MTR Corporation Limited

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Kwun Tong Line Extension (KTE)

Baseline Monitoring Report (Revision A)

(July 2011)

Verified by	
Position:	Independent Environmental Checker
Date:	8 Jaby 2011

MTR Corporation Limited

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Certified by: <u>glenn Frommer</u> Position: <u>Environmental Team Leader</u> - 8 JUL 2011 Date:

# MTR Corporation Limited

# Kwun Tong Line Extension Project Baseline Monitoring Report (Revision A)

July 2011

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# EXECUTIVE SUMMARY

### Background

MTR Corporation Limited (MTRCL) proposes to build a new railway line, the Kwun Tong Line Extension (KTE), otherwise referred to as 'the Project', which is an extension of the existing Kwun Tong Line from Yau Ma Tei Station to Whampoa area. The route length of the fully underground KTE is approximately 2.6 km with two new stations namely Ho Man Tin Station (HOM) and Whampoa Station (WHA).

#### Impact Assessment and Baseline Monitoring

With the development of the Environmental Monitoring and Audit Manual (EM&A Manual) in accordance with the guideline set out in the Environmental Impact Assessment (EIA) report prepared by Meinhardt Infrastructure and Environmental Limited in June 2010. The baseline monitoring has been conducted at the agreed monitoring locations to establish action and target levels for both construction dust and noise for the civil construction work of the Project.

#### Results and Conclusions

Baseline monitoring has been carried out in accordance with the recommendations contained in the Technical Memoranda associated with EIAO, Air Pollution Control Ordinance and Noise Control Ordinance, where applicable. Results and Conclusions are presented in the subsequent sections of this report.

# 1 INTRODUCTION

# 1.1 BACKGROUND

The Kwun Tong Line Extension Project

MTR Corporation Limited (MTRCL) proposes to build a new railway line, the Kwun Tong Line Extension (KTE), otherwise referred to as 'the Project', which is an extension of the existing Kwun Tong Line from Yau Ma Tei Station to Whampoa area. The route length of the fully underground KTE is approximately 2.6 km with two new stations namely Ho Man Tin Station (HOM) and Whampoa Station (WHA).

- 1.1.1 An EIA study (refer to EIA Report dated June 2010) has been conducted by Meinhardt Infrastructure and Environmental Limited for the Project. An EM&A Manual has provided guidelines in the preparation of this baseline monitoring report.
- 1.1.2 Baseline levels have been established for both dust and noise, by which the performance of the construction contractors may be measured in meeting the required environmental protection standards and requirements under the Environmental Permit, during the course of the construction work. These are presented in subsequent sections of this report.
- 1.1.3 Monitoring locations for both dust and noise have been identified in the EM&A Manual but access to some of the proposed monitoring locations, namely Lok Ka House (CD3), Block 1, Cherry Mansions, Whampoa Garden Site 2 (CD4) and Harbourfront Horizon (CD6) for dust monitoring; and Caritas Bianchi College of Careers (CN5) for noise monitoring, were not granted. Alternative monitoring locations were proposed in the Alternative Proposal which was submitted on 14 Apr 2011 and agreed by the Environmental Protection Department on 29 Apr 2011.
- 1.1.4 This Baseline Monitoring Report presents the results for the baseline monitoring conducted for both dust and noise at the agreed monitoring locations and establishes action and target levels for both construction dust and noise for the civil construction work of the Project.

# 1.2 ORGANISATION OF THE REPORT

Following the introduction, the remainder of this Report is arranged as follows:

- Section 2	describes the air quality monitoring methodology and analyses the monitoring results;
- Section 3	describes the noise monitoring methodology and analyses the monitoring results.
- Section 4	Conclusions

# 2 AIR QUALITY

# 2.1 MONITORING METHODOLOGY

Monitoring was undertaken to establish baseline levels for both 1-hour and 24hour Total Suspended Particulates (TSP) at the proposed monitoring locations. This provides data against which any environmental impacts due to construction activities can be compared. During the construction period impact monitoring will only be conducted for 24-hour TSP, although 1-hour TSP monitoring may also be conducted and used in following up on complaints or exceedances, in order to provide a more rapid indication of the source of the problem at hand.

Baseline monitoring stations for both 1-hour and 24-hour TSP measurements have been established at the following locations, see *Figures 2.1-2.4*:

- CD1 Queen Elizabeth Hospital Specialist Clinic
- CD2 Yee Fu Building
- CD3a No. 238 Chatham Road North
- CD4a Ka Fu Building, Whampoa Estate
- CD5 Fung Kei Millennium Primary School
- CD6a Site Boundary of Finger Pier adjacent to Harbourfront Horizon

As per the requirements of the EM&A Manual, three 1-hour TSP measurements daily for a period of at least 14 days were made at the monitoring stations to establish the ambient 1-hour TSP levels.

24-hour TSP measurements were carried out over a continuous period of at least 14 days at the monitoring stations to establish the ambient 24-hour TSP levels.

24-hour samples were collected by High Volume Sampler (Graseby-Andersen) following United Sates Environmental Protection Agency regulations and 1-hour TSP levels were measured by real time dust monitor (MIE - DataRam).

# 2.2 CALIBRATION REQUIREMENTS

The flow rate of the high volume sampler with mass flow controller will be calibrated using an orifice calibrator. Initial calibration (five points) will be conducted upon installation and prior to commissioning. Calibration will be carried out every six months. Calibration certificate is attached in Annex C.

The sensing system of MIE is calibrated by clean filtered air passing through the flow-sensing system, providing a controlled check of the zeroconcentration condition. Calibration of the MIE by certified laboratory or manufacturer shall be carried out every two years and properly documented. Calibration certificate is attached in Annex C. The samplers shall be properly maintained. Prior to dust monitoring commencing, appropriate checks shall be made to ensure that all equipment and necessary power supply are in good working condition.

# 2.3 MONITORING PROCEDURES

# 1-hour TSP Levels Monitoring

TSP is sampled by drawing air into the MIE where particulate concentrations are measured instantaneously with an in-built silicon detector sensing light scattered by the particles in the sampled air (optical sensing stage). Continuous TSP levels are indicated on the MIE along with a 'Time Weighted Average' value.

#### 24-hour TSP Levels Monitoring

The sampling procedure follows to that described in the App. B of Pt 50 in 40CFR Ch.1 (U.S. Environmental Protection Agency). TSP is sampled by drawing air through a conditioned, pre-weighed filter paper inside the high volume sampler at a controlled rate. After 24-hour sampling the filter paper with retained particles shall be collected and returned to the laboratory for drying in a desiccator followed by accurate weighing. TSP levels are calculated from the ratio of the mass of particulate retained on the filter paper to the total volume of air sampled.

# 2.4 MONITORING RESULTS

# 2.4.1 1-hour TSP

1-hour TSP baseline monitoring was conducted at the monitoring stations between 16 February 2011 and 11 April 2011. Weather conditions throughout the monitoring period were mild and relatively dry. Some rainy periods were recorded in the monitoring period.

The average 1-hour TSP baseline levels have been established from the baseline data listed in *Annex A*, and are shown in *Table 2.4a* below.

Monitoring Station	Monitoring Period	Baseline Level (µg/m <sup>3</sup> )
Queen Elizabeth Hospital – Specialist Clinic (CD1)	16 Feb – 1 Mar 2011	92
Yee Fu Building (CD2)	8 Mar – 21 Mar 2011	79
No. 238 Chatham Road North (CD3a)	21 Mar – 3 Apr 2011	94
Ka Fu Building, Whampoa Estate (CD4a)	29 Mar – 11 Apr 2011	81
Fung Kei Millennium Primary School (CD5)	16 Feb – 1 Mar 2011	90

Table 2.4a1-hour TSP Baseline Levels

Site boundary of Finger Pier adjacent to Harbourfront Horizon (CD6a)	8 Mar – 21 Mar 2011	102
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Note: TSP levels are to the nearest whole number, with values of 0.5 rounded up

Busy road traffic was observed along Gascoigne Road near CD1, and Chatham Road North near CD2 and CD3a. It was noted that the background TSP levels were mainly attributed to the dust particulate generated from the exhaust fumes from the road traffic.

#### Action and Limit Levels

To provide an early indication of any deterioration in the Contractor's environmental performance, Action Levels were derived based on the measured baseline levels. Limit Level is set at  $500\mu g/m^3$  for the 1-hour TSP level as recommended in the EIAO-TM.

For 1-hour TSP the Action Level for baseline smaller than or equal to  $384\mu g/m^3$  is the average of 130% of the baseline and the Limit Level. For baseline greater than  $384\mu g/m^3$  the Action Level is  $500\mu g/m^3$ . The derived levels for the monitoring stations are shown in *Table 2.4b* below.

Monitoring Station	Action Level (µg/m3)	Limit Level (µg/m3)
Queen Elizabeth Hospital – Specialist Clinic (CD1)	310	
Yee Fu Building (CD2)	301	
No. 238 Chatham Road North (CD3a)	311	<b>z</b> oo(1)
Ka Fu Building, Whampoa Estate (CD4a)	303	500 <sup>(1)</sup>
Fung Kei Millennium Primary School (CD5)	309	
Site boundary of Finger Pier adjacent to Harbourfront Horizon (CD6a)	316	

#### Table 2.4bBaseline, Action and Limit Levels for 1-hour TSP

<sup>1)</sup> - 1-hour TSP criterion recommended in the EIAO-TM

Note: TSP levels are to the nearest whole number, with values of 0.5 rounded up

# 2.4.2 24-hour TSP

24-hour TSP baseline monitoring was conducted at the monitoring stations between 11 February 2011 and 11 April 2011. Weather conditions throughout the monitoring period were mild and relatively dry. Some rainy periods were recorded in the monitoring period

The averaged 24-hour TSP baseline levels have been established from the baseline data listed in *Annex A*, and are shown in *Table 2.4c* below.

Monitoring Station	Monitoring Period	Baseline Level (µg/m <sup>3</sup> )
Queen Elizabeth Hospital – Specialist Clinic (CD1)	11 Feb – 24 Feb 2011	63
Yee Fu Building (CD2)	7 Mar – 20 Mar 2011	82
No. 238 Chatham Road North (CD3a)	19 Mar – 1 Apr 2011	96
Ka Fu Building, Whampoa Estate (CD4a)	29 Mar – 11 Apr 2011	87
Fung Kei Millennium Primary School (CD5)	11 Feb – 24 Feb 2011	58
Site boundary of Finger Pier adjacent to Harbourfront Horizon (CD6a)	8 Mar – 21 Mar 2011	80

Table 2.4c24-hour TSP Baseline Levels

Note: TSP levels are to the nearest whole number, with values of 0.5 rounded up

Busy road traffic was observed along Gascoigne Road near CD1, and Chatham Road North near CD2 and CD3a. It was noted that the background TSP levels were mainly attributed to the dust particulate generated from the exhaust fumes from the road traffic.

#### Action and Limit Levels

To provide an early indication of any deterioration in the Contractor's environmental performance, Action Levels were derived based on the measured baseline levels. Limit Level is set at  $260\mu g/m^3$  for the 24-hour TSP level as stipulated in the statutory Air Quality Objectives (AQOs) under the Air Pollution Control Ordinance.

For 24-hour TSP the Action Level for baseline smaller than or equal to  $200\mu g/m^3$  is the average of 130% of the baseline and the Limit Level. For baseline greater than  $200\mu g/m^3$  the Action Level is  $260\mu g/m^3$ . The derived levels for the monitoring stations are shown in *Table 2.4d* below.

Monitoring Station	Action Level (µg/m3)	Limit Level (µg/m3)
Queen Elizabeth Hospital – Specialist Clinic (CD1)	171	
Yee Fu Building (CD2)	183	
No. 238 Chatham Road North (CD3a)	192	260 <sup>(1)</sup>
Ka Fu Building, Whampoa Estate (CD4a)	187	
Fung Kei Millennium Primary School (CD5)	168	
Site boundary of Finger Pier adjacent to Harbourfront Horizon (CD6a)	182	

Table 2.4dBaseline, Action and Limit Levels for 24-hour TSP

<sup>(1)</sup> - 24-hour TSP criterion stipulated in the AQOs

Note: TSP levels are to the nearest whole number, with values of 0.5 rounded up

# 3 NOISE

#### 3.1 MONITORING METHODOLOGY

Monitoring was undertaken to establish baseline levels at the proposed monitoring locations. This provides data against which any environmental impacts due to construction activities can be compared.

Baseline monitoring stations have been established at the following locations, see *Figures 3.1-3.3*:

- CN1 Alhambra Building
- CN2 Methodist College
- CN3 Queen Elizabeth Hospital Specialist Clinic
- CN4 Yee Fu Building
- CN5 Caritas Bianchi College of Careers\*
- CN6 Lok Do Building
- CN7 Block Y, Ki Fu Building, Whampoa Estate
- CN8 Block I, Lok Wah Building, Whampoa Estate
- CN9 Block 13, Bauhinia Mansions, Whampoa Garden Site 11
- CN10 Block 1, Oak Mansions, Whampoa Garden Site 5
- CN11 Fung Kei Millennium Primary School
- CN12 GCEPSA Whampoa Primary School

\* Caritas Bianchi College of Careers has been relocated to Tiu Keng Leng with the original premise unoccupied and inaccessible. The baseline monitoring was carried out at the adjacent Bulkeley Building (CN5a) to provide a record of background noise level in case if the premise would be occupied by similar educational use in future.

Consecutive noise measurements were undertaken over a period of at least 14 days at the monitoring stations between 18 January 2011 and 5 April 2011 to establish the ambient noise levels at representative nearest sensitive receivers. Continuous 5 minute A-weighted noise levels were recorded throughout the monitoring period and the noise levels were then averaged over each 30 minute period to produce the baseline conditions.

Monitoring was conducted using B&K sound analysis equipment – B&K 2250L sound level meters. Microphones were extended 1 metre from building facades and oriented towards the future works sites.

Weather conditions throughout the monitoring period were mild and relatively dry. Some rainy periods were recorded in the monitoring period, and the baseline monitoring period had to be extended.

# 3.2 CALIBRATION REQUIREMENTS

B&K 2250L sound level meters and B&K 4231 calibrator which complied with the International Electrotechnical Commission Publication 651:1979 (Type 1) and 804:1985 (Type 1), specification as referred to in the Technical Memoranda to the NCO were used for the baseline monitoring. The sound

level meters and calibrator are verified by the certified laboratory or manufacturer once every two years to ensure they perform to the same level of accuracy as stated in the manufacturer's specifications. Calibration certificates are attached in Annex C.

Immediately prior to and following each set of measurements at any NSR, the accuracy of the sound level meter was checked using an acoustic calibrator generating a known sound pressure level at a known frequency. If the calibration levels before and after the measurement differ by more than 1.0dB the measurement shall be repeated to obtain a reliable result. Periods of prolonged or repeated overloading of the sound level meter detector were avoided by setting the meter with adequate headroom prior to commencing measurements. Measurements were recorded to the nearest 0.1 dB, with values of 0.05 being rounded up.

# 3.3 MONITORING RESULTS

5-minute, "fast" detector response, levels were recorded in the following indices,  $L_{Aeq}$ ,  $L_{A10}$ ,  $L_{A90}$ . The baseline data was initially downloaded into a spreadsheet, directly from the noise loggers in ASCII format for checking, and then imported into the database. The data were then averaged for each 30-minute period between 0700 and 1900 hours of 14 consecutive days (with rainy days excluded) to give the 'Time Slot Averaged' baseline levels for each 30-minute interval, and an 'Overall Baseline Level' for each monitoring station is established by averaging all the 'Time Slot Averaged' baseline levels between 0700 and 1900 hours of the 14 days. The baseline levels are presented in *Annex B*. The 'Overall Baseline Level' for each monitoring station is also given in *Table 3.3a* below.

Monitoring Station	Monitoring Period	Overall Baseline Level (dB(A), L <sub>Aeq(30min)</sub> )
Alhambra Building (CN1)	11 Feb – 2 Mar 2011	71
Methodist College (CN2)	20 Jan – 3 Feb 2011	75
Queen Elizabeth Hospital – Specialist Clinic (CN3)	10 Feb – 1 Mar 2011	64
Yee Fu Building (CN4)	4 Mar – 24 Mar 2011	70
Caritas Bianchi College of Careers (CN5)*	22 Mar – 5 Apr 2011	75
Lok Do Building (CN6)	4 Mar – 24 Mar 2011	71
Block Y, Ki Fu Building, Whampoa Estate (CN7)	1 Mar – 21 Mar 2011	71
Block I, Lok Wah Building, Whampoa Estate (CN8)	1 Mar – 21 Mar 2011	69
Block 13, Bauhinia Mansions, Whampoa Garden Site 11 (CN9)	8 Feb – 27 Feb 2011	70
Block 1, Oak Mansions, Whampoa Garden Site 5 (CN10)	8 Feb – 27 Feb 2011	66

Table 3.3aOverall Baseline Noise Level

Fung Kei (CN11)	Millennium	Primary	School	11 Mar – 28 Mar 2011	64
GCEPSA (CN12)	Whampoa	Primary	School	18 Jan – 1 Feb 2011	64

Note: Noise levels are to the nearest whole number, with values of 0.5 rounded up \* The baseline monitoring was carried out at the adjacent Bulkeley Building (CN)

\* The baseline monitoring was carried out at the adjacent Bulkeley Building (CN5a)

Busy road traffic was observed along Nathan Road near CN1, Gascoigne Road near CN2 and CN3, and Chatham Road North near CN4, CN5 and CN6. It was noted that the background noise levels were mainly attributed to the road traffic.

