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Agreement No. 合約編號CE 26/94

Tsuen Wan Bay Further Reclamation, Area 35

Engineering, Planning and Environmental Investigation

荃灣海灣進一步的填海工程 - 第35區

工程、規劃及環境研究

VOLUME 5 : EIA EXECUTIVE SUMMARY

卷五：環境影響評估執行摘要

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AGREEMENT NO. CE 26/94
TSUEN WAN BAY FURTHER RECLAMATION, AREA 35
ENGINEERING, PLANNING AND ENVIRONMENTAL INVESTIGATION

VOLUME 5

EIA EXECUTIVE SUMMARY

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1 INTRODUCTION

1.1 Background and Project Description

1.1.1 The in-house preliminary study on the improvement of land use and transport infrastructure conducted by Tsuen Wan Development Office in 1986 concluded that a detailed investigation into Tsuen Wan Bay (TWB) further reclamation should be carried out and this was endorsed by the Development Progress Committee in 1987. Following the endorsement of Metroplan by the Executive Council in 1991, planning studies undertaken in 1992 formulated a "Tsuen Wan - Kwai Tsing Development Statement", which was endorsed by the Land Development Policy Committee (LDPC) as the framework for the planning of the area. The need for undertaking an engineering feasibility, planning and environmental study on the proposed TWB further reclamation was confirmed.

1.1.2 On 20 June 1995 the Territory Development Department (TDD) of the Hong Kong Government commissioned Maunsell Consultants Asia Ltd (MCAL) as the lead consultants for the TWB further reclamation Study (TWBFRS) and CES (Asia) Ltd as the environmental consultants to MCAL. The purpose of the study is to investigate the feasibility of carrying out further reclamation in TWB, Area 35 with a view to providing necessary facilities to enable key planning objectives to be fulfilled. The study area and the proposed reclamation are shown in **Figure 1**.

1.1.3 The site is located in an embayment at the northern end of Rambler Channel. The bay served as a Public Cargo Working Area (PCWA) and a Dangerous Goods Anchorage (DGA), which need to be relocated before further reclamation can proceed. The PCWA is reprovisioned in a reclaimed area close to the former Stonecutter's Island and the DGA would be reprovisioned to the south of Ma Wan.

1.1.4 The environmental assessment conducted for the study includes assessment of air quality impacts, water quality impacts, noise, waste, and contamination issues related to development and the hazard to the population on the reclamation relating to the Yau Kom Tau Water Treatment Works (YKT WTW) at the north west of the site.

1.1.5 **Figure 2** shows the Master Development Plan (MDP) for the proposed reclamation and development. The land use proposals for the new development areas cover a total area of 31 hectares. The new development area includes proposed reclamation and land which is currently used as Cargo Working Area (CWA). Approximately 45% of the proposed development is occupied by housing and 20% by open space. Commercial development sites provide about 5% of the total land use budget, and education uses approximately 8% of the total land. The proposed development would support a residential population of about 30,000, with a total of 11,000 flats. Reclamation would be carried out in five different phases to allow early provision of housing sites.

1.1.6 The Environmental Impact Assessment (EIA) conducted under the current Feasibility Study indicated that there would be no insurmountable environmental effects arising from the reclamation and the associated developments on the site. Identified impacts during different phases of the development and ways to minimise the impacts are discussed in

following sections.

2 EFFECT OF RECLAMATION ON FLOW AND WATER QUALITY

2.1 Before discussing the potential environmental impacts during the construction phase and operational phase of the development, it would be necessary to study the overall effect of introducing a piece of land in Rambler Channel on the water flow through the channel. By filling up the TWB, the volume of water in Rambler Channel will be reduced and there is a concern about whether volume of water flowing through the channel would reduce, which would in turn affect the flushing capacity and water quality in the channel. Model simulation was carried out using a three-dimensional numerical hydrodynamic model to assess changes in tidal flow due to the reclamation.

2.2 Based on modelling results, TWB reclamation would only have changes of approximately 2% for the tidal flow volume through the Rambler Channel for most situations. For the other main water channels like the Victoria Harbour and Ma Wan, percentage changes in tidal flow volume would be mostly less than 1%. These small changes would unlikely cause any noticeable effects on the flow and water quality in the Channel.

3 CONSTRUCTION PHASE IMPACTS

3.1 Construction Noise

3.1.1 Out of twelve selected representative Noise Sensitive Receivers (NSRs), exceedances of the non-statutory day time limit (75 dB(A) for residential area and 70 dB(A) for school) were predicted to occur at four NSRs in Belvedere Garden and one at Ng Kwok Wai Memorial Kindergarten, for four of seven identified phases of reclamation construction. With three exceptions, all predicted exceedance would be less than 5 dB(A).

