of actions taken in the event of non-compliance and deficiency reporting, and follow-up actions related to earlier non-compliance

(vii) Others

- an account of the future key issues as reviewed from the works programme and work method statements; and
- advice on the solid and liquid waste management status during the month.

5.5 Subsequent Monthly EM&A Reports

Subsequent monthly EM&A reports should include the following:

(i) Executive summary

- breaches of Action and Limit levels;
- complaint log;
- notifications of any summons and successful prosecutions;
- report changes; and
- future key issues.

(ii) Environmental status:

- construction programme with fine tuning of construction activities showing the inter-relationship with environmental protection/mitigation measures for the month;
- works undertaken during month with illustration including key personnel contact names and telephone numbers; and
- drawing showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations.

(iii) Implementation status:

- advice on the status of compliance with the Environmental Permit (EP), submission status under the EP, implementation status of environmental protection and pollution control / mitigation measures, as recommended in the PP

(iv) Monitoring results

- monitoring methodology;
- name of laboratory and types of equipment used and calibration details;
- parameters monitored;
- monitoring locations (and depth);
- monitoring date, time, frequency and duration;
- weather conditions during the period;
- graphical plots of the monitored parameters in the month annotated;
  - the major activities being carried out on site during the period;
  - weather conditions that may affect the results;
  - any factors which might affect the monitoring results;
- QA/QC results and detection limits.

(v) Report on non-compliance, complaints, and notifications of summons and successful prosecutions:

- Record of all non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels);
- Record of all complaints received, including locations and nature of complaints, investigation, liaison and consultation undertaken, actions and follow-up procedures taken, results and summary;
- Record of all notification of summons and successful prosecutions for breaches of current environmental protection / pollution control legislation, including locations and nature of the breaches, investigation, follow-up actions taken, results and summary;
- Review of reasons for and the implications of non-compliance, complaints, summons and prosecutions including review of pollution sources and working procedures; and

- A description of the actions taken in the event of non-compliance and deficiency, and follow-up actions related to earlier non-compliance

(vi) Others

- an account of the future key issues as reviewed from the works programme and work method statements; and
- advice on the solid and liquid waste management.

5.6 Quarterly EM&A Reports

A quarterly EM&A report should be produced and should contain at least the following information. In addition, the first quarterly summary report should also confirm if the monitoring work is proving effective and that it is generating data with the necessary statistical power to categorically identify or confirm the absence of impact attributable to the works.

(i) Executive summary;

(ii) Basic project information including a synopsis of the project organisation, programme, contacts of key management, and a synopsis of works undertaken during the quarter;

(iii) A brief summary of EM&A requirements including:

- monitoring parameters
- environmental quality performance limits (Action and Limit levels)
- environmental mitigation measures, as recommended in the PP

(iv) advice on the implementation status of environmental protection and pollution control / mitigation measures, as recommended in the PP, summarised in the updated implementation schedule;

(v) Drawings showing the project area, environmental sensitive receivers and the locations of the monitoring and control stations;

(vi) Graphical plots of the monitored parameters over the past four months (the last month of the previous quarter and the present quarter) for representative monitoring stations annotated:

- the major activities being carried out on site during the period
- weather conditions during the period
- any other factors which might affect the monitoring results

(vii) Advice on the solid and liquid waste management status during the quarter including waste generation and disposal records;

(viii) A summary of non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels);

(ix) A brief review of the reasons for and the implications of any non-compliance, including a review of pollution sources and working procedures;

(x) A summary description of actions taken in the event of non-compliance and any follow-up procedures related to any earlier non-compliance;

(xi) A summary of all complaints received (written or verbal) for each media, liaison and consultation undertaken, actions and follow-up procedures taken;

(xii) A summary record of notifications of summons and successful prosecution for breaches of the current environmental protection/pollution control legislations, locations and nature of the breaches, investigation, follow-up actions taken and results;

(xiii) Comments on the effectiveness and efficiency of the mitigation measures); recommendations on any improvement in the EM&A programme and conclusions for the quarter; and

(xiii) Proponents' contacts and any hotline telephone number for the public to make enquiries.

