

MTR Corporation Limited

Kwun Tong Line Extension (KTE)

Monthly EM&A Report (September 2011)

Verified by:  _____


Position: Independent Environmental Checker

Date: 17 Oct 2011

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Certified by: 
Position: Environmental Team Leader
Date: 17 Oct 2011

EXECUTIVE SUMMARY

The Kwun Tong Line Extension (KTE) Project was awarded to the respective contractors in late May 2011. The EM&A programme for the Kwun Tong Line Extension (KTE) Project commenced on 20 June 2011, the commencement date of construction of the Project. This is the third monthly Environmental Monitoring and Audit (EM&A) Report for Kwun Tong Line Extension (KTE) Project. The Report presents the results of EM&A works and the impact monitoring for the construction works undertaken during the period of 1 September 2011 to 30 September 2011. The major construction activities in the reporting period included drainage diversion works, ground investigation works, installation of noise barrier for construction shafts, temporary road & traffic diversion and piling preparation.

Impact monitoring for air quality and noise were conducted in accordance with the EM&A Manual in the reporting period. No exceedance was found and there was no breach of Limit Levels for air and noise monitoring.

No environmental notification of summon, prosecution and valid complaint were received in the reporting period.

Regular joint site inspections, led by the ER with the presence with representatives from the Contractors and Environmental Team, were conducted on a weekly basis to monitor Contractors' performance on environmental management and implementation of environmental pollution control and mitigation measures for the Project. No non-conformance was identified in the reporting period. Some environmental concern items raised during the site inspections have been followed up the respective contractors in an acceptable manner.

The Environmental Permit (EP-399/2010/A) dated on 1 December 2010 is being used for the KTE Project.

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1 INTRODUCTION

1.1 Project 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), and a new ancillary ventilation building at Wylie Road.

1.2 Project Programme

The Kwun Tong Line Extension (KTE) Project was awarded to the respective Contractors Nishimatsu Construction Co. Ltd (NCC) and Chun Wo-Hip Hing Joint Venture (CHJV) for construction in late May 2011. The commencement of construction was on 20 June 2011. The commencement of operation of the Project is scheduled to be in 2015. Contractors’ summary programme for Contract 1001 and Contract 1002 are presented below.

NCC, as the Contractor of Contract 1001, is responsible for the construction of alignment link from the existing Yau Ma Tei Station to Wuhu Street at Whampoa and the new Ho Man Tin Station as well as the ancillary ventilation building at Wylie Road. CHJV, as the Contractor of Contract 1002, is responsible for the construction of the underground Whampoa Station and a platform & overrun tunnel.

Contract 1001 – Yau Ma Tei to Whampoa Tunnels and Ho Man Tin Station

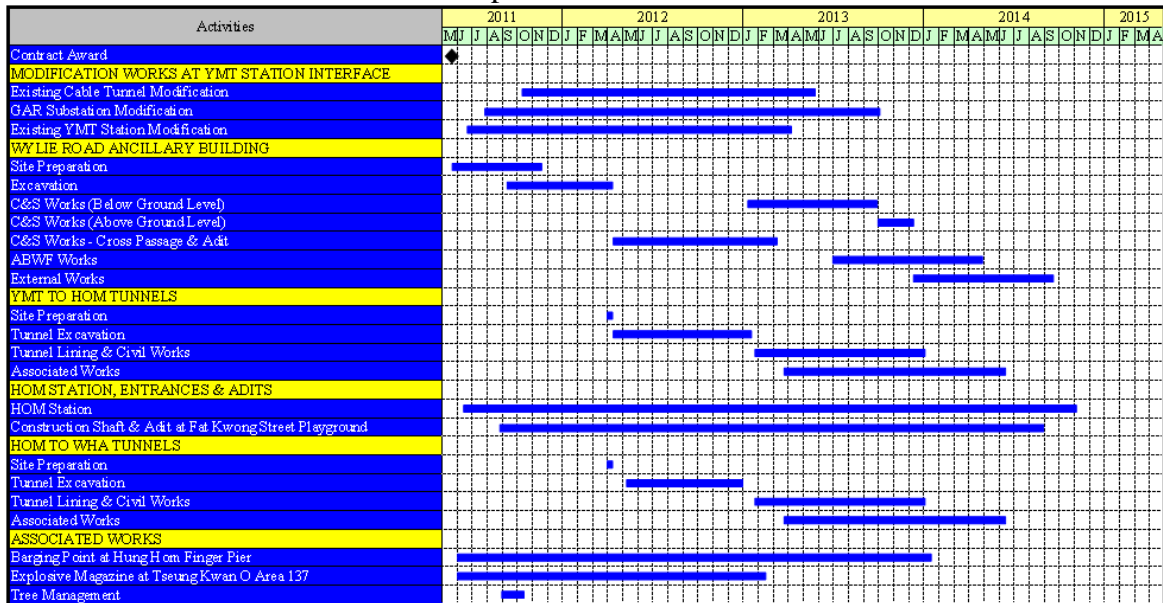


Table 1a Contact List of Key Personnel for Project Management

Organization	Name	Telephone
Engineer's Representative		
Project Manager	James Chow	2163 6283
Construction Manager	Kenny Kong	2163 6355
Construction Manager	Reilly Brendan James	2163 6325
Independent Environmental Checker		
Consultant – Arup	Jacky Chan	3447 6051
Environmental Team		
Environmental Team Leader	Richard Kwan	2688 1179
Contact 1001 Contractor		
Project Manager	M. Matsuzaki	9136 5832
Environmental Officer	Ben Ho	2163 6785
Contact 1002 Contractor		
Project Manager	Eric Wu	2743 3711
Deputy Project Manager	C M Lau	9490 8995
Senior Environmental Engineer	Louie Chan	92701390

Table 1b Contact List of Environmental Authority

Organization	Name	Telephone
Environmental Protection Department		
Sr Env Protection Offr(Metro Assessment) 3	Colin Keung	2835 1125
Sr Env Protection Offr(Regional E) 6	C L Wong	2150 8002
Sr Env Protection Offr(Regional E) 5	Warren Wong	2117 7538
Sr Env Protection Offr(Regional E) 4	Louis Chan	2117 7502

2.2 Project Works Sites and Areas and Environmental Monitoring Locations

The KTE Project works sites and areas are summarized in Table 2 below and shown in Appendix A Figures 1 to 8. The locations of environmental monitoring stations are indicated in Appendix A Figures 2 to 8. Table 3 shows the details of the active monitoring stations as reported in Sections 3.1 and 3.2.

Table 2 Summary of KTE Project Works Sites and Areas

<i>Contract 1001 Works Sites and Areas</i>	
Works Site A	Gascoigne Road Rest Garden
Works Site B	Underground Tunnel between Yau Ma Tei Station and Wylie Road Ancillary Building
Works Site C	Wylie Road Ancillary Building
Works Site D	Underground Tunnel between Wylie Road Ancillary Building and Ho Man Tin Station
Works Site E	Ho Man Tin Station
Works Site F	Fat Kwong Street Playground
Works Site G	Underground Tunnel between Ho Man Tin Station and Whampoa Station
Works Area J	Finger Pier Barging Point
Works Area K	Tseung Kwan O Area 137 Magazine Site

<i>Contract 1002 Works Sites and Areas</i>	
Works Site H	Whampoa Station West Concourse
Works Site I	Whampoa Station East Concourse
Works Area L	Hung Lok Road Site Office

Table 3 Summary of impact air quality and noise monitoring stations

ID	Monitoring Station
Air	
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
Noise	
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

ID	Monitoring Station
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

Note: 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. The noise monitoring location at Caritas Bianchi College of Careers, which has been relocated to Tiu Keng Leng with the original premise unoccupied and inaccessible, is suspended until the premises are occupied by similar educational use. No noise monitoring will be conducted for CN5.

2.3 Summary of EM&A Requirements

The EM&A programme mainly requires environmental monitoring for air quality, noise, landscape and visual, water quality and waste management as specified in the EM&A Manual.

A summary of impact EM&A requirements as applicable to this EM&A Report is presented in Table 4 below.

Table 4 Summary of impact EM&A Requirements

Parameters	Descriptions	Locations	Monitoring Frequencies	Duration
Air Quality	24-hr TSP	Shown in Table 2	Once per 6 days	Construction stage
Noise	Leq(30min)	Shown in Table 2	Once a week	Construction stage
Landscape and visual	On-Site Audit	Active Works Sites	Bi-weekly	Construction stage
Waste	On-Site Audit	Active Works Sites	Weekly	Construction stage
Wastewater	On-Site Audit	Active Works Sites	Weekly and in accordance to the discharge licences	Construction stage
General Site Conditions	Environmental Site Inspection	Active Works Sites	Weekly	Construction stage

Environmental Quality Performance Limits for air quality and noise are shown in **Appendix B**. The Event Action Plan for air quality and noise are shown in **Appendix C**.