3.1.2 No exceedances of the non-statutory day time limit were predicted to occur during the reclamation road works.

3.2 Construction Phase Air Quality

3.2.1 No exceedance of the 1-hour average guideline level and the 24-hour average air quality objectives (AQO) for total suspended particulate (TSP) were predicted at air sensitive receivers (ASRs) with the implementation of sufficient dust suppression measures. Fifty percent dust reduction by watering with complete coverage of active working areas twice a day was tested to be sufficient.

3.3 Marine Mud Contamination

3.3.1 To minimise environmental impacts, an undredged reclamation by leaving the marine clays in place within the reclamation area was recommended. Dredging would be confined to areas beneath the seawall foundation where contamination was generally only found at surface sediments. Out of the 0.194 Mm^3 of sediments to be dredged for seawall foundation, about 0.042 Mm^3 would be classified as Class C contaminated sediments.

3.4 Construction Phase Water Quality Impacts

3.4.1 Dredging and filling impacts would be confined after a submerged seawall is built at the south reclamation boundary. The critical period when dredging might have an effect would be the period when dredging is undertaken for seawall foundation. According to the current construction schedule, this period would be about 3 months in 2002. It was predicted that there would be an elevation of suspended particles in water due to the dredging activities, and this would have an potential impact on the seawater intakes nearby, e.g. the Tsuen Wan Central Seawater Intake of Water Supplies Department (WSD). However, dredging impacts for a particular location would only be observed during a short period in a day depending on the tidal condition. Also, dredging impact outside the Rambler Channel is minimal and mostly unnoticeable.

3.5 Waste Management

Wastes generated by construction works are likely include general site wastes, workforce wastes, maintenances wastes, infrastructure wastes and accidental spillage. It is not expected to generate significant waste management related impacts, provided good site practice is adhered to.

4 OPERATIONAL PHASE ENVIRONMENTAL IMPACTS

4.1 Sewerage and Water Quality

4.1.1 No deterioration of water quality was expected due to the following reasons:

- TWB reclamation would only induce a small amount of change to the flow through Rambler Channel.
- Expedient connections into the drainage system, which are major sources of water pollution, would be removed by the sewerage improvement schemes under DSD Contract No. Tsuen Wan DC 94/01, scheduled to be completed by 1997.
- Instead of discharging into the Rambler Channel, sewage generated from the reclamation development would be directed to Strategic Sewage Disposal Scheme (SSDS) Stage I where they would be treated and then disposed of via a submarine outfall near Stonecutters. The SSDS Stage I is currently on-going and is anticipated to be completed by 1999.

4.1.2 The collector sewer in the study area will flow generally south to north by gravity to the proposed pumping station in Hoi Hing Road. From the proposed pumping station a 450 diameter rising main is proposed to convey the sewage to Wing Shun Street where a short length of 525 diameter gravity sewer will be provided for connection into the existing 2100 mm diameter trunk sewer in Texaco Road. The existing trunk sewer and the Tsuen Wan Pumping Station have been found to have sufficient capacities to receive the sewage flows from the reclamation. Potential septicity problem associated with the long rising main shall be addressed in the detailed design stage.

4.2 Control of Noise Impact

4.2.1 In the early conceptual stage of the study, consideration was given to control and reduce

traffic noise impacts to the existing receivers nearby and those on the future reclamation by having the major trunk road bypass at the northern side of the site in a tunnel **(Figure 3)**.

4.2.2 Traffic noise assessment had been performed using the predicted 2011 traffic data for more than 150 representative NSRs in the whole study area (includes existing and planned, residential areas and schools). Major road noise sources are traffic along the existing Tsuen Wan Road, Hoi Hing Road and Hoi On Road. The close proximity of the planned district distributor and local roads to the proposed residential dwellings may also cause exceedances of the Hong Kong Planning Standards and Guidelines (HKPSG) noise standards.

Future Development on Reclamation

4.2.3 Exceedence by up to 9 dB(A) of the HKPSG noise standards at buildings adjacent to Hoi Hing Road and Tsuen Wan Road in Areas 102 and 104 were predicted for an unmitigated scenario. Noise barriers on new ramps would be ineffective in reducing the noise levels at these facades to meet the HKPSG standards since contribution from new ramps to the cumulative noise level is predicted to be less than 1 dB(A). There is no current policy to apply retroactive mitigation to existing roads. Nevertheless, direct mitigation measures on Tsuen Wan Road would be more effective in resolving the potential noise problems, and thus should be considered in any future study that aims to upgrade Tsuen Wan Road.

4.2.4 Although direct mitigation measures cannot be applied on Tsuen Wan Road, other suitable windows and air-conditioning have been recommended to minimise the noise impacts to Areas 102 and 104. These includes extended podia, use of boundary walls and reorientation of openable windows to the facade with an acute angle of exposure to road traffic.

