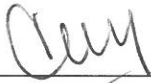



Contract No. CV/2007/03

**Development at Anderson Road –  
Site Formation and Associated  
Infrastructure Works****Updated Environmental Monitoring  
and Audit Manual**

December 2017

	Name	Signature
Prepared & Checked:	Candy Chung	
Reviewed, Approved & Certified:	Yiu Wah Fung (ETL)	

Version: 2

Date: 12 December 2017

**Disclaimer**

This report is prepared for China State Construction Engineering (Hong Kong) Ltd. and is given for its sole benefit in relation to and pursuant to Contract No. CV/2007/03 Development at Anderson Road – Site Formation and Associated Infrastructure Works and may not be disclosed to, quoted to or relied upon by any person other than China State Construction Engineering (Hong Kong) Ltd. without our prior written consent. No person (other than China State Construction Engineering (Hong Kong) Ltd.) into whose possession a copy of this report comes may rely on this report without our express written consent and China State Construction Engineering (Hong Kong) Ltd. may not rely on it for any purpose other than as described above.

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Ref.: OAPANDSNEM00\_0\_2008L.17

12 December 2017

Engineer's Representative  
Ove Arup & Partners  
Level 5, Festival Walk  
80 Tat Chee Avenue  
Kowloon Tong, Kowloon  
Hong Kong

By Post and Fax: 2407 8382

Attention: Mr. Dennis Leung

Dear Sir,

**Re: Contract No. CV/2007/03 (Environmental Permit No. EP -483/2013)  
Development at Anderson Road  
Site Formation and Associated Infrastructure Works  
Updated EM&A Manual**

Reference is made to the Environmental Team's submission of the Updated EM&A Manual (December 2017) received by e-mail on 11 December 2017 for our review and comment.

Please be informed that we have no adverse comment on the captioned submission. We write to verify the captioned submission in accordance with Condition 2.3 of the Environmental Permit No. EP-483/2013.

Thank you very much for your attention and please feel free to contact the undersigned should you require further information.

Yours faithfully,



David Yeung  
Independent Environmental Checker

c.c.            AECOM            Attn.: Mr. Y. W. Fung  
                  CSCEC            Attn.: Mr. Holmes Wong

By Fax: 3922 9797  
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Q:\Projects\OAPANDSNEM00\Corr\OAPANDSNEM00\_0\_2008L.17.docx

## **Confirmation from Engineer's Representative on 30 June 2017**

**From:** Brian Wan <brian.wan@dar.com.hk>  
**Sent:** Friday, June 30, 2017 9:16 AM  
**To:** Chung, Wing Tung Candy  
**Cc:** F C Tsang; Daisy Auyeung; Polly Yip; 黃家裕; 張廣賢; 'Helen Chong'; Dennis Leung ; Cliff Ko; Fung, Yiu Wah  
**Subject:** RE: CV/2007/03 - Development at Anderson Road- Updated EM&A manual (Draft)

Dear Candy,

We don't have any comment on the Updated EM&A Manual. If IEC does not have further comment, please proceed with the submission to EPD. Thank you.

### Brian Wan

Assistant Resident Engineer | CEDD Contract No. CV/2007/03 Development at Anderson Road – Site Formation and Associated Infrastructure Works  
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Yiu Wah

**Subject:** RE: CV/2007/03 - Development at Anderson Road- Updated EM&A manual (Draft)

Dear Polly,

As per our discussion, the two locations were selected according to the requirement stated in Clause 3.7.1 of the existing EM&A manual.

In summary, updates made to the EM&A manual include the following:

- 1) Addition of Clause 3.7.4; and
- 2) Provision of Appendix 3.

Thank you very much and please let me know if you have any questions.

Best regards,

**Candy Chung**

Graduate Environmental Consultant, Environment

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**Subject:** RE: CV/2007/03 - Development at Anderson Road- Updated EM&A manual (Draft)

Dear Candy,

Please kindly find comment below for the captioned EM&A manual:

1. Appendix 3, S2.8 – Please elaborate why only two locations are selected for road traffic noise monitoring, and why these two are selected.

Should you have any queries, please feel free to contact me.

Regards,

**Polly Yip**

Assistant Environmental Consultant

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**Subject:** CV/2007/03 - Development at Anderson Road- Updated EM&A manual (Draft)

Dear Polly,

Please kindly review and verify the draft of the Updated EM&A manual. The Operational Phase Noise Monitoring Proposal is annexed in Appendix 3.

These files will be available for download until 6/23/2017

<b><u>File</u></b>	<b><u>Description</u></b>	<b><u>Size</u></b>
<a href="#">Updated EM&amp;A Manual Appendix 1.pdf</a>		8,189KB
<a href="#">Updated EM&amp;A Manual Appendix 2.pdf</a>		1,012KB
<a href="#">Updated EM&amp;A Manual Appendix 3.pdf</a>		1,353KB
<a href="#">Updated EM&amp;A Manual Appendix 4.pdf</a>		462KB
<a href="#">Updated EM&amp;A Manual Figures.pdf</a>		47,636KB

[Updated EM&A Manual\\_main text1706.pdf](#)

2,804KB

[Download all files \(.zip\)](#)

Thank you very much and please let me know if you have any questions.

Best regards,

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# 1 INTRODUCTION

## 1.1 Purpose of this Manual

- 1.1.1 This updated Environmental Monitoring and Audit (EM&A) Manual guides the setup of an EM&A programme to ensure compliance with the Environmental Impact Assessment (EIA) study recommendations, to assess the effectiveness of the recommended mitigation measures and to identify any further need for additional mitigation measures or remedial action. This Manual outlines the monitoring and audit programme to be undertaken for the construction work related to development at Anderson Road. It aims to provide systematic procedures for monitoring, auditing and minimizing environmental impacts associated with construction works.
- 1.1.2 The purpose of this updated EM&A Manual is to comply with the requirement of the Environmental Permit Condition 2.3 of EP-483/2013 regarding the operation monitoring of traffic noise.
- 1.1.3 Hong Kong environmental regulations for air quality, noise and waste, together with the Hong Kong Planning Standards and Guidelines (HKPSG) and recommendations presented in the EIA study for the Planning and Engineering Feasibility Study for Development at Anderson Road have served as environmental standards and guidelines in the preparation of this Manual.
- 1.1.4 This Manual contains the following:
- Responsibilities of the Contractor, the Engineer or Engineer's Representative (ER), Environmental Team (ET), and the Independent Checker (Environment) (IC(E)) with respect to the environmental monitoring and audit requirements during the course of the project;
  - Information on project organization and programming of construction activities for the project
  - Hypotheses of potential impacts, the basis for, and description of the broad approach underlying the environmental monitoring and audit programme;
  - Requirements with respect to the construction schedule and the necessary environmental monitoring and audit programme to track the varying environmental impact;
  - Specific questions and testable hypotheses that the monitoring programme is designed to answer;
  - Full details of the methodologies to be adopted, including all field laboratory and analytical procedures, and details on quality assurance and quality control programme;
  - Rationale on which the environmental monitoring data will be evaluated and interpreted and the details of the statistical procedures that will be used to interpret the data;
  - Definition of Action and Limit Levels;
  - Establishment of Event and Action Plans;
  - Requirements of reviewing pollution sources and working procedures required in the event of non-compliance of the environmental criteria and complaints;
  - Requirements of presentation of environmental monitoring and audit data and appropriate reporting procedures; and
  - Requirements for review of EIA predictions and effectiveness of the environmental monitoring and audit programme.
- 1.1.5 For the purpose of this Manual, the "Architect/Engineer" shall refer to the Architect/Engineer as defined in the Contract and the Architect/Engineer's Representative (A/ER), in cases where the

Architect/Engineer's powers have been delegated to the A/ER, in accordance with the Contract. The ET Leader, who shall be responsible for and in charge of the ET, shall refer to the person delegated the role of executing the environmental monitoring and audit requirements.

## 1.2 Background

- 1.2.1 According to the Territorial Development Strategy Review 1996, the housing supply capacity of current approved plans and programmes will not be adequate to meet the estimated housing in 2000/01, the site bounded by Anderson Road and the realigned Sau Mau Ping Road was identified as one of the selected sites for assessing their suitability for housing development.
- 1.2.2 Civil Engineering Department commissioned the Consultants to undertake a planning and engineering feasibility study for development at Anderson Road. The development site is located in the East Kowloon District. It is bounded by Anderson Road to the north, the realigned Sau Mau Ping Road to the south, Po Lam Road to the east, and Lee On Road and Shun On Road to the west. The Project is proposed to form platforms for housing development and associated uses in area of about 50 hectares, and to carry out necessary infrastructural upgrading or improvement works to cater for the proposed development. Figure 1.1 and Figure 1.2 show the location of the development site and the layout of the Preferred Development respectively.
- 1.2.3 There are a number of re-development schemes in the vicinity of the development site which are at various stages of planning and construction. Sau Mau Ping Estate located immediately to the southwest of the development site is currently redeveloped and the final phase will be completed in 2005. As part of the redevelopment programme, the section of Sau Mau Ping Road between Sau Mau Path and Hiu Kwong Street is scheduled to be realigned and widened to 13.5 metres. Construction activity has not commenced and the target date for this realignment is 1999.
- 1.2.4 Po Lam Road Platform located to the south of the development site is currently under construction. It is expected that occupation of public housing on Po Lam Road Platform will be in 2001.
- 1.2.5 The Anderson Road Quarry, adjacent to the development site, has a new phased programme of extraction, processing and rehabilitation. The 17-year rehabilitation scheme of Anderson Road Quarry includes 15 years of operation to January 2012 followed by nearly 2 years of establishment works with completion in December 2013.
- 1.2.6 During the construction phase of the project, air quality (dust) and noise impacts from the development site itself and the adjacent Anderson Road Quarry and other nearby construction sites are identified as the major environmental issues of concern. Details of the monitoring and audit requirements for these impacts are presented in this Manual. Besides, waste management is also identified in the EIA study as another environmental issue during the construction phase of the project that requires mitigation measures.
- 1.2.7 There are a number of sensitive receivers located to the south and west of the site, namely Shun Chi Court, Shun Lee Estate, Shun On Estate, Shun Tin Estate, Sau Man Ping Estate, the United Christian Hospital and Po Lam Road Platform Development. They are all located within 500 metres from the boundary of the development site. Locations of these receivers are shown in Figure 1.1 and are summarised in Table 1.1 below.

**Table 1.1 Existing and Future Sensitive Receivers**

Sensitive Receiver	Sensitive to Air Quality and/or Noise		Closest Distance to the Site	Description
	A	N		
Shun Chi Court	✓	✓	220m	12 residential towers (16 storeys)
Shun Lee Estate	✓	✓	108m	6 residential towers (17 to 23 storeys)
Shun On Estate	✓	✓	26m	3 residential towers (7 to 29 storeys)
Shun Tin Estate	✓	✓	32m	11 residential towers (19 to 26 storeys)
Sau Mau Ping Estate (receivers on existing and redeveloped sites)	✓	✓	26m	12 residential towers (15 to 36 storeys)
United Christian Hospital	✓	✓	260m	1 clinical tower (15 storeys) 2 staff quarters (16 storeys)
Po Lam Road Platform Development	✓	✓	30m	14 residential towers (30 to 40 storeys) 1 primary school (5 storeys)

1.2.8 Criteria for evaluating air quality and noise impacts at sensitive receivers during the construction phase of the project are summarised as follows:

***Air Quality***

1.2.9 The APCO (Cap.3 1-1) provides powers for controlling air pollutants from a variety of stationary and mobile sources and encompasses a number of Air Quality Objectives (AQOs). Currently AQOs stipulate concentrations for a range of pollutants. For dust emissions from construction activities, the maximum acceptable TSP concentration averaged over a 24-hour period is 260µgm-3, as defined in the AQOS. Besides, as stated in the Technical Memorandum on Environmental Impact Assessment Process, an hourly average total suspended particulates (TSP) concentration of 500µgm-3 should not be exceeded.

1.2.10 The APCO specifies a number of processes which require licensing and are subject to special controls. For quarry operation, licensing would be required for size reduction activities exceeding an annual processing capacity of 5000 tonnes. Cement works is also covered by the APCO if the total silo capacity exceeds 50 tonnes. Compliance with limits imposed under licence is monitored by EPD.

1.2.11 The Air Pollution Control (Construction Dust) Regulations are effective from 16 June 1997. Site formation is one of the processes enforced under this regulation. Contractors and site agents are required to inform EPD and adopt dust reduction measures to cut down dust emission while carrying out construction works.

## *Noise*

- 1.2.12 The Noise Control Ordinance (NCO) provides the statutory framework for noise control. Assessment procedures and standards are set out in four Technical Memoranda (TM) listed below:
- TM on Noise from Places other than Domestic Premises, Public Places or Construction Sites;
  - TM on Noise from Construction Work other than Percussive Piling;
  - TM on Noise from Percussive Piling; and
  - TM on Noise from Construction Work in Designated Area
- 1.2.13 The NCO divides construction work into activities involving powered mechanical equipment excluding percussive piling, and percussive piling activity. The criteria for the assessment of noise from construction work are therefore similarly divided.
- 1.2.14 Under the existing provisions, there is no legal restriction on noise generated by construction work (other than percussive piling) between the hours of 07:00 and 19:00 on normal weekdays. However, EPD's Practice Note for Professional Persons PN2/93 (ProPECCNote PN 2/93) sets a non-statutory daytime noise limit of 75dB(A) Leq (30min) at the facades of dwellings, and 70 dB(A) at the facades of schools (65 dB(A) during examinations).

## 1.3 Environmental Mitigation Measures Proposed in the EIA

### 1.3.1 Air Quality

#### *Construction Phase*

- 1.3.1.1 Since the development site is located next to the Anderson Road Quarry, the cumulative impacts would be considerably high. Therefore in order to comply with the 1-hour average TSP guideline level and the 24-hour average TSP AQO, a commitment by the contractor to adopt the following mitigation measures is necessary:

#### *Site Practice*

- Mean vehicle speed of haulage trucks at 10 kmhr<sup>-1</sup>.
- Twice daily watering of all open site areas.
- Regular watering (once every 1.5 hours) of all site roads and access roads with frequent truck movement.
- Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.
- Establishment and use of vehicle wheel and body washing facilities at the exit points of the site, combined with cleaning of public roads where necessary.
- Suitable side and tailboards on haulage vehicles.
- Watering of temporary stockpiles.
- Paved northern and southern temporary access roads.

#### *Blasting*

- Use of select aggregate and fines to stem the charge with drill holes and watering of blast face
- Use of vacuum extraction drilling methods.
- Carefully sequenced blasting.
- Blasting should not be carried out under unfavourable meteorological conditions with wind speed less than 2 ms<sup>-1</sup>.

### *Crushing*

- Fabric filters installed for the crushing plant.
- Water sprays on the crusher.

### *Loading and Unloading Points, and Conveyor Belt System*

- Water sprays at all fixed loading and unloading points (at the crusher and conveyor belts).
- The loading point at the crusher is enclosed with dust collection system installed.
- When transferring materials from conveyor belt or crusher to the dump trucks, chutes or dust curtains are used for controlling dust.
- Cover the conveyor belts with steel roof and canvas sides.

1.3.1.2 Apart from the dust suppression measures listed above, the Contractor should also satisfy the requirements stipulated in Air Pollution Control (Construction Dust) Regulation. It is noted that no adverse environmental effects from the above mentioned mitigation measures would be expected.

## **1.3.2 Noise**

### *Construction Phase*

1.3.2.1 The intention at each stage of the construction period should be to minimize site noise levels, whilst having due regard to the practicability of any proposed control or mitigation measures. The initial aim in the design of the construction programme should be trying to schedule the minimum number of simultaneous operations.

1.3.2.2 Proper scheduling of site formation works is required to avoid several site formation works to occur concurrently in the areas close to sensitive receivers. It is recommended that rock drilling cannot be undertaken concurrently (i) at Platforms C(1) and C(2) and Platform C(3); and (ii) at Platforms C(1) and C(2) and Platform B to avoid adverse impacts at sensitive receivers. In addition, quieter powered mechanical equipment should be employed during site formation process.

1.3.2.3 Operation of noisy equipment, such as hydraulic hammer and drilling rig, near school receivers should be kept to minimum. The operation of noisy equipment should not be carried out during examination period. The operation of noisy equipment should be carried out during non-school hours (i.e. lunch time and around 4:00 pm - 7:00 pm) whenever possible.

1.3.2.4 The basic requirement for any construction contractors is to use all available techniques to minimise the noise level to which operation and others in the neighbourhood of site operations would be exposed. The effective measures are as follows:

- a rigorous EM&A programme should be undertaken, and should focus on those NSRs of particular concern, in order to identify and rectify any problems at the earliest possible stage;
- construction plant should be properly maintained and operated;
- conditions from EPD's *Recommended Pollution Control*, Clauses should be incorporated into future contract documents and implemented in order to control construction noise impacts to within acceptable levels; and
- any scheduling of occupancy of sensitive receivers e.g. new schools or residential units, shall be at a time when all noisy construction works in nearby areas have been completed.

### *Operational Phase*

1.3.2.5 In order to minimise the plant noise impacts from the Anderson Road Quarry during operational phase of the development, it is recommended that noise sensitive uses including residential uses should not be planned within the shaded area in Platform E as shown in Figure 1.3. In order to comply with the day

time NCO noise limit of 70 dB(A), noise sensitive uses, if any, planned within the shaded area should not exceed the elevation of 190mPD until quarry plant operation ceases in January 2012.

- 1.3.2.6 Solid boundary walls are proposed to reduce the traffic noise impacts at schools during the operational stage of the development. Location and extent of the proposed noise barriers/boundary walls are shown in Figures 1.4 to 1.6.
- 1.3.2.7 The residential flats and school classrooms with residual traffic noise impacts should be mitigated with indirect technical remedies such as window glazing with air-conditioning.
- 1.3.2.8 No potential adverse environmental effects of proposed mitigation measures for construction and operational phases would be expected.

### **1.3.3 Landscape and Visual**

- 1.3.3.1 Mitigation of landscape and visual impacts has been achieved largely by the careful location and design of components of the development (e.g. tower blocks, regraded slopes, access road alignment etc.). These inherent mitigation measures are the most significant in reducing landscape and visual impacts. Additional mitigation measures have also been recommended. These measures comprise surface treatments to the elements of the Project (e.g. slope planting, colour treatments).
- 1.3.3.2 These mitigation measures are described below and are illustrated in Figure 1.7.

#### ***Inherent Mitigation Measures***

- 1.3.3.3 In designing and laying out elements of the Project, reducing landscape and visual impacts to a minimum, was one of the key design criteria. Efforts taken to fulfil this criterion included careful attention to the layout of the tower blocks themselves. These have been concentrated into two separate groups on either side of the peak of Tai Sheung Tok, rather than in a single wall along the length of the ridge. This leaves the peak visible as a landscape feature whilst at the same time creating, when viewed from a distance an interesting compositional rhythm, in counterpoint to that of the ridge itself. The towers in each group have been composed so that the highest towers are at the centre of each group, and the lowest, at the edges, thus creating coherent forms echoing the shape of the ridge.
- 1.3.3.4 In addition, the location of towers in staggered rows, means that from important viewpoints (such as Quarry Bay), views are available through the groups of towers to the ridge behind, breaking up the mass of the development and helping to integrate it with the landscape.
- 1.3.3.5 The alignment of the road has sought to follow the natural contours of the surrounding hillside. This results in a form that is sympathetic to the surrounding landscape and in harmony with its relief and character, whilst at the same time reducing the amount of slope regrading and elevated structure required, to an absolute minimum.

#### ***Additional Mitigation Measures***

- 1.3.3.6 During construction, the ability to mitigate landscape and visual impacts will be limited by virtue of the large scale of the works and machinery necessary to carry it out. Measures such as screen hoardings will be effective screening for those people viewing the Site from very close range.
- 1.3.3.7 During the operational phase of development, the size of the proposed towers means that it is likely to be impossible entirely to mitigate landscape and visual impacts. However, measures can be taken to reduce certain impacts to a practicable minimum. These will include:
  - Planting and vegetation restoration on soil slopes. This will include restoration of grassland, scrub and woodland on slopes around the development platforms and access road. Restoration would be

undertaken using predominantly native species. Soil slopes may include slopes which are currently rock-covered.

- Screen planting along the access roads, to limit impacts of elevated structures and rock slopes.
- Colouring of and limited planting on, shotcrete slopes.
- Landscape buffers and planting in and around the development itself to screen partially close views of the site.
- Colour rendering of towers to minimise visual impacts.
- Screen planting in front of retaining walls as well as granite cladding to those walls to reduce glare and visual impacts.
- Careful design of road elevated structure and abutments, to limit visual impacts.
- Colour rendering of roadside features to limit visual impacts.
- Conservation of CDG (Completely Decomposed Granite) or CDV (Completely Decompose Volcanic) recovered from the site for re-use, in the landscape restoration.
- Conservation of top soil and the preservation and/or transplanting of valuable trees. All slopes should be designed to be hydroseeded and planted with trees and shrubs.
- Preservation (by transplanting if necessary) of any trees identified as being of particular landscape value.

1.3.3.8 Planting will take a number of years to establish and so the full effects of mitigation will not be seen until some 15-20 years after completion of the project. The planting strategy for the development is shown in Figure 1.7. The various types of planting and suggested species are elaborated below.

## 1.3.4 Ecology

1.3.4.1 Based on the Master Layout Plan of the Preferred Development (Figures 1.2 and 1.8), a total of approximately 13.4 ha of soft cut slopes at 30° would be formed on the periphery of the development. These cut slopes, when result in exposed area of soil (known as "cut soil slopes"), will be potentially available for woodland planting. A list of native trees and shrubs proposed for revegetation is provided in Table 1.2. Many of these species are found on the site, and many are berry-bearing plants which provide a food source for birds. Planting with native species will enhance the ecological value of the area. Some fast growing native trees, including Liquidambar fomesana, Casstanopsis fissa, and Schima superba are currently used in reforestation projects and can be planted as nurse species. Others (e.g. Rhodomyrtus tomentosa, Gordonia axillaris, Ternstroemia gymnanthera, Rhus spp., Rraphiolepis indica, Ficus spp.) are pioneer species able to thrive in poor conditions. Loss of woodland can only be mitigated by planting native species, preferably with documented ecological utility (e.g. Corlett 1992). Native species should be used as possible in other landscape planting programmes on the site as well.

1.3.4.2 Seeds of the native species when possible should be added into the hydroseeding mix. Seedlings should be pit planted with placement of slow release fertilizer. Maintenance and service, including weeding fertilizing, replacement of dead plants, etc. should be performed during the first 2 years of planting Little maintenance is anticipated, however, in a long term.



**Table 1.2 Native Tree and Shrub Species Recommended for Revegetation at Anderson Road Development**

Species	Growth form	Species	Growth form
<i>Acronychia pedunculata</i>	tree	<i>Microcos paniculatus</i>	tree
<i>Aporosa dioica</i>	tree	<i>Ormosia emarginata</i>	tree
<i>Bridelia tomentosa</i>	tree	<i>Quercus edithae</i>	tree
<i>Castanopsis fissa</i>	tree	<i>Quercus myrsinaefolia</i>	tree
<i>Celtis sinensis</i>	tree	<i>Rhus chinensis</i>	tree
<i>Cinnamomum camphora</i>	tree	<i>Rhus succedanea</i>	tree
<i>Cleistocalyx operculata</i>	tree	<i>Sapium discolor</i>	tree
<i>Cratoxylum cochinchinensis</i>	tree	<i>Sapium sebiferum</i>	tree
<i>Daphniphyllum calycinum</i>	tree	<i>Schefflera octophylla</i>	tree
<i>Evodia lepta</i>	tree	<i>Schima superba</i>	tree
<i>Ficus hispida</i>	tree	<i>Sterculia lanceolata</i>	tree
<i>Ficus microcarpa</i>	tree	<i>Ternstroemia gymnanthera</i>	tree
<i>Ficus superba</i>	tree	<i>Ardisia crenata</i>	shrub
<i>Ficus variegata</i>	tree	<i>Ilex pubescens</i>	shrub
<i>Gordonia axillaris</i>	tree	<i>Ligustrum sinensis</i>	shrub
<i>Itea chinensis</i>	tree	<i>Litsea rotundifolia</i>	shrub
<i>Liquidambar formosana</i>	tree	<i>Melastoma candidum</i>	shrub
<i>Litsea glutinosa</i>	tree	<i>Melastoma sanguineum</i>	shrub
<i>Macaranga tanarius</i>	tree	<i>Psychotria rubra</i>	shrub
<i>Machilus breviflora</i>	tree	<i>Rhaphiolepis indica</i>	shrub
<i>Machilus spp.</i>	tree	<i>Rhodomyrtus tomentosa</i>	shrub
<i>Mallotus paniculatus</i>	tree	<i>Sarcandra glabra</i>	shrub

- 1.3.4.3 Landscape contractors should be consulted for provision of native plants, which are in relatively short supply and require a relatively long lead time to produce. The landscape contractor should also be responsible for the planting and maintenance of the plantation for at least 2 years to enhance the survival rate of the plants. Detailed planting specification and the cost of revegetation should be estimated and included in the detailed design phase.
- 1.3.4.4 Maximum available area on soft cut slopes (about 13.4 ha) would be less than the total area of woodland loss (16 ha). However, due to the nature of the woodland to be lost, compensatory planting with a ratio less than 1:1 in this case is considered to be sufficient.
- 1.3.4.5 Should this mitigation measure be implemented, there will not be significant residual impacts from the project.
- 1.3.4.6 No other mitigation measures are considered necessary due to the minor nature of other impacts.

### 1.3.5 Water Quality and Drainage

#### *Construction Phase*

- 1.3.5.1 All active working areas should be bounded to retain stormwater with sufficient retention time to ensure that suspended solids are not discharged from the site in concentrations above those specified in the TM for the Victoria Harbour (Phase I) WCZ. All fuel storage areas should be bounded with drainage directed to an oil interceptor.
- 1.3.5.2 Separate treatment facilities may be required for effluent from site offices, toilets (unless chemical toilets are used) and canteens.
- 1.3.5.3 Discharged wastewater from the construction sites to surface water and/or public drainage systems should be controlled through licensing. Discharges should follow fully the terms and conditions in the licences.
- 1.3.5.4 Practice for dealing with various type of construction discharges provided in EPD's ProPECC Note PN1/94 Construction Site Drainage should be adopted. Practices relevant to this project are reproduced in the following paragraphs.

#### Surface Runoff

- 1.3.5.5 Surface runoff from construction sites should be discharged into storm drains via separately designated sand / silt removal facilities such as sand traps, silt traps and sediment basins. Channels or earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Perimeter channels at site boundaries should be provided where necessary to intercept storm runoff from outside the site so that it will not wash across the site. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks.
- 1.3.5.6 Silt removal facilities, channels and manholes should be maintained and the deposited silt and grit should be removed regularly, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.
- 1.3.5.7 Construction works should be programmed to minimize soil excavation works in rainy seasons (April to September). If excavation in soil could not be avoided in these months or at any time of year rainstorms are likely, for the purpose of preventing soil erosion, temporarily exposed slope surfaces should be covered, for example, by tarpaulin, and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds. Intercepting channels should be provided (for example, along the crest / edge of excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements should always be in place to ensure that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm.
- 1.3.5.8 Earthworks final surfaces should be well compacted and the subsequent permanent work or surface protection should be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels should be provided where necessary.
- 1.3.5.9 Measures should be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they should be dug and backfilled in short sections. Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.
- 1.3.5.10 Open stockpiles of construction materials (for example, aggregates, sand and fill material) on sites should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system.
- 1.3.5.11 Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm runoff from getting into foul sewers. Discharge of surface runoff into foul sewers must always be prevented in order not to unduly overload the foul sewerage system.

- 1.3.5.12 Precautions listed below should be taken at any time of year when rainstorms are likely. Actions listed below should be taken when a rainstorm is imminent or forecast and actions to be taken during or after rainstorms.
- Precautions to be taken at any time of year when rainstorms are likely:
    - Silt removal facilities, channels and manholes should be maintained and the deposited silt and grit should be removed regularly.
    - Temporarily exposed slope surfaces should be covered, for example, by tarpaulin.
    - Temporary access roads should be protected by crushed stone or gravel.
    - Intercepting channels should be provided (for example, along the crest/ edge of excavation) to prevent storm runoff from washing exposed soil surfaces.
    - Trenches should be dug and backfilled in short sections. Measures should be taken to minimize the ingress of rainwater into trenches.
  - Actions to be taken when a rainstorm is imminent or forecast
    - Silt removal facilities, channels and manholes should be checked to ensure that they can function properly.
    - Open-stockpiles of construction materials (for example, aggregates, sand and fill materials) on site should be covered with tarpaulin or similar fabric.
    - All temporary covers to slopes and stockpiles should be secured.
  - Actions to be taken during or after rainstorms
    - Silt removal facilities, channels and manholes should be checked and maintained to ensure satisfactory working conditions. Attention should be given to safety when carrying out this work.

#### Groundwater

- 1.3.5.13 Groundwater pumped out of wells, etc. for foundation construction or other activities should be discharged into storm drains after the removal of silt in silt removal facilities.

#### Boring and Drilling Water

- 1.3.5.14 Water used in ground boring and drilling for site investigation or rock / soil anchoring should as far as practicable be recirculated after sedimentation. When there is a need for final disposal, the wastewater should be discharged into storm drains via silt removal facilities.

#### Wastewater from Concrete Batching and Precast Concrete Casting

- 1.3.5.15 Wastewater generated from the washing down of mixer trucks and drum mixers and similar equipment should wherever practicable be recycled. The discharge of wastewater should be kept to a minimum.
- 1.3.5.16 To prevent pollution from wastewater overflow, the pump sump of any water recycling system should be provided with an on-line standby pump of adequate capacity and with automatic alternating devices.
- 1.3.5.17 Under normal circumstances, surplus wastewater may be discharged into foul sewers after treatment in silt removal and pH adjustment facilities (to within the pH range of 6 to 10). Disposal of wastewater into storm drains will require more elaborate treatment. Surface runoff should be segregated from the concrete batching plant and casting yard area as much as possible, and diverted to the stormwater drainage system. Surface runoff contaminated by materials in a concrete batching plant or casting yard should be adequately treated before disposal into stormwater drains.

#### Wheel Washing Water

- 1.3.5.18 All vehicles and plant should be cleaned before they leave a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. A wheel washing bay should be provided at every site

exit if practicable and wash-water should have sand and silt settled out or removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road should be paved with backfall to reduce vehicle tracking of soil and to prevent site runoff from entering public road drains.

#### Bentonite Slurries

- 1.3.5.19 Bentonite slurries used in diaphragm wall and bore-pile construction should be reconditioned and reused wherever practicable. If the disposal of a certain residual quantity cannot be avoided, the used slurry may be disposed of at the marine spoil grounds subject to obtaining a marine dumping licence from EPD on a case-by-case basis.
- 1.3.5.20 If the used bentonite slurry is intended to be disposed of through the public drainage system, it should be treated to the respective effluent standards applicable to foul sewers, storm drains or the receiving waters as set out in the TM on Effluent Standards.

#### Water for Testing and Sterilization, of Water Retaining Structures and Water Pipes

- 1.3.5.21 Water used in water testing to check leakage of structures and pipes should be reused for other purposes as far as practicable. Surplus unpolluted water could be discharged into storm drains.
- 1.3.5.22 Sterilization is commonly accomplished by chlorination. Specific advice from EPD should be sought during the design stage of works with regard to the disposal of the sterilizing water. The sterilizing water should be reused wherever practicable.

#### Wastewater from Building Construction

- 1.3.5.23 Before commencing any demolition works, all sewer and drainage connections should be sealed to prevent building debris, soil, sand, etc. from entering public sewers/ drains.
- 1.3.5.24 Wastewater generated from building construction activities including concreting, plastering, internal decoration, cleaning of works and similar activities should not be discharged into the stormwater drainage system. If the wastewater is to be discharged into foul sewers, it should undergo the removal of settleable solids in a silt removal facility, and pH adjustment as necessary.

#### Wastewater from Site Facilities

- 1.3.5.25 Sewage from toilets, kitchens and similar facilities should be discharged into a foul sewer. If there is no foul sewer in the vicinity, a septic tank and soakaway system or for large flows, a sewage treatment plant will have to be provided. For sites where there are only toilet wastes arising, the use of chemical toilets may also be considered if a septic tank and soakaway system is found to be not feasible.
- 1.3.5.26 Wastewater collected from canteen kitchens, including that from basins, sinks and floor drains, should be discharged into foul sewers via grease traps capable of providing at least 20 minutes retention during peak flow.
- 1.3.5.27 Drainage serving an open oil filling point should be connected to storm drains via a petrol interceptor with peak storm bypass.
- 1.3.5.28 Vehicle and plant servicing areas, vehicle wash bays and lubrication bays should as far as possible be located within roofed areas. The drainage in these covered areas should be connected to foul sewers via a petrol interceptor. Oil leakage or spillage should be contained and cleaned up immediately. Waste oil should be collected and stored for recycling or disposal in accordance with the Waste Disposal Ordinance.

**Operational Phase**

- 1.3.5.29 Modification of the existing drainage system has been proposed to cope with an increased drainage flow. Two storage tanks for the future Rehabilitated Quarry Site and one storage tank for Anderson Road Development (Figures 1.9 and 1.10) as described below to attenuate the peak runoff, thus no downstream upgrading is required.
- 1.3.5.30 Rehabilitated Quarry Site: A stormwater tank with indicative size of 75m x 55m x 3m deep for the northern catchment and another tank of indicative size of 110m x 60m x 3m deep for the southern catchment are proposed to attenuate the peak flow runoff from respective catchment (Figure 1.10). These two storage tanks will control the runoff crossing under Anderson Road and piped through the proposed Development at Anderson Road to the downstream drainage.
- 1.3.5.31 Anderson Road Development Site: An underground storage tank of 100m x 45m x 5m deep is proposed. The tank will attenuate the peak discharge during the rising phase of the runoff hydrograph by locally storing excess runoff and later discharging it into the drainage system during the receding phase of the hydrograph.
- 1.3.5.32 It is estimated that with the installation of these tanks, the discharge flow rates at proposed discharge point will be controlled with the existing drainage capacity (Table 1.3).
- 1.3.5.33 In terms of the flooding problem, modelling results in the Final DIA Report indicated flooded manholes and inadequate capacity drainage pipes in some locations for 1 in 200 Year rainfall as summarised in Table 1.5. The locations of drainage impacts are similar to the existing situation as indicated in Table 1.4.

