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TERRITORY DEVELOPMENT DEPARTMENT
HONG KONG

Tseung Kwan O Development

將軍澳發展計劃

Contract No. TK43/96

合約編號 TK 43/96

Widening and Improvements of Wan Po Road

擴闊及改善環保大道

Environmental Impact Assessment

環境影響評估

Executive Summary

摘要

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MAUNSELL

CONSULTANTS ASIA LTD.

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August 1997

一九九七年八月

Maunsell Consultants Asia Ltd.

茂盛（亞洲）工程顧問有限公司

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Tseung Kwan O Development
Contract No. TK43/96
Widening and Improvements of Wan Po Road

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1. INTRODUCTION

The Tseung Kwan O Feasibility Study of Opportunities for Further Development (TKOOFD) was completed in May 1990 and endorsed by the then LDPC for implementation. Under Agreement CE13/90, Project Manager/NTE of Territory Development Department (TDD) further commissioned Maunsell Consultants Asia Limited to undertake the design and construction of Contract No. TK43/96 - Widening and Improvements of Wan Po Road (hereinafter called the "Project"). Figure 1.1 is a key plan and location plan of the Project site.

In view of the close proximity of the existing sensitive receivers to the Project site and the potential impacts of the proposed engineering works on the planned land uses along Roads P1 and D6 in Tseung Kwan O (TKO), an Environmental Impact Assessment Study has been conducted as part of the contract requirements to properly address all key environmental issues of the Project. The findings of the EIA are summarized in the following sections.

2. PROJECT CHARACTERISTICS

The proposed project comprises mainly the construction of the second carriageway of Wan Po Road (Roads P1 and D6) from its junction with access to Areas 50 and 51 to the northern boundary of the Tseung Kwan O Industrial Estate together with a flyover spanning across the roundabout at Roads P1/D4/Chiu Shun Road in TKO. Figure 2.1 shows the layout of works on the Project site.

A preliminary construction programme for the widening and improvements of Wan Po Road is given in Figure 2.2. According to the study brief, the construction works are scheduled for completion in 26 months, commencing from February 1998.

3. NOISE IMPACT ASSESSMENT AND AIR IMPACT ASSESSMENT

3.1 Environmental Setting

3.1.1 *Existing Receivers*

The Project site is situated at the outskirts of the Tseung Kwan O Town Centre. The majority of the existing receivers in the project site are sensitive to noise and air quality, and they include two housing developments, i.e. On Ning Garden and Yuk Ming Court, and two educational institutions located to the north of the roundabout. The two housing developments comprise of high-rise residential blocks of about 40-storeys high. Apart from a few industrial buildings (which are air sensitive) located at the southern end of the project limit, no other existing dwellings can be identified south of the above roundabout. Figures 3.1 and 3.2 show the existing noise and air sensitive receivers and the designated representative facades, respectively. No water courses or streams can be identified in the Project site.

3.1.2 *Future and Planned Receivers*

According to the Tseung Kwan O Outline Zoning Plan (Plan No. S/TKO/4), the area to the north of the roundabout is zoned for residential, government/institutional, commercial as well as open-space uses. For the purpose of this EIA study, the latest available building layouts have been obtained and consolidated from relevant previous studies and private developers. Future and planned receivers that are sensitive to noise and/or air quality include a government building located in the G/IC zone in Area 106, a proposed church located on site 37f, medium to high-rise residential tower blocks on sites 37a, 37b, 37c, 50, 51 and 78, and all the industrial buildings at the southern end of the project limit. Figures 3.3 and 3.4 show the future and planned noise and air sensitive receivers, respectively.

3.2 Construction Noise Impact Assessment

Construction of the proposed infrastructure works is likely to produce high noise levels exceeding 75 dB(A) Leq(30-min) at the existing NSRs, if unmitigated. The maximum anticipated noise levels are predicted to range between 65 and 82 dB(A) and occur during the simultaneous operation of drainage and sewerage works, excavation on slope, roadwork, and foundation for flyover. The potential impacts are amenable through proper implementation of suitable noise control measures, including the use of silenced equipment, siting of equipment, and use of noise mufflers and acoustic enclosures. In particular, the use of drilling machines for the construction of the foundation of the flyover and gantry signs should be minimised as much as practicable. It is anticipated that using the above measures, the impacts from the construction works could be reduced to an acceptable level and satisfy the stipulated construction noise criteria.

3.3 Operational Noise Impact Assessment

Road traffic noise is likely to be a key environmental issue during the operation phase. It has been predicted that the majority of the noise sensitive facades along Road P1 and Road D6 would be exposed to noise levels exceeding the HKPSG noise criteria by 1-7 dB(A) based on the highest traffic flows within 15 years after opening of the roads to traffic. To mitigate the potential traffic noise impacts, noise mitigation measures committed in previous relevant studies have been included and additional direct mitigation measures of the new roads have been proposed and examined in this study.