5.7 Final EM&A Review Report

The EM&A program could be terminated on the following basis:

(i) completion of construction activities and insignificant environmental impacts of the remaining outstanding construction works;

(ii) trends analysis to demonstrate the narrow down of monitoring exceedances due to construction activities and the return of ambient environmental conditions in comparison with baseline data; and

(iii) no environmental complaints and prosecution involved.

The proposed termination may need to be consulted with the related local community and the proposal should be endorsed by the IEC, ER and the project proponent prior to final approval from the Director of Environmental Protection.

The final EM&A report should include, inter alia, the following information:

(i) Executive summary;

(ii) Basic project information including a synopsis of the project organisation, programme, contracts of key management, and synopsis of work undertaken during the entire construction period;

(iii) Brief summary of EM&A requirements including:

- monitoring parameters
- environmental quality performance limits (Action and Limit levels)
- environmental mitigation measures, as recommended in the PP.

(iv) Advice on the implementation status of the environmental protection and pollution control/mitigation measures, as recommended in the PP, summarised in the updated implementation status;

(v) Drawings showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations;

(vi) Graphical plots of the trends of monitored parameters over the construction period for representative monitoring stations annotated against;

- the major activities being carried out on site during the period
- weather conditions during the period
- any other factors which might affect the monitoring results
- the return of ambient environmental conditions in comparison with baseline data

(vii) Compare and contrast the EM&A data with the PP predictions and annotate with explanation for any discrepancies;

(viii) Provide clear-cut decisions on the environmental acceptability of the project with reference to the specific impact hypothesis;

(ix) Advice on the solid and liquid waste management status;

(x) A summary of non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels);

(xi) A brief account of the reasons for and the implications of the non-compliance including a review of pollution sources and working procedures as appropriate;

(xii) A summary description of the actions taken in the event of the non-compliance and any follow-up procedures related to earlier non-compliance;

(xii) A summary record of all complaints received, liaison and consultation undertaken, actions and follow-up procedures taken;

(xiii) Review the monitoring methodology adopted and with the benfit of hindsight, comment on its effectiveness (including cost effectiveness);

(ixx) A summary record of notifications of summons and successful prosecutions for breaches of the current environmental protection/pollution control legislations, locations and nature of the breaches, investigation, follow-up actions taken and results;

(xx) A review of the effectiveness of the mitigation measures; and

(xxi) A conclusion to state the return of ambient and/or the predicted scenario.

5.8 Data Keeping

All site document such as monitoring field records, laboratory analysis records, site inspection forms, calibration certifications, etc. are required to be included in the EM&A reporting documents. However, any such document should be well kept by the ET and be ready for inspection upon request. Soft copies of all documents and data should be kept for at least six months following completion of the construction phase EM&A.

5.9 Interim Notifications of Environmental Quality Limit Exceedances

For construction phase EM&A, with reference to the Event and Action Plan, when the environmental quality performance limits are exceeded, the ET should immediately notify the IEC, the ER and EPD, as appropriate. The notification should be followed up with advice to EPD on results of investigation, proposed action and success of the action taken, with any necessary follow-up proposals.