#### Action and Limit Levels

The Action Level is set on occurrence when one documented complaint is received while the Limit Levels are set at specific levels with reference to the uses of the sensitive receivers as recommended in EIAO-TM. The Limit Levels are only applicable for the monitoring stations where no residual impact is anticipated. In case residual impact is anticipated as predicted in the approved EIA Report, the residual impact shall be taken into account by comparing the future impact monitoring result with the Predicted Construction Noise Level in the approved EIA Report instead of the Limit Level. The Action Level, Limit Levels and Maximum Predicted Construction Noise Levels in the approved EIA Report are shown in *Table 3.3b*.

Monitoring Station	Action Level	Limit Level	Maximum Predicted Construction Noise Level, dB(A)
Alhambra Building (CN1)		75	74
Methodist College (CN2)		70 (65)	<u>75</u>
Queen Elizabeth Hospital – Specialist Clinic (CN3)		75	73
Yee Fu Building (CN4)		75	<u>77</u>
Caritas Bianchi College of Careers (CN5)*		70 (65)	<u>72</u>
Lok Do Building (CN6)	When one	75	72
Block Y, Ki Fu Building, Whampoa Estate (CN7) Block I, Lok Wah Building, Whampoa Estate (CN8)	documented complaint is received.	75	<u>83</u>
	leceiveu.	75	<u>81</u>
Block 13, Bauhinia Mansions, Whampoa Garden Site 11 (CN9)		75	<u>79</u>
Block 1, Oak Mansions, Whampoa Garden Site 5 (CN10)		75	<u>82</u>
Fung Kei Millennium Primary School (CN11)		70 (65)	<u>78</u>
GCEPSA Whampoa Primary		70 (65)	<u>76</u>

Table 3.3bActionLevel,LimitLevelandMaximumPredictedConstruction NoiseLevel for Construction Noise

School (CN12)

Note:	- Noise levels are to the nearest whole number, with values of 0.5 rounded up
	- Numbers in bracket signify the Limit Level during examination period
	- Numbers in bold underline signify that residual impact is anticipated at the monitoring
	stations as predicted in the approved EIA Report, the residual impact shall be taken into
	account by comparing the future impact monitoring result with the Predicted Construction
	Noise Level in the approved EIA Report instead of the Limit Level
	* The baseline monitoring was carried out at the adjacent Bulkeley Building (CN5a)
Acco	rding to the approved EIA Report, the duration of residual impact shall
last fo	or 4 months for Methodist College (CN2), 7 months for Yee Fu Building
	) and Caritas Bianchi College of Careers (CN5) 16 months for Ki Fu

(CN4) and Caritas Bianchi College of Careers (CN5), 16 months for Ki Fu Building, Whampoa Estate (CN7), 13 months for Lok Wah Building, Whampoa Estate (CN8) and Oak Mansions, Whampoa Garden (CN10), 22 months for Bauhinia Mansions, Whampoa Garden (CN9), 28 months for Fung Kei Millennium Primary School (CN11) and 20 months for GCEPSA Whampoa Primary School (CN12).

The duration may be longer for schools if examination period is encountered but noisy construction works will be scheduled outside examination period as far as practicable. As predicted in the approved EIA Report, if examination is undertaken during the construction period, the maximum duration of residual impact shall last for 13 months for Methodist College (CN2), 31 months for Caritas Bianchi College of Careers (CN5), 43 months for Fung Kei Millennium Primary School (CN11) and 32 months for GCEPSA Whampoa Primary School (CN12). Other than these periods, residual noise impact is not anticipated and so the Limit Levels are applicable at these monitoring stations.

The baseline noise level should be deducted from the future impact monitoring result for comparison with the Limit Level or the Predicted Construction Noise Level in case residual impact is anticipated as predicted in the approved EIA Report.

# 4 CONCLUSION

#### 4.1 BASELINE LEVEL

### 4.1.1 Air Quality

1-hour TSP

1-hour TSP baseline monitoring was conducted at the proposed monitoring stations between 16 February 2011 and 11 April 2011. The measured 1-hour TSP levels were in the range of  $13-333 \ \mu g/m^3$ .

#### 24-hour TSP

24-hour TSP baseline monitoring was conducted at the proposed monitoring stations between 11 February 2011 and 11 April 2011. The measured 24-hour TSP levels were in the range of 24-158  $\mu$ g/m<sup>3</sup>.

# 4.1.2 Noise

Baseline monitoring was conducted at the proposed monitoring stations between 18 January 2011 and 5 April 2011. The overall baseline noise levels  $(L_{Aeq(30min)})$  at the monitoring stations were in the range of 64-75 dB(A). The baseline noise level should be deducted from the future impact monitoring result for comparison with the Limit Level or the Predicted Construction Noise Level in case residual impact is anticipated.

# 4.2 ACTION AND TARGET LEVELS

# 4.2.1 Air

#### 1-hour TSP

The 1-hour TSP Action Levels have been calculated from baseline levels and are presented in *Table 2.4b*. Limit Level is set at 500  $\mu$ g/m<sup>3</sup> recommended in the EIAO-TM. The 1-hour TSP monitoring is intended to use in following up on complaints or exceedances, in order to provide a more rapid indication of the source of the problem at hand.

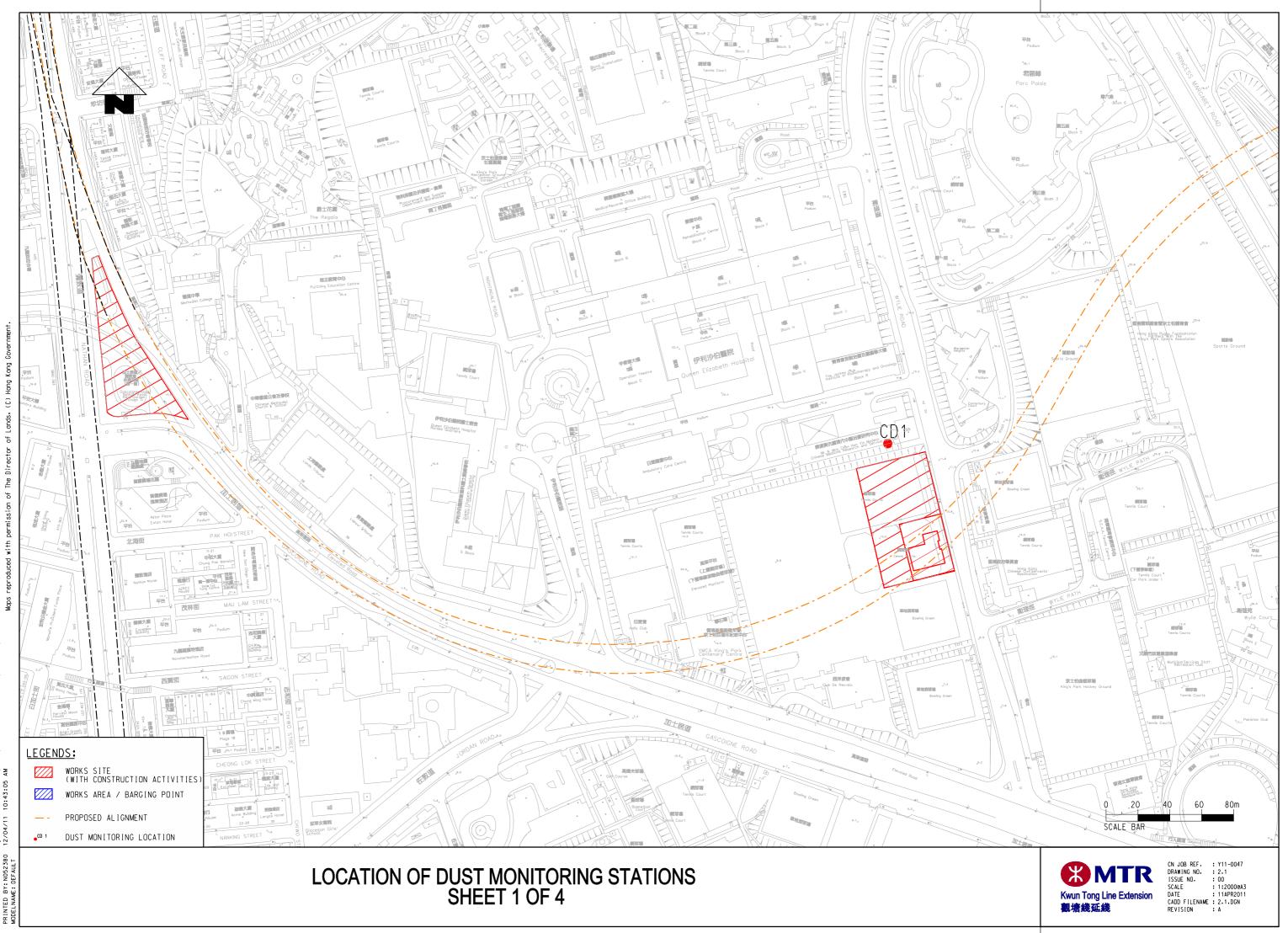
# 24-hour TSP

The 24-hour TSP Action Levels have been calculated from baseline levels and are presented in *Table 2.4d*. Limit Level is set at 260  $\mu$ g/m<sup>3</sup> stipulated in the AQOs.

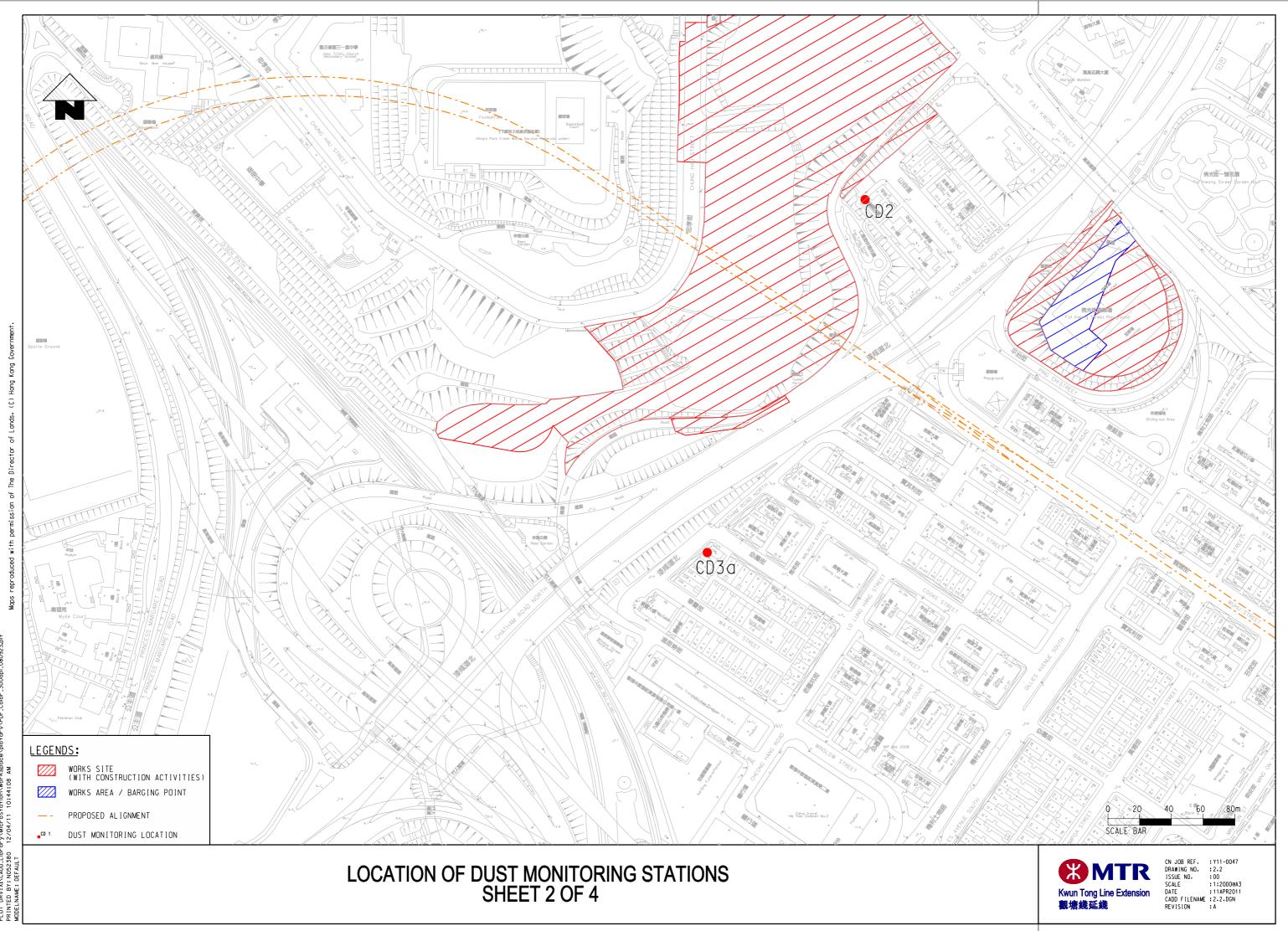
#### 4.2.2 Noise

Construction noise Action Level is set on occurrence when one documented complaint is received. Limit Level is set at 75 dB(A) for domestic premises and 70 dB(A) (or 65 dB(A) during examinations) for educational institutions between 0700 and 1900 hours on normal weekday as recommended in EIAO-TM.

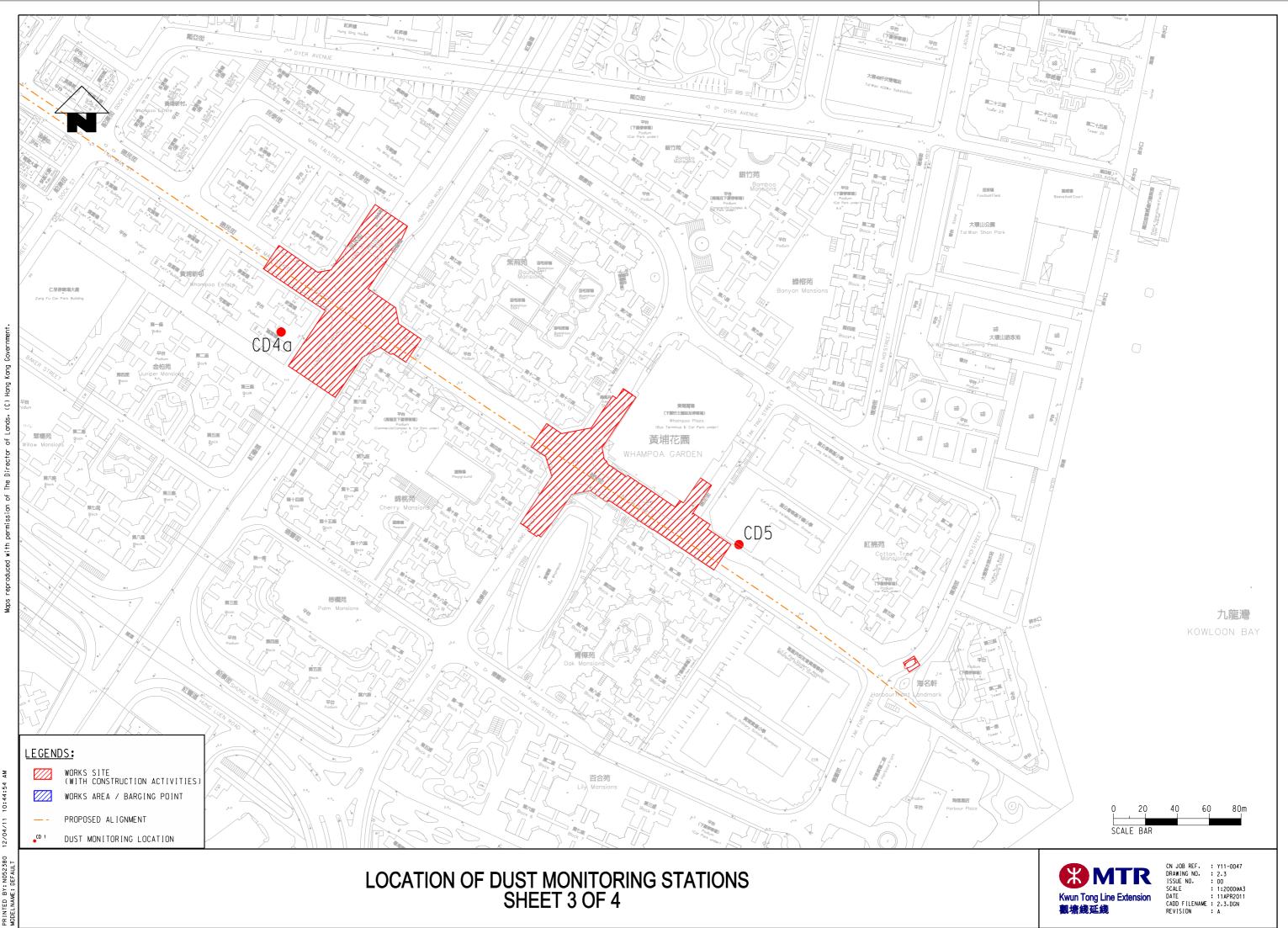
The Limit Levels are applicable for the monitoring stations where no residual impact is anticipated. In case residual impact is anticipated as predicted in the approved EIA Report, the residual impact shall be taken into account by comparing the future impact monitoring result with the Predicted Construction Noise Level in the approved EIA Report instead of the Limit Level.