The recommended noise mitigation measures for this Project include :

- (a) a 4m high barrier extension towards the roundabout along Road P1;
- (b) a 5m inverted L-shaped barrier along Chiu Shun Road from the roundabout to the project limit;
- (c) a segment of 5m inverted L-shaped barrier from the project limit to the junction of Chiu Shun Road and Ngan O Road;
- (d) a 4m high noise barrier on the flyover; and
- (e) the application of Low Noise Road Surface (LNRS) on Road P1,

provides the maximum protection in terms of meeting the HKPSG criteria. However, the 5m inverted L-shaped barrier abutting site 37b outside the current project limit will not be built under this contract but will be reviewed in the subsequent *Dualling of Hang Hau Road - Environmental Impact Assessment Study*. Having taken into account of the provision of direct mitigation measures, few remaining affected premises that still exceed the HKPSG include the middle floors of facades 371 and 374 in Area 37a, the top floor floor of facades ch1 and ch2 in Area 37f, and the entire facade at the proposed fire station in Area 87. To mitigate the residual traffic noise impact, indirect mitigation measures in the form of noise insulation and air conditioner will be provided by relevant developers, as concluded by previous studies, for the few remaining affected premises in Areas 37a, 37f and 87. Various setbacks have also been considered for the future development in Area 78.

3.4 Construction Dust Impact Assessment

Construction of the Project will give rise to considerable amount of dust from the roadworks, and the haulage of construction materials on unpaved surfaces. Dust suppression measures in the form of good housekeeping and frequent watering of the dusty areas, are necessary to reduce the impacts. It is anticipated that the Dust Guideline and Air Quality Objectives can be achieved by the implementation of these dust suppression measures. However, an EM&A programme should be implemented to ensure that the dust suppression measures are effective and that the relevant guideline and standard are met. The need for further mitigation measures will be determined from the monitoring data.

3.5 Operational Air Quality Impact Assessment

Model calculations using the worst traffic scenario in terms of vehicle emissions have shown that no adverse impacts on air quality will result from the use of the new roads for traffic. As a result, no mitigation measures are considered necessary.

3.6 Environmental Monitoring and Audit Requirements

An environmental monitoring and audit (EM&A) programme performs three functions. It ensures that noise from the construction of the project is kept within acceptable levels; it establishes procedures for checking the application and effectiveness of mitigation measures; and it provides the means by which compliance can be checked, exceedances documented, and corrective action recorded.

In view of the close proximity of the northern and southern ends of Wan Po Road to the identified sensitive receivers, an EM&A programme monitoring air and noise is considered necessary during the construction period.

Noise

The construction noise level should be measured in terms of the A-weighted equivalent continuous sound pressure level (Leq). Noise monitoring locations are shown in Figure 3.1.

Air Quality

1-hour and 24-hour TSP levels should be measured to indicate the impacts of construction dust on air quality. Air quality monitoring locations are shown in Figure 3.2.

4. ECOLOGICAL IMPACT ASSESSMENT

Due to the relatively small scale of the construction work, no severe ecological impacts are anticipated in this project. A small number of trees are expected to be felled due to this project. However, all of them are common flora. As for the birds, effects on them due to the felling of trees is little because there are numerous tree coverage still left outside the working area.

5. LANDSCAPE ASSESSMENT AND VISUAL IMPACT ASSESSMENT

5.1 Introduction

The Landscape and Visual Impact Assessment Study identifies the existing landscape and visual quality within the study area for the purpose of evaluating the potential landscape and visual impacts of the proposed road alignment. The assessment identifies sensitive areas of existing landscape and also visually sensitive receivers which will be affected by the proposed project, and sets out the criteria and methodology for mitigation methods required to reduce the impact of the proposals on the affected landscape and visual quality of the site. The impact assessment for the landscape and visual aspect of the project include the construction phase and operational phase.

5.2 Identification of Sensitive Receivers

5.2.1 Landscape Sensitive Areas

Landscape Sensitive areas are identified by assessing the natural elements of the existing Landscape which collectively form the Landscape 'quality' of the site.

The landscape quality is assessed upon elements such as designated landscape classification, e.g. 'Green Belt', the landform vegetation, historical and cultural components, built structures, aesthetic quality and amenity value. High quality landscape areas are considered to be more sensitive to impact.

There are no Landscape areas within the study site of Wan Po Road that are sensitive to the widening proposal. The existing landscape quality is low, being on landfill, and much is reserved for future landuse / development. Existing vegetation within the site is of low quality and consists of young roadside amenity planting and young woodland planting on the engineered slopes by the road.

5.2.2 Visual Sensitive Receivers

Visual sensitive receivers are those areas within or around the study site with clear views toward the affected areas of the proposed route, and those which will suffer visual intrusion as a consequence of the proposed road widening.

The majority of the visually sensitive properties are future residential high rise blocks currently under construction in Tsung Kwan O areas 28 to 38 which will overlook the proposed flyover. Future residential site Area 51 will overlook a small length of the widened road. The other visually sensitive receivers will be the workers in industrial areas, pedestrians and vehicular passengers, all of which are not considered very sensitive to visual change.

5.3 Construction Phase Impacts

5.3.1 Landscape Impacts

Within the context of this study site, the construction phase impacts will be negligible in view of the scale of the existing development and construction taking place in the area. During the course of the widening and construction, existing roadside trees of low quality will be lost to the west of the road and some low quality roadside vegetation on the proposed cut slopes will also be lost.

Disruption to the existing road due to the construction of the new flyover will be of the most impact, although contextually the degree of impact to the landscape character will be low. The landscape impact will be slight.

5.3.2 Visual Impacts

There will be minimal visual impact caused by the road widening at construction stage as there are presently no existing visually sensitive receivers within the study area.