4.2.5 Most noise impacts caused by the traffic along Hoi On Road in Areas 101 and 102 can be reduced effectively by having sufficient setback between the proposed buildings and the road. Exceedance by 1-3 dB(A) has been predicted for buildings closest to Hoi On Road. By extending the podium closer to Hoi On Road to enhance the shielding and relocating the openable window to the facade with an acute angle of exposure to road traffic (Figure 4), most of the affected facades are predicted with noise levels below the HKPSG standards. Area 103 is quite far away from major roads and is bounded by distributor and local roads only. As a result, all residential receivers would not be exposed to levels in excess of the HKPSG noise standards.

4.2.6 Slight exceedances of HKPSG noise standards at schools adjacent to the planned district distributor and local roads were also predicted. Boundary walls of 3m height along the site boundaries were found to be effective in resolving the predicted non-compliance at most schools.

Existing Developments near TWB

4.2.7 Although the predicted noise levels at some facades of the existing receivers at developments near TWB exceed 70 dB(A), most of them would be benefited from the

proposed tunnel such that unmitigated noise contribution from new roads does not exceed 1.0 dB(A) except at locations near the tunnel portals.

4.2.8 Near the western side of the site, facades within 20 m from the road-edge of Hoi On Road in Bayview Garden and Belvedere Garden Phase 3 are exposed to noise levels of 70 dB(A) or higher. With the provision of canopy type barriers (5 m tall with a 2 m overhang) on the improved sections of Hoi On Road, most of the dwellings in Bayview Garden were predicted with noise levels in compliance with the HKPSG standards and the new ramps to the cumulative noise level would be greatly reduced. As a result, none of the affected units would meet the eligibility criteria for indirect technical remedies. Similarly, with the provision of canopy type barriers (5 m tall with a 3 m overhang) along eastbound of the new ramps associated with the tunnel bypass, the contribution of the new ramps to the cumulative noise level would be greatly reduced. As a results, none of the affected units in Clague Garden Estate would be eligible for indirect technical remedies.

4.3 Air Quality

4.3.1 No exceedance of the Air Quality Objectives (AQO) at the representative air sensitive receivers (ASRs) in year 2011 was predicted from modelling of air quality effects from traffic emission, provided that the ventilation system for the tunnel connecting Hoi On Road and Tsuen Wan Road (Figure 3) can discharge up to 70% of the traffic emission into the atmosphere through a ventilation shaft, instead of the tunnel portals. Nevertheless, it is recommended to locate the ventilation shaft at a distance of 100 m or more from any ASRs to minimise the air quality impact.

4.3.2 As the development area is close to some industrial sites to the north and northeast side, assessment has been carried out to investigate whether there will be air quality problem due to stack emission from the industrial sites. The assessment concludes that there would be no exceedance of the AQO caused by stack emission at the future ASRs provided that a height restriction of 90 m would be imposed on the developments at the northern edge of Area 102 (Figure 5). This area is intended to serve as open space based on the current MDP.

4.4 Solid Waste and Contamination

4.4.1 The estimated quantity of wastes generated from the development in 2011 would be around 43,425 kg/day in which 31,361 kg/day would be from the residential sector and 12,064 kg/day from the commercial/industrial sector. A refuse collection point (RCP) will be provided for the proposed development.

4.4.2 The study area is mainly marine. Only a small portion of land on the northeast and northwest fringes of the site was reclaimed in the 1980's to accommodate Tsuen Wan Road, Hoi On Road and TW PCWA. The site is concrete paved and site inspection indicated no sign of oil spills or chemical leakage. No spillage has been recorded at the PCWA and land contamination is not considered a key issue. On the other hand, chemical analysis of marine sediments at the existing TWB seabed indicated that contaminated sediments were found in the inner part of the bay, as discussed in paragraph 3.3.

4.5 Hazard related to the YKT WTW

4.5.1 The western half of the study area lies within the 1 km Consultation Zone (CZ) established around YKT WTW, which is a designated Potentially Hazardous Installation (PHI) due to the storage and use of chlorine. Reclamation and development of TWB would lead to the introduction of approximately 15,000 people within the CZ.

4.5.2 Assessment indicated that individual risk would comply with the Individual Risk Guideline endorsed by the Co-ordinating Committee on Land-use Planning and Control relating to Potentially Hazardous Installations (CCPHI). Societal risks associated with YKT WTW to people within the TWB reclamation area would also be well within the 'acceptable' region of the Societal Risk Guidelines. The overall societal risks related to the YKT WTW would only be increased by about 3% due to the TWB development.

5 ENVIRONMENTAL MONITORING AND AUDIT

In order to ensure compliance with relevant standards, a requirement for baseline and compliance monitoring for noise, air and water quality has been identified. An environmental monitoring and audit (EM&A) will be set up during the construction phase of the project to ensure compliance with the EIA study recommendations, to assess the effectiveness of the recommended mitigation measures and to identify further need for additional mitigation measures. All monitoring and audit work will be undertaken in accordance with the EM&A manual issued for the study.

