邁進工程顧問有限公司
Meinhardt Consulting Engineers Ltd

香港飛機工程公司 將軍澳飛機引擎測試設施 環境影響評估研究： 行政撮要

Environmental Impact Assessment for HAECO Aircraft Engine Test Cell Facility at Tseung Kwan O: *Executive Summary*

一九九六年七月十二日
12 July 1996

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EXECUTIVE SUMMARY

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Reference C1276

For and on behalf of ERM-Hong Kong, Ltd

Approved by: [signature]

Position: Technical Director

Date: 12 July 1996

1. 引言

香港飛機工程公司（以下簡稱港機工程）需在一九九七後將業務遷離啓德機場，以騰出機場地區供再發展之用。該公司之飛機引擎測試設施將遷往新設於佛堂洲以北的將軍澳工業邨。是次搬遷將分兩期進行，第一期將於一九九六年投產。

一九九四年八月完成的一份初步環境影響評估確定了建議中廠址在環境方面的可行性。香港環境資源管理顧問有限公司根據以邁進工程顧問有限公司及AERO SYSTEMS ENGINEERING INC（來自美國明尼蘇達的航空專家顧問）為首的設計小組提供的資料，完成了一份環境影響評估（以下簡稱環評）。

2. 建議中的發展

建議中的第一期發展包括如圖2a所示的兩幢建築物及停車處。引擎測試將在一個長100米的飛機引擎測試室中進行。測試室末端分別設有進氣及排氣管道，另有位於中央的測試房間及輔助管道、控制室及員工設施。測試室為堅固的混凝土建築物，進氣／排氣管道都裝有減音器。另一幢建築物是引擎裝拆工場，用以準備需測試的引擎，或進行例行維修。

飛機引擎將由貨車運抵廠址，先送往引擎裝拆工場作測試前準備，然後再用架空單軌吊重設備移入測試室。測試過程包括不同引擎推動力設定下的運行步驟測試，需時約2.5小時。

3. 鄰近的發展

引擎測試設施廠址位於建議興建的將軍澳工業邨以南將軍澳新填海區的邊緣，亦即佛堂洲東北岸連接填海區之處，如圖3a所示。廠址附近有位於佛堂洲及海面之外，廠址以南約2.5公里港島上的小西灣。廠址以西約相同距離的地方是疏落的民居及村落。廠址以東填海區外則為新界東南堆填區。

將軍澳新填海區不僅是一個大型工業邨所在，亦同時提供土地供廠址以北約3公里的將軍澳新市鎮繼續發展之用。圖3a顯示了該區的分區計劃大綱圖中的重要特點，其中包括有建議中的新市鎮及有關基本建設。

由於填海區、新市鎮及其他發展項目的規模龐大，故此該區的環境也不斷有重大的轉變。該區原來的郊野特質將為工業及市鎮發展取代。佛堂洲上及新界東南堆填區附近舊有海岸線上的零星村落已遷走供新發展之用。

1 INTRODUCTION

The Hong Kong Aircraft Engineering Company (HAECO) are required to move their operation from Kai Tak to make way for the redevelopment of the Airport area after 1997. The aircraft engine testing facility is to be relocated to the new Tseung Kwan O Industrial Estate, just north of Junk Island. The relocation will be in two phases with phase 1 becoming operational in 1996.

An initial EIA was completed in August 1994 in which the feasibility of the proposed site was established in terms of key Environmental Impacts. An Environmental Impact Assessment (EIA) was prepared on behalf of HAECO, drawing on information supplied by the design team which was lead by Meinhardt Consulting Engineers Ltd and Aero Systems Engineering Inc, Specialist Aeronautical Consultants from Minnesota USA.

2 PROPOSED DEVELOPMENT

The proposed phase 1 development comprises two buildings and car parking space as shown in *Figure 2a*. A 100 m long aircraft engine test cell will be used to run the engines under test. The test cell has inlet and exhaust stacks at either end, with a central testing chamber and augmentor tube, a control room, and staff facilities. The test cell incorporates substansive acoustic silencers in the stacks and is a solid concrete building. The second building is an engine strip and build workshop used to prepare the engines for testing, as well as routine maintenance operations.

