China State Construction Engineering (Hong Kong) Ltd.

Contract No. CV/2007/03

Development at Anderson Road – Site Formation and Associated Infrastructure Works

Operational Phase Noise Monitoring Report

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

Version: 0	Date: December 2018

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RAMBOLL

Ref.: OAPANDSNEM00_0_2089L.19

2 January 2019

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. YK Cheung

Dear Sir,

Re: Contract No. CV/2007/03 (Environmental Permit No. EP-483/2013)
Development at Anderson Road
Site Formation and Associated Infrastructure Works
Operational Phase Noise Monitoring Report

Reference is made to the Environmental Team's submission of the Operational Phase Noise Monitoring Report received by e-mail on 2 January 2019 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 3.2 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	By Fax: 3922 9797
	CSCEC	Attn.: Mr. Holmes Wong	By Email

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Ramboll Hong Kong Limited 英環香港有限公司
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1 INTRODUCTION

1.1 Background

1.1.1 The objective of "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.

1.1.2 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.

1.1.3 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.

1.1.4 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.

1.1.5 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) for the Project. In accordance with Section 3.7 of the approved Updated EM&A Manual, traffic noise monitoring shall be carried out after the completion of the Po Lam Road widening work.

1.1.6 The operation phase noise monitoring has been carried out in accordance with the methodology and requirements set out in the approved Updated EM&A Manual. This Operational Phase Noise Monitoring Report presents the noise monitoring results and the verification of the traffic noise assessment conducted in Environmental Impact Assessment (EIA) Study, by comparing the project noise impact predictions with the actual impacts.

2 OPERATIONAL PHASE NOISE MONITORING

2.1 Monitoring Requirement

2.1.1 According to the Environmental Permit Condition 2.3 and 3.3 of 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 predications in the Final EIA report (Register No. AEIAR-007/1999), using the counted traffic data at the time of measurement. The project lay out plan is provided in **Appendix F**.

2.1.2 The purpose of this monitoring is to verify the traffic noise assessment and effectiveness of the proposed noise mitigation measures, which is the provisioning of a 7m high cantilevered noise barrier wall (6 m vertical barrier with 1.4m cantilever length at 45 degree to the horizontal) (same configuration as those being removed), along the footpath of the widened Po Lam Road is proposed, that the impact at NSRs are within acceptable noise limits. The proposed noise mitigation measures plan are provided in **Appendix G**.

2.2 Monitoring Frequency, Parameter and Duration

2.2.1 As required by Section 3 of the Updated 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.

2.3 Monitoring Equipment

2.3.1 Integrating Sound Level Meters (Type 1), which comply with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1), was used for the noise monitoring. The sound level meter is capable of giving a continuous readout of the noise level readings including equivalent continuous sound pressure level (Leq) and percentile sound pressure level (Lx). Acoustic calibrator was deployed to check the sound level meter at a known sound pressure level. Information of the equipment is given in **Table 2.1** and the calibration certificates are provided in **Appendix A**.

Table 2.1 Noise Monitoring Equipment

Equipment	Model
Integrating Sound Level Meter	B&K 2238 & 2270
Hand-held Acoustic Calibrator	B&K 4231

2.3.2 The sound level meter was calibrated using a Bruel and Kjaer Sound Level Calibrator Type 4231 for 94dB at 1kHz, immediate prior to and after each set of measurements. The results of the calibration were recorded on the field data sheet. The difference between the readings made before and after each set of measurements was less than 1 dB(A).

2.4 Monitoring Date and Time

2.4.1 As stipulated in the Updated EM&A manual, noise level shall be measured at the time of peak traffic flow on normal weekdays. According to the latest publication on traffic flow produced by Transport Department, The Annual Traffic Census 2017, peak hours on normal weekdays was 0900-1000 and 1800-1900 for the east bound; and 0800-0900 and 1700-1800 for the west bound. The Annual Traffic Census 2017 are provided in **Appendix C**.

2.4.2 Since there is a concurrent project in the vicinity (i.e. Contract: NE/2016/01 – Site Formation and Infrastructure Works for Development of Anderson Road Quarry Site) which involves heavy breaking activities and site formation, noise from construction activities (such as breaking activities) would be dominant during normal working hours (normal weekdays, 0700-1900). Monitoring during normal working hours (normal weekdays, 0700-1900) is not feasible as noise from construction activities would

affect the monitoring result and validity. Taking into account that typical construction works shifts end at 1800 and with consideration of peak hours from the Annual Traffic Census, the monitoring time is proposed to be any 1 hour between 1830 and 2000 during normal weekdays.

2.4.3 The set of monitoring was performed on 04 September 2018 at PM traffic peak hour, i.e. 18:30 to 20:00. The site survey photos are provided in **Appendix E**.

2.5 Monitoring Location

2.5.1 Noise measurements were carried out at two locations according to the Updated EM&A manual as shown in **Table 2.2** below. The figure of the monitoring location are provided in **Appendix D**.

Table 2.2 Noise Monitoring Locations

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

2.6 Noise Monitoring Methodology

2.6.1 Noise measurements were made in accordance with Section III of the "Calculation of Road Traffic Noise (CRTN), 1998".

2.6.2 The noise measurements were conducted to obtain one sets of A-weighted L_{10} (1 hour) sound pressure level during the PM peak traffic hour in any one hour monitoring period between 1830 and 2000 at each designated monitoring station. Statistical results such as L_{eq} and L_{90} were also obtained for reference.

2.6.3 For Tat Yan House and Tat Chui House, noise measurements were conducted at a point 1m from exterior of the sensitive receiver building façade.

2.6.4 The wind speed should be checked with a portable wind meter. Observations were recorded when intrusive noise was unavoidable. No noise monitoring should be carried out in case in the presence of fog, rain, wind with a steady speed exceeding 5 m/s, or wind with gusts exceeding 10 m/s.

2.7 Traffic Survey

2.7.1 Road traffic data including average vehicle speeds, number of vehicles per hour and percentage of heavy vehicles for both west-bound and east-bound of Po Lam Road were recorded at the time of noise measurement for the two monitoring stations. The road traffic count details are summarized in **Table 2.3**.

Table 2.3 Road Traffic Count Details

Noise Monitoring Locations	Sensitive Receiver ID.	Location of Road Traffic Count
30/F, Tat Yan House of Po Tat Estate	2094	Roof top of Tat Yan House
30/F, Tat Chui House of Po Tat Estate	2088	Roof top of Tat Chui House

2.8 Projected Noise Levels

2.8.1 The measured noise levels should be compared with the predicted noise levels by the application of appropriate corrections to normalise the traffic conditions of the assessment year as adopted in the EIA Study (i.e.Year 2011).

2.8.2 The correction factor should be calculated as follows:

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

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

2.8.3 The traffic noise prediction and effectiveness of the proposed noise mitigation measures should be verified by this monitoring. The discrepancy, if any, should be reported to the EPD.

3 RESULTS AND OBSERVATIONS

3.1 General

3.1.1 During the course of noise monitoring, road traffic along Po Lam road was the major noise source. Noise data were continuously recorded by sound level meters at an interval of 1 minute.

3.2 Traffic Noise Monitoring Results

3.2.1 The operational phase noise monitoring was conducted on a weekday during PM peak traffic hour from 18:30 to 20:00 on 04 September 2018. The weather condition during the monitoring days were fine. Random check of wind speed at the monitoring stations showed that it was below 5 m/s.

3.2.2 The noise levels measured during 18:30 – 19:30 were taken as the representative PM peak hour noise level. **Table 3.1** summarizes the traffic noise measurement results during the PM peak hour.

Table 3.1 Noise Measurement Results

Monitoring Date	Monitoring Station	Period	Measured Noise Level (Mitigated), $L_{10\ (1\text{-}hr)}$ dB(A)
04 September 2018	Tat Yan House	PM Traffic Peak hour (18:30 – 19:30)	64.6
04 September 2018	Tat Chui House		65.1

3.3 Road Condition and Traffic Survey

3.3.1 The traffic conditions along the concerned road sections were normal and there was no traffic congestion during the monitoring period.

3.3.2 Details of the traffic flow, percentage of heavy vehicle and estimated traffic speed collected during the survey are presented in **Appendix B**. **Table 3.2** shows a summary of the traffic data obtained in the peak hour.

Table 3.2 Traffic Survey Results

Monitoring Station		No. of Vehicles	Percentage of Heavy Vehicles	Average Vehicle Speed (km/h)
30/F, Tat Yan House	East Bound	636[a]	11	71
	West Bound	660	27	66
30/F, Tat Chui House	East Bound	996[a]	25	42[b]
	West Bound	654	20	68

Notes:
(a) According to the observation during the operational noise monitoring, some vehicles from east-bound traffic counting position for Tat Chui House were driven into On Sau Road or the internal road of Po Tat Estate before reaching the east-bound traffic counting position for Tat Yan House. Therefore, the counted number of vehicles for Tat Yan House is lower.
(b) According to the observation during the operational noise monitoring, east-bound vehicle speed measured at the road section that proposed for vehicle speed estimation for Tat Chui House is relatively lower due to traffic light control and vehicles moving uphill.

4 DISCUSSION

4.1 Predicted Noise Levels under the Traffic Flow Condition in 2011

4.1.1 According to approved EIA Report for the Project, the traffic forecast was produced for the design year of 2001, 2006 and 2011 as part of the Traffic Impact Assessment (TIA) of EIA study.

4.1.2 The traffic noise levels at the identified NSRs were predicted using the computer model "Road Noise" which implements the calculation method as prescribed in "Calculation of Road Traffic Noise (CRTN)" developed by the UK Department of Transport, Welsh Office in 1988.

