

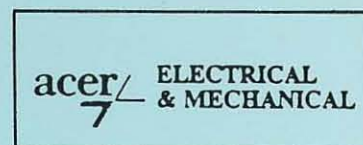


Highways Department
Highways (Hong Kong) Region

DESIGN AND CONSTRUCTION OF SMITHFIELD EXTENSION

ENVIRONMENTAL IMPACT ASSESSMENT
REPORT

EXECUTIVE SUMMARY



EIA/00
EIA-031/BC

**ENVIRONMENTAL IMPACT ASSESSMENT
REPORT**

EXECUTIVE SUMMARY

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2. OPERATIONAL PHASE ASSESSMENT
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FEBRUARY 1994

1. INTRODUCTION

- 1.1 In August 1993, the Design Review Report identified a layout for the Smithfield Extension project which was in the same month endorsed by the Ad-hoc Steering Group set up for the purpose. The location plan and the layout of the proposed extension is shown on figure 1. This layout was then the subject of an Environmental Impact Assessment (EIA), the results of which were presented to Government. Following consideration of comments made by Government, the Environmental Impact Assessment Report for the Smithfield Extension project has now been finalised, and this Executive Summary has been prepared from that Report.
- 1.2 The Executive Summary follows the headings of the full Report, which covers operational phase assessment, construction phase assessment, and monitoring and audit requirements. The final recommendations of the full Report are also summarised.

2. OPERATIONAL PHASE ASSESSMENT

Noise Impact Assessment

- 2.1 The traffic Noise Impact Assessment has revealed that traffic flows for 2006 would result in high facade levels at all Noise Sensitive Receivers (NSR) along Smithfield and most of the NSR along Old Pokfulam Road. Apart from Tresend Garden, Smith Court, Mei Wah Mansion and Wah Fai House, the main noise contribution is from the existing roads.
- 2.2 Direct technical remedies have been considered as protection for all NSR, including those affected by the existing road system, with facade noise levels in excess of 70 dB(A) L10(1hr) during peak traffic hours. It has been shown that by employing noise reducing friction course and a 2.5m high noise barrier along the section of new road facing Mei Wah and Wah Fai Mansions, and by providing 2.5m high parapet walls from Fulham Garden to the junction of Pokfulam Road and Mount Davis Road along the footpath of the northbound carriageway of Pokfulam Road, the noise levels affecting NSR in Mei Wah Mansion and Wah Fai House are reduced to below the desirable limits of HKPSG. However, barriers are ineffective for the NSR primarily affected by traffic on Pokfulam Road.
- 2.3 The effectiveness and practicability of providing a noise containment enclosure over Smithfield outside Tresend Garden and Smith Court has been assessed. However a gap has to be left in this enclosure for fire services access, and with this gap an enclosure would not bring the necessary relief to all NSR. Also, the vertical supports and sidewalls of the enclosure would reduce pavement width below acceptable levels, and would interfere with the sightlines of vehicles exiting from Tresend Garden. It is thus concluded that provision of an enclosure is both insufficiently effective and impractical.

- 2.4 The only direct technical remedy which can be provided along the existing Smithfield is a noise reducing friction course, and relief from this is insufficient. Thus, provision of indirect technical remedies in the form of insulation and air-conditioners is recommended to 51 units in Tresend Garden and 33 units in Smith Court eligible in accordance with the criteria laid down by the Environmental Protection Department. A submission will be made to the Executive Council for approval of the provision of these indirect technical remedies.