2.4 *Implementation of Environmental Mitigation Measures*

The KTE Civil Works Contractors are required to implement the mitigation measures as specified in the EP, EIA Report and EM&A Manual. During the regular environmental site inspections, the Contractors' implementation of mitigation measures were inspected and reviewed. A schedule of the implementation of mitigation measures identified in the KTE EIA is given in **Appendix D**.

2.5 *Construction Activities in the Reporting Month*

Major construction activities carried out by the respective KTE Civil Works Contractors during the reporting period include:

Contract 1001 - Works Sites and Areas

Works Site A (Gascoigne Road Rest Garden)

- Tree transplant
- Preparation works for the noise enclosure

Works Site B (Underground Tunnel between Yau Ma Tei Station and Wylie Road Ancillary Building)

- Nil

Works Site C (Wylie Road Ancillary Building)

- Pipe piling works for noise enclosure installation

Works Site D (Underground Tunnel between Wylie Road Ancillary Building and Ho Man Tin Station)

- Nil

Works Site E (Ho Man Tin Station)

- Construction of site hoarding
- Preparation work of pipe piling work
- Trail pits for identification of underground utilities

Works Site F (Fat Kwong Street Playground)

- Erection of site office
- Pipe piling works for noise enclosure installation

Works Site G (Underground Tunnel between Ho Man Tin Station and Whampoa Station)

- Nil

Works Area J (Hung Hom Barging Point)

- Preparation work of barging ramp / jetty, weight-bridge and wheel washing facilities

Works Area K (Tseung Kwan O Area 137 Magazine Site)

- Site formation for magazine and EVA
- Preparation work of DG store, FS pump room and water tank

Contract 1002 - Works Sites and Areas

Works Site H (Whampoa Station West Concourse)

- Planter boxes removal
- Diversion of utilities and ground instrument installation work
- Temporary traffic management implementation
- Ground instrument installation work

Works Site I (Whampoa Station East Concourse)

- Site clearance
- Utilities diversion and ground instrument installation work

Works Area L (Hung Lok Road Site Office)

- Erection of Site office and material stores

2.6 Construction Activities for the Coming Month

According to the construction programme for the Civil Works Contracts, the scheduled major construction activities in the next reporting month are as follows:

Contract 1001 - Works Sites and Areas

Works Site A (Gascoigne Road Rest Garden)

- CCTV survey for the existing drainages
- Construction of noise enclosure for construction shaft

Works Site B (Underground Tunnel between Yau Ma Tei Station and Wylie Road Ancillary Building)

- Nil

Works Site C (Wylie Road Ancillary Building)

- Pipe piling works for noise enclosure installation
- Pumping test and ground instrument installation
- CCTV survey for the existing drainages

Works Site D (Underground Tunnel between Wylie Road Ancillary Building and Ho Man Tin Station)

- Nil

Works Site E (Ho Man Tin Station)

- Pipe piling works for noise enclosure installation
- Installation of ground instrument
- Site formation works
- Water main & storm water drain diversion
- CCTV survey for existing drainages

Works Site F (Fat Kwong Street Playground)

- Construction of noise enclosure
- CCTV survey for the existing drainages

Works Site G (Underground Tunnel between Ho Man Tin Station and Whampoa Station)

- Nil

Works Area J (Hung Hom Barging Point)

- Construction of barge ramp
- CCTV survey for the existing drainages

Works Area K (Tseung Kwan O Area 137 Magazine Site)

- Construction of site magazine
- Construction of EVA and associated FSI and E&M works

Contract 1002 - Works Sites and Area

Works Site H (Whampoa Station West Concourse)

- Ground instrument installation
- Utilities diversion
- TTM implementation
- Hoarding erection
- Piling works preparation
- Demolition of part of the existing footbridge near WHA station entrance A1

Works Site I (Whampoa Station East Concourse)

- Utilities diversion
- Underground Instrument installation

Works Area L (Hung Lok Road Site Office)

- Erection of site office

3 IMPACT MONITORING

3.1 Air Quality

24-Hour TSP Levels Monitoring

The sampling procedure follows 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 is collected and returned to the laboratory for drying in a desiccator followed by 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.

The samplers should be properly maintained. Prior to dust monitoring commencing, appropriate checks should be made to ensure that all equipment and necessary power supply are in good working condition.

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 certificates are attached in **Appendix E**.

To examine the construction dust levels, 24-hour TSP monitoring was undertaken according to the EM&A Manual. The dust monitoring locations are shown in the Section 2.2 above. Monitoring results are presented in the following table and Appendix F for graphical plot. The 24-hour TSP monitoring results in the range from 27.0 to 98 ug/m³ recorded in the monitoring period shows that the dust levels generated by the active construction activities were within the Action Levels with no exceedance. This indicates that the construction activities did not have a noticeable adverse effect on the general air quality for the works areas.

CD1 Queen Elizabeth Hospital – Special Clinic					
Date	TSP (µg/m ³)	Action Level (µg/m ³)	Limit Level (µg/m ³)	Compliance (Yes/No)	Weather Condition
02/09/2011	58.2	171	260	Yes	Sunny
08/09/2011	47.4	171	260	Yes	Sunny
17/09/2011	76.8	171	260	Yes	Sunny
23/09/2011	79.9	171	260	Yes	Cloudy
28/09/2011	92.2	171	260	Yes	Cloudy
CD2 Yee Fu Building, Whampoa Estate					
Date	TSP (µg/m ³)	Action Level (µg/m ³)	Limit Level (µg/m ³)	Compliance (Yes/No)	Weather Condition
02/09/2011	55.0	183	260	Yes	Sunny
08/09/2011	57.2	183	260	Yes	Sunny
16/09/2011	67.5	183	260	Yes	Cloudy
22/09/2011	88.4	183	260	Yes	Cloudy
28/09/2011	97.9	183	260	Yes	Cloudy
CD3a No.238 Chatham Road North*					
Date	TSP (µg/m ³)	Action Level (µg/m ³)	Limit Level (µg/m ³)	Compliance (Yes/No)	Weather Condition
02/09/2011	68.4	192	260	Yes	Sunny
08/09/2011	56.3	192	260	Yes	Sunny
15/09/2011	46.2	192	260	Yes	Cloudy
21/09/2011	70.2	192	260	Yes	Cloudy
28/09/2011	87.2	192	260	Yes	Cloudy
CD4a Ka Fu Building, Whampoa Estate*					
Date	TSP (µg/m ³)	Action Level (µg/m ³)	Limit Level (µg/m ³)	Compliance (Yes/No)	Weather Condition
02/09/2011	39.7	187	260	Yes	Sunny
08/09/2011	40.1	187	260	Yes	Cloudy
16/09/2011	26.8	187	260	Yes	Sunny
20/09/2011	63.2	187	260	Yes	Cloudy
27/09/2011	90.6	187	260	Yes	Sunny

CD5 Fung Kei Millennium Primary School					
Date	TSP ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)	Compliance (Yes/No)	Weather Condition
02/09/2011	47.3	168	260	Yes	Sunny
08/09/2011	38.5	168	260	Yes	Cloudy
16/09/2011	30.1	168	260	Yes	Sunny
21/09/2011	72.0	168	260	Yes	Cloudy
27/09/2011	86.3	168	260	Yes	Sunny
CD6a Site boundary of Finger Pier adjacent to Harbourfront Horizon*					
Date	TSP ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)	Compliance (Yes/No)	Weather Condition
02/09/2011	69.9	182	260	Yes	Sunny
08/09/2011	49.0	182	260	Yes	Sunny
15/09/2011	39.3	182	260	Yes	Sunny
21/09/2011	66.9	182	260	Yes	Cloudy
28/09/2011	87.3	182	260	Yes	Cloudy

3.2 Noise

B&K 2250 sound level meters 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 construction noise impact monitoring. The B&K sound level meters and B&K 4231 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. In this reporting period, two sound level meters with serial number 2731886 and 2741136 were used. All relevant calibration certificates are attached in **Appendix E**.

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 differs 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 whole dB, with values of 0.5 or more being rounded up.

Impact noise monitoring of LA,eq30 was undertaken to measure construction noise levels in accordance with the EM&A Manual. The noise monitoring locations are shown in Section 2.2 above.

The monitoring results corrected to the baselines in the range from 54 to 73 dBA are presented in the following table and **Appendix F** for graphical plot. No exceedance was found.