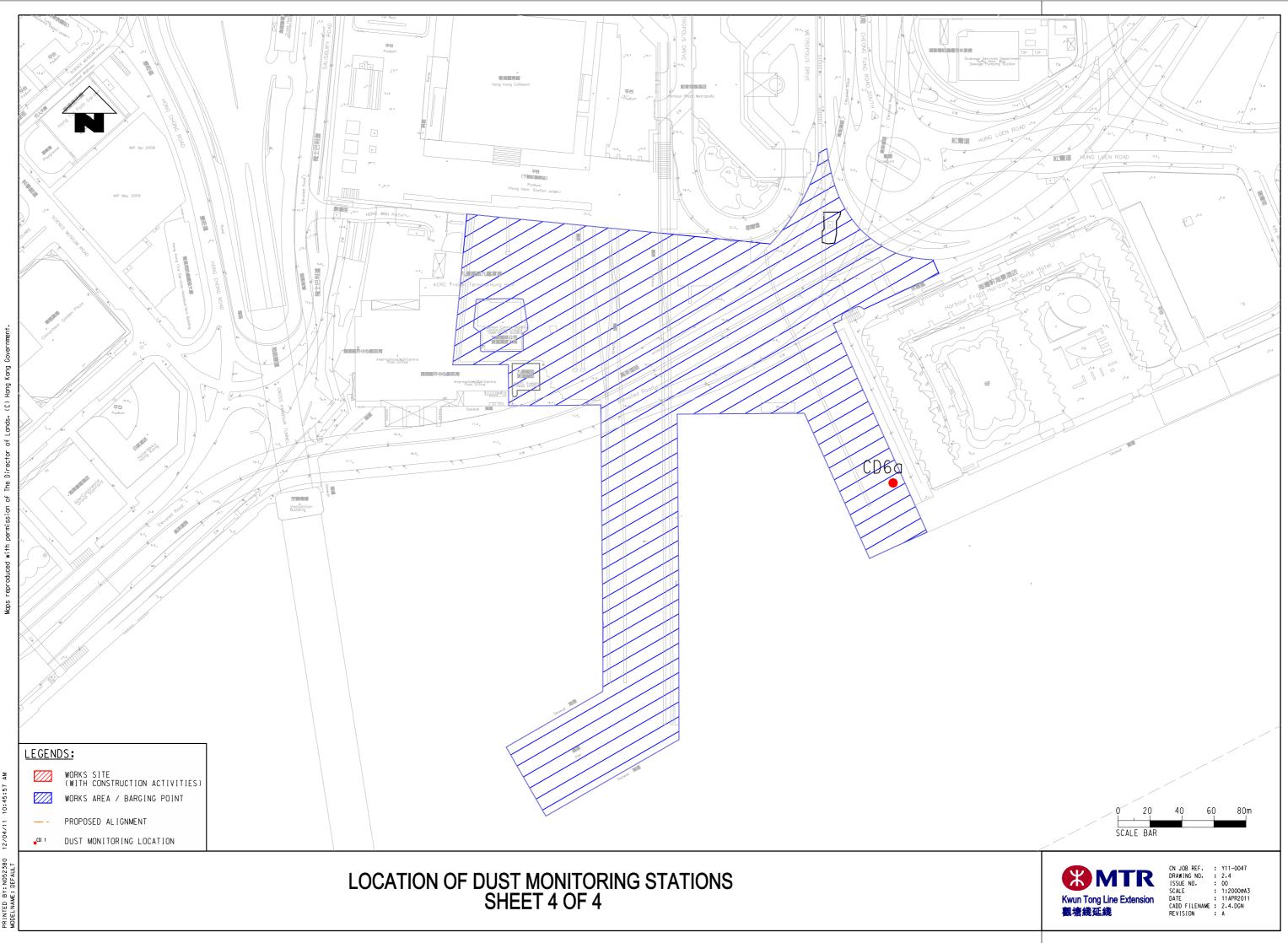
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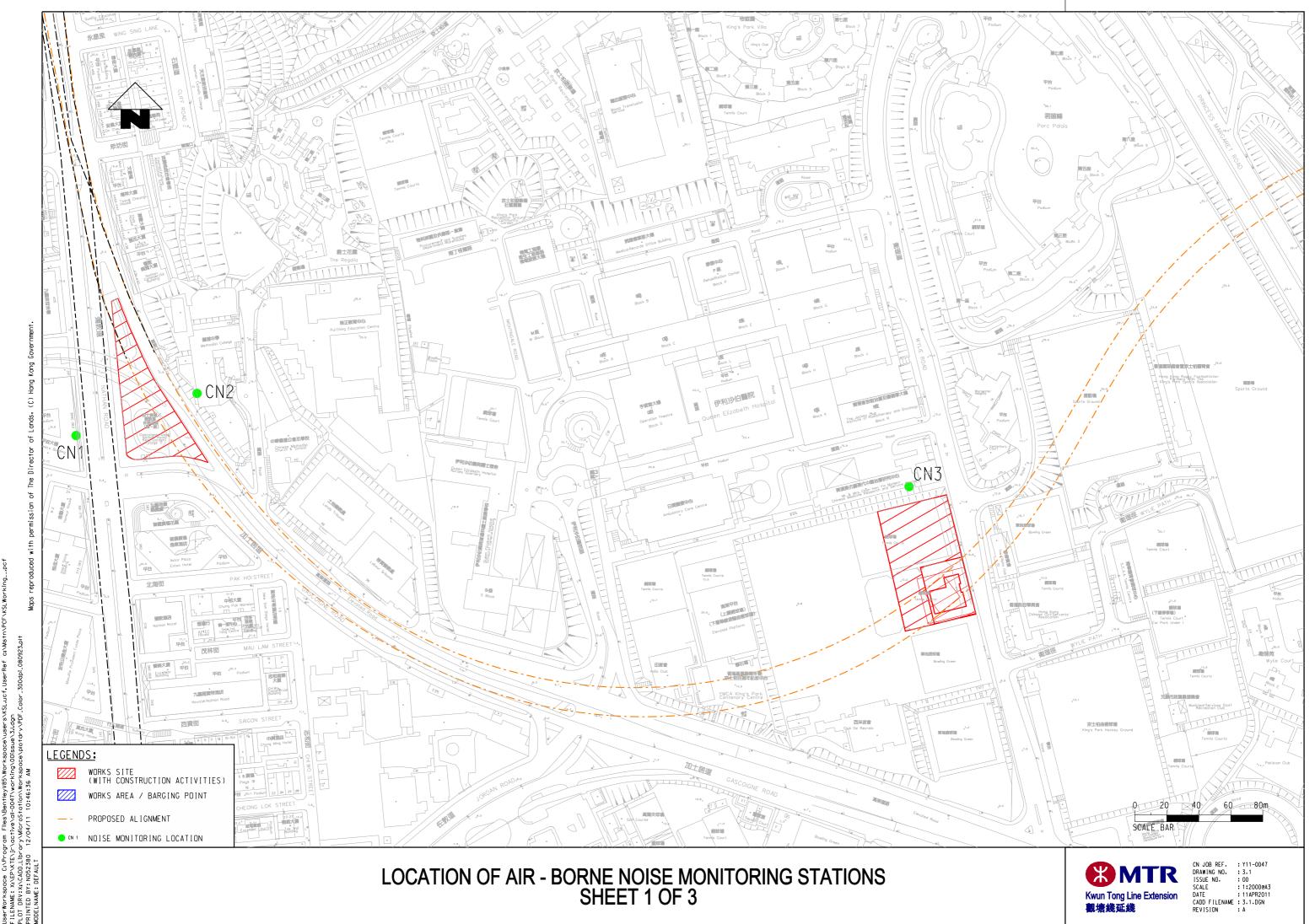
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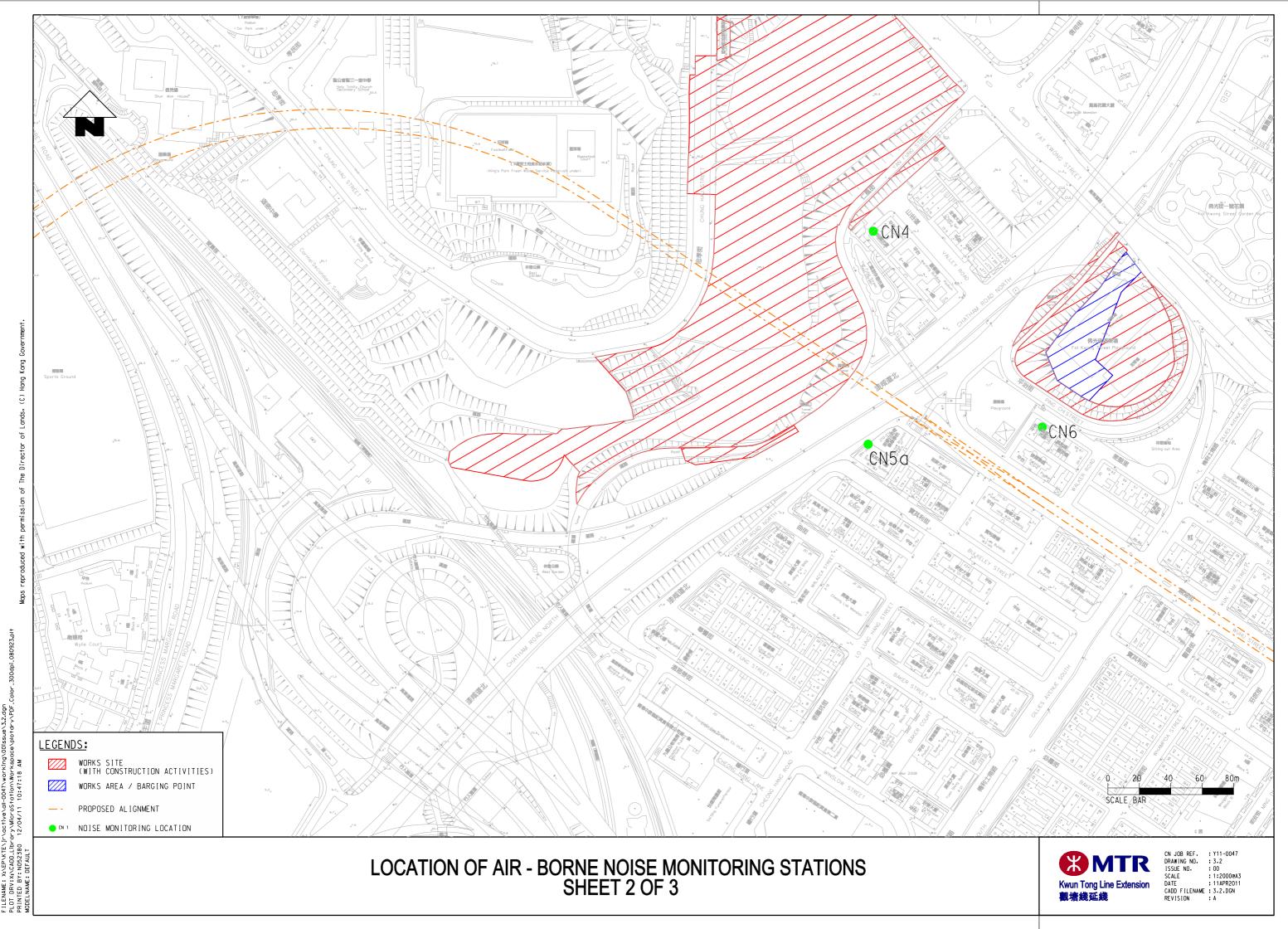
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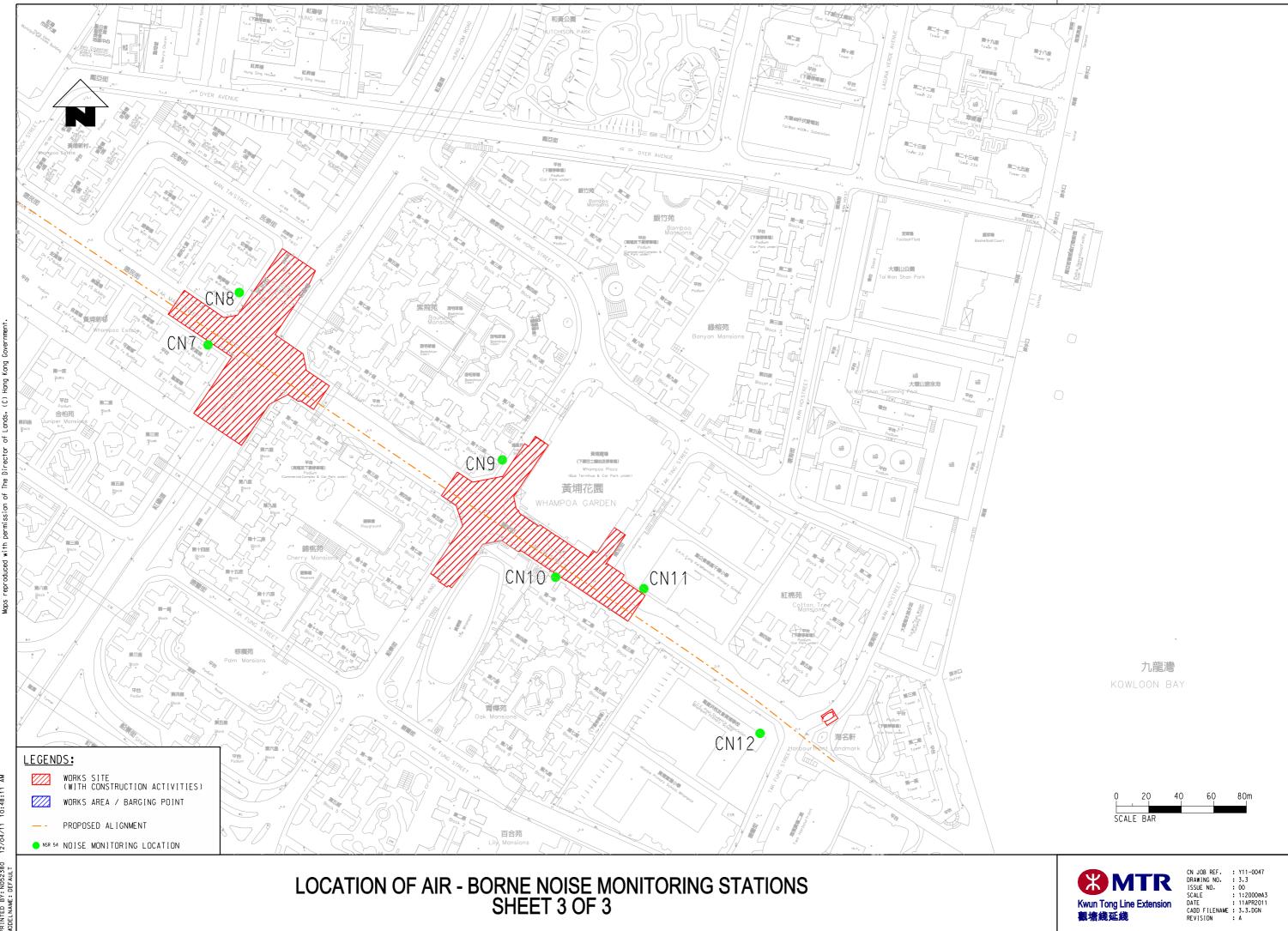
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# ANNEX A

**TSP** Baseline Measurements

Project:	Kwun Tong Line Extension					
Location:	Queen Elizabeth Hospital - Specialist Clinic (CD1)					
Sampling Period:	16-Feb-11 - 01-Mar-11					
Sample Type:	1-hr Total Suspended Particulate					
Equipment:	MIE DR-2000					
<b>Report Date:</b>	01-Apr-11					

