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路政署主要工程管理處
Highways Department
Major Works Project Management Office

KTB/202/第三稿 KTB/202/Issue 3

合約編號 CE 7/94 Agreement No. CE 7/94

工務項目編號 6246TH PWP Item No. 6246TH

# 錦田繞道 Kam Tin Bypass

設計和施工工程顧問 Design and Construction Consultancy

環境影響評估 Environmental Impact Assessment

> 執行摘要 Executive Summary

聯合顧問公司 Joint Consultants

-JA-088.1/RC

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in association with

賓尼工程顧問有限公司 Binnie Consultants Limited 施偉拔顧問有限公司 Wilbur Smith Associates Limited 夏達能(遠東)顧問有限公司 Harris & Sutherland (Far East) Limited

Peter Tan & Associates

一九九六年二月 February 1996

及

Agreement No. CE 7/94

Design and Construction Consultancy for Kam Tin Bypass EIA - Executive Summary

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## 1 INTRODUCTION

Kam Tin is located in the North West New Territories (NWNT), 3 km to the east of Yuen Long.

At present, Kam Tin Road is a 2-lane 2-way single carriageway road with the provision of narrow footpaths. With the opening of the Tolo Highway and the New Territories Circular Road, and the rapid development of the NWNT areas, Kam Tin Road has been increasingly used as a main route for east-west traffic movements. The road is currently approaching its capacity and will experience serious traffic congestion in the future. Additional traffic burden is expected when the Route 3 (Country Park Section) opens to traffic in 1998.

A joint venture between Binnie Consultants Limited, Wilbur Smith Associates Limited and Harris & Sutherland (Far East) Limited has been appointed by Highways Department to undertake the review, design, tender documentation and construction supervision of a dual 2-lane carriageway road to bypass Kam Tin.

The new route, about 1.3 km long and constructed on an embankment, will run to the north of Kam Tin connecting onto Kam Tin Road to the east and west of the rural centre (general layout see Figure 1). This will relieve the section of Kam Tin Road through the central area of Kam Tin of traffic. The implementation of Kam Tin Bypass will reduce traffic noise levels at residences along Kam Tin Road.

An Environmental Impact Assessment (EIA) Study has been undertaken to determine the acceptability of residual environmental impacts and cumulative effects, requirements for implementation of the Project, and the basis for and implications of those requirements.

## 2 POTENTIAL CUMULATIVE IMPACTS

Throughout the EIA study period, information has been sought about any nearby projects. The potential for any environmental impacts from the Kam Tin Bypass project increasing predicted impacts from other projects or vice versa has been continuously reviewed. The two projects of most concern have been the 43 CD drainage channel works and the construction of the Yuen Long section of Route 3.

Due to the timing of these two projects or to the sensitive receivers affected, Kam Tin Bypass project will not noticeably affect or be affected by either of these two projects from an environmental viewpoint.

#### 3 NOISE

Noise from the construction of the Bypass will be noticeable for limited periods at some residences. This noise will be subject to careful monitoring and checking to ensure it does not exceed EPD's standards or recommendations at any time.

Construction noise calculations have been based on the worst case scenario for each noise sensitive receiver, ie. when the nearest section of the Bypass to that NSR undergoes construction as well as for the major activities.

Provided that the recommended mitigation measures is implemented, noise levels can be maintained below 75 dB(A) at dwellings during the daytime and below 70 dB(A) at schools (or below 65 dB(A) during examinations).

Traffic noise is the only significant source of noise for the operation of Kam Tin Bypass. Without any direct technical remedies such as friction course or barriers, about 160 dwellings and 3 schools would suffer from traffic noise levels above the HKPSG criteria after completion of the roadworks. The noise modelling studies have shown that the construction of substantial permanent noise barriers is essential to protect existing and future residents of Kam Tin and the surrounding areas from the impact of traffic noise.