CN1- Alhambra building							
Date	Time	Measured Leq(dBA)	Baseline Leq (dBA)	Corrected Leq(dBA)#	Limit Level (dBA)	Compliance (Yes/No)	Weather Conditions
01/09/2011	17:30	68	71	***	75	Yes	Fine, wind<2m/s
07/09/2011	14:00	68	71	***	75	Yes	Fine, wind<2m/s
14/09/2011	15:30	69	71	***	75	Yes	Fine, wind<2m/s
20/09/2011	12:30	69	71	***	75	Yes	Fine, wind<2m/s
27/09/2011	15:30	69	71	***	75	Yes	Fine, wind<2m/s
CN2- Methodist College							
01/09/2011	17:00	74	75	***	70	Yes	Fine, wind<2m/s
07/09/2011	14:30	74	75	***	70	Yes	Fine, wind<2m/s
14/09/2011	16:30	74	76	***	70	Yes	Fine, wind<2m/s
20/09/2011	11:00	74	76	***	70	Yes	Fine, wind<2m/s
27/09/2011	16:00	74	76	***	70	Yes	Fine, wind<2m/s
CN3- Queen Elizabeth Hospital – Specialist Clinic							
01/09/2011	16:00	65	64	60	75	Yes	Fine, wind<2m/s
06/09/2011	13:00	73	64	73	75	Yes	Fine, wind<2m/s
14/09/2011	17:00	66	64	63	75	Yes	Fine, wind<2m/s
20/09/2011	14:00	64	64	56	75	Yes	Fine, wind<2m/s
27/09/2011	16:30	67	64	65	75	Yes	Fine, wind<2m/s
CN4- Yee Fu Building							
02/09/2011	10:30	70	70	***	75	Yes	Fine, wind<2m/s
06/09/2011	18:00	68	69	***	75	Yes	Fine, wind<2m/s
14/09/2011	18:00	69	69	***	75	Yes	Fine, wind<2m/s
20/09/2011	14:30	70	70	***	75	Yes	Fine, wind<2m/s
27/09/2011	17:30	69	70	***	75	Yes	Fine, wind<2m/s
CN6- Lok Do Building							
02/09/2011	10:00	72	71	66	75	Yes	Fine, wind<2m/s

06/09/2011	17:30	72	71	65	75	Yes	Fine, wind<2m/s
15/09/2011	12:30	71	71	54	75	Yes	Fine, wind<2m/s
20/09/2011	15:30	74	71	72	75	Yes	Fine, wind<2m/s
27/09/2011	18:00	70	70	***	75	Yes	Fine, wind<2m/s
CN7- Block Y, Ki Fu Building, Whampoa Estate							
08/09/2011	11:30	71	71	57	75	Yes	Fine, wind<2m/s
14/09/2011	17:30	72	71	60	75	Yes	Fine, wind<2m/s
20/09/2011	15:30	71	71	55	75	Yes	Fine, wind<2m/s
27/09/2011	13:30	73	71	67	75	Yes	Fine, wind<2m/s
CN8- Block I, Lok Wah Building, Whampoa Garden							
08/09/2011	15:00	65	70	***	75	Yes	Fine, wind<2m/s
14/09/2011	17:00	69	70	***	75	Yes	Fine, wind<2m/s
20/09/2011	14:30	69	69	***	75	Yes	Fine, wind<2m/s
27/09/2011	14:30	70	69	63	75	Yes	Fine, wind<2m/s
CN9- Block 13, Bauhinia Mansions, Whampoa Garden Site 11							
08/09/2011	16:00	69	70	***	75	Yes	Fine, wind<2m/s
14/09/2011	11:30	71	69	64	75	Yes	Fine, wind<2m/s
20/09/2011	13:30	68	70	***	75	Yes	Fine, wind<2m/s
27/09/2011	15:00	68	71	***	75	Yes	Fine, wind<2m/s
CN10- Block 1, Oak Mansions, Whampoa Garden Site 5							
08/09/2011	15:30	68	67	64	75	Yes	Fine, wind<2m/s
14/09/2011	16:30	68	66	61	75	Yes	Fine, wind<2m/s
20/09/2011	13:00	66	65	57	75	Yes	Fine, wind<2m/s
27/09/2011	11:30	68	66	61	75	Yes	Fine, wind<2m/s
CN11- Fung Kei Millennium Primary School							
08/09/2011	13:30	64	64	54	70	Yes	Fine, wind<2m/s
14/09/2011	15:30	65	64	58	70	Yes	Fine, wind<2m/s
20/09/2011	11:30	65	64	58	70	Yes	Fine, wind<2m/s

27/09/2011	11:00	65	64	61	70	Yes	Fine, wind<2m/s
CN12- GCEPSA Whampoa Primary School							
08/09/2011	14:00	66	64	61	70	Yes	Fine, wind<2m/s
14/09/2011	11:00	65	65	***	70	Yes	Fine, wind<2m/s
20/09/2011	11:00	66	65	57	70	Yes	Fine, wind<2m/s
27/09/2011	10:30	67	65	60	70	Yes	Fine, wind<2m/s

Notes:

It is noted that all noise monitoring were not undergone in the raining period.

The Measured Leq is corrected against the corresponding Baseline Level.

*** Refers to the Measured Leq is lower than the Baseline Level.

3.3 Action taken in Event of Exceedence

There was no exceedance in air quality and noise monitoring parameters recorded in the reporting period, therefore no action was taken.

4 LANDSCAPE AND VISUAL

4.1 Monitoring Requirements

Monitoring of the implementation of the landscape and visual mitigation measures during construction phase was conducted in accordance with the requirements as stipulated in the EM&A Manual.

The landscape and visual monitoring and audit will be conducted once every two weeks throughout the construction stage covering the entire project site areas.

4.2 Audit Results

Monitoring and audit was undertaken in accordance with the EM&A Manual.

Tree Felling at Contract 1001 Works Sites / Works Areas

A total of 1 number of tree was felled in Works Site A in September 2011 in accordance with the Tree Removal Application Report.

Tree Felling at Contract 1002 Works Sites / Areas

No tree were felled in September 2011 in the Works Site H in accordance with the Tree Removal Application Report.

Tree Transplantation in this reporting period for Contract 1001

A total of 3 numbers of trees were transplanted in Works Site A in September 2011 in

accordance with the Tree Removal Application Report.

Tree Transplantation in this reporting period for Contract 1002

No tree was transplanted during the reporting month.

Bi-weekly inspection

The Registered Landscape Architect of Environmental Team or his representatives conducted inspections and audits and found that the transplanting works and the tree protection works being planned and implemented by the respective contractors of Contract 1001 and 1002 were in progress. No non compliance was identified in the reporting period.

4.3 Action Taken in Event of Non-Conformance

No actions on landscape and visual were required to be taken in this reporting period.

5 WASTE MANAGEMENT

Mitigation measures on waste management have been implemented in accordance with the requirements of the EM&A Manual. The C&D material and non-inert wastes were disposed at the public filling reception facilities and the landfills respectively. The quantities disposed in the reporting period are summarized in the following table:

Amount of Construction Wastes Disposed				
Reporting Period	Inert C&D Materials to Public (m ³)	Inert C&D Materials Reused (m ³)	Non-inert Waste to Landfill (m ³)	Chemical Waste to designated treatment facility (trips)
Contract 1001				
June – July 2011	588	0	66	0
August 2011	66	0	78	0
September 2011	960	0	78	
Subtotal	1614	0	222	0
Contract 1002				
June – July 2011	534	0	0	0
August 2011	602	0	5	0
September 2011	283	0	0	0
Subtotal	1419	0	5	0
Overall Total	3033	0	227	0

6 WATER QUALITY

Monitoring of the implementation of the water quality mitigation measures during construction phase was conducted in accordance with the requirements as stipulated in the EM&A Manual.

Weekly site inspection will be conducted throughout the construction stage covering the entire project site areas to ensure the recommended mitigation measures are properly implemented.

In the reporting period, the water quality mitigation measures were implemented in accordance with the requirements as stipulated in the EM&A Manual and found in an acceptable manner.

Water sample tests were conducted for Works Sites C & F in the reporting month. Results were satisfactory and were in compliance with the requirements under the WPCO licenses.

7 RECORD OF ENVIRONMENTAL COMPLAINTS

A complaint was referred from EPD on 30 Sep 2011 about a complaint on construction noise on Sundays near Fat Kwong Street, Hung Hom (Works Site F) received on 19 Aug 2011. Investigation conducted by EPD did not reveal any construction noise on Sunday from the above site. To follow up with the captioned complaint case, Environmental Team checked with and clarified by the Contractor that no construction work was carried out on any Sunday before 19 Aug 2011 at Works Sites E & F. EPD was informed and satisfied with the findings, and no further action was requested to be taken. The complaint is considered invalid.

No valid environmental complaint was recorded in the reporting period. A summary of environmental complaint since commencement of construction is shown below:

Reporting Period	Invalid Complaint			Valid Complaint		
	Frequency	Nature	Status	Frequency	Nature	Status
June 2011	0	N/A	N/A	0	N/A	N/A
July 2011	0	N/A	N/A	0	N/A	N/A
August 2011	0	N/A	N/A	0	N/A	N/A
September 2011	1	Noise	Closed	0	N/A	N/A
Cumulative	1	N/A	N/A	0	N/A	N/A

8 RECORD OF NON-COMPLIANCES

There was no non-compliance identified in the reporting period.