**Table 1.3 Proposed Peak Runoff at Discharge Points for a 1 Year Rainfall, including Stormwater Attenuation for Developments Sites (in m<sup>3</sup>/s)**

Discharge Point	Q <sub>A</sub> (merge with Q <sub>B</sub> )	Q <sub>B</sub>	Q <sub>C</sub>	Q <sub>D</sub>
Node	Y1.080	Y1.110	A51.10	Y1B.050
Rehabilitated Quarry Site	4.5	-	-	19.7
Anderson Road Development	-	7.2	3.2	10.8
Total Peak Runoff (including areas in the vicinity)		19.4	**8.6	**28.3
Existing Runoff		18.8	5.1	20.8
Current Capacity		21.1	*7.0	35.6

\* Capacity will be increased to 25.8 m<sup>3</sup>/s by HD's new culvert, but is only 5.3 m<sup>3</sup>/s further downstream of the BC.  
 \*\* Total peak flow includes non-simultaneous peak flows from the two sites.  
 Source: Table 6.2 of the *Final DIA Report*.

**Table 1.4 Locations of Flooding and Inadequate Drainage Capacity for a 1 in 200 Year Rainfall - Existing**

Discharge Point	Node		Flooding Manhole	Inadequate Capacity	Location
	From	To			
2 (Q <sub>B</sub> )	Y1.080	Y1.090	Yes	Yes	Shun On Road
	Y1.100	Y1.110	No	Yes	Sau Mau Ping Road
	Y1.150	Y1.170	No	Yes	Hip Wo Street
	Y1.230	Y1.240	Yes	No	
	Y1.260	Y1.270	No	Yes	
	Y1.270	Y1.280	No	Yes	
	Y1.280	Y1.290	Yes	No	
	Y1.350	Y1.450	No	Yes	
	Y1.470	Y1.471	Yes	No	
	Y1.471	Y1.481	Yes	Yes	
	Y1.482	Y1.483	No	Yes	Decked Nullah Section of Existing Footbridge
	Y1.484	Y1.485	No	Yes	
	Y1.490	Y1.510	No	Yes	
	Y1.511	Y1.512	No	Yes	
	Y1.513	Y1.514	No	Yes	
3 (Q <sub>C</sub> )	A51.70	Y61.080	No	Yes	Sau Ming Road
	Y61.080	Y61.090	No	Yes	
	Y61.120	Y61.130	No	Yes	
4 & 5 (Q <sub>D</sub> ) Trunk Drain upstream of Y1.470	Y1D.200	Y1.210	Yes	No	Kai Lim Road

Source: Table 4.2 of the *Final DIA Report*.

**Table 1.5 Locations of Flooding and Inadequate Drainage Capacity for a 1 in 200 Year Rainfall - Preferred Development**

Discharge Point	Node		Flooding Manhole	Inadequate Capacity	Location
	From	To			
2 (Q <sub>B</sub> )	Y1.110	Y1.120	Yes	No	Sau Mau Ping Road
	Y1.140	Y1.150	Yes	No	Hip Wo Street
	Y1.150	Y1.170	No	Yes	
	Y1.230	Y1.240	Yes	No	
	Y1.260	Y1.290	No	Yes	Tsui Ping Road
	Y1.350	Y1.450	No	Yes	
	Y1.470	Y1.471	Yes	No	
	Y1.471	Y1.481	Yes	Yes	Decked Nullah Section of Existing Footbridge
	Y1.482	Y1.483	No	Yes	
	Y1.484	Y1.485	No	Yes	
	Y1.490	Y1.510	No	Yes	
	Y1.511	Y1.512	No	Yes	
	Y1.513	Y1.514	No	Yes	
	3 (Q <sub>C</sub> )	A51.70	Y61.080	No	Yes
Y61.080		Y61.100	No	Yes	
Y61.120		Y61.130	No	Yes	
Y61.160		Y61.170	No	Yes	
4 & 5 (Q <sub>D</sub> ) Trunk Drain upstream of Y1.470	Y1D.200	Y1.210	Yes	No	Kai Lim Road

Source: Table 6.1 of the *Final DIA Report*.

- 1.3.5.34 As presented in Section 6.3 of Final EIA Report, the storm runoff from the development site would not be a major contributor to the pollutant load of the Victoria Harbour. Nevertheless, water quality pollution due to non-point sources within the development site should be minimised by the implementation of the mitigation measures discussed in the following paragraphs.
- 1.3.5.35 In this development site, up to about 50% of the site area including the slopes will be planted. This includes restoration of grassland, scrub and woodland on slopes around the development platforms and access road, screen planting along the access road and limited planting on shotcrete slopes. The planting areas will reduce the impact of surface runoff by reducing the impervious surface of the development site.
- 1.3.5.36 In order to further reduce the impacts of suspended solids from surface runoff on the receiving waters, sand traps designed to DSD and EPD's requirements are recommended for each land lot. The configuration and numbers of sand traps will be dependent on the individual site and drainage layouts.

For sites with areas up to approximately 1ha and pipe sizes less than 900mm diameter, sand traps based on the standard details described in EPD's ProPECC Note PN1/94 can be used. The typical sand trap size will be 3m wide x 4.5m long x 0.745m retained depth. The sizing allows a half hour retention time for a

2mm/hour rainfall. The sand traps can be located within the open space areas of the development where access for maintenance is available.

- 1.3.5.37 For site areas greater than 1ha, individual sand traps could be provided along the branch drainage which serves the smaller site areas. The numbers of typical sand traps required for each land lot are estimated and presented in Table 1.6 below. For example, the residential development on Platform E, which has an area of approximately 3ha could be provided with 3 sand traps serving the individual drainage systems. Alternatively, the developers I users may prefer to design a special sand trap to serve the area as a whole.

**Table 1.6 Estimated Number of Typical Sand Traps Required for Each Land Lot**

Platform	Land Use	Approximate Area (m <sup>2</sup> )	Approximate Number of Typical Sand Traps
A	R1	10,125	1
	E (School S1)	6,330	1
B	R1	41,080	4
C1	R1	10,170	1
C2	E (School S2)	8,000	1
	E (School S3)	7,000	1
	E (School S4)	4,500	1
C3	DO	15,170	2
D	HOS/PSPS	31,250	3
E	HOS/PSPS	32,250	3
	E (School S5)	6,250	1

Note: Refer to Figure 1.2 for the locations of the platforms.

- 1.3.5.38 To minimise the potential for contamination of the receiving waters from road surface runoff, drainage from road surfaces including open bus bays should be directed through oil interceptors. Such oil/water separators will also allow suspended sediment to settle and must therefore be of sufficient size to accommodate storm events. Maintenance of the interceptors, including periodic condition checks and emptying of oil and sludge, is essential to maintain an adequate retention time. Additional protection can be gained by the use of oil absorbent media to trap oil and grease on entry to, or exit from, the drainage system. Special precautions for the correct disposal of all intercepted material will be required.
- 1.3.5.39 It is considered that the combination of the above control measures will effectively reduce the water quality impacts on receiving waters due to the surface runoff. Significant increase in pollutant load of the Victoria Harbour due to non-point sources within the development site is therefore not expected.
- 1.3.5.40 No potential adverse environmental effects of recommended mitigation measures from construction and operational phases would be anticipated.

## 1.3.6 Sewerage

### *Proposed Sewer Connections*

- 1.3.6.1 New sewers will be required to connect the development area to the existing sewerage system to accommodate the Development as indicated in Figure 1.11. A summary of the proposed sewer connections is presented in Table 1.7. The proposed connection points to the existing sewerage system are shown in Figure 1.11.



**Table 1.7 Proposed Sewer Connections for the Development**

Connection Point	Location	Pipe Size Diameter (mm)	Model Node
3	Po Lam Road	600	610-035
4	Lee On Road	600	200-075
5	Sau Mau Ping Road	225	210-025
6	Hiu Kwong Street	600	220-035

Source: Table 6.1 of the *Final SIA Report*

**Proposed Upgrading Work**

1.3.6.2 As mentioned earlier, upgrading of downstream existing sewerage system will be required to mitigate the surcharging sewers due to the population growth in the Development. Table 1.8 and Figure 1.12 illustrate the extent of the proposed upgrading of the existing sewerage system for year 2009.

**Table 1.8 Proposed New Sewer and Upgrading Works (2009)**

U/S Node	D/S Node	Existing Size (mm)	Proposed Size (mm)	Length (m)	Location	Notes
610-035	200-035	-	600 Ø	427	Po Lam Road /Sau Mau Ping Road	New sewer between Connection Points 3 & 6
200-423	200-426	3000W x 375H	4300W x 375H	9	Tsui Ping Road /Kwun Tong Road	Upgrading Works
				Total	436	

Source: Table 6.3 of the *Final SIA Report*

**1.3.7 Solid Waste Management**

**Construction Phase**

Waste Disposal

- 1.3.7.1 Generally, different types of wastes should be segregated, stored, transported and disposed of separately in accordance with the relevant legislative requirements and guidelines as proper practice of waste management.
- 1.3.7.2 It is important that the sorting of wastes should be done on-site. Different types of wastes should be segregated and stored in different stockpiles, containers or skips to enhance recycling of materials and proper disposal of wastes.
- 1.3.7.3 It will be the contractors' responsibility to dispose of excavated spoil and construction wastes. The contractors should make use of excavated spoil as much as possible to minimise off-site fill material requirements and disposal of spoil. During road transportation of excavated spoil, vehicles should be

covered to avoid dust impact. Besides, the northern and southern temporary access roads should be paved to reduce dust impacts from truck movements. Wheel washing facilities should be installed at all site exits together with regular watering of the site access roads.

- 1.3.7.4 Chemical waste should be recycled on-site or removed by licenced companies. It should be handled according to the Code of Practice on the Packaging, Labeling and Storage of Chemical Wastes. When off-site disposal is required, it should be collected and delivered by licenced contractors to Tsing Yi Chemical Waste Treatment Facility and disposed of in accordance with the Chemical Waste (General) Regulation.
- 1.3.7.5 The contractor should adopt the necessary mitigation measures to prevent the uncontrolled disposal of chemical and hazardous waste into air, soil, surface waters and ground waters.

#### Waste Storage

- 1.3.7.6 Chemical material storage areas should be bounded, constructed of impervious materials, and have the capacity to contain 120 percent of the total volume of the containers. The area should be enclosed on at least three sides by a wall, partition or fence with a height of not less than two metres or the total height of stacked containers, whichever is less. Leakage, spill or discharge can be contained more effectively in these specially prepared areas. Indoor storage areas must have sufficient ventilation to prevent the build-up of fumes, and must be capable of evacuating the space in the event of an accidental release. Outdoor storage areas must be covered with a canopy or contain provisions for the safe removal of rainwater. In both cases, storage areas must not be connected to the foul or stormwater sewer system.
- 1.3.7.7 Dangerous materials as defined under the DGO, including fuel, oil and lubricants, should be stored and properly labelled on site in accordance with the requirements in the DGO. If transportation of hazardous materials is necessary, the contractor should ensure that hazardous materials, chemical wastes and fuel are packed or stored in containers or vessels of suitable design and construction to prevent leakage, spillage or escape.
- 1.3.7.8 Human waste should be discharged into septic tanks provided by the contractors and be removed regularly by a hygiene services company. Refuse containers such as open skips should be provided at every work site for use by the workforce. On-site refuse collection points must also be provided.

### **1.3.8 Implementation of Recommended Mitigation Measures**

- 1.3.8.1 The schedule of implementation of the recommended mitigation measures for various environmental aspects are presented in Tables 1.9 to 1.17 for different environmental aspects.

Table 1.9 Summary of Proposed Construction Dust Mitigation Measures for Development at Anderson Road

EIA* Ref.	EM&A Log Ref.	Environmental Protection Measures*	Location (duration / completion of measures)	Funding Agent	Implementation Agent	Maintenance Agent	Implementation Stages**			Relevant Legislation & Guidelines
							D	C	O	
S2.7	S1, S2.8	<p><i>Site Practice</i></p> <ul style="list-style-type: none"> <li>• Mean vehicle speed of haulage trucks at 10 kmhr<sup>-1</sup>.</li> <li>• Twice daily watering of all open site areas.</li> <li>• Regular watering (once every 1.5 hours) of all site roads and access roads with frequent truck movement.</li> <li>• Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.</li> <li>• Establishment and use of vehicle wheel and body washing facilities at the exit points of the site, combined with cleaning of public roads where necessary.</li> <li>• Suitable side and tailboards on haulage vehicles.</li> <li>• Watering of temporary stockpiles.</li> <li>• Paved northern and southern temporary access roads.</li> </ul> <p><i>Blasting</i></p> <ul style="list-style-type: none"> <li>• Use of select aggregate and fines to stem the charge with drill holes and watering of blast face.</li> <li>• Use of vacuum extraction drilling methods.</li> <li>• Carefully sequenced blasting.</li> <li>• Blasting should not be carried out under unfavourable meteorological conditions with wind speed less than 2 ms<sup>-1</sup>.</li> </ul> <p><i>Crushing</i></p> <ul style="list-style-type: none"> <li>• Fabric filters installed for the crushing plant.</li> <li>• Water sprays on the crusher.</li> </ul>	All construction sites (late 2001 to late 2008)	CED	CED	N/A	✓	✓		TM on EIA Process, APCO, Air Pollution Control (Construction Dust) Regulation

\* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.

\*\* D=Design, C=Construction, O=Operation

Table 1.9 Summary of Proposed Construction Dust Mitigation Measures for Development at Anderson Road (con't)

EIA* Ref.	EM&A Log Ref.	Environmental Protection Measures*	Location (Duration / completion of measures)	Funding Agent	Implementation Agent	Maintenance Agent	Implementation Stages**			Relevant Legislation & Guidelines
							D	C	O	
S2.7	S1, S2.8	<p><i>Loading and Unloading Points, and Conveyor Belt System</i></p> <ul style="list-style-type: none"> <li>• Water sprays at all fixed loading and unloading points (at the crusher and conveyor belts).</li> <li>• The loading point at the crusher is enclosed with dust collection system installed.</li> <li>• When transferring materials from conveyor belt or crusher to the dump trucks, chutes or dust curtains are used for controlling dust.</li> <li>• Cover the conveyor belts with steel roof and canvas sides.</li> </ul>	All construction sites (late 2001 to late 2008)	CED	CED	N/A	✓	✓		TM on EIA Process, APCO, Air Pollution Control (Construction Dust) Regulation

\* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.

\*\* D=Design, C=Construction, O=Operation

Table 1.10 Summary of Proposed Construction Noise Mitigation Measures for Development at Anderson Road

EIA* Ref.	EM&A Log Ref.	Environmental Protection Measures*	Location / (duration / completion of measures)	Funding Agent	Implementation Agent	Maintenance Agent	Implementation Stages**			Relevant Legislation & Guidelines
							D	C	O	
S3.7	S1, S3.7	<p><i>Site Formation</i></p> <ul style="list-style-type: none"> <li>Proper scheduling of site formation works is required to avoid several site formation works to occur concurrently in the areas close to sensitive receivers. It is recommended that rock drilling cannot be undertaken concurrently (i) at Platforms C(1) and C(2) and Platform C(3); and (ii) at Platforms C(1) and C(2) and Platform B to avoid adverse impacts at sensitive receivers.</li> <li>Quieter powered mechanical equipment should be employed during site formation process.</li> </ul>	All construction sites (late 2001 to late 2008)	CED	CED	N/A	✓	✓		TM on EIA Process, NCO, TM on Noise from Construction Work other than Percussive Piling, ProPECC Note PN2/93

\* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.

\*\* D=Design, C=Construction, O=Operation

Table 1.11 Summary of Proposed Quarry Noise Mitigation Measures for Development at Anderson Road

EIA* Ref.	EM&A Log Ref.	Environmental Protection Measures*	Location (duration / completion of measures)	Funding Agent	Implementation Agent	Maintenance Agent	Implementation Stages**			Relevant Legislation & Guidelines
							D	C	O	
S3.7	S1	Noise sensitive uses including residential uses are not recommended within the shaded area shown in Figure 1.19. In order to comply with the NCO, noise sensitive uses, if any, planned within the shaded area should not exceed the elevation of 190mPD until quarry operation ceases in January 2012	Platform E (HOS/PSPS) (late 2008 to Jan 2012)	Developer	Developer	Lot owner	✓		✓	TM on EIA Process, NCO

\* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.

\*\* D=Design, C=Construction, O=Operation

Table 1.12 Summary of Proposed Traffic Noise Mitigation Measures for Development at Anderson Road

EIA* Ref.	EM&A Log Ref.	Environmental Protection Measures*	Location (duration / completion of measures)	Funding Agent	Implementation Agent	Maintenance Agent	Implementation Stages**			Relevant Legislation & Guidelines
							D	C	O	
S3.7	S1	Podium with a minimum effective height of 14m for all residential blocks within the Platform A	Before occupation of Platform A (R1)	Developer	Developer	Lot owner	✓	✓		TM on EIA Process
		School building orientation and 3m high boundary walls along the road to the south and west of School S1 (refer to Figure 1.13)	Before occupation of School S1	ED	Arch SD	Arch SD	✓	✓		
		Podium with a minimum effective height of 14m for all residential blocks within the Platform B	Before occupation of Platform B (R1)	Developer	Developer	Lot owner	✓	✓		

\* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.

\*\* D=Design, C=Construction, O=Operation

Table 1.12 Summary of Proposed Traffic Noise Mitigation Measures for Development at Anderson Road (con't)

EIA* Ref.	EM&A Log Ref.	Environmental Protection Measures*	Location (duration / completion of measures)	Funding Agent	Implementation Agent	Maintenance Agent	Implementation Stages**				Relevant Legislation & Guidelines
							D	C	O	O	
S3.7	S1	Podium of a minimum effective height of 12m for all residential blocks within the Platform C	Before occupation of Platform C1 (R1)	Developer	Developer	Lot owner	✓	✓			TM on EIA Process
		School S2 building orientation; window insulation and air conditioning for classrooms and other rooms for teaching purpose with residual impact	Before occupation of School S2	ED	Arch SD	Arch SD	✓	✓			
		School building orientation and 3m high boundary walls along the road to the south and west of Schools S3 and S4 (refer to Figure 1.14)	Before occupation of School S3 & S4	ED	Arch SD	Arch SD	✓	✓			

\* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.

\*\* D=Design, C=Construction, O=Operation



Table 1.12 Summary of Proposed Traffic Noise Mitigation Measures for Development at Anderson Road (con't)

EIA* Ref.	EM&A Log Ref.	Environmental Protection Measures*	Location / (duration / completion of measures)	Funding Agent	Implementation Agent	Maintenance Agent	Implementation Stages**			Relevant Legislation & Guidelines
							D	C	O	
S3/7	S1	The final development layouts should satisfy the site constraints (podium and blanked end facades) in Figures 1.18 and 1.19 or, depending on the layout finally adopted, provide measures of noise mitigation effect equivalent to those considered in this EIA report.	Before occupation of Platform D (HOS/PSPS)	Developer	Developer	Lot owner	✓	✓		TM on EIA Process
		The final development layouts should satisfy the site constraints (podium and blanked end facades) in Figures 1.18 and 1.19 or, depending on the layout finally adopted, provide measures of noise mitigation effect equivalent to those considered in this EIA report.	Before occupation of Platform E (HOS/PSPS)	Developer	Developer	Lot owner	✓	✓		

\* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.  
\*\* D=Design, C=Construction, O=Operation

Table 1.12 Summary of Proposed Traffic Noise Mitigation Measures for Development at Anderson Road (con't)

EIA* Ref.	EM&A Log Ref.	Environmental Protection Measures*	Location / (duration / completion of measures)	Funding Agent	Implementation Agent	Maintenance Agent	Implementation Stages**			Relevant Legislation & Guidelines
							D	C	O	
S3.7	S1	School building orientation and 3m high boundary wall along the roads to the south of School S5 (refer to Figure 1.15)	Before occupation of the corresponding residential block or School	ED	Arch SD	Arch SD	✓	✓		TM on EIA Process
		Window glazing *** with air-conditioning at the residential flats, school classrooms and other rooms for teaching purpose with residual traffic noise impacts					Developer	Developer	Arch SD for schools/ owner or tenant for residential premises	
S12	S1	7 m high cantilevered noise barrier along the widened section of Po Lam Road at the boundary of Po Lam Road Platform Development (refer to Figures 1.20 & 1.21)	Po Lam Road (During widening of Po Lam Road)	CED	CED	HyD	✓	✓		TM on EIA Process

\* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.

\*\* D=Design, C=Construction, O=Operation

\*\*\* According to Table 2 in Annex 5 of TM on EIA Process

Table 1.13 Summary of Proposed Landscape and Visual Mitigation Measures for Development at Anderson Road

EIA* Ref.	EM&A Log Ref.	Environmental Protection Measures*	Location (duration / completion of measures)	Funding Agent	Implementation Agent	Maintenance Agent	Implementation Stages**			Relevant Legislation & Guidelines
							D	C	O	
S4.8	S1	<p><i>Design of Development</i></p> <ul style="list-style-type: none"> <li>• Tower blocks are concentrated into two separate groups on either side of the peak of Tai Sheung Tok with the highest towers are at the centre of each group, and the lowest, at the edges, thus creating coherent forms echoing the shape of the ridge.</li> <li>• Location of towers in staggered rows such that views are available through the groups of towers to the ridge behind.</li> </ul>	Whole development (completed by early 2009)	Developer	Developer	Lot Owner	✓	✓	✓	TM on EIA Process, Metroplan, HKPSG

\* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.

\*\* D=Design, C=Construction, O=Operation

Table 1.13 Summary of Proposed Landscape and Visual Mitigation Measures for Development at Anderson Road (con't)

EIA* Ref.	EM&A Log Ref.	Environmental Protection Measures*	Location (duration / completion of measures)	Funding Agent	Implementation Agent	Maintenance Agent	Implementation Stages**			Relevant Legislation & Guidelines	
							D	C	O		
S4.8	SI	<p><i>Additional Measures</i></p> <ul style="list-style-type: none"> <li>Planting and vegetation restoration (including transplanted trees) on soil slopes including restoration of grassland, scrub and woodland on slopes around the development platforms and access road. Restoration would be undertaken using predominantly native species.</li> <li>Screen planting along the access roads, to limit impacts of elevated structures and rock slopes.</li> <li>Colouring of shotcrete slopes.</li> <li>Limited planting on shotcrete slopes.</li> <li>Landscape buffers and planting in and around the development itself to screen partially close views of the site.</li> <li>Colour rendering of towers to minimise visual impacts.</li> <li>Screen planting in front of retaining walls / granite cladding to those walls to reduce glare and visual impacts.</li> <li>Careful design of road elevated structure and abutments, to limit visual impacts.</li> <li>Roadside landscape features/hardworks to limit visual impacts.</li> <li>Conservation of CDG or CDV recovered from the site for re-use in the landscape restoration</li> <li>Preservation (by transplanting if necessary) of any trees identified as being of particular landscape value.</li> </ul>	Whole development (completed by early 2009)	CED*	CED*	^^	✓	✓	✓	TM on EIA Process, Metroplan, HKPSG	
				CED*	CED*	^^	✓	✓	✓	✓	
				CED	CED	HyD	✓	✓	✓	✓	
				CED	CED	^	✓	✓	✓	✓	
				CED*	CED*	^^	✓	✓	✓	✓	
				Developer CED	Developer CED	Lot owner ^	✓	✓	✓	✓	
				CED	CED	-	✓	✓	✓	✓	
				CED	CED	^^	✓	✓	✓	✓	
				CED	CED	-	✓	✓	✓	✓	
				CED	CED	-	✓	✓	✓	✓	

\* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.

\*\* D=Design, C=Construction, O=Operation

+ Where land may be leased, Funding Agent, Implementation Agent & Maintenance Agent to be Developer, Developer and Lot owner respectively.

^ Refer to WBTC No. 24/94 Tree Preservation (also known as PELB TC No. 3/94) and WBTC No. 18/94 Management and Maintenance of both Natural Vegetation and Landscape Works.

Table 1.14 Summary of Proposed Ecology Mitigation Measures for Development at Anderson Road

EIA* Ref.	EM&A Log Ref.	Environmental Protection Measures*	Location (duration / completion of measures)	Funding Agent	Implementation Agent	Maintenance Agent	Implementation Stages**			Relevant Legislation & Guidelines
							D	C	O	
S5.6	S1	<ul style="list-style-type: none"> <li>Woodland planting on soft cut slopes available (about 13.4 ha) within the development site. Native species, preferably with documented ecological utility, should be used.</li> <li>Seeds of the native species when possible should be added into the hydroseeding mix. Seedlings should be pit planted with placement of slow release fertilizer.</li> <li>Maintenance and service, including weeding, fertilizing, replacement of dead plants, etc. should be performed during the first 2 years of planting to enhance the survival rate of the plants.</li> <li>Detailed planting specification and the cost of revegetation should be estimated and included in the detailed design phase.</li> </ul>	Soft cut slopes (development completed by early 2009)	CED*	CED*	+^	✓	✓	✓	TM on EIA Process, HKPSG

\* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.

\*\* D=Design, C=Construction, O=Operation

+ Where land may be leased, Funding Agent, Implementation Agent and Maintenance Agent are Developer, Developer and Lot Owner, respectively.

^ Refer to WBTC No. 24/94 Tree Preservation (also known as PELB TC No. 3/94) and WBTC No. 18/94 Management and Maintenance of both Natural Vegetation and Landscape Works.

Table 1.15 Summary of Proposed Water Quality Mitigation Measures for Development at Anderson Road

EIA* Ref.	EM&A Log Ref.	Environmental Protection Measures*	Location (duration / completion of measures)	Funding Agent	Implementation Agent	Maintenance Agent	Implementation Stages**			Relevant Legislation & Guidelines
							D	C	O	
S6.4	S1	<p><i>Construction Phase</i></p> <ul style="list-style-type: none"> <li>All active working areas should be bunded to retain stormwater with sufficient retention time to ensure that suspended solids are not discharged from the site in concentrations above those specified in the TM for the Victoria Harbour (Phase I) WCZ. All fuel storage areas should be bunded with drainage directed to an oil interceptor.</li> <li>Separate treatment facilities may be required for effluent from site offices, toilets (unless chemical toilets are used) and canteens.</li> <li>Discharged wastewater from the construction sites to surface water and/or public drainage systems should be controlled through licensing. Discharges should follow fully the terms and conditions in the licences.</li> <li>Relevant practice for dealing with various type of construction discharges provided in EPD's ProPECC Note PN 1/94 should be adopted.</li> </ul>	All construction sites (late 2001 to late 2008)	CED	CED	N/A	✓	✓		TM on EIA Process, WPCO, ProPECC Note PN1/94

\* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.

\*\* D=Design, C=Construction, O=Operation

Table 1.15 Summary of Proposed Water Quality Mitigation Measures for Development at Anderson Road (con't)

EIA* Ref.	EM&A Log Ref.	Environmental Protection Measures*	Location / (duration / completion of measures)	Funding Agent	Implementation Agent	Maintenance Agent	Implementation Stages**			Relevant Legislation & Guidelines
							D	C	O	
S6.4	S1	<p><i>Operational Phase</i></p> <ul style="list-style-type: none"> <li>Sand traps designed to DSD and EPD's requirements to be provided for each land lot. One typical sand trap of size 3m wide x 4.5m long x 0.745m retained depth to be provided for each 1 ha site area.</li> <li>Drainage from road surfaces including bus bays should be directed through oil interceptors.</li> </ul>	<p>Whole development site (late 2008)</p> <p>All roads included in this project (late 2008)</p>	Developer	Developer	Lot owner	✓		✓	TM on EIA Process, WPCO
				CED	CED	DSD	✓		✓	

\* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.

\*\* D=Design, C=Construction, O=Operation

Table 1.16 Summary of Proposed Construction Waste Mitigation Measures for Development at Anderson Road

EIA* Ref.	EM&A Log Ref.	Environmental Protection Measures*	Location (duration / completion of measures)	Funding Agent	Implementation Agent	Maintenance Agent	Implementation Stages**			Relevant Legislation & Guidelines
							D	C	O	
S8.4	S1, S4	<p><i>Waste Disposal</i></p> <ul style="list-style-type: none"> <li>Different types of wastes should be segregated, stored, transported and disposed of separately in accordance with the relevant legislative requirements and guidelines as proper practice of waste management.</li> <li>Sorting of wastes should be done on-site. Different types of wastes should be segregated and stored in different stockpiles, containers or skips to enhance recycling of materials and proper disposal of wastes.</li> <li>Excavated spoil should be used as much as possible to minimise off-site fill material requirements and disposal of spoil.</li> <li>During road transportation of excavated spoil, vehicles should be covered to avoid dust impact. Besides, the northern and southern temporary access roads should be paved to reduce dust impacts from truck movements.</li> <li>Wheel washing facilities should be installed at all site exits together with regular watering of the site access roads.</li> <li>Chemical waste should be recycled on-site or removed by licenced companies. It should be handled according to the Code of Practice on the Packaging, Labeling and Storage of Chemical Wastes. When off-site disposal is required, it should be collected and delivered by licenced contractors to Tsing Yi Chemical Waste Treatment Facility and disposed of in accordance with the Chemical Waste (General) Regulation.</li> <li>Necessary mitigation measures should be adopted to prevent the uncontrolled disposal of chemical and hazardous waste into air, soil, surface waters and ground waters.</li> </ul>	All construction sites (late 2001 to late 2008)	CED	CED	N/A	✓	✓		TM on EIA Process, WDO, DGO, Waste Disposal (Chemical Waste) (General) Regulation

\* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.

\*\* D=Design, C=Construction, O=Operation



Table 1.16 Summary of Proposed Construction Waste Mitigation Measures for Development at Anderson Road (con't)

EIA * Ref.	EM&A Log Ref.	Environmental Protection Measures*	Location / (duration / completion of measures)	Funding Agent	Implementation Agent	Maintenance Agent	Implementation Stages**			Relevant Legislation & Guidelines
							D	C	O	
S8.4	S1, S4	<p><i>Waste Storage</i></p> <ul style="list-style-type: none"> <li>Chemical material storage areas should be bounded, constructed of impervious materials, and have the capacity to contain 120 percent of the total volume of the containers. Indoor storage areas must have sufficient ventilation to prevent the build-up of fumes, and must be capable of evacuating the space in the event of an accidental release. Outdoor storage areas must be covered with a canopy or contain provisions for the safe removal of rainwater. In both cases, storage areas must not be connected to the foul or stormwater sewer system.</li> <li>Dangerous materials as defined under the DGO, including fuel, oil and lubricants, should be stored and properly labelled on site in accordance with the requirements in the DGO. If transportation of hazardous materials is necessary, hazardous materials, chemical wastes and fuel should be packed or stored in containers or vessels of suitable design and construction to prevent leakage, spillage or escape.</li> <li>Human waste should be discharged into septic tanks provided by the contractors and be removed regularly by a hygiene services company. Refuse containers such as open skips should be provided at every work site for use by the workforce. On-site refuse collection points must also be provided.</li> </ul>	All construction sites (late 2001 to late 2008)	CED	CED	N/A	✓	✓		TM on EIA Process, WDO, DGO, Waste Disposal (Chemical Waste) (General) Regulation

\* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.  
\*\* D=Design, C=Construction, O=Operation

**Table 1.17 Summary of Proposed Contaminated Land Mitigation Measures for Development at Anderson Road**

EIA* Ref.	EM&A Log Ref.	Environmental Protection Measures*	Location (duration / completion of measures)	Funding Agent	Implementation Agent	Maintenance Agent	Implementation Stages**			Relevant Legislation & Guidelines
							D	C	O	
S9.8	S1	A detailed contaminated land study including the preparation of a Contamination Assessment Report (CAR) and/or a Remediation Action Plan (RAP) should be carried out during the land resumption stage or the detailed design stage.	Locations identified in Table 1.18 (1999-2000)	CED	CED	N/A	✓	✓		TM on EIA Process, ProPECC Note PN3/94

\* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.

\*\* D=Design, C=Construction, O=Operation

**Table 1.18 Summary of Proposed Mitigation Measures for Landfill Gas Hazard on Development at Anderson Road**

EIA* Ref.	EM&A Log Ref.	Environmental Protection Measures*	Location (duration / completion of measures)	Funding Agent	Implementation Agent	Maintenance Agent	Implementa- tion Stages**			Relevant Legislation & Guidelines
							D	C	O	
S10.4.7	N/A	Further site investigation should be carried out during the detailed design stage in order to measure landfill gas around the perimeter of the site, to re-confirm that there is no preferential pathway for landfill gas migration and to assess the potential for landfill gas hazards on the future development. If a landfill gas hazard is identified, mitigation measures should be proposed and implemented to address the hazard.	The whole development site (during the detailed design stage)	CED	CED	N/A	✓			TM on EIA Process, ProPECC Note PN3/96

\* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.