Traffic noise levels have been carefully assessed taking into account all residences and schools in the area and all future sensitive land use. Noise reduction measures have been designed to meet at minimum the Hong Kong Planning Standards and Guidelines up to the year 2011. Mitigation will include the use of noise-reducing friction course and noise barriers (with architectural and landscape treatment).

A 1 metre high noise barrier will be built along the full length of the northern side of the Bypass, except for a short section with a 2 metres high noise barrier. The proposed mitigation measures will ensure that 3-storey houses can be built to the north of the Bypass in future, without traffic noise forming a constraint to their development.

In order to protect both existing and future NSRs to the south of the Bypass, it will be necessary to construct higher noise barriers along the southern boundary of the Bypass. Most of these barriers will be 2 metres high built on top of a 1.5 metre high earth bund. For a short section, the noise barriers will need to be increased to 3.5 metres and 5.5 metres high respectively (see Figure 2).

After completion of the works and the implementation of the direct technical remedies, that is the earth bunds, about 2½ km of barriers, and a section of friction course, 5 dwellings and 1 school will still exceed the HKPSG criteria. However, in every case the exceedance is due to traffic noise from Kam Tin Road. No dwelling meets the "eligibility criteria" for indirect technical remedies.

## 4 AIR QUALITY

The construction of Kam Tin Bypass is not expected to cause any significant dust impacts in relation to the Air Quality Ordinance (AQO) standard, providing that good site practices designed to minimise the generation of construction dust are fully implemented. The regular watering of haul roads is of particular importance.

The major source of operational phase air pollution will be vehicular emissions from traffic on Kam Tin Bypass and Kam Sheung Road. Traffic air pollution is mainly nitrogen dioxide ( $NO_2$ ) and respirable suspended particles (RSP). Predicted Pollution levels due to operational phase traffic emissions meet the AQO standards, consequently no mitigation measures are considered necessary to reduce their impact.

## 5 LANDSCAPE AND VISUAL IMPACT

The landscape and visual assessment has evaluated the existing landscape and visual quality in the Study Area, identified representative sensitive receivers, analysed the impacts of the Project on the area and proposed effective mitigation measures. Without mitigation, the Bypass would degrade the existing visual quality.

The perspective views presented in the landscape and visual impact assessment demonstrate the effectiveness of a comprehensive landscape and tree planting programme. Extensive landscaping will be provided under the Kam Tin Bypass project. The roadside will be planted with substantial quantities of suitable trees and scrubs. The visual appearance of the area will change but will be made green and attractive under the landscaping plan.

#### 6 ECOLOGY

Field investigations have been undertaken in the Study Area to assess the overall conservation importance and general wildlife interest of the area. None of the animal and plant species recorded in the Study Area are listed in either the Forests and Countryside Ordinance (Cap 96) or in the Animals and Plants (Protection of Endangered Species) Ordinance (Cap 197).

Areas potentially affected by the Project include agricultural land, the Kam Tin River and associated reedbeds, fishponds and the Ko Po Village Egretry. Construction of the Bypass will necessitate the loss of around 5 hectares of agricultural land currently used for commercial production of water spinach (*Ipomoea aquatica*). In addition, some large individual trees and other plants will inevitably be lost.

The fishponds and reedbeds are located outside of the Works boundary and are not expected to be affected by this Project. Mitigation measures recommended for water, air and noise have been assessed in minimising impacts to the Kam Tin River and the Ko Po Village Egretry.

Although two existing tree corridors, at either end of the middle section of the Site, are to be lost, the subsequent landscaping and replanting with native plant species along the Bypass boundary would improve the visual quality of the Project as well as the overall ecology of the area.

## 7 WATER QUALITY

Kam Tin is located within the Deep Bay Water Control Zone. In view of the existing highly unsatisfactory water quality in Deep Bay and the ecological and economic importance of Deep Bay, stringent requirements for effluent discharges into waters within the Deep Bay WCZ are laid out in the relevant legislation.