Sample Environmental Monitoring Data Recording Sheet

Noise Monitoring Field Record Sheet

Monitoring Location							
Details of Location							
Date of Monitoring							
Measurement Start Time (hh:mm)							
Measurement Time Length (min.)							
Weather Conditions	Fine / Sunny / Cloudy / Rainy						
Wind Speed (m/s)							
Noise Meter Model/Identification							
Calibrator Model/Identification							
Calibration Before Measurement (dB(A))							
Calibration After Measurement (dB(A))							
Measurement Result	5min	5min	5min	5min	5min	5min	30min
L_{90} (dB(A))							
L_{10} (dB(A))							
L_{eq} (dB(A))							
Major Construction Noise Source(s) During Monitoring							
Other Noise Source(s) During Monitoring							
Remarks							

	Name & Designation	Signature	Date
Record by:	_____	_____	_____
Checked by:	_____	_____	_____

Data Sheet for 24-hr TSP Monitoring

Monitoring Location		
Details of Location		
Sampler Identification		
Date & Time of Sampling		
Elapsed-time Meter Reading	Start (hour)	
	Stop (hour)	
Total Sampling Time (min.)		
Weather Conditions		Fine / Sunny / Cloudy / Rainy
Site Conditions		
Initial Flow Rate, Qsi	Pi (hpa)	
	Ti (^{o}C)	
	Hi (cfm)	
	Qsi (Std. m^3)	
Final Flow Rate, Qsf	Pf (hpa)	
	Tf (^{o}C)	
	Hf (cfm)	
	Qsf (Std. m^3)	
Average Flow Rate (Std.m^3)		
Total Volume (Std.m^3)		
Filter Identification No.		
Initial Wt. of Filter (g)		
Final wt. of Filter (g)		
Measured TSP Level (µg/m^3)		
Observations / Remarks		

	Name & Designation	Signature	Date
Record by:	_____	_____	_____
Checked by:	_____	_____	_____

Sample template for the interim notifications of Environmental Quality Limits Exceedances

Incident Report on Action Level or Limit Level Non-compliance

Project	
Date	
Time	
Monitoring Location	
Parameter	
Action & Limit Levels	
Measured Level	
Possible reason for Action or Limit Level Non-compliance	
Actions taken / to be taken	
Remarks	

Location Plan

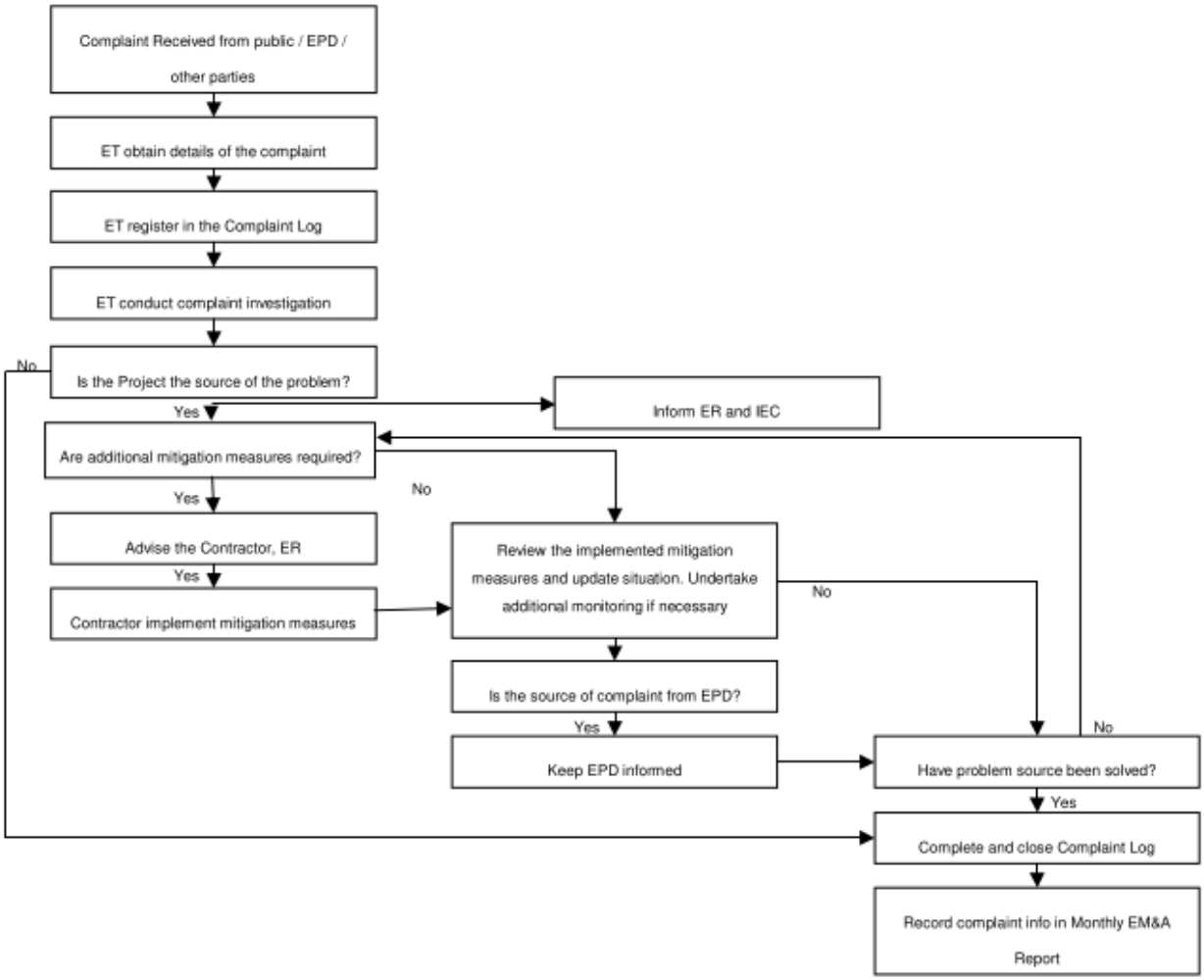
Prepared by:

Designation:

Signature:

Date:

Complaint Response Procedure



附錄 VIII. 實施時間表

Appendix VIII

Implementation Schedule

Project Profile Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Parties	Location of the measure	When to implement the measure	Relevant requirements or standards for the measure to achieve
	Noise Impact					
S.3.1	Use of quieter plant	To minimise construction noise emissions	Contractor	Work site	Construction Stage	ProPECC PN2/93 and Noise Control Ordinance
S.3.1	Use of noise enclosure and movable barrier • movable barrier can achieve a 5 dB(A) reduction for movable PME and 10 dB(A) reduction for stationary PME; • noise enclosure can achieve 15dB(A) reduction for PME; • A typical design barrier with a steel frame of vertical / cantilever type would be adopted and located close to the noise generating part of PME; • Barrier material of surface mass in excess of 7kg/m^2 shall be required to achieve the maximum screening effect (and minimum 10kg/m^2 for noise enclosure); • The length of barrier should generally be at least five times greater than its height and the minimum height of a barrier should be such that no part of the noise source will be visible from the noise sensitive receiver being protected.	To minimize construction noise emissions	Contractor	Work site	Construction Stage	ProPECC PN2/93, Noise Control Ordinance and EIAO Guidance Note NO. 9/2010
S.3.1	General Construction Noise Control Measures • The Code of Practice on Good Management Practice	To minimize construction noise	Contractor	Work site	Construction Stage	ProPECC PN2/93 and Noise Control

Project Profile Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Parties	Location of the measure	When to implement the measure	Relevant requirements or standards for the measure to achieve
	to Prevent Violation of the Noise Control Ordinance (Chapter 400) (for Construction Industry) published by EPD shall be adopted; • The statutory and non-statutory requirements and guidelines shall be complied with; • Approval for the method of working, equipment and noise mitigation measures intended to be used at the site shall be granted from the Project Engineer before commencing any work; • Working methods to minimize the noise impact on the surrounding NSRs shall be formulated and executed, and the implementation of these methods shall be monitored by experienced personnel with suitable training; • Noisy equipment and noisy activities shall be located as far away from the NSRs as is practical; • Unused equipment shall be turned off; • PME should be kept to a minimum and the parallel use of noisy equipment / machinery should be avoided; • All plant and equipment shall be maintained regularly; and • Material stockpiles and other structures shall be effectively utilized as noise barriers, whenever practicable.	emissions				Ordinance
	Air Quality Impact					
S.3.2	Construction Dust Control Measures • Decking will be provided subsequent to the completion of surface excavation works. The duration	To minimise the dust impacts arising from the	Contractor	Work site	Construction Stage	Air Pollution Control (Construction