4.1.3 In the EIA study, the traffic data of year 2011, which was agreed by the Transport Department, shows that the projected population figures of the future development of Shun On, Shun Lee, Shun Tin and Shun Lee THA and Rehabilitation of the existing Anderson Road Quarry planned beyond 2011 are included to predict a worst case traffic projection. The traffic forecast for year 2011 (AM peak hour) was therefore taken in the noise impact assessment to predict worst case noise impacts.

4.2 Predicted Noise Levels in Current Situation

4.2.1 According to the Updated EM&A Manual, the measured noise levels should be compared with the noise modeling result obtained with the counted traffic data.

4.2.2 The traffic flow, vehicular speed and percentage of heavy vehicle obtained during the course of traffic noise measurements and that adopted in the approved EIA report for the assessment year of 2011 are summarized in **Table 4.1**.

Table 4.1 Counted Traffic Data and Traffic Data in the Approved EIA Report for the assessment year of 2011

Road	No. of Vehicles (East Bound + West Bound)	Percentage of Heavy Vehicles	Estimated Speed (km/h)
Traffic data from the approved EIA report for the Project			
Po Lam Road (Road Segment No.124-126)	4040	19	50
Counted traffic data during operational noise monitoring			
Po Lam Road (Counted from Tat Yan House)	1296	19.4 (a)	68.6 (a)
Po Lam Road (Counted from Tat Chui House)	1650	23.3 (a)	52.5 (a)

Note:
(a) Averaged value of east bound and west bound counted traffic data.

4.2.3 Based on the counted traffic data, correction factors are calculated based on the equation shown in **Section 2.8.2**. **Table 4.2** shows the measured noise levels, the projected noise levels and the EIA predicted noise levels in assessment year of 2011 in comparison with the noise standard.

Table 4.2 Comparison of the Projected Noise Levels and the EIA Predicted Noise Levels

Monitoring Station	Noise Level, $L_{10\ (1\text{-}hr)}$ dB(A)				
	Measured Noise Level [1]	Correction Factor [2]	Projected Noise Level [(a)] [1]+[2]	EIA Predicted Noise Level in Year 2011 (AM Peak Hour)	Noise Standard
30/F, Tat Yan House	64.6	3.6	68.2	68.6	70
30/F, Tat Chui House	65.1	3.2	68.3	68.7	70

Note:
(a) The noise level that projected to the traffic condition that adopted in the approved EIA report for the assessment year of 2011 from the measured noise level.

4.2.4 As shown in **Table 4.2**, all of the measured noise levels and the projected noise levels are within the criterion of 70 dB(A). The projected noise levels and the EIA predicted noise level in Year 2011 are considered comparable within a reasonable deviation range. Hence, the noise mitigation measures implemented are considered effective.

5 CONCLUSION

5.1.1 The Operational Phase Noise Monitoring was conducted from 18:30 to 20:00 on 04 September 2018 in accordance with the methodology and requirements set out in the Updated EM&A Manual. The weather condition during the monitoring days were fine. The traffic conditions along the concerned road sections were normal and there was no traffic congestion during the monitoring periods. All of the measured noise levels are within the criterion of 70 dB(A).

5.1.2 The traffic flow, speed and percentage of heavy vehicles were recorded during the monitoring period. The measured noise levels were projected to the traffic condition that adopted in the approved EIA report for the assessment year of 2011 in order to compare with the predicted traffic noise levels in the approved EIA report. The projected noise levels and the EIA predicted noise levels for each of the NSRs are considered comparable within a reasonable deviation range. In conclusion, the noise mitigation measures implemented are considered effective.

APPENDIX A

Calibration Certificates

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 18CA0406 02-01 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2238	,	4188
Serial/Equipment No.:	2285692	,	2250455
Adaptors used:	-	,	-

Item submitted by

Customer Name:	AECOM ASIA CO., LTD.
Address of Customer:	-
Request No.:	-
Date of receipt:	06-Apr-2018

Date of test: 10-Apr-2018

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	08-Sep-2018	CIGISMEC
Signal generator	DS 360	33873	25-Apr-2018	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	50 ± 10 %
Air pressure:	1005 ± 5 hPa

Test specifications

1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.

2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.

3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsess of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory: Feng Jun Qi **Date:** 11-Apr-2017 **Company Chop:** SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
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Fax: (852) 2555 7533

HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 18CA0406 02-01 **Page** 2 **of** 2

1, Electrical Tests

The electrical tests were perfomed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	
	C	Pass	1.0	2.1
	Lin	Pass	2.0	2.2
Linearity range for Leq	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
Frequency weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100μs rectangular pulse	Pass	0.3	
R.M.S. accuracy	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor $1/10^3$ at 4kHz	Pass	0.3	
	1 ms burst duty factor $1/10^4$ at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Expanded Uncertanity (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

3, Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by: Fung Chi Yip **Date:** 10-Apr-2018

Checked by: Lam Tze Wai **Date:** 11-Apr-2017

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

CERTIFICATE OF CALIBRATION

Certificate No.: 18CA0321 01-01

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone	Pream
Manufacturer:	B & K	,	B & K	B & K
Type/Model No.:	2270	,	4950	ZC0032
Serial/Equipment No.:	2644597	,	2879980	19428
Adaptors used:	- (N.012.01)	,	-	-

Item submitted by

Customer Name:	AECOM ASIA CO LTD
Address of Customer:	-
Request No.:	-
Date of receipt:	21-Mar-2018

Date of test: 24-Mar-2018

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	08-Sep-2018	CIGISMEC
Signal generator	DS 360	33873	25-Apr-2018	CEPREI
Signal generator	DS 360	61227	01-Apr-2018	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	50 ± 10 %
Air pressure:	1005 ± 5 hPa

Test specifications

1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.

2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.

3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsess of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory: Feng Jun Qi **Date:** 24-Mar-2018 **Company Chop:** SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

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SOILS & MATERIALS ENGINEERING CO., LTD.
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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 18CA0321 01-01 **Page** 2 **of** 2

1, Electrical Tests

The electrical tests were perfomed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Uncertainty (dB) / Coverage Factor	
Self-generated noise	A	Pass	0.3	
	C	Pass	1.0	2.1
	Lin	Pass	2.0	2.2
Linearity range for Leq	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
Frequency weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100μs rectangular pulse	Pass	0.3	
R.M.S. accuracy	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor $1/10^3$ at 4kHz	Pass	0.3	
	1 ms burst duty factor $1/10^4$ at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Uncertainty (dB) / Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3
	Weighting A at 8000 Hz	Pass	0.5

3, Response to associated sound calibrator

N/A

The uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95 %. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by: Fung Chi Yip **Date:** 24-Mar-2018

Checked by: Lam Tze Wai **Date:** 24-Mar-2018

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

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Fax: (852) 2555 7533

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CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 18CA0406 02-02 **Page:** 1 **of** 2

Item tested

Description:	Acoustical Calibrator (Class 1)
Manufacturer:	B & K
Type/Model No.:	4231
Serial/Equipment No.:	3006428 / N004.03
Adaptors used:	-

Item submitted by

Curstomer:	AECOM ASIA CO LIMITED
Address of Customer:	-
Request No.:	-
Date of receipt:	06-Apr-2018

Date of test: 09-Apr-2018

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	11-Apr-2018	SCL
Preamplifier	B&K 2673	2743150	05-May-2018	CEPREI
Measuring amplifier	B&K 2610	2346941	03-May-2018	CEPREI
Signal generator	DS 360	33873	25-Apr-2018	CEPREI
Digital multi-meter	34401A	US36087050	25-Apr-2018	CEPREI
Audio analyzer	8903B	GB41300350	21-Apr-2018	CEPREI
Universal counter	53132A	MY40003662	22-Apr-2018	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	50 ± 10 %
Air pressure:	1005 ± 5 hPa

Test specifications

1, The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.

2, The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.

3, The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

Details of the performed measurements are presented on **page 2** of this certificate.

Approved Signatory: Feng Jun Qi **Date:** 11-Apr-2018 **Company Chop:** SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Comments: The results reported in this certificate refer to the conditon of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

HOKLAS 028
CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 18CA0406 02-02 Page: 2 of 2

1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

(Output level in dB re 20 μPa)

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	94.20	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz **STF = 0.015 dB**

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz **Actual Frequency = 999.96 Hz**

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz **TND = 0.4 %**

Estimated expanded uncertainty 0.7 %

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by: Fung Chi Yip **Date:** 09-Apr-2018

Checked by: Lam Tze Wai **Date:** 11-Apr-2018

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
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Fax: (852) 2555 7533

HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 17CA0922 03-01 **Page:** 1 **of** 2

Item tested

Description:	Acoustical Calibrator (Class 1)
Manufacturer:	B & K
Type/Model No.:	4231
Serial/Equipment No.:	3014024 / N004.04
Adaptors used:	-

Item submitted by

Curstomer:	AECOM ASIA CO LIMITED
Address of Customer:	-
Request No.:	-
Date of receipt:	22-Sep-2017

Date of test: 28-Sep-2017

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	11-Apr-2018	SCL
Preamplifier	B&K 2673	2743150	05-May-2018	CEPREI
Measuring amplifier	B&K 2610	2346941	03-May-2018	CEPREI
Signal generator	DS 360	61227	01-Apr-2018	CEPREI
Digital multi-meter	34401A	US36087050	25-Apr-2018	CEPREI
Audio analyzer	8903B	GB41300350	21-Apr-2018	CEPREI
Universal counter	53132A	MY40003662	22-Apr-2018	CEPREI

Ambient conditions

Temperature:	23 ± 1 °C
Relative humidity:	55 ± 10 %
Air pressure:	1000 ± 5 hPa

Test specifications

1. The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
2. The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
3. The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

Details of the performed measurements are presented on **page 2** of this certificate.