We do not anticipate deterioration in surface water quality or contamination of any agricultural land or fishpond due to the construction of the Kam Tin Bypass, provided that the stipulated site management practice and sensible measures are observed.

#### 8 CONSTRUCTION WASTE & SPOIL MANAGEMENT

Wastes will be generated during the site clearance and construction of the Kam Tin Bypass. In order to minimise unnecessary wastage, the EIA considered potential for reuse and recycling of construction materials.

Most fill material will be imported from the Tai Tong East Borrow Area in Yuen Long, where some  $110,000 \text{ m}^3$  of material has been reserved for the Project. The remaining small quantity of fill will be reused material excavated from the Site and material from another borrow area.

#### 9 EM&A MANUAL

An Environmental Monitoring & Audit Manual has been developed as part of the EIA Report to ensure that good construction practice and monitoring and audit of environmental effects is carried out systematically. The manual also provides a schedule of post project evaluation to allow the identification of unforeseen detrimental impacts. The manual includes a set of Contract Clauses recommended to ensure protection of the environs of the project.

## 10 CONCLUSION

Provided that the requirements of the EIA and the Environmental Monitoring & Audit Manual are carried out diligently, particularly with respect to:

#### Construction Phase

- (i) erection of appropriate temporary acoustic barriers near the most affected NSRs during the construction phase;
- (ii) use of quiet working methods;
- (iii) frequent watering of haul roads, exposed areas and dusty stockpiles;
- (iv) proper installation, use and maintenance of wheel washes at Site exits;
- (v) adequate management of Site runoff;

#### **Operational Phase**

- (vi) construction of permanent noise barriers and application of friction course on sections of the Bypass;
- (vii) appropriate and well-maintained landscaping and tree planting,

the Project can be constructed and operated with a minimum of impact on the environment, to the benefit of both current and future residents in the Study Area and users of the new Kam Tin Bypass.

The Kam Tin Bypass is an integral and essential part of Highways Department's development of the road network in the North West New Territories. Highways Department is committed to constructing and operating the new road in a manner which minimises adverse environmental impacts on the existing and future residents of the Kam Tin area.

The Kam Tin Bypass Project will generally give an overall improvement to the environmental quality of the Kam Tin area. The Bypass will reduce levels of traffic noise and traffic emissions experienced by residences near Kam Tin Road whilst allowing the development of sensitive land uses adjacent to the Bypass.

# 一. 緒言

錦田位於新界西北,在元朗以東約三公里。由於近期新界西北的急速發展,以 及吐露港公路和新界環迴公路的相繼通車,錦田路成為了貫通新界東西的一條 要道。但現時的錦田路祇是一條附有狹窄行人道的雙線雙程行車道,錦田公路 的交通已漸趨飽和,以及面臨嚴重交通擠塞。展望於一九九八年,錦田公路的 交通負荷更會因三號幹線(郊野公園段)的開放而日益嚴重。

為了盡早減輕錦田公路(石崗至錦田市段)的交通負荷,香港政府路政署委任 了由賓尼工程顧問有限公司、施偉拔顧問有限公司和夏達能(遠東)顧問有限 公司所組成的聯合工程顧問進行覆驗、設計及監督建造一條四線雙程分隔行車 道的錦田繞道。該繞道將會是全長1.3公里及建築在土堤上。繞道與錦田公路之 東西連接點分別位於石崗軍營西端和錦田市西面(請參考圖一)。預計在繞道 落成之後,貫通錦田市中心的一段錦田公路(石崗至錦田市段)的交通流量將 會大為減少,因此錦田公路兩旁的居民可望享受一個比目前寧靜的環境。

聯合工程顧問最近完成了一個環境影響評估報告。在該報告中,聯合工程顧問 評估了在錦田繞道通車前後,附近民居將會受到的環境影響,並作出了一系列 減輕該等環境影響的建議。