5.4 Operational Phase Impacts

5.4.1 Landscape Impacts

The impact from loss of existing roadside amenity vegetation, cutting of slopes and consequential loss of plantation vegetation will be slight. The existing planting is of low quality, immature and does not contribute the landscape character of the site. The creation of landscape amenity strips associated with the new road widening will create opportunities to strengthen the landscape framework of the route, and be beneficial in the long term.

5.4.2 Visual Impacts

Visually, the proposed noise barriers (4 and 5m high panels to the north of the roundabout) will be of the most detrimental visual impact by creating a visually hard edge to the new road from future residents of sites 37, 38 and 34, and the 4m barrier running parkway along the edge of the new flyover will be difficult to visually integrate with the road corridor. The visual impact to area 51 residential towers will be slight, as their views of the vegetated slopes to the east will be unaffected. Generally the visual impact of the widening within the residential / industrial site context will be slight.

6. LAND USE IMPACT ASSESSMENT

The Section of the Wan Po Road under study is largely flanked by Green Belt zoning, District Open Space and G/IC uses in the approved Tseung Kwan O Outline Zoning Plan, Plan No. S/TKO/4. A strip of land reserve has been set aside for the proposed road and it will not involve any government resumption for road widening implementation. Area 50 will be developed for Residential (Group A) use with a plot ratio of 8. The District Open Space at Area 77 is reserved for both active and passive recreational uses including possibly a public Golf driving range. Area 86 currently zoned industrial G/IC, Open Space and other specified uses would possibly be rezoned for Residential (Group A) use and will need to be reassessed for such rezoning.

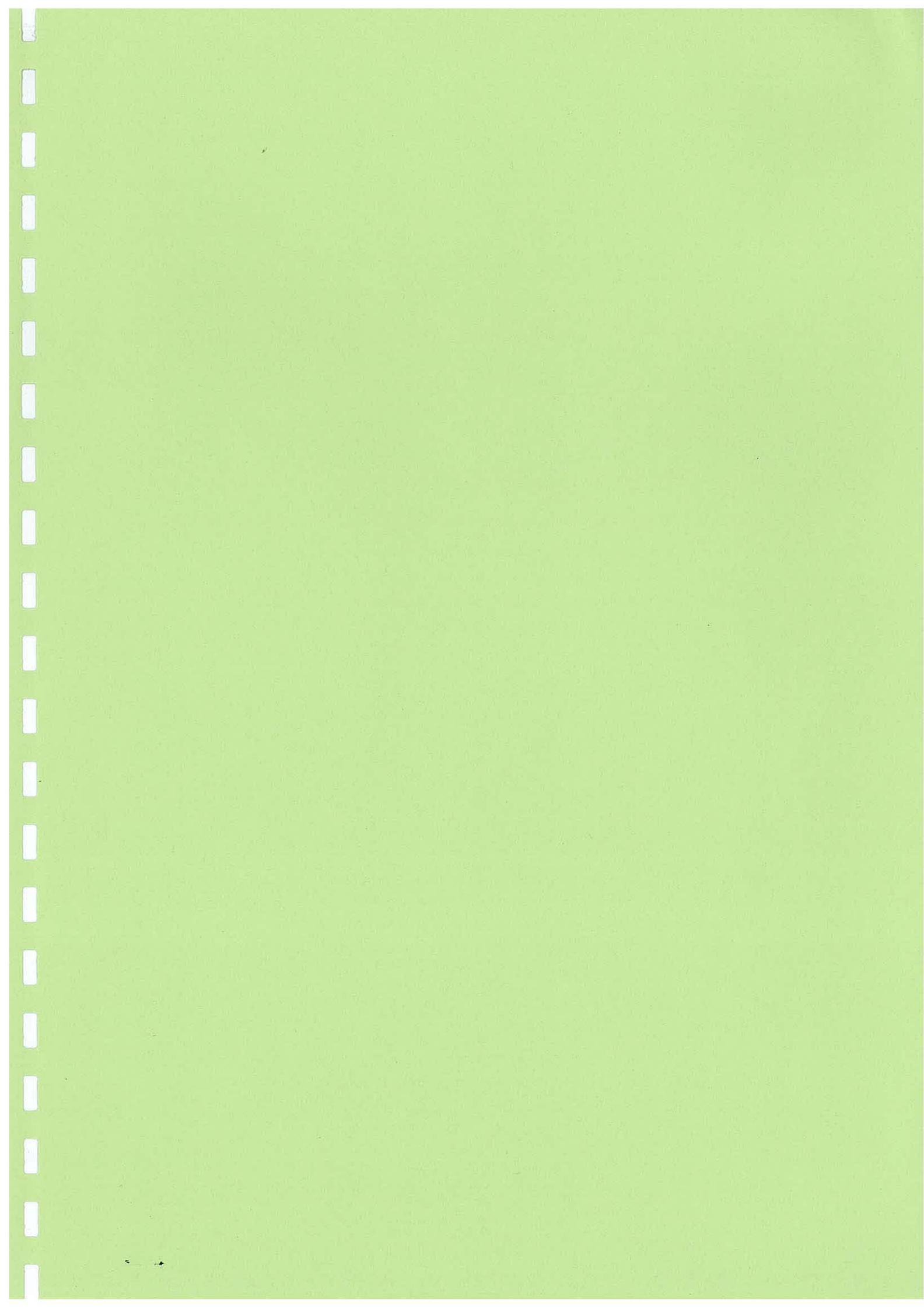
Other land uses affected will include G/IC zoning in Area 87. Area 78 zoned R(C)2 is at present a borrow Area and will possibly be rezoned for R(B) use. Any changes to these land uses will be subject to a separate assessment.