6 CONCLUSION AND RECOMMENDATION

The noise, air quality and water quality impacts associated with the project can be minimised to acceptable levels with the implementation of environmental mitigation measures. Mitigation measures proposed in the EIA are briefly summarised as follows:

Construction Noise

6.0.1 Due to the size of the site, height of NSRs, and the mobile nature of most powered mechanical equipments (PME), it would not be practical to recommend conventional mitigation measures such as acoustic enclosures or acoustic barriers. Quieter plant was recommended where practicable, and this was predicted to bring the mitigated noise level from the construction activities to below the day time limit for residential area. In addition, good site practices were recommended to further reduce noise levels.

Construction Phase Air Quality

6.0.2 Potential high levels of dust arising from the construction activities would be mitigated by good operational practices, which include regular watering, avoidance of open stockpiles, provision of barriers, wind shield, dust extraction, side enclosure and covering and imposition of speed controls for vehicles on unpaved site roads.

Marine Mud Contamination

6.0.3 It is recommended to reuse the dredged marine mud on site in a controlled manner to avoid off-site disposal of the materials. No dredged materials will be disposed of off-site and the dredged material placed in the site would be isolated from the environment by a layer of sand cap.

Construction Phase Water Quality

6.0.4 To minimise the impacts on water quality at the nearby seawater intakes, in particular the WSD's saltwater pumping station intake, appropriate mitigation measures including use of silt screens and implementation of good dredging practices were recommended during both dredging and reclamation. Careful programming of the works schedule would also help to minimise the impacts. A monitoring programme is required to ensure that dredging, reclamation and construction activities are not causing unacceptable deterioration of water quality at the intakes nearby, and to maintain the seawater quality at the WSD intake within WSD's water quality objectives for flushing at all time for the normal functions and operation of the pumping station.

6.0.5 During construction, properly maintained facilities such as chemical toilets, septic tanks and grease traps would be provided for the wastewater generated from the workforce. Mitigation measures to control site run-off and erosion would be carefully designed and implemented, following standard guidance.

Construction Waste Management

6.0.6 Proper waste management and handling procedures including good site practice would be adopted during the construction phase to minimise the waste impacts.