Project Profile Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Parties	Location of the measure	When to implement the measure	Relevant requirements or standards for the measure to achieve
	of decking is around 13 months after surface excavation works; • Regular watering to reduce dust emissions from all exposed site surface, particularly during dry weather; • Frequent watering for particularly dusty construction areas and areas close to air sensitive receivers; • Cover all excavated or stockpile of dusty material by impervious sheeting or spraying with water to maintain the entire surface wet; • Provision of vehicle washing facilities at the exit points of the site; and • Provision of tarpaulin covering of any dusty materials on a vehicle leaving the site.	construction works				Dust) Regulation
	Water Quality Impact					
S.3.3	Construction Water Quality Impact Measures • The Contractor should design and implement all the mitigation measures and practices specified in the ProPECC PN 1/94 "Construction Site Drainage" and "Recommended Pollution Control Clauses for Construction Contracts" issued by EPD. • All runoffs arising from the construction site should be properly collected and treated to ensure the discharge standards as stipulated in WPCO are met. Silt trap and oil interceptor should be provided to remove the oil, lubricants, grease, silt, grit and debris from the wastewater before being pumped to the public stormwater drainage system. The silt traps and oil interceptors should be cleaned and maintained regularly.	To reduce water quality impact induced by the construction work	Contractor	Work Site	Construction Stage	ProPECC PN1/94; Water Pollution Control Ordinance

Project Profile Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Parties	Location of the measure	When to implement the measure	Relevant requirements or standards for the measure to achieve
	• Any foul effluent should not be discharged into any public sewer and stormwater drain, unless an effluent discharge permit is obtained under the WPCO by the Contractor. • Site toilet facilities, if needed, should be chemical toilets or should have the foul water effluent directed to a foul sewer.					
	Waste Management					
S.3.4	Construction Waste Management Measures • Excavated material should be reused on site as far as possible to minimise off-site disposal. Scrap metals or abandoned equipment should be recycled if possible. • Waste arising should be kept to a minimum and be handled, transported and disposed of in a suitable manner. • The Contractor should adopt a trip ticket system for the disposal of C&D materials to any designated public filling facility and/or landfill. Independent audits of the Contractor and resident site staff will be undertaken to ensure that the correct procedures are being followed. • Chemical waste shall be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes. • All general refuse should be segregated and stored in enclosed bins or compaction units and waste separation facilities for paper, aluminium cans, plastic bottles etc. should be provided to facilitate reuse or	To adopt waste management measures in the way of avoiding, minimising, reusing and recycling so as to reduce waste generation	Contractor	Work Site	Construction Stage	Waste Disposal Ordinance (Cap. 54); Waste Disposal (Chemical Waste) (General) Regulation; ETWB TCW No. 31/2004; ETWB TCW No. 19/2005.

Project Profile Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Parties	Location of the measure	When to implement the measure	Relevant requirements or standards for the measure to achieve
	recycling of materials and their proper disposal.					
	Landscape and Visual Impact					
S.3.5	Landscape and Visual Measures • Screening of construction works by hoardings/noise barriers around works area with visually unobtrusive colours	To reduce visual impact by construction works.	Contractor	Temporary Storage Area at Salisbury Road	Construction Stage	EIAO
S.3.5	• Reinstating the affected amenity planting area at Salisbury Road after the completion of works	To prevent loss of planter after construction	Contractor	Temporary Storage Area at Salisbury Road	Operation Stage	ETWB TCW No. 2/2004