7. RECOMMENDATIONS:

- Implementation of suitable noise control measures during the construction phase, including the use of silenced equipment, siting of equipment, and use of noise mufflers and acoustic enclosures.
- Implementation of the following recommended noise mitigation measures:
 1. 4m high barrier extension towards the roundabout along Road P1;
 2. 5m inverted L-shaped barrier along Chiu Shun Road from the roundabout to the project limit;
 3. 4m high noise barrier at the edge of the southbound lane of the flyover; and
 4. application of Low Noise Road Surface (LNRS) on the remaining portion of Road P1.

Summary of recommended environmental mitigation measures is referred to Figure 3.5.

- 20m setback for the part of the site near the Junction of Roads P1 and D6 in planning Area 78. (Refer to Figure 3.5)
- 5 m inverted L-shaped barrier from the project limit to the junction of Chiu Shun Road and Ngan O Road will be reviewed in the subsequent Dualling of Hang Hau Road - Environmental Impact Assessment Study. (Refer to Figure 3.5)
- Inclusion of pollution control clauses in the Contract Documents to control construct noise, dust, and waste disposal from the engineering works.
- Landscape Mitigation Measures to soften the impact of the road widening and flyover should include re-establishment planting to cut slopes, appropriate compensatory amenity planting to roadside / roundabout areas so as to visually strengthen the route, offsite screen planting within boundary areas of adjacent landfill sites, and design of noise barriers as visually unobtrusive structure within their context.
- Compensation planting of similar existing species should be implemented after the completion of the Project.



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一 引言

將軍澳發展機會可行性研究報告於一九九零年五月完成，並且由當時的土地發展政策小組同意落實執行。根據合約編號 CE 13/90，拓展署再委託茂盛(亞洲)工程顧問有限公司進行環保大道擴闊及改善工程之設計及建築合約編號 TK 43/96 (下文簡稱『工程』)。工程位置所在已顯示於圖紙編號 1.1。

鑑於工程地盤接近噪音或空氣感應強的地方，以及預期會影響沿 P1 及 D6 公路的來發展用地，工程合約要求顧問公司進行有關之環境影響評估。

二 工程特性

工程包括在現有環保大道興建第二條雙線行車道 (P1 及 D6 公路)，以及興建一條橫跨昭信路的行車天橋。以上工程之位置所在已顯示於圖紙編號 2.1。

工程預算於一九九八年二月動工，為期廿六個月。工程建築計劃已顯示於圖紙編號 2.2。

三 噪音及空氣影響評估

環境設定

• 現有噪音或空氣感應強的地方

工程地盤位於將軍澳市中心外圍，現有噪音及空氣感應強的地方包括有安寧花園，煜明苑，以及兩所位於 P1 公路及昭信路交界之迴旋處(下文簡稱『迴旋處』)北面的學校。安寧花園和煜明苑樓高約四十層。在迴旋處以南的地方，除了工程範圍南端地方有少數的工業建築物外，並沒有民居。圖紙編號 3.1 和 3.2 分別顯示現有噪音和空氣感應強的地方。工程地盤範圍內並無發現水道和河流溪澗。

• 未來噪音或空氣感應強的地方

根據將軍澳分區計劃大綱圖(編號 S/TKO/4),迴旋處以北地方規劃為住宅、政府、商業和休憩用地。未來噪音或空氣感應強的地方包括一座位於第 106 區內的政府大樓,第 37f 區的教堂,第 37a,37b,37c,50,51, 和 78 區內的低至高層住宅,以及所有位於工程地盤南端的工業大廈,圖 3.3 和 3.4 分別顯示未來的噪音和空氣感應強的地方。

建築噪音影響評估

在沒有執行緩解措施的情況下,大部份現有噪音感應強的地方將受到介乎 65 至 82 分貝的建築噪音影響,不過如果能徹實執行適當的措施如使用低噪音機械設備和隔音物料等,建築噪音便能降至可接受水平。另外,在興建行車天橋基座時,應盡量減少利用鑽地的機械設備。

交通噪音影響評估

根據評估結果顯示,絕大部份沿 P1 公路的噪音感應強的地方將面對超出噪音標準 1 至 7 分貝的交通噪音影響。為了緩減交通噪音,除了其他有關的評估研究所建議的噪音紓緩措施外,顧問公司曾就三項方案作出評審。結果顯示第三項方案能夠提供最大的噪音緩減效果。

此方案包括:

- 延長在 P1 公路的四米高隔音屏障;
- 於昭信路加建五米高倒 L 型的隔音屏障;
- 另一段在工程範圍以外的昭信路和銀澳路交界加建五米高倒 L 型的隔音屏障;
- 行車天橋上興建四米高隔音屏障;及
- 在 P1 公路鋪設低噪音路面。

由於建議在 37b 區鄰近興建的 5 米高倒 L 型的隔音屏障位於此工程範圍以外地方,故此將不會在此工程合約下興建,而會在坑口道擴闊工程的環境影響評估中

再作檢討。即使執行第三項方案所提及的直接噪音紓緩措施，仍然有少數建築物受交通噪音影響，它們分別是 37a 區內的中層，37f 區內的頂層及 87 區內整座擬建的消防局。為解決以上地方的噪音問題，發展商及有關部門將會為這些受影響的地方提供隔音工程和安裝冷氣機來紓緩交通噪音影響。另外，顧問公司建議增加噪音感應強的地方與道路之間的距離來改善 78 區的噪音情況。