Sample Code	Date	<u>Start Time</u>	Parameter	<u>Hour 1</u>	Hour 2	Hour 3	Average	<u>Unit</u>
QEH1/001	16-Feb-11	11:30	1-hr TSP	110	113	113	112	µg/m3
QEH1/002	17-Feb-11	12:00	1-hr TSP	146	304	322	258	µg/m3
QEH1/003	18-Feb-11	12:30	1-hr TSP	38	57	66	54	µg/m3
QEH1/004	19-Feb-11	12:00	1-hr TSP	32	27	23	27	µg/m3
QEH1/005	20-Feb-11	11:30	1-hr TSP	41	53	62	52	µg/m3
QEH1/006	21-Feb-11	11:00	1-hr TSP	146	126	118	130	µg/m3
QEH1/007	22-Feb-11	12:00	1-hr TSP	76	64	63	67	µg/m3
QEH1/008	23-Feb-11	12:15	1-hr TSP	68	68	71	69	µg/m3
QEH1/009	24-Feb-11	12:00	1-hr TSP	102	120	125	115	µg/m3
QEH1/010	25-Feb-11	16:00	1-hr TSP	107	104	122	111	µg/m3
QEH1/011	26-Feb-11	11:00	1-hr TSP	99	91	83	91	µg/m3
QEH1/012	27-Feb-11	16:00	1-hr TSP	77	93	103	91	µg/m3
QEH1/013	28-Feb-11	11:00	1-hr TSP	39	26	24	30	µg/m3
QEH1/014	01-Mar-11	9:00	1-hr TSP	76	69	99	81	µg/m3

Average of 14-Day Baseline 92 µg/m3

Project:	Kwun Tong Line Extension					
Location:	Queen Elizabeth Hospital - Specialist Clinic (CD1)					
Sampling Period:	11-Feb-11 - 24-Feb-11					
Sample Type:	24-hr Total Suspended Particulate					
<b>Equipment:</b>	High Volume Sampler					
<b>Report Date:</b>	01-Apr-11					

Sample Code	Date	<u>Start Time</u>	Parameter	Value	<u>Unit</u>
QEH24/001	11-Feb-11	12:30	24-hr TSP	81	µg/m3
QEH24/002	12-Feb-11	12:00	24-hr TSP	105	µg/m3
QEH24/003	13-Feb-11	12:30	24-hr TSP	35	µg/m3
QEH24/004	14-Feb-11	12:00	24-hr TSP	55	µg/m3
QEH24/005	15-Feb-11	12:00	24-hr TSP	52	µg/m3
QEH24/006	16-Feb-11	11:30	24-hr TSP	44	µg/m3
QEH24/007	17-Feb-11	12:00	24-hr TSP	89	µg/m3
QEH24/008	18-Feb-11	12:30	24-hr TSP	40	µg/m3
QEH24/009	19-Feb-11	12:00	24-hr TSP	28	µg/m3
QEH24/010	20-Feb-11	11:30	24-hr TSP	54	µg/m3
QEH24/011	21-Feb-11	11:00	24-hr TSP	61	µg/m3
QEH24/012	22-Feb-11	12:00	24-hr TSP	65	µg/m3
QEH24/013	23-Feb-11	12:15	24-hr TSP	82	µg/m3
QEH24/014	24-Feb-11	12:00	24-hr TSP	87	µg/m3

Project:	Kwun Tong Line Extension				
Location:	Yee Fu Building (CD2)				
Sampling Period:	08-Mar-11	-	21-Mar-11		
Sample Type:	1-hr Total Suspended Particulate				
<b>Equipment:</b>	MIE DR-2000				
<b>Report Date:</b>	01-Apr-11				

Sample Code	Date	<u>Start Time</u>	Parameter	Hour 1	Hour 2	Hour 3	Average	<u>Unit</u>
YF1/001	08-Mar-11	13:45	1-hr TSP	107	106	121	111	µg/m3
YF1/002	09-Mar-11	14:00	1-hr TSP	43	84	100	76	µg/m3
YF1/003	10-Mar-11	14:00	1-hr TSP	62	60	67	63	µg/m3
YF1/004	11-Mar-11	14:15	1-hr TSP	102	87	108	99	µg/m3
YF1/005	12-Mar-11	14:30	1-hr TSP	86	88	103	92	µg/m3
YF1/006	13-Mar-11	14:30	1-hr TSP	97	92	98	96	µg/m3
YF1/007	14-Mar-11	15:00	1-hr TSP	65	64	64	65	µg/m3
YF1/008	15-Mar-11	15:00	1-hr TSP	137	55	49	80	µg/m3
YF1/009	16-Mar-11	14:30	1-hr TSP	53	56	60	56	µg/m3
YF1/010	17-Mar-11	14:30	1-hr TSP	65	69	82	72	µg/m3
YF1/011	18-Mar-11	14:30	1-hr TSP	112	135	133	127	µg/m3
YF1/012	19-Mar-11	14:00	1-hr TSP	18	15	21	18	µg/m3
YF1/013	20-Mar-11	13:30	1-hr TSP	92	93	100	95	µg/m3
YF1/014	21-Mar-11	9:00	1-hr TSP	52	52	47	50	µg/m3

Average of 14-Day Baseline 79 µg

Project:	Kwun Tong Line Extension				
Location:	Yee Fu Building (CD2)				
Sampling Period:	07-Mar-11	-	20-Mar-11		
Sample Type:	24-hr Total Suspended Particulate				
<b>Equipment:</b>	High Volume Sampler				
<b>Report Date:</b>	01-Apr-11				

Sample Code	Date	<u>Start Time</u>	<b>Parameter</b>	Value	<u>Unit</u>
YF24/001	07-Mar-11	12:45	24-hr TSP	94	µg/m3
YF24/002	08-Mar-11	13:45	24-hr TSP	90	µg/m3
YF24/003	09-Mar-11	14:00	24-hr TSP	77	µg/m3
YF24/004	10-Mar-11	14:00	24-hr TSP	105	µg/m3
YF24/005	11-Mar-11	14:15	24-hr TSP	99	µg/m3
YF24/006	12-Mar-11	14:30	24-hr TSP	85	µg/m3
YF24/007	13-Mar-11	14:30	24-hr TSP	80	µg/m3
YF24/008	14-Mar-11	15:00	24-hr TSP	98	µg/m3
YF24/009	15-Mar-11	15:00	24-hr TSP	118	µg/m3
YF24/010	16-Mar-11	14:30	24-hr TSP	102	µg/m3
YF24/011	17-Mar-11	14:30	24-hr TSP	103	µg/m3
YF24/012	18-Mar-11	14:30	24-hr TSP	36	µg/m3
YF24/013	19-Mar-11	14:00	24-hr TSP	24	µg/m3
YF24/014	20-Mar-11	13:30	24-hr TSP	35	µg/m3

Project:	Kwun Tong Line Extension					
Location:	Fung Kei Millennium Primary School (CD5)					
Sampling Period:	16-Feb-11 - 01-Mar-11					
Sample Type:	1-hr Total Suspended Particulate					
<b>Equipment:</b>	MIE DR-2000					
<b>Report Date:</b>	01-Apr-11					

Sample Code	Date	<u>Start Time</u>	Parameter <b>1</b>	<u>Hour 1</u>	Hour 2	Hour 3	Average	<u>Unit</u>
FK1/001	16-Feb-11	13:15	1-hr TSP	105	109	119	111	µg/m3
FK1/002	17-Feb-11	13:00	1-hr TSP	283	291	333	302	µg/m3
FK1/003	18-Feb-11	14:00	1-hr TSP	49	55	52	52	µg/m3
FK1/004	19-Feb-11	13:30	1-hr TSP	20	17	13	17	µg/m3
FK1/005	20-Feb-11	13:00	1-hr TSP	58	67	47	58	µg/m3
FK1/006	21-Feb-11	14:00	1-hr TSP	113	140	142	131	µg/m3
FK1/007	22-Feb-11	13:30	1-hr TSP	50	50	52	51	µg/m3
FK1/008	23-Feb-11	13:30	1-hr TSP	68	77	81	75	µg/m3
FK1/009	24-Feb-11	13:00	1-hr TSP	80	87	87	85	µg/m3
FK1/010	25-Feb-11	16:30	1-hr TSP	101	101	96	100	µg/m3
FK1/011	26-Feb-11	11:30	1-hr TSP	77	71	72	73	µg/m3
FK1/012	27-Feb-11	16:30	1-hr TSP	95	103	123	107	µg/m3
FK1/013	28-Feb-11	11:30	1-hr TSP	38	25	27	30	µg/m3
FK1/014	01-Mar-11	9:30	1-hr TSP	60	70	95	75	µg/m3

µg/m3

Project:	Kwun Tong Line Extension					
Location:	Fung Kei Millennium Primary School (CD5)					
Sampling Period:	11-Feb-11 - 24-Feb-11					
Sample Type:	24-hr Total Suspended Particulate					
<b>Equipment:</b>	High Volume Sampler					
<b>Report Date:</b>	01-Apr-11					

Sample Code	Date	<u>Start Time</u>	Parameter	Value	<u>Unit</u>
FK24/001	11-Feb-11	13:30	24-hr TSP	73	µg/m3
FK24/002	12-Feb-11	13:00	24-hr TSP	104	µg/m3
FK24/003	13-Feb-11	13:00	24-hr TSP	34	µg/m3
FK24/004	14-Feb-11	12:30	24-hr TSP	50	µg/m3
FK24/005	15-Feb-11	13:30	24-hr TSP	44	µg/m3
FK24/006	16-Feb-11	13:15	24-hr TSP	35	µg/m3
FK24/007	17-Feb-11	13:00	24-hr TSP	73	µg/m3
FK24/008	18-Feb-11	14:00	24-hr TSP	36	µg/m3
FK24/009	19-Feb-11	13:30	24-hr TSP	28	µg/m3
FK24/010	20-Feb-11	13:00	24-hr TSP	55	µg/m3
FK24/011	21-Feb-11	14:00	24-hr TSP	67	µg/m3
FK24/012	22-Feb-11	13:30	24-hr TSP	71	µg/m3
FK24/013	23-Feb-11	13:30	24-hr TSP	77	µg/m3
FK24/014	24-Feb-11	13:00	24-hr TSP	68	µg/m3

Project:	Kwun Tong Line Extension						
Location:	Site Boundary of Finger Pier adjacent to Harbourfront Horizon (CD6a)						
Sampling Period:	08-Mar-11 - 21-Mar-11						
Sample Type:	1-hr Total Suspended Particulate						
Equipment:	MIE DR-2000						
<b>Report Date:</b>	01-Apr-11						

Sample Code	Date	<u>Start Time</u>	Parameter	<u>Hour 1</u>	Hour 2	Hour 3	Average	<u>Unit</u>
FP1/001	08-Mar-11	14:45	1-hr TSP	133	137	152	141	µg/m3
FP1/002	09-Mar-11	14:45	1-hr TSP	77	118	123	106	µg/m3
FP1/003	10-Mar-11	14:45	1-hr TSP	70	74	76	73	µg/m3
FP1/004	11-Mar-11	15:15	1-hr TSP	94	119	162	125	µg/m3
FP1/005	12-Mar-11	15:15	1-hr TSP	94	111	111	105	µg/m3
FP1/006	13-Mar-11	15:15	1-hr TSP	112	114	124	116	µg/m3
FP1/007	14-Mar-11	12:00	1-hr TSP	275	220	185	227	µg/m3
FP1/008	15-Mar-11	15:45	1-hr TSP	64	57	48	56	µg/m3
FP1/009	16-Mar-11	15:45	1-hr TSP	67	67	69	67	µg/m3
FP1/010	17-Mar-11	15:15	1-hr TSP	76	91	88	85	µg/m3
FP1/011	18-Mar-11	16:15	1-hr TSP	129	126	117	124	µg/m3
FP1/012	19-Mar-11	15:45	1-hr TSP	25	36	42	34	µg/m3
FP1/013	20-Mar-11	15:15	1-hr TSP	129	142	149	140	µg/m3
FP1/014	21-Mar-11	15:15	1-hr TSP	33	29	33	32	µg/m3

Average of 14-Day Baseline 102 µg/m3

Project:	Kwun Tong Line Extension						
Location:	Site Boundary of Finger Pier adjacent to Harbourfront Horizon (CD6a)						
Sampling Period:	08-Mar-11 - 21-Mar-11						
Sample Type:	24-hr Total Suspended Particulate						
Equipment:	High Volume Sampler						
<b>Report Date:</b>	01-Apr-11						

Sample Code	Date	<u>Start Time</u>	<b>Parameter</b>	Value	<u>Unit</u>
FP24/001	08-Mar-11	14:45	24-hr TSP	93	µg/m3
FP24/002	09-Mar-11	14:45	24-hr TSP	82	µg/m3
FP24/003	10-Mar-11	14:45	24-hr TSP	105	µg/m3
FP24/004	11-Mar-11	15:15	24-hr TSP	98	µg/m3
FP24/005	12-Mar-11	15:15	24-hr TSP	84	µg/m3
FP24/006	13-Mar-11	15:15	24-hr TSP	100	µg/m3
FP24/007	14-Mar-11	16:00	24-hr TSP	102	µg/m3
FP24/008	15-Mar-11	15:45	24-hr TSP	107	µg/m3
FP24/009	16-Mar-11	15:45	24-hr TSP	97	µg/m3
FP24/010	17-Mar-11	15:15	24-hr TSP	107	µg/m3
FP24/011	18-Mar-11	16:15	24-hr TSP	32	µg/m3
FP24/012	19-Mar-11	15:45	24-hr TSP	24	µg/m3
FP24/013	20-Mar-11	15:15	24-hr TSP	38	µg/m3
FP24/014	21-Mar-11	15:15	24-hr TSP	50	µg/m3

Project:	Kwun Tong Line Extension					
Location:	No. 238 Chatham Road North (CD3a)					
Sampling Period:	21-Mar-11 - 03-Apr-11					
Sample Type:	1-hr Total Suspended Particulate					
<b>Equipment:</b>	MIE DR-2000					
<b>Report Date:</b>	07-Apr-11					

Sample Code	Date	<u>Start Time</u>	Parameter	<u>Hour 1</u>	Hour 2	Hour 3	Average	<u>Unit</u>
CHRN1/001	21-Mar-11	13:00	1-hr TSP	42	56	49	49	µg/m3
CHRN1/002	22-Mar-11	13:30	1-hr TSP	57	50	42	50	µg/m3
CHRN1/003	23-Mar-11	13:30	1-hr TSP	75	80	85	80	µg/m3
CHRN1/004	24-Mar-11	14:00	1-hr TSP	124	111	93	109	µg/m3
CHRN1/005	25-Mar-11	13:30	1-hr TSP	98	103	104	102	µg/m3
CHRN1/006	26-Mar-11	14:00	1-hr TSP	148	146	154	149	µg/m3
CHRN1/007	27-Mar-11	13:30	1-hr TSP	163	166	173	167	µg/m3
CHRN1/008	28-Mar-11	13:00	1-hr TSP	72	79	81	77	µg/m3
CHRN1/009	29-Mar-11	14:00	1-hr TSP	119	123	106	116	µg/m3
CHRN1/010	30-Mar-11	14:00	1-hr TSP	85	84	91	87	µg/m3
CHRN1/011	31-Mar-11	14:15	1-hr TSP	46	53	66	55	µg/m3
CHRN1/012	01-Apr-11	14:00	1-hr TSP	73	83	114	90	µg/m3
CHRN1/013	02-Apr-11	14:00	1-hr TSP	87	89	80	85	µg/m3
CHRN1/014	03-Apr-11	12:30	1-hr TSP	100	97	103	100	µg/m3

Project:	Kwun Tong Line Extension					
Location:	No. 238 Chatham Road North (CD3a)					
Sampling Period:	19-Mar-11 - 01-Apr-11					
Sample Type:	24-hr Total Suspended Particulate					
<b>Equipment:</b>	High Volume Sampler					
<b>Report Date:</b>	07-Apr-11					

Sample Code	<b>Date</b>	<u>Start Time</u>	Parameter	Value	<u>Unit</u>
CHRN24/001	19-Mar-11	13:00	24-hr TSP	32	µg/m3
CHRN24/002	20-Mar-11	12:30	24-hr TSP	45	µg/m3
CHRN24/003	21-Mar-11	13:00	24-hr TSP	49	µg/m3
CHRN24/004	22-Mar-11	13:30	24-hr TSP	65	µg/m3
CHRN24/005	23-Mar-11	13:30	24-hr TSP	89	µg/m3
CHRN24/006	24-Mar-11	14:00	24-hr TSP	98	µg/m3
CHRN24/007	25-Mar-11	13:30	24-hr TSP	158	µg/m3
CHRN24/008	26-Mar-11	14:00	24-hr TSP	157	µg/m3
CHRN24/009	27-Mar-11	13:30	24-hr TSP	95	µg/m3
CHRN24/010	28-Mar-11	13:00	24-hr TSP	121	µg/m3
CHRN24/011	29-Mar-11	14:00	24-hr TSP	141	µg/m3
CHRN24/012	30-Mar-11	14:00	24-hr TSP	109	µg/m3
CHRN24/013	31-Mar-11	14:15	24-hr TSP	86	µg/m3
CHRN24/014	01-Apr-11	14:00	24-hr TSP	93	µg/m3