# 二. 鄰近工程的潛在相互環境影響

由於錦田繞道附近有幾項大型基建工程正在施工中,其中最關切的包括渠務署 設計及監督建造之錦田河改善工程(編號43CD)及路政署統籌之三號幹線(郊 野公園段),聯合工程顧問亦評估了這些工程對錦田繞道工程的相互潛在環境 影響,期間亦向有關工程負責部門或工程公司索取了有關資料進行評估。

由於這兩項工程的施工期及受影響的地方和錦田繞道的無明顯抵觸,錦田繞道 和這兩項工程在環境方面沒有實際的相互的影響。

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## 三. 噪音

預計在繞道施工期間,繞道旁特別接近工地的一些民居在某一段相對地較短的 施工期將會受到建築噪音影響,但有關方面,將會就此進行嚴謹的監察,確保 在任何時刻對居民的影響會減至環境保護署的法定或建議標準以下。

報告內,建築噪音是基於建造工程對附近受滋擾的民居在可預見最壞情況下的 影響來估計。亦即是說,假設在建築高峰期內,在該等民居附近的不同工程工 序會同時展開。如實行報告內的消減噪音建議,估計施工期間的日間噪音水平 將會維持在75分貝以下,學校所受的噪音影響會在70分貝以下〔或在考試期間 在65分貝以下〕。

在錦田繞道通車後,交通噪音是唯一重要的噪音來源。如不加設防滑壢青路 面、隔音屏障等消減噪音措施,大約有160戶民居和3間學校會受到超出香港規 劃標準的噪音滋擾。聯合工程顧問的模擬噪音研究的結論指出,為了保護錦田 及鄰近現時或未來發展地區的居民免受交通噪音滋擾,廣泛興建永久隔音屏障 在所難免。報告中對交通噪音的影響進行了小心的評估,已把附近民居、學校 和將來土地使用等因素包括在內,建議的噪音消減措施更確保到2011年時亦能 符合香港規劃標準及指引的標準。建議的措施包括在馬路面舖設有消減噪音功 能的防滑瀝青路面以及沿路加設適當的隔音屏障。而這些隔音屏障將會配合適 當的景觀美化設計來建造。

在整條繞道的北邊,報告建議興建一條一米高可作隔音屏障的混凝土側護攔, 但其中一小段將需要加至兩米高。這道隔音屏障使將來在錦田繞道北面可能興 建的三層高鄉村屋宇免受交通噪音影響。繞道南邊建議興建的隔音屏障,大部 份為2米高,並建築在比路面高1.5米的小土堤上。在東邊的一小段隔音屏障有 需要加高至3.5米及5.5米(請參考圖二)。

在繞道實施減低噪音措施包括建造總長度2、5公里的隔音屏障及在一段繞道路面 鋪上防滑壢青後,依預測在繞道開放通車時,仍有5戶民居及一間學校將會受到 超出香港規劃標準的噪音影響。但根據模擬噪音研究,這些噪音均來自錦田公 路的交通噪音。而這些民居可能面對的噪音亦未達至有需要採用間接減低噪音 措施的地步。

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## 四. 空氣質素

在錦田繞道施工期間,參照現有空氣質素條例的標準,預料工地附近的空氣質素,包括空氣中的泥塵,將不會有太大影響。在這方面需要承建商和地盤工程 監督人員通力合作,盡量減少地盤泥塵對附近居民的影響,包括經常在工地通 道上作適當的灑水。

錦田繞道通車後,最主要的空氣污染來源將會是繞道和錦上路上的汽車廢氣, 其中包括二氧化氮和空氣中的浮游粒子。因預計污染程度不會超過空氣質素條 例的標準,所以無需要特別作出減低空氣質素污染的措施。

# 五. 景觀影響

園林及景觀評估中評定了錦田繞道附近的現有自然景觀,研究了繞道工程對自 然景觀的影響,以及建議了減輕景觀影響的措施。報告發現,如不實行減輕影 響的措施,繞道工程會令附近現有自然景觀受到一定程度的損害。