Air Quality Impact Assessment

- 2.5 During the operational phase, the major source of air pollution will be vehicle emission. Air Sensitive Receivers (ASR) in the vicinity of the scheme include, in addition to the NSR set, users of the Urban Council Playground at Pokfulam Road. Air quality predictions relevant to these ASR have been made using appropriate air pollution modelling techniques.
- 2.6 The predicted concentrations of Nitrogen Dioxide (NO₂) and Respirable Suspended Particulates (RSP) are well below the maximum allowable concentrations stipulated in the Hong Kong Air Quality Objectives (AQO).
- 2.7 The Pokfulam Road Underpass will be operated with the southern portal under a negative pressure and the western portal under a positive pressure using a series of exhaust fans inside the tunnel. Thus the impact of air emissions from the southern portal will be negligible. Model analysis indicates that the impact on ASR from emissions from the western portal will also be negligible, with NO₂ and RSP concentrations within AQO limits at the nearest ASR including the active recreational areas of Pokfulam Playground, which will be located at least 5m away from Pokfulam Road.
- 2.8 The cumulative air quality impacts on all ASR are predicted to be within AQO standards, and no mitigation measures are therefore necessary in respect of air quality as a result of operation of the scheme.

3. CONSTRUCTION PHASE ASSESSMENT

Noise Impact Assessment

- 3.1 Construction of the Smithfield Extension will generate noise from the use of powered mechanical equipment. The work will take around 34 months to complete.
- 3.2 The works will be subject to the provisions of the Noise Control Ordinance which restricts noise emission between 1900 and 0700 hours. In addition, a non-statutory noise limit of 75 dB(A) Leq (30 mins) will be imposed on the Contractor's daytime working.

- 3.3 An assessment of the noise likely to be generated by construction plant has been carried out, and this indicates that noise levels would be excessive at some locations if unmitigated. It will therefore be necessary to ensure that the Contractor adopts all practicable noise mitigation measures, including the use of silenced equipment, quiet construction methods, scheduling of work, and use of noise barriers. The use of such measures will therefore be made a requirement of the contract, and monitoring will be carried out to enforce their use.

Air Quality Impact Assessment

- 3.4 Dust will be emitted during earthworks, cut and cover operations, and construction of the elevated road foundations. This could cause nuisance to sensitive receivers surrounding the site. Other minor air emission sources, such as asphalt emissions during laying of road pavement, and exhaust from powered mechanical equipment, are unlikely to have any adverse impact on air quality.
- 3.5 Dust concentrations during construction have been calculated based on modelling techniques which represent dust sources as area sources. It has been assumed that no concrete batching plant will be established within the site for this project, due to site constraints, but in all other respects worst-case construction activity scenarios along the entire alignment have been assumed.
- 3.6 Results show concentration levels for individual receivers to be within the AQO limits. However despite this, and in view of the difficulty of predicting meteorological conditions, construction methods, and the duration of construction activities, mitigation measures should be undertaken on site and will be specified.
- 3.7 The most common dust control method for exposed site surfaces is watering, the effectiveness of which depends on the degree of coverage and the frequency of application. Effective use of watering will thus be a contract requirement. To help control dust generated by the transport of soil by dumptruck, materials with the potential to create dust should not be loaded to a level higher than the side and tail boards, and this will be a contract requirement also.

4. WATER QUALITY ASSESSMENT

Construction Stage Assessment

- 4.1 Water quality in stream courses will not be adversely affected during construction provided proper pollution control measures are taken. The Contract will require that water containing high concentrations of suspended solids not be pumped or discharged directly to streams or drains. Silt traps or settling containers will be provided to reduce the amount of suspended solids. Wheel washing bays at all exits will be provided to avoid silt being deposited on existing roads. All materials, plant, fuel or oil delivered to site will be properly stored to prevent any pollution to the existing stream and drainage system. Grease traps will be provided to contain any accidental spillage. Existing streams, drainage system silt and grease traps will also be adequately maintained at all times to prevent pollutants discharging to the streams and drains.

Operation Stage Assessment

- 4.2 The impact on water quality of the introduction of the Smithfield Extension will be minimal. The clearance of squatters on the downhill slope will contribute to improved water quality as the amount of improper sewage discharge and rubbish dumping will be reduced.