Project:	Kwun Tong Line Extension					
Location:	Ka Fu Building, Whampoa Estate (CD4a)					
Sampling Period:	29-Mar-11 - 11-Apr-11					
Sample Type:	1-hr Total Suspended Particulate					
Equipment:	MIE DR-2000					
<b>Report Date:</b>	12-Apr-11					

Sample Code	Date	<u>Start Time</u>	Parameter	Hour 1	Hour 2	Hour 3	Average	<u>Unit</u>
KF1/001	29-Mar-11	17:00	1-hr TSP	128	117	140	128	µg/m3
KF1/002	30-Mar-11	15:00	1-hr TSP	103	102	107	104	µg/m3
KF1/003	31-Mar-11	14:45	1-hr TSP	55	72	76	68	µg/m3
KF1/004	01-Apr-11	14:45	1-hr TSP	72	87	126	95	µg/m3
KF1/005	02-Apr-11	14:15	1-hr TSP	78	95	75	82	µg/m3
KF1/006	03-Apr-11	13:45	1-hr TSP	99	105	111	105	µg/m3
KF1/007	04-Apr-11	13:45	1-hr TSP	118	122	124	121	µg/m3
KF1/008	05-Apr-11	13:45	1-hr TSP	54	47	48	50	µg/m3
KF1/009	06-Apr-11	13:45	1-hr TSP	47	46	41	45	µg/m3
KF1/010	07-Apr-11	13:45	1-hr TSP	62	50	55	56	µg/m3
KF1/011	08-Apr-11	13:45	1-hr TSP	58	46	38	47	µg/m3
KF1/012	09-Apr-11	13:45	1-hr TSP	92	86	93	90	µg/m3
KF1/013	10-Apr-11	13:45	1-hr TSP	51	70	84	68	µg/m3
KF1/014	11-Apr-11	14:00	1-hr TSP	78	77	79	78	µg/m3

Average of 14-Day Baseline 81 µg

Project:	Kwun Tong Line Extension					
Location:	Ka Fu Building, Whampoa Estate (CD4a)					
Sampling Period:	29-Mar-11 - 11-Apr-11					
Sample Type:	24-hr Total Suspended Particulate					
<b>Equipment:</b>	High Volume Sampler					
<b>Report Date:</b>	12-Apr-11					

Sample Code	Date	<u>Start Time</u>	Parameter	Value	<u>Unit</u>
KF24/001	29-Mar-11	15:15	24-hr TSP	140	µg/m3
KF24/002	30-Mar-11	15:00	24-hr TSP	104	µg/m3
KF24/003	31-Mar-11	14:45	24-hr TSP	90	µg/m3
KF24/004	01-Apr-11	14:45	24-hr TSP	90	µg/m3
KF24/005	02-Apr-11	14:15	24-hr TSP	89	µg/m3
KF24/006	03-Apr-11	13:45	24-hr TSP	71	µg/m3
KF24/007	04-Apr-11	13:45	24-hr TSP	81	µg/m3
KF24/008	05-Apr-11	13:45	24-hr TSP	69	µg/m3
KF24/009	06-Apr-11	13:45	24-hr TSP	61	µg/m3
KF24/010	07-Apr-11	13:45	24-hr TSP	79	µg/m3
KF24/011	08-Apr-11	13:45	24-hr TSP	69	µg/m3
KF24/012	09-Apr-11	13:45	24-hr TSP	78	µg/m3
KF24/013	10-Apr-11	13:45	24-hr TSP	81	µg/m3
KF24/014	11-Apr-11	14:00	24-hr TSP	124	µg/m3

# ANNEX B

Noise Baseline Measurements

Project:	Kwun Tong Line Extension				
Location:	Alhambra Building (CN1)				
Sampling Period:	11-Feb-11	-	02-Mar-11		
Sample Type:	Noise Level				
<b>Report Date:</b>	01-Apr-11				

<b><u>Time Interval</u></b>	$\mathbf{L}_{\mathbf{Aeq}}$	$\mathbf{L}_{A10}$	$L_{A90}$	<u>Unit</u>
7:00-7:30	70	72	68	dB(A)
7:30-8:00	71	72	69	dB(A)
8:00-8:30	71	73	69	dB(A)
8:30-9:00	71	72	69	dB(A)
9:00-9:30	71	73	69	dB(A)
9:30-10:00	71	72	69	dB(A)
10:00-10:30	71	73	69	dB(A)
10:30-11:00	71	73	69	dB(A)
11:00-11:30	71	73	69	dB(A)
11:30-12:00	71	73	69	dB(A)
12:00-12:30	71	73	69	dB(A)
12:30-13:00	71	73	69	dB(A)
13:00-13:30	72	73	69	dB(A)
13:30-14:00	72	73	69	dB(A)
14:00-14:30	71	73	69	dB(A)
14:30-15:00	71	73	69	dB(A)
15:00-15:30	71	73	69	dB(A)
15:30-16:00	71	73	69	dB(A)
16:00-16:30	72	73	69	dB(A)
16:30-17:00	71	73	69	dB(A)
17:00-17:30	71	73	70	dB(A)
17:30-18:00	71	73	69	dB(A)
18:00-18:30	71	73	69	dB(A)
18:30-19:00	71	72	69	dB(A)
<b>Overall Baseline Level</b>	71	73	69	dB(A)

Remark - Logarithmic Averaging is being used

- Noise data during rainy periods on 13, 14, 15, 19 & 20 Feb 2011 are excluded

Project:	Kwun Tong Line Extension				
Location:	Methodist College (CN2)				
Sampling Period:	20-Jan-11	-	03-Feb-11		
Sample Type:	Noise Level				
<b>Report Date:</b>	01-Apr-11				

<b><u>Time Interval</u></b>	$L_{Aeq}$	$\mathbf{L}_{\mathbf{A10}}$	L <sub>A90</sub>	<u>Unit</u>
7:00-7:30	75	77	72	dB(A)
7:30-8:00	75	77	73	dB(A)
8:00-8:30	75	77	73	dB(A)
8:30-9:00	75	77	73	dB(A)
9:00-9:30	75	77	73	dB(A)
9:30-10:00	75	77	72	dB(A)
10:00-10:30	75	77	73	dB(A)
10:30-11:00	75	77	73	dB(A)
11:00-11:30	76	77	73	dB(A)
11:30-12:00	75	77	73	dB(A)
12:00-12:30	75	77	73	dB(A)
12:30-13:00	76	77	73	dB(A)
13:00-13:30	76	77	73	dB(A)
13:30-14:00	76	77	73	dB(A)
14:00-14:30	76	77	73	dB(A)
14:30-15:00	75	77	73	dB(A)
15:00-15:30	76	77	73	dB(A)
15:30-16:00	75	77	73	dB(A)
16:00-16:30	76	77	73	dB(A)
16:30-17:00	76	77	73	dB(A)
17:00-17:30	75	77	73	dB(A)
17:30-18:00	75	77	73	dB(A)
18:00-18:30	75	76	73	dB(A)
18:30-19:00	75	76	73	dB(A)
<b>Overall Baseline Level</b>	75	77	73	dB(A)

Remark - Logarithmic Averaging is being used

Project:	Kwun Tong Line Extension			
Location:	Queen Elizabeth Hospital - Specialist Clinic (CN3)			
Sampling Period:	10-Feb-11 - 01-Mar-11			
Sample Type:	Noise Level			
<b>Report Date:</b>	01-Apr-11			

<b>Time Interval</b>	$L_{Aeq}$	$\underline{L}_{A10}$	LA90	<u>Unit</u>
7:00-7:30	63	65	61	dB(A)
7:30-8:00	63	65	61	dB(A)
8:00-8:30	63	65	61	dB(A)
8:30-9:00	63	65	61	dB(A)
9:00-9:30	63	65	61	dB(A)
9:30-10:00	63	65	61	dB(A)
10:00-10:30	63	65	61	dB(A)
10:30-11:00	63	65	61	dB(A)
11:00-11:30	64	65	61	dB(A)
11:30-12:00	64	65	62	dB(A)
12:00-12:30	64	65	62	dB(A)
12:30-13:00	64	65	62	dB(A)
13:00-13:30	64	65	62	dB(A)
13:30-14:00	64	65	62	dB(A)
14:00-14:30	64	65	62	dB(A)
14:30-15:00	63	65	61	dB(A)
15:00-15:30	64	65	62	dB(A)
15:30-16:00	64	65	62	dB(A)
16:00-16:30	64	65	62	dB(A)
16:30-17:00	64	65	62	dB(A)
17:00-17:30	64	66	62	dB(A)
17:30-18:00	64	66	62	dB(A)
18:00-18:30	64	65	62	dB(A)
18:30-19:00	63	65	62	dB(A)
Overall Baseline Level	64	65	61	dB(A)

Remark - Logarithmic Averaging is being used

- Noise data during rainy periods on 13, 14, 15, 19 & 20 Feb 2011 are excluded

Project:	Kwun Tong Line Extension			
Location:	Yee Fu Building (CN4)			
Sampling Period:	04-Mar-11	-	24-Mar-11	
Sample Type:	Noise Level			
<b>Report Date:</b>	01-Apr-11			

<b>Time Interval</b>	$\mathbf{L}_{Aeq}$	$\underline{L}_{A10}$	$L_{A90}$	<u>Unit</u>
7:00-7:30	70	71	68	dB(A)
7:30-8:00	70	72	69	dB(A)
8:00-8:30	70	71	69	dB(A)
8:30-9:00	70	71	69	dB(A)
9:00-9:30	70	71	69	dB(A)
9:30-10:00	70	71	68	dB(A)
10:00-10:30	70	71	68	dB(A)
10:30-11:00	70	71	68	dB(A)
11:00-11:30	70	71	68	dB(A)
11:30-12:00	70	71	68	dB(A)
12:00-12:30	70	71	68	dB(A)
12:30-13:00	70	71	68	dB(A)
13:00-13:30	70	71	69	dB(A)
13:30-14:00	70	71	68	dB(A)
14:00-14:30	70	71	68	dB(A)
14:30-15:00	70	71	68	dB(A)
15:00-15:30	70	71	68	dB(A)
15:30-16:00	70	71	68	dB(A)
16:00-16:30	70	71	68	dB(A)
16:30-17:00	70	71	68	dB(A)
17:00-17:30	70	71	68	dB(A)
17:30-18:00	70	71	68	dB(A)
18:00-18:30	69	71	68	dB(A)
18:30-19:00	69	70	68	dB(A)
<b>Overall Baseline Level</b>	70	71	68	dB(A)

Remark - Logarithmic Averaging is being used

Project:	Kwun Tong Line Extension				
Location:	Bulkeley Building (CN5a)				
Sampling Period:	22-Mar-11	-	05-Apr-11		
Sample Type:	Noise Level				
<b>Report Date:</b>	08-Apr-11				

<b><u>Time Interval</u></b>	$L_{Aeq}$	$\mathbf{L}_{\mathbf{A10}}$	$L_{A90}$	<u>Unit</u>
7:00-7:30	76	78	72	dB(A)
7:30-8:00	76	78	73	dB(A)
8:00-8:30	76	78	73	dB(A)
8:30-9:00	75	77	73	dB(A)
9:00-9:30	76	77	73	dB(A)
9:30-10:00	76	77	73	dB(A)
10:00-10:30	76	77	73	dB(A)
10:30-11:00	76	77	73	dB(A)
11:00-11:30	76	77	73	dB(A)
11:30-12:00	76	77	73	dB(A)
12:00-12:30	76	77	73	dB(A)
12:30-13:00	76	77	73	dB(A)
13:00-13:30	76	78	73	dB(A)
13:30-14:00	76	78	73	dB(A)
14:00-14:30	76	77	73	dB(A)
14:30-15:00	75	77	73	dB(A)
15:00-15:30	75	77	73	dB(A)
15:30-16:00	75	77	73	dB(A)
16:00-16:30	75	77	73	dB(A)
16:30-17:00	75	77	73	dB(A)
17:00-17:30	75	77	73	dB(A)
17:30-18:00	75	77	73	dB(A)
18:00-18:30	75	77	73	dB(A)
18:30-19:00	74	76	72	dB(A)
<b>Overall Baseline Level</b>	75	77	73	dB(A)

Remark - Logarithmic Averaging is being used

Project:	Kwun Tong Line Extension			
Location:	Lok Do Building (CN6)			
Sampling Period:	04-Mar-11	-	24-Mar-11	
Sample Type:	Noise Level			
<b>Report Date:</b>	01-Apr-11			

<b>Time Interval</b>	$\mathbf{L}_{\mathbf{Aeq}}$	$\mathbf{L}_{A10}$	$L_{A90}$	<u>Unit</u>
7:00-7:30	71	72	69	dB(A)
7:30-8:00	71	72	69	dB(A)
8:00-8:30	71	72	69	dB(A)
8:30-9:00	71	72	69	dB(A)
9:00-9:30	71	72	69	dB(A)
9:30-10:00	71	72	69	dB(A)
10:00-10:30	71	72	69	dB(A)
10:30-11:00	71	72	69	dB(A)
11:00-11:30	71	72	69	dB(A)
11:30-12:00	71	72	69	dB(A)
12:00-12:30	71	72	69	dB(A)
12:30-13:00	71	72	69	dB(A)
13:00-13:30	71	72	69	dB(A)
13:30-14:00	71	72	69	dB(A)
14:00-14:30	71	72	69	dB(A)
14:30-15:00	71	72	69	dB(A)
15:00-15:30	71	72	69	dB(A)
15:30-16:00	71	72	69	dB(A)
16:00-16:30	71	72	69	dB(A)
16:30-17:00	71	72	69	dB(A)
17:00-17:30	71	72	69	dB(A)
17:30-18:00	71	72	69	dB(A)
18:00-18:30	70	72	69	dB(A)
18:30-19:00	70	71	69	dB(A)
<b>Overall Baseline Level</b>	71	72	69	dB(A)

Remark - Logarithmic Averaging is being used

Project:	Kwun Tong Line Extension			
Location:	Block Y, Ki Fu Building, Whampoa Estate (CN7)			
Sampling Period:	01-Mar-11 - 21-Mar-11			
Sample Type:	Noise Level			
<b>Report Date:</b>	01-Apr-11			

<b><u>Time Interval</u></b>	$L_{Aeq}$	$\mathbf{L}_{A10}$	L <sub>A90</sub>	<u>Unit</u>
7:00-7:30	69	72	59	dB(A)
7:30-8:00	70	74	61	dB(A)
8:00-8:30	71	74	62	dB(A)
8:30-9:00	71	74	62	dB(A)
9:00-9:30	72	75	64	dB(A)
9:30-10:00	71	75	64	dB(A)
10:00-10:30	71	75	64	dB(A)
10:30-11:00	71	74	64	dB(A)
11:00-11:30	71	74	65	dB(A)
11:30-12:00	71	74	65	dB(A)
12:00-12:30	71	74	65	dB(A)
12:30-13:00	71	74	65	dB(A)
13:00-13:30	71	74	65	dB(A)
13:30-14:00	71	74	65	dB(A)
14:00-14:30	71	74	65	dB(A)
14:30-15:00	71	74	65	dB(A)
15:00-15:30	71	74	66	dB(A)
15:30-16:00	71	74	66	dB(A)
16:00-16:30	71	74	65	dB(A)
16:30-17:00	71	74	65	dB(A)
17:00-17:30	71	75	65	dB(A)
17:30-18:00	71	74	65	dB(A)
18:00-18:30	71	74	65	dB(A)
18:30-19:00	71	74	65	dB(A)
<b>Overall Baseline Level</b>	71	74	64	dB(A)

Remark - Logarithmic Averaging is being used

Project:	Kwun Tong Line Extension			
Location:	Block I, Lok Wah Building, Whampoa Estate (CN8)			
Sampling Period:	01-Mar-11 - 21-Mar-11			
Sample Type:	Noise Level			
<b>Report Date:</b>	01-Apr-11			

<b><u>Time Interval</u></b>	$\mathbf{L}_{\mathbf{Aeq}}$	$\mathbf{L}_{\mathbf{A10}}$	L <sub>490</sub>	<u>Unit</u>
7:00-7:30	67	71	60	dB(A)
7:30-8:00	68	72	61	dB(A)
8:00-8:30	69	73	62	dB(A)
8:30-9:00	70	73	62	dB(A)
9:00-9:30	70	73	64	dB(A)
9:30-10:00	70	73	63	dB(A)
10:00-10:30	70	73	63	dB(A)
10:30-11:00	69	73	63	dB(A)
11:00-11:30	70	73	64	dB(A)
11:30-12:00	69	72	64	dB(A)
12:00-12:30	70	73	64	dB(A)
12:30-13:00	70	73	64	dB(A)
13:00-13:30	70	73	64	dB(A)
13:30-14:00	70	73	64	dB(A)
14:00-14:30	69	73	64	dB(A)
14:30-15:00	69	72	64	dB(A)
15:00-15:30	70	73	64	dB(A)
15:30-16:00	70	73	64	dB(A)
16:00-16:30	69	72	64	dB(A)
16:30-17:00	70	73	64	dB(A)
17:00-17:30	70	73	64	dB(A)
17:30-18:00	69	72	63	dB(A)
18:00-18:30	69	72	63	dB(A)
18:30-19:00	69	72	63	dB(A)
Overall Baseline Level	69	73	63	dB(A)