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 28-Sep-2017 **Company Chop:**

SOILS & MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Comments: The results reported in this certificate refer to the conditon of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 17CA0922 03-01 **Page:** 2 **of** 2

1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

(Output level in dB re 20 μPa)

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	94.16	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz **STF = 0.007 dB**

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz **Actual Frequency = 1000.0 Hz**

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz **TND = 0.4 %**

Estimated expanded uncertainty 0.7 %

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by: Lai Sheng Jie **Date:** 28-Sep-2017

Checked by: Fung Chi Yip **Date:** 28-Sep-2017

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

APPENDIX B

Details Traffic Data

Appendix B - Details Traffic Data

Counted Traffic Data obtained on 04 September 2018 during PM Traffic Peak Hour

Sensitive Receivers		No. of Heavy Vehicle	No. of Light Vehicle	No. of Vehicles	No. of Vehicles (Hourly) [(a)]	Percentage of Heavy Vehicle (Hourly)	Estimated Speed (km/hr) [(b)]	No. of Heavy Vehicle	No. of Light Vehicle	No. of Vehicles	No. of Vehicles (Hourly)	Percentage of Heavy Vehicle (Hourly)	Estimated Speed (km/hr)
		East Bound						West Bound					
Tat Yan House	18:30-19:00	36	336	372	636	11%	71	90	222	312	660	27%	66
	19:00-19:30	36	228	264				90	258	348			
		East Bound						West Bound					
Tat Chui House	18:30-19:00	108	438	546	996	25%	42	78	240	318	654	20%	68
	19:00-19:30	144	306	450				54	282	336			

Note:

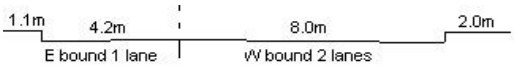
(a) According to the observation during the operational noise monitoring, some vehicles from east-bound traffic counting position for Tat Chui House were driven into On Sau Road or the internal road of Po Tat Estate before reaching the east-bound traffic counting position for Tat Yan House. Therefore, the counted number of vehicles for Tat Yan House is lower.

(b) According to the observation during the operational noise monitoring, east-bound vehicle speed measured at the road section that proposed for vehicle speed estimation for Tat Chui House is relatively lower due to traffic light control and vehicles moving uphill.

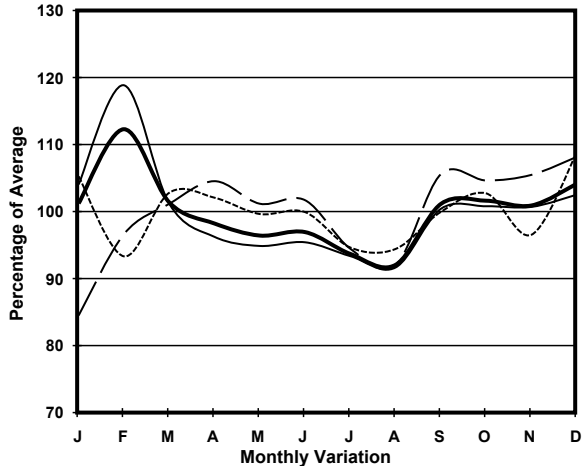
APPENDIX C

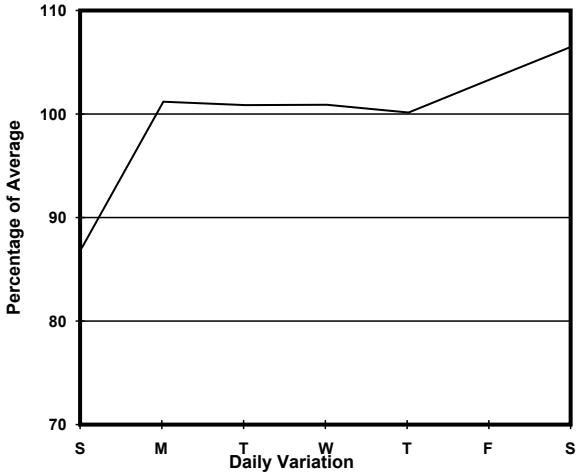
Traffic data of Po Lam Road extracted from the Annual Traffic Census 2017

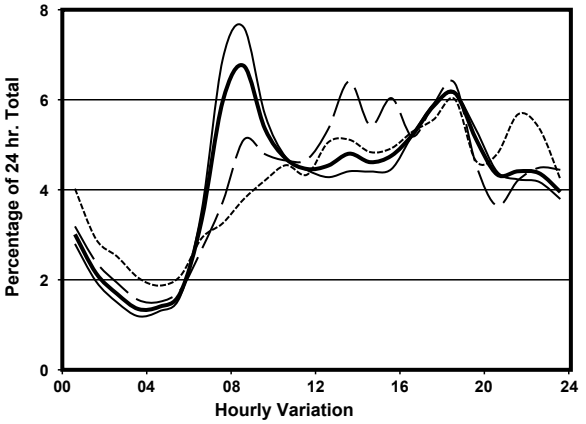
YEAR	2017	**LINK**	PO LAM RD (from ANDERSON RD to TSUI LAM RD)
CORE STATION	5023		
ROAD NETWORK	MAJOR		
ROAD TYPE	DISTRICT DISTRIBUTOR		

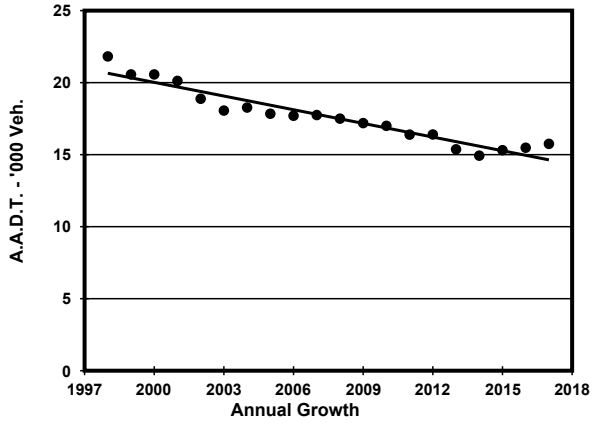


1. TRAFFIC FLOW VARIATION AND GROWTH









All day — Mon.- Fri. ····· Sat. - - - - - - Sun.

2. TRAFFIC CHARACTERISTICS (BY DIRECTION)

Parameter	All - Day	Mon. - Fri.	Sat.	Sun.
EAST BOUND				
A.A.D.T.	6990	7100	7290	6480
R 12 / 24 - %	61.9	63	60.9	57.2
R 16 / 24 - %	82.1	83.3	80.1	78.4
AM Peak Hour	0900-1000	0900-1000	0800-0900	0900-1000
One-way flow at AM peak hour	350	380	330	270
T - % (AM)	-	18.1	-	-
PM Peak Hour	1800-1900	1800-1900	1800-1900	1800-1900
One-way flow at PM peak hour	490	510	480	400
T - % (PM)	-	8.3	-	-
Prop.of commercial vehicles - 16 hr.	-	13.1	-	-
WEST BOUND				
A.A.D.T.	8760	8940	9680	7430
R 12 / 24 - %	64.2	65.1	65.7	56.7
R 16 / 24 - %	80.9	81.5	80.8	76.6
AM Peak Hour	0800-0900	0800-0900	0800-0900	0800-0900
One-way flow at AM peak hour	720	840	540	330
T - % (AM)	-	8.5	-	-
PM Peak Hour	1800-1900	1700-1800	1800-1900	1800-1900
One-way flow at PM peak hour	480	490	600	440
T - % (PM)	-	17.5	-	-
Prop.of commercial vehicles - 16 hr.	-	11.4	-	-

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	6.5	36.1	14.4	2.7	6.5	20.9	1.9	3.0	0.2	8.0
	Ocp	1.1	1.4	2.0	4.7	13.5	1.3	1.2	9.3	30.0	34.9
0800-0900	Pro	5.7	38.1	19.1	1.8	4.2	19.7	2.4	3.6	0.2	5.1
Peak hour	Ocp	1.1	1.4	2.0	4.7	11.6	1.4	1.0	6.5	23.5	40.7
0900-1000	Pro	4.5	29.6	19.7	2.5	3.3	24.3	7.0	2.5	0.1	6.6
	Ocp	1.0	1.5	2.0	3.2	6.6	1.7	1.2	7.3	7.0	26.0
1000-1100	Pro	4.4	36.5	24.5	1.8	4.0	19.3	2.9	0.4	0.0	6.2
	Ocp	1.1	1.4	1.9	1.2	4.4	1.5	1.0	10.0	0.0	16.1
1100-1200	Pro	3.8	36.5	23.1	1.9	7.1	12.8	3.2	1.3	0.0	10.3
	Ocp	1.0	1.5	1.7	1.0	7.4	1.7	1.6	10.5	0.0	15.5
1200-1300	Pro	5.3	38.2	21.7	3.9	4.6	13.8	2.6	2.0	0.0	7.9
	Ocp	1.3	1.4	1.8	4.7	8.0	1.3	1.8	4.0	0.0	17.5
1300-1400	Pro	2.2	26.3	22.4	2.2	7.3	27.4	2.8	0.6	0.3	8.5
	Ocp	1.0	1.5	1.5	4.0	8.8	1.6	1.6	18.0	12.0	18.7
1400-1500	Pro	3.9	31.7	10.4	3.2	8.4	26.5	3.2	3.2	0.2	9.2
	Ocp	1.0	1.3	1.3	2.0	5.5	1.6	1.8	2.0	23.0	19.7
1500-1600	Pro	6.1	19.9	23.5	5.1	6.1	25.0	5.1	2.0	0.1	6.9
	Ocp	1.1	1.5	1.5	5.5	7.8	1.4	1.5	7.3	6.0	22.6
1600-1700	Pro	2.9	25.9	24.5	3.8	5.3	25.9	1.0	4.3	0.0	6.4
	Ocp	1.0	1.4	1.5	5.8	11.0	1.4	1.5	4.6	0.0	31.1
1700-1800	Pro	3.6	35.1	19.6	3.6	4.6	18.7	2.3	5.9	0.1	6.5
	Ocp	1.0	1.4	1.6	5.1	13.0	1.3	1.2	1.6	29.0	41.0
1800-1900	Pro	7.9	37.4	23.3	1.4	4.8	17.5	2.1	0.3	0.2	5.2
	Ocp	1.1	1.3	1.6	1.3	9.2	1.4	1.0	1.0	26.5	43.3
1900-2000	Pro	7.3	45.3	22.4	0.0	4.3	10.8	1.3	0.4	0.2	8.0
	Ocp	1.1	1.3	1.9	0.0	9.2	1.7	1.0	1.0	8.5	29.1
2000-2100	Pro	8.1	33.4	29.1	0.0	6.2	11.8	0.6	0.0	0.2	10.7
	Ocp	1.1	1.4	1.7	0.0	10.5	1.4	4.0	0.0	32.0	17.1
2100-2200	Pro	2.1	39.0	38.4	0.0	5.5	2.7	1.4	0.7	0.3	9.9
	Ocp	1.0	1.4	1.6	0.0	5.6	1.3	1.0	1.0	9.0	20.7
2200-2300	Pro	5.6	38.0	35.9	0.0	3.1	6.7	2.1	0.5	0.0	8.1
	Ocp	1.0	1.4	1.5	0.0	6.0	1.2	1.5	1.0	0.0	19.1
16 hours	Pro	5.2	34.5	22.8	2.1	5.1	18.2	2.6	2.0	0.1	7.4
	Ocp	1.1	1.4	1.7	4.0	8.9	1.5	1.3	5.3	18.6	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