9 NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

No summon or prosecution related to environmental issue was recorded in the reporting period. A summary of environmental prosecution since commencement of construction

is shown below:-

Reporting Period	Frequency	Cumulative	Nature	Status
June 2011	0	0	N/A	N/A
July 2011	0	0	N/A	N/A
August 2011	0	0	N/A	N/A
September 2011	0	0	N/A	N/A
Cumulative	0	0	N/A	N/A

10 STATUS OF STATUTORY SUBMISSIONS

10.1 Submissions required under Environmental Permit

A summary of the status of submissions required under the KTE Environmental Permit as of 30 September 2011 is shown below:

EP-399/2010/A Part C Clause No.	Description		Status
1.12	1	Notification of commencement of construction	Submitted on 17 May 2011
2.1	2	Establishment of ET with ET Leader	Submitted on 1 April 2011
2.1	3	Establishment of Registered Landscape Architect	Submitted on 14 April 2011
2.2	4	Employment of IEC	Submitted on 1 April 2011 and 7 July 2011
2.3	5	Notification of the management organization of main construction companies and/or any form of JV	Submitted on 19 May 2011
2.4	6	Layout drawings with explanatory statement, showing Project boundary, alignment and associated work areas and works sites locations	Submitted on 10 June 2011 and 13 July 2011
2.5	7	Notification of setting up hotline to service complaints, comments, suggestions or requests for information	Submitted on 12 May 2011
3.7	8	Report any contamination hotspot(s) identified from the reconnaissance site visit to the kerosene store at Chung Hau Street	Submitted on 25 July 2011
5.3	9	Submission of Baseline Monitoring Report	Submitted on 4 May 2011 and 8 July 2011
6.2	10	Notification of Internet address to place EM&A data	Submitted on 1 August 2011
5.4	11	Monitoring Report for July 2011	Submitted on 12 August 2011
5.4	12	Monitoring Report for August 2011	Submitted on 15 September 2011

10.2 Statutory Permits and Licenses

A summary of the status of all relevant environmental permits and licenses as of 30 September 2011 is shown below:

Description	License/ Permit Reference	Issue Date	Expired Date
<u>Environmental Permit</u>			
Environmental Permit for Kwun Tong Line Extension Project (EP-399/2010)	(EP-399/2010)	27 September 2010	NA
Variation of Environmental Permit for Kwun Tong Line Extension Project	(EP-399/2010/A)	1 December 2010	NA

<u>Contract 1001</u>			
Wastewater Discharge License	WT00009504-2011 (Works Site C),	14 July 2011	31 July 2016
		27 July 2011	31 July 2016
	WT00009580-2011 (Works Site E),	27 July 2011	31 July 2016
	WT00009582-2011 (Works Site F),	1 August 2011	31 August 2016
		9 August 2011	31 August 2016
	WT00009608-2011 (Works Site A),		
	WT00009611-2011 (Works Area J)		
Registration as a Chemical Waste Producer	5213-226-N2206-22 (Works Site A)	1 August 2011	NA
	5213-226-N2206-23 (Works Site C)	1 August 2011	NA
Disposal of Construction Waste	Billing Account no. 7012910 activated	26 May 2011	NA
Construction Noise Permit	GW-RE0596-11	18 August 2011.	Valid period from 20 August 2011 to 20 January 2012
	GW-RE0692-11	26 September 2011.	Valid period from 30 September 2011 to 31 December 2011
<u>Contract 1002</u>			
Wastewater Discharge License	WT00009415-2011 (Site office)	11 July 2011	30 September 2016
	WT00009253-2011 (Tak Man Street)		
Registration as a Chemical Waste Producer	Waste Producer No. 5213-245-C3672-01	16 June 2011	NA
Disposal of Construction Waste	Billing Account No. 7012934 activated	31 May 2011	NA
Construction Noise Permit	CNP No. GWRE0575-11	10 August 2011	Valid period from 4 to 11 September 2011
	CNP No. GWRE0595-11	17 August 2011	Valid period from 1 to 22 September 2011

11 SITE INSPECTIONS

11.1 Observations

Regular site inspections led by the Engineer's Representative and anticipated by ET and respective Contractors were undertaken in accordance with the EM&A Manual in the report period. The contractors' performance on environmental matters were assessed and found in an acceptable manner. The inspection findings and the associated recommendations on improvement to the environmental protection and pollution control works were raised to the contractors for reference and/ or action.

Observations against the implementation of the mitigation measures recommended in the EP/EIA are summarized as follows:

Item	Description	Follow-up Status
	<u>Contract 1001</u>	
1	The contractor was reminded to affix the Noise Emission Labels on air compressors properly at Works Sites C & F.	Completed
2	The contractor was reminded to allow sufficient space between stockpiling materials and retained trees, and provide protection fencing for trees to be retained / transplanted.	Ongoing
3	The contractor was reminded to place chemicals in chemical storage cabinet instead of chemical waste storage cabinet at Works Site F.	Completed
4	The contractor was reminded to cover cement bags with more than 20 bags 3-sides & top by tarpaulin at Works Site C.	Completed
5	The contractor was reminded to remove stagnant water in drip tray regularly.	Ongoing
6	The contractor was reminded to clean the floor where several oil stains were observed at Works Site F.	Completed
7	The contractor was reminded to complete the temporary drainage setting with water treatment facility before excavation at Works Site E.	Ongoing
	<u>Contract 1002</u>	
1	The contractor was reminded to display the EP properly especially for the sites with TTMS arrangement.	Completed
2	The contractor was reminded to provide sufficient movable noise barriers/acoustic fabric to minimize noise nuisance to nearby residents during site clearance works	Completed
3	The contractor was reminded to secure the trees fencing with steel bar for the trees protection.	Completed

The respective contractors have followed the concerned items raised during the inspections for rectification in an acceptable manner.

11.2 Other Notable Events

IEC Site Inspections

The IEC conducted site inspections for Works Areas on 16 and 7 September 2011 for Contract 1001 and 1002 respectively, and minor irregularities including providing noise barriers for ground breaking works, providing temporary drainage setting with water treatment facility and improving the conditions for trees protection were observed during the site inspections and the respective Contractors had followed up and satisfactorily rectified the issues as identified in the site inspections promptly.

EPD Inspections

EPD conducted a site inspection on 2 September 2011 for Works Sites A, C, E, F, H, I and Work Area J. The inspection was conducted jointly with the ET, Construction Team of ER and the Contractors of Contract 1001 and 1002. EPD reminded ER and the Contractors to comply with the EP requirements.

12 FUTURE KEY ISSUES

12.1 Key Issues for the Coming Month

Future key issues envisaged in the coming month include the followings:

- Noise impact from operating equipment from site construction activities, e.g. piping works;
- Site water discharge generated from construction works;
- Tree protection, felling and transplant.

12.2 Effectiveness and Efficiency of Mitigation Measures

Based on the environmental monitoring results of the reporting period, the effectiveness and efficiency of the mitigation measures implemented were found to be satisfactory. The respective contractors were reminded to carry out their future construction activities to comply with the requirements of the EP and the relevant contract requirements.

13 CONCLUSIONS

The Report presents the results of EM&A works and the impact monitoring for the construction works undertaken during the period of September 2011. The major construction activities in the reporting period included drainage diversion works, ground investigation works, installation of noise barrier for construction shafts, temporary road & traffic diversion and piling preparation.

Impact monitoring at the representative sensitive receivers for air quality and noise were conducted in accordance with the EM&A Manual in the reporting period. No exceedance of limit levels for air and noise monitoring were recorded.

No valid environmental complaint and notification of summon and prosecution were received in the reporting period.

Regular site inspections led by the Engineer's Representative and anticipated by the representatives from ET and the respective Contractors' Team were conducted on a weekly basis to monitor the implementation of environmental pollution control and

mitigation measures for the Project. No non-conformance to the environmental requirements was identified by the Environmental Team in the reporting period. The performances of the respective contractors on site environmental management were found in an acceptable manner in this reporting period.

It is concluded from the environmental monitoring and audit works for the Kwun Tong Line Extension Project were undertaken in a responsible manner. The environmental protection and pollution control measures provided by respective contractors of Contract 1001 and 1002 were generally acceptable apart from some minor irregularities which were rectified timely by the respective civil works contractors.