5. CONSTRUCTION WASTE IMPACT ASSESSMENT

Waste Impact Assessment

- 5.1 Construction wastes and debris including cut timber, set concrete, packing materials etc, will be generated in the course of the construction. However, the construction of Smithfield Extension will produce only small quantities of such waste and no contaminated materials. The Contractor will be required to dispose of all unsuitable material outside the site.

6. VISUAL IMPACT

- 6.1 The residents within the project area enjoy views onto green natural hillside, and views of the tree-lined Urban Council (UC) playground area. The proposed alignment is designed so that the bridge structure on Smithfield Extension is close to the hillside slopes which will minimize visual intrusion. At Mt Davis Road where bridge piers and columns may be more intrusive, textured finishes and compensatory planting are proposed to reduce the visual impact. Also, every effort will be made to preserve existing vegetation and trees. Although the scheme requires occupation of the UC Playground through construction by the Contractor, it will be reinstated after the completion of construction.
- 6.2 Relocation of the squatters along the hillside will improve the appearance of the hillside and additional landscaping will further ease visual impact.

7. MONITORING AND AUDIT REQUIREMENTS

- 7.1 The objective of a monitoring and audit programme is to identify as early as possible a deterioration in the noise and air quality and to enact measures to reverse such deterioration.
- 7.2 Construction noise will be monitored at least three times per week, involving measurement over a 30-minute period of typical activities.
- 7.3 Baseline monitoring of construction dust will be carried out for two weeks prior to start of construction, and 24 hours samples, and at least three 1-hour samples, will be taken every six days during construction phase.
- 7.4 A Construction Noise Action Plan will be triggered when the construction noise exceeds 75dB(A) Leq (30 mins).
- 7.5 A Construction Dust Action Plan will be triggered when ambient TSP concentrations exceed the baseline by 30 percent.

8. RECOMMENDATIONS

- 8.1 The recommendations of the Environmental Impact Assessment Report can be summarised as follows:

To mitigate operational phase noise:

noise reducing friction course should be applied on the existing Smithfield and Smithfield Extension;

a 2.5m high parapet wall should be provided on Pokfulam Road, and a 2.5m high barrier should be provided along the section of new road facing Mei Wah and Wah Fai Mansions to reduce noise impact on NSR in these buildings;

indirect technical remedies, in the form of acoustic insulation and provision of air conditioning, should be provided for Tresend Garden and Smith Court subject to EXCO's approval.

To ensure operational air quality:

Forced ventilation should be provided to vent out of the western portal of the Pokfulam Road Underpass. A 5m buffer area should be provided at the Pokfulam Playground along the Pokfulam Road within which no active recreational areas should be located.

To mitigate construction noise:

The Contractor should be required to adopt a package of noise mitigation measures.

To maintain air quality during construction

The Contractor should be required to adopt a package of dust mitigation measures.

To maintain water quality

The Contractor should be required to take pollution control measures during construction. After completion the impact on water quality due to the introduction of the Smithfield Extension will be minimal and no mitigation measures are necessary.

To contain construction waste

The contractor should be required to dispose of all unsuitable material outside the project site.

To minimise the visual impact

Every effort will be made to preserve the existing vegetation. Tree loss will be minimised and where inevitable will be compensated for by replanting. At Mt Davis Road where the bridge piers and columns are visually intrusive, textured finish and compensatory planting will be provided.