Remark - Logarithmic Averaging is being used

Project:	Kwun Tong Line Extension			
Location:	Block 13, Bauhinia Mansions, Whampoa Garden Site 11 (CN9)			
Sampling Period:	08-Feb-11 - 27-Feb-11			
Sample Type:	Noise Level			
<b>Report Date:</b>	01-Apr-11			

<b>Time Interval</b>	$L_{Aeq}$	$\underline{L}_{A10}$	LA90	<u>Unit</u>
7:00-7:30	68	72	59	dB(A)
7:30-8:00	69	73	59	dB(A)
8:00-8:30	69	73	60	dB(A)
8:30-9:00	69	73	60	dB(A)
9:00-9:30	69	73	61	dB(A)
9:30-10:00	69	73	61	dB(A)
10:00-10:30	69	72	61	dB(A)
10:30-11:00	69	72	61	dB(A)
11:00-11:30	69	72	62	dB(A)
11:30-12:00	69	73	62	dB(A)
12:00-12:30	70	73	63	dB(A)
12:30-13:00	69	73	63	dB(A)
13:00-13:30	69	73	63	dB(A)
13:30-14:00	70	73	63	dB(A)
14:00-14:30	71	75	63	dB(A)
14:30-15:00	69	72	63	dB(A)
15:00-15:30	71	73	64	dB(A)
15:30-16:00	70	73	63	dB(A)
16:00-16:30	70	73	63	dB(A)
16:30-17:00	69	73	63	dB(A)
17:00-17:30	70	73	63	dB(A)
17:30-18:00	70	73	62	dB(A)
18:00-18:30	70	73	62	dB(A)
18:30-19:00	70	72	62	dB(A)
<b>Overall Baseline Level</b>	70	73	62	dB(A)

Remark - Logarithmic Averaging is being used

- Noise data during rainy periods on 13, 14, 15, 19 & 20 Feb 2011 are excluded

Project:	Kwun Tong Line Extension			
Location:	Block 1, Oak Mansions, Whampoa Garden Site 5 (CN10)			
Sampling Period:	08-Feb-11 - 27-Feb-11			
Sample Type:	Noise Level			
<b>Report Date:</b>	01-Apr-11			

<b><u>Time Interval</u></b>	$L_{Aeq}$	$\mathbf{L}_{A10}$	L <sub>A90</sub>	<u>Unit</u>
7:00-7:30	64	67	59	dB(A)
7:30-8:00	65	68	60	dB(A)
8:00-8:30	65	69	60	dB(A)
8:30-9:00	65	69	60	dB(A)
9:00-9:30	66	69	62	dB(A)
9:30-10:00	66	69	61	dB(A)
10:00-10:30	66	69	63	dB(A)
10:30-11:00	66	68	63	dB(A)
11:00-11:30	67	70	63	dB(A)
11:30-12:00	66	69	63	dB(A)
12:00-12:30	67	69	63	dB(A)
12:30-13:00	66	69	61	dB(A)
13:00-13:30	65	68	61	dB(A)
13:30-14:00	67	70	62	dB(A)
14:00-14:30	69	72	64	dB(A)
14:30-15:00	66	68	63	dB(A)
15:00-15:30	67	69	64	dB(A)
15:30-16:00	67	69	64	dB(A)
16:00-16:30	66	69	64	dB(A)
16:30-17:00	66	69	63	dB(A)
17:00-17:30	67	69	64	dB(A)
17:30-18:00	66	68	62	dB(A)
18:00-18:30	66	68	63	dB(A)
18:30-19:00	66	68	63	dB(A)
Overall Baseline Level	66	69	63	dB(A)

Remark - Logarithmic Averaging is being used

- Noise data during rainy periods on 13, 14, 15, 19 & 20 Feb 2011 are excluded

Project:	Kwun Tong Line Extension			
Location:	Fung Kei Millennium Primary School (CN11)			
Sampling Period:	11-Mar-11 - 28-Mar-11			
Sample Type:	Noise Level			
<b>Report Date:</b>	01-Apr-11			

<b><u>Time Interval</u></b>	$L_{Aeq}$	$\mathbf{L}_{A10}$	L <sub>490</sub>	<u>Unit</u>
7:00-7:30	61	63	57	dB(A)
7:30-8:00	63	65	59	dB(A)
8:00-8:30	62	65	59	dB(A)
8:30-9:00	62	65	59	dB(A)
9:00-9:30	63	65	60	dB(A)
9:30-10:00	63	65	60	dB(A)
10:00-10:30	64	66	61	dB(A)
10:30-11:00	66	68	63	dB(A)
11:00-11:30	64	66	61	dB(A)
11:30-12:00	64	66	61	dB(A)
12:00-12:30	64	66	61	dB(A)
12:30-13:00	64	66	61	dB(A)
13:00-13:30	65	67	62	dB(A)
13:30-14:00	64	66	61	dB(A)
14:00-14:30	64	66	61	dB(A)
14:30-15:00	64	66	61	dB(A)
15:00-15:30	66	68	63	dB(A)
15:30-16:00	64	66	61	dB(A)
16:00-16:30	64	67	62	dB(A)
16:30-17:00	64	66	61	dB(A)
17:00-17:30	64	66	61	dB(A)
17:30-18:00	63	65	60	dB(A)
18:00-18:30	67	65	60	dB(A)
18:30-19:00	63	65	59	dB(A)
<b>Overall Baseline Level</b>	64	66	61	dB(A)

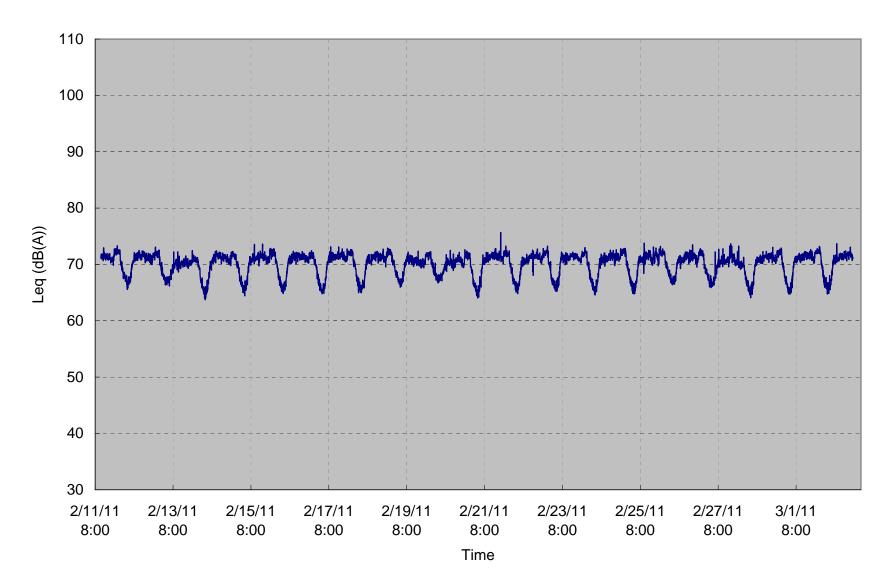
Remark - Logarithmic Averaging is being used

Project:	Kwun Tong Line Extension				
Location:	GCEPSA Whampoa Primary School (CN12)				
Sampling Period:	18-Jan-11 - 01-Feb-11				
Sample Type:	Noise Level				
<b>Report Date:</b>	01-Apr-11				

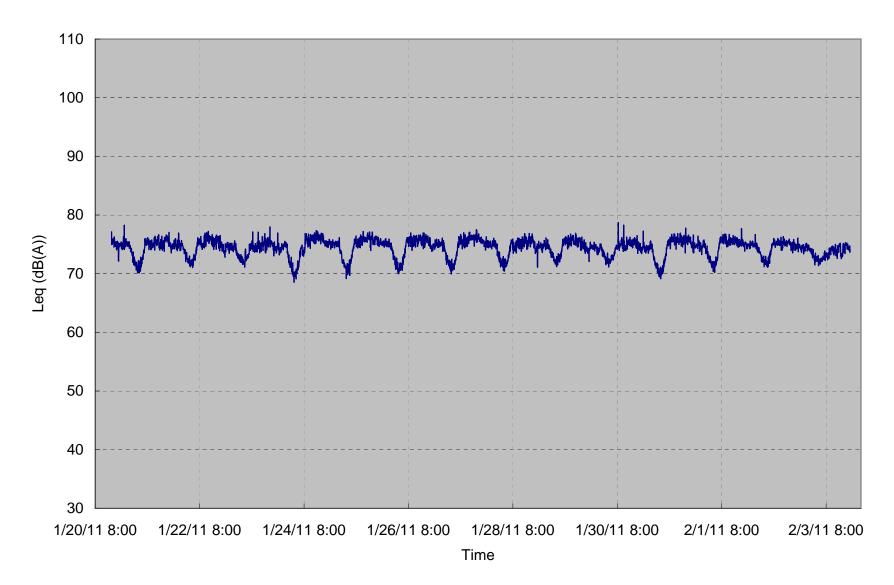
<b><u>Time Interval</u></b>	$L_{Aeq}$	$\mathbf{L}_{A10}$	L <sub>A90</sub>	<u>Unit</u>
7:00-7:30	61	64	56	dB(A)
7:30-8:00	63	65	59	dB(A)
8:00-8:30	63	66	60	dB(A)
8:30-9:00	64	66	60	dB(A)
9:00-9:30	63	66	60	dB(A)
9:30-10:00	64	66	60	dB(A)
10:00-10:30	65	67	61	dB(A)
10:30-11:00	65	68	62	dB(A)
11:00-11:30	65	67	61	dB(A)
11:30-12:00	65	68	61	dB(A)
12:00-12:30	65	67	61	dB(A)
12:30-13:00	65	68	62	dB(A)
13:00-13:30	66	68	63	dB(A)
13:30-14:00	64	67	61	dB(A)
14:00-14:30	64	66	61	dB(A)
14:30-15:00	64	66	61	dB(A)
15:00-15:30	65	67	62	dB(A)
15:30-16:00	65	67	61	dB(A)
16:00-16:30	64	67	61	dB(A)
16:30-17:00	64	67	60	dB(A)
17:00-17:30	64	66	60	dB(A)
17:30-18:00	63	65	59	dB(A)
18:00-18:30	62	65	59	dB(A)
18:30-19:00	62	64	59	dB(A)
<b>Overall Baseline Level</b>	64	67	61	dB(A)

Remark - Logarithmic Averaging is being used

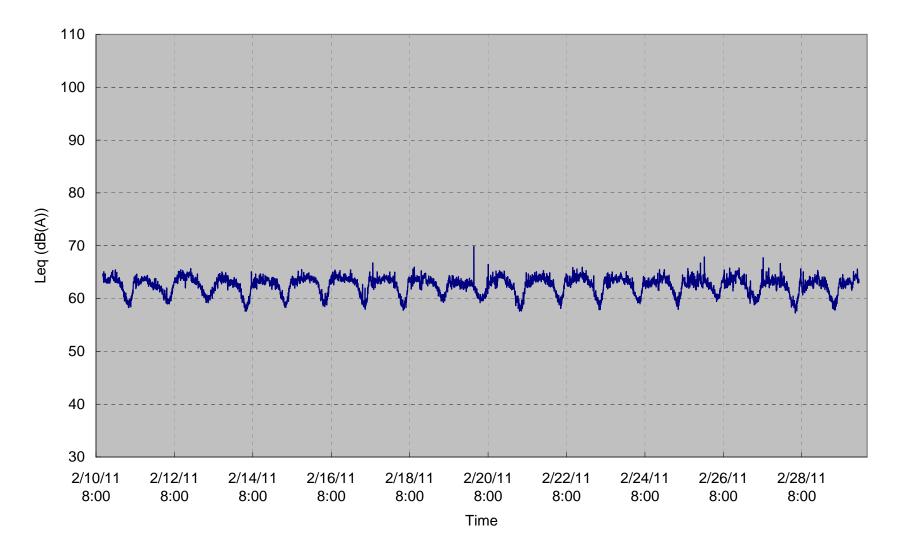
Alhambra Building (CN1)



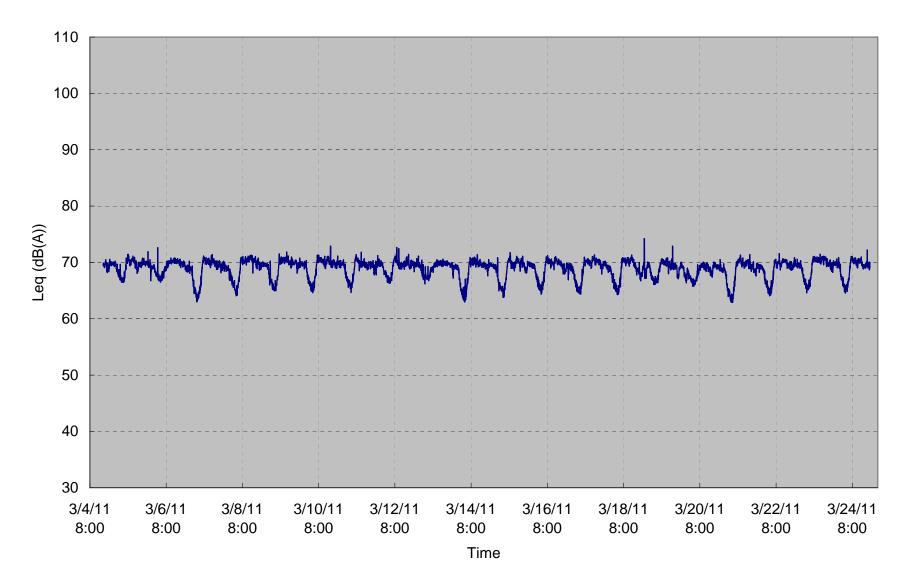
Methodist College (CN2)



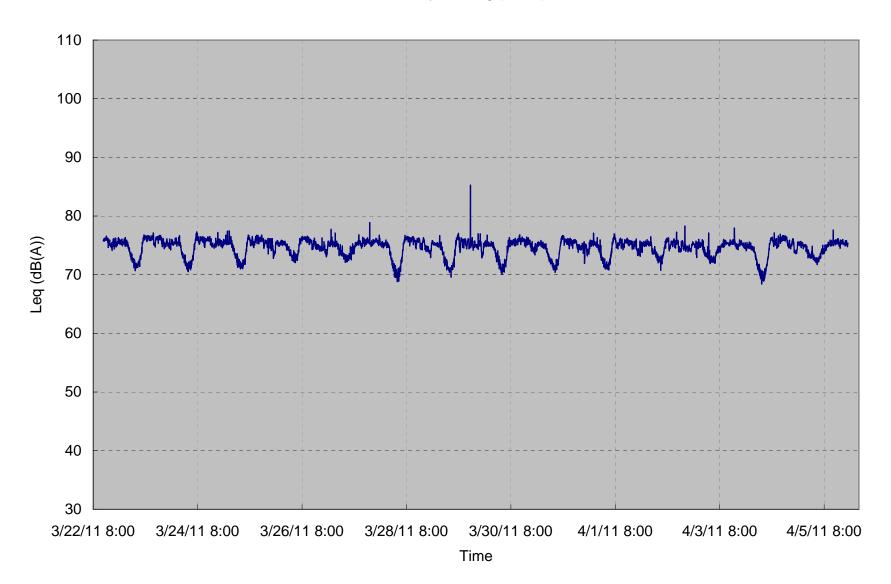
Queen Elizabeth Hospital - Specialist Clinic (CN3)



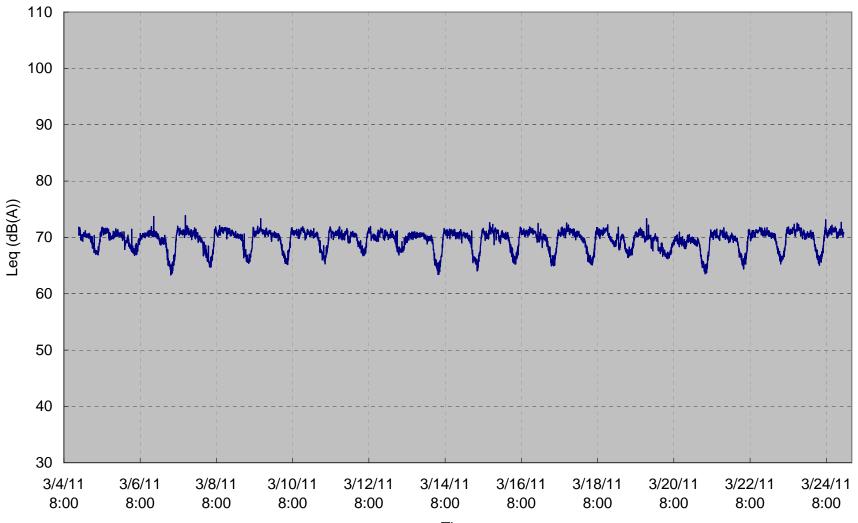
Yee Fu Building (CN4)