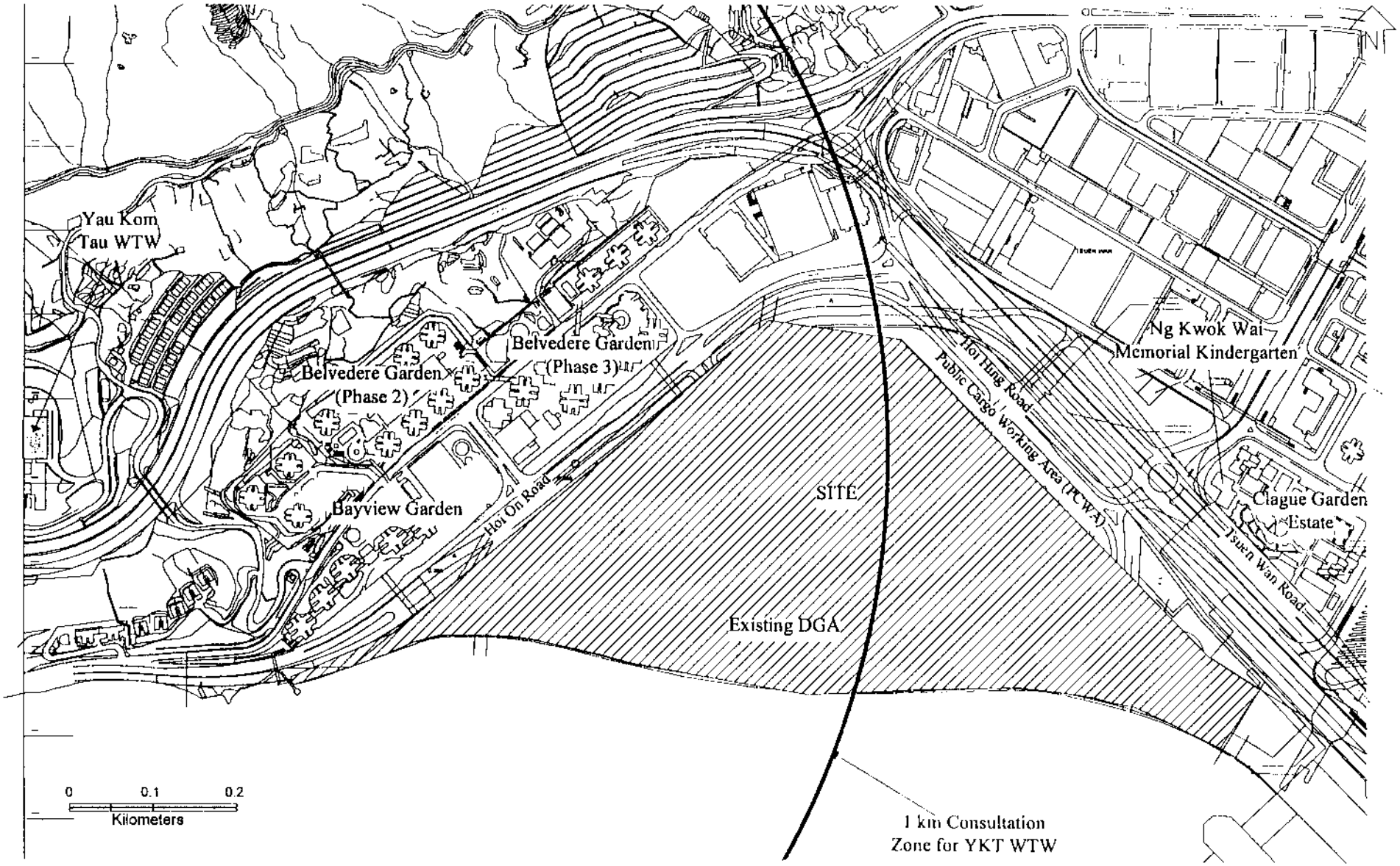
Operational Noise

6.0.7 Mitigation measures on new roads and within the development sites were considered to minimize noise impacts and a set of practicable and effective measures. Proposed noise mitigation measures on new development are summarised in **Table 1** and also illustrated in **Figure 4**.

Table 1 Summary of Noise Mitigation Measures on New Development

Block	Major Traffic Noise Contributor	Minimum Setback Distance (m)	Proposed Mitigation Measures	Flats >70 dB(A)	
				Unmitigated	Mitigated
Area 101 (PSPS) 2400 Flats					
A	Hoi On Road	46	Extended Podium (10 m closer to D1) Window Orientation	40	0
	Road D1	16			
B - E	Hoi On Road	85	Nil	0	0
	Road L1	46			
F	Road L1	12	Window Orientation	10	0
Area 102 (PSPS) 2000 Flats					
A	Hoi On Road	44	Extended Podium (10 m closer 10 D1) Window Orientation	90	30
	Road D1	15			
B,C	Hoi On Road	93	Window Orientation	100	0
	Tsuen Wan Road	216			
D - F	Hoi Hing Road	18	Window Orientation	375	345
	Tsuen Wan Road	76			
	Road D2	15			
	Road D3	23			
Area 103 (R1) 3000 Flats					
ALL	Road L1	18	Nil	0	0
	Road L2	10			
	Road D3	15			
Area 104 (RS) 3600 Flats					
A	Hoi Hing Road	8	5m tall boundary wall	360	360
	Tsuen Wan Road	72			
	Road D2	22			
B	Road D2	22	3m tall boundary wall	40	0
	Road D3	50			
	Road L2	6			
	Roundabout	10			
C - E	Tsuen Wan Road	134	3m tall boundary wall	230	130
	Road L2	8			