建築塵埃影響評估

建築活動如路面工程和物料運輸都會帶來大量塵埃，透過適當的塵埃控制措施如灑水和良好的地盤管理，塵埃濃度將會符合空氣質素標準和指引。此外，在建築期間承建商應執行環境監察及審查計劃，藉此確保建築塵埃得以控制。

交通空氣質素影響評估

根據評估結果顯示，新建道路所帶來的汽車廢氣並不太嚴重，故此，沒有需要實施任何緩解措施。

環境監察及審查

環境監察及審查計劃能夠確保建築噪音和塵埃合乎標準，亦能確保所建設的改善措施能夠有效地執行。鑑於環保大道與噪音或空氣感應強的地方非常接近，故此環境監察及審查有需要在建築期間執行。

噪音

量度建築噪音以 A 加權等效連續聲級為單位，噪音監察位置所在已顯示於圖紙編號 3.1。

空氣質素

量度一小時及廿四小時總懸浮粒子水平，空氣質素監察位置所在已顯示於圖紙編號 3.2。

四 生態影響評估

由於工程規模不大，故此預期對生態環境影響並不太嚴重。少量樹木因工程影響而需砍伐，但這些受影響樹木全屬於常見品種。此外，因為工程地盤以外還有大量樹木提供雀鳥棲身，故此工程對雀鳥影響亦不大。

五 園景與景觀影響評估

現有的園景與景觀質素用作評估由於工程計劃潛在的園景與景觀質素的影響。評估包括建築階段及使用階段。

園景感應強的地區

確認園景感應強的地區為評估園景現有的自然要素，而歸納成該工程範圍的園景「質素」。評估園景質素的元素包括園景設計類別如：「綠化地帶」、地質、植物、歷史及文化成份、已興建的建築物、美觀的質素及文娛康樂/美化市容的價值。優質的園景地區被界定為最容易受影響的地區。

除於環保大道的評估範圍內，園景地區並未受到該擴闊工程的影響。因鄰近土地為堆填區，所以園景質素屬於低級。並且大部份將會留作未來發展用地。工程範圍之現存植物質素也很低，而路旁斜坡存有幼小路旁美化市容地帶種植及幼小樹林種植在路旁的斜坡上。

景觀感應強的地方

景觀感應強的地方是工程範圍之內及圍繞地帶，而擁被建議道路影響的地區的清楚視野及那些被建議道路而受到景觀破壞的地區。

在第 28 至 38 區，大部份景觀感應強的地方為正在興建中的高密度居住發展樓宇。這些樓宇將會擁有向天橋的視野。在第51區，擬興建中的高密度居住發展樓宇將會擁有向小部份道路的視野。其餘景觀感應強的地方的包括在工業區工作的人、行人及乘客。不過他們對於景觀的改變不會有太大的反應。

建築階段影響

園景的影響

根據地區的背景及鑒於現有發展及建設的比例、建築階段的園景影響十分輕微。在建築階段會有部份現存在路旁及山坡上質素低的植物將會被移走。

雖然建設新行車天橋對現有道路會造成很大的滋擾，但對於整體的園景影響不大。

景觀的影響

由於沒有現存景觀感應強的地方在研究地區內，在道路擴闊階段景觀影響會很輕微。

使用階段影響

園景的影響

因現存植物的質素低及不成熟，故籌劃園景美化環境及新設道路擴闊時會加強道路的園景架構。因斜坡工程而影響路旁美化環境的種植情況會很輕微。

景觀的影響

建議的隔音屏障(於迴旋處北的四至五米高的牆)會局部遮蔽未來於第 37, 38 及 34 區住宅觀看迴旋處的美化市容地帶。隔音屏障的設計應不會在區中之景觀區內造成顯著的影響。在新行車天橋邊沿的四米高隔音屏障會產生景觀的影響。但整體對工程造成景觀上的影響會很輕微。由於附近的山坡不會有大變動，第 51 區的景觀影響會很輕微。

六 土地使用影響評估

在已審核的將軍澳分區計劃大綱(圖編號 S/TK0/4)，研究報告裡的環保大道路段是被綠化地帶、地區休憩用地、政府、團體、社區之用地圍繞者。因為政府已預留土地給建議興建之道路，所以不需要經政府徵收土地。

第 50 區將發展為住宅(甲類)用途之地積比率為 1:8。第 77 區地區遊憩用地預留作動態或靜態康樂用途，如公共哥爾夫球練習場。第 86 區將發展為工業、政府、團體、社區及休憩之用地而可能重訂分區用途給住宅用地(甲類)。