APPENDIX D

Figures of the locations of traffic noise monitoring and traffic survey

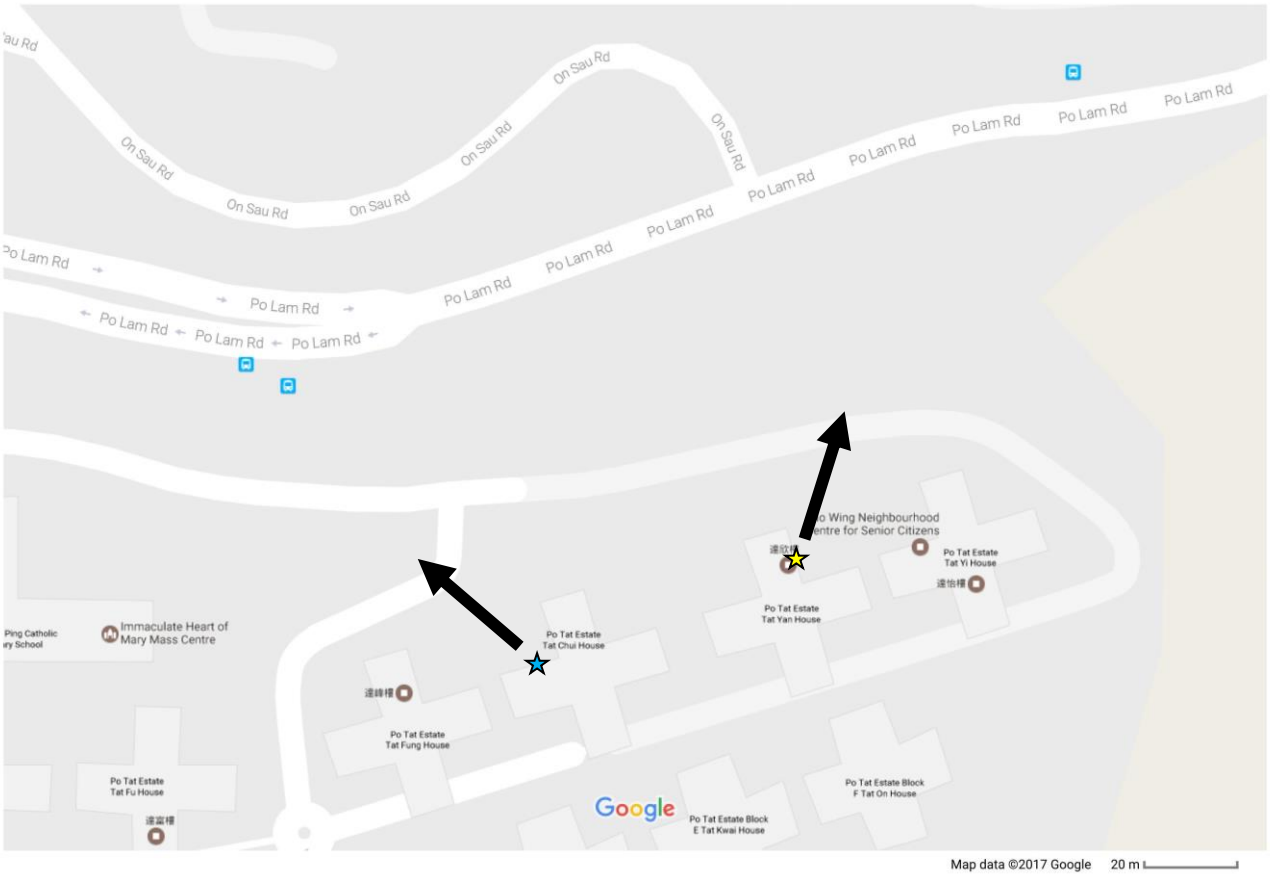


Figure 1 Equipment installation location

Legend:

- Location of sound level meter at Tat Chui House
- 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