B010

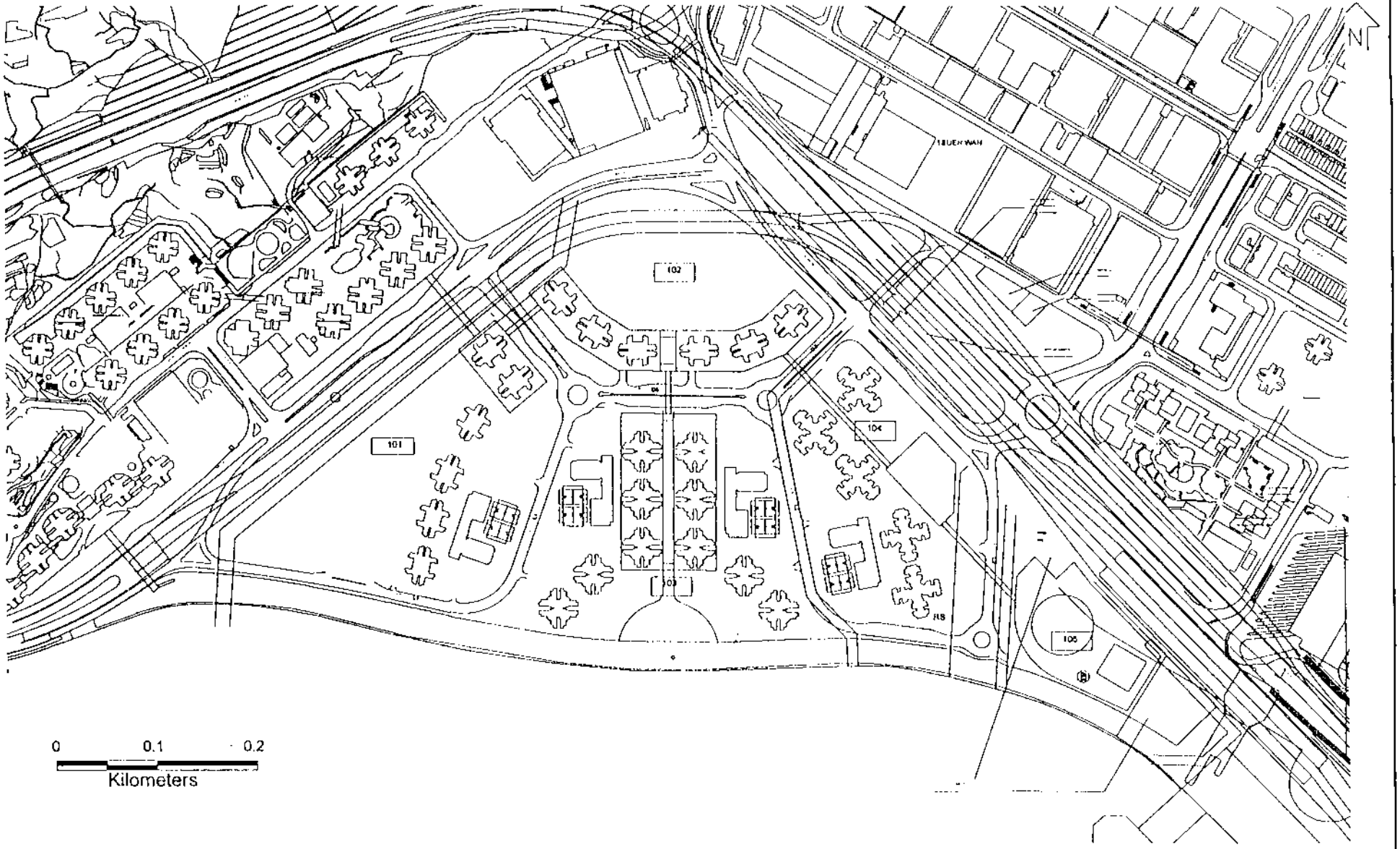


TSUEN WAN BAY FURTHER RECLAMATION, AREA 35

THE STUDY AREA

FIGURE	1
SCALE	1 : 6500

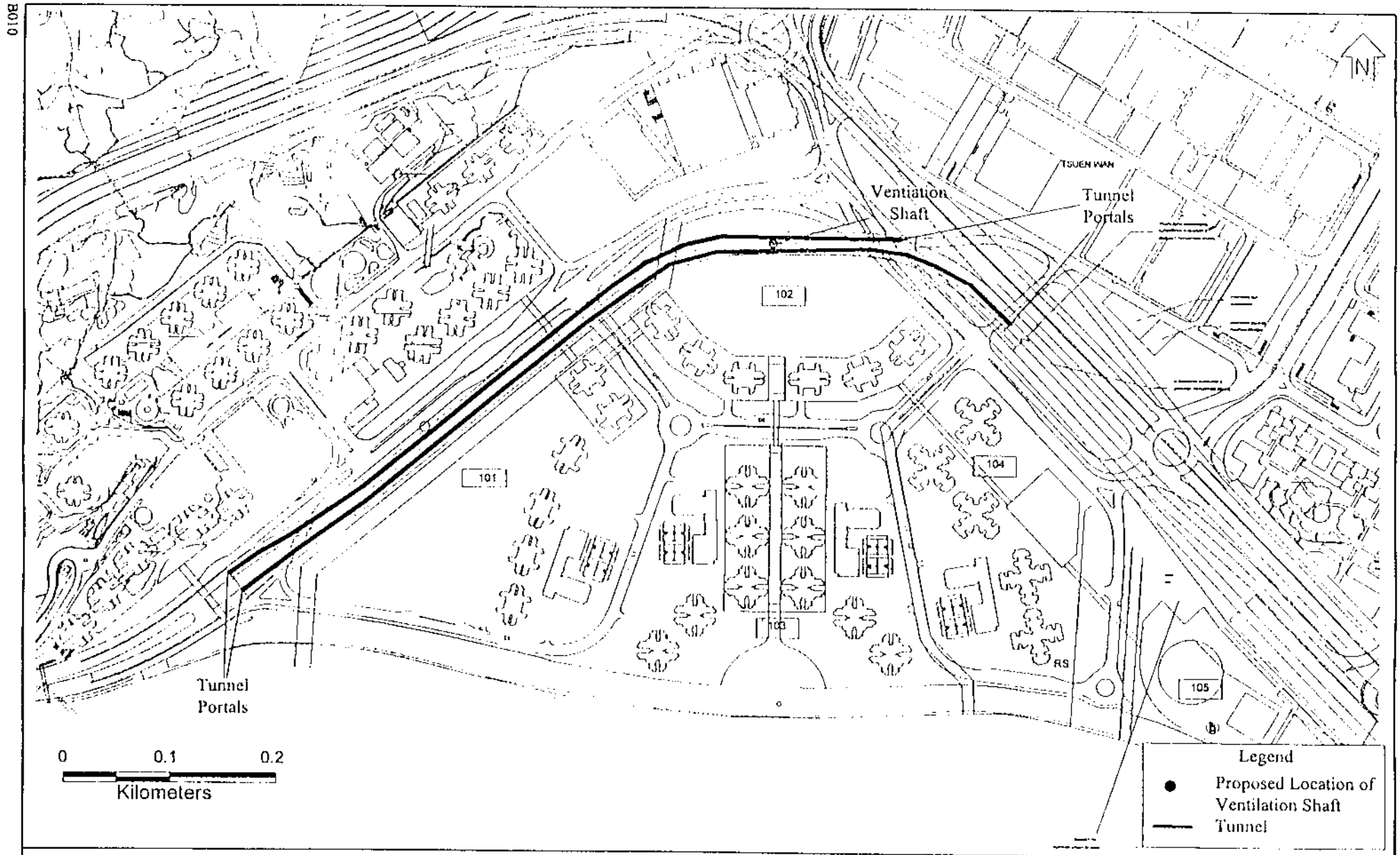
B010



TSUEN WAN BAY FURTHER RECLAMATION, AREA 35

MASTER DEVELOPMENT PLAN