\*\* D=Design, C=Construction, O=Operation

Table 1.19 Outline of the Contamination Assessment Plan

Site/Area of Concern*	Nature	Sampling		Laboratory Analysis
		Location**	Method	
Truck maintenance and repair unit (at Location 3)	Vehicle maintenance and repairing	5 locations be chosen at 'hot spots' e.g. chemical wastes storage site, general working area, oil exchange area, points with discolouration or other signs of contamination.	Borehole drilling, soil to be sampled at depths 0.5m, 1.5m & 3.0m or immediately above groundwater level	TPH BTEX, VOCs, SVOCs
Open Stage Area in the southeast of the Study Area (at Locations 15, 16 & 17)	Construction materials and metals storage	8 locations selected at 'hot spots' and points with discolouration or other signs of contamination.	5 borehole drillings, soil to be sampled at depths 0.5m, 1.5m & 3.0m or immediately above groundwater level 3 trial pits, soil to be sampled at depths 0.5 m & 1.5 m	Metals VOCs, SVOCs, CN, PAHs, PCBs
Inactive or abandoned workshop (in between Locations 4 and 21)	Workshops (activities not clear)	8 locations selected over the area at 'hot spots' and points with discolouration or other signs of contamination.	8 borehole drillings, soil to be sampled at depths 0.5m, 1.5m & 3.0m or immediately above groundwater level	Metals VOCs, SVOCs, PAHs, CN
Vehicle maintenance and repair activities along Anderson Road (Anderson Road section from Locations 2 to 4)	Vehicle maintenance and repairing	5 locations along the roadside of Anderson Road with discolouration or other signs of contamination.	Surface soil sampling and sampling at 1 m by trial pit at 5 locations.	TPH, BTEX, VOCs, SVOCs
Unauthorised or illegal dumping of wastes inside the site (Location 2)	Waste dumping	3 locations inside the dumping ground.	Surface soil sampling and sampling at 1 m by trial pit at 5 locations.	Metals VOCs SVOCs PAHs CN

Note: \* please refer to Figure 1.21

\*\* exact sampling location to be confirmed before sampling

## 1.4 Environmental Monitoring and Audit Requirements

- 1.4.1 The EIA study identified the likely environmental impacts, namely air quality (dust) and noise impacts during the construction phase, can be minimized to acceptable levels with the implementation of environmental mitigation measures by the Contractor. For air quality, dust suppression measure is recommended in aspects of site practice, blasting, crushing, and material handling operations. For noise, certain construction noise controls are recommended. However, in order to ensure compliance with relevant standards, a requirement for baseline and compliance monitoring for air quality and noise has been identified.
- 1.4.2 For the baseline monitoring, its purposes are to establish ambient conditions prior to the commencement of the works and to demonstrate the suitability of the proposed monitoring stations. For the compliance monitoring, its purposes are to ensure the compliance of the impact during the course of the works under the implementation of mitigation measures recommended in the EIA report and to check whether unanticipated impacts are found during the course of the works. These requirements of the baseline monitoring and compliance monitoring are detailed in subsequent sections of this Manual.

## 1.5 Project Organization

- 1.5.1 The proposed project organization and lines of communication with respect to environmental protection works are shown in Figure 1.22.
- 1.5.2 The Environmental Team (ET) Leader shall be an independent party from the Contractor and have relevant professional qualifications, or have sufficient relevant EM&A experience subject to approval of the Engineer's Representative (ER) and the Environmental Protection Department (EPD).
- 1.5.3 The responsibility of respective parties are:

### *The Contractor*

- Employ an Environmental Team (ET) to undertake monitoring, laboratory analysis and reporting of environmental monitoring and audit;
  - Provide assistance to the ET in carrying out monitoring;
  - Submit proposals on mitigation measures in case of exceedances of Action and Limit Levels in accordance with the Event and Action Plans;
  - Implement measures to reduce impact where Action and Limit Levels are exceeded; and
  - Adhere to the procedures for carrying out complaint investigation in accordance with Section 5.3 of this Manual.

### *Engineer or Engineer's Representative*

- Supervise the Contractor's activities and ensure that the requirements in the EM&A Manual are fully complied with;
- Inform the Contractor when action is required to reduce impacts in accordance with the Event and Action Plans;
- Employ an Independent Checker (Environment)(IC(E)) to audit the results of the EM&A works carried out by the ET; and

- Adhere to the procedures for carrying out complaint investigation in accordance with Section 5.3 of this Manual.

***Environmental Team***

- Monitor the various environmental parameters as required in this Manual;
- Analyse the environmental monitoring and audit data and review the success of EM&A programme to cost effectively confirm the adequacy of mitigatory measures implemented and the validity of the EIA predictions and to identify any adverse environmental impacts arising;
- Carry out site inspection to investigate and audit the Contractor's site practice, equipment and work methodologies with respect to pollution control and environmental mitigation, and effect proactive action to pre-empt problems;
- Audit and prepare audit reports on the environmental monitoring data and site environmental conditions;
- Report on the environmental monitoring and audit results to the IC(E), the Contractor, the ER and EPD or its delegated representative;
- Recommend suitable mitigation measures to the Contractor in the case of exceedance of Action and Limit Levels in accordance with the Event and Action Plans; and
- Adhere to the procedures for carrying out complaint investigation in accordance with Section 5.3 of this Manual.

***Independent Checker (Environment)***

- Review the EM&A works performed by the ET;
- Audit the monitoring activities and results;
- Report the audit results to the ER and EPD in parallel;
- Review the EM&A reports submitted by the ET;
- Review the proposal on mitigation measures submitted by the Contractor in accordance with the Event and Action Plans; and
- Adhere to the procedures for carrying out complaint investigation in accordance with Section 5.3 of this Manual.

- 1.5.4 Sufficient and suitably qualified professional and technical staff shall be employed by the respective parties to ensure full compliance with their duties and responsibility, as required under the EM&A programme for the duration of the project.

## 1.6 Construction Programme

- 1.6.1 The Master Implementation Program for the Development at Anderson Road is included in Appendix 1 of this Manual. The construction work for the site development, not including building construction, are programmed to be conducted in the period between Nov 2001 and Dec 2007. The work programme includes four work packages which are confined to different areas. For Work Package 1, the work is confined to

Platforms C3, D, E and the southern access road. For Work Package 2, the work is confined to Platforms A, B, C1, C2 and the pumping station. For Work Package 3, the work is confined to the new reservoirs and the northern access road. For Work Package 4, the work includes sewerage and roadworks upgrading outside the development site.

- 1.6.2 The work packages will not be conducted sequentially. Work Package 1 will begin together with Work Package 2 while Work Packages 3 and 4 will start after completion of Work Packages 1 and 2.
- 1.6.3 The ET Leader shall make reference to the actual works progress and programme during the construction stage to schedule the EM&A works, and the Contractor shall provide the respective information to the ET Leader for formulating the EM&A schedule.

## 2 AIR QUALITY

### 2.1 Air Quality Parameters

- 2.1.1 Monitoring and audit of Total Suspended Particulates (TSP) levels shall be carried out by the ET to ensure that any deteriorating air quality will be quickly detected and timely action may be taken to rectify the situation.
- 2.1.2 1-hour average and 24-hour average TSP levels shall be measured to indicate any impacts of construction dust on air quality. The 24-hour average TSP levels shall be measured in accordance with the high-volume sampling method as set out in the Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B. Upon approval by the ER, 1-hour average TSP levels may be measured by direct reading methods capable of producing results comparable to the high-volume sampling method, to indicate short event impacts.
- 2.1.3 All relevant data, including temperature, pressure, weather conditions, elapsed-time metre reading for the start and stop of the sampler, filter paper identification and weight, and any other local atmospheric factors affecting or affected by site conditions etc., shall be recorded down in detail. A sample data sheet for dust monitoring is presented in Appendix 2.

### 2.2 Monitoring Equipment

- 2.2.1 When using high-volume samplers (HVSs), the sampling methodology shall be undertaken in compliance with the following specifications:
- 0.6-1.7 m<sup>3</sup>/min (20-60 SCFM) adjustable flow range;
  - Equipped with a timing/control device with +/- 5 minutes accuracy for 24 hours operation;
  - Installed with elapsed-time metre with +/- 2 minutes accuracy for 24 hours operation;
  - Capable of providing a minimum exposed area of 406 cm<sup>2</sup> (63 in<sup>2</sup>);
  - Flow control accuracy: +/- 2.5% deviation over 24-hour sampling period;
  - Equipped with a shelter to protect the filter and sampler;
  - Incorporated with an electronic mass flow rate controller or other equivalent devices;
  - Equipped with a flow recorder for continuous monitoring;
  - Provided with a peaked roof inlet;
  - Incorporated with a manometer;
  - Able to hold and seal the filter paper to the sampler housing at horizontal position;
  - Easy to change the filter; and
  - Capable of operating continuously for 24-hour period.

- 2.2.2 The ET Leader shall be responsible for provision of the monitoring equipment. He shall ensure that sufficient number of HVSs with an appropriate calibration kit are available for carrying out the baseline monitoring, regular impact monitoring and ad hoc monitoring. The HVSs shall be calibrated against a traceable standard at regular intervals. All equipment, calibration kits, filter papers, etc. shall be clearly labelled.
- 2.2.3 Initial calibration of dust monitoring equipment shall be conducted upon installation and thereafter at bi-monthly intervals. The transfer standard shall be traceable to the internationally recognised primary standard and be calibrated annually. The calibration data shall be properly documented for future reference by concerned parties such as the IC(E). All data shall be converted into standard temperature and pressure equivalents.
- 2.2.4 The sampler flow-rate shall be verified to be constant before and after the sampling exercise with the filter in position. Results shall be recorded in an appropriate data sheet (an example is given in Appendix 2).
- 2.2.5 If the ET Leader proposes to use a direct reading dust metre to measure 1-hour average TSP levels, he shall submit sufficient information to the IC(E) to prove the instrument is capable of achieving a comparable result to HVS machines. Any such instrument should be calibrated regularly, and 1-hour average measurements shall also be determined periodically by HVS to check the validity and accuracy of the results measured by direct reading method.
- 2.2.6 Wind data monitoring equipment shall also be provided and set up at conspicuous locations near to dust monitoring locations for logging wind speed and wind direction. The location shall be proposed by the ET Leader and agreed with the ER in consultation with the IC(E). The following points shall be observed for the installation and operation of wind data monitoring equipment:
- Wind sensors should be installed on masts elevated 10 m above ground so that they are clear of obstructions or turbulence caused by the buildings;
  - Wind data should be captured by a data logger and downloaded for processing at least once a month;
  - Wind data monitoring equipment should be re-calibrated at least once every six months; and
  - Wind direction should be divided into 16 sectors of 22.5 degrees each.
- In exceptional situations, the ET Leader may propose alternative methods to obtain representative wind data upon approval from the ER and agreement with the IC(E).

## 2.3 Laboratory Measurement /Analysis

- 2.3.1 A clean laboratory with constant temperature and humidity control shall be available for dust sample analysis, and this shall be equipped with the necessary measuring conditioning, calibration instrumentation and maintenance facilities. The laboratory should be HOKLAS accredited.
- 2.3.2 If a site laboratory is set up or a non-HOKLAS accredited laboratory is retained for analysis, laboratory equipment shall be approved by the ER in consultation with the IC(E). Measurement performed by the laboratory shall be demonstrated to the satisfaction of the ER and the IC(E). The IC(E) shall conduct regular audit to the measurement performed by the laboratory to ensure the accuracy of measurement results. The ET Leader shall provide the ER with one copy of the Title 40 of the Code of Federal Regulations, Chapter I (Part 50), Appendix B for his reference.
- 2.3.3 Filter paper of size 8"x10" shall be labelled before sampling. It shall be a clean filter paper with no pin holes, and shall be conditioned in a humidity controlled chamber for over 24-hour and be pre-weighed before use.
- 2.3.4 Upon completion of sampling, the used filter paper shall be kept in a clean and tightly sealed plastic bag. The filter paper shall then be returned to the laboratory for reconditioning in the humidity controlled chamber followed by accurate weighing to 0.1 mg by an electronic balance. The balance shall be regularly calibrated against a traceable standard.



2.3.5 All collected samples shall be kept in good condition for six months prior to disposal.

## 2.4 Monitoring Locations

2.4.1 The proposed monitoring locations are shown in Figure 2.1. They are all located at the site boundary close to nearby air quality sensitive receivers. The selection of final monitoring stations should take account of the following criteria, as far as practicable:

- It is preferable to monitor at the site boundary or locations close to the major dust emission source;
- Locations should be in proximity to sensitive receivers; and
- Prevailing meteorological conditions.

2.4.2 The ET Leader shall agree the monitoring locations with the ER in consultation with the IC(E). When installing sampling equipment, the following points shall be considered:

- A horizontal platform should be provided with appropriate support to secure samplers against gusty wind;
- No two samplers should be placed less than two metres apart;
- The distance between the sampler and any substantial structure must be equal to at least twice the height that the structure protrudes above the sampler;
- A minimum of two metres separation from walls, parapets and penthouses is required for any rooftop samplers;
- A minimum of 2 metres separation from any supporting structure, measured horizontally is required;
- No furnace or incinerator should be located nearby;
- Airflow should be unrestricted around the sampler;
- The sampler should be located more than 20 metres from any dripline;
- Any wire fence and gate, required to protect the sampler, should not obstruct the monitoring process;
- Permission must be obtained to setup and access samplers; and
- A secured and uninterrupted supply of electricity shall be provided.

## 2.5 Baseline Monitoring

2.5.1 24-hour average TSP baseline monitoring shall be carried out at all designated monitoring locations for at least 14 consecutive days prior to the commissioning of the construction works. 1-hour average sampling shall also be done at least 3 times per day while the highest dust impact is expected. Before commencing the baseline monitoring, the ET Leader shall inform the IC(E) of the baseline monitoring programme such that the IC(E) can conduct on-site audit to ensure accuracy of the baseline monitoring results.

2.5.2 No construction or dust generating activities should be underway during the baseline monitoring in the vicinity of the monitoring stations.

- 2.5.3 In the event that baseline monitoring cannot be carried out at the designated locations during the baseline monitoring period, representative alternative locations should be used. This shall only be undertaken with the approval of the ER and in agreement with the IC(E).
- 2.5.4 In exceptional cases, when insufficient baseline monitoring data or questionable results are obtained, the ET Leader shall liaise with the IC(E) and EPD to agree on an appropriate set of data to be used as a baseline reference and submit to the ER for approval.
- 2.5.5 Ambient conditions may vary seasonally and shall be reviewed at three monthly intervals. When ambient conditions have changed and baseline data requires updating, monitoring should be undertaken at times when the Contractor's activities are not generating dust, at least in the proximity to the monitoring stations. All revised baseline levels and air quality criteria should be agreed with the IC(E) and EPD.

## 2.6 Impact Monitoring

- 2.6.1 Impact monitoring should be carried out during construction works. The sampling frequency shall be at least once every six days for 24-hour average TSP monitoring. For 1-hour average TSP monitoring, a sampling frequency of at least three times every six days shall be undertaken to coincide with the highest dust impacts. Before commencing the baseline monitoring, the ET Leader shall inform the IC(E) of the impact monitoring programme such that the IC(E) can conduct on-site audit to ensure accuracy of the impact monitoring results.
- 2.6.2 A specific and consistent start and stop time shall be clearly defined for each location and this shall be strictly followed by the operator for 24-hour average TSP monitoring.
- 2.6.3 Within 24 hours for any non-compliance with the air quality criteria, more frequent monitoring shall be conducted within 24 hours after the result is obtained as specified in the Event and Action Plan detailed in the next section. This additional monitoring shall continue until the excessive dust emissions subside, or the deterioration in air quality is rectified.

## 2.7 Event and Action Plan for Air Quality

- 2.7.1 Baseline monitoring results shall form the basis for determining Action and Limit Levels for impact monitoring in accordance with the criteria listed in Table 2.1. When any exceedance of Action and Limit Levels occur, action must be undertaken to control environmental impacts to acceptable levels, as indicated in Table 2.2.

Table 2.1 Action and Limit Levels for Air Quality

Parameters	Action Level	Limit Level
24-hour average TSP level	<p>For Baseline Level &lt; 108 µg/m<sup>3</sup>, Action Level = average of Baseline Level plus 30% of Limit Level</p> <p>For Baseline Level &gt; 108 µg/m<sup>3</sup> and Baseline Level &lt; 154 µg/m<sup>3</sup>, Action Level = 200 µg/m<sup>3</sup></p> <p>For Baseline Level &gt; 154 µg/m<sup>3</sup>, Action Level = 130% of Baseline Level</p>	260 µg/m <sup>3</sup>
1-hour average TSP level	<p>For Baseline Level &lt; 154 µg/m<sup>3</sup>, Action Level = average of Baseline Level plus 30% of Limit Level</p> <p>For Baseline Level &gt;154 µg/m<sup>3</sup> and Baseline Level &lt;269 µg/m<sup>3</sup>, Action Level = 350 µg/m<sup>3</sup></p> <p>For Baseline Level &gt; 269 µg/m<sup>3</sup>, Action Level = 130% of Baseline Level</p>	500 µg/m <sup>3</sup>

Table 2.2 Event and Action Plan for Air Quality

EVENT	ACTION				CONTRACTOR
	ET	IC(E)	ER		
<b>ACTION LEVEL</b>					
1. Exceedance for one sample	<ol style="list-style-type: none"> <li>Identify source.</li> <li>Inform IC(E) and ER.</li> <li>Repeat measurement to confirm finding.</li> <li>Increase monitoring frequency to daily.</li> </ol>	<ol style="list-style-type: none"> <li>Check monitoring data submitted by ET.</li> <li>Check Contractor's working method.</li> </ol>	<ol style="list-style-type: none"> <li>Notify Contractor.</li> </ol>	<ol style="list-style-type: none"> <li>Rectify any unacceptable practice.</li> <li>Amend working methods if appropriate.</li> </ol>	
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>Identify source.</li> <li>Inform IC(E) and ER.</li> <li>Repeat measurements to confirm findings.</li> <li>Increase monitoring frequency to daily.</li> <li>Discuss with IC(E) and Contractor for remedial actions required.</li> <li>If exceedance continues, arrange meeting with IC(E) and ER.</li> <li>If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>Check monitoring data submitted by ET.</li> <li>Check Contractor's working method.</li> <li>Discuss with ET and Contractor on possible remedial measures.</li> <li>Advise ER on the effectiveness of the proposed remedial measures.</li> <li>Supervise implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>Confirm receipt of notification of failure in writing.</li> <li>Notify Contractor.</li> <li>Ensure remedial actions properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>Submit proposals for remedial actions to IC(E) within 3 working days of notification.</li> <li>Implement the agreed proposals.</li> <li>Amend proposal if appropriate.</li> </ol>	
<b>LIMIT LEVEL</b>					
1. Exceedance for one sample	<ol style="list-style-type: none"> <li>Identify source.</li> <li>Inform ER and EPD.</li> <li>Repeat measurement to confirm finding.</li> <li>Increase monitoring frequency to daily.</li> <li>Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results.</li> </ol>	<ol style="list-style-type: none"> <li>Check monitoring data submitted by ET.</li> <li>Check Contractor's working method.</li> <li>Discuss with ET and Contractor on possible remedial measures.</li> <li>Advise ER on the effectiveness of the proposed remedial measures.</li> <li>Supervise implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>Confirm receipt of notification of failure in writing.</li> <li>Notify Contractor.</li> <li>Ensure remedial actions properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>Take immediate action to avoid further exceedance.</li> <li>Submit proposals for remedial actions to IC(E) within 3 working days of notification.</li> <li>Implement the agreed proposals.</li> <li>Amend proposal if appropriate.</li> </ol>	
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>Notify IC(E), ER, Contractor and EPD.</li> <li>Identify source.</li> <li>Repeat measurement to confirm findings.</li> <li>Increase monitoring frequency to daily.</li> <li>Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented.</li> <li>Arrange meeting with IC(E) and ER to discuss the remedial actions to be taken.</li> <li>Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results.</li> <li>If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>Discuss amongst ER, ET, and Contractor on the potential remedial actions.</li> <li>Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise ER accordingly.</li> <li>Supervise implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>Confirm receipt of notification of failure in writing.</li> <li>Notify Contractor.</li> <li>In consultation with IC(E), agree with Contractor on the remedial measures to be implemented.</li> <li>Ensure remedial measures properly implemented.</li> <li>If exceedance continues, consider what portion of the work is responsible and instruct Contractor to stop that portion of work until the exceedance is abated.</li> </ol>	<ol style="list-style-type: none"> <li>Take immediate action to avoid further exceedance.</li> <li>Submit proposals for remedial actions to IC(E) within 3 working days of notification.</li> <li>Implement the agreed proposals.</li> <li>Resubmit proposals if problem still not under control.</li> <li>Stop the relevant portion of works as determined by ER until the exceedance is abated.</li> </ol>	

## 2.8 Air Quality Mitigation Measures

2.8.1 In view of the potential high levels of dust arising from the construction activities of the project, it will be necessary to adopt control and mitigation measures wherever practicable. A commitment by the Contractor to adopt good operational practices for dust minimisation should reduce the dust nuisance to a minimum. A number of practical measures recommended in the EIA study are listed below:

### *Site Practice*

- Mean vehicle speed of haulage trucks at 10 kmhr<sup>-1</sup>.
- Twice daily watering of all open site areas.
- Regular watering (once every 1.5 hours) of all site roads and access roads with frequent truck movement.
- Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.
- Establishment and use of vehicle wheel and body washing facilities at the exit points of the site, combined with cleaning of public roads where necessary.
- Suitable side and tailboards on haulage vehicles.
- Watering of temporary stockpiles.
- Paved northern and southern temporary access roads.

### *Blasting*

- Use of select aggregate and fines to stem the charge with drill holes and watering of blast face
- Use of vacuum extraction drilling methods.
- Carefully sequenced blasting.
- Blasting should not be carried out under unfavourable meteorological conditions with wind speed less than 2 ms<sup>-1</sup>.

### *Crushing*

- Fabric filters installed for the crushing plant.
- Water sprays on the crusher.

### *Loading and Unloading Points, and Conveyor Belt System*

- Water sprays at all fixed loading and unloading points (at the crusher and conveyor belts).
- The loading point at the crusher is enclosed with dust collection system installed.
- When transferring materials from conveyor belt or crusher to the dump trucks, chutes or dust curtains are used for controlling dust.
- Cover the conveyor belts with steel roof and canvas sides.

2.8.2 Apart from the dust suppression measures listed above, the Contractor should also satisfy the requirements in Air Pollution Control (Construction Dust) Regulation.

2.8.3 The Contractor shall be responsible for the design and implementation of these measures. If further measures are required to restore air quality to acceptable levels, these shall be implemented in liaison with the ET Leader and the ER.

## 3 NOISE

### 3.1 Noise Parameters

- 3.1.1 Levels of construction noise and traffic noise generated after the widening of Po Lam Road shall be measured in terms of the A-weighted L10.
- 3.1.2 For construction noise, Leq(30 min) shall be used as the monitoring parameter for the time period between 0700-1900 hours on normal weekdays.
- 3.1.3 For traffic noise, L10 (1-hr) shall be used as the monitoring parameter for the time of peak traffic flow during weekday. During the traffic noise measurement, traffic count shall be undertaken.
- 3.1.4 As supplementary information for data auditing, statistical results such as Leq and L90 shall also be obtained for reference. A sample data sheet for noise monitoring is provided in Appendix 2.

### 3.2 Monitoring Equipment

- 3.2.1 As referred to in the Technical Memorandum (TM) issued under the Noise Control Ordinance (NCO), sound level meters shall comply with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications. Immediately prior to and following each noise measurement the accuracy of the sound level metre shall be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements may be accepted as valid only if the calibration level from before and after the noise measurement agree to within 1.0 dB.
- 3.2.2 Noise measurements should not be made in the presence of fog, rain, wind with a steady speed exceeding 5 m/s or wind with gusts exceeding 10 m/s. The wind speed shall be checked with a portable wind speed metre capable of measuring the wind speed in m/s.
- 3.2.3 The ET Leader shall be responsible for the provision of monitoring equipment. He shall ensure that sufficient noise measuring equipment and associated instrumentation are available for carrying out baseline monitoring, regular impact monitoring and ad hoc monitoring. All equipment and associated instrumentation shall be clearly labelled.

### 3.3 Monitoring Locations

- 3.3.1 Monitoring shall, at least, be carried out at the most affected receiver. Proposed monitoring locations for construction noise are shown in Figure 3.1 whereas the monitoring locations for traffic noise (Po Lam Road) are shown in Figure 3.2. They are the nearby noise sensitive receivers facing the construction site. The final selection of monitoring locations should ensure that these are:
  - At locations close to the major site activities likely to cause noise impacts;
  - Close to noise sensitive receivers (for the purposes of this section, any domestic premises, hotel, hostel, temporary housing accommodation, hospital, medical clinic, educational institution, place of public worship, library, court of law, performing art centre should be considered as noise sensitive receiver); and
  - Located such that disturbance to any occupants is minimized during monitoring.

- 3.3.2 Monitoring locations shall normally be at a point 1 m from the exterior of the sensitive receiver's building facade and at a position 1.2 m above the ground. If there is problem with access to the normal monitoring position, an alternative position may be chosen, and a correction to the measurements shall be made. For reference, a correction of +3 dB(A) shall be made to free field measurements. The ET Leader shall agree with the IC(E) all monitoring positions and corrections adopted. Once the positions for the monitoring locations are chosen, baseline monitoring and impact monitoring shall be carried out at the same positions.

### 3.4 Baseline Monitoring

- 3.4.1 The ET Leader shall carry out baseline noise monitoring prior to the commencement of any construction works. Baseline monitoring shall be carried out on a daily basis for a period of at least two weeks. A schedule for baseline monitoring shall be submitted to the ER for approval prior to commencement.
- 3.4.2 There shall not be any ongoing construction activities in the vicinity of the monitoring locations during the baseline monitoring.
- 3.4.3 Under certain circumstances, insufficient, or questionable, baseline monitoring data may be obtained in such cases the ET Leader shall liaise with the IC(E) and EPD to agree on an appropriate data set for use as a baseline reference. These data shall also be submitted to the ER for approval.

### 3.5 Impact Monitoring of Construction Noise

- 3.4.4 Noise monitoring shall be carried out at all designated locations. Monitoring frequency shall depend on the scale of the construction activities. However, the following is an initial guide on the regular monitoring frequency for each location on a per week basis when noise generating activities are underway:
- One set of measurement restricted to normal weekdays between 0700-1900 hours
- 3.4.5 In case of non-compliance with the construction noise criteria, more frequent monitoring as specified in the Event and Action Plan in Section 3.6 shall be carried out. This additional monitoring shall continue until recorded noise subsides to acceptable levels, or is proved unrelated to the construction activities.

### 3.6 Event and Action Plan for Construction Noise

- 3.6.1 Action and Limit Levels for construction noise are defined in Table 3.1. In the event of any non-compliance with these levels, action shall be carried out in accordance with the Event and Action Plan in Table 3.2.
- 3.6.2 To avoid the exceedance of action or limit levels, all practical mitigation measures should be implemented to reduce the noise impacts at nearby sensitive receivers through the residential receivers are complying with the noise level standard. The mitigation measures shall include but not limited to clauses 3.6.3 to 3.6.7.
- 3.6.3 The intention at each stage of the construction period should be to minimize site noise levels, whilst having due regard to the practicability of any proposed control or mitigation measures. The initial aim in the design of the construction programme should be trying to schedule the minimum number of simultaneous operations.
- 3.6.4 Proper scheduling of site formation works is required to avoid several site formation works to occur concurrently in the areas close to sensitive receivers. It is recommended that rock drilling cannot be undertaken concurrently (i) at Platforms C(1) and C(2) and Platform C(3); and (ii) at Platforms C(1) and C(2) and Platform B to avoid adverse impacts at sensitive receivers. In addition, quieter powered mechanical equipment should be employed during site formation process.
- 3.6.5 All plant and equipment used on the construction works should be routinely maintained in good working condition. In addition, silencers, mufflers, acoustic linings or screens shall be used to reduce sound level where feasible.

- 3.6.6 Operation of noisy equipment, such as hydraulic hammer and drilling rig, near school receivers should be kept to minimum. The operation of noisy equipment should not be carried out during examination period. The operation of noisy equipment for road levelling and road paving should be carried out during non- school hours (i.e. lunch time and around 4:00 pm - 7:00 pm) whenever possible.
- 3.6.7 The basic requirement for any construction contractors is to use all available techniques to minimise the noise level to which operation and others in the neighbourhood of site operations would be exposed. In addition, the noise levels at the noise sensitive receivers should comply with the noise level limit. The effective measures are as follows:
- a rigorous EM&A programme should be undertaken, and should focus on those NSRs of particular concern, in order to identify and rectify any problems at the earliest possible stage;
  - construction plant should be properly maintained and operated;
  - conditions from EPD's Recommended Pollution Control Clauses should be incorporated into future contract documents and implemented in order to control construction noise impacts to within acceptable levels; and
  - any scheduling of occupancy of sensitive receivers e.g. new schools or residential units, shall be at a time when all noisy construction works in nearby areas have been completed.
- 3.6.8 If the above measures are not sufficient to restore noise to acceptable levels, upon the advice of the ET Leader, the Contractor shall liaise with the ET Leader to propose and implement further mitigation. This shall be undertaken in agreement with the ER.

Table 3.1 Action and Limit Levels for Construction Noise

Time Period	Action Level	Limit Level
0700- 1900 hours on normal weekdays	When one documented complaint is received	75* dB(A)

Note: \*70 dB(A) for schools (65 dB(A) during examinations)

Table 3.2 Event and Action Plan for Construction Noise

EVENT	ACTION			
	ET	IC(E)	ER	Contractor
Exceedance of Action Level	<ol style="list-style-type: none"> <li>1. Notify IC(E) and Contractor.</li> <li>2. Carry out investigation.</li> <li>3. Report the results of investigation to IC(E) and Contractor.</li> <li>4. Discuss with Contractor and formulate remedial measures.</li> <li>5. Increase monitoring frequency to check mitigation effectiveness.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review the analysed results submitted by ET.</li> <li>2. Review the proposed remedial measures by the Contractor and advise ER accordingly.</li> <li>3. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing.</li> <li>2. Notify Contractor.</li> <li>3. Require Contractor to propose remedial measures for the analysed noise problem.</li> <li>4. Ensure remedial measures are properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit noise mitigation proposals to IC(E).</li> <li>2. Implement noise mitigation proposals.</li> </ol>
Exceedance of Limit Level	<ol style="list-style-type: none"> <li>1. Notify IC(E), ER, EPD and Contractor.</li> <li>2. Identify source.</li> <li>3. Repeat measurement to confirm findings.</li> <li>4. Increase monitoring frequency.</li> <li>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented.</li> <li>6. Inform IC(E), ER and EPD the causes and actions taken for the exceedance.</li> <li>7. Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results.</li> <li>8. If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst ER, ET, and Contractor on the potential remedial actions.</li> <li>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise ER accordingly.</li> <li>3. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing.</li> <li>2. Notify Contractor.</li> <li>3. Require Contractor to propose remedial measures for the analysed noise problem.</li> <li>4. Ensure remedial measures are properly implemented.</li> <li>5. If exceedance continues, consider what portion of the work is responsible and instruct Contractor to stop that portion of work until the exceedance is abated.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance.</li> <li>2. Submit proposals for remedial actions to IC(E) within 3 working days of notification.</li> <li>3. Implement the agreed proposals.</li> <li>4. Resubmit proposals if problem still not under control.</li> <li>5. Stop the relevant portion of works as determined by ER until the exceedance is abated.</li> </ol>



### 3.7 Operation Monitoring of Traffic Noise

3.7.1 Noise monitoring shall be carried out at all designated locations after the completion of the Po Lam Road widening work, the monitoring locations are as follows;

- the 30th floor of NSR 2094;
- the 30th floor of NSR 2088.

3.7.2 Before the commencement of measurement, the monitoring locations shall be agreed by the Director of EPD.

3.7.3 One set of L10 (1-hr) shall be measured during weekdays, the time of peak traffic flow.

3.7.4 Monitoring plan regarding the operation monitoring of traffic noise is provided in Appendix 3.

### 3.8 Traffic Count

3.8.1 During the one-hour L10 measurement of traffic noise, traffic count shall be undertaken in order to adjust the measured traffic noise level and compare to the predicted traffic noise level.

3.8.2 The parameter listed below shall be measured for each of the two bounds.

- total number of vehicle per hour
- percentage of heavy vehicle
- average of vehicle speed

## 4 WASTE MANAGEMENT

- 4.1.1 The Contractor is responsible for waste control within the construction site, removal of the waste material produced from the site and to implement any mitigation measures to minimise waste or redress problems arising from the waste from the site. The waste material may include any sewage, waste water or effluent containing sand, cement, silt or any other suspended or dissolved material to flow from the site onto any adjoining land, storm sewer, sanitary sewer, or any waste matter or refuse to be deposited anywhere within the site or onto any adjoining land.
- 4.1.2 When handling the waste material, the following measures as recommended in the EIA study should be undertaken:
- Surface run-off from the site should be desilted and degrittied. Silt traps and sedimentation tanks should be provided at construction sites. Regular maintenance of the sediment traps, e.g. Digging out, should be carried out to ensure their efficiency.
  - Measures to intercept rainwater run-off onto the work sites should be provided so that it will not flow across the sites.
  - Measures to intercept water from workshop areas should be considered to prevent any runoff consisting of high petroleum, oil, paint waste and hydraulic fluids in the event of accidental spills.
  - Sewage arising from construction sites should be collected and treated prior to discharge.
  - Discharge wastewater from the construction sites to surface water and/or public drainage systems should be controlled through licensing. Discharges should fully comply with the terms and conditions in the licences.
  - Wastewater generated from the washing down of vehicles and wheel washing facilities and dust suppression activities should, wherever possible, be recycled for re-use within the site. If discharge is unavoidable, it must be pre-treated.
  - Generally, different types of wastes should be segregated, stored, transported and disposed of separately in accordance with EPD's required procedures.
  - Excavated spoil should be re-used on site where possible.
  - During road transportation of excavated spoil, vehicles should be covered to avoid dust impact.
  - Chemical waste should be recycled on-site or removed by licenced companies. It should be handled according to the *Code of Practice on the Packaging, Labeling and Storage of Chemical Wastes*. When off-site disposal is required, it should be collected and delivered by licenced contractors to Tsing Yi Chemical Waste Treatment Facility and disposed of in accordance with the Chemical Waste (General) Regulation. In addition, mitigation measures must be adopted to prevent the uncontrolled disposal of chemical and hazardous waste to the air, soil and water.
  - A sewerage system or septic tanks must be provided to collect human waste. On-site refuse collection points must also be provided.
- 4.1.3 The Contractor shall also pay attention to the Waste Disposal Ordinance, the Dumping at Sea Ordinance, the Public Health and Municipal Services Ordinance and the Water Pollution Control Ordinance, and carry out the appropriate waste management work. The relevant licence/permit, such as the effluent discharge licence, the chemical waste producer registration, etc. shall be obtained. The Contractor shall refer to the relevant booklets issued by EPD when applying for the licence/permit.