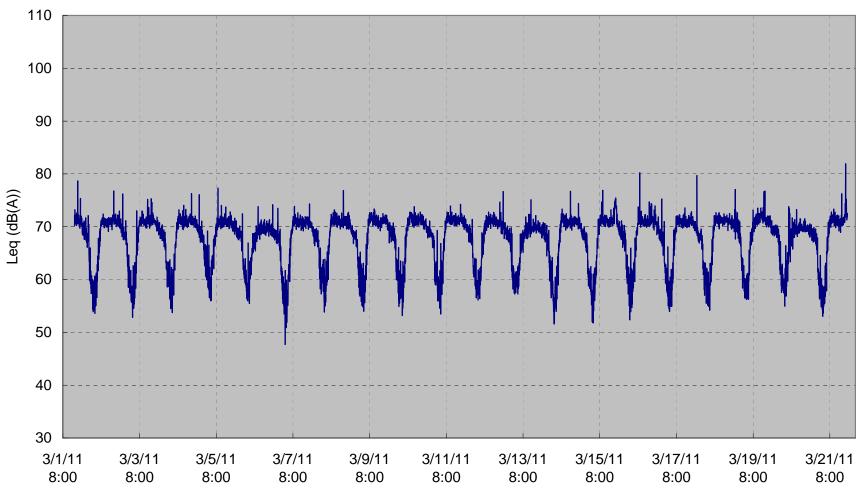


Bulkeley Building (CN5a)

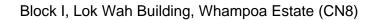


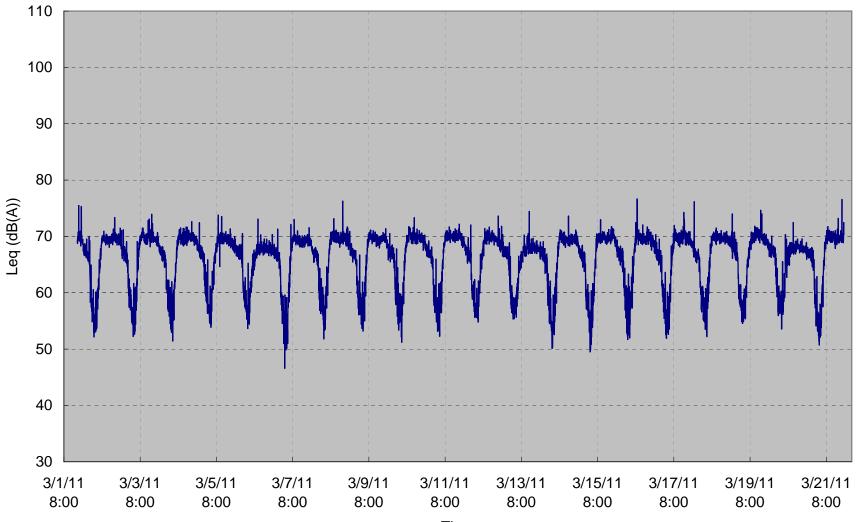
Lok Do Building (CN6)

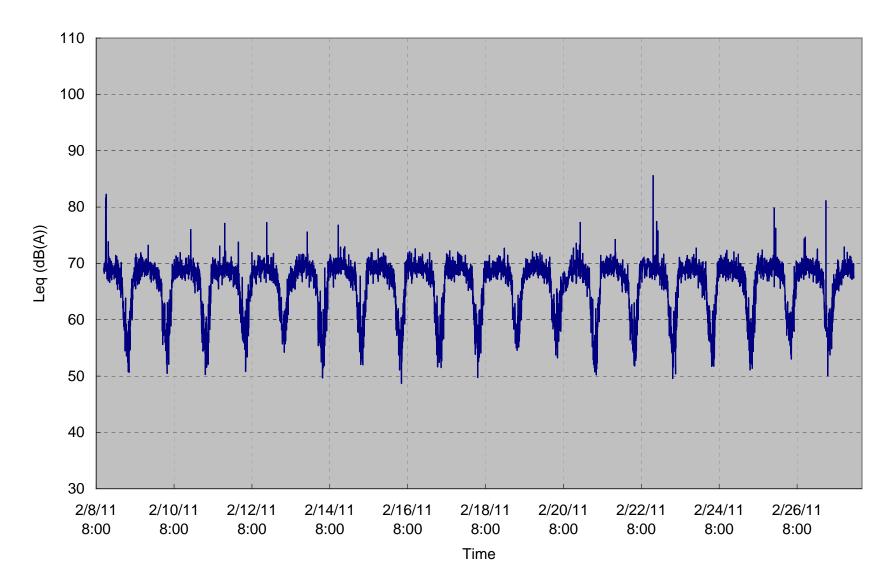




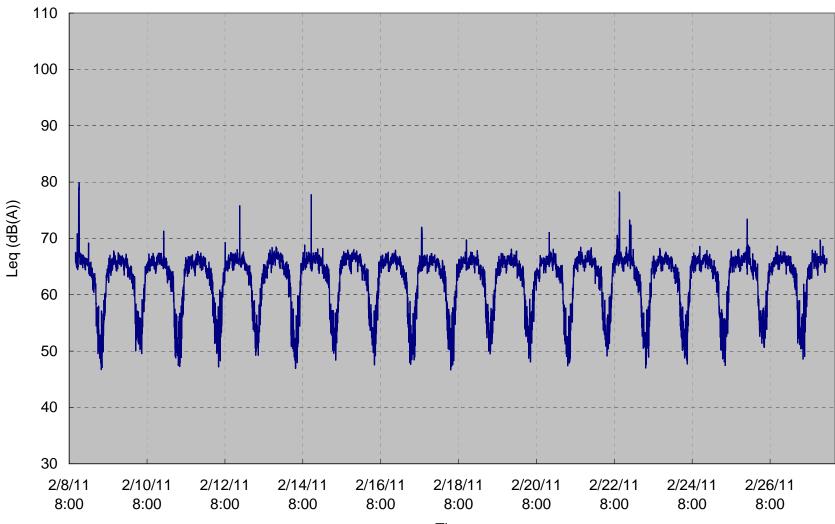
Block Y, Ki Fu Building, Whampoa Estate (CN7)





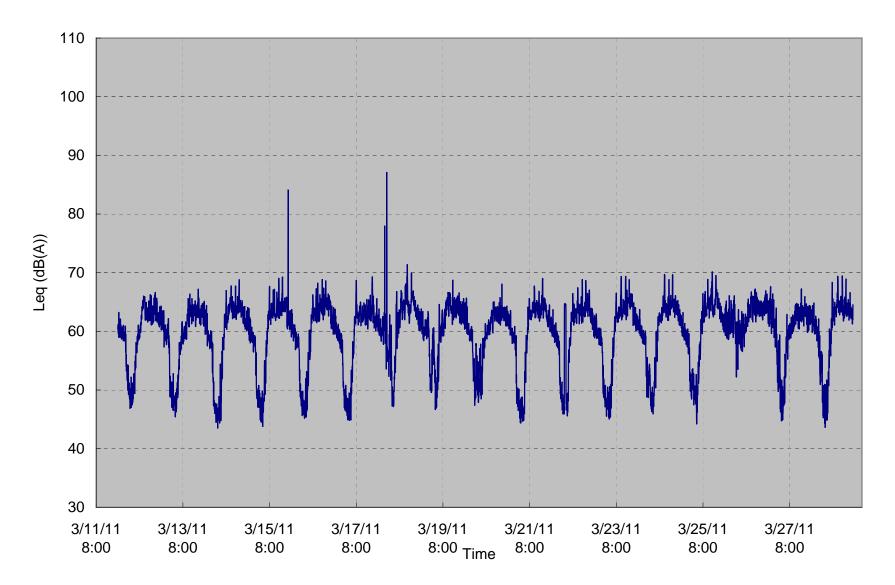


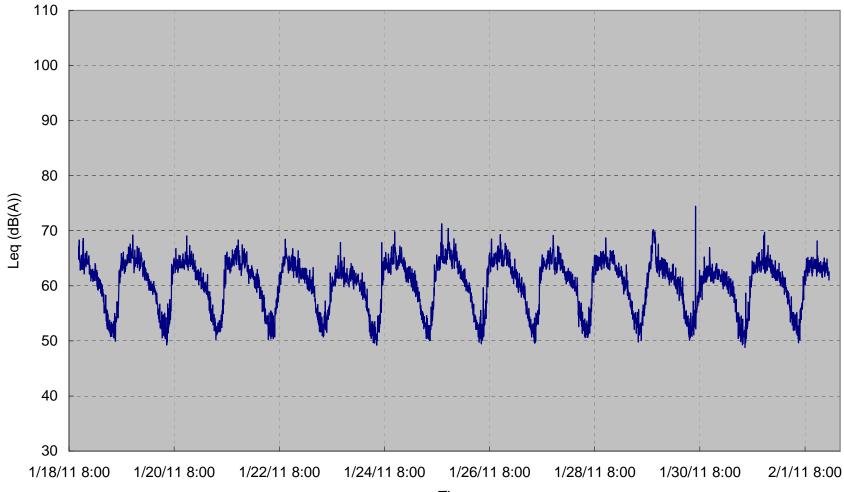
Block 13, Bauhinia Mansions, Whampoa Garden Site 11 (CN9)



Block 1, Oak Mansions, Whampoa Garden Site 5 (CN10)

Fung Kei Millennium Primary School (CN11)





### GCEPSA Whampoa Primary School (CN12)

## ANNEX C

Calibration Certificates for Monitoring Equipment

#### ThermoFisher

,

S C I E N T I F I C 27 FORGE PARKWAY FRANKLIN MA 02038 TOLL FREE: 866-282-0430 TEL: 508-553-6949 FAX: 508-541-8366 www.thermo.com/aqi

### DR2000 CALIBRATION CERTIFICATE

This calibration is traceable to the National Institute of Standards and Testing

SERIAL NUMBER:	<u>2003</u>
CALIBRATION RATIO:	<u>0.991</u>
AVG. DR CONCENTRATION:	<u>2.47 mg/m3</u>
MASTER AVG CONCENTRATION:	<u>2.04 mg/m3</u>
PDR BACKROUND CONCENTRATION:	0.332 mg/m3

TEMPERATURE:	73	F
RH:	39	%

CALIBRATION MASTER: D187 LAST CALIBRATED: 5/1/2009

TECHNICIAN: KL

DATE: \_\_\_\_\_ 5/19/2009

ThermoFisher SCIENTIFIC 27 FORGE PARKWAY FRANKLIN MA 02038 TOLL FREE: 866-282-0430 TEL: 508-553-6949 FAX: 508-541-8366 www.thermo.com/aqi

### DR2000 CALIBRATION CERTIFICATE

This calibration is traceable to the National Institute of Standards and Testing

SERIAL NUMBER:	<u>2032</u>
CALIBRATION RATIO:	<u>0.999</u>
AVG. DR CONCENTRATION:	<u>2.41 mg/m3</u>
MASTER AVG CONCENTRATION:	<u>2.13 mg/m3</u>
DR BACKROUND CONCENTRATION:	<u>0.361</u> mg/m3

TEMPERATURE:	73	F
RH:	39	%

CALIBRATION MASTER: D187 LAST CALIBRATED: 5/1/2009

TECHNICIAN: KL

DATE: <u>5/29/2009</u>

	GS2310 Series Sampler Calibration								
				son Reco			·		
	Customer ->	MTRC		SITE					
	Location ->	· Fung Ko	ei MPS		Date ->	9-Feb-11			
	Sampler ->	1294-11	10		Tech ->	Chan Kin Fung			
			CC	NDITIO	NS				
Sea Leve	1 Pressure	(hpa)	1008		Sampler Elev		. 60		
Sea Leve	1 Pressure	(in Hg)	29.77		Corrected Pr	essure (mm Hg)	754.48		
Temperat	ture	(deg C)	23		Temperature		296.00		
	SL Pressure	(in Hg)	29.77			asonal (mm Hg)	754.48		
Seasonal	Temperature	c (deg C)	23.00			nperature(deg K)	296.00		
					ORIFICE				
	Make ->		en Instrumer	nts Inc.		Qstd Slope ->	1.99		
	Model ->	25A				Qstd Intercept ->	-0.014012		
	Serial# ->	5303				Date Certified ->			
				LIBRAT					
	Plate or	H <sub>2</sub> O	Qstd	Ι	IC	LINEAR			
	Test #	(in)	(M <sup>3</sup> /min)	(chart)	(corrected)	REGRESSION			
1	18	14.3	1.907	66	65.982	Slope =	35.0314		
2	13	11.5	1.711	60	59.984	Intercept =	-0.0448		
3	10	9.1	1.523	54	53.985	Corr. Coeff. =	0.9976		
4	7	5.9	1.227	44	43.988				
5	5	3.7	0.973	33	32.991				
	Calculation	S							
Qstd = 1/	m [Sqrt (H <sub>2</sub> C	O (Pa/Pste	d) (Tstd/Ta)	) - b]					
IC = I [So	qrt (Pa/Pstd)	(Tstd/Ta)	)]						
-	andard flow								
	ected chart re	-							
	chart respor								
	orator Qstd sl	-							
	rator Qstd inf	-	actinuction	(dag V)					
	al temperatu	-							
	al pressure d	uring car	ioration (mi	п пд)		A STATE OF THE STA			
Tstd = 29	-					CE INTERNATION	Con and a second		
	50 mm Hg	ation of -	ammler flerr			氨新儀会。			
For subse	equent calcul	ation of s	ampier now	V <b>.</b>					

1/m ((I) [Sqrt (298/Tav) (Pav/760)] - b)

m = sampler slopeb = sampler interceptI = chart responseTav = daily average temperature Pav = daily average pressure



				JMENTS I		
	G	S2310 Serie	es Sampl	er Calibration		
		(Dick	son Reco	order)		
Customer -	> MTRC		SITE			
Location -	> Queen F	Elizabeth Ho	ospital	Date ->	10-Feb-11	
Sampler -	> 1294-11	.12		Tech ->	Chan Kin Fung	
		CC	NDITIO	NS		
Sea Level Pressure	(hpa)	1007.5		Sampler Elev	vation (feet)	60
Sea Level Pressure	(in Hg)	29.75		Corrected Pr	essure (mm Hg)	754.11
Temperature	(deg C)	22		Temperature	(deg K)	295.00
Seasonal SL Pressur	e (in Hg)	29.75		Corrected Se	easonal (mm Hg)	754.11
Seasonal Temperatur	re (deg C)	22.00		Seasonal Ter	mperature(deg K)	295.00
*	·····	CALIBR	ATION	ORIFICE		
Make ->	Anderse	en Instrumei	nts Inc.		Qstd Slope ->	1.99
Model ->	25A				Qstd Intercept ->	-0.014012
Serial# ->	5303				Date Certified ->	
		CA	LIBRAT	ION		
Plate or	$H_2O$	Qstd	Ι	IC	LINEAR	
Test #	(in)	(M <sup>3</sup> /min)	(chart)	(corrected)	REGRESSION	
1 18	14.6	1.929	62	62.073	Slope =	27.3527
2 13	11.9	1.743	57	57.067	Intercept =	9.2264
3 10	9.3	1.541	51	51.060	Corr. Coeff. =	0.9998
4 7	6	1.239	43	43.050		
5 5	3.7	0.975	36	36.042		
Calculatio	ons					

 $Qstd = 1/m [Sqrt (H_2O (Pa/Pstd) (Tstd/Ta)) - b]$ 

IC = I [Sqrt (Pa/Pstd) (Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow: 1/m ((I) [Sqrt (298/Tav) (Pav/760)] - b)

m = sampler slope b = sampler intercept I = chart response Tav = daily average temperature