Appendix A

Figures

Figure 1. KTE Project Works Area

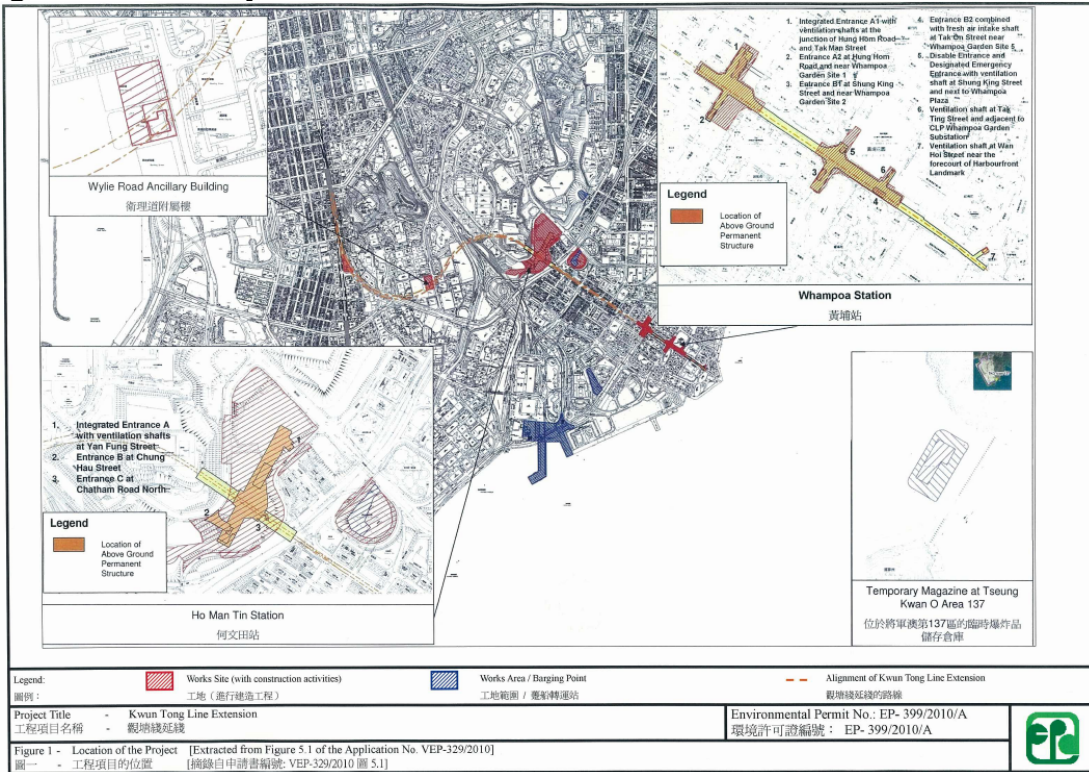


Figure 2. Location of Dust Monitoring Stations (CD1)

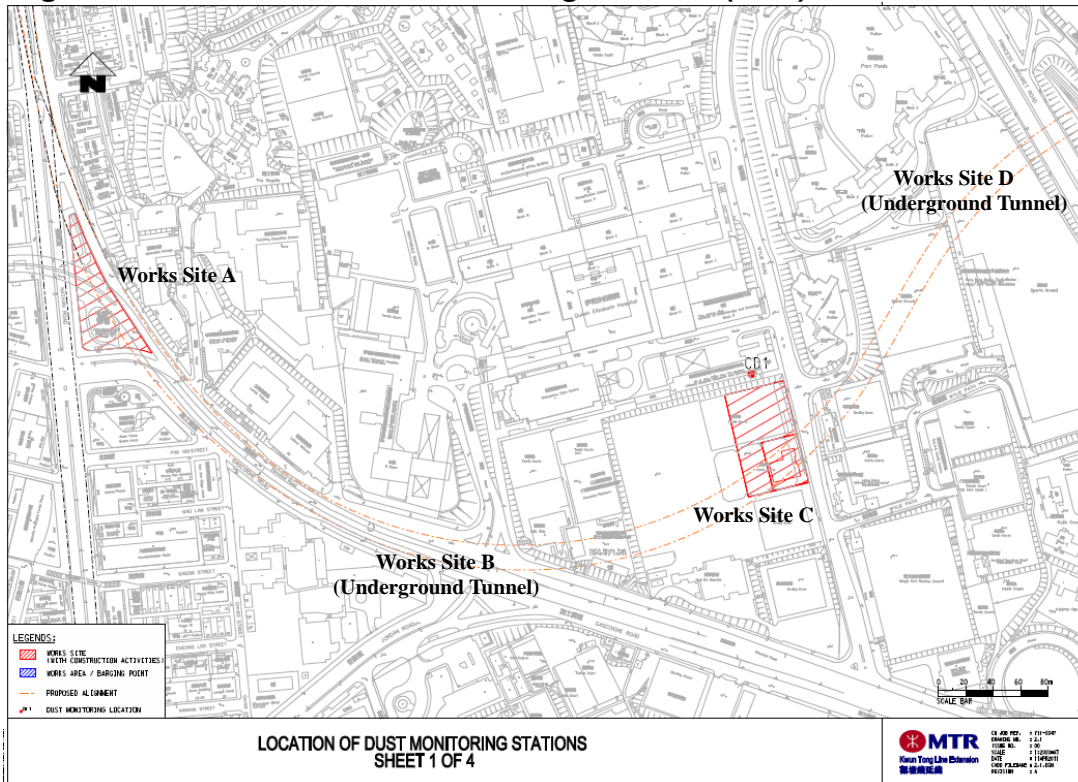


Figure 3. Location of Dust Monitoring Stations (CD2 and CD3a)

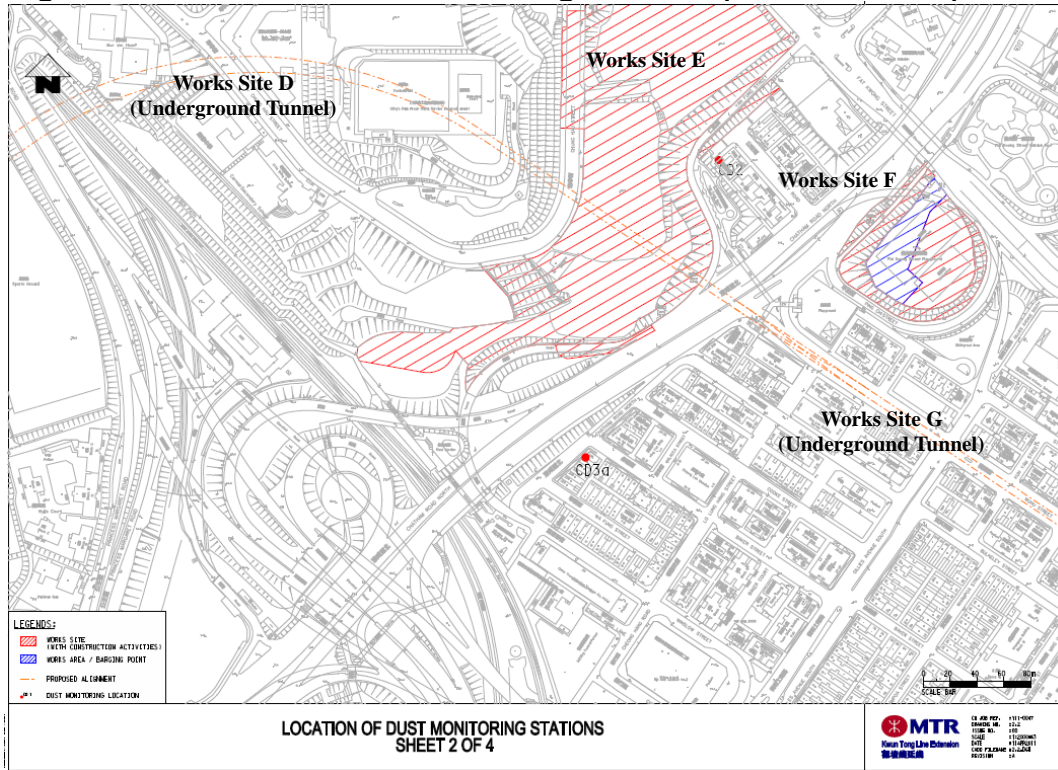


Figure 4. Location of Dust Monitoring Stations (CD4a and CD5)