中文譯本

**CHINESE TRANSLATED
VERSION**

環境評估報告

執行摘要

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6. 視覺影響
7. 監察和審核的要求
8. 建議

1. 序言

- 1.1 於一九九三年八月，設計重審報告確定士美非路延長工程計劃路線，並被於同月為此專設的臨時督導小組所確認。此位置平面圖及佈置可見於圖一。這設計成爲一個環境影響評估（EIA）的研究對象，而研究所得結論將提交政府審議。綜合政府對此作出之意見，士美非路延長工程環境影響評估報告現已被定稿，而這篇執行摘要乃由此報告，準備而成。
- 1.2 執行概是要依據這整份報告的標題，包括使用期評估、施工期評估、監察及審核要求，而這份報告的總結推薦也被摘要。

2. 使用期評估

噪音影響評估

- 2.1 道路交通噪音影響評估已顯示於二零零六年。所有在士美非路及大部份舊薄扶林道一帶對噪音感應強的地方（NSR），其交通流量引致之噪音，將在高於正面水平線上。除翠麗苑、時美閣、美華樓及華輝大廈外，主要噪音的來源是由原有舊道路所引發。
- 2.2 對於 NSR，直接保護技術措施已經被考慮，包括那些受舊有道路系統影響人仕，其受噪音水平在繁忙交通時間高於70分貝L10（一小時），研究顯示出，採用減音路面，在新路一段沿線上加設 2.5 米 高的隔聲屏障，及由富林苑至薄扶林道和摩星嶺交界的一段北行薄扶林道行人路上，加設 2.5 米高的碟牆。美華樓及華輝大廈的噪音影響者，其受噪音水平，將降至低於香港規劃標準與準則(HKPSG)規定之程度。無論如何，隔聲屏障是對那些主要受薄扶林道交通影響者是無效的。
- 2.3 對於位於翠麗苑及美華樓的一段士美非路，加置隔聲屏罩的有效性及其實際性已作出評估。但是，一個缺口必須保留在隔聲罩上作為火警時救急之用，而這隔聲罩缺口，將令所有噪音影響者未能收到有效的隔音緩和作用。同時，隔聲罩的支柱及外牆，將令路面闊度低於可接受程度及將干擾翠麗苑一段行車視線。總括來說，採用隔聲罩是無效及不實用的。
- 2.4 唯一的直接補救措施是在現有士美非路加上減音路面，但相信這些是不足夠的。因此，建議一個非直接補救措施，是在五十一戶翠麗苑及三十三戶時美閣中，于符合環境保護署所定下之準則，安裝隔音裝置及空調設備，而對於這非直接補救措施的一份建議書，將會交由行政局批准。

空氣質素影響評估

- 2.5 在使用期間，主要的空氣污染將來自車輛所噴出之廢氣。在此工程範圍或鄰近對空氣感應強的地方 (ASR)，包括那些 NSR 及市政局轄下位於薄扶林道的遊樂場之使用者。對於這些空氣污染影響者，其受空氣質量已基於空氣污染模擬技術作了出預測。
- 2.6 預測二氧化氮 (NO_2) 的濃度和可吸入的懸浮粒分子 (RSP)，將遠低於香港空氣質素指標 (AQO) 規定之最高許可濃度。
- 2.7 薄扶林道之隧道內的空氣流通，是利用一連串安裝在隧道的強力抽氣扇造出一個南面低氣壓區和西面高氣壓區。因此，於南面出口的空气污染則極為微小，而模擬分析顯示對於 ASR 來說，由西面出口的空气污染也極為微小。在距離薄扶林道最少五米外最近 ASR 範圍包括薄扶林遊樂場康樂區，其二氧化氮和空氣浮游物的濃度亦會低於 AQO 規定。
- 2.8 累積空氣質素影響對於所有 ASR 範圍將估計在 AQO 之規定內，基於空氣質量，在使用期內可確定不需要舒緩措施。

3. 施工期影響評估

噪音影響評估

- 3.1 建築士美非路延長工程期間，在使用發動機械裝備時，將會產生噪音。而工程約需三十四個月才完成。
- 3.2 工程將基於噪音管制條例下，管制噪音在晚上七時至凌晨七時的發放；同時，承建商在日常施工時，噪音管制亦限於在 75 分貝下 Leq (三十分鐘)。
- 3.3 根據由工程機械所產生的噪音已作出評估，並顯示出在部份地區如沒有舒緩措施，產生噪音程度將超越規定。因此，需要確定承建者，採用所有實際噪音舒緩措施，包括使用寂靜裝備、寂靜工程方法、制訂工作時間表和使用噪音隔音罩等，這些措施將成為合約的一個必要條件，監察實施。