Aircraft engines will be delivered to the site by lorry, to the engine strip and build workshop, where they will be prepared for testing before being manouevered into the test cell via overhead monorail. Testing takes about 2½ hours, and comprises a run-up procedure at various engine thrust settings.

3 SURROUNDING DEVELOPMENT

The site of the engine test cell facility is on the edge of the newly formed Tseung Kwan O reclamation at the southern end of the proposed Tseung Kwan O Industrial Estate, located where the northeast coast of Junk Island meets the reclamation and is shown in *Figure 3a*. The surrounding environment includes Siu Sai Wan, on Hong Kong Island, which is about 2.5 km to the South of the site, beyond Junk Island and open water. A similar distance to the West are scattered dwellings and villages. The SENT landfill is to the East of the site beyond the reclamation.

The new reclamation in Tseung Kwan O will not only be the site of a large Industrial Estate, but will allow the development of Tseung Kwan O new Town further North, which is about 3 km from the site. *Figure 3a* shows some key features of Outline Zoning Plan for the area with the proposed new town and it's associated infrastructure.

As a result of the large scale of the reclamation, new town, and other developments, the environment of the area is changing substantially. The rural nature of the area will be lost to industrial and townscape settings. The

4. 施工期影響

噪音及空氣質素

港機工程的引擎測試設施位於將軍澳工業邨，離建議中設施最近的「噪音及空氣質素感應強的地方」亦有2.5公里之遙。由於地盤平整已由香港工業邨公司進行，故此該引擎測試設施只需進行有限度的建築工程。由於廠址和「噪音感應強的地方」的距離遠，建築工程規模亦小，故此預料並不會有顯著的建築噪音影響。

由於港機工程的建築地盤所在地和「空氣質素感應強的地方」之間有2.5公里的緩衝距離，涉及的建築工程規模亦小，所以預料因興建該設施而引起的空氣質素影響將會極少。不過，亦有需要採用標準的塵埃控制措施，如在未鋪設的道路或地盤灑水，以緩減工程可能引起的塵埃。

水質

由於廠址離海岸約300米，所以預料並不會有顯著的水質影響。不過，有見於該區的多項建築工程可能產生累積影響，本環評亦建議採取適當的工地管理及施程序以減低化學品／油類洩漏的機會，和控制工地表面徑流及垃圾雜物。

廢物管理

根據政府有關法例和指引的要求作出的評估，顯示建築廢物的儲存、收集、運送和處置並不會引起不能接受的環境影響。大部份的廢棄物料都可輕易地供其他建築工地重用，或於堆填區棄置。本環評亦建議了緩解措施，以確保港機工程設施的施工不會引起環境滋擾。

5. 運作期影響

噪音

本環評根據飛機引擎製造商提供的噪音數據，採用了一個專為引擎測試室而設的聲學模型，就距離遠至3.5公里外的噪音影響，透過詳盡的電腦模擬而進行了評估。雖然測試室內的噪音將無可避免地達至極高的水平，但是若有適當的聲學設計，加上設施與最近的「噪音感應強的地方」最少相隔2.5公里的距離，將可確保就是在晚間操作的情況下，噪音水平亦低於規劃標準。

scattered villages on Junk Island and on the old coastline around the South East New Territories (SENT) Landfill have already been relocated to make way for the development of the area.

4 CONSTRUCTION PHASE IMPACTS

Noise And Air Quality

The HAECO jet engine test facility is located at the Tseung Kwan O Industrial Estate and the nearest sensitive receivers to the proposed facility are more than 2.5 km distant. Site formation has been carried out by the Hong Kong Industrial Estate Corporation that the construction works required for the engine test facilities will be limited. No significant impacts from construction noise emission has been predicted because of the large separation of the site from any sensitive receivers and the small scale of construction works.

The air quality impact from the construction of the facility will be minimal given the 2.5 km buffer distances between the HAECO site and the ASRs, and the small scale of construction works. Nevertheless, standard dust suppression measures such as water spraying on unpaved road/site should be adopted to mitigate the potential dust emission.