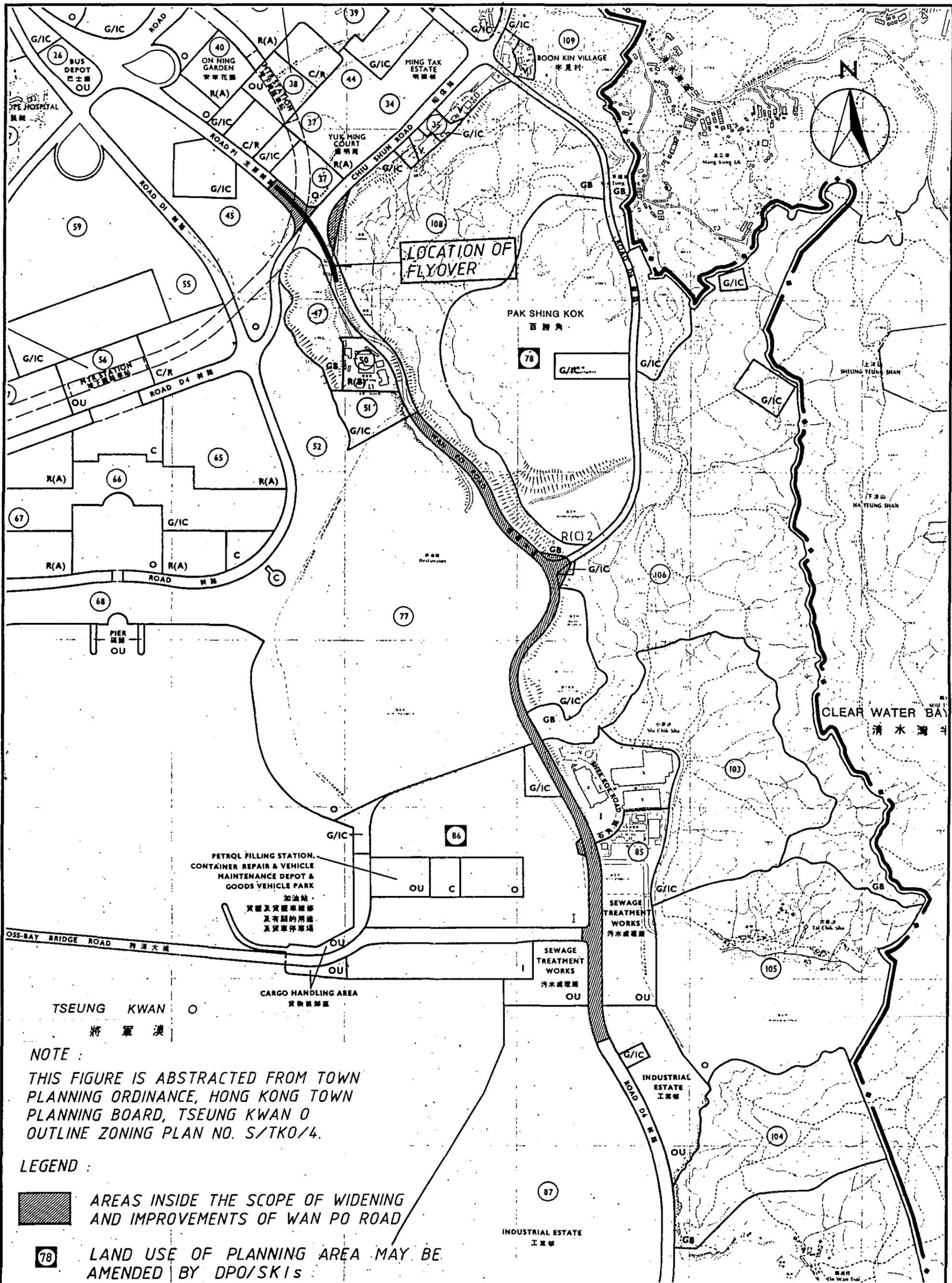
其它土地用途之影響將會包括第 87 區的政府、團體、社區之用地。第 78 區現在是採泥區而可能重訂分區用途給住宅用地(乙類)。如果以上土地用途改動落實，應作另外評估。

七 建議

- 執行緩減建築噪音措施。
- 執行以下緩減交通噪音措施〔參閱圖紙編號 3.5〕：
 1. 伸延四米高隔音屏障至 P1 公路的迴旋處。
 2. 在昭信路興建五米高倒 L 型的隔音屏障。
 3. 行車天橋南行車道旁興建四米高隔音屏障。
 4. 在 P1 公路鋪設低噪音路面。
- 在第 78 區近 P1 公路和 D6 公路交界處部份，預留距離路邊 20 米的空間作緩衝區。〔參閱圖紙編號 3.5〕
- 在另一段在工程範圍以外的昭信路和銀澳路交界加建五米高倒 L 型的隔音屏障。由於建議的隔音屏障位於此工程範圍以外地方，故此將不會在此工程合約下興建，而會在坑口道擴闊工程的環境影響評估中再作檢討。〔參閱圖紙編號 3.5〕
- 將污染消滅控制條款列入承建商合約文件。
- 採用園景緩解措施，去軟化因道路擴闊及天橋建造的影響。措施包括從新種植樹木於斜坡上，適量的路旁及迴旋處美化市容的種植，以加強道路的景觀感。
- 當工程完成後，應種植類同品種樹木的以作補償。

Appendix A

Figures



LOCATION OF FLYOVER

PETROL FILLING STATION,
CONTAINER REPAIR & VEHICLE
MAINTENANCE DEPOT &
GOODS VEHICLE PARK
加油站、
貨櫃及貨車維修
及有關的用途
及貨車停車場