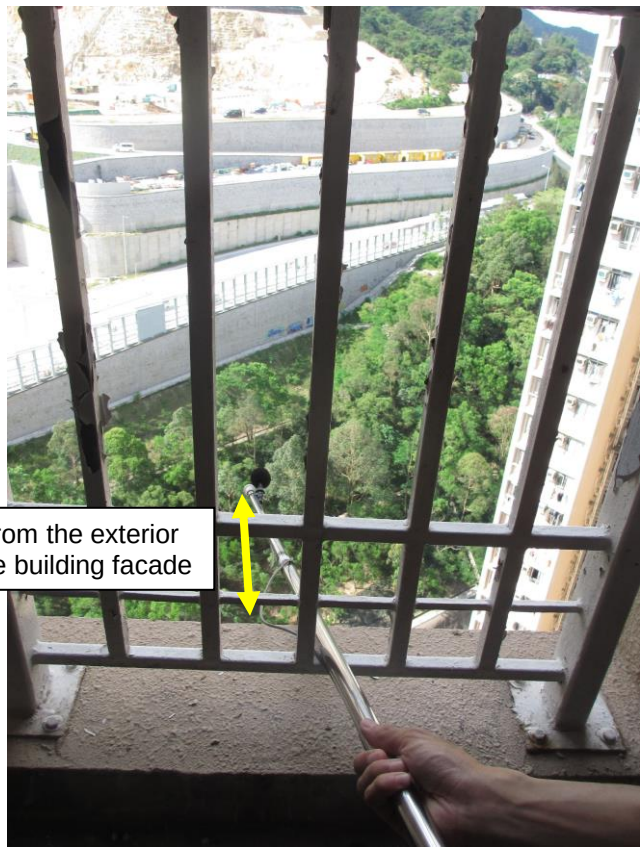


Figure 3 Equipment set-up at Tat Yan House

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

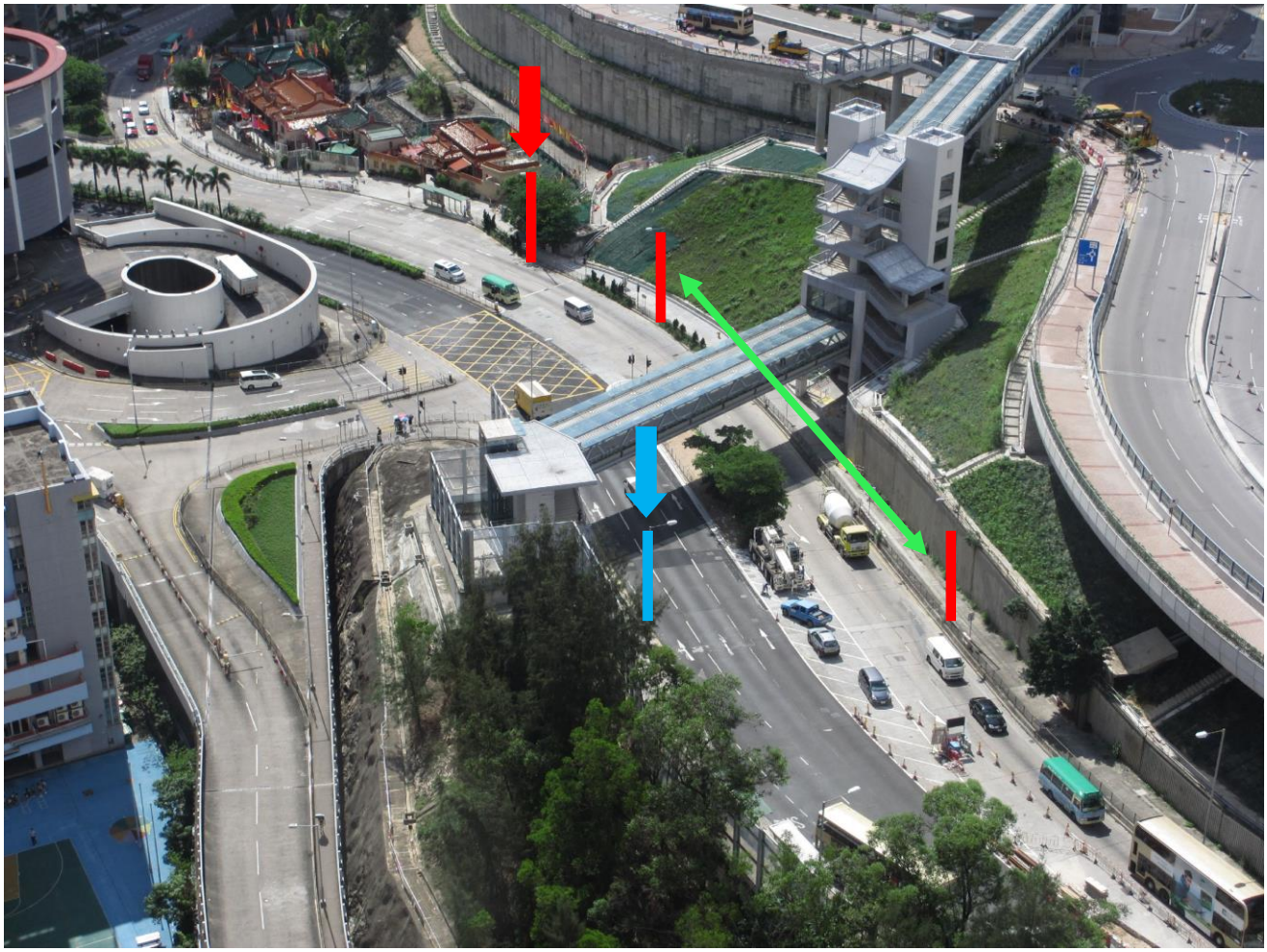


Figure 5 Location of counting vehicle on the two bounds of Po Lam Road and measuring speed of vehicles on the east bound at Tat Chui House rooftop

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

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

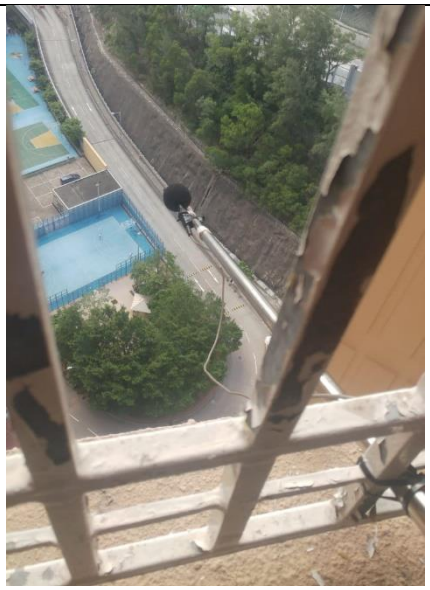
Figure 7 Location of carrying out traffic count and vehicle speed measurement at Tat Yan House rooftop

APPENDIX E

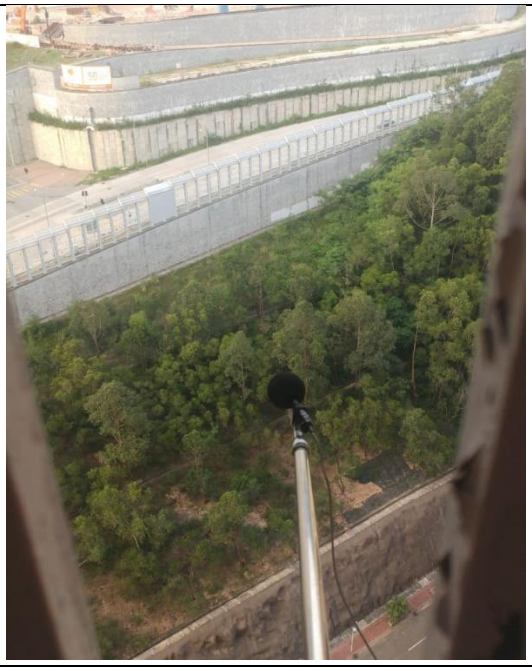
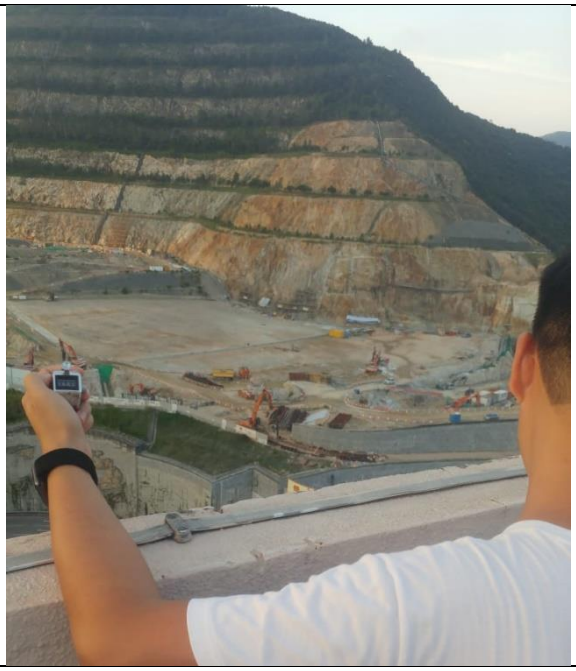
Site survey photo

Appendix E – Site survey photo

Tat Chui House

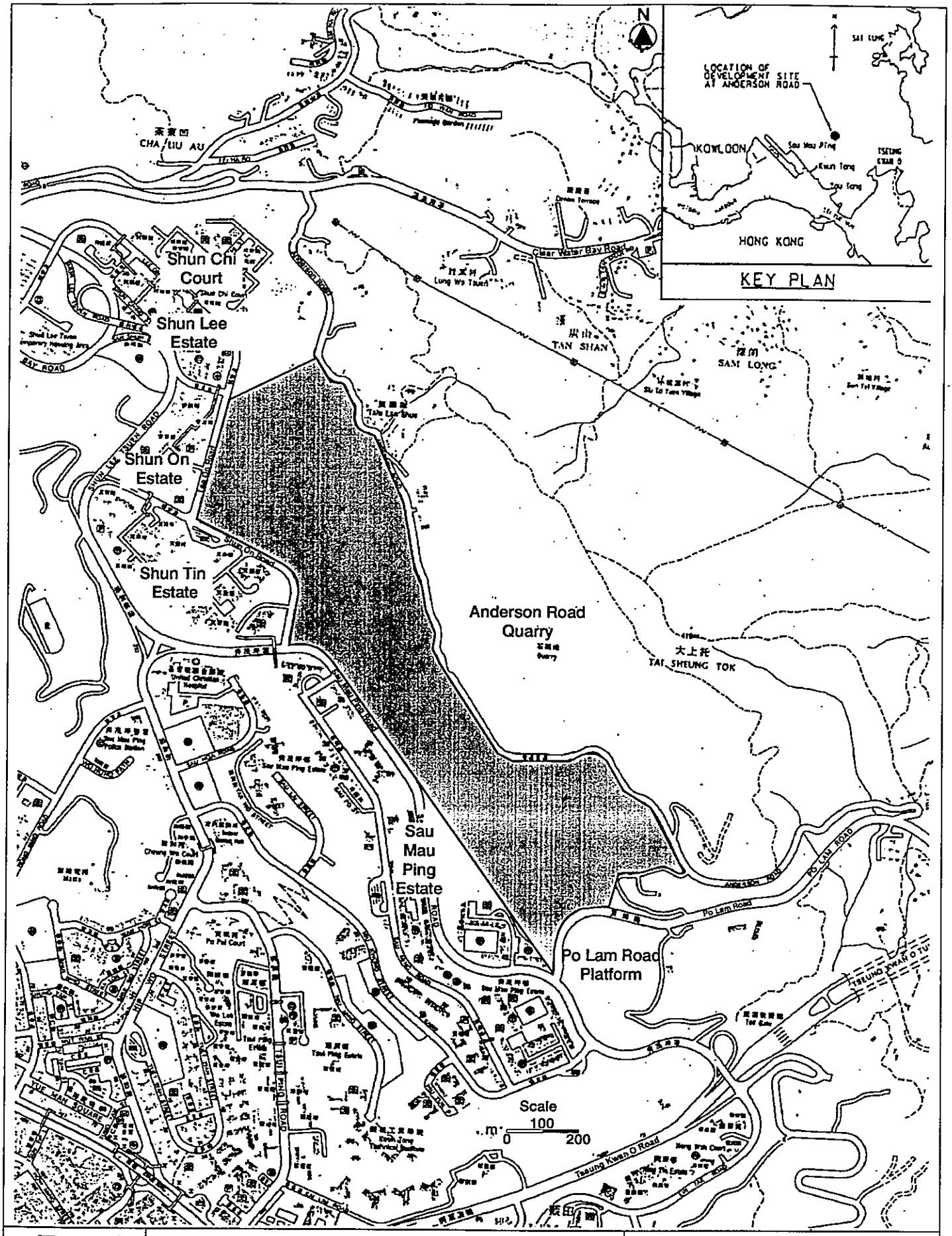
	
Traffic noise monitoring for Po Lam Road in Tat Chui House	Counting vehicle for Po Lam Road in Tat Chui House

Tat Yan House

	
Traffic noise monitoring Po Lam Road in Tat Yan House	Counting vehicle Po Lam Road in Tat Yan House

APPENDIX F

Project layout plan



環科 CES	TITLE: Location Plan of the Development Site	CES (ASIA) LIMITED	
		PROJECT NO: C210	DATE: January 1998
		DESIGNED: Suki Chung	DRAWING NO: Figure 1.1

PROPOSED FRESH WATER SERVICE RESERVOIR (POSITION INDICATIVE)

PROPOSED SALT WATER SERVICE RESERVOIR (POSITION INDICATIVE)