Water Quality

No significant water quality impacts are expected because the site is about 300 m from the shoreline. However, in light of the potential for cumulative impacts due to numerous construction projects in the area, proper site management and good construction practices have been recommended to reduce the chance of chemical/oil spillages, to control site run-off, and the occurrence of littering and debris.

Waste Management

No unacceptable environmental impacts, in terms of specified government regulations and guidelines, have been identified arising from the storage, handling, collection, transport and disposal of wastes from the construction works. In most cases the waste material can be easily re-used on other construction sites or disposed of to landfill. Mitigation measures have been recommended to ensure that environmental nuisance does not arise from the HAECO site.

5 OPERATIONAL PHASE IMPACTS

Noise

The potential for noise impacts to receivers up to 3.5 km away have been assessed by detailed computer modelling starting with the aircraft engine manufacturers noise data, using a specialist test cell acoustic model. Whilst the noise levels generated inside the test cell will inevitably be extremely high, the combination of an appropriate acoustic design and the minimum separation distance of over 2.5 km to the nearest sensitive receivers ensure that predicted

空氣質素

本環評根據最壞情況下的引擎測試及氣象條件模擬了測試室的廢氣排放。在距離廠址2公里以外的「空氣質素感應強的地方」的二氧化氮、二氧化硫及一氧化碳的水平，預料將低於香港空氣質素指標的水平，表示不會有顯著的環境影響。

水質

廠址第一期發展並不包括廢料處理系統（但此系統將包括在第二期發展內）。現時在港機工程啓德廠址使用的流動處理系統將在新址繼續使用。在測試室投產前需就流動處理系統對第一期特有的廢料處理的效用進行測試。此外，亦需定期監測排放。原有的流動廢料處理系統預期將會有效（但此廠址可能需要一套額外處理系統）。假定廠址設有流動處理系統及其他建議的緩解措施得以實施，預料測試設施的運作並不會對水質造成重大影響。

廢物管理

引擎測試設施產生廢物的處理將不會產生任何不能接受的環境影響。無論如何，所有廢物都可安排送往堆填區或青衣的化學廢料處理中心處理。有少量高價的廢料，如鋁及紙，亦可回收再造。本環評已就引擎測試設施運作所產生的各類廢物的儲存、運輸及處置建議了緩解措施，以確保不會引起環境滋擾。

6. 結論

建議中的引擎測試設施將位於將軍澳工業邨。本設施可能引起的環境影響，如噪音、空氣質素、水質及廢物管理，已透過本環評研究進行了評估。研究顯示所有可能產生的環境影響都可緩減至可以接受的水平。

noise levels are below the required planning standard even for night-time operation.

Air Quality

Emissions from the test cell have been modelled based on worst case engine test and meterological conditions. The predicted NO_2, SO_2, and CO levels at the nearest sensitive receivers, over 2 km away, are well below the Hong Kong Air Quality Objective levels implying that no significant impacts are expected.

Water Quality

A waste treatment plant will not be included within the Phase 1 development (but will be built in Phase 2). Instead the existing mobile treatment plant, currently used at the HAECO operation at Kai Tak, will be used. Testing will be required, prior to commissioning, to determine the efficacy of the mobile treatment plant on those waste arisings specific to Phase 1. In addition, regular monitoring of discharge will be required. It is anticipated that the existing mobile waste treatment plant will be effective (although a second plant may be needed to serve this site), and provided these and other recommended mitigation measures are implemented, no major water quality impacts are expected.

Waste Management

No unacceptable impacts upon the environment have been identified from the disposal of waste from the engine testing facility. In all cases provisions can be made for the waste material disposed of to landfill or the Chemical Waste Treatment Centre at Tsing Yi. Some small quantities of high value waste such as aluminium and paper can also be recycled. Mitigation measures have been recommended to ensure that environmental nuisance will not arise from the storage, transport and disposal of the various types of waste arisings from the operation of the new engine testing facility.

6 *CONCLUSION*

The proposed engine testing facility will be located at the Tseung Kwan O Industrial Estate. An EIA has been undertaken to assess the potential environmental impacts arising from the proposed facility, such as noise, air quality, water quality and waste impacts. The study concludes that all the identified potential environmental impacts can be mitigated to acceptable levels.