園林及景觀評估報告中的透視圖展示了一個全面的園林及樹木種植計劃後的效 果。聯合工程顧問將會為繞道進行廣泛的園林設計,包括在道路兩旁種植大量 樹木及灌木,以收美化之效。繞道四周的景觀難兒會因興建繞道而改變,但園 林計劃將會綠化及美化這一帶。總括來說,經綠化後的繞道可自然融匯於四周 美觀的環境。

# 六. 生態影響

聯合工程顧問在繞道地盤附近實地調查了當地野生動、植物整體保留的重要 性,調查中並未發現任何名列在「樹林及郊野條例」或「動、植物(保護瀕臨 絕種品種)條例」上的動、植物。 繞道工程將可能會影響到現有農地、錦田河、蘆葦地、漁塘及高埔村鳥類繁殖區。大約有五公頃西洋菜田、一些大樹和其它植物會因繞道工程而無可避免地受到影響。在地盤範圍以外的漁塘和蘆葦地將不會受到工程影響,報告中提出的各種減低環境影響的措施均有助減低對錦田河和高埔村鳥類繁殖區的生態影響。

雖然兩組位於繞道中段兩端的樹木會因工程而喪失,但道路工程中包括的園林 及原生樹木再種植計劃會同時改進道路兩旁的自然景觀和整個生態環境。

## 七. 水質

錦田位於后海灣水質管制區。鑑於現時后海灣水質惡劣和后海灣的生態及經濟 重要性,有關法例對排往后海灣的污水和廢物有非常嚴格的限制。聯合工程顧 問估計繞道工程不至會令至河道水質變壞,或者附近農地及漁塘會因工程受到 污染,不過這必需有賴承建商和地盤監督人員通力合作,嚴格遵守訂下之有關 地盤管理及運作守則。

# 八. 建築廢料及棄土管理

清理地盤及施工期間自會產生建築廢料及棄土,聯合工程顧問探討了再用和再 循環建築廢料及棄土的可行性。工程所需的大部份土方將會來自元朗附近的大 棠採泥區,總數約為十一萬立方米。其餘所需的小量土方將會來自其他採泥區 及棄土再用或適用的建築廢料。

# 九. 環境監察及審核守則

為確保良好建造運作程序和環境監察能有系統地進行,聯合工程顧問制訂了一本為本工程而訂立之環境監察及審核守則。這守則亦包括了一套繞道通車後的 審核程序以應付未在預計之內的環境影響。守則中更建議了一些合約條文,促 使承建商在施工期間能切實執行環境保護措施。

# 十. 結論

為了確保錦田繞道附近的居民和使用者的利益,施工期間和通車後的環境影響 必需盡量減低。因此環境評估和環境監察及審核守則中的各種要求需要切實執 行,特別是以下各項:--

施工期間

(i) 在最受噪音影響的居民或其他建築物附近安裝臨時隔音屏障;

(ii) 使用靜音施工方法;

(iii)對工地道路、泥面及存倉土方的地方進行經常性的灑水措施;

(iv) 在地盤出入口安裝車輪洗輪池,並需作定期維修保養;

(v) 地盤排水要有足夠的管制;

繞道通車後

(i) 建造適當的隔音屏障和在路面上鋪設防滑瀝靑層以減低噪音;

(ii) 落實適當的園林美化計劃,並定期保養沿路的樹木及植物。

錦田繞道是新界西北整體道路網絡的其中重要一環,路政署切志為現在及將來 的錦田社群建造及提供一條新道路。在施工期間,影響會減至合理水平。施工 完峻通車後,錦田路旁邊的現有居民所受到的交通噪音和廢氣污染會得到一定 的改進,而錦田繞道旁的居民亦可享受一個合標準的居住環境。總括來說,錦 田繞道的興建對錦田的環境質素會帶來整體上的改善。

## END OF TEXT 〔全文完〕

February 1996