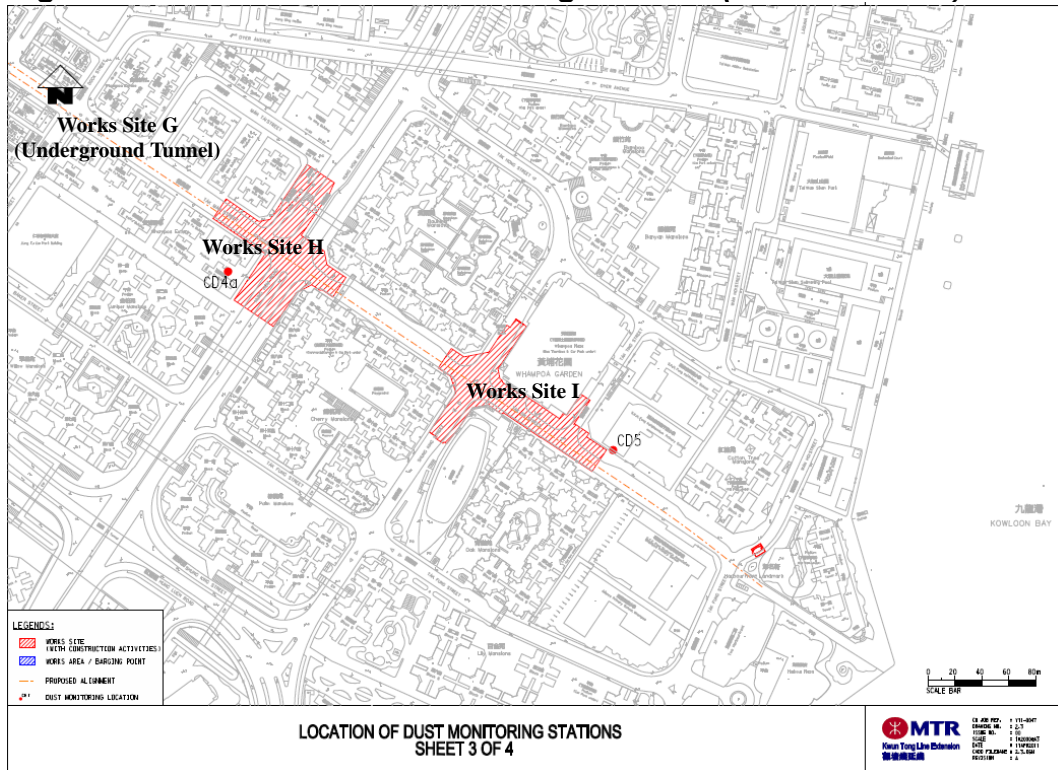


Figure 5. Location of Dust Monitoring Stations (CD6a)

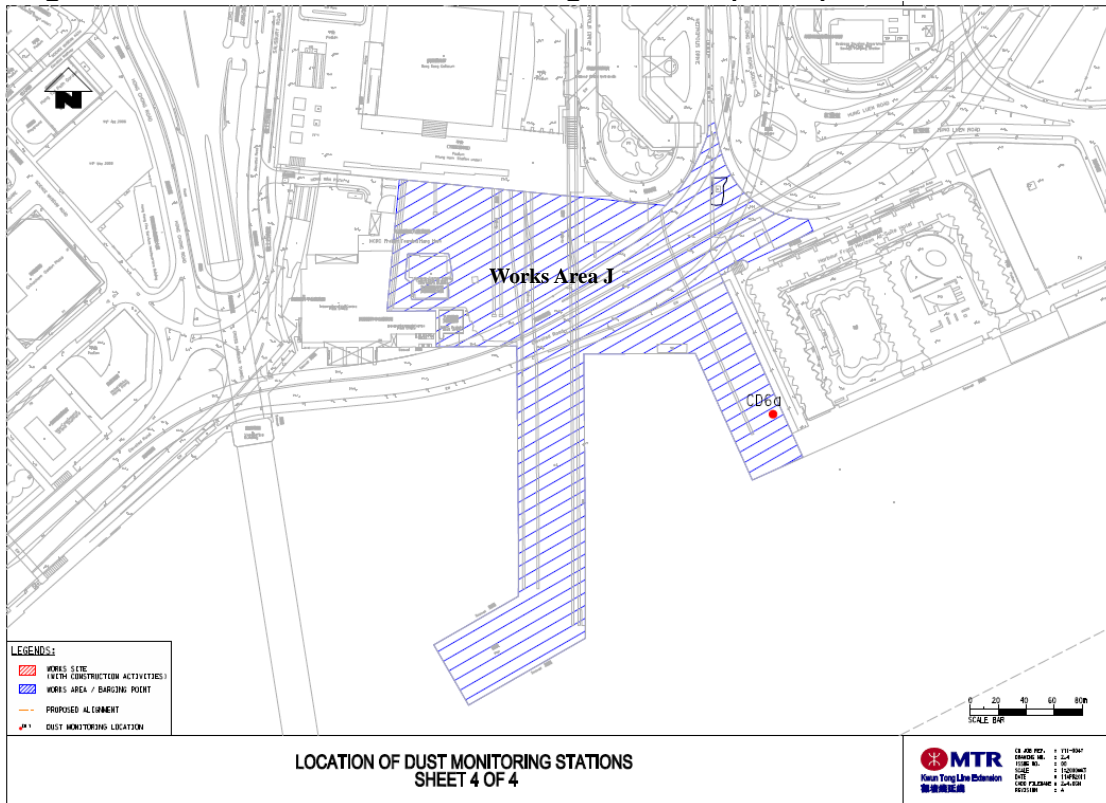


Figure 6. Location of Noise Monitoring Stations (CN1, CN2 and CN3)