FIGURE	2
SCALE	1 : 5500



TSUEN WAN BAY FURTHER RECLAMATION, AREA 35

LOCATION OF THE TUNNEL BYPASS AND THE VENTILATION SHAFT

FIGURE 3

SCALE 1 : 5000

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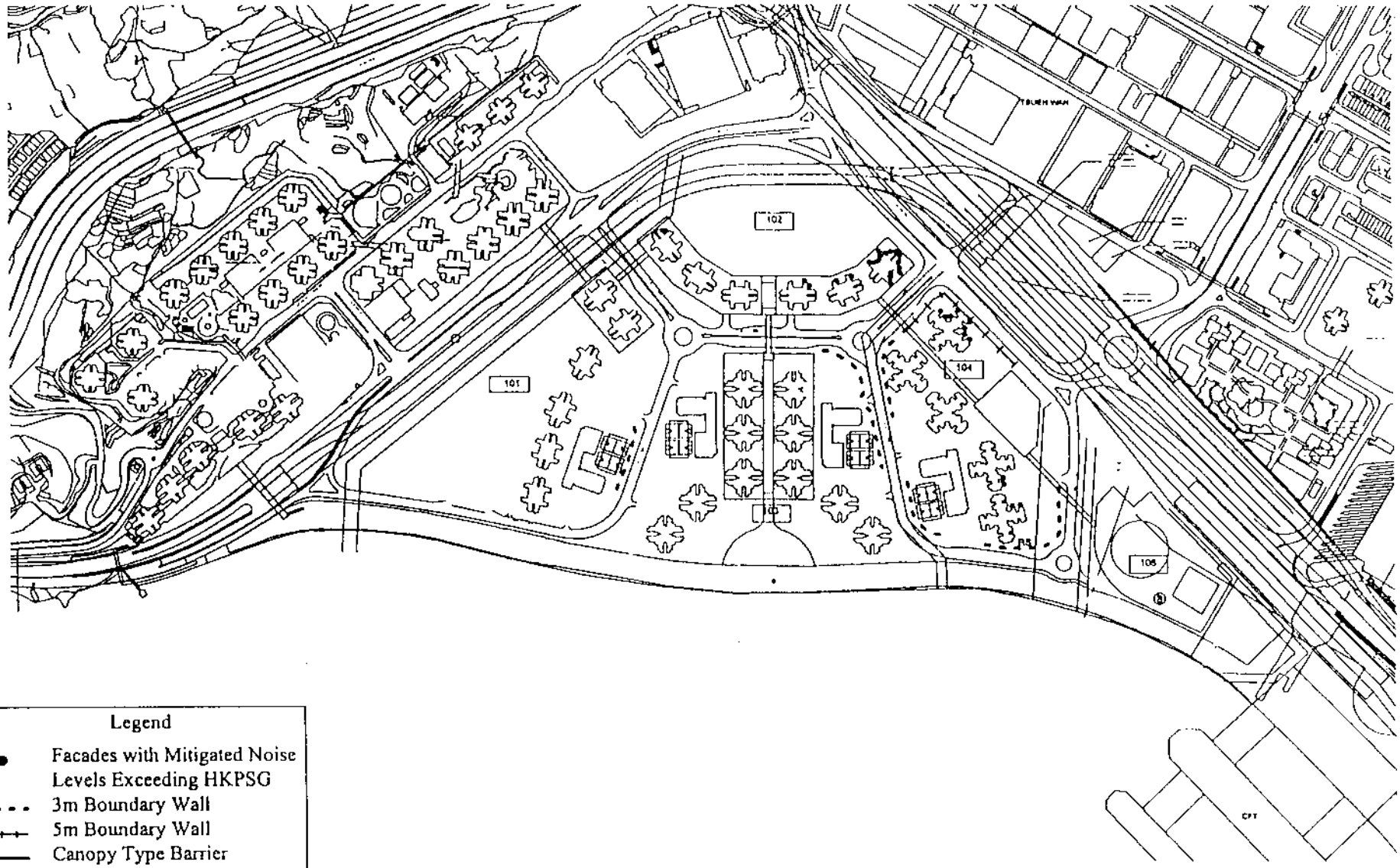