空氣質素影響評估

- 3.4 在道路建築興建隧道，及天橋地基工程所產生的泥塵，將對於鄰近地盤感應強的樓宇產生滋擾。其次空氣污染排放的來源，如鋪放道路路面瀝青和發動機械裝備的排放廢氣，將不會對空氣產生不良影響。

- 3.5 根據模擬技術，泥塵的來源，中心作為代表範圍來源中心，而計算出在
施工期間泥塵的濃度，並假想不會有任何混凝土製造的設置，但在整條
路線上預計最惡劣的情況，亦已在假設內。
- 3.6 結果指出，對於個別影響者，其濃度程度將在 AQO 之規定內，無論如
何，儘管這些由於在難以估計氣象情況、施工方法及施工為期間，緩和
措施則需要在地盆作詳細指定和實施。
- 3.7 對於地盆路面最普遍泥塵管理方法是灑水，其有效性則在於範圍大小及
實行的頻密次數。有效地使用灑水，因而成為合約的一個規定，為幫
助管理因泥頭車搬運時所產生的泥塵，合約亦規定可產生泥塵的材料，
必須不可堆積高過圍板。

4. 水質評估

施工期間評估

- 4.1 在施工期間，恰當的污染管制措施，可確保河流水質不受影響。 建築
合約訂明，污水若含有高度懸浮物，將不准直接排放或抽放至河流或下
水道。 為減少懸浮物，將興建隔泥井或沉澱槽等。 為減少泥塵散落
在附近的道路上，所有工地出口將設置輪軟清洗處，而所有建築材料、
機械燃料和燃油，於運抵工地後，應適當的儲藏，以防止洩漏油污，污
染河流。 又經常巡查及維修現有河流及下水道、隔泥井和隔油井，以
防止有污染物排放於河道及下水道。

使用期間的評估

- 4.2 士美非路延長工程極少影響水質。 遷徙山腳木屋後，從而減少污水及
垃圾的堆積，可使水質得到改善。

5. 建築廢物影響評估

廢物影響評估

- 5.1 建築工程產生的廢物，其包括木頭，三合土及其他物料。 然而，士美
非路延長工程祇製造少量建築廢物和無受污染的物料，所有不合適的物
將由承建商運出工地處理。

6. 視覺影響

- 6.1 在施工範圍內的居民，在視覺上享受著翠綠的山坡以及林蔭的市政局公園。為使減少視覺上的干擾，故建議的在路線設計上，使行車橋緊靠著山坡，而在摩星嶺道的橋柱可能更影響視覺。為減少視覺影響，橋柱表面將加以修飾及補種植物。現有的樹木及植物將盡量保持。因工程而暫時封閉的市政局公園將會於工程完結後重開。
- 6.2 遷徙沿山木屋，將可改善山坡外貌，加上美化景觀，將進一步消除視覺上的影響。

7. 監察和審核的要求

- 7.1 監察的目的是要盡快察覺噪音與空氣污染的惡化，及時制定辦法加以改善。
- 7.2 每星期至少三次檢查施工時所產生的噪音，包括不少於三十分鐘的量度日常施工活動。
- 7.3 在開始工程兩星期前，收集該地區的塵埃量定一基數。在施工期間每六天收集一次二十四小時的樣本及最少三次一小時的樣本。
- 7.4 當噪音超過75分貝 Leq（三十分鐘），會實行一套施工噪音應變計劃。
- 7.5 當工地附近的總懸浮粒子（TSP）濃度超過基數的百份之三十時，會實行一套施工塵埃應變計劃。