- 4.1.4 During the site inspections and the document review procedures as mentioned in Sections 5.1 and 5.2 of this Manual, the ET Leader shall pay special attention to the issues relating to waste management, and check whether the Contractor has followed the relevant contract specifications and the procedures specified under the laws of Hong Kong.

## 5 SITE ENVIRONMENTAL AUDIT

### 5.1 Site Inspections

- 5.1.1 Site Inspections provide a direct means to initiate and enforce specified environmental protection and pollution control measures. These shall be undertaken routinely to inspect construction activities in order to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented. The site inspection is one of the most effective tools to enforce the environmental protection requirements on the construction site.
- 5.1.2 The ET Leader shall be responsible for formulating the environmental site inspection, the deficiency and action reporting system, and for carrying out site inspection works. Within 21 days of the construction contract commencement, he shall submit a proposal for site inspection, and deficiency and action reporting procedures to the Contractor for agreement and to the ER for approval. The ET's proposal for rectification would be made known to the IC(E).
- 5.1.3 Regular site inspections shall be carried out at least once per week. The inspection shall not be limited to the environmental situation, pollution control and mitigation measures within the site and should also include the environmental situation outside the site area which is likely to be affected, directly or indirectly, by site activities. The ET Leader shall make reference to the following information in conducting inspections:
- EIA recommendations on environmental protection and pollution control mitigation measures;
  - Works progress and programme;
  - Individual works methodology proposals (which shall include proposal on associated pollution control measures);
  - Contract specifications on environmental protection;
  - Relevant environmental protection and pollution control laws; and
  - Previous site inspection results.
- 5.1.4 The Contractor shall keep the ET Leader updated with all relevant information on the construction contract necessary for him to carry out site inspections. Inspection results and associated recommendations for improvements to the environmental protection and pollution control works shall be submitted to the IC(E) and the Contractor within 24 hours. The Contractor shall follow the procedures and time-frame as stipulated in the environmental site inspection, and the deficiency and action reporting system formulated by the ET Leader, to report on any remedial measures subsequent to the site inspections.
- 5.1.5 Ad hoc site inspections shall also be carried out if significant environmental problems are identified. Inspections may also be required subsequent to receipt of an environmental complaint, or as part of the investigation work, as specified in the Event and Action Plan for environmental monitoring and audit.

### 5.2 Compliance with Legal and Contractual Requirements

- 5.2.1 There are contractual environmental protection and pollution control requirements as well as environmental protection and pollution control laws in Hong Kong with which construction activities must comply.
- 5.2.2 In order that the works comply with contractual requirements, all works method statements submitted by the Contractor to the ER for approval shall be sent to the ET Leader for vetting to see whether sufficient environmental protection and pollution control measures have been included.

- 5.2.3 The ET Leader shall also review the progress and programme of the works to check that relevant environmental laws have not been violated, and that any foreseeable potential for violating laws can be prevented.
- 5.2.4 The Contractor shall regularly copy relevant documents to the ET Leader so that work checking can be carried out. The document shall at least include the updated Work Progress Reports, updated Works Programme, any application letters for different licence/permits under the environmental protection laws, and copies or all valid licences/permits. The site diary shall also be available for the ET Leader's inspection upon his request.
- 5.2.5 After reviewing the document, the ET Leader shall advise the ER and the Contractor of any non-compliance with contractual and legislative requirements on environmental protection and pollution control for them to take follow-up actions. If the ET Leader's review concludes that the current status on licence/permit application and any environmental protection and pollution control preparation works may result in potential violation of environmental protection and pollution control requirements, he shall also advise the Contractor and the ER accordingly.
- 5.2.6 Upon receipt of the advice, the Contractor shall undertake immediate action to correct the situation. The ER shall follow up to ensure that appropriate action has been taken in order to satisfy contractual and legal requirements.

### 5.3 Environmental Complaints

- 5.3.1 Complaints shall be referred to the ET Leader for action. The ET Leader shall undertake the following procedures upon receipt of any complaint:
- Log complaint and date of receipt onto the complaint database and inform the IC(E) immediately;
  - Investigate the complaint to determine its validity, and assess whether the source of the problem is due to works activities;
  - Identify mitigation measures in consultation with the IC(E) if a complaint is valid and due to works;
  - Advise the Contractor if mitigation measures are required;
  - Review the Contractor's response to identified mitigation measures, and the updated situation;
  - If the complaint is transferred from EPD, submit interim report to EPD on status of the complaint investigation and follow-up action within the time frame assigned by EPD;
  - Undertake additional monitoring and audit to verify the situation if necessary, and review that circumstances leading to the complaint do not recur;
  - Report investigation results and subsequent actions to complainant (if the source of complaint is EPD, the results should be reported within the time frame assigned by EPD); and
  - Record the complaint, investigation, the subsequent actions and the results in the monthly EM&A reports.
- 5.3.2 During any complaint investigation work, the Contractor and the ER shall cooperate with the ET Leader in providing all necessary information and assistance for completion of the investigation. If mitigation measures are identified in the investigation, the Contractor shall promptly carry out the mitigation. The ER shall ensure that all necessary measures have been carried out by the Contractor.

## 6 REPORTING

### 6.1 General

- 6.1.1 Reports can be provided in an electronic medium upon agreeing the format with the ER and EPD. This would enable a transition from a paper/historic and reactive approach to an electronic/real time proactive approach.

### 6.2 Baseline Monitoring Report

- 6.2.1 The ET Leader shall prepare and submit a Baseline Environmental Monitoring Report within 10 working days of completion of the baseline monitoring. Copies of the Baseline Environmental Monitoring Report shall be submitted to the Contractor, the IC(E), the ER and EPD. The ET Leader shall liaise with the relevant parties on the exact number of copies they require. The report format and baseline monitoring data format shall be agreed with EPD prior to submission.

- 6.2.2 The baseline monitoring report shall include at least the following:

- Executive summary (up to half a page).
- Brief project background information.
- Drawings showing locations of the baseline monitoring stations.
- Monitoring results (in both hard and diskette copies) together with the following information:
  - monitoring methodology;
  - name of laboratory and types of equipment used and calibration details;
  - parameters monitored;
  - monitoring locations;
  - monitoring date, time, frequency and duration; and
  - QA/QC results and detection limits.
- Details of influencing factors, including:
  - major activities, if any, being carried out on the site during the period;
  - weather conditions during the period; and
  - other factors which might affect results.
- Determination of the Action and Limit Levels for each monitoring parameter and statistical analysis of the baseline data, the analysis shall conclude if there is any significant difference between control and impact stations for the parameters monitored.
- Revisions for inclusion in the EM&A Manual.
- Comments and conclusions.

### 6.3 Monthly EM&A Reports

- 6.3.1 The results and findings of all EM&A work required in the Manual shall be recorded in the monthly EM&A reports prepared by the ET Leader. The EM&A report shall be prepared and submitted within 10 working days of the end of each reporting month, with the first report due the month after construction commences. Each monthly EM&A report shall be submitted to four parties: the Contractor, the IC(E), the ER and EPD. Before submission of the first EM&A report, the ET Leader shall liaise with the parties on the required number of copies and format of the monthly reports in both hard copy and electronic medium.

- 6.3.2 The ET Leader shall review the number and location of monitoring stations and parameters every six months or on as needed basis in order to cater for any changes in the surrounding environment and the nature of works in progress.

***First Monthly EM&A Report***

- 6.3.3 The first monthly EM&A report shall include at least the following:

- Executive summary (1-2 pages)
  - breaches of Action and Limit Levels;
  - complaint log;
  - notifications of any summons and successful prosecutions;
  - reporting changes; and
  - future key issues.
- Basic project information:
  - project organisation including key personnel contact names and telephone numbers;
  - programme;
  - management structure; and
  - work undertaken during the month.
- Environmental status:
  - works undertaken during the month with illustrations (such as location of works, daily dredging/filling rates, percentage fines in the fill material used); and
  - drawing showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations.
- A brief summary of EM&A requirements including:
  - all monitoring parameters;
  - environmental quality performance limits (Action and Limit Levels);
  - Event and Action Plans;
  - environmental mitigation measures, as recommended in the project EIA study final report; and
  - environmental requirements in contract documents.
- Implementation status:
  - advice on the implementation status of environmental protection and pollution control/mitigation measures, as recommended in the project EIA study.
- Monitoring results (in both hard and diskette copies) together with the following information:
  - monitoring methodology;
  - name of laboratory and types of equipment used and calibration details;
  - parameters monitored;
  - monitoring locations;
  - monitoring date, time, frequency, and duration;
  - weather conditions during the period;
  - any other factors which might affect the monitoring results; and
  - QA/QC results and detection limits.
- Report on non-compliance, complaints, notifications of summons and successful prosecutions
  - record of all non-compliance (exceedances) of the environmental quality performance limits (Action and Limit Levels);
  - record of all complaints received (written or verbal) for each media, including locations and nature of complaints investigation, liaison and consultation undertaken, actions and follow-up procedures taken, results and summary;
  - record of all notification of summons and successful prosecutions for breaches of current environmental protection/pollution control legislations, including locations and nature of the breaches, investigation, follow-up actions taken, results and summary;
  - review of the reasons for and the implications of non-compliance, complaints, summons and prosecutions including review of pollution sources and working procedures; and

- description of the actions taken in the event of non-compliance and deficiency reporting and any follow-up procedures related to earlier non-compliance.
- Others:
  - an account of the future key issues as reviewed from the works programme and work method statements; and
  - advice on the solid and liquid waste management status.

### ***Subsequent EM&A Reports***

6.3.4 Subsequent monthly EM&A reports shall include the following:

- Executive summary (1-2 pages):
  - breaches of Action and Limit Levels;
  - complaints log;
  - notifications of any summons and successful prosecutions;
  - reporting changes; and
  - future key issues.
- Basic project information:
  - project organisation including key personnel contact names and telephone numbers;
  - programme;
  - management structure; and
  - work undertaken during the month.
- Environmental status:
  - works undertaken during the month with illustrations (such as location of works, daily dredging/filling rates, percentage fines in the fill material used); and
  - drawing showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations.
- Implementation status:
  - advice on the implementation status of environmental protection and pollution control/mitigation measures, as recommended in the project EIA study.
- Monitoring results (in both hard and diskette copies) together with the following information:
  - monitoring methodology;
  - name of laboratory and types of equipment used and calibration details;
  - parameters monitored;
  - monitoring locations;
  - monitoring date, time, frequency, and duration;
  - weather conditions during the period;
  - any other factors which might affect the monitoring results; and
  - QA/QC results and detection limits.
- Report on non-compliance, complaints, notifications of summons and successful prosecutions:
  - record of all non-compliance (exceedances) of the environmental quality performance limits (Action and Limit Levels);
  - record of all complaints received (written or verbal) for each media, including locations and nature of complaints investigation, liaison and consultation undertaken, actions and follow-up procedures taken, results and summary;
  - record of all notification of summons and successful prosecutions for breaches of current environmental protection/pollution control legislations, including locations and nature of the breaches, investigation, follow-up actions taken, results and summary;
  - review of the reasons for and the implications of non-compliance, complaints, summons and prosecutions including review of pollution sources and working procedures; and
  - description of the actions taken in the event of non-compliance and deficiency reporting and any follow-up procedures related to earlier non-compliance.
- Others:



- an account of the future key issues as reviewed from the works programme and work method statements; and
- advice on the solid and liquid waste management status.
  
- Appendix:
  - Action and Limit Levels;
  - graphical plots of trends of monitored parameters at key stations over the past four reporting periods for representative monitoring stations annotated against the followings:
    - major activities being carried out on site during the period;
    - weather conditions during the period; and
    - any other factors which might affect the monitoring results.
  - monitoring schedule for the present and next reporting period;
  - cumulative statistics on complaints, notifications of summons and successful prosecutions; and
  - outstanding issues and deficiencies.

## 6.4 Quarterly EM&A Summary Reports

6.4.1 A quarterly EM&A summary report of around 5 pages shall be produced and shall contain at least the following information:

- Up to half a page executive summary.
- Basic project information including a synopsis of the project organisation, programme, contacts of key management, and a synopsis of work undertaken during the quarter.
- A brief summary of EM&A requirements including:
  - monitoring parameters;
  - environmental quality performance limits (Action and Limit Levels); and
  - environmental mitigation measures, as recommended in the project EIA study final report.
- Advice on the implementation status of environmental protection and pollution control/ mitigation measures, as recommended in the project EIA study report, summarised in the updated implementation schedule.
- Drawings showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations.
- Graphical plots of any trends in monitored parameters over the past 4 months (the last month of the previous quarter and the present quarter) for representative monitoring stations annotated against:
  - the major activities being carried out on site during the period;
  - weather conditions during the period; and
  - any other factors which might affect the monitoring results.
- Advice on the solid and liquid waste management status.
- A summary of non-compliance (exceedances) of the environmental quality performance limits (Action and Limit Levels).
- A brief review of the reasons for and the implications of any non-compliance, including a review of pollution sources and working procedures.
- A summary description of actions taken in the event of non-compliance and any follow-up procedures related to any earlier non-compliance.
- A summarized record of all complaints received (written or verbal) for each media, liaison and consultation undertaken, actions and follow-up procedures taken.
- Comments (e.g. effectiveness and efficiency of the mitigation measures), recommendations (e.g. any improvement in the EM&A programme) and conclusions for the quarter.
- Proponents' contacts and any hotline telephone number for the public to make enquiries.

## 6.5 Annual/ Final EM&A Review Reports

6.5.1 The annual/ final EM&A report should contain at least the following information:

- Executive summary (1-2 pages).
- Drawings showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations.
- Basic project information including a synopsis of the project organization, contacts of key management, and a synopsis of work undertaken during the course of the project or past twelve months.
- A brief summary of EM&A requirements including:
  - environmental mitigation measures, as recommended in the project EIA study final report;
  - environmental impact hypotheses tested;
  - environmental quality performance limits (Action and Limit Levels);
  - all monitoring parameters; and
  - Event and Action Plans.
- A summary of the implementation status of environmental protection and pollution control/mitigation measures, as recommended in the project EIA study report, summarised in the updated implementation schedule.
- Graphical plots and the statistical analysis of the trends of monitored parameters over the course of the project, including the post-project monitoring (or the past twelve months for annual reports) for all monitoring stations annotated against:
  - the major activities being carried out on site during the period;
  - weather conditions during the period; and
  - any other factors which might affect the monitoring results.
- A summary of non-compliance (exceedances) of the environmental quality performance limits (Action and Limit Levels).
- A review of the reasons for and the implications of non-compliance including review of pollution sources and working procedures as appropriate.
- A description of the actions taken in the event of non-compliance.
- A summary record of all complaints received (written or verbal) for each media, liaison and consultation undertaken, actions and follow-up procedures taken.
- A summary record of notifications of summons and successful prosecutions for breaches of the current environmental protection/pollution control legislations, locations and nature of the breaches, investigation follow-up actions taken and results.
- A review of the validity of EIA predictions and identification of shortcomings in EIA recommendations.
- A review of the effectiveness and efficiency of the mitigation measures.
- A review of success of the EM&A programme to cost effectively identify deterioration and to initiate prompt effective mitigatory action when necessary.

## 6.6 Data Keeping

6.6.1 No site based documents (such as monitoring field records, laboratory analysis records, site inspection forms, etc.) are required to be included in the monthly EM&A reports. However, any such document shall be well kept by the ET Leader and be ready for inspection upon request. All relevant information shall be clearly and systematically recorded in the document. Monitoring data shall also be recorded in magnetic media form, and the software copy must be available upon request. Data format shall be agreed with EPD. All documents and data shall be kept for at least one year following completion of the construction contract.

## 6.7 Interim Notifications of Environmental Quality Limit Exceedances

- 6.7.1 With reference to Event and Action Plans in Tables 2.2 and 3.2, when the environmental quality limits are exceeded, the ET Leader shall immediately notify the IC(E) and EPD, as appropriate. The notification shall be followed up with advice to the IC(E) and EPD on the results of the investigation, proposed action and success of the action taken, with any necessary follow-up proposals. A sample template for the interim notifications is presented in Appendix 4.

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**APPENDIX 1**

**Master Implementation Program of Development at Anderson  
Road**

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Activity ID	Description	Orig Dur	Early Start	Early Finish	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
1001	Planning and engineering feasibility study	365	29AUG97	28AUG98														
1002	Circulate Draft Final Report	0		29MAY98 *														
1003	Consult study findings with CPL/DB	76	30MAY98	13AUG98														
1004	Issue Final Report	0		09OCT98														
<b>Site Preparation &amp; Construction</b>																		
2001	Prepare Draft OZP amendments	60	29AUG98	27OCT98														
2002	Circulate Draft OZP amendments for comment	45	28OCT98	11DEC98														
2003	Submit Draft OZP to district planning conference	30	12DEC98	10JAN99														
2004	Submit Draft OZP to MPC	30	11JAN99	09FEB99														
2005	Consult with ACE/TPB	60	10FEB99	10APR99														
2006	First gazetal of Draft OZP	0		12MAY99														
2007	Exhibition period	60	13MAY99	11JUL99														
2008	Consider objections (preliminary and further)	270	12JUL99	06APR00														
2009	Submit Draft OZP to Chief Executive-in-Council	30	07APR00	06MAY00														
2010	Obtain authority-to-proceed	0		06MAY00														
2011	S16 planning application (service reservoirs)	180	12DEC98	09JUN99														
2012	Approval of S16 planning application	0		09JUN99														
<b>Roads (Works, Use and Compensation) Order</b>																		
3001	Prepare road plan, consult DB and circulate	120	07OCT99	03FEB00														
3002	Gazette road plan	0		06MAY00														
3003	Objection period	60	07MAY00	05JUL00														
3004	Resolve objections	270	06JUL00	01APR01														
3005	Authorisation	0		30APR01														
<b>Land Matters (Clearance)</b>																		
<b>Work Packages 1 &amp; 2</b>																		
4001	Finalise work site boundaries	60	09NOV98	07JAN99														
4002	Submit Clearance Application Form to DLO	0		07JAN99														
4003	Prepare Draft Resumption Plan	90	08JAN99	07APR99														
4004	Prepare Final Resumption Plan	90	08APR99	06JUL99														
4005	Seek Exco's approval	90	07MAY00	04AUG00														
4006	Gazette land resumption and notice period	92	05AUG00	04NOV00														
4007	Reversion Date	0		04NOV00														

Activity ID	Description	Orig Dur	Early Start	Early Finish	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
4008	Clearance	365	05NOV00	04NOV01														
<b>Work Package 3</b>																		
4011	Finalise work site boundaries	60	02DEC00	30JAN01														
4012	Submit clearance application form to DLO	0		30JAN01														
4013	Prepare Draft Resumption & Temp. Occupation Plan	90	31JAN01	30APR01														
4014	Prepare Final Resumption & Temp. Occupation Plan	90	01MAY01	29JUL01														
4015	Gazette land resumption and notice period	92	30JUL01	29OCT01														
4016	Reversion Date	0		29OCT01														
4017	Clearance	545	30OCT01	27APR03														
<b>Pre-construction</b>																		
5001	Approve PPFS Report (Cat C status)	0		15MAR98														
5002	Confirm Cat B status	0		09OCT98														
5003	Consult Works Departments re in-house resources	45	10OCT98	23NOV98														
5004	Draft & process PWSC Paper for consultancy fees	60	10OCT98	08DEC98														
5005	Submit Final Draft PWSC Paper to FB	0		08DEC98														
5006	PWSC meeting	1	13JAN99	13JAN99														
5007	FC meeting & partial upgrade to Cat A for fees	1	05FEB99	05FEB99														
5008	Prepare Consultancy Brief	75	15SEP98 *	28NOV98														
5009	Invite prelim submission & shortlist consultants	30	29NOV98	28DEC98														
5010	EACSB approval of shortlist	30	29DEC98	27JAN99														
5011	Invite technical & fee proposals	30	28JAN99	26FEB99														
5012	Select & appoint consultant	30	27FEB99	28MAR99														
5013	Detail design	645	29MAR99	01JAN01														
5014	Prequalification	180	26OCT00	23APR01														
5015	Prepare & finalise tender documents	172	02JAN01	22JUN01														
5016	Draft & process PWSC Paper for works	90	02JAN01	01APR01														
5017	Submit Final Draft PWSC Paper to FB	0		01MAY01														
5018	PWSC meeting	1	30MAY01	30MAY01														
5019	FC meeting & upgrade to Cat A for works	1	22JUN01	22JUN01														
5020	Process tender notice	8	23JUN01	30JUN01														
5021	Tender period	60	01JUL01	29AUG01														
5022	Tender assessment	60	30AUG01	28OCT01														
5023	Contract award	0		04NOV01														

Activity ID	Description	Orig Dur	Early Start	Early Finish	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
<b>Civil Construction Areas A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z</b>																		
<b>Work Package 1: South Rd, Platforms E, D, C3</b>																		
<b>Access Roads</b>																		
6101	Quarry Access Road	90	05NOV01	02FEB02														
6102	Reservoir Access Road	60	31OCT02	29DEC02														
<b>Soft-cut Excavation</b>																		
6103	Southern Access Rd	21	03FEB02	23FEB02														
6104	Area F	462	24FEB02	31MAY03														
6105	Area E	150	01JUN03	28OCT03														
6106	Area D	11	29OCT03	08NOV03														
6107	Area L	37	09NOV03	15DEC03														
<b>Rock-cut Excavation</b>																		
6111	Southern Access Rd	15	24FEB02	10MAR02														
6112	Area F	123	02MAY03	01SEP03														
6113	Area E	104	29SEP03	10/JAN04														
6114	Area L	203	11/JAN04	31/JUL04														
<b>Retaining Walls</b>																		
6115	Southern Access Rd	360	05NOV01	30OCT02														
6116	Area F	255	02SEP03	13MAY04														
6117	Area E	110	14MAY04	31AUG04														
<b>Filling</b>																		
6121	Southern Access Rd	15	31OCT02	14NOV02														
6122	Area D	60	09NOV03	07/JAN04														
<b>Elevated Road Structures</b>																		
6123	Southern Access Rd	270	15NOV02	11AUG03														
<b>Main Drains, Road Drainage &amp; Utilities</b>																		
6131	Southern Access Rd	60	12AUG03	10OCT03														
6132	Area D	60	08/JAN04	07/MAR04														
6133	Area F	75	14MAY04	27/JUL04														
6134	Area E	75	01SEP04	14NOV04														
6135	Area L	60	15NOV04	13/JAN05														
<b>Slope Drainage</b>																		
6141	Southern Access Rd	60	15NOV02	13/JAN03														
6142	Area F	60	14MAY04	12/JUL04														
6143	Area E	60	13/JUL04	10SEP04														
6144	Area D	60	11SEP04	09NOV04														
6145	Area L	60	10NOV04	08/JAN05														
<b>Stormwater Drainage Storage Tank</b>																		
6146	Construct drainage storage tank	180	01AUG04	27/JAN05														

Activity ID	Description	Orig Dur	Early Start	Early Finish	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
<b>Sewerage</b>																	
6151	Area P	75	14MAY04	27JUL04								154					
6152	Area E	75	01SEP04	14NOV04								152					
<b>Watermains</b>																	
6161	Area D	60	08JAN04	07MAR04								153					
6162	Area F	75	14MAY04	27JUL04								154					
6163	Area E	75	01SEP04	14NOV04								155					
6164	Area L	60	15NOV04	13JAN05								156					
<b>Roadworks</b>																	
6171	Upgrade junction at Southern Access / Po Lam Rds	360	02SEP03	26AUG04								157					
6172	Internal road - southern access	30	11OCT03	09NOV03								158					
6173	Internal road - Area D	30	08MAR04	06APR04								159					
6174	Internal road - Area F	30	28JUL04	26AUG04								160					
6175	Internal road - Area E	30	15NOV04	14DEC04								161					
6176	Internal road - Area L	30	14JAN05	12FEB05								162					
6177	Handover - building site at Platform D	0		26AUG04								163					
6178	Handover - building site at Platform E	0		14DEC04								164					
<b>Landscaping</b>																	
7181	Landscap	180	01AUG04	27JAN05								165					
<b>Work Package 2: Platforms A, B, C1, C2, Pump S/m</b>																	
<b>Access Roads</b>																	
6201	Temporary haul road	30	05NOV01	04DEC01													
<b>Soft-cut Excavation</b>																	
6211	Area A	288	05DEC01	18SEP02													
6212	Area B	105	19SEP02	01JAN03													
6213	Area G	94	02JAN03	05APR03													
6214	Area K	89	06APR03	03JUL03													
6215	Area C	160	04JUL03	10DEC03													
<b>Rock-cut Excavation</b>																	
6221	Area A	189	05AUG02	09FEB03													
6222	Area B	18	10FEB03	27FEB03													
6223	Area G	156	28FEB03	02AUG03													
6224	Area K	428	03AUG03	03OCT04													
6225	Area C	254	11NOV03	21JUL04													
<b>Retaining Walls</b>																	
6231	Area A	120	10FEB03	09JUN03													
6232	Area B	60	10JUN03	08AUG03													
6233	Area G	30	03AUG03	01SEP03													
6234	Area C	60	22JUL04	19SEP04													
6235	Area K	75	04OCT04	17DEC04													



Activity ID	Description	Orig Dur	Early Start	Early Finish	Year											
					1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<b>Filling</b>																
6241	Area B	30	09AUG03	07SEP03												
6242	Area G	45	02SEP03	16OCT03												
<b>Main Drains, Road Drainage, Sewerage &amp; Utilities</b>																
6251	Area A	60	10JUN03	08AUG03												
6252	Area B	60	08SEP03	06NOV03												
6253	Area G	60	07NOV03	05JAN04												
6254	Area C	60	20SEP04	18NOV04												
6255	Area K	60	18DEC04	15FEB05												
<b>Slope Drainage</b>																
6260	Area A	60	10JUN03	08AUG03												
6261	Area B	60	08SEP03	06NOV03												
6262	Area G	60	07NOV03	05JAN04												
6263	Area C	60	20SEP04	18NOV04												
6264	Area K	60	18DEC04	15FEB05												
<b>Watermains</b>																
6271	Area A	60	10JUN03	08AUG03												
6272	Area B	60	08SEP03	06NOV03												
6273	Area G	60	07NOV03	05JAN04												
6274	Area C	60	20SEP04	18NOV04												
6275	Area K	60	18DEC04	15FEB05												
<b>Roadworks</b>																
6281	Internal road-Area A	30	09AUG03	07SEP03												
6282	Internal road-Area B	30	07NOV03	06DEC03												
6283	Internal road-Area G	30	06JAN04	04FEB04												
6284	Internal road-Area C	30	19NOV04	18DEC04												
6285	Internal road-Area K	30	16FEB05	17MAR05												
6286	Handover - building sites at Platforms A, B & C	0		17MAR05												
<b>Landscaping</b>																
6291	Landscape	180	19SEP04	17MAR05												
<b>Work Package 3: Northern Access Rd, Reservoirs</b>																
6300	Construct retaining walls	720	28APR03	16APR05												
6301	Soft-cut excavation	271	24DEC03	19SEP04												
6302	Rock-cut excavation	265	20SEP04	11JUN05												
6304	Lay slope drainage at reservoir sites	60	12JUN05	10AUG05												
6305	Landscaping at reservoir sites	60	11AUG05	09OCT05												
6306	Handover of the reservoir sites to WSD	0		09OCT05												
6307	Filling	90	17APR05	15JUL05												
6308	Lay slope drainage along Northern Access Rd	60	16JUL05	13SEP05												

Activity ID	Description	Orig Dur	Early Start	Early Finish	Year																				
					1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009								
6309	Construct elevated road structures	540	17APR05	08OCT06																					
6310	Lay main drains, road drainage & sewer	120	09OCT06	05FEB07																					
6311	Watermains	120	09OCT06	05FEB07																					
6312	Provide for non-Government utilities	120	09OCT06	05FEB07																					
6313	Roadworks	120	06FEB07	05JUN07																					
6314	Upgrade junction with Clear Water Bay Rd	30	07MAY07	05JUN07																					
6315	Landscaping along Northern Access Rd	60	07APR07	05JUN07																					
<b>Work Package 4: Infrastructure Outside Dev Site</b>																									
<b>Sewerage</b>																									
6406	Upgrade Tsui Ping Rd / Kwun Tong Rd	180	27OCT06	24APR07																					
<b>Roadworks</b>																									
6402	Upgrade Sau Mau Ping Rd / Hiu Kwong St	90	29JUL06 *	26OCT06																					
6403	Upgrade Hip Wo St / Hiu Kwong St	90	25APR07	23JUL07																					
6404	Upgrade Sau Mau Ping Rd / Hip Wo St	60	24JUL07	21SEP07																					
6405	Upgrade New Clear Water Bay Rd / Lee On Rd	90	22SEP07	20DEC07																					
<b>Watermains</b>																									
7001	Upgrade regional sewerage treatment system	2741	03FEB01	05AUG08																					
<b>Watermains</b>																									
7002	Construct new service reservoirs	1031	10OCT05	05AUG08																					
7003	Construct new freshwater pumping station	1237	18MAR05	05AUG08																					
7004	Lay watermains from reservoirs to Stage II	1031	10OCT05	05AUG08																					
7005	Upgrade regional saltwater supply system	2741	03FEB01	05AUG08																					
<b>Roadworks</b>																									
7006	New Lung Chung Rd / New Clear Water Bay Rd link	2741	03FEB01	05AUG08																					
<b>Building Construction (By Others)</b>																									
8001	Building const - 1st Phase (Platform D)	1440	27AUG04	05AUG08																					
8002	Building const - 2nd Phase (Platform E)	1440	15DEC04	23NOV08																					
8022	Building const - 3rd Phase (Platforms A, B & C1)	1440	18MAR05	24FEB09																					

---

**APPENDIX 2**

**Sample Data Sheets for Dust and Noise Monitoring**

---

### Sample Data Sheet for TSP Monitoring

Monitoring Location		
Details of Location		
Sampler Identification		
Date & Time of Sampling		
Elapsed-time Meter Reading	Start (min.)	
	Stop (min.)	
Total Sampling Time (min.)		
Weather Conditions		
Site Conditions		
Initial Flow Rate, Qsi	Pi (mmHg)	
	Ti (°C)	
	Hi (in.)	
	Qsi (Std. m <sup>3</sup> )	
Final Flow Rate, Qsf	Pf (mmHg)	
	Tf (°C)	
	Hf (in.)	
	Qsf (Std. m <sup>3</sup> )	
Average Flow Rate (Std. m <sup>3</sup> )		
Total Volume (Std. m <sup>3</sup> )		
Filter Identification No.		
Initial Wt. of Filter (g)		
Final Wt. of Filter (g)		
Measured TSP Level (µg/m <sup>3</sup> )		

	<u>Name &amp; Designation</u>	<u>Signature</u>	<u>Date</u>
Field Operator :	_____	_____	_____
Laboratory Staff :	_____	_____	_____
Checked by :	_____	_____	_____

### Sample Data Sheet for Noise Monitoring

Monitoring Location		
Description of Location		
Date of Monitoring		
Measurement Start Time (hh:mm)		
Measurement Time Length (min.)		
Noise Meter Model/Identification		
Calibrator Model/Identification		
Measurement Results	L <sub>90</sub> (dB(A))	
	L <sub>10</sub> (dB(A))	
	Leq (dB(A))	
Major Construction Noise Source(s) During Monitoring		
Other Noise Source(s) During Monitoring		
Remarks		

Name & Designation

Signature

Date

Recorded By :

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Checked By :

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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**APPENDIX 3**

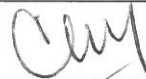

**Monitoring Plan for Operational Phase Noise Monitoring**

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Contract No. CV/2007/03

**Environmental Team for the  
Development at Anderson Road –  
Site Formation and Associated  
Infrastructure Works****Operational Phase Noise Monitoring  
Proposal**

December 2017

	Name	Signature
Prepared & Checked:	Candy Chung	
Reviewed, Approved & Certified:	Yiu Wah Fung (ETL)	

Version: 2

Date: 12 December 2017

**Disclaimer**

This report is prepared for China State Construction Engineering (Hong Kong) Ltd. and is given for its sole benefit in relation to and pursuant to Contract No. CV/2007/03 Development at Anderson Road – Site Formation and Associated Infrastructure Works and may not be disclosed to, quoted to or relied upon by any person other than China State Construction Engineering (Hong Kong) Ltd. without our prior written consent. No person (other than China State Construction Engineering (Hong Kong) Ltd.) into whose possession a copy of this report comes may rely on this report without our express written consent and China State Construction Engineering (Hong Kong) Ltd. may not rely on it for any purpose other than as described above.

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Annex A	Traffic Data of Po Lam Road extracted from The Annual Traffic Census 2015
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Annex C	Location of carrying out road traffic count and vehicle speed measurement



# 1 INTRODUCTION

## Background

- 1.1 The objective of the Project “Development at Anderson Road Site Formation and Associated Infrastructure Works” under Contract CV/2007/03 (hereafter called “the Project”) is to form platforms for housing development of 16,100 public housing units for 48,000 people in phases between 2015 and 2016; and associated uses in area of about 50 hectares. It also aims to carry out necessary infrastructural upgrading or improvement works to cater for the proposed development.
- 1.2 The scope of works of this Project includes construction of site formation, roads, drains and upgrading of existing infrastructure to provide usable land of about 20 hectares for housing and associated government, institution or community uses at the site between existing Anderson Road Quarry and Sau Mau Ping Road in Kwun Tong District.
- 1.3 The Project site is located in the East Kowloon District. It is bounded by Anderson Road to the north, the realigned Sau Mau Ping Road to the south, Po Lam Road to the east, and Lee On Road and Shun On Road to the west. Po Lam Road Platform is located to the south of the development site.
- 1.4 Widening of the existing Po Lam Road, is a designated project and is governed by the Environmental Permit (EP) EP-140/2002 issued on 18 June 2002. Subsequently, Director of Environmental Protection issued EP-483/2013 on 23 December 2013 regarding the operation of the widened Po Lam Road. Apart from the abovementioned works, the rest of the Project is non-designated.
- 1.5 AECOM Asia Co. Ltd. (AECOM) was employed by the Contractor, China State Construction Engineering (Hong Kong) Limited (CSCE), as the Environmental Team (ET) to undertake Environmental Monitoring and Audit (EM&A) works for the Project, while Ramboll Environ acts as the Independent Environmental Checker (IEC) for the Project.
- 1.6 This is the Operational Phase Noise Monitoring Proposal prepared by AECOM Asia Co. Ltd. for the Project “Development at Anderson Road Site Formation and Associated Infrastructure Works” (the “Project”). This report outlines the proposal for works that will be performed during the first year of the operation of the Project.