Legend

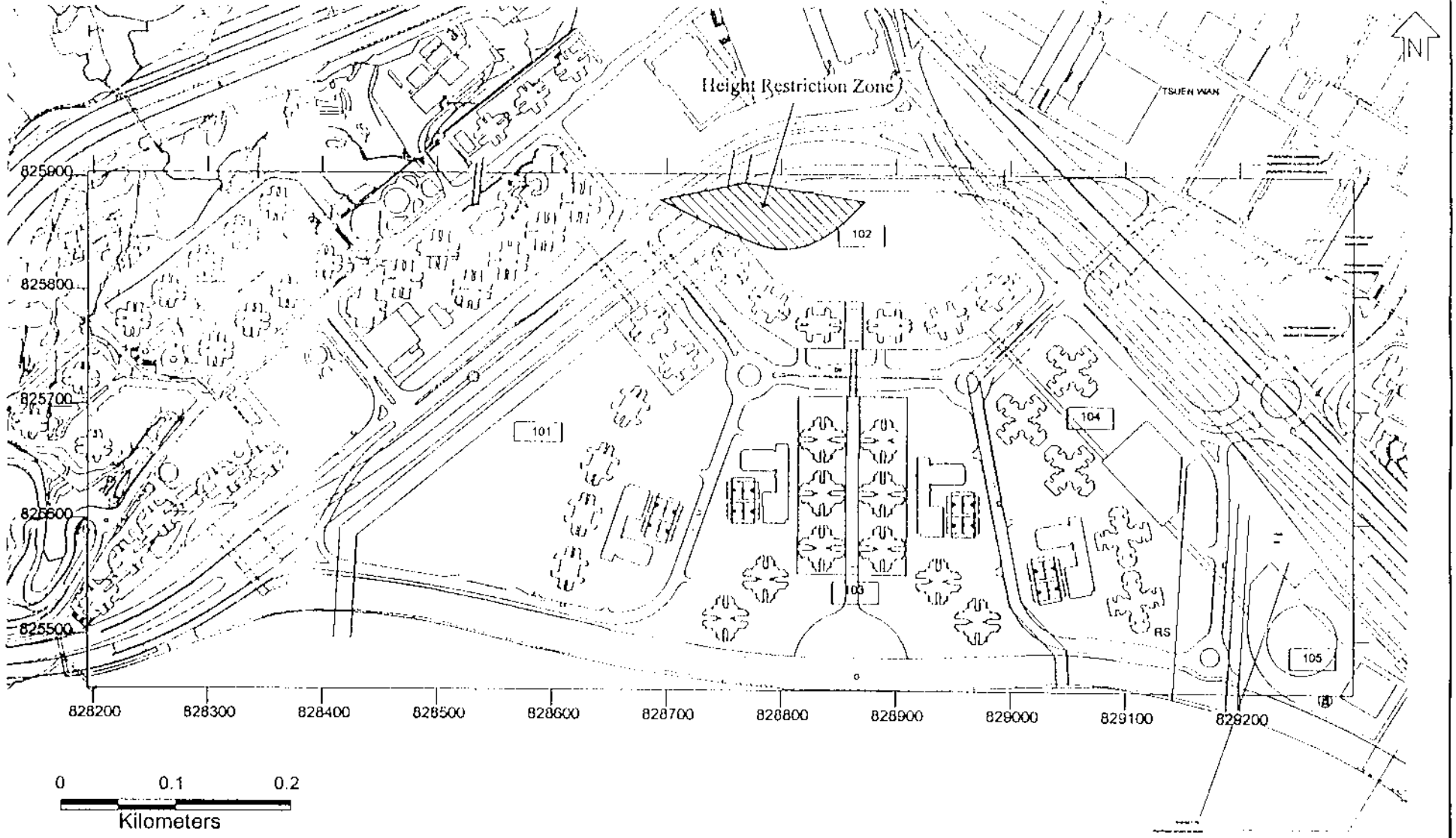
- Facades with Mitigated Noise Levels Exceeding HKPSG
- 3m Boundary Wall
- 5m Boundary Wall
- Canopy Type Barrier

TSUEN WAN BAY FURTHER RECLAMATION, AREA 35

PROPOSED MITIGATION MEASURES AND FACADES WITH MITIGATED NOISE LEVELS EXCEEDING HKPSG

FIGURE	4
SCALE	1 : 6250

B010



Note : A building height restriction of 90m is proposed for the height restriction zone

TSUEN WAN BAY FURTHER RECLAMATION, AREA 35

HEIGHT RESTRICTION ZONE

FIGURE	5
SCALE	1 : 5000