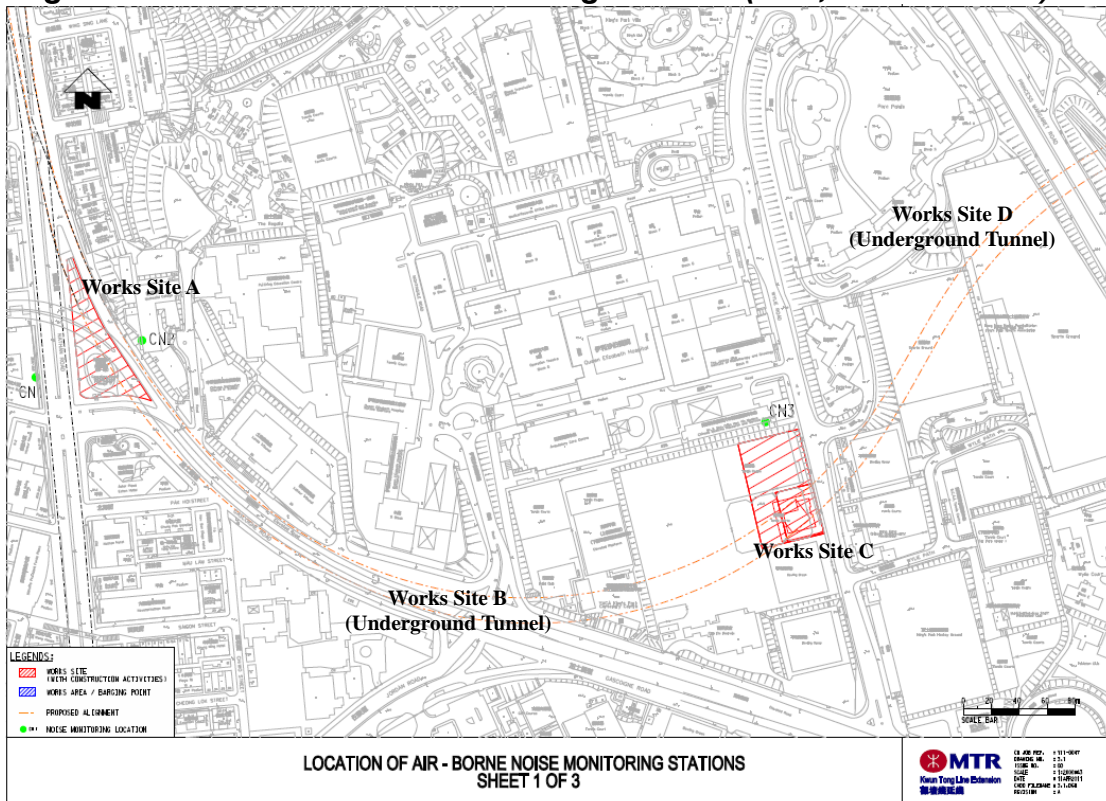


Figure 9. Location of Tseung Kwan O Area 137 Magazine Site

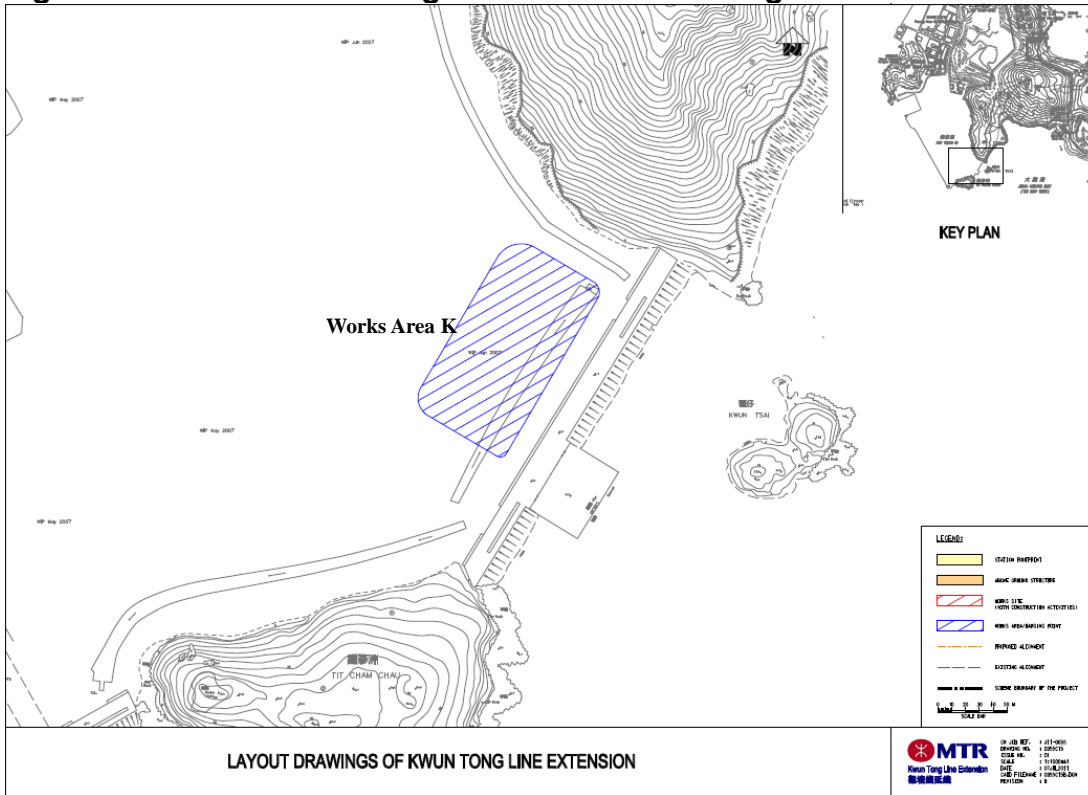
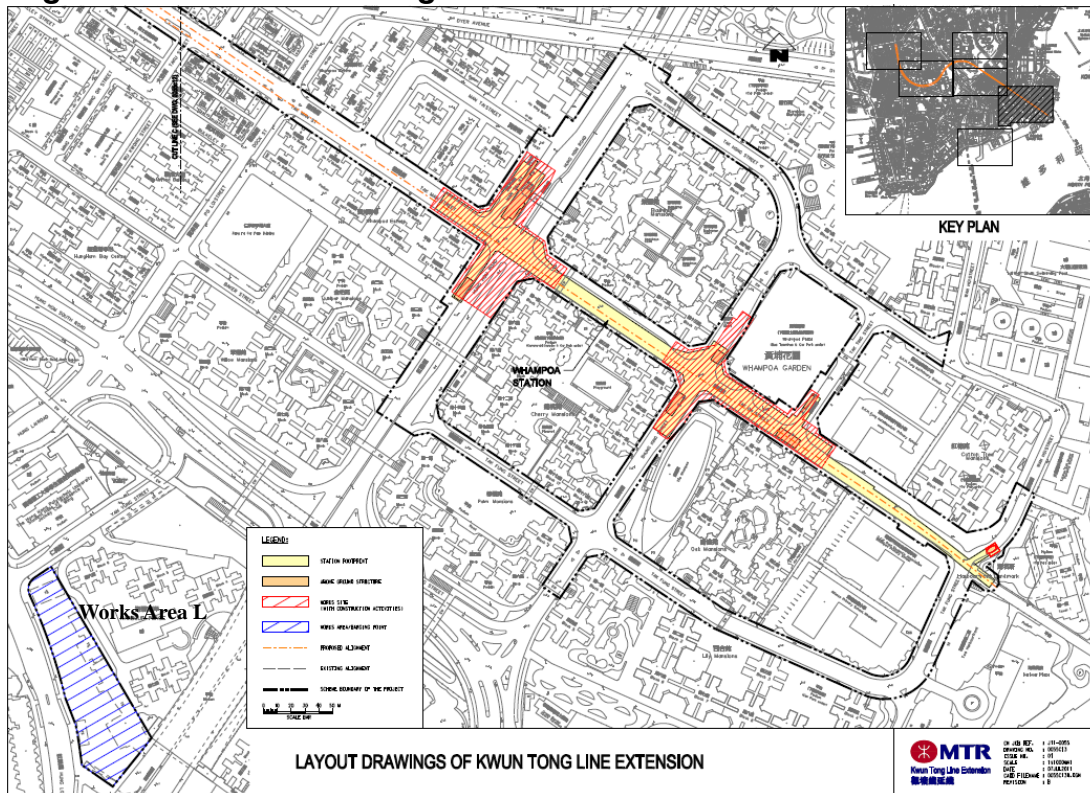


Figure 10. Location of Hung Lok Road Site Office



Appendix B

Environmental Quality Performance Limits

Action and Limit Levels for 24-hour TSP

Monitoring Station	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
CD1	171	260
CD2	183	260
CD3a	192	260
CD4a	187	260
CD5	168	260
CD6a	182	260

Action and Limit Levels for 1-hour TSP for Complaint Handling

Monitoring Station	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
CD1	310	500
CD2	301	500
CD3a	311	500
CD4a	303	500
CD5	309	500
CD6a	316	500

Action and Limit Levels for Construction Noise

Time Period	Action Level	Limit Level (dB(A)), Leq(30min)
0700-1900 hr on normal weekdays	When one documented complaint is received	75*

* Limit for school is 70 dB(A) and 65 dB(A) during school examination periods.

Appendix C

Event Action Plans

Table 4.4: Event and Action Plan for Construction Dust Monitoring

EVENT	ACTION			
	ET ⁽¹⁾	IEC ⁽¹⁾	ER ⁽¹⁾	Contractor
Action Level				
1. Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify sources, investigate the causes of complaint and propose remedial measures. 2. Inform IEC and ER. 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by the ET. 2. Check the Contractor's working methods. 	<ol style="list-style-type: none"> 1. Notify the Contractor. 	<ol style="list-style-type: none"> 1. Rectify any unacceptable practices. 2. Amend working methods agreed with the ER as appropriate.
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Identify sources. 2. Inform the IEC and ER. 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings. 5. Increase monitoring frequency to daily. 6. Discuss with the IEC, ER and Contractor on remedial action required. 7. If exceedance continues, arrange meeting with the IEC, Contractor and ER. 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by the ET. 2. Check the Contractor's working methods. 3. Discuss with the ET, ER and Contractor on possible remedial measures if required. 4. Advise the ER on the effectiveness of proposed remedial measures if required. 	<ol style="list-style-type: none"> 1. Notify the Contractor. 2. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Submit proposals for remedial action to the ER within 3 working days of notification. 2. Implement the agreed proposals. 3. Amend proposal as appropriate.

EVENT	ACTION			
	ET ⁽¹⁾	IEC ⁽¹⁾	ER ⁽¹⁾	Contractor
Limit Level				
1. Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify sources, investigate causes of exceedance and proposed remedial measures. 2. Inform the IEC, ER, and Contractor. 3. Repeat measurement to confirm finding. 4. Increase monitoring frequency to daily. 5. Assess effectiveness of the Contractor's remedial action and keep the IEC and ER informed of the results. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by the ET. 2. Check the Contractor's working methods. 3. Discuss with the ET, ER and Contractor on possible remedial measures. 4. Advise the ER and ET on the effectiveness of the proposed remedial measures. 5. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of the notification of exceedance in writing. 2. Notify the Contractor. 3. Ensure remedial measures are properly implemented. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance. 2. Submit proposals for remedial action to the ER and copy to the ET and IEC within 3 working days of notification. 3. Implement the agreed proposals. 4. Amend proposal as appropriate.

Table 5.3: Event and Action Plan for Construction Noise Monitoring

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

Note (1): ET – Environmental Team, IEC – Independent Environmental Checker, ER – Engineer's Representative

Table 3.2: Event / Action Plan for Construction/Operational Phase

Action Level	ET	IEC	ER	Contractor
Non-conformity on one occasion	<ol style="list-style-type: none"> 1. Identify Source 2. Inform the IEC and the ER 3. Discuss remedial actions with the IEC, the ER and the Contractor 4. Monitor remedial actions until rectification has been completed 	<ol style="list-style-type: none"> 1. Check report 2. Check the Contractor's working method 3. Discuss with the ET and the Contractor on possible remedial measures 4. Advise the ER on effectiveness of proposed remedial measures. 5. Check implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Notify Contractor 2. Ensure remedial measures are properly implemented 	<ol style="list-style-type: none"> 1. Amend working methods 2. Rectify damage and undertake any necessary replacement
Repeated Non-conformity	<ol style="list-style-type: none"> 1. Identify Source 2. Inform the IEC and the ER 3. Increase monitoring frequency 4. Discuss remedial actions with the IEC, the ER and the Contractor 5. Monitor remedial actions until rectification has been completed 6. If exceedance stops, cease additional monitoring 	<ol style="list-style-type: none"> 1. Check monitoring report 2. Check the Contractor's working method 3. Discuss with the ET and the Contractor on possible remedial measures 4. Advise the ER on effectiveness of proposed remedial measures 5. Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Notify the Contractor 2. Ensure remedial measures are properly implemented 	<ol style="list-style-type: none"> 1. Amend working methods 2. Rectify damage and undertake any necessary replacement

Note:

- ET – Environmental Team
- IEC – Independent Environmental Checker
- ER – Engineer's Representative

Appendix D

Implementation of Environmental Mitigation Measures

Appendix 1.1 Implementation Schedule for Environmental Mitigation Measures

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Objectives of Measures and Main Concern to Address	Location	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Maintenance Agent
							D	C	O	
Miscellaneous										
3.4.2.1		<u>WSD Fresh Water Service Reservoir</u> Undertake an independent study of the effects of the drill and blast tunnelling on the reservoir to the satisfaction of WSD.	Ensure stability of the reservoir during construction	WSD Fresh Water Service Reservoir	MTR Corporation/ Main Contractor	-		✓		n/a
Landscape and Visual										
5.12.1.2		<u>Reuse of Existing Topsoil</u> Existing topsoil shall be re-used for new planting areas within the project. The Contractor's construction plan shall consider using the soil removed for backfilling. Suitable storage ground, gathering ground and mixing ground shall be set up if necessary.	Conservation of valuable natural landscape resources	Gascoigne Road Rest Garden, Hill slopes above Chatham Road North, Roadside planters at Hung Hom Road	MTR Corporation/ Main Contractor	EIA recommendation		✓		MTR Corporation / LandsD, LCSD / HyD
5.12.1.2		<u>Tree Transplantation</u> Transplantation is proposed for a number of trees which are generally able to provide high amenity value and are likely to survive the transplantation process.	Conservation of valuable natural landscape resources	Gascoigne Road Rest Garden, HOM Station, Yan Fung Street Rest Garden Slopes surrounding Fat Kwong Street Playground, WHA Station	MTR Corporation/ Main Contractor/ Detailed Design Consultant	All transplantation will be carried out in accordance with ETWB TCW No. 3/2006.	✓	✓		MTR Corporation / LandsD / HyD / LCSD / AFCD

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Objectives of Measures and Main Concern to Address	Location	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Maintenance Agent
							D	C	O	
5.12.1.2		<u>Erection of Decorative Hoardings</u> Temporary decorative screen hoardings shall be designed and erected to be compatible with the existing urban context, either brightly and imaginatively or with visually unobtrusive design and colours where more appropriate. All works sites and works areas shall be surrounded by such hoardings, which shall be removed at project completion.	Visual screening of works site during construction	All works sites and Temporary Works Areas	MTR Corporation/ Main Contractor/ Detailed Design Consultant	EIA recommendation	✓	✓		Contractor
5.12.1.2		<u>Control of night-time lighting glare</u> All security floodlights for construction sites and temporary works areas shall be equipped with adjustable shield, frosted diffusers and reflective covers, and be carefully controlled to minimize light pollution and night-time glare to nearby receivers.	Restricting light pollution to nearby receivers	All works sites and Temporary Works Areas	Main Contractor	EIA recommendation		✓		Contractor
5.12.1.2		<u>Re-provisioning of Public Open Spaces</u> Every effort should be made to minimise use of public open spaces, however if affected by the Project they shall be re-provisioned to an equal or improved standard at completion of the project. Sensitive design and reinstatement of the affected Public Open Spaces (Gascoigne Road Rest Garden, Yan Fung Street Rest Garden, Fat Kwong Street Playground) shall be made, incorporating replacement facilities to those currently provided and using materials of quality suitable for long term use and acceptable to the relevant government departments including LCSD and PlanD, who shall be consulted on the design of the reinstated public open spaces at an early stage of the design process.	Replacement of loss of resources	Gascoigne Road Rest Garden, Yan Fung Street Rest Garden, Fat Kwong Street Playground,	MTR Corporation / Main Contractor/ Detailed Design Consultant	EIA recommendation	✓	✓	✓	LCSD

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Objectives of Measures and Main Concern to Address	Location	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Maintenance Agent
							D	C	O	
5.12.1.2		<p><u>Compensatory Tree Planting</u> Suitable land pockets within the project area will be used for the implementation of compensatory mitigation to offset the net loss of key landscape resources and improve visual amenity. A compensatory tree planting proposal including locations of tree compensation will be submitted separately to seek relevant government department's approval, in accordance with ETWB TCW No. 3/2006.</p>	<p>Replacement of loss of resources and Enhancement of visual amenity</p>	<p>Gascoigne Road Rest Garden, Yan Fung Street Rest Garden, Fat Kwong Street Playground, WAB, HOM Station WHA Station</p>	<p>MTR Corporation / Main Contractor/ Detailed Design Consultant</p>	<p>ETWB TCW No. 3/2006. WBTC 7/2002</p>	✓	✓	✓	<p>MTR Corporation / LandsD/ HyD/ LCSD/ AFCD</p>
5.12.1.2		<p><u>Horizontal and Slope Greening</u> Shotcreting of cut rock slopes shall be avoided and greening applications employed throughout the project. At HOM Station the backfill slopes shall be hydroseeded and native seedling trees planted. The station roof shall be temporarily greened should there be no further on-site development within 1 year of completion of KTE, until permanent measures are undertaken under the proposed property development stage. Parapets at WAB and HOM Station shall be provided with internal permanent planter boxes. The roof at WAB shall be greened to improve visual amelioration from surrounding high level viewers Station entrances at HOM and WHA shall utilise</p>	<p>Mitigation of loss of resources and Enhancement of visual amenity</p>	<p>Gascoigne Road Rest Garden, Yan Fung Street Rest Garden, Fat Kwong Street Playground, WAB, HOM Station WHA Station</p>	<p>MTR Corporation/ Main Contractor/ Detailed Design Consultant</p>	<p>WBTC 25/93 WBTC 17/2000</p>	✓	✓	✓	<p>MTR Corporation / LandsD</p>

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Objectives of Measures and Main Concern to Address	Location	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Maintenance Agent
							D	C	O	
		shrub planting areas to provide localised greening								
5.12.1.2		<u>Planting</u> Vertical greening / climbers shall be applied to all above ground structures against exposed walls where appropriate. Further such localised planting systems shall be instigated subject to technical operational and maintenance constraints.	Mitigation of loss of resources and Enhancement of visual amenity	WAB, HOM Station	MTR Corporation/ Main Contractor/ Detailed Design Consultant	EIA recommendation	✓	✓	✓	MTR Corporation
5.12.1.2		<u>Architectural Design Aesthetics for the WAB at Club de Recreio</u> The emergency access and ventilation building shall be designed in a way so as to ensure the form, material and surface detailing of this structure can fit sympathetically into the local context. The form shall consider the Cultural Heritage of the Club de Recreio site as well as other proximate buildings. The structure shall incorporate vertical greening / climbers.	Enhancement of visual amenity	WAB	MTR Corporation/ Main Contractor/ Detailed Design Consultant	EIA recommendation	✓	✓	✓	MTR Corporation
5.12.1.2		<u>Architectural Design Aesthetics for Above-Ground Structures at HOM Station</u> All station entrances, vent shafts, chillers and other above-ground structures shall be designed in accordance with the standardised MTR Corporation architectural theme for the KTE and other current rail projects. However specific attention shall be undertaken to ensure the form, material and surface detailing of these structures is considered to fit into the local context in terms of the architectural character of the site.	Enhancement of visual amenity	HOM Station	MTR Corporation/ Main Contractor/ Detailed Design Consultant	EIA recommendation	✓	✓	✓	MTR Corporation
5.12.1.2		<u>Architectural Design Aesthetics for Above-Ground Structures at WHA Station</u> These shall be designed in accordance with the standardised MTR Corporation architectural	Enhancement of visual amenity	WHA Station	MTR Corporation/ Main Contractor/	EIA recommendation	✓	✓	✓	MTR Corporation

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Objectives of Measures and Main Concern to Address	Location	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Maintenance Agent
							D	C	O	
		theme for the KTE and other current rail projects. However specific attention shall be undertaken to ensure the form, material and surface detailing of these structures is considered to fit into the local context in terms of the architectural character of the site.			Detailed Design Consultant					
Air Quality										
S.6.7.1.7 & S.6.9.2.3		Cut-and-Cover areas in the vicinity of adits and shafts (if applicable):- <ul style="list-style-type: none"> ▪ Heavy construction activities and wind erosion at the cut-and-cover areas, active areas for heavy construction activities: <ul style="list-style-type: none"> - Watering every hour at exposed soil. ▪ Trucks for transportation of materials: <ul style="list-style-type: none"> - Wheel washing facilities should be provided at all site exits. Vehicles should be washed before leaving works sites. Spoil on trucks should be well covered before leaving works sites to minimise the generation of dusty materials. - Haul roads within works sites should be paved and water spraying would be provided to keep the wet condition. 	To minimise dust impacts	All relevant works sites	MTR Corporation/ Main Contractor/ Detailed Design Consultant	Air Pollution Control Ordinance	✓	✓		
S.6.7.1.7 & S.6.9.2.3		Barging point at Hung Hom Finger Pier: <ul style="list-style-type: none"> ▪ For haul