## 2 OPERATIONAL PHASE NOISE MONITORING

### Introduction

- 2.1 According to the Environmental Permit (Permit No. EP-483/2013), traffic noise impact monitoring for the operational phase shall be conducted within 12 months after the commencement of operation of the Project. The measured noise levels shall be compared with the project noise impact predictions in the Final EIA report (Register No. AEIAR-007/1999), using the counted traffic data at the time of measurement.
- 2.2 The purpose of this monitoring is to verify the traffic noise assessment and effectiveness of the proposed noise mitigation measures, that the impact at NSRs are within acceptable noise limits.

### Monitoring Frequency, Parameter and Duration

- 2.3 As required by the EM&A manual, one set of traffic noise impact monitoring for the operational phase shall be measured in terms of A-weighted L10, for the peak traffic flow on normal weekdays. In order to capture the actual peak hour traffic, the noise monitoring will be carried out for one hour at each designated sensitive receiver.

### Monitoring Equipment

- 2.4 Integrating Sound Level Meters will be used for noise monitoring. They are Type 1 sound level meters capable of giving a continuous readout of the noise level readings including equivalent continuous sound pressure level ( $L_{eq}$ ) and percentile sound pressure level ( $L_x$ ). They comply with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1). Acoustic calibrator was deployed to check the sound level meter at a known sound pressure level. Brand and Model of the equipment is given in Table 2.1.

**Table 2.1 Noise Monitoring Equipment**

Equipment	Model
Integrating Sound Level Meter	B&K 2238/ B&K 2250L/ B&K 2250/ B&K 2270
Calibrator	B&K 4231

Also, a portable electronic wind speed indicator capable of measuring wind speed in m/s will be used to check the wind speed.

### Monitoring Time

- 2.5 As stipulated in the EM&A manual, one set L10(1-hr) shall be measured during weekdays, at the time of peak traffic flow. According to the latest publication on traffic flow produced by Transport Department, *The Annual Traffic Census 2015*, peak hours on normal weekdays was 0800-0900 and 1800-1900 for the east bound; and 0800-0900 and 1700-1800 for the west bound, as shown in Annex A. To enable a fair comparison with the data in EIA- Final Assessment Report, which used traffic data of AM peak hour, monitoring will be carried out at 0800-0900.

### Monitoring Date

- 2.6 According to the Environmental Permit, traffic noise impact monitoring will be conducted within 12 months after the commencement of operation of the Project.
- 2.7 The noise monitoring will be performed in March 2018 tentatively.

### Monitoring Location

2.8 The monitoring will be carried out at two monitoring locations as shown in Table 2.2 below:

**Table 2.2 Noise Monitoring Locations**

Location	Sensitive Receiver	Description	Monitoring Floor
Tat Yan House of Po Tat Estate	2094	Residential	30/F
Tat Chui House of Po Tat Estate	2088	Residential	30/F

2.9 The proposed equipment installation location and the detailed set-up of equipment are annexed in Annex B.

### Monitoring Methodology

2.10 Noise measurements will be made in accordance with Section III of the “Calculation of Road Traffic Noise (CRTN), 1998”.

2.11 Statistical results such as  $L_{eq}$  and  $L_{90}$  will also be obtained for reference.

2.12 Road traffic data will be recorded at the time of noise measurement for the two monitoring locations, including 1) total number of vehicles per hour; 2) percentage of heavy vehicles; and 3) average vehicle speeds for east bound and west bound.

2.13 Road traffic count and vehicle speed measurement will only be conducted for vehicles on Po Lam Road. The location are summarized and shown in Table 2.3 below.

**Table 2.3 Road Traffic Count and Vehicle Speed Measurement Details**

Noise Monitoring Locations	Location where Road Traffic Count and vehicle speed measurement are carried out
Tat Yan House of Po Tat Estate	Roof top of Tat Yan House
Tat Chui House of Po Tat Estate	Roof top of Tat Chui House

2.14 Lamp posts along Po Lam Road will be used as reference points for traffic count and measurement of vehicle speed.

2.15 Cut-off points for traffic count and location of vehicle speed measurement are shown in Figure 5, 6 and 7 of Annex C.

2.16 Observation will be made when intrusive noise is unavoidable.

### Projected Noise Levels

2.17 The measured noise levels will be compared to the predicted noise levels by the application of appropriate corrections to normalise the predicted traffic conditions of a future year, i.e. Year 2017.

2.18 The correction factor will be calculated as follows:

$$\text{Correction Factor} = 10\text{Log}\left(\frac{Q'}{Q}\right) + 33\text{Log}\left(\frac{V'+40+500/V'}{V+40+500/V}\right) + 10\text{Log}\left(\frac{1+5p'/V'}{1+5p/V}\right)$$

Where Q' is predicted traffic flow using the CRTN noise model

V' is predicted traffic speed using the CRTN noise model

p' is predicted percentage of heavy vehicle using the CRTN noise model

Q is measured traffic flow during the traffic noise monitoring event

V is measured traffic speed during the traffic noise monitoring event

p is measured percentage of heavy vehicle during the traffic noise monitoring event

2.19 The discrepancy, if any, will be reported to EPD.

2.20 The traffic noise prediction and effectiveness of the proposed noise mitigation measures will be verified by this monitoring.

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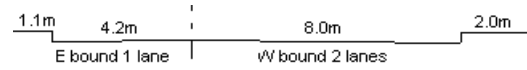
**ANNEX A**

Traffic data of Po Lam Road extracted from The Annual Traffic  
Census 2015

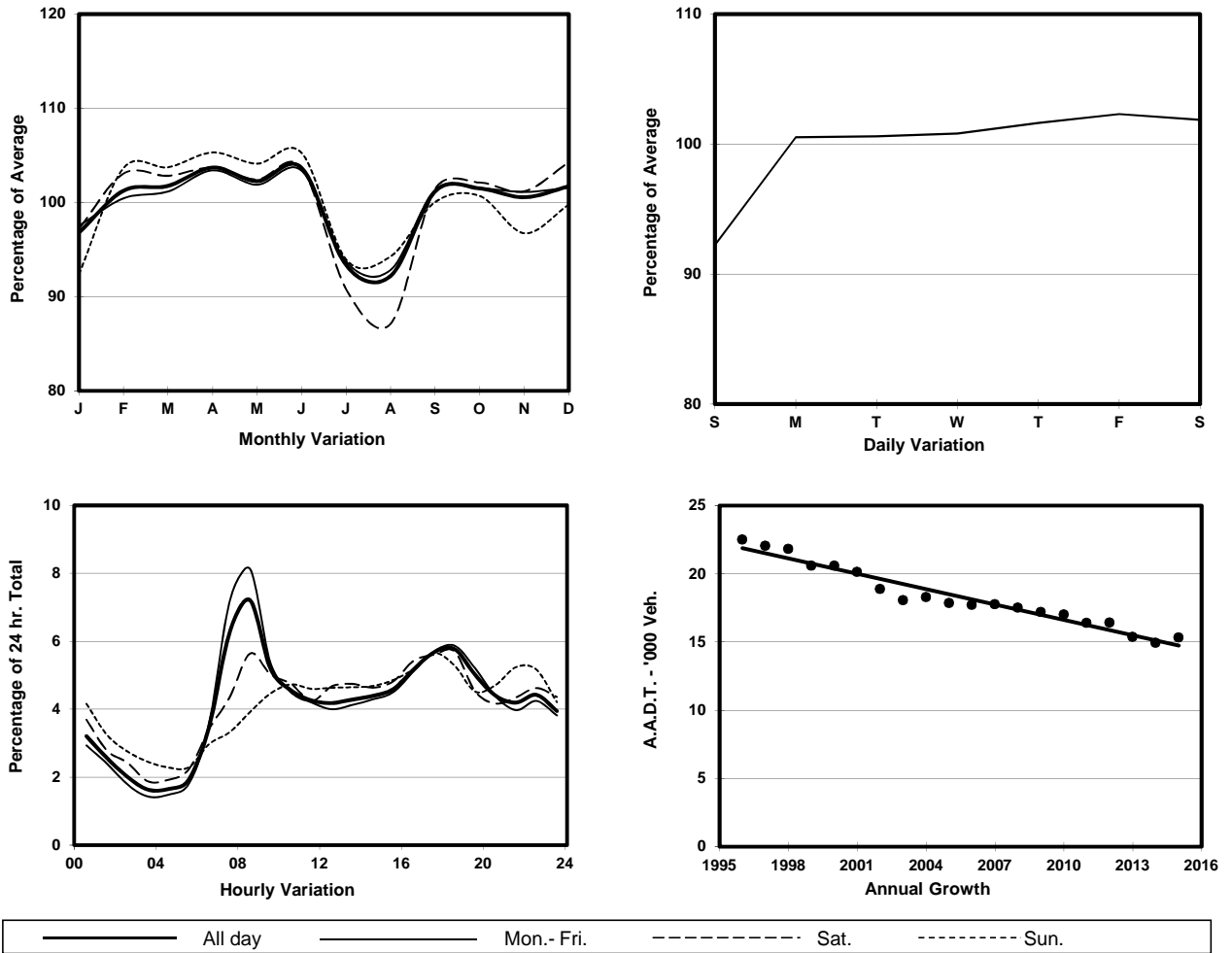
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YEAR 2015  
 CORE STATION 5023  
 ROAD NETWORK MAJOR  
 ROAD TYPE DISTRICT DISTRIBUTOR

LINK PO LAM RD (from ANDERSON RD to TSUI LAM RD)



1. TRAFFIC FLOW VARIATION AND GROWTH



2. TRAFFIC CHARACTERISTICS (BY DIRECTION)

Parameter	All - Day	Mon. - Fri.	Sat.	Sun.
<b>EAST BOUND</b>				
A.A.D.T.	7030	7100	7180	6680
R 12 / 24 - %	60.2	61.1	58.6	56.7
R 16 / 24 - %	80.2	81.1	78.2	77.3
AM Peak Hour	0800-0900	0800-0900	0900-1000	0900-1000
One-way flow at AM peak hour	370	400	330	310
T - % (AM)	-	16.9	-	-
PM Peak Hour	1800-1900	1800-1900	1600-1700	1700-1800
One-way flow at PM peak hour	460	490	430	400
T - % (PM)	-	14.1	-	-
Prop.of commercial vehicles - 16 hr.	-	16.5	-	-
<b>WEST BOUND</b>				
A.A.D.T.	8280	8450	8400	7560
R 12 / 24 - %	62.7	64.5	60.5	55.3
R 16 / 24 - %	79.1	80.5	76.5	74.2
AM Peak Hour	0800-0900	0800-0900	0800-0900	0900-1000
One-way flow at AM peak hour	730	860	560	330
T - % (AM)	-	9.7	-	-
PM Peak Hour	1700-1800	1700-1800	1800-1900	1700-1800
One-way flow at PM peak hour	430	440	480	410
T - % (PM)	-	10.5	-	-
Prop.of commercial vehicles - 16 hr.	-	12	-	-

3. OTHER INFORMATION AND COMMENT

**4. Vehicle classification and occupancy - Monday to Friday**

Time		Class of vehicle									
		Motor Cycle	Private Car	Taxi	Private LB	PLB	Goods veh.		Non Fr. Bus	Fr. Bus	
							Light	M & H		SD	DD
0700-0800	Pro	6.8	30.0	20.5	1.9	5.7	20.5	3.4	1.9	0.0	9.2
	Ocp	1.1	1.5	1.8	7.0	13.0	1.3	1.1	5.8	0.0	33.3
0800-0900 Peak hour	Pro	4.1	39.9	19.6	1.6	4.4	18.4	1.9	4.4	0.0	5.7
	Ocp	1.1	1.3	1.9	2.6	10.9	1.5	1.3	5.3	0.0	41.4
0900-1000	Pro	3.8	29.2	25.4	1.9	7.1	17.9	5.2	0.9	0.0	8.6
	Ocp	1.1	1.3	1.9	3.8	8.3	1.5	1.5	25.0	0.0	24.9
1000-1100	Pro	5.7	23.5	29.2	3.2	6.3	17.8	4.4	1.3	0.0	8.7
	Ocp	1.1	1.4	1.5	2.0	7.2	1.4	1.3	8.0	0.0	20.6
1100-1200	Pro	4.2	18.2	25.2	3.5	7.7	25.2	4.2	1.4	0.0	10.3
	Ocp	1.0	1.2	1.8	2.4	7.6	1.6	1.7	11.5	0.0	18.3
1200-1300	Pro	5.9	22.8	23.5	4.4	5.9	19.8	5.1	1.5	0.0	11.2
	Ocp	1.0	1.3	2.0	4.0	7.6	1.3	1.7	9.5	0.0	23.8
1300-1400	Pro	5.3	19.4	27.4	3.3	6.0	18.7	8.7	1.3	0.0	9.9
	Ocp	1.0	1.3	1.5	1.8	8.6	1.7	1.3	1.5	0.0	18.8
1400-1500	Pro	4.1	20.3	23.5	1.6	6.5	28.4	2.4	1.6	0.0	11.6
	Ocp	1.0	1.8	1.6	1.5	7.8	1.3	1.0	3.0	0.0	18.2
1500-1600	Pro	5.3	27.0	19.4	4.1	8.2	20.6	3.5	2.9	0.0	9.0
	Ocp	1.1	1.5	1.6	6.7	8.3	1.5	1.2	6.2	0.0	22.4
1600-1700	Pro	4.7	28.5	20.4	4.7	6.6	19.0	1.9	7.1	0.0	7.0
	Ocp	1.2	1.5	1.4	4.5	9.1	1.6	1.8	5.5	0.0	25.4
1700-1800	Pro	6.4	27.0	21.6	3.9	5.4	21.6	3.4	3.4	0.2	7.0
	Ocp	1.3	1.3	1.6	1.6	12.9	1.5	1.0	6.6	1.0	41.4
1800-1900	Pro	8.4	38.1	20.8	0.4	5.8	15.5	1.3	1.8	0.0	7.8
	Ocp	1.2	1.3	1.6	2.0	9.6	1.3	1.0	5.3	0.0	37.1
1900-2000	Pro	7.4	40.7	21.7	0.0	7.4	11.7	1.7	1.3	0.0	8.1
	Ocp	1.1	1.3	1.5	0.0	10.0	1.4	1.5	1.3	0.0	25.5
2000-2100	Pro	3.6	35.4	31.8	0.0	8.0	9.4	1.4	0.0	0.0	10.3
	Ocp	1.2	1.4	1.3	0.0	8.3	1.7	1.5	0.0	0.0	19.4
2100-2200	Pro	3.3	32.8	31.4	0.0	8.0	12.0	1.3	0.0	0.0	11.0
	Ocp	1.4	1.6	1.7	0.0	7.0	1.6	1.5	0.0	0.0	18.9
2200-2300	Pro	8.1	31.3	40.6	0.0	5.0	3.8	0.6	1.3	0.0	9.4
	Ocp	1.2	1.6	1.5	0.0	6.8	1.2	1.0	1.5	0.0	20.3
16 hours	Pro	5.6	30.2	24.3	2.1	6.4	17.5	3.0	2.2	0.1	8.7
	Ocp	1.1	1.4	1.6	3.6	9.1	1.5	1.3	6.1	1.0	26.1

**Legend**

**Pro.** Proportion of vehicles in % (Sum may not add up to 100% due to figure rounding)\*

**Ocp.** Average occupancy of vehicles including both driver and passengers\*

**M&H** Medium and Heavy

\* All traffic data are collected from combined bounds except for one way traffic

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**ANNEX B**

**Proposed equipment installation location and set-up**

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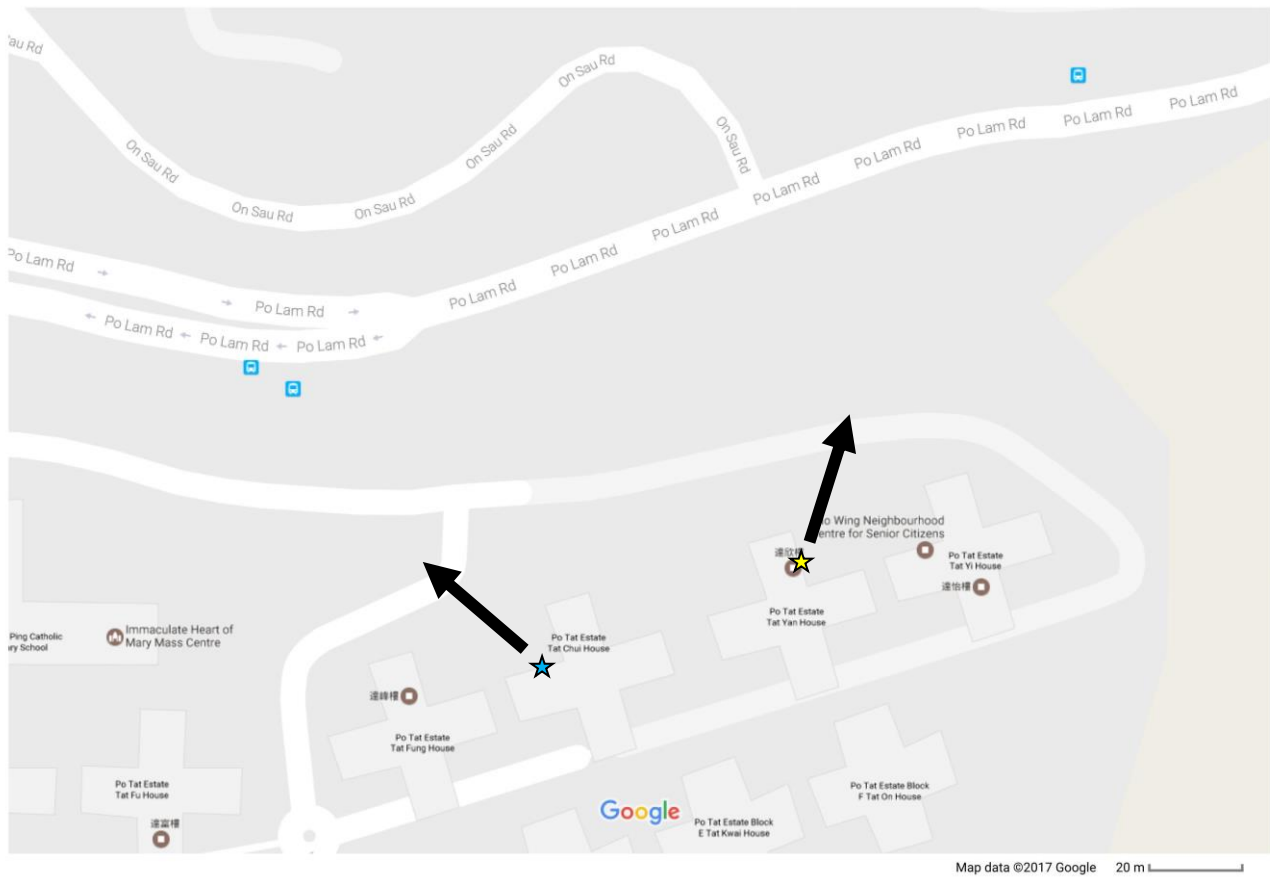


Figure 1 Proposed equipment installation location

Legend:

- ★ Proposed location of sound level meter at Tat Chui House
- ★ Proposed location of sound level meter at Tat Yan House
- ↖ Direction in which the sound level meter will face



Figure 2 Equipment set-up at Tat Chui House

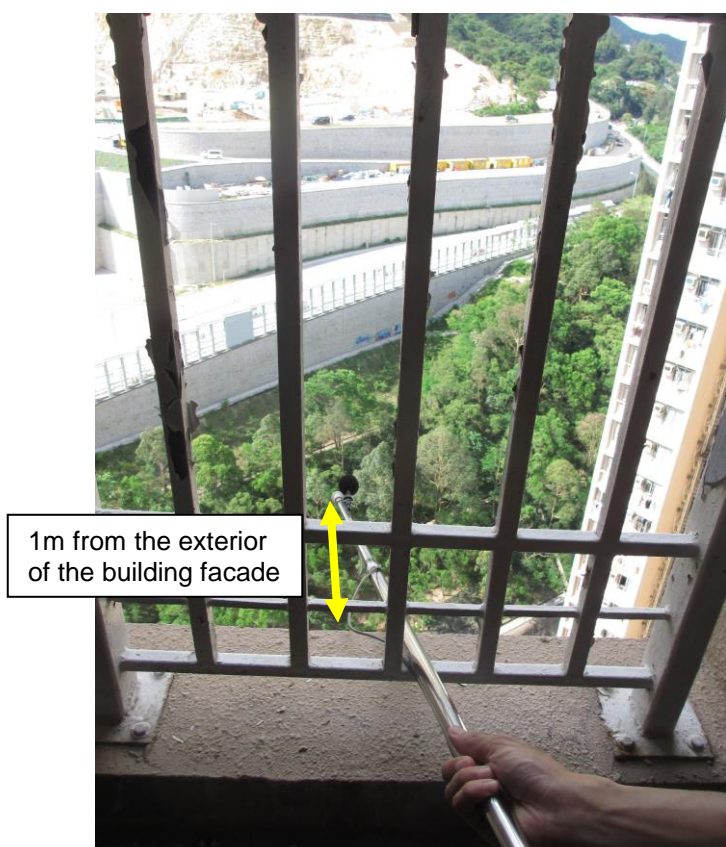


Figure 3 Equipment set-up at Tat Yan House



Figure 4 Indicative photo of equipment set up viewing from outside of the building

Legend:



Microphone of the sound level meter on an extension rod

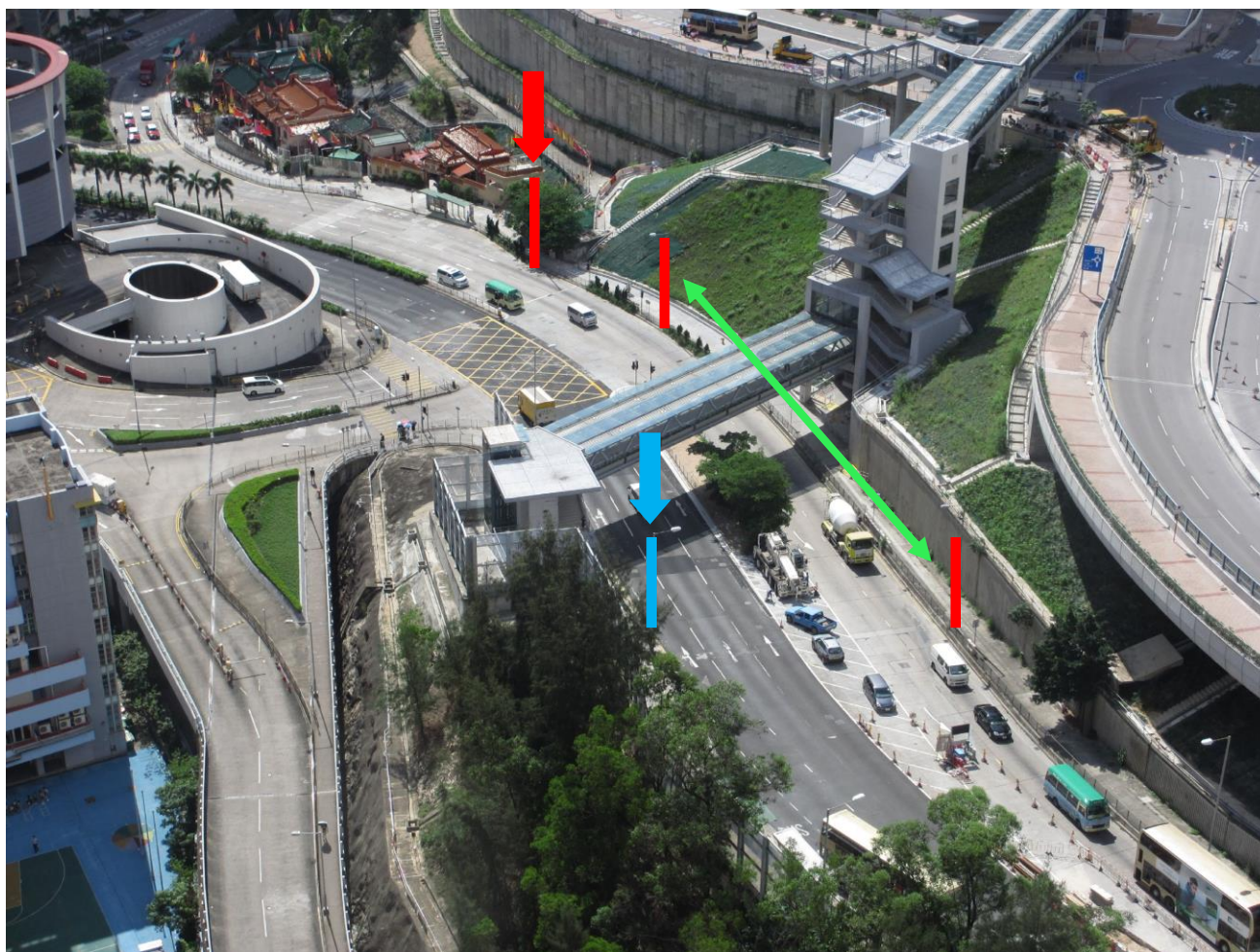







Figure 5 Location of counting vehicle on the two bounds of Po Lam Road and measuring speed of vehicles on the east bound at Tat Chui House rooftop

Legend:

-  Traffic count cut-off point for east bound
-  Traffic count cut-off point for west bound
-  Lamp post on east bound of Po Lam Road
-  Lamp post on west bound of Po Lam Road
-  Road section for measuring vehicle speed on east bound

---

**ANNEX C**

**Location of carrying out road traffic count and vehicle speed  
measurement**

---



Figure 6 Location of measuring speed of vehicle on west bound of Po Lam Road at Tat Chui House rooftop

Legend:








-  Lamp post on west bound of Po Lam Road
-  Road section for measuring vehicle speed on west-bound lane



Figure 7 Location of carrying out traffic count and vehicle speed measurement at Tat Yan House rooftop

Legend:

-  Traffic count cut-off point for east-bound traffic
-  Traffic count cut-off point for west-bound traffic
-  Lamp post on east-bound lane of Po Lam Road
-  Lamp post on west-bound lane of Po Lam Road
-  Road section for measuring vehicle speed

---

**APPENDIX 4**

**Sample Template for Interim Notification of Environmental  
Quality Limit Exceedances**

---



## Sample Template for Interim Notifications of Environmental Quality Limits Exceedances

---

### Incident Report on Action Level or Limit Level Non-compliance

Project	
Date	
Time	
Monitoring Location	
Parameter	
Action & Limit Levels	
Measured Level	
Possible reason for Action or Limit Level Non-compliance	
Actions taken / to be taken	
Remarks	

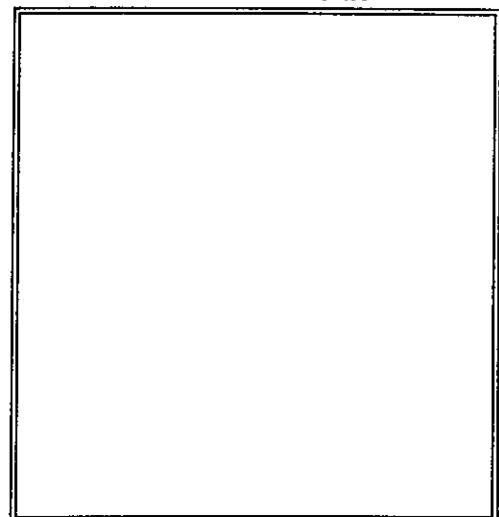
### Location Plan

Prepared by : \_\_\_\_\_

Designation : \_\_\_\_\_

Signature : \_\_\_\_\_

Date : \_\_\_\_\_



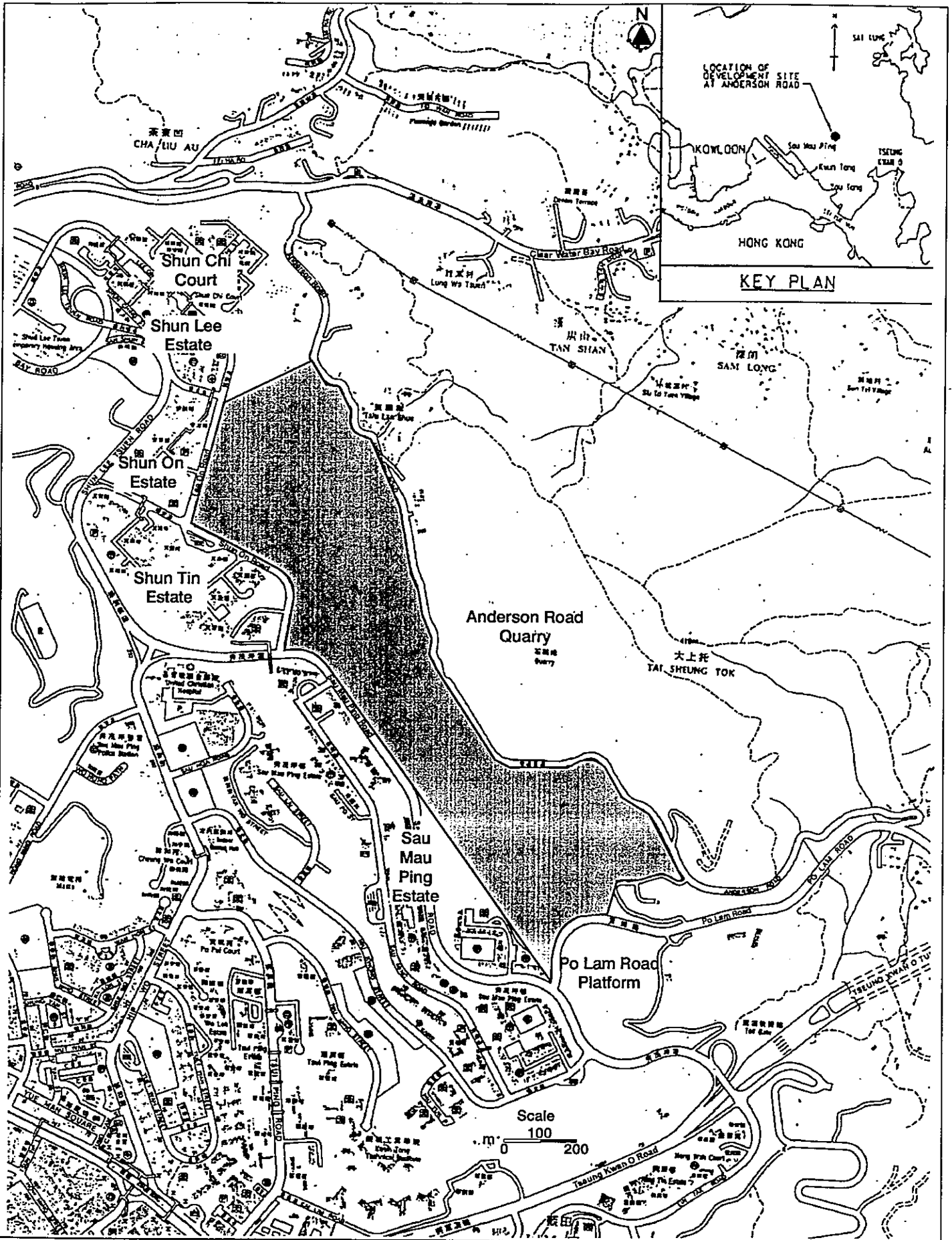
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## FIGURES

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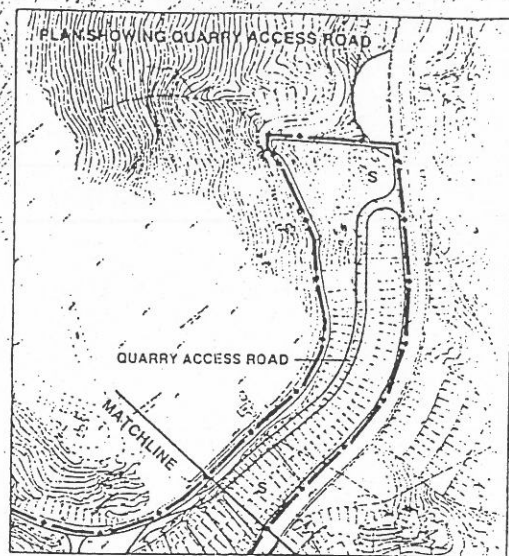
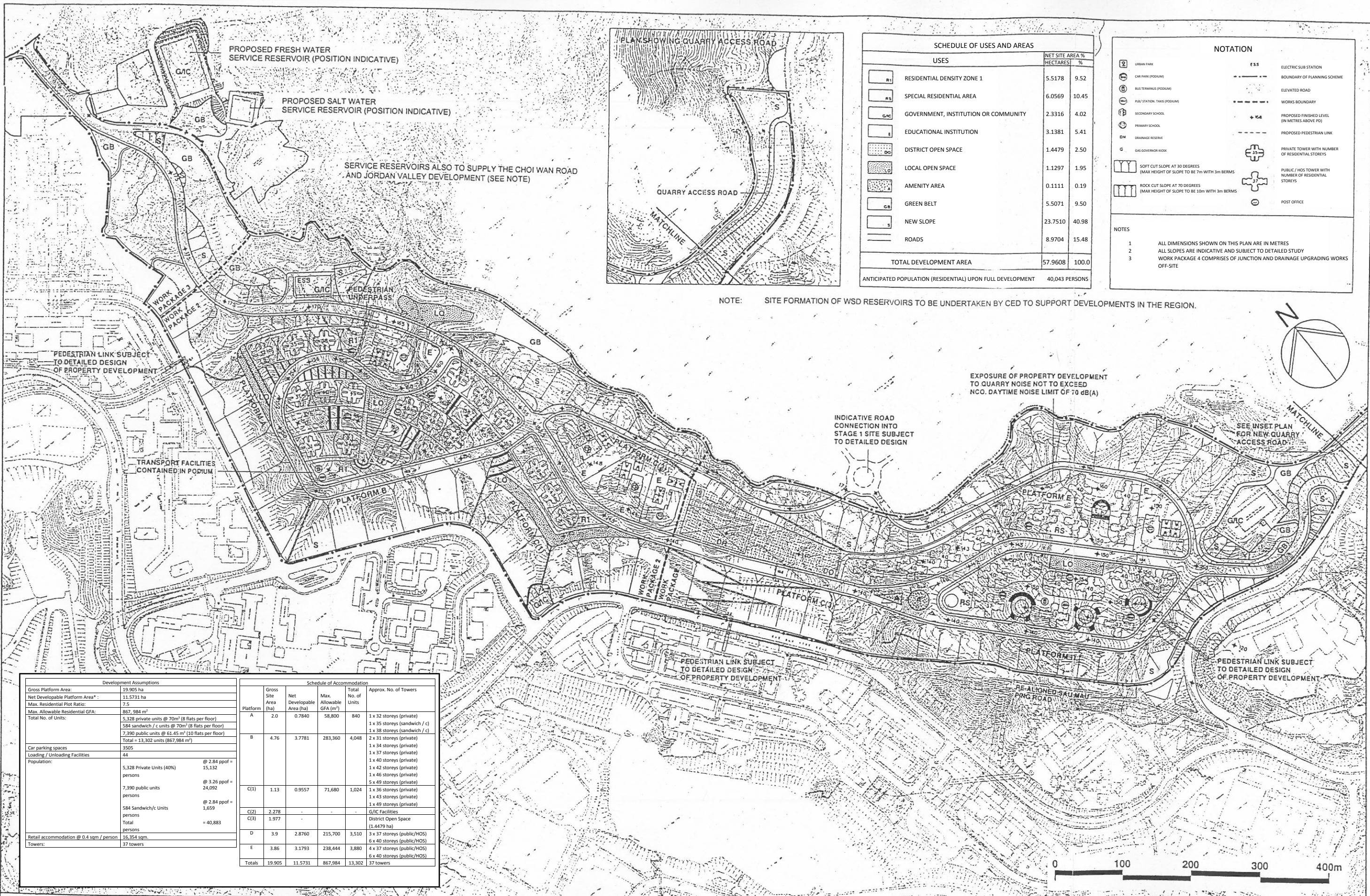
---



TITLE

Location Plan of the Development Site

CES (ASIA) LIMITED			
PROJECT NO	C210	DATE	January 1998
DESIGNED	Suki Chung	DRAWING NO	Figure 1.1



SCHEDULE OF USES AND AREAS		
USES	NET SITE AREA %	
	HECTARES	%
R1 RESIDENTIAL DENSITY ZONE 1	5.5178	9.52
RS SPECIAL RESIDENTIAL AREA	6.0569	10.45
G/C GOVERNMENT, INSTITUTION OR COMMUNITY	2.3316	4.02
E EDUCATIONAL INSTITUTION	3.1381	5.41
DO DISTRICT OPEN SPACE	1.4479	2.50
LO LOCAL OPEN SPACE	1.1297	1.95
AA AMENITY AREA	0.1111	0.19
GB GREEN BELT	5.5071	9.50
S NEW SLOPE	23.7510	40.98
Roads	8.9704	15.48
<b>TOTAL DEVELOPMENT AREA</b>	<b>57.9608</b>	<b>100.0</b>
ANTICIPATED POPULATION (RESIDENTIAL) UPON FULL DEVELOPMENT	40,043 PERSONS	

NOTATION	
	URBAN PARK
	CAR PARK (PODIUM)
	BUS TERMINUS (PODIUM)
	PLAY STATION, TAXIS (PODIUM)
	SECONDARY SCHOOL
	PRIMARY SCHOOL
	DRAINAGE RESERVE
	GAS GOVERNOR ROAD
	SOFT CUT SLOPE AT 30 DEGREES (MAX HEIGHT OF SLOPE TO BE 7m WITH 3m BERMS)
	ROCK CUT SLOPE AT 70 DEGREES (MAX HEIGHT OF SLOPE TO BE 10m WITH 3m BERMS)
	ELECTRIC SUB STATION
	BOUNDARY OF PLANNING SCHEME
	ELEVATED ROAD
	WORKS BOUNDARY
	PROPOSED FINISHED LEVEL (IN METRES ABOVE PD)
	PROPOSED PEDESTRIAN LINK
	PRIVATE TOWER WITH NUMBER OF RESIDENTIAL STOREYS
	PUBLIC / HOS TOWER WITH NUMBER OF RESIDENTIAL STOREYS
	POST OFFICE

NOTES

- ALL DIMENSIONS SHOWN ON THIS PLAN ARE IN METRES
- ALL SLOPES ARE INDICATIVE AND SUBJECT TO DETAILED STUDY
- WORK PACKAGE 4 COMPRISES OF JUNCTION AND DRAINAGE UPGRADING WORKS OFF-SITE

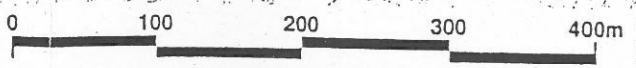
NOTE: SITE FORMATION OF WSD RESERVOIRS TO BE UNDERTAKEN BY CED TO SUPPORT DEVELOPMENTS IN THE REGION.