SERVICE RESERVOIRS ALSO TO SUPPLY THE CHOI WAN ROAD AND JORDAN VALLEY DEVELOPMENT (SEE NOTE)

PLAN SHOWING QUARRY ACCESS ROAD

QUARRY ACCESS ROAD

MATCHLINE

SCHEDULE OF USES AND AREAS		
USES	NET SITE AREA % HECTARES	%
R1	5.5178	
R5	6	
G/IC	2	
E	3	
OU	1	
LO	1	
A	0	
GB	5	
S	2	
	8	
MMUNITY		
TOTAL DEVELOPMENT AREA	57.9608	100.0
AI :NT	40,043 PERSONS	

URBA	ELECTRIC SUB STATION
CAR I	BOUNDARY OF PLANNING SCHEME
BUS T	ELEVATED ROAD
PUB/	WORKS BOUNDARY
SECO	PROPOSED FINISHED LEVEL (IN METRES ABOVE PD)
PRIM	PROPOSED PEDESTRIAN LINK
DRAI	PRIVATE TOWER WITH NUMBER OF RESIDENTIAL STOREYS
GAS (	PUBLIC / HOS TOWER WITH NUMBER OF RESIDENTIAL STOREYS
SOFT CUT SLOPE AT 30 DEGREES (MAX HEIGHT OF SLOPE TO BE 7m WITH 3m BERMS	POST OFFICE
ROCK CUT SLOPE AT 70 DEGREES (MAX HEIGHT OF SLOPE TO BE 10m WITH 3m BERMS	

NOTES

1. ALL DIMENSIONS SHOWN ON THIS PLAN ARE IN METRES
2. ALL SLOPES ARE INDICATIVE AND SUBJECT TO DETAILED STUDY
3. 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.

PEDESTRIAN LINK SUBJECT TO DETAILED DESIGN OF PROPERTY DEVELOPMENT

TRANSPORT FACILITIES CONTAINED IN PODIUM

WORK PACKAGE 3

WORK PACKAGE 2

PEDESTRIAN UNDERPASS

PLATFORM A

PLATFORM B

PLATFORM C(1)

PLATFORM C(2)

PLATFORM D

PLATFORM E

PLATFORM F

INDICATIVE ROAD CONNECTION INTO STAGE 1 SITE SUBJECT TO DETAILED DESIGN

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

SEE INSET PLAN FOR NEW QUARRY ACCESS ROAD

RE-ALIGNED SAI WAN PING ROAD

N

0 100 200 300 400m

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^2	
Total No. of Units:	5,328 private units @ 70m^2 (8 flats per floor)	
	584 sandwich / c units @ 70m^2 (8 flats per floor)	
	7,390 public units @ 61.45 m^2 (10 flats per floor)	
	Total = 13,302 units (867,984 m^2)	
Car parking spaces	3505	
Loading / Unloading Facilities	44	
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
Retail accommodation @ 0.4 sqm / person	16,354 sqm.	
Towers:	37 towers	

Schedule of Accommodation					
Platform	Gross Site Area (ha)	Net Developable Area (ha)	Max. Allowable GFA (m^2)	Total No. of Units	Approx. No. of Towers
A	2.0	0.7840	58,800	840	1 x 32 storeys (private) 1 x 35 storeys (sandwich / c) 1 x 38 storeys (sandwich / c)
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)
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/IC 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

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

TITLE: PROJECT LAYOUT PLAN

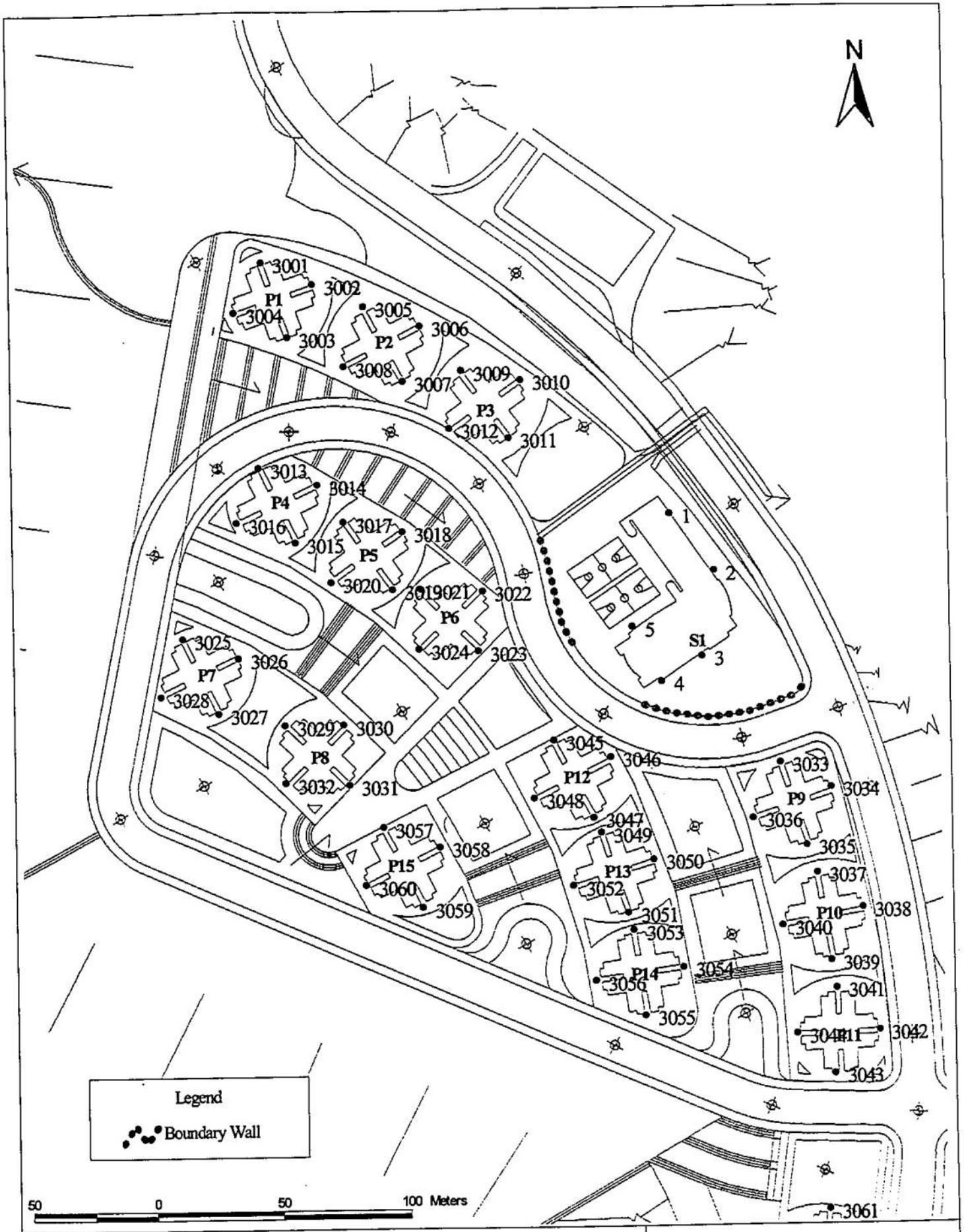
SCALE: AS SHOWN | DATE: SEPTEMBER 1994

DESIGNED | DRAWN

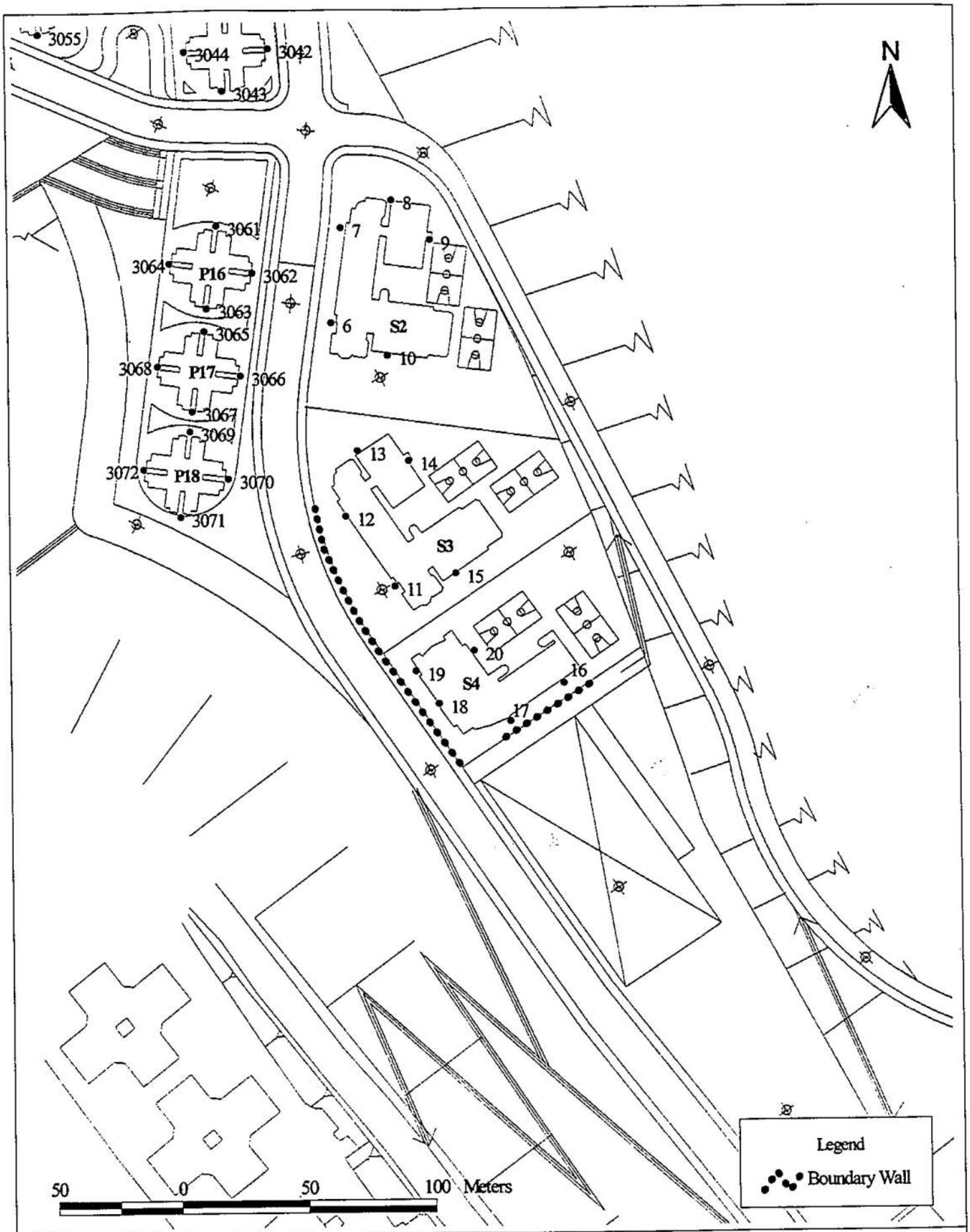
CAD REF: 007_E_L_DGN | DRAWING No: Figure 1.2 | REV

APPENDIX G

Proposed noise mitigation measures for the project



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 1.4



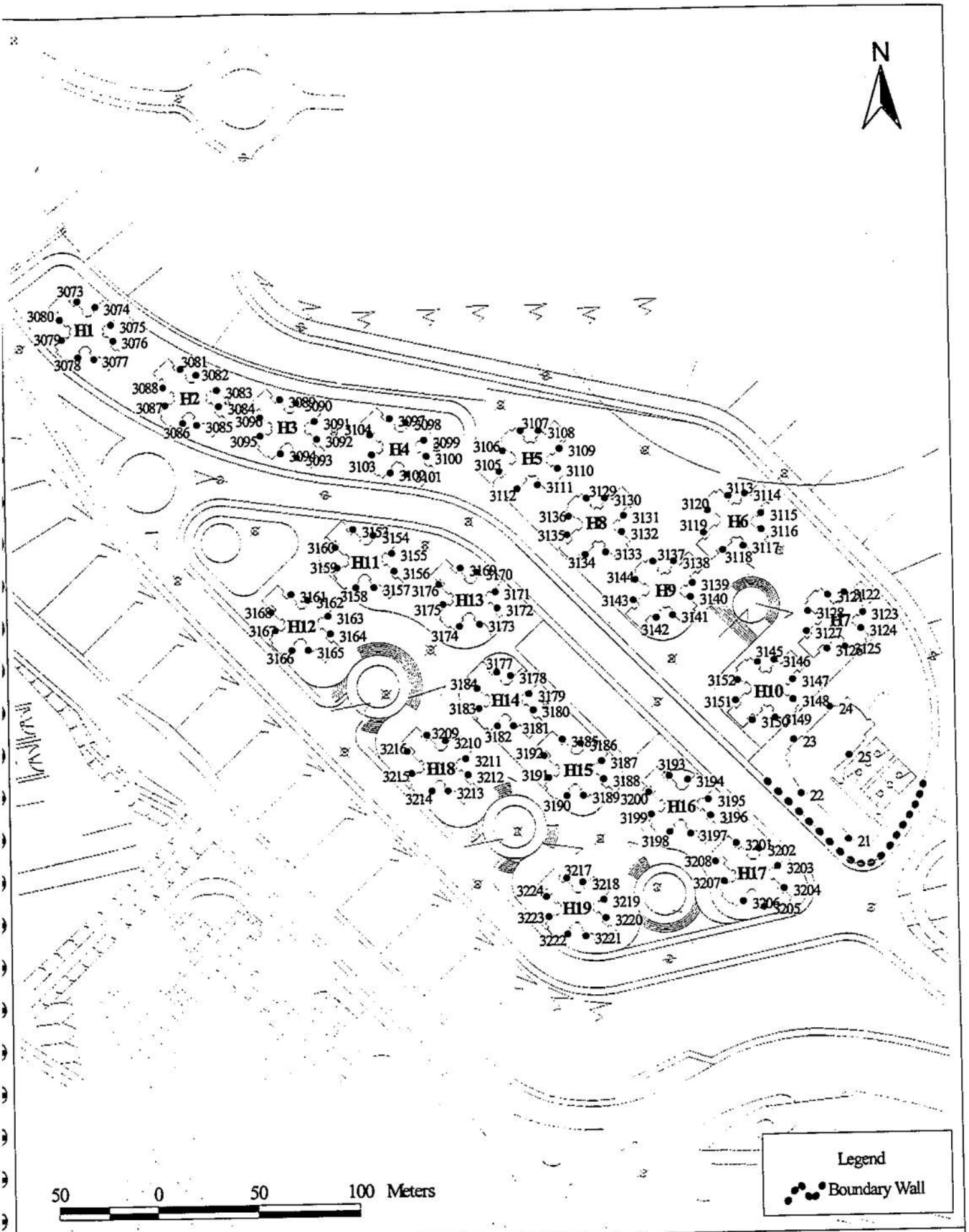
環科 CES

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



環科 CES	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	

841 800 E

821 200 N

821 000 N

841 600 E

165

161.6

160

170

164

160

S1

P9

49

P10

49

P3

38

3m HIGH BOUNDARY WALL
(LENGTH = 72m)

P2

35

G

3m HIGH BOUNDARY WALL
(LENGTH = 50m)

158

160

160

156

160

156

P1

32

P12

49

P13

46

P14

42

151

P6

49

P5

40

154

P4

31

160

160

150

150

152

P8

34

P15

37

150

P7

0 10 20 30
METRES

PLATFO

Maunsell
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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

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

SCALE	1 : 1000	DATE	SEPTEMBER 98
DESIGNED	TMK	DRAWN	EW
CAD REF.		CHECKED	REV.

Figure 1.13

PLATFORM C(2)

842 000 E

841 800 E

820 800 N

155

160

165

155

153.5

P11

49

151

152

152

150

P16

49

150

43

P17

36

P18

148

S2

SS

141

S3

SS

144

145

140

PS

S4

140

3m HIGH BOUNDARY WALL
(LENGTH ≈ 40m)

3m HIGH BOUNDARY WALL
(LENGTH ≈ 118m)

0 10 20 30
METRES

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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

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

SCALE	1 : 1000	DATE	SEPTEMBER 98
DESIGNED	TMK	DRAWN	EW
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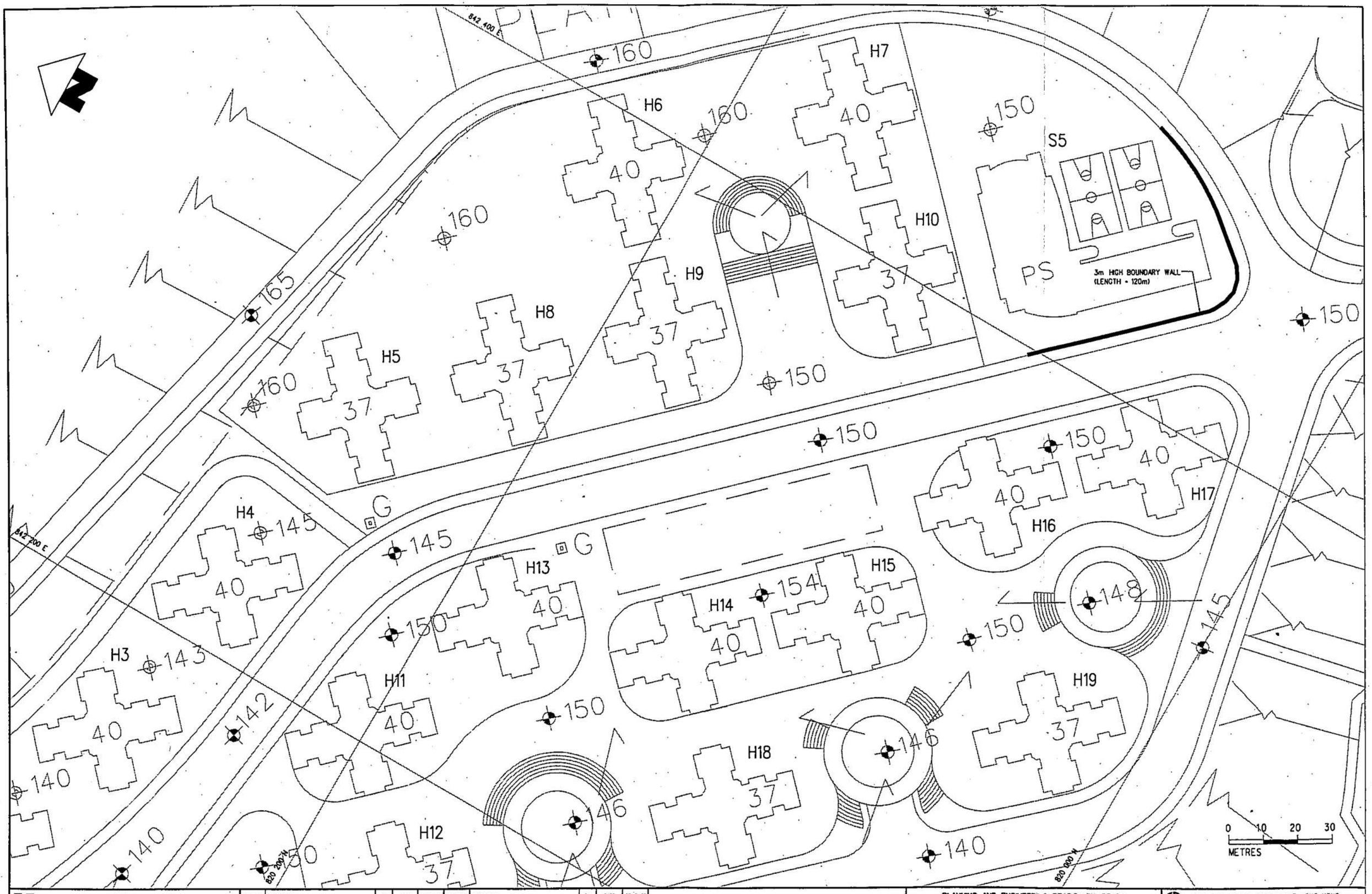
			REV