CARGO HANDLING AREA
貨物裝卸區

SEWAGE TREATMENT WORKS
污水處理廠

SEWAGE TREATMENT WORKS
污水處理廠

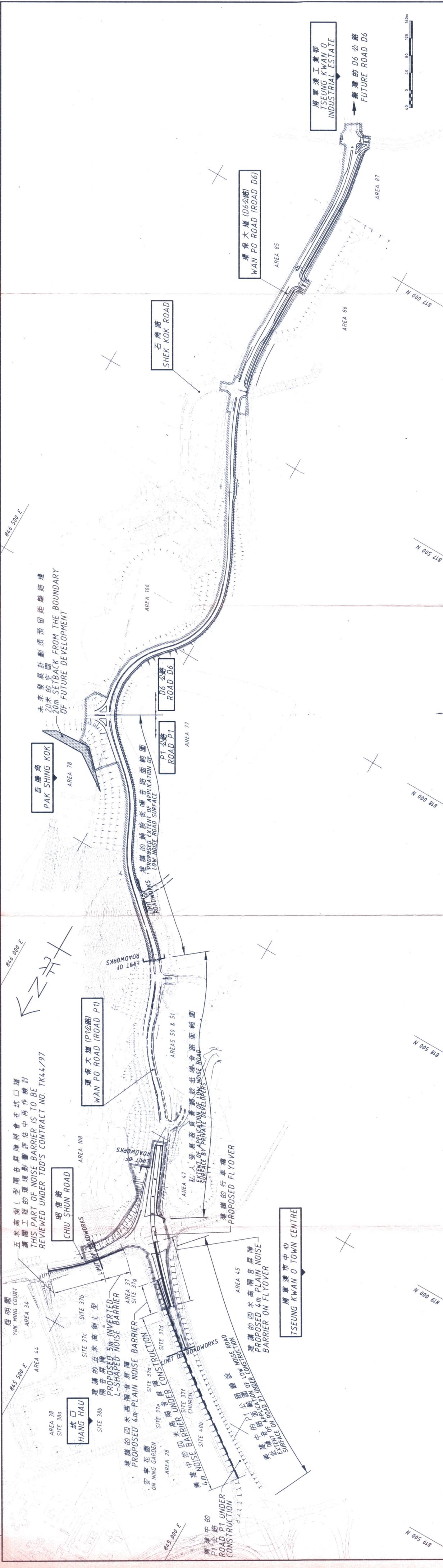
INDUSTRIAL ESTATE
工業區

NOTE:
THIS FIGURE IS ABSTRACTED FROM TOWN
PLANNING ORDINANCE, HONG KONG TOWN
PLANNING BOARD, TSEUNG KWAN O
OUTLINE ZONING PLAN NO. S/TKO/4.

LEGEND:

AREAS INSIDE THE SCOPE OF WIDENING
AND IMPROVEMENTS OF WAN PO ROAD

LAND USE OF PLANNING AREA MAY BE
AMENDED BY DPO/SKIS



五米高倒L型隔音屏障將會在坑口道擴闊工程的環境影響評估中再作檢討
 THIS PART OF NOISE BARRIER IS TO BE REVIEWED UNDER TDD'S CONTRACT NO. TK44/97

百勝角
 PAK SHING KOK

昭信路
 CHIU SHUN ROAD

環保大道 (P1公路)
 WAN PO ROAD (ROAD P1)

坑口
 HANG HAU

P1公路
 ROAD P1

石角路
 SHEK KOK ROAD

環保大道 (D6公路)
 WAN PO ROAD (ROAD D6)

將軍澳市中心
 TSEUNG KWAN O TOWN CENTRE

將軍澳工業邨
 TSEUNG KWAN O INDUSTRIAL ESTATE

擬建的D6公路
 FUTURE ROAD D6

未來發展計劃須預留距離路邊20米的空間
 20m SETBACK FROM THE BOUNDARY OF FUTURE DEVELOPMENT

建議的鋪設低噪音路面範圍
 PROPOSED EXTENT OF APPLICATION OF LOW NOISE ROAD SURFACE

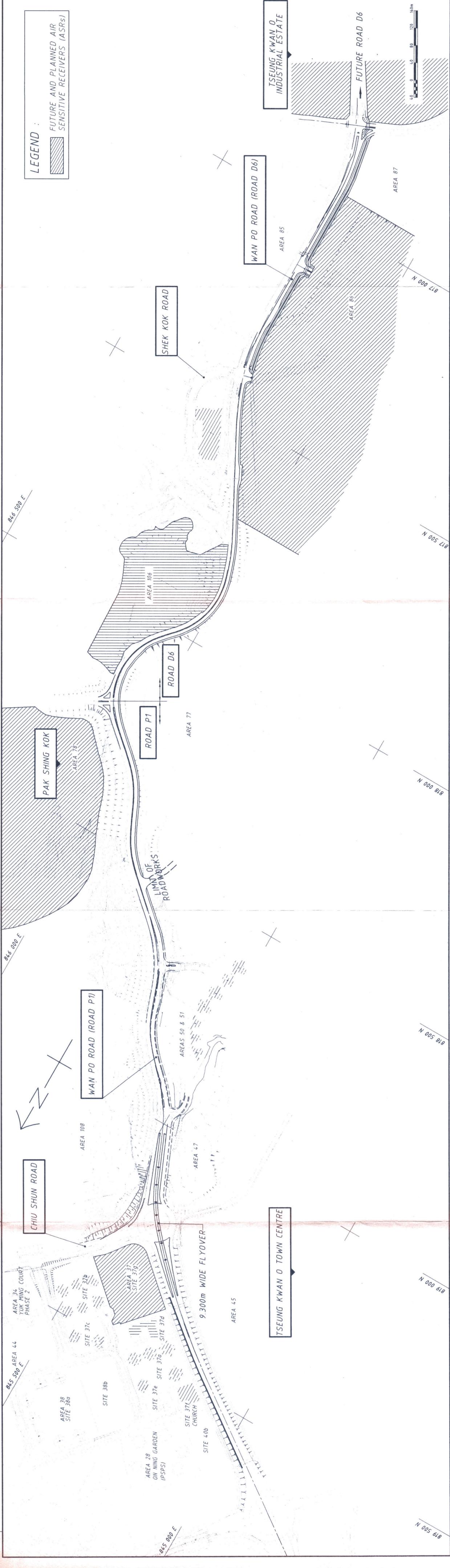
私人發展商負責鋪設低噪音路面範圍
 EXTENT OF APPLICATION OF LOW NOISE ROAD SURFACE BY PRIVATE DEVELOPERS