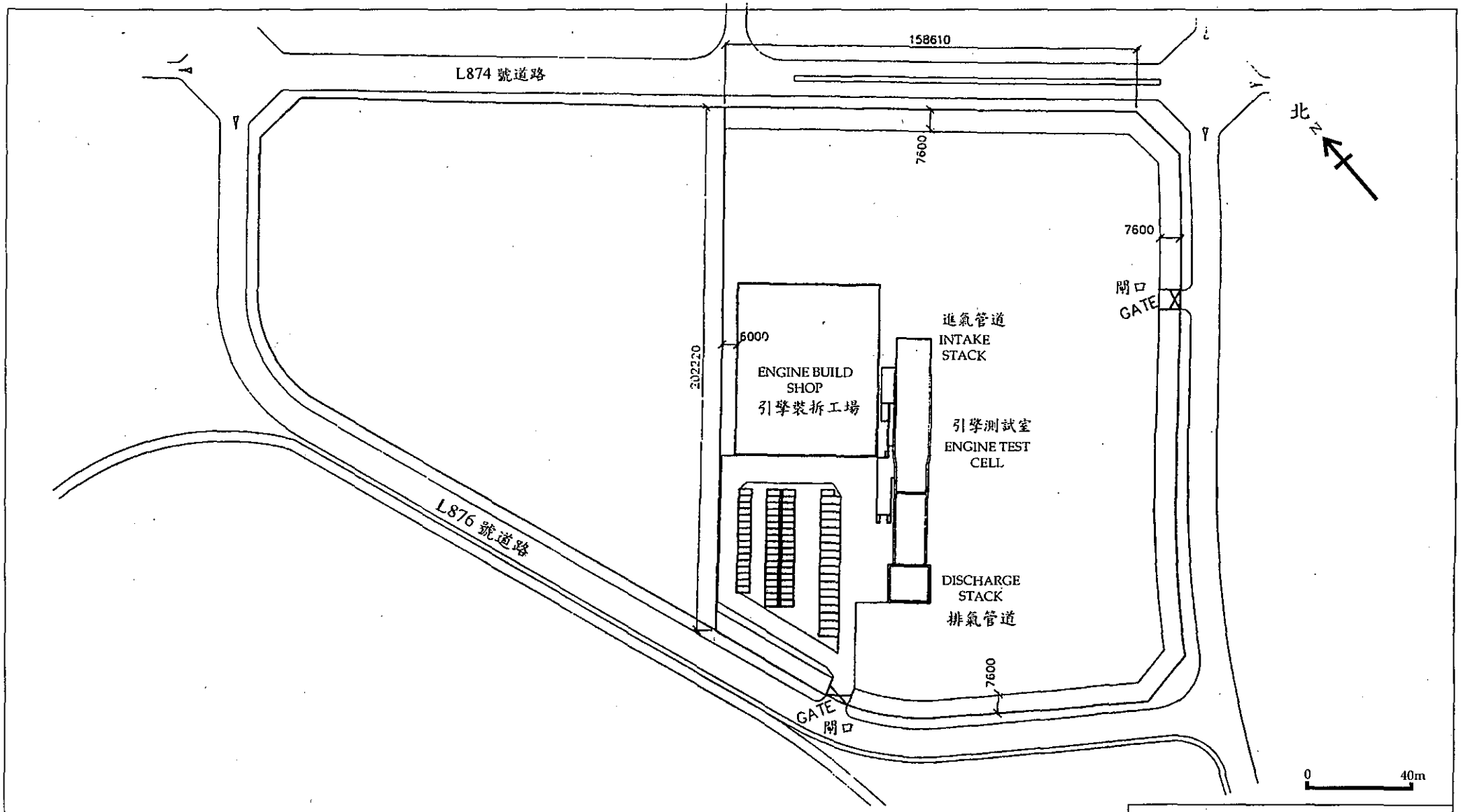

圖2a - 第一期引擎測試設施平面圖

FIGURE 2a - PHASE 1 ENGINE TEST CELL FACILITY SITE LAYOUT