Pav = daily average pressure



				J <b>MENTS I</b>				
	G		-	er Calibration				
~		(Dick	son Reco	order)		•••••		
Customer ->		0 111	SITE	Data	0 1 (			
Location ->		0			2-Mar-11			
-> Sampler	> 1294-11				Chan Kin Fung			
	(1		NDITIO		ration (fact)	60		
Sea Level Pressure	(hpa)	1007.5		Sampler Elev		754.11		
Sea Level Pressure	(in Hg)	29.75			essure (mm Hg) $(dag K)$	295.00		
Temperature	(deg C)	22		Temperature	(deg K) asonal (mm Hg)	295.00 754.11		
Seasonal SL Pressure	· •	29.75			· •	295.00		
Seasonal Temperature (deg C) 22.00 Seasonal Temperature(deg K) 295.00 CALIBRATION ORIFICE								
Make ->	Anderse	n Instrumer	nts Inc.		Qstd Slope ->	1.99		
Model ->	25A				Qstd Intercept ->	-0.014012		
Serial# ->	5303			]	Date Certified ->			
		CA	LIBRAT	ION				
Plate or	$H_2O$	Qstd	Ι	IC	LINEAR			
Test #	(in)	(M <sup>3</sup> /min)	(chart)	(corrected)	REGRESSION			
1 18	15.1	1.962	59	59.069	Slope =	23.6930		
2 13	12.2	1.764	54	54.063	Intercept =	12.5532		
3 10	9.2	1.533	49	49.057	Corr. Coeff. =	0.9995		
4 7	5.9	1.229	42	42.049				
5 5	3.6	0.962	35	35.041				
Calculation	15							
$Qstd = 1/m [Sqrt (H_2)]$	O (Pa/Psto	l) (Tstd/Ta)	) - b]					
IC = I [Sqrt (Pa/Pstd)								
Qstd = standard flow	rate							
IC = corrected chart r	esponse							
I = actual chart respon	nse							
m = calibrator Qstd s	lope							
b = calibrator Qstd in								
Ta = actual temperatu	ire during	calibration	(deg K)					
Pa = actual pressure d	luring cali	ibration (mr	n Hg)					
Tstd = 298 deg K						~~		
Pstd = 760  mm Hg					a community of TOMA	CORD BALL		
For subsequent calcu			V:		新儀公			
1/m ((I) [Sqrt (298/T	av) (Pav/7	60)] - b)						
					G KC	P. P. J. Standard Street		
m = sampler slope								
b = sampler intercept								
I = chart response Tay = daily average t	emneratur	• <u>e</u>						

Tav = daily average temperature Pav = daily average pressure

## ANDERSEN INSTRUMENTS INC.

GS2310 Series Sampler Calibration								
			(Dick	son Reco	order)			
(	Customer ->	MTRC		SITE				
	Location ->	Finger Pi	ier		Date ->	7-Mar-11		
	Sampler ->	694-0665	5		Tech ->	Chan Kin Fung		
			CO	NDITIO	NS			
Sea Level	Pressure	(hpa)	1010		Sampler Elev	ration (feet)	60	
Sea Level	Pressure	(in Hg)	29.83		Corrected Pre	essure (mm Hg)	755.98	
Temperatu	ıre	(deg C)					295.50	
Seasonal S	SL Pressure	(in Hg)					755.98	
Seasonal 7	Гemperature	(deg C)	22.50		Seasonal Ten	nperature(deg K)	295.50	
			CALIBR	ATION	ORIFICE			
	Make ->	Andersei	n Instrumer	nts Inc.		Qstd Slope ->	1.99	
	Model ->	25A			(	Qstd Intercept ->	-0.014012	
	Serial# ->	5303			Ι	Date Certified ->		
			CAI	LIBRAT	ION			
	Plate or	$H_2O$	Qstd	Ι	IC	LINEAR		
	Test #	(in)	$(M^3/min)$	(chart)	(corrected)	REGRESSION		
1	18	15	1.956	64	64.100	Slope =	31.3414	
2	13	11.9	1.743	59	59.092	Intercept =	3.8585	
3	10	9.3	1.542	53	53.083	Corr. Coeff. =	0.9974	
4	7	6	1.240	43	43.067			
5	5	3.8	0.988	34	34.053			
	Calculation	S						
Ostd = 1/r	n [Sqrt (H <sub>2</sub> C	) (Pa/Pstd	) (Tstd/Ta)	) - b]				
-	IC = I [Sqrt (Pa/Pstd) (Tstd/Ta)]							
10 1[~1		().	1					
Ostd = sta	ndard flow	rate						
•	cted chart re							
	chart respon	-						
	rator Qstd sl							
	ator Qstd int	-						
o canon	~~~~ ~~~~ ~~ ~~ ~~ ~~ ~~ ~~ ~~ ~~ ~~ ~~	P*						

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow:

1/m ((I) [Sqrt (298/Tav) (Pav/760)] - b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



				MENTS I	NC.	
	C		-	r Calibration		
		(Dicl	kson Reco	rder)		
Customer -			SITE	_		
		Chatham R	oad North		> 18-Mar-11	
Sampler -	> 894-083				<ul> <li>Chan Kin Fung</li> </ul>	
			ONDITION			< D
Sea Level Pressure	(hpa)	1010		Sampler Ele		60
Sea Level Pressure	(in Hg)	29.83			ressure (mm Hg)	755.98
Temperature	(deg C)	22.5		Temperature	· • /	295.50
Seasonal SL Pressure	· •	29.83			easonal (mm Hg)	755.98
Seasonal Temperatur	re (deg C)	22.50			mperature(deg K)	295.50
	4 1		RATION C	RIFICE	0,101	1.00
Make ->		n Instrumen	ts Inc.		Qstd Slope ->	1.99
Model ->	25A				Qstd Intercept ->	-0.014012
Serial# ->	5303				Date Certified ->	
			LIBRATI			
Plate or	$H_2O$	Qstd	Ι	IC	LINEAR	
Test #	(in)	$(M^3/min)$	(chart)	(corrected)	REGRESSION	
1 18	14.7	1.937	62	62.097	Slope =	32.0235
2 13	12.1	1.758	57	57.089	Intercept =	0.5546
3 10	9.2	1.534	50	50.078	Corr. Coeff. =	0.9995
4 7	5.9	1.230	40	40.063		
5 5	3.6	0.962	31	31.049		
Calculatio	ns					
$Qstd = 1/m [Sqrt (H_2)]$	O (Pa/Pstd	l) (Tstd/Ta))	- b]			
IC = I [Sqrt (Pa/Pstd	) (Tstd/Ta)	]				
	().	3				
Qstd = standard flow	rate					
IC = corrected chart						
I = actual chart respo	-					
m = calibrator Qstd s						
b = calibrator Qstd in	-					
Ta = actual temperat	-	calibration (	(deg K)			
Pa = actual pressure	-		. – .			
-	during can	oration (init	i iig)			
Tstd = 298 deg K						
Pstd = 760  mm Hg	1		_		THETHERE CO	
For subsequent calcu		-	:		Stiller Conge	1
1/m ((I) [Sqrt (298/T	av) (Pav//0	50)] - b)			《《新儀公司》》	j
1 1					NO ROSO A	Ŷ
m = sampler slope	L				and the second sec	
b = sampler intercep	l					
I = chart response						
Tav = daily average	-	e				
Pav = daily average	pressure					

					UMENTS I er Calibration						
(Dickson Recorder)											
Customer -> MTRC SITE											
	Location -> Ka Fu Building Date -> 29-Mar-11										
	Sampler ->	994-087	4		Tech ->	Chan Kin Fung					
			CC	ONDITIO	NS						
Sea Leve	1 Pressure	(hpa)	1011		Sampler Elev	vation (feet)	60	• .			
Sea Leve	l Pressure	(in Hg)	29.85		Corrected Pr	essure (mm Hg)	756.73				
Tempera	ture	(deg C)	22		Temperature	(deg K)	295.00				
Seasonal	SL Pressure	(in Hg)	29.85		Corrected Se	easonal (mm Hg)	756.73				
Seasonal	Temperature	(deg C)	22.00		Seasonal Ter	nperature(deg K)	295.00				
			CALIBR	ATION	ORIFICE						
	Make ->	Anderse	n Instrumer	nts Inc.		Qstd Slope ->	1.99				
	Model ->	25A				Qstd Intercept ->	-0.014012				
	Serial# ->	5303				Date Certified ->					
			CA	LIBRAT	ION						
	Plate or	$H_2O$	Qstd	Ι	IC	LINEAR					
	Test #	(in)	$(M^3/min)$	(chart)	(corrected)	REGRESSION					
1	18	13	1.824	60	60.175	Slope =	29.0331				
2	13	10.5	1.640	55	55.160	Intercept =	7.5836				
3	10	8.1	1.441	50	50.146	Corr. Coeff. =	0.9992				
4	7	5.2	1.156	41	41.119						
5	5	3.3	0.923	34	34.099						
	Calculation	s									
Qstd = 1/	m [Sqrt (H <sub>2</sub> C	) (Pa/Psto	1) (Tstd/Ta)	) - b]							
IC = I [Science]	qrt (Pa/Pstd)	(Tstd/Ta)	]								
Ostd = st	andard flow 1	ate									
-	ected chart re										
	chart respon	-									
	orator Qstd slo										
	rator Qstd int	-									
	al temperatur	-	calibration	(deg K)							
	al pressure di	-		· - ·							
Tat = 29	*	ung vun									
	60 mm Hg					and the second second second second second					
	equent calcula	ation of s	ampler flow	<i>.</i>		A INTERNATIONAL CON.	No. No.				
	Quein ealeun		-			前班保办	a A				

1/m ((I) [Sqrt (298/Tav) (Pav/760)] - b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure





### Balance Calibration Report Tested to MTRC Method WI/707M/01

Laboratory Equipr	ment Identificatior	Number		BA0011	
Manufacturer	Sartorius	Model	A200S-**DIB	Serial No.	1065989
Capacity	120g	Discrimination	0.1mg	Туре	Top Loading
Location	Concrete Testing Area		Temperature	<b>2</b> 4℃	

Reference Mass Set Used (Equip. ID. No.)		RM001	
Manufacturer	Troemner	roemner OIML F1 Classification	
Last Calibration Date	29-04-2002	Calibrated By	South China National Centre of Metrology

### (1) Repeatability of Reading

Reference Mass (g)	Standard Deviation of Balance Reading (g)	Maximum Difference Between Successive Readings (g)
10	0.000094	0.0002
60	0.000079	0.0002
120	0.000042	0.0001

Standard Deviation of the Balance = 0.000422 g

### (2) Departure from Nominal Value

Reading (g)	Correction (g)	Uncertainty (g)
09.9998	0.00020	
19.9980	0.00025	
29.9999	0.00015	
39.9997	0.00043	
49.9998	0.00017	±0.000301
59.9996	0.00032	
69.9996	0.00037	
79.9996	0.00042	
89.9996	0.00045	
99.9993	0.00050	

Maximum Correction = 0.00050 g

MTR Corporation Internal Calibration



#### (3) Off-Centre Loading

A mass of approximately 10000g was moved to various position on the balance pan. The balance readings obtained at different position are given in the table.

Centre	Front	Back	Left	Right
59.9986	59.9984	59.9981	59.9987	59.9988

### Maximum Difference = 0.0007 g

#### (4) Hysteresis

Load	Hysteresis
(g)	(g)
. 50	0.000367

#### (5) Limit of Performance of the Balance = $\pm 0.000783$ g

Checked by :	Dick Lee	Certified by :	
Date :	14-02-2011	Date : 14 (2/2011	

#### Notes:

1. The balance has been tested according to the specifications laid down in Chapter 6 of the CSIRO Publication "The Calibration of Balances - by David B. Prowse".

2.Uncertainties quoted in this report have been estimated on the basis of there being not more than one chance in one hundred that any value differs from the true value by more than the stated uncertainty.

3. The Limit of Performance is the tolerance band within which all readings of the balance will fall.

We certify that Brüel & Kjær -2250-L-- Serial No. 2741134 has been tested and passed all production tests, confirming compliance with the manufacturer's published specification at the date of the test.

The final test has been performed using calibrated equipment, traceable to National or International Standards or by ratio measurements.

Brüel & Kjær is certified under ISO 9001:2008 assuring that all test data is retained on file and is available for inspection upon request.

Nærum 21-jan-2011

Torben Bjørn Vice President, Operations

A 0238 - 17

Please note that this document is not a calibration certificate. For information on our calibration services please contact your nearest Brüel & Kjær office.

HEADQUARTERS: Brüel & Kjær Sound & Vibration Measurement A/S · DK-2850 Nærum · Denmark Telephone: +45 7741 2000 · Fax: +45 4580 1405 · www.bksv.com · info@bksv.com



We certify that Brüel & Kjær -2250-L-- Serial No. 2741135 has been tested and passed all production tests, confirming compliance with the manufacturer's published specification at the date of the test.

The final test has been performed using calibrated equipment, traceable to National or International Standards or by ratio measurements.

Brüel & Kjær is certified under ISO 9001:2008 assuring that all test data is retained on file and is available for inspection upon request.

Nærum 21-jan-2011

Torben Bjørn Vice President, Operations

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We certify that Brüel & Kjær -2250-L-- Serial No. 2741136 has been tested and passed all production tests, confirming compliance with the manufacturer's published specification at the date of the test.

The final test has been performed using calibrated equipment, traceable to National or International Standards or by ratio measurements.

Brüel & Kjær is certified under ISO 9001:2008 assuring that all test data is retained on file and is available for inspection upon request.

Nærum 21-jan-2011

Torben Bjørn Vice President, Operations

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We certify that Brüel & Kjær -2250-L-- Serial No. 2731887 has been tested and passed all production tests, confirming compliance with the manufacturer's published specification at the date of the test.

The final test has been performed using calibrated equipment, traceable to National or International Standards or by ratio measurements.

Brüel & Kjær is certified under ISO 9001:2008 assuring that all test data is retained on file and is available for inspection upon request.

Nærum 02-nov-2010

Torben Bjørn Vice President, Operations

A 0238 - 1

Please note that this document is not a calibration certificate. For information on our calibration services please contact your nearest Brüel & Kjær office.

HEADQUARTERS: Brüel & Kjær Sound & Vibration Measurement A/S · DK-2850 Nærum · Denmark Telephone: +45 7741 2000 · Fax: +45 4580 1405 · www.bksv.com · info@bksv.com



We certify that Brüel & Kjær -2250-L-- Serial No. 2731888 has been tested and passed all production tests, confirming compliance with the manufacturer's published specification at the date of the test.

The final test has been performed using calibrated equipment, traceable to National or International Standards or by ratio measurements.

Brüel & Kjær is certified under ISO 9001:2008 assuring that all test data is retained on file and is available for inspection upon request.

Nærum 02-nov-2010

Torben Bjørn Vice President, Operations

Please note that this document is not a calibration certificate. For information on our calibration services please contact your nearest Brüel & Kjær office.

HEADQUARTERS: Brüel & Kjær Sound & Vibration Measurement A/S · DK-2850 Nærum · Denmark Telephone: +45 7741 2000 · Fax: +45 4580 1405 · www.bksv.com · info@bksv.com





### CALIBRATION CERTIFICATE

Certificate Inj	formation		
Date of Issue	25 <sup>th</sup> May, 2009	Certificate Number	MLCN090442S

<b>Customer</b> Informat	ion	
Company Name	MTR Corporation Limited	
Address	MTR Tower, Telford Plaza,	
	33 Wai Yip St., Kowloon Bay,	
	Kowloon,	
	Hong Kong	

Unit Under Test (UUT)			
Description	Sound Level Calibrator		
Manufacturer	Brüel & Kjær		
Model Number	4231		
Serial Number	2309393		
Equipment Number	-		

#### Calibration Result

- \* All calibration results within the manufacturer's specification.
- \* Calibration data are detailed on the attached sheet(s).

Approved By	
1	
Laboratory Manager	_

- \* Calibration equipment used for this calibration are traceable to national / international standards.
- The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the UUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.
   May Leb Colibration Control imited between the second second
- \* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the UUT.
- \* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.

Page 1 of 2

#### 萬儀校正中心有限公司 MaxLab Calibration Centre Limited



## **CALIBRATION** CERTIFICATE

Date of Issue 25	5 <sup>th</sup> May, 2009	Certificate Number	MLCN090442S
Calibration Status			

Date of Calibration		23 <sup>rd</sup> May, 2009		
Calibration Equipment Used		4231 (Spec) (MLTE008)/ CA0801167/ 24 <sup>th</sup> Feb 2010		
Calibration Procedure		1351 (MLTE049)/ MLEC08/06/02/ 14 <sup>th</sup> Jun 2009 MLCG00 & MLCG15.		
Calibration Uncertainty		± 0.1 dB	± 0.1 dB	
		_		
Calibration Condition	Lab	Temperature	23 °C ± 5 °C	
		<b>Relative Humidity</b>	55% ± 25%	
	UUT	Stabilizing Time	24 hours	
		Warm-up Time	Not applicable	
		Supply Voltage	Not applicable	

Calibration Data					
UUT Setting		STD Rdg	UUT Error from Setting		UUT Error Limit
94	dB	94.0 dB	0.0	dB	0.2 dB
114	dB	114.1 dB	0.1	dB	0.2 dB

萬儀校正中心有限公司 MaxLab Calibration Centre Limited Unit B2, 9/F., Boldwin Industrial Bldg., 16-18 Wah Sing Street, Kwai Chung, N.T., Hong Kong. Tel: (852) 2116 1380 Fax: (852) 2264 6480 Email: info@maxlab.com.hk 香港新界葵涌華星街16-18號保盈工業大厦 9 樓 B2 室 電話: (852) 2116 1380 傳真: (852) 2264 6480 電郵: info@maxlab.com.hk