建議的單車橋
 PROPOSED FLYOVER

建議的四米高隔音屏障
 PROPOSED 4m PLAIN NOISE BARRIER ON FLYOVER

建議的鋪設低噪音路面範圍
 PROPOSED EXTENT OF APPLICATION OF LOW NOISE ROAD SURFACE





LEGEND :
 [Hatched Box] FUTURE AND PLANNED AIR SENSITIVE RECEIVERS (ASRs)

PROJECT NO. **60295**
 FIGURE NO. **3.4**

Maunsell
 茂盛亞洲工程顧問有限公司

LOCATIONS OF FUTURE AND PLANNED AIR SENSITIVE RECEIVERS (ASRs)

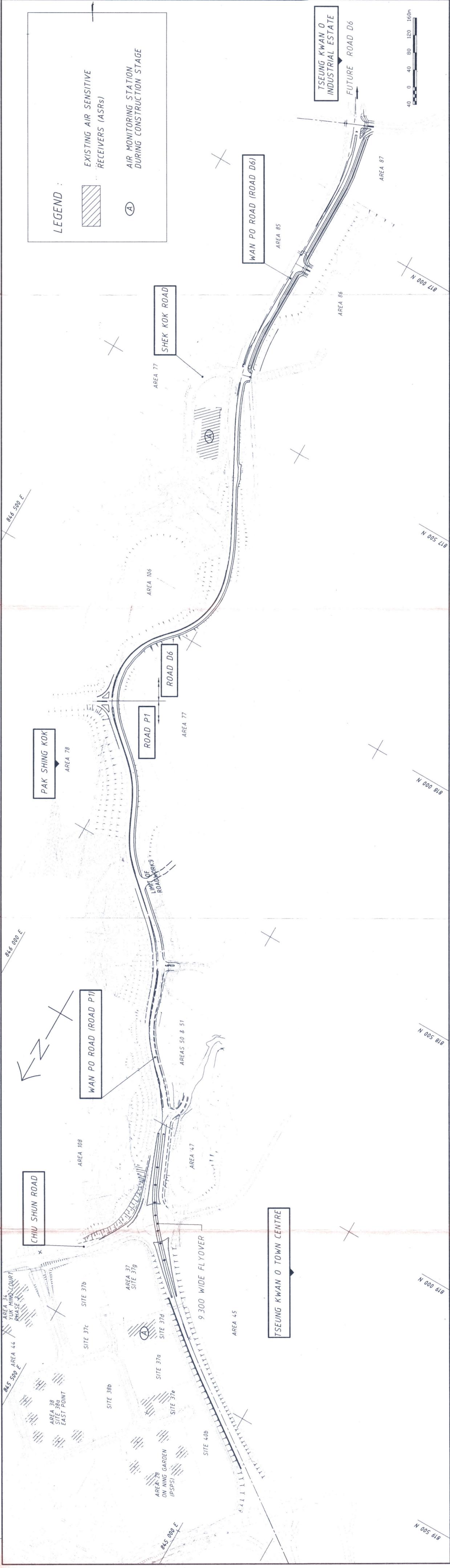
TSEUNG KWAN O DEVELOPMENT CONTRACT NO. TK43/96 ENVIRONMENTAL IMPACT ASSESSMENT



LEGEND :
 [Hatched Box] FUTURE AND PLANNED NOISE SENSITIVE RECEIVERS (NSRs)

LOCATIONS OF FUTURE AND PLANNED NOISE SENSITIVE RECEIVERS (NSRs)

TSEUNG KWAN O DEVELOPMENT CONTRACT NO. TK43/96 ENVIRONMENTAL IMPACT ASSESSMENT



LEGEND :

- EXISTING AIR SENSITIVE RECEIVERS (ASRS)
- AIR MONITORING STATION DURING CONSTRUCTION STAGE



PROJECT NO. **60295**
 FIGURE NO. **3.2**

Mausnell
 茂盛亞洲工程顧問有限公司

TSEUNG KWAN O DEVELOPMENT CONTRACT NO. TK13/96 ENVIRONMENTAL IMPACT ASSESSMENT

LOCATIONS OF EXISTING AIR SENSITIVE RECEIVERS (ASRs)

LEGEND :

-  PROPOSED ROAD WIDENING
-  PROPOSED FLYOVER