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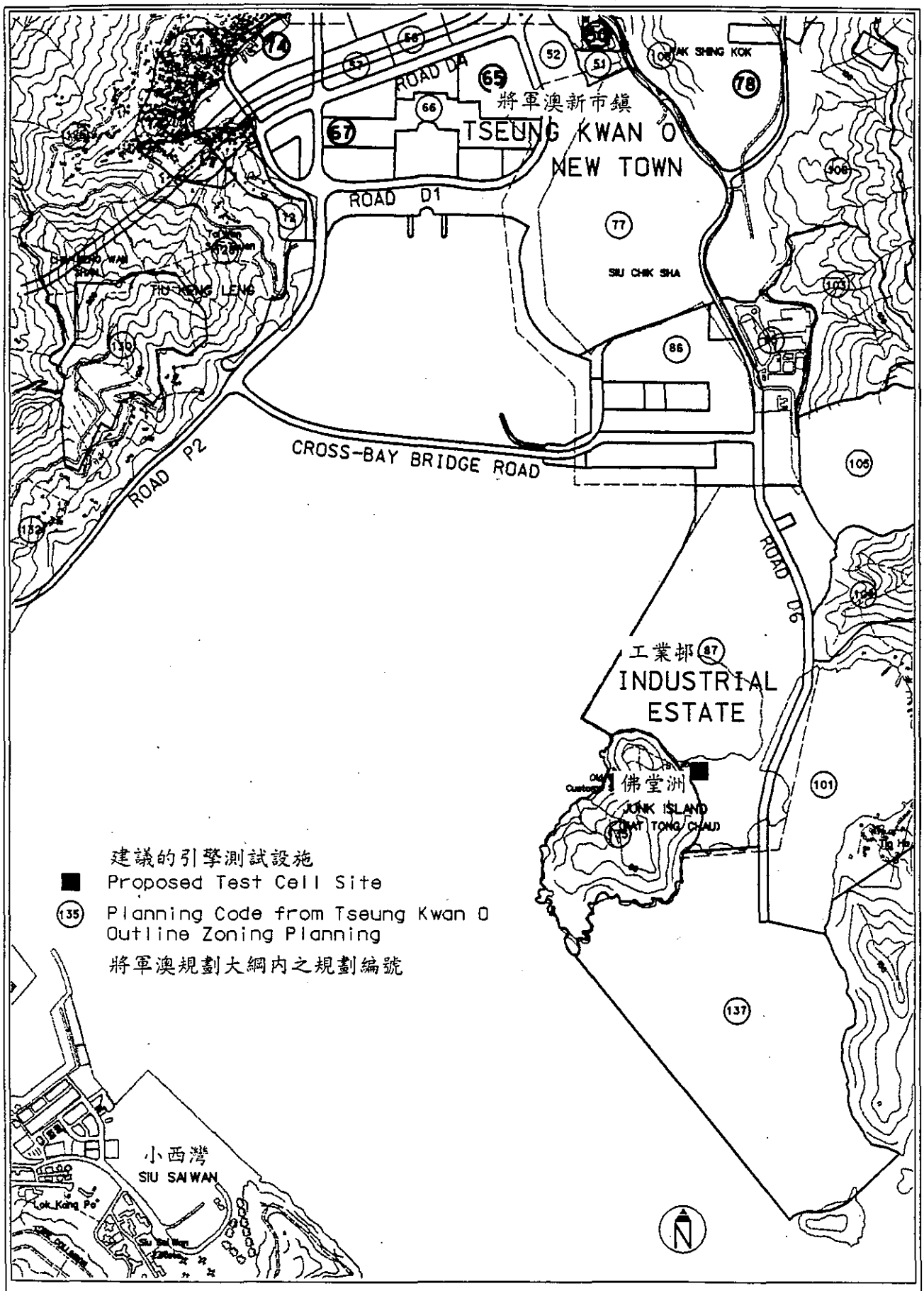

Figure 3a Site Location and Surrounding Area

圖3a - 廠址位置及其鄰近環境