EXPOSURE OF PROPERTY DEVELOPMENT TO QUARRY NOISE NOT TO EXCEED NCG DAYTIME NOISE LIMIT OF 70 dB(A)

INDICATIVE ROAD CONNECTION INTO STAGE 1 SITE SUBJECT TO DETAILED DESIGN

SEE INSET PLAN FOR NEW QUARRY ACCESS ROAD

Development Assumptions		Schedule of Accommodation					
Gross Platform Area:	19,905 ha	Platform	Gross Site Area (ha)	Net Developable Area (ha)	Max. Allowable GFA (m <sup>2</sup> )	Total No. of Units	Approx. No. of Towers
Net Developable Platform Area*	11,5731 ha	A	2.0	0.7840	58,900	840	1 x 32 storeys (private) 1 x 35 storeys (sandwich / c) 1 x 38 storeys (sandwich / c)
Max. Residential Plot Ratio:	7.5	B	4.76	3.7781	283,360	4,048	2 x 31 storeys (private) 1 x 34 storeys (private) 1 x 37 storeys (private) 1 x 40 storeys (private) 1 x 42 storeys (private) 1 x 46 storeys (private) 5 x 49 storeys (private)
Max. Allowable Residential GFA:	867,984 m <sup>2</sup>	C(1)	1.13	0.9557	71,680	1,024	1 x 36 storeys (private) 1 x 43 storeys (private) 1 x 49 storeys (private)
Total No. of Units:	5,328 private units @ 70m <sup>2</sup> (8 flats per floor) 584 sandwich / c units @ 70m <sup>2</sup> (8 flats per floor) 7,390 public units @ 61.45 m <sup>2</sup> (10 flats per floor) Total = 13,302 units (867,984 m <sup>2</sup> )	C(2)	2.278				G/C Facilities
Car parking spaces:	3595	C(3)	1.977				District Open Space (1,4479 ha)
Loading / Unloading Facilities:	44	D	3.9	2.8760	215,700	3,510	3 x 37 storeys (public/HOS) 6 x 40 storeys (public/HOS)
Population:	5,328 Private Units (40%) persons @ 2.84 ppof = 15,132 7,390 public units persons @ 3.26 ppof = 24,092 584 Sandwich/c Units persons @ 2.84 ppof = 1,659 Total persons = 40,883	E	3.86	3.1793	238,444	3,880	4 x 37 storeys (public/HOS) 6 x 40 storeys (public/HOS)
Retail accommodation @ 0.4 sqm / person:	16,354 sqm.	Totals	19,905	11,5731	867,984	13,302	37 towers
Towers:	37 towers						



**Maunsell**  
in association with  
Urbis  
CES

REVISION	DESCRIPTION	BY	DATE	REVIEWED	REVISION	DESCRIPTION	BY	DATE	REVIEWED

PLANNING AND ENGINEERING FEASIBILITY STUDY FOR DEVELOPMENT AT ANDERSON ROAD

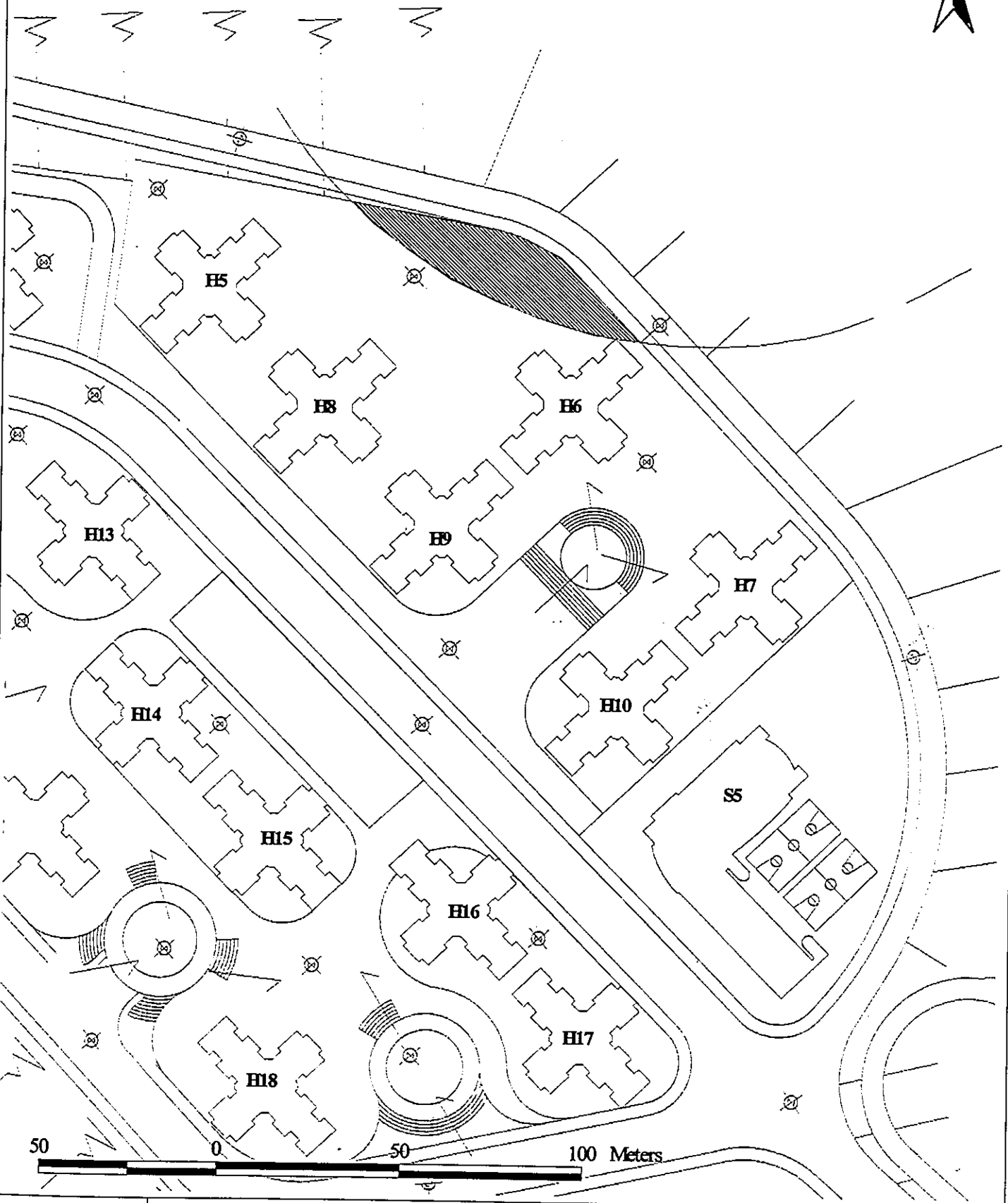
CIVIL ENGINEERING DEPARTMENT, HONG KONG

SCALE: AS SHOWN DATE: SEPTEMBER 1998

DESIGNED: DATE: DRAWING NO: CAD REF: 007.C.L.DOH

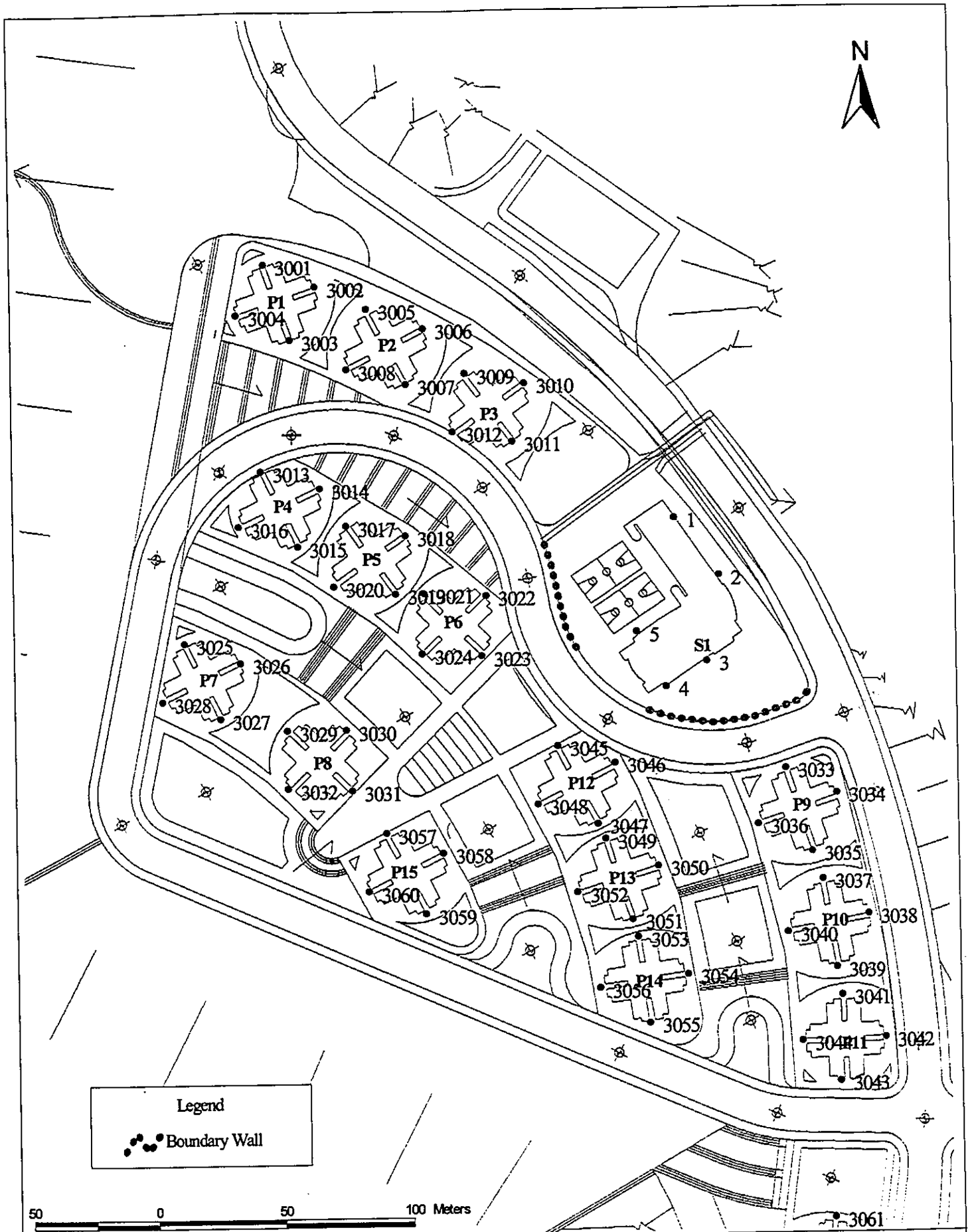
**PROJECT LAYOUT PLAN**


REV: Figure 1.2

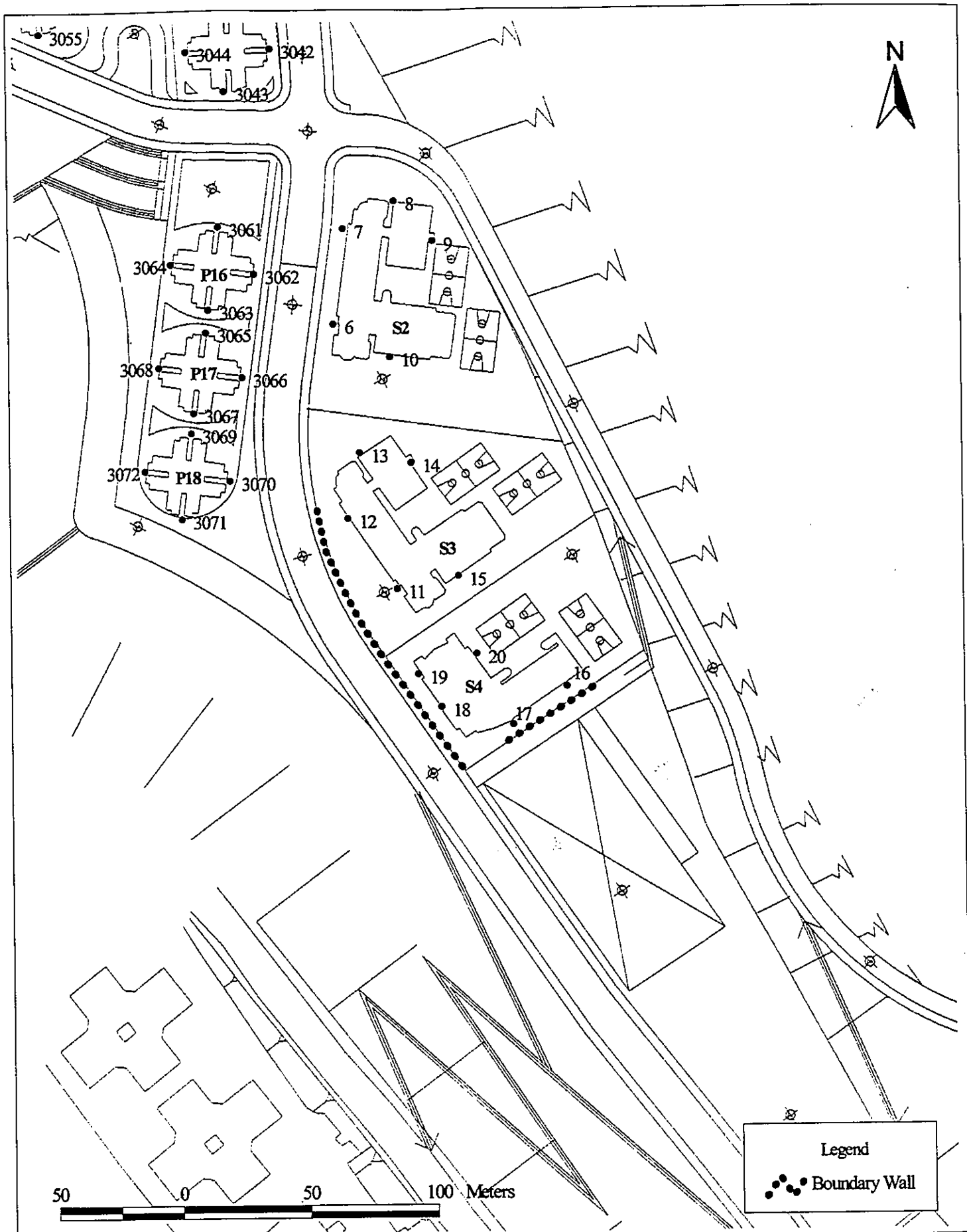


TITLE  
Layout of Platform E - Alternative B

CES (ASIA) LIMITED			
PROJECT NO.	C210	DATE	Sept. 1998
DESIGNED	Fanny Lau	DRAWING NO.	Figure 1.3



	TITLE	CES (ASIA) LIMITED			
	Proposed Noise Mitigation Measures for Anderson Road Development Site	PROJECT NO.	C210	DATE	Nov. 1998
		DESIGNED	Fanny Lau	DRAWING NO.	Figure 1.4



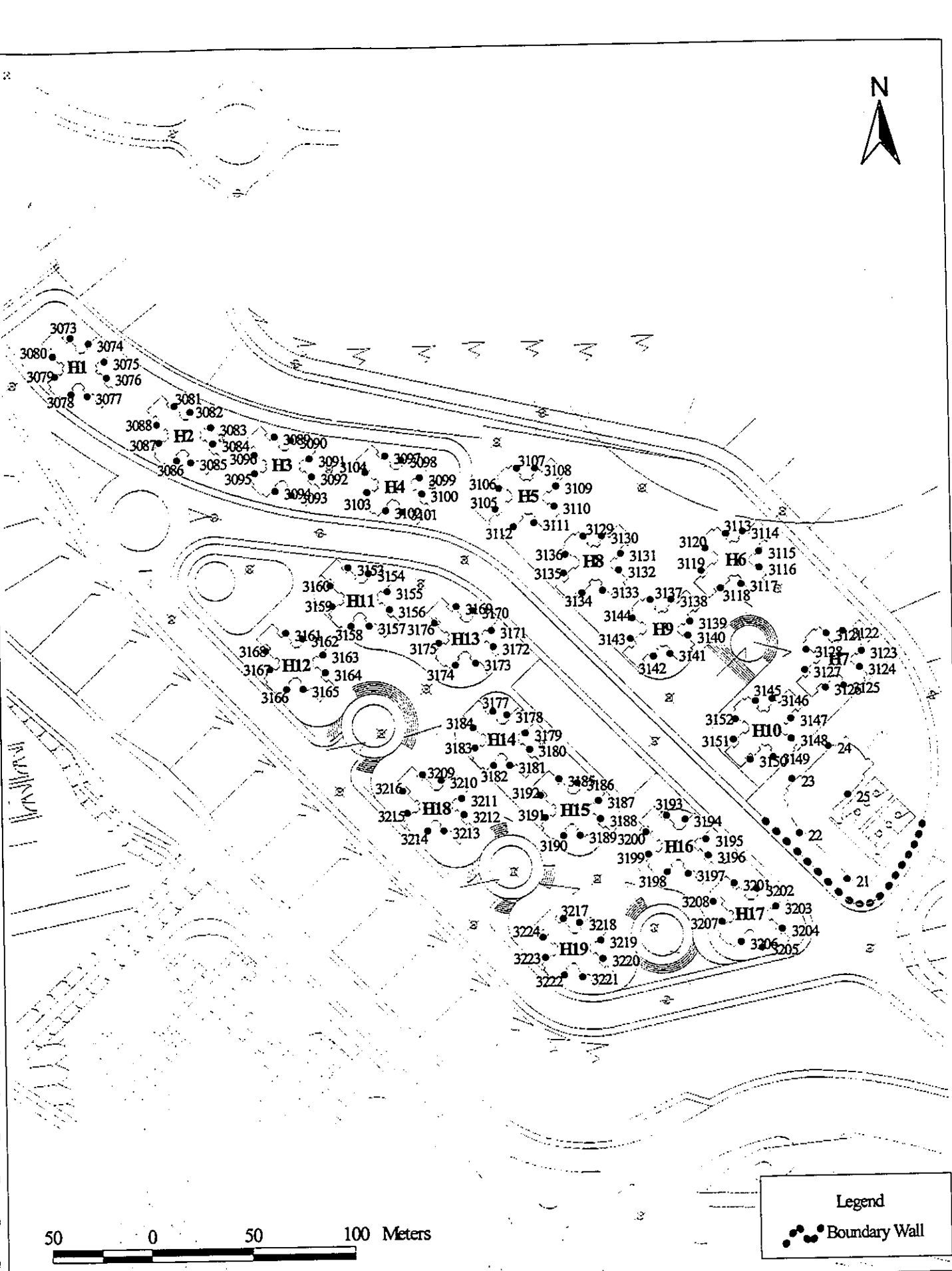
環科 CES

TITLE

Proposed Noise Mitigation Measures  
for Anderson Road Development Site


CES (ASIA) LIMITED

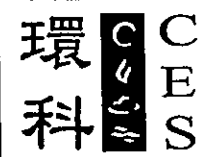
PROJECT NO.	C210	DATE	Nov. 1998
DESIGNED	Fanny Lau	DRAWING NO.	Figure 1.5



50 0 50 100 Meters

Legend

 Boundary Wall

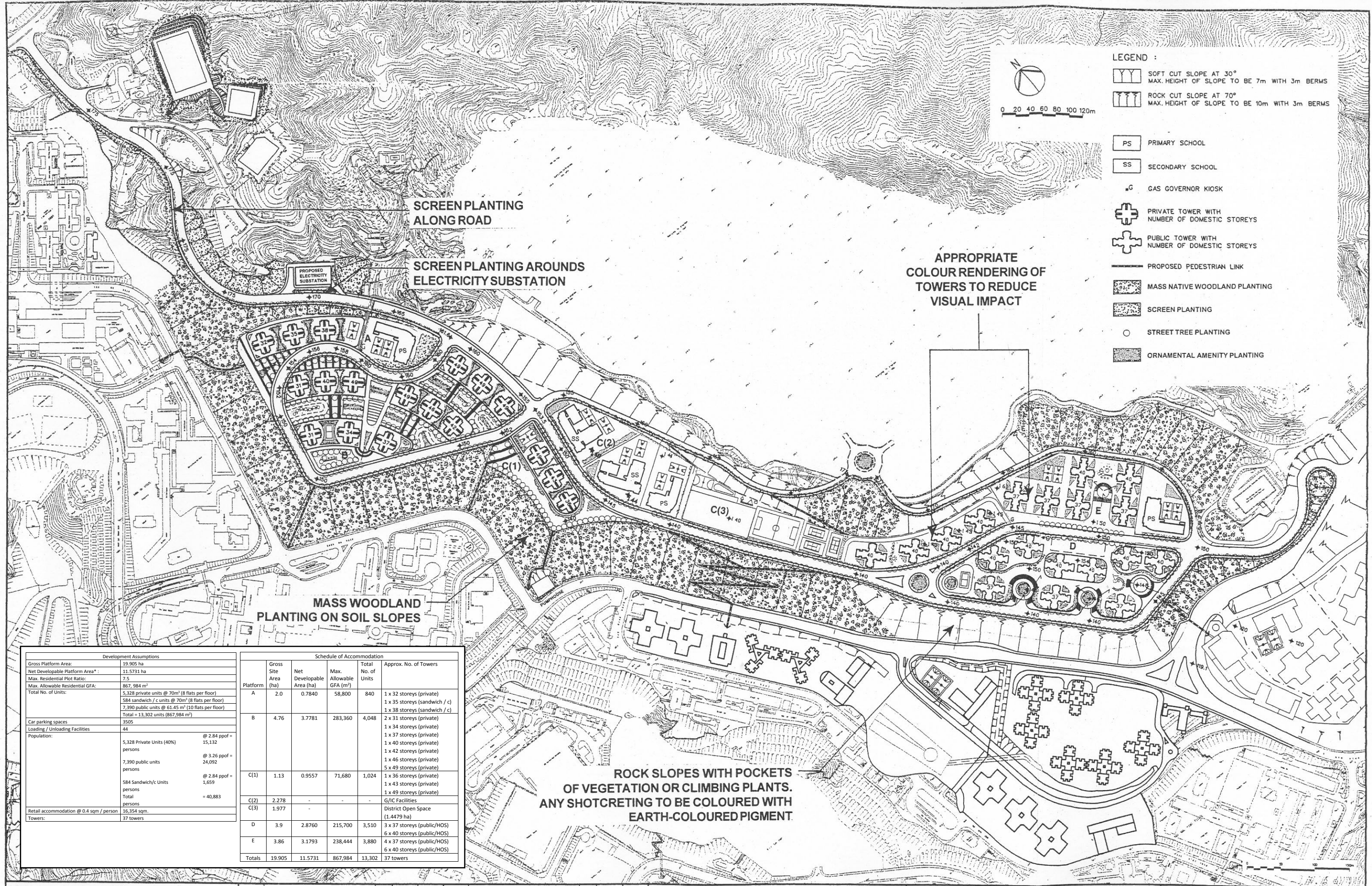


TITLE

Proposed Noise Mitigation Measures  
for Anderson Road Development Sites

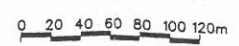
CES (ASIA) LIMITED			
PROJECT NO.	C210	DATE	Nov. 1998
DESIGNED	Fanny Lau	DRAWING NO.	Figure 1.6





**LEGEND :**

- SOFT CUT SLOPE AT 30°  
MAX. HEIGHT OF SLOPE TO BE 7m WITH 3m BERMS
- ROCK CUT SLOPE AT 70°  
MAX. HEIGHT OF SLOPE TO BE 10m WITH 3m BERMS
- PS PRIMARY SCHOOL
- SS SECONDARY SCHOOL
- G GAS GOVERNOR KIOSK
- PRIVATE TOWER WITH NUMBER OF DOMESTIC STOREYS
- PUBLIC TOWER WITH NUMBER OF DOMESTIC STOREYS
- PROPOSED PEDESTRIAN LINK
- MASS NATIVE WOODLAND PLANTING
- SCREEN PLANTING
- STREET TREE PLANTING
- ORNAMENTAL AMENITY PLANTING



Development Assumptions	
Gross Platform Area:	19,905 ha
Net Developable Platform Area*	11,5731 ha
Max. Residential Plot Ratio:	7.5
Max. Allowable Residential GFA:	867,984 m <sup>2</sup>
Total No. of Units:	5,328 private units @ 70m <sup>2</sup> (8 flats per floor) 584 sandwich / c units @ 70m <sup>2</sup> (8 flats per floor) 7,390 public units @ 61.45 m <sup>2</sup> (10 flats per floor) Total = 13,302 units (867,984 m <sup>2</sup> )
Car parking spaces	3505
Loading / Unloading Facilities	44
Population:	5,328 Private Units (40%) @ 2.84 ppof = 15,132 persons 7,390 public units @ 3.26 ppof = 24,092 persons 584 Sandwich/c Units @ 2.84 ppof = 1,659 persons Total persons = 40,883
Retail accommodation @ 0.4 sqm / person	16,354 sqm.
Towers:	37 towers

Schedule of Accommodation					
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C(1)	1.13	0.9557	71,680	1,024	1 x 36 storeys (private) 1 x 43 storeys (private) 1 x 49 storeys (private)
C(2)	2.278				G/C Facilities
C(3)	1.977				District Open Space (1.4479 ha)
D	3.9	2.8760	215,700	3,510	3 x 37 storeys (public/HOS) 6 x 40 storeys (public/HOS)
E	3.86	3.1793	238,444	3,880	4 x 37 storeys (public/HOS) 6 x 40 storeys (public/HOS)
Totals	19.905	11.5731	867,984	13,302	37 towers

**ROCK SLOPES WITH POCKETS OF VEGETATION OR CLIMBING PLANTS. ANY SHOTCRETING TO BE COLOURED WITH EARTH-COLOURED PIGMENT.**

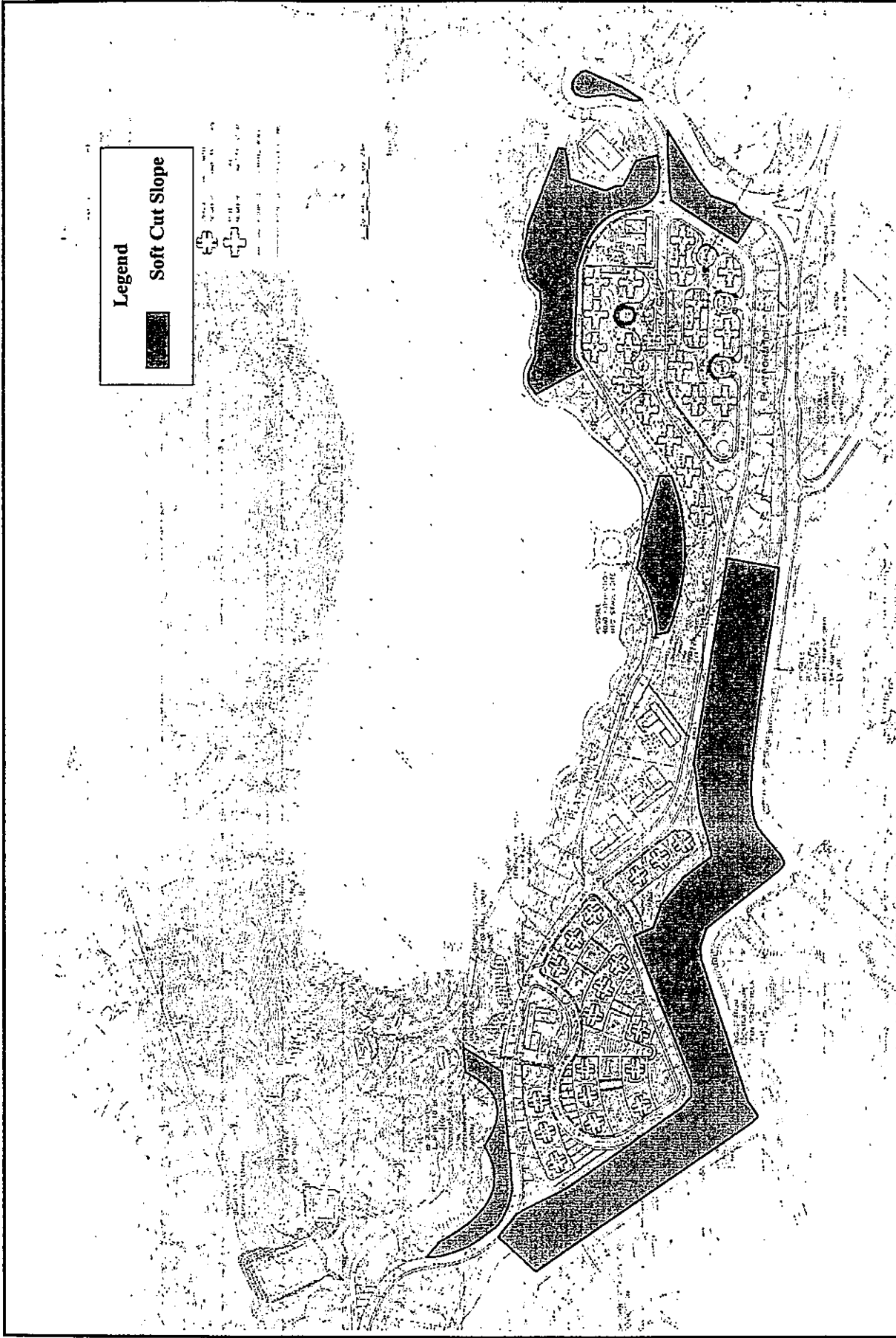
**Maunsell**  
in association with  
Urbis  
CES

REVISION	DESCRIPTION	BY	DATE	REVIEWED	REVISION	DESCRIPTION	BY	DATE	REVIEWED

PLANNING AND ENGINEERING FEASIBILITY STUDY  
FOR DEVELOPMENT AT ANDERSON ROAD

**LANDSCAPE AND VISUAL MITIGATION PROPOSALS**

CIVIL ENGINEERING DEPARTMENT, HONG KONG	
SCALE: 1:2,500 AT A1	DATE: MAY 98
DESIGNED:	DRAWN:
CAD REF:	DRAWING No. Figure 1.7



**Legend**  
 [Shaded Area] **Soft Cut Slope**

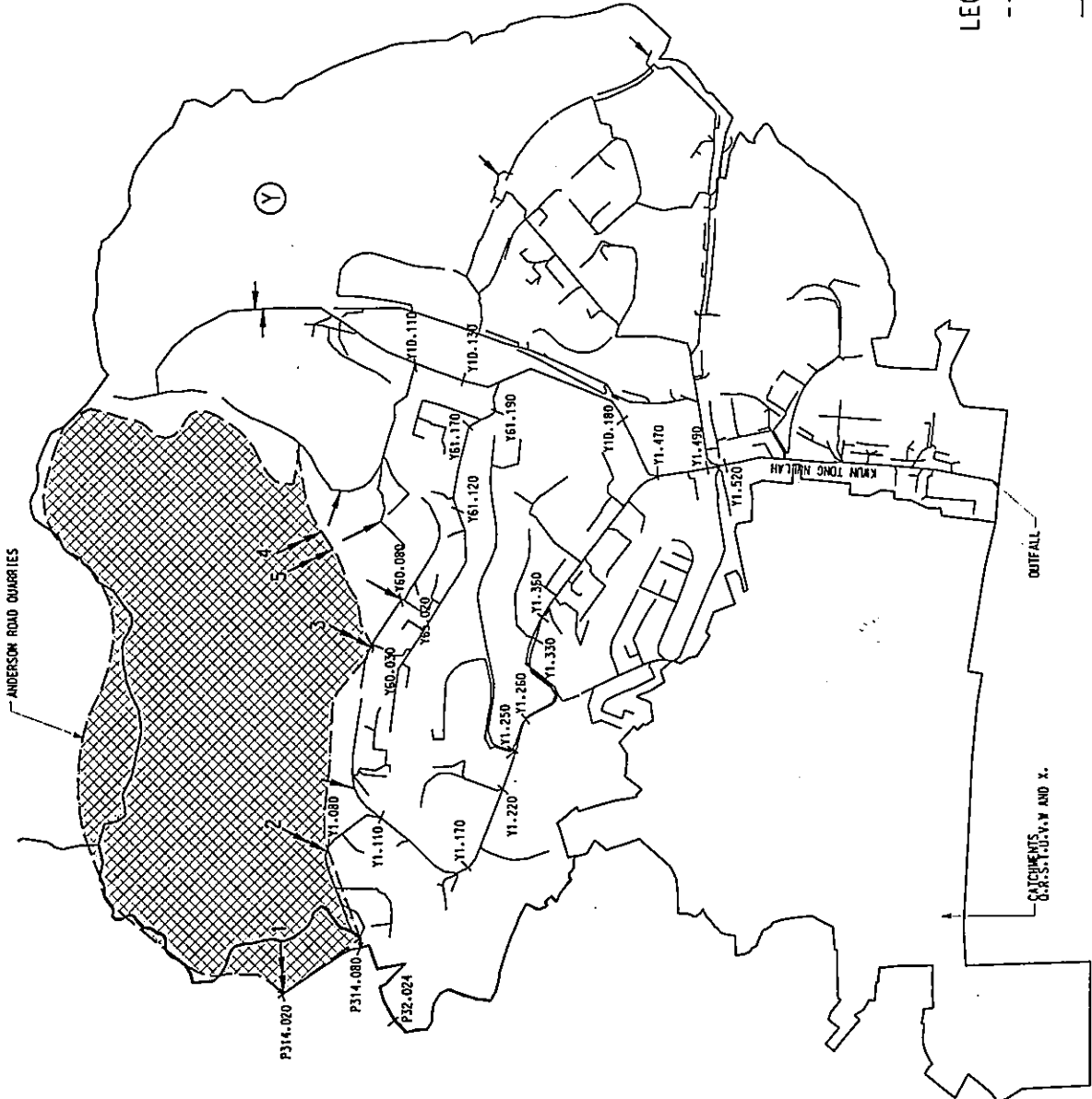
環 科  
 C E S

TITLE

Locations of the soft cut slopes potentially available for compensatory planting

CES (ASIA) LIMITED

PROJECT NO	C210	DATE	Sept. 1998
DESIGNED	Ecosystems Ltd	DRAWING NO	Figure 1.8



**LEGEND:--**

- ANDERSON ROAD QUARRY (ARO)
- DISCHARGE POINT FROM ARO
- STREAM/CHANNEL INFLOW
- CATCHMENT BOUNDARY
- DRAINAGE NETWORK
- ANDERSON ROAD QUARRIES



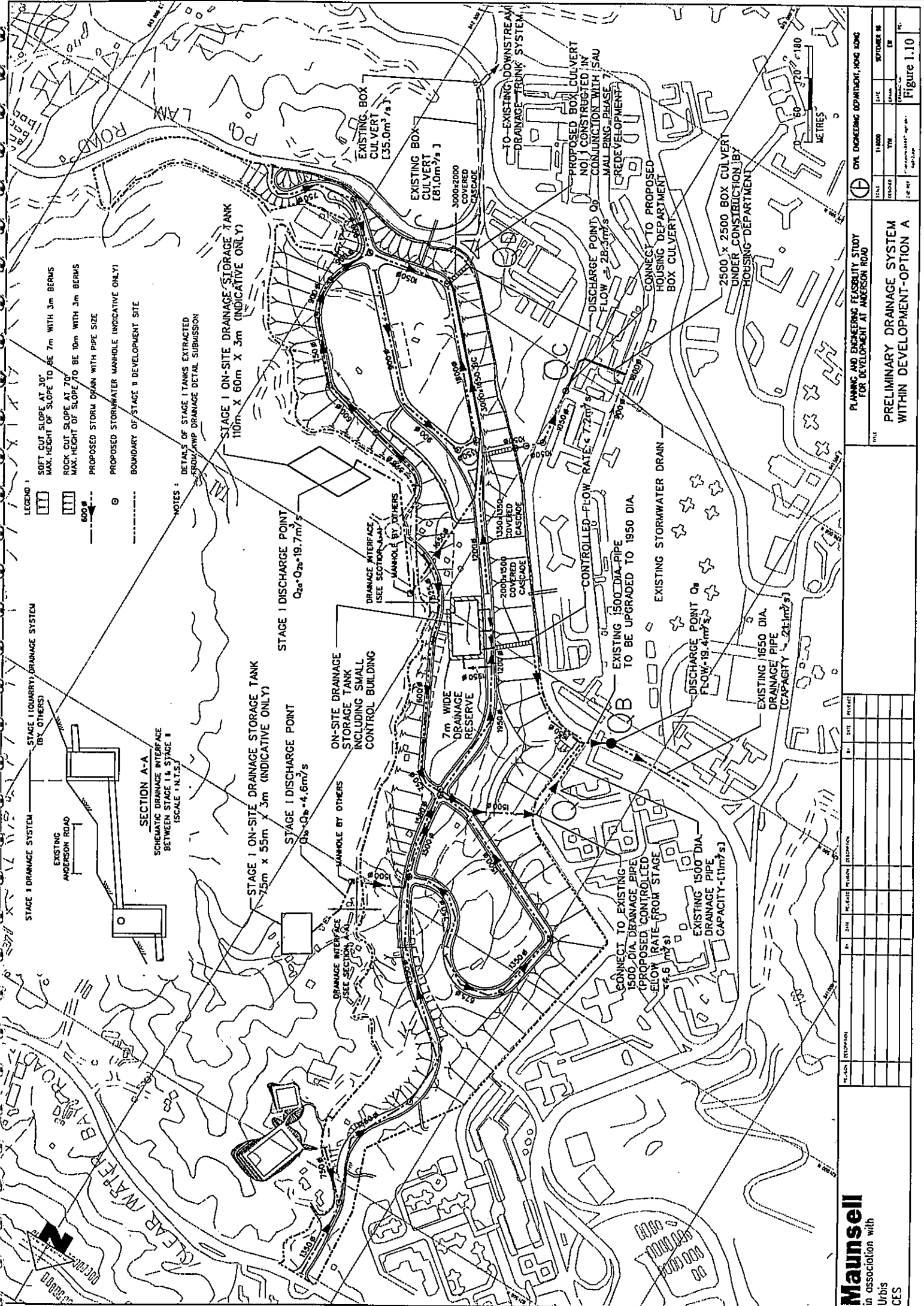
**Mausnell**  
in association with  
Urbis  
CES

PLANNING AND ENGINEERING FEASIBILITY STUDY  
FOR DEVELOPMENT AT ANDERSON ROAD  
MODEL NODE NUMBERING OF  
DRAINAGE SYSTEM

SCALE	1:10000	DATE	OCTOBER 88
DRAWN	JH	CHECKED	EB
DESIGNED		APPROVED	
DATE		BY	
Figure 1.9			

NO.	DATE	REVISION	BY	DATE	REVISION

CIVIL ENGINEERING DEPARTMENT, HONG KONG



**LEGEND**

SOFT CUT SLOPE AT 30°  
MAX. HEIGHT OF SLOPE TO BE 7m WITH 3m BERMS

ROCK CUT SLOPE AT 70°  
MAX. HEIGHT OF SLOPE TO BE 10m WITH 3m BERMS

PROPOSED STORM DRAIN WITH PIPE SIZE

PROPOSED STORMWATER MANHOLE (INDICATIVE ONLY)

BOUNDARY OF STAGE II DEVELOPMENT SITE

**SECTION A-A**  
SCHEMATIC DRAINAGE INTERFACE  
BETWEEN STAGE I & STAGE II  
SCALE 1:12.5

**NOTES**

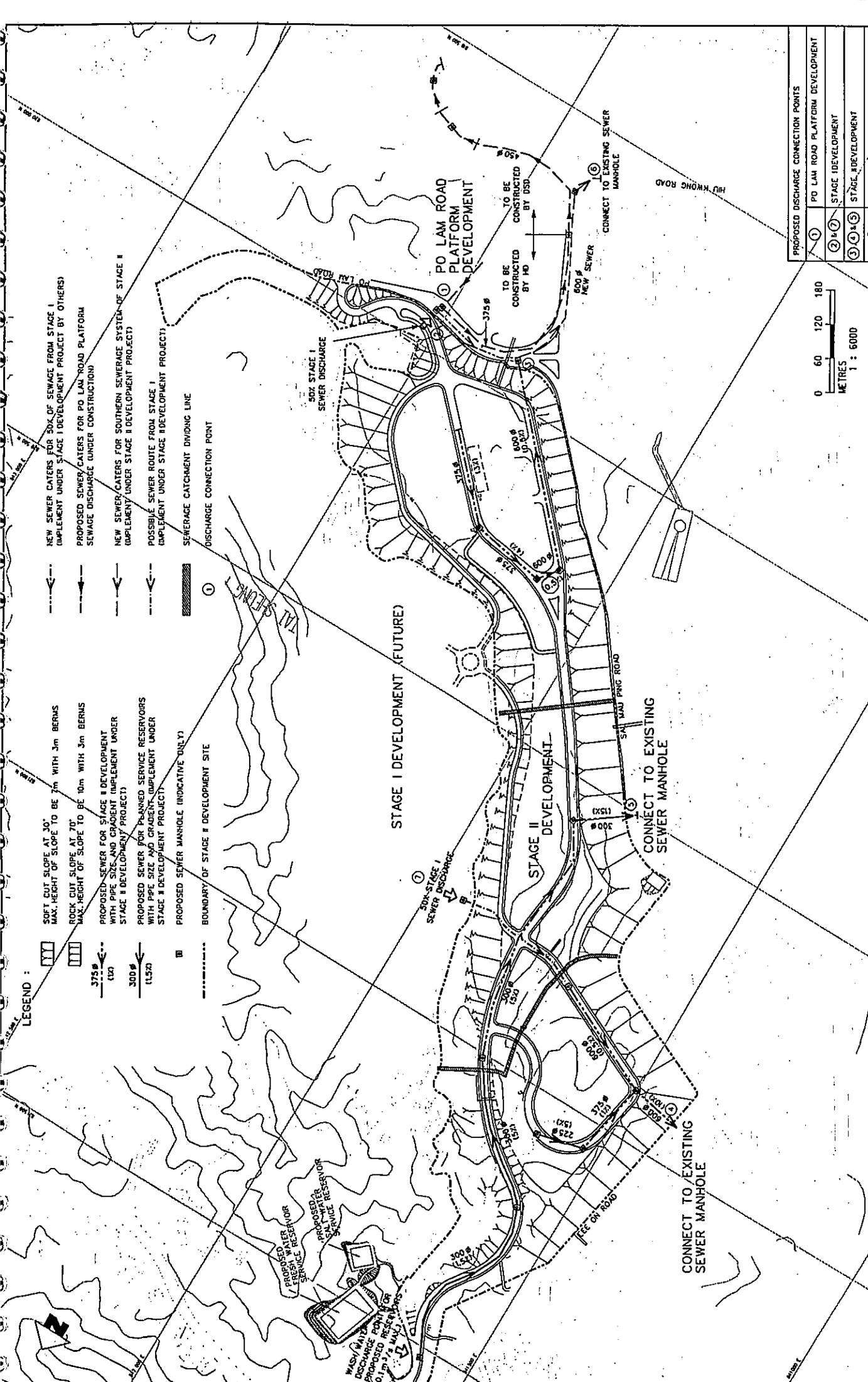
DETAILS OF STAGE I TANKS EXTRACTED FROM CAMP DRAINAGE DETAIL SUBMISSION

DATE		DRAWN BY		CHECKED BY	
DATE	BY	DATE	BY	DATE	BY

PLANNING AND ENGINEERING FEASIBILITY STUDY  
FOR DEVELOPMENT AT ANDERSON ROAD

PRELIMINARY DRAINAGE SYSTEM  
WITHIN DEVELOPMENT - OPTION A

NO.	REVISION	DATE	BY	REASON



NEW SEWER CATERERS FOR SDK OF SEWAGE FROM STAGE I (IMPLEMENT UNDER STAGE I DEVELOPMENT PROJECT BY OTHERS)

PROPOSED SEWER/CATERERS FOR PO LAM ROAD PLATFORM SEWAGE DISCHARGE (UNDER CONSTRUCTION)

NEW SEWER/CATERERS FOR SOUTHERN SEWERAGE SYSTEM-OF STAGE II (IMPLEMENT UNDER STAGE II DEVELOPMENT PROJECT)

POSSIBLE SEWER ROUTE FROM STAGE I (IMPLEMENT UNDER STAGE II DEVELOPMENT PROJECT)

SEWERAGE CATCHMENT DIVIDING LINE

DISCHARGE CONNECTION POINT

SOFT CUT SLOPE AT 30° MAX. HEIGHT OF SLOPE TO BE 3m WITH 3m BERMS

ROCK CUT SLOPE AT 70° MAX. HEIGHT OF SLOPE TO BE 10m WITH 3m BERMS

PROPOSED SEWER FOR STAGE I DEVELOPMENT WITH PIPE SIZE AND GRADIENT IMPLEMENT UNDER STAGE I DEVELOPMENT PROJECT

PROPOSED SEWER FOR PLANNED SERVICE RESERVOIRS WITH PIPE SIZE AND GRADIENT IMPLEMENT UNDER STAGE II DEVELOPMENT PROJECT

PROPOSED SEWER MANHOLE (INDICATIVE ONLY)

BOUNDARY OF STAGE II DEVELOPMENT SITE

LEGEND :

375# (1.2%)

300# (1.5%)

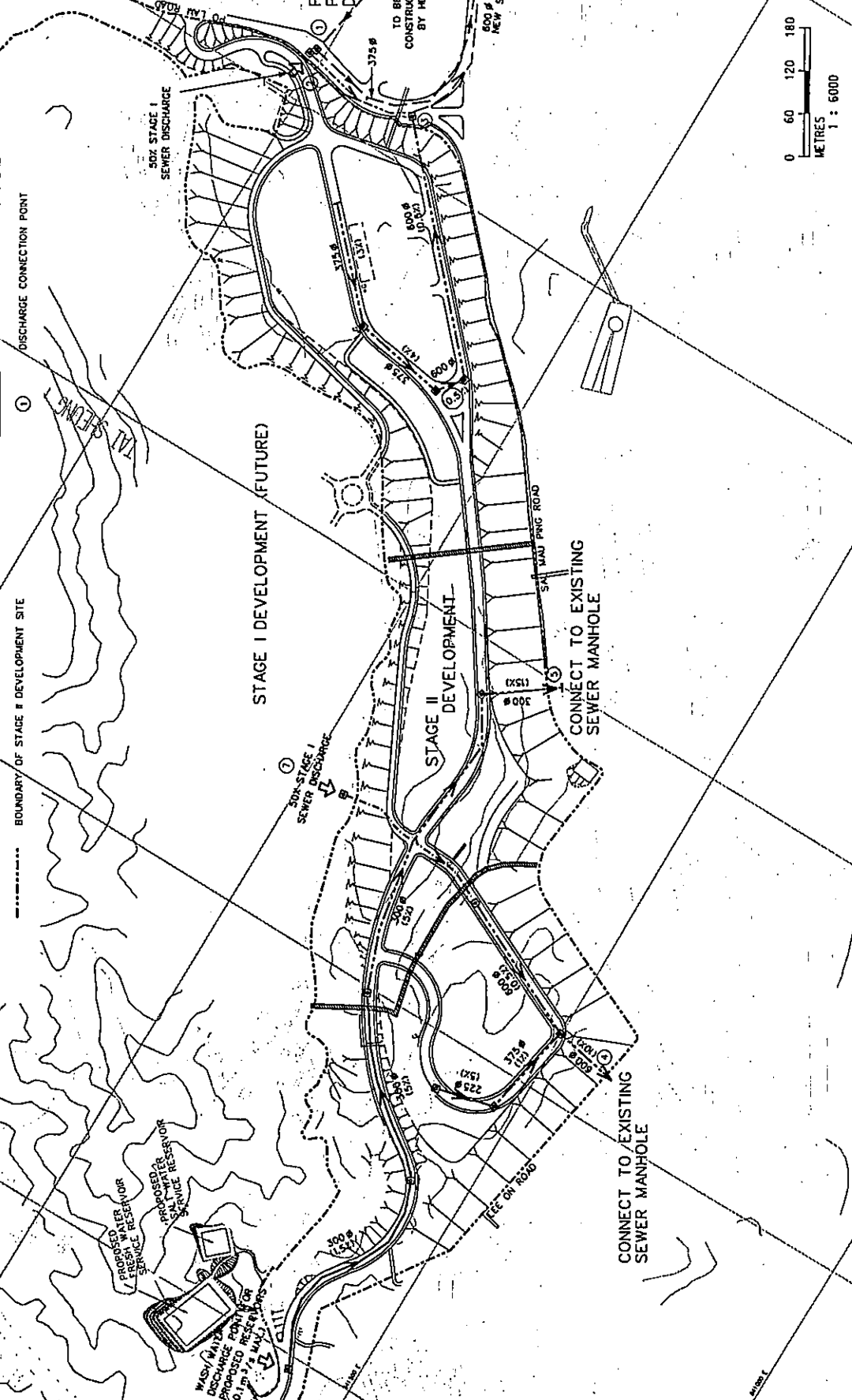
PROPOSED WATER RESERVOIR / FRESH WATER SERVICE RESERVOIR

PROPOSED DISCHARGE POINT FOR 10.7m<sup>3</sup> x 4.5m<sup>3</sup> M.U.

CONNECT TO EXISTING SEWER MANHOLE

CONNECT TO EXISTING SEWER MANHOLE

CONNECT TO EXISTING SEWER MANHOLE



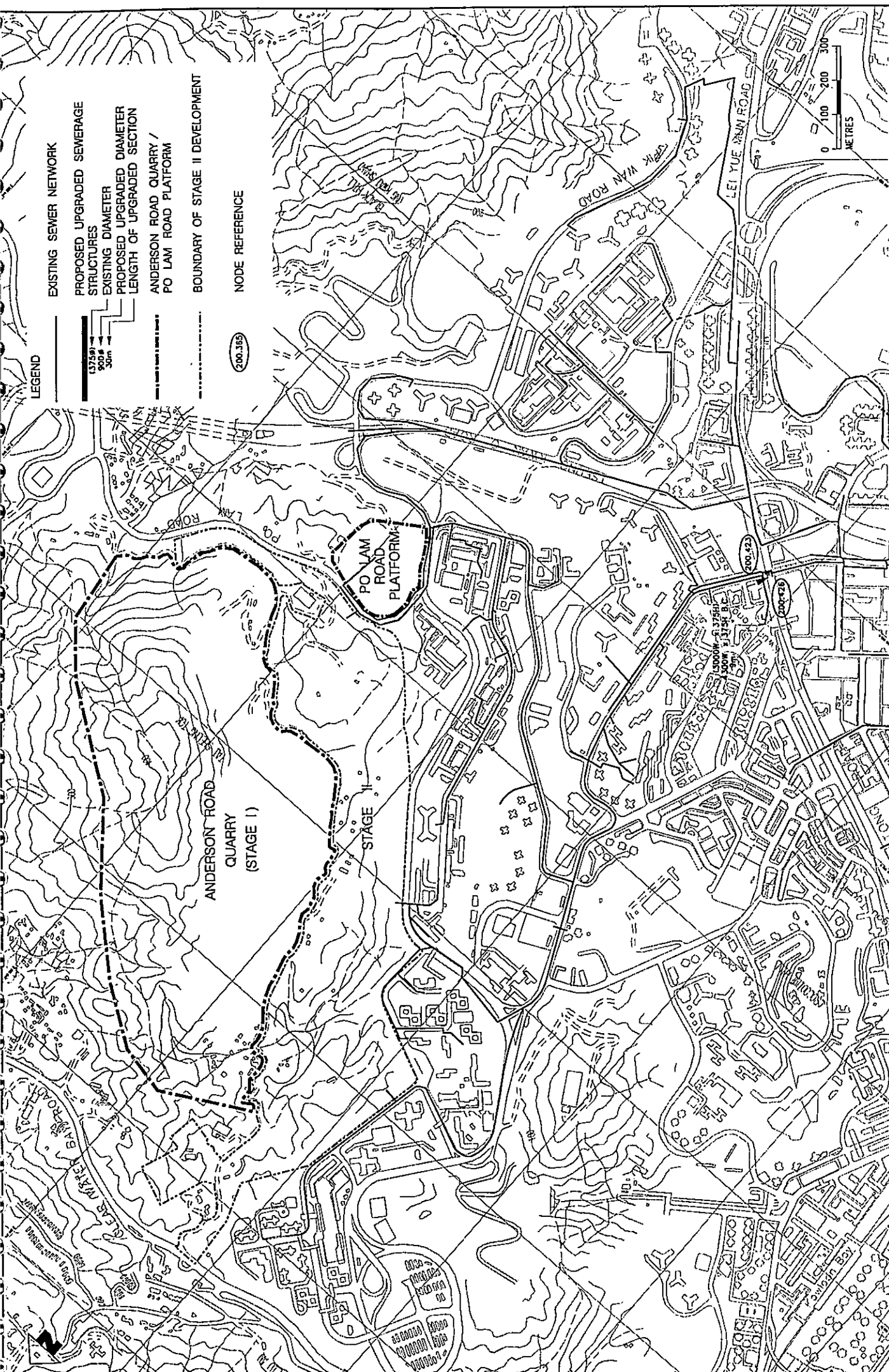
PROPOSED DISCHARGE CONNECTION POINTS	
①	PO LAM ROAD PLATFORM DEVELOPMENT
② & ⑦	STAGE I DEVELOPMENT
③ & ⑤	STAGE II DEVELOPMENT
⑥	HU KWONG ROAD

PLANNING AND ENGINEERING FEASIBILITY STUDY FOR DEVELOPMENT AT ANDERSON ROAD	
SCALE	1:10000
DATE	1974
PROJECT NO.	111
DESIGNER	MAUNSELL
CLIENT	DEPARTMENT OF PUBLIC WORKS
LOCATION	HONG KONG

PRELIMINARY SEWERAGE SYSTEM WITHIN STAGE II DEVELOPMENT

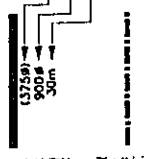
Figure 1.11

NO.	DATE	REVISION	BY	CHECKED	APPROVED



**LEGEND**

- EXISTING SEWER NETWORK
- PROPOSED UPGRADED SEWERAGE STRUCTURES
- EXISTING DIAMETER
- PROPOSED UPGRADED DIAMETER
- LENGTH OF UPGRADED SECTION
- ANDERSON ROAD QUARRY / PO LAM ROAD PLATFORM
- BOUNDARY OF STAGE II DEVELOPMENT
- NODE REFERENCE



DATE		BY		FOR	
11/2009	11/2009	11/2009	11/2009	11/2009	11/2009
11/2009	11/2009	11/2009	11/2009	11/2009	11/2009
11/2009	11/2009	11/2009	11/2009	11/2009	11/2009
11/2009	11/2009	11/2009	11/2009	11/2009	11/2009

PLANNING AND ENGINEERING FEASIBILITY STUDY FOR DEVELOPMENT AT ANDERSON ROAD

UPGRADING OF EXISTING SEWERAGE SYSTEM FOR 2009

NO.	DATE	REVISION	BY	CHECKED

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Urbis  
CCS



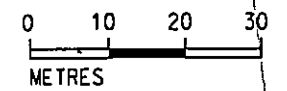
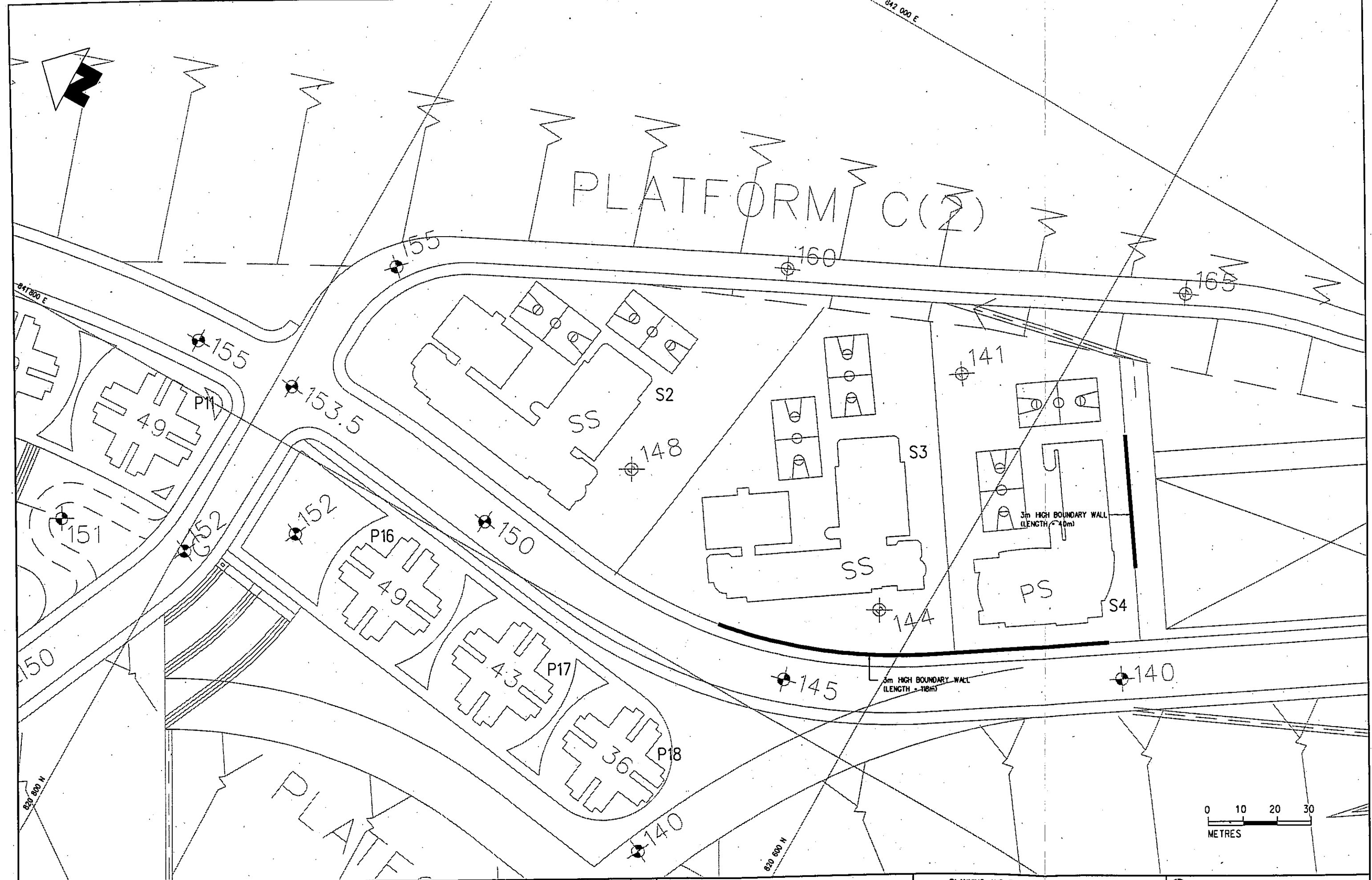
**Maunsell**  
in association with  
Urbis  
CES

REVISION	DESCRIPTION	BY	DATE	REVIEWED	REVISION	DESCRIPTION	BY	DATE	REVIEWED

PLANNING AND ENGINEERING FEASIBILITY STUDY  
FOR DEVELOPMENT AT ANDERSON ROAD

PROPOSED NOISE MITIGATION  
MEASURES FOR ANDERSON  
ROAD DEVELOPMENT SITE SHEET 1 OF 5

CIVIL ENGINEERING DEPARTMENT, HONG KONG			
SCALE	1:1000	DATE	SEPTEMBER 98
DESIGN	TMK	DRAWN	EW
CAD REF.	C:\projects\p1997\april\1995-2a.dwg		Figure 1.13



**Maunsell**  
in association with  
Urbis  
CES

REVISION	DESCRIPTION	BY	DATE	REVISION	DESCRIPTION	BY	DATE	REVISION	DESCRIPTION	BY	DATE	REVISION	DESCRIPTION	BY	DATE

PLANNING AND ENGINEERING FEASIBILITY STUDY  
FOR DEVELOPMENT AT ANDERSON ROAD

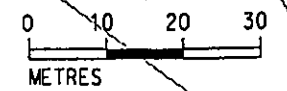
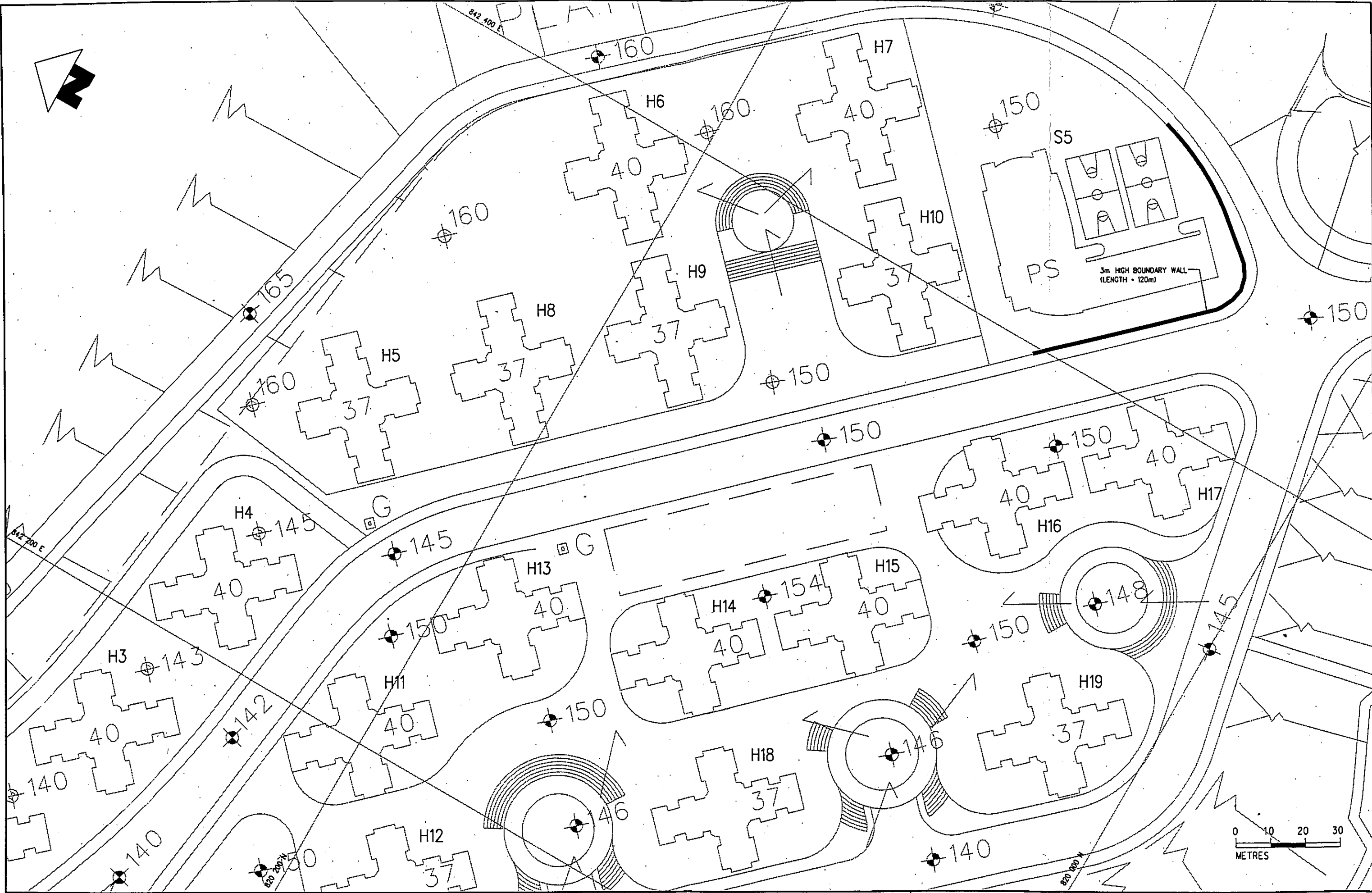
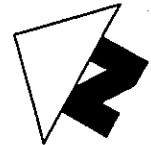
TITLE  
**PROPOSED NOISE MITIGATION  
MEASURES FOR ANDERSON  
ROAD DEVELOPMENT SITE** SHEET 2 OF 5

CIVIL ENGINEERING DEPARTMENT, HONG KONG

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DESIGNED	TMK	CHECKED	EW
OLD REF.	PL/ENR/1998/09/01/198-1.1a	CR/ENR/1998/09/01/198-1.1a	REV

Figure 1.14





**Maunsell**  
in association with  
Urbis  
CES

REV/SCH	DESCRIPTION	BY	DATE	REVIEWED	REVISION	DESCRIPTION	BY	DATE	REVIEWED

PLANNING AND ENGINEERING FEASIBILITY STUDY  
FOR DEVELOPMENT AT ANDERSON ROAD

TITLE  
**PROPOSED NOISE MITIGATION  
MEASURES FOR ANDERSON  
ROAD DEVELOPMENT SITE**

SHEET 3 OF 5

CIVIL ENGINEERING DEPARTMENT, HONG KONG

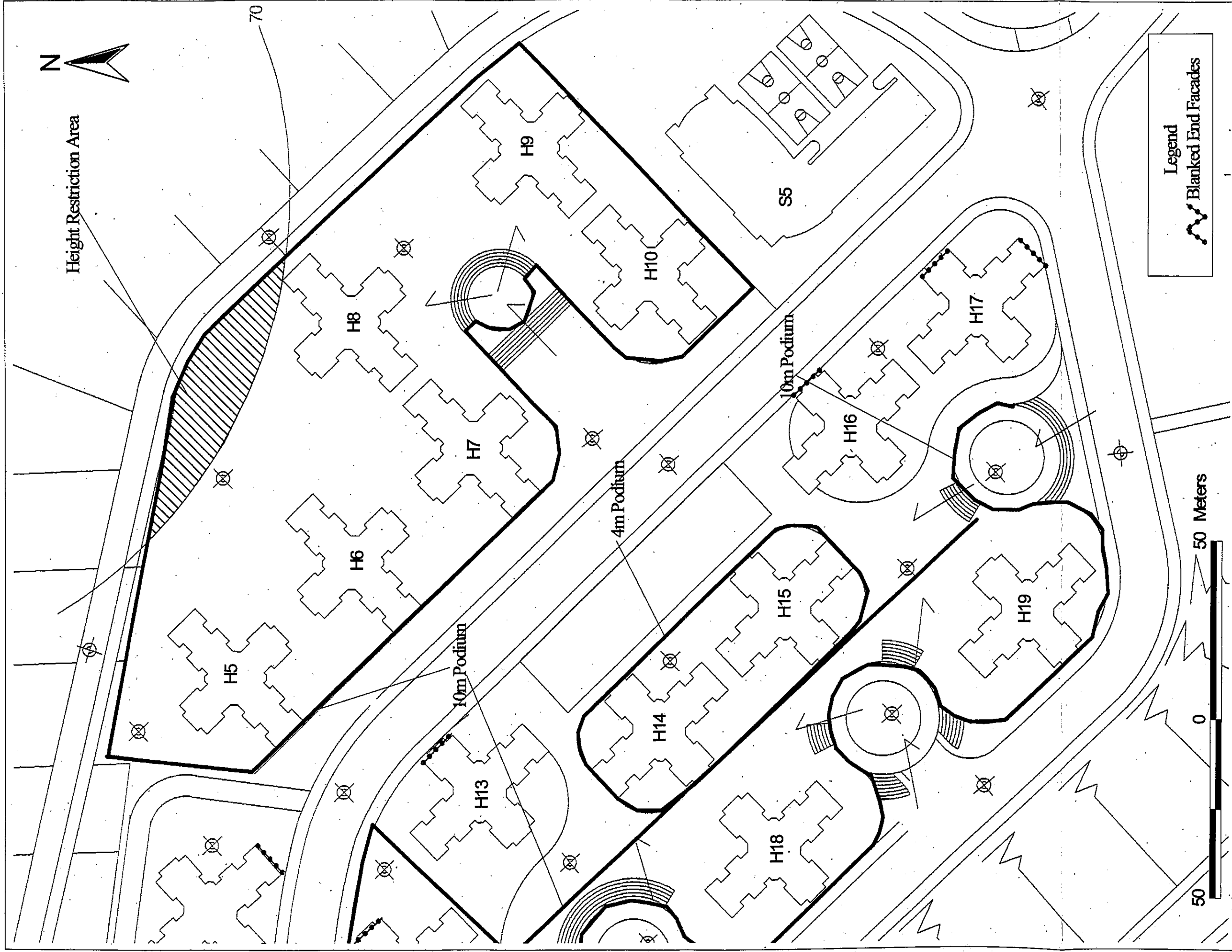
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CHECKED		DRAWING NO.	Figure 1.15
LOAD REF.		REV	



環科  
CES

TITLE Proposed Noise Mitigation Measures  
for Anderson Road Development Site  
- Sheet 4 of 5

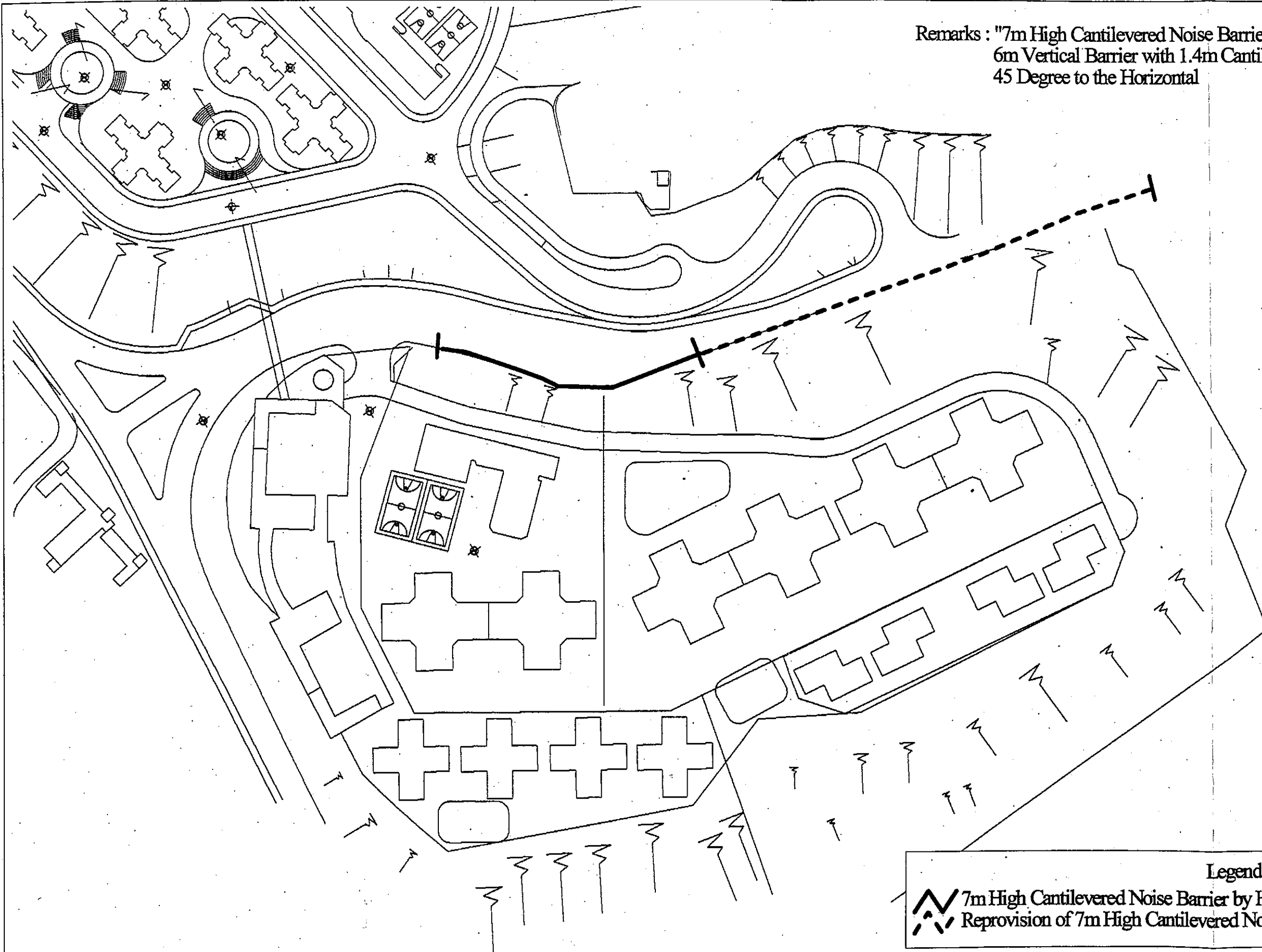
CES (ASIA) LIMITED		PROJECT NO.	DATE	DESIGNED	DRAWING NO.
		C210	Sept. 1998	Fanny Lau	Figure 1.18



環科  
CES

TITLE Proposed Noise Mitigation Measures  
for Anderson Road Development Site  
- Sheet 5 of 5

PROJECT NO.	DATE	DESIGNED	DRAWING NO.
C210	Sept. 1998	Fanny Lau	Figure 1.19
CES (ASIA) LIMITED			



Remarks : "7m High Cantilevered Noise Barrier" means  
 6m Vertical Barrier with 1.4m Cantilever Length at  
 45 Degree to the Horizontal



**Legend**

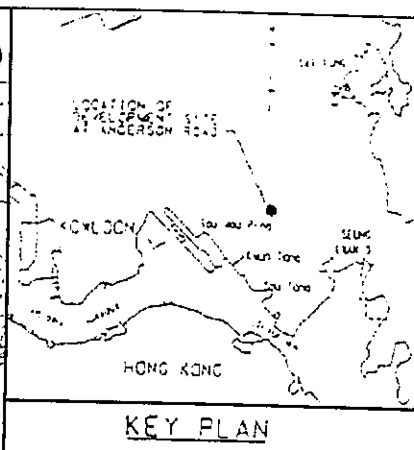
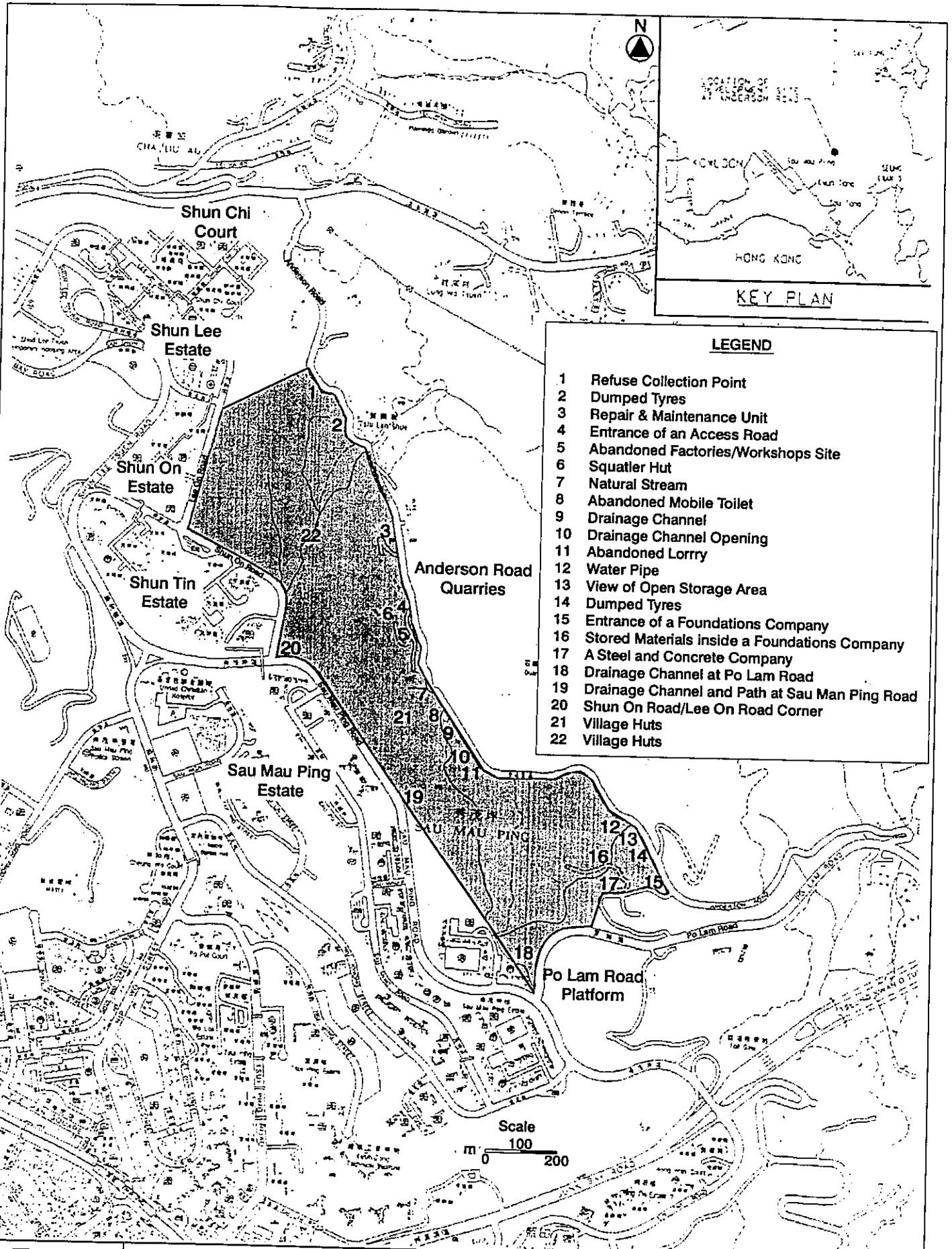
7m High Cantilevered Noise Barrier by Housing Department  
 Reprovision of 7m High Cantilevered Noise Barrier by Highway Department

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 CES

TITLE

Proposed Noise Mitigation Measures for Po Lam Road

CES (ASIA) LIMITED			
PROJECT NO.	C210	DATE	Sept. 1998
DESIGNED	Fanny Lau	DRAWING NO.	Figure 1.20

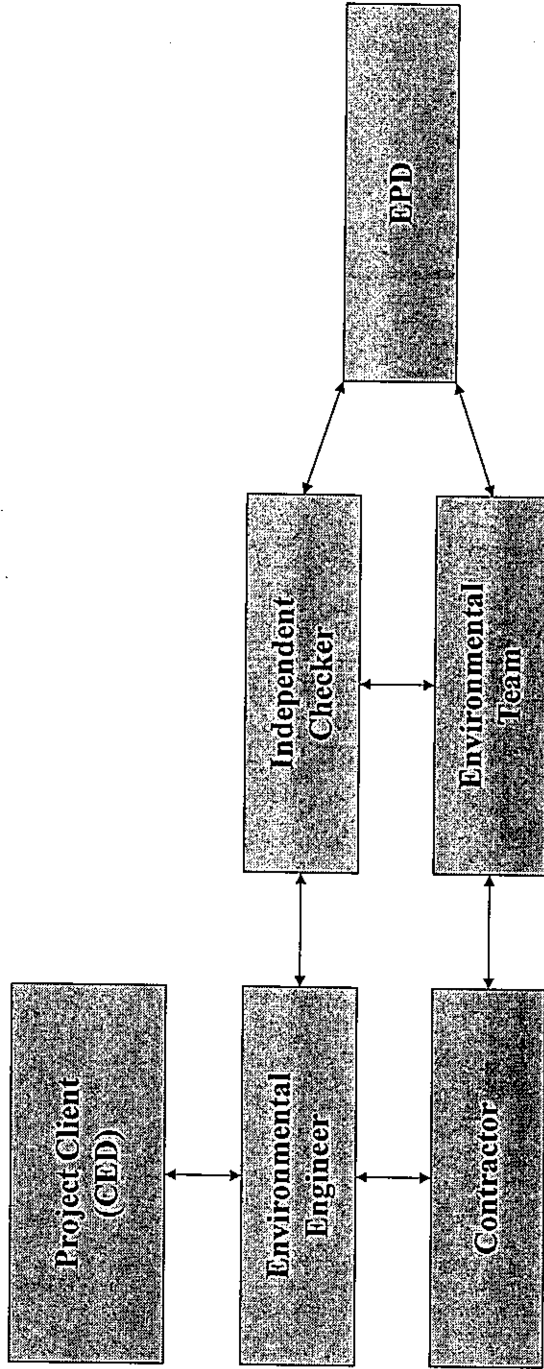


- LEGEND**
- 1 Refuse Collection Point
  - 2 Dumped Tyres
  - 3 Repair & Maintenance Unit
  - 4 Entrance of an Access Road
  - 5 Abandoned Factories/Workshops Site
  - 6 Squatter Hut
  - 7 Natural Stream
  - 8 Abandoned Mobile Toilet
  - 9 Drainage Channel
  - 10 Drainage Channel Opening
  - 11 Abandoned Lorry
  - 12 Water Pipe
  - 13 View of Open Storage Area
  - 14 Dumped Tyres
  - 15 Entrance of a Foundations Company
  - 16 Stored Materials inside a Foundations Company
  - 17 A Steel and Concrete Company
  - 18 Drainage Channel at Po Lam Road
  - 19 Drainage Channel and Path at Sau Man Ping Road
  - 20 Shun On Road/Lee On Road Corner
  - 21 Village Huts
  - 22 Village Huts



TITLE  
**Location Map of Special Facilities/Features  
 Around Development Site**

<b>CES (ASIA) LIMITED</b>			
PROJECT NO	C210	DATE	Sept. 1998
DESIGNED	Peter Lee	DRAWING NO	Figure 1.21



TITLE

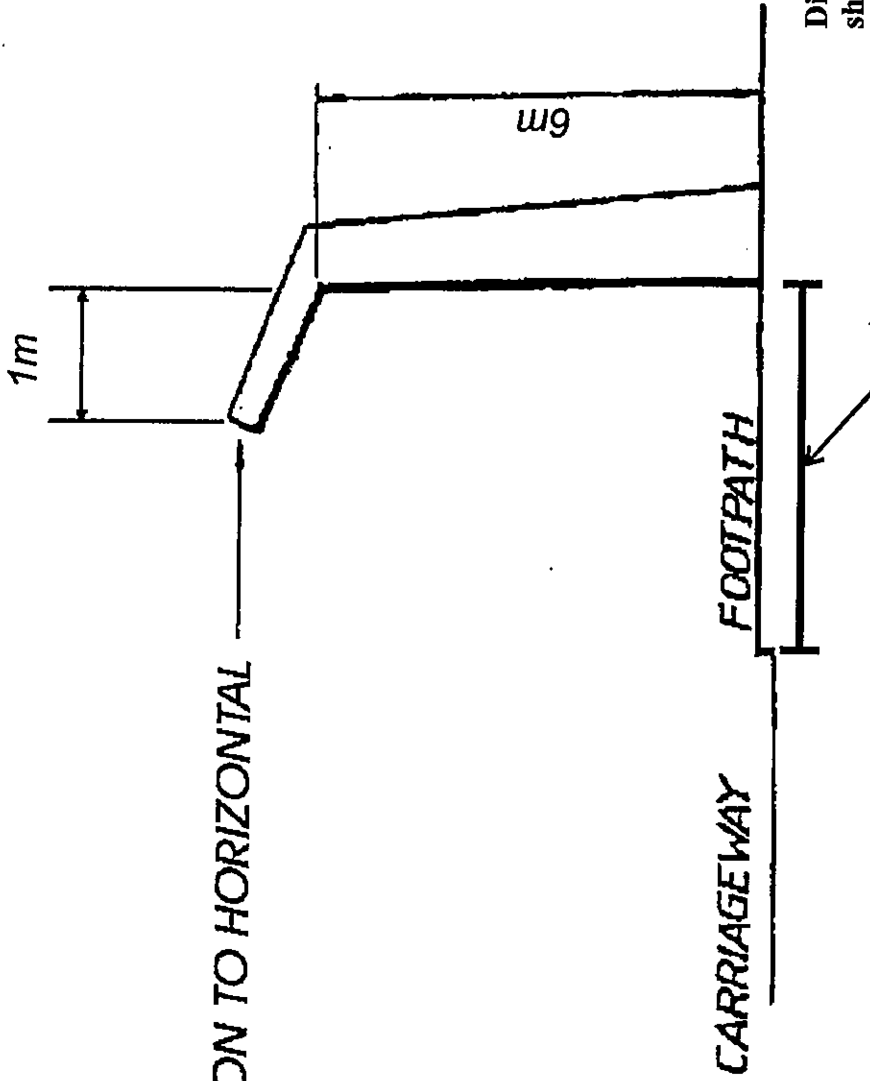


**Project Organisation Structure**

CES (Asia) LIMITED

PROJECT NO	C210	DATE	Sept.1998
DRAWING NO	T C Wong	DRAWING NO	Figure 1.22

45° INCLINATION TO HORIZONTAL



TITLE

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Typical Section of Noise Barrier at Po Lam Road

CES (ASIA) LIMITED

PROJECT NO

C210

DATE

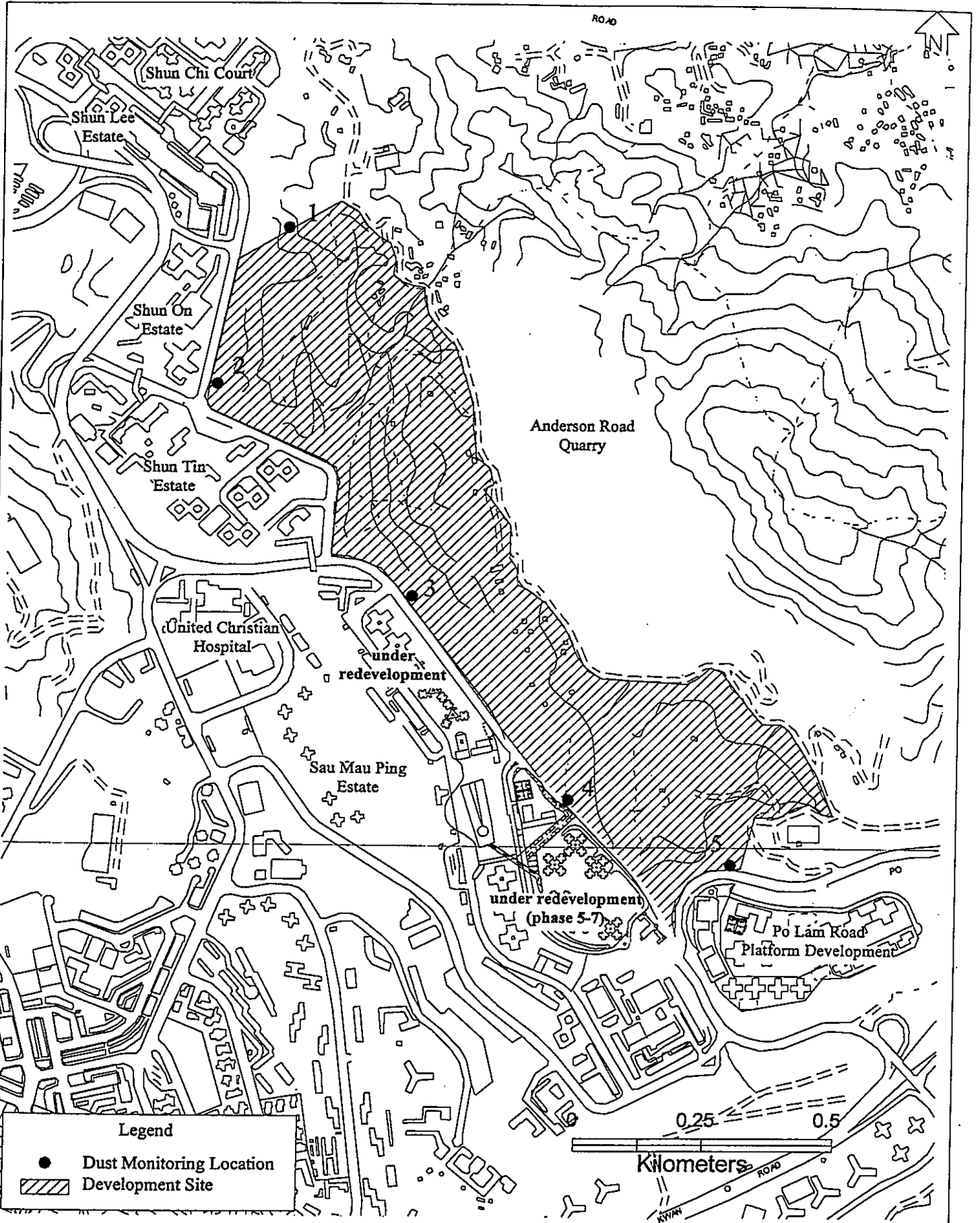
Nov. 1998

DESIGNED

Anna Chung

DRAWING NO

Figure 1.23



**Legend**

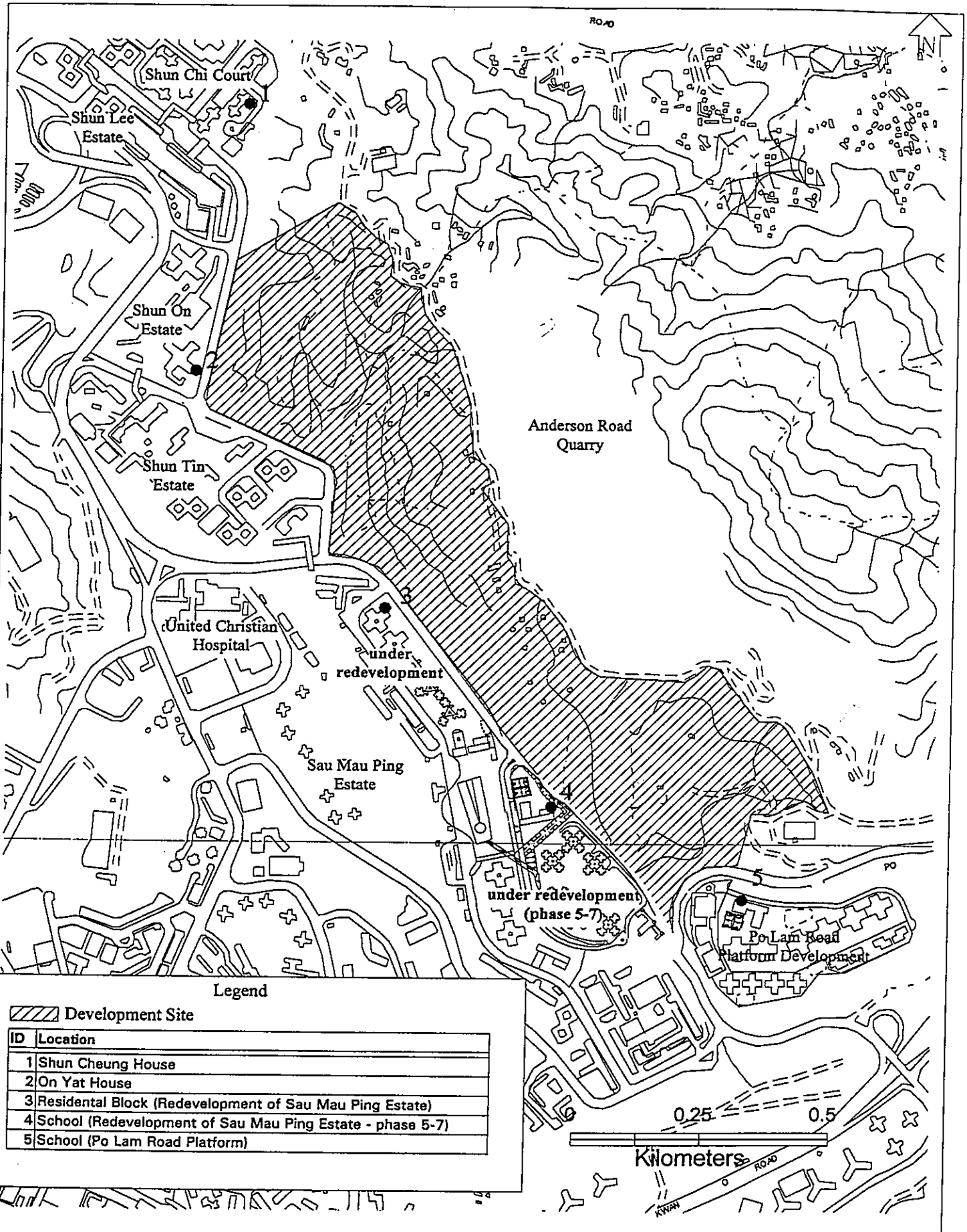
- Dust Monitoring Location
- ▨ Development Site

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TITLE  
Proposed Dust Monitoring Locations

CES (ASIA) LIMITED			
PROJECT NO.	C210	DATE	May 1998
DESIGNED	Fanny Lau	DRAWING NO.	Figure 2.1





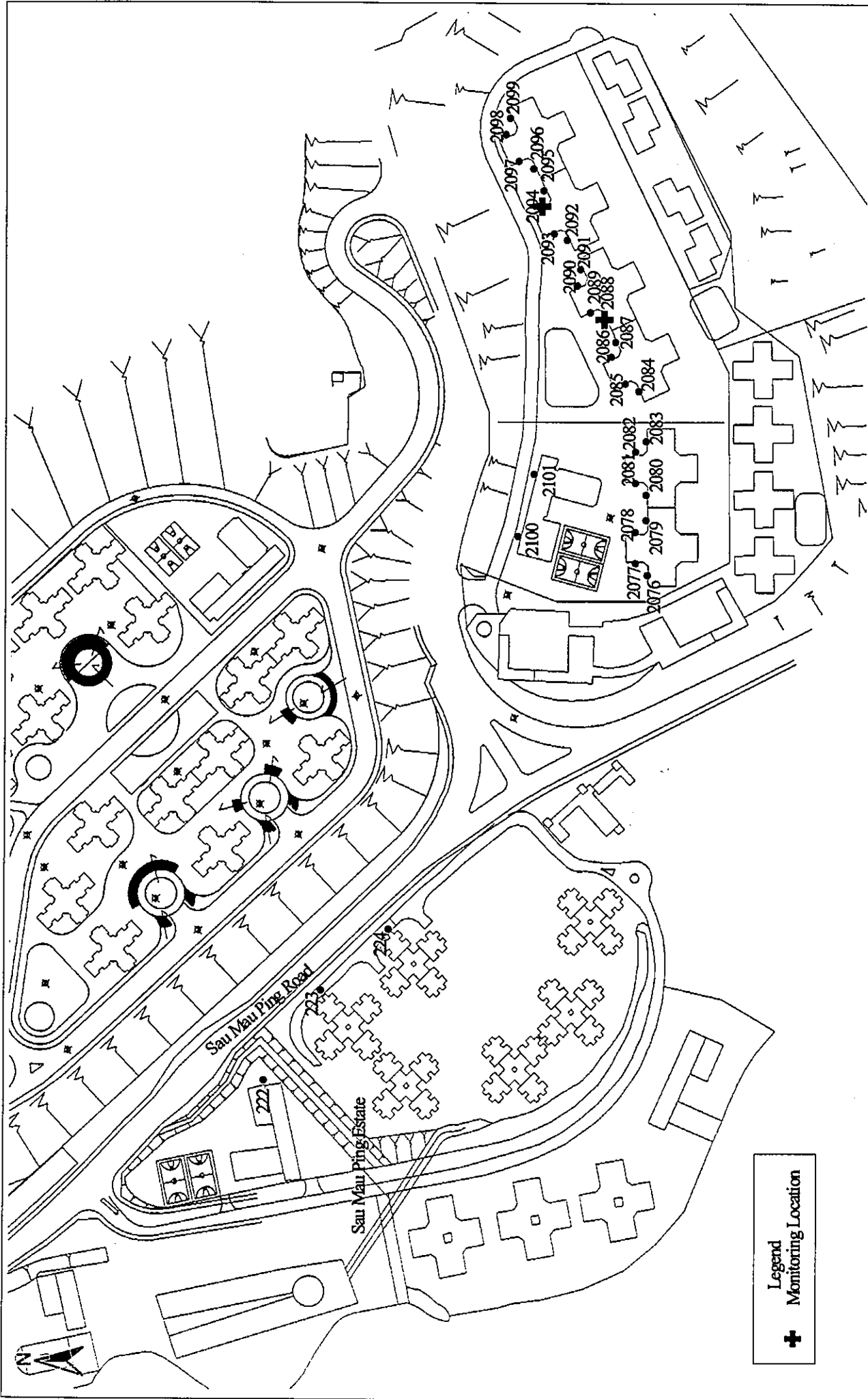
**Legend**


 Development Site	
ID	Location
1	Shun Cheung House
2	On Yat House
3	Residential Block (Redevelopment of Sau Mau Ping Estate)
4	School (Redevelopment of Sau Mau Ping Estate - phase 5-7)
5	School (Po Lam Road Platform)



TITLE  
**Proposed Noise Monitoring Locations**

CES (ASIA) LIMITED			
PROJECT NO.	C210	DATE	June 1998
DESIGNED	Fanny Lau	DRAWING NO.	Figure 3.1



 環 科	TITLE		CES (ASIA) LIMITED	
	Proposed Traffic Noise Monitoring Location		PROJECT NO.	DATE
			C210	Nov. 1998
			DESIGNED BY	DRAWING NO.
			Fanny Lau	Figure 3.2