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REVISION	DESCRIPTION	BY	DATE	REVIEWED	REVISION	DESCRIPTION	BY	DATE	REVIEWED

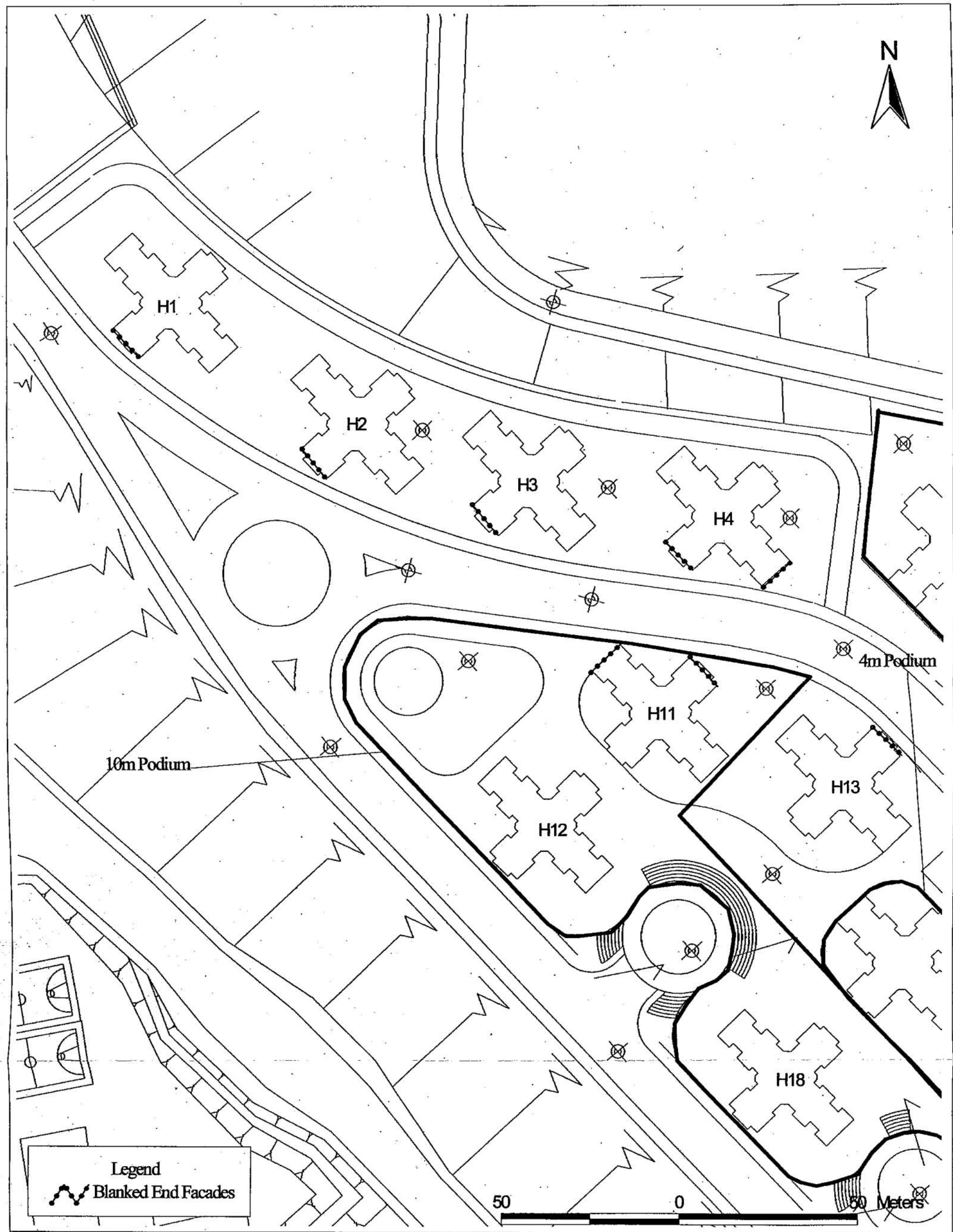
PLANNING AND ENGINEERING FEASIBILITY STUDY FOR DEVELOPMENT AT ANDERSON ROAD

CIVIL ENGINEERING DEPARTMENT, HONG KONG

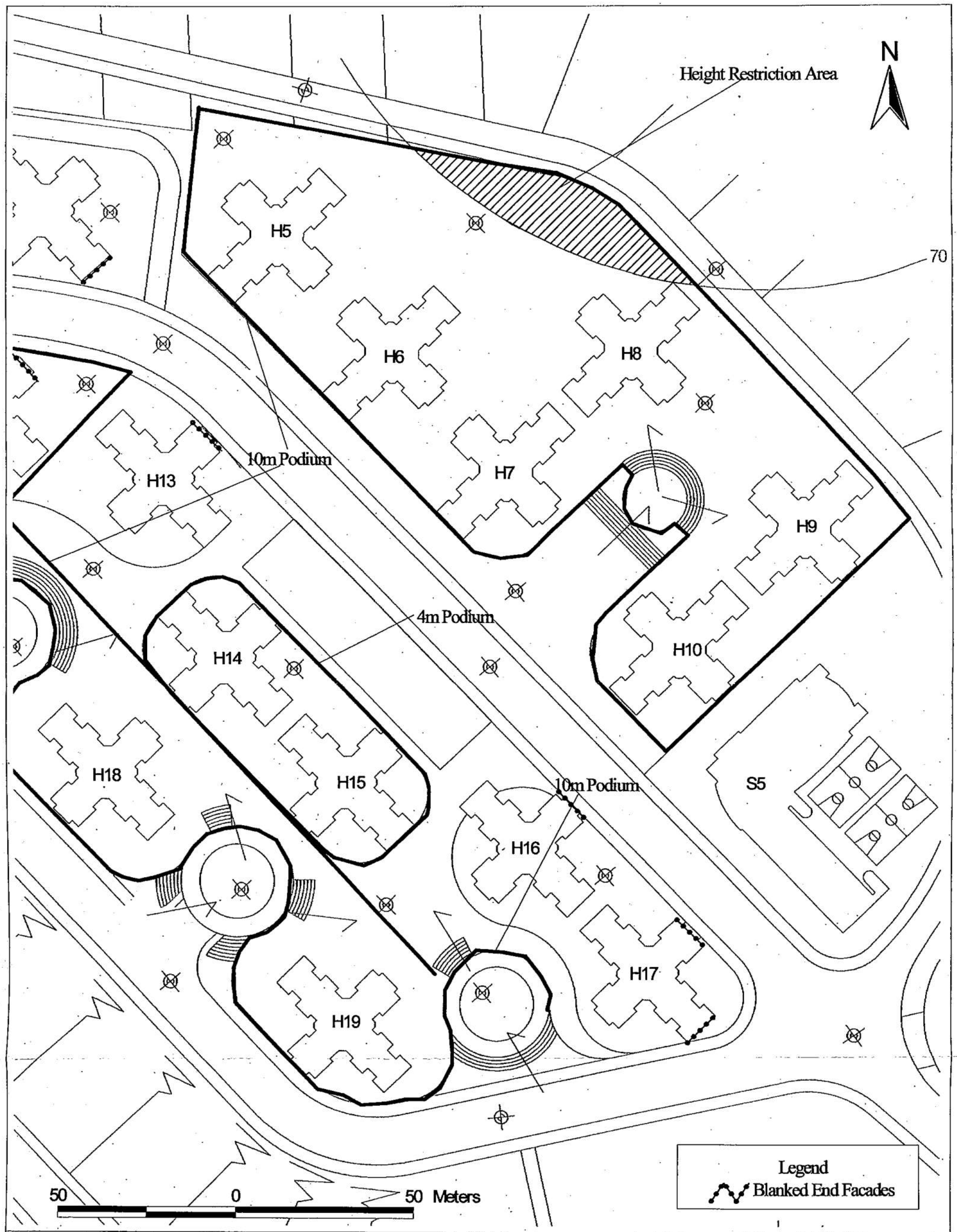
TITLE: PROPOSED NOISE MITGATION MEASURES FOR ANDERSON ROAD DEVELOPMENT SITE

SHEET 3 OF 5

SCALE	1:1000	DATE	SEPTEMBER 98
DESIGNED	TMK	DRAWN	EW
CAD REF.		DRAWING No.	Figure 1.15



環科 CES	TITLE: Proposed Noise Mitigation Measures for Anderson Road Development Site - Sheet 4 of 5	CES (ASIA) LIMITED	
		PROJECT NO. C210	DATE Sept.1998
		DESIGNED Fanny Lau	DRAWING NO. Figure 1.18



環科 CES	TITLE: Proposed Noise Mitigation Measures for Anderson Road Development Site - Sheet 5 of 5	CES (ASIA) LIMITED	
		PROJECT NO. C210	DATE Sept.1998
		DESIGNED Fanny Lau	DRAWING NO. Figure 1.19

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

N

Legend

7m High Cantilevered Noise Barrier by Housing Department

Reprovision of 7m High Cantilevered Noise Barrier by Highway Department

環科 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