8. 建議

- 8.1 環境影響評估報告書的主要內容，可歸納如下：

減少施工期間的噪音：

- 現時的士美非路及其延長部份，鋪上減音路面。
- 在薄扶林道興建一段 2.5 米高的堦牆，另外在美華樓及華輝大廈對出的一段新路上，興建一段 2.5 米高的隔聲罩，以減低該兩幢大廈內 NSR 所受的噪音滋擾。

- 採用間接補救措施，在翠麗苑與時美閣安裝隔音玻璃窗和空氣調節系統，但此等安排有待行政局批准。

維持施工期間的空氣質素：

- 利用抽氣扇把薄扶林道隧道內的汽車廢氣抽離。同時亦預留一段五米闊的緩衝地帶，將不設置任何康樂設施。

減少施工時的噪音：

- 承建商需採用一系列的減少噪音措施。

維持施工期間的空氣質素：

- 承建商需採用一系列的減少塵埃措施。

維持水質：

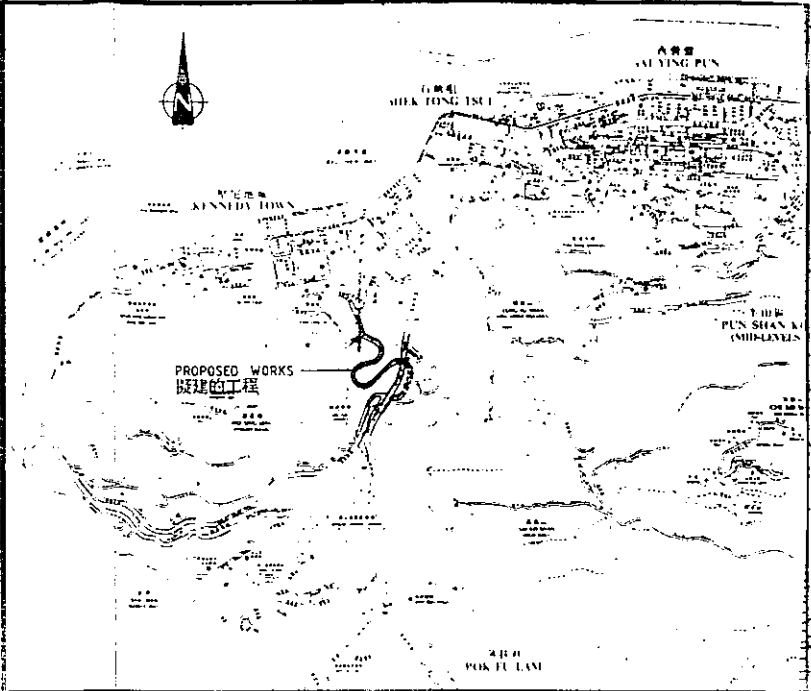
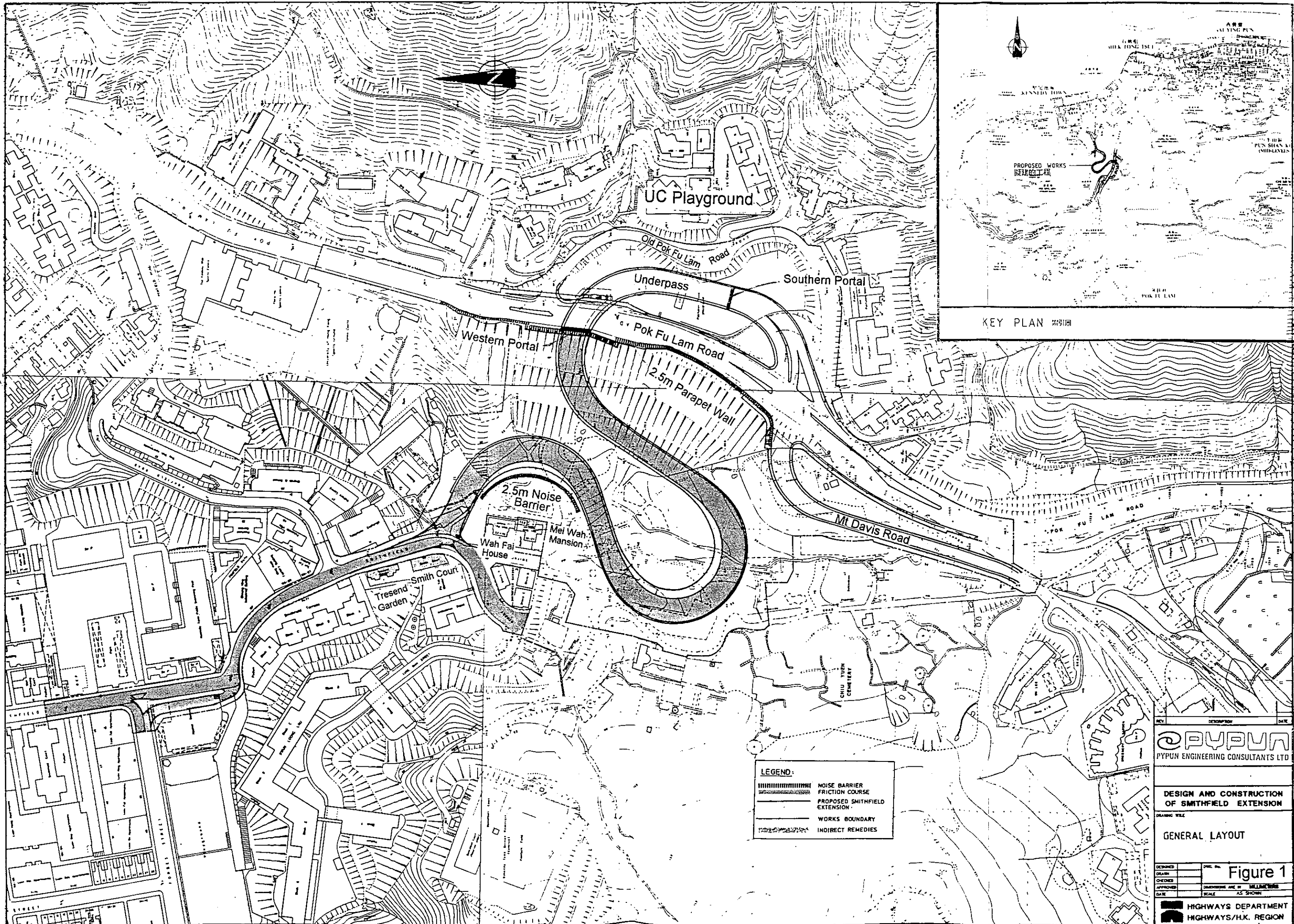
- 承建商於施工期間需進行管制水質污染措施。士美非延長工程完成後，水質污染將會消除，該些預防措施便可終止。

處理建築廢物：

- 承建商負責把建築廢物運出工地外處理。

減少視覺影響：

- 現有的植坡將會盡量保留，而樹木的損失量亦將會減至最低。如無可避免時，需要再植樹木以作補償。而摩嶺道的橋柱，在視覺上有較大影響，橋柱面將加以修飾和在適當的位置種上植物。



KEY PLAN

LEGEND:

	NOISE BARRIER
	FRICTION COURSE
	PROPOSED SMITHFIELD EXTENSION
	WORKS BOUNDARY
	INDIRECT REMEDIES

PYPUN
PYPUN ENGINEERING CONSULTANTS LTD

DESIGN AND CONSTRUCTION
OF SMITHFIELD EXTENSION

GENERAL LAYOUT

DESIGNED	DATE	Figure 1
DRAWN		
CHECKED		
APPROVED		
DATE	SCALE	AS SHOWN

HIGHWAYS DEPARTMENT
HIGHWAYS/H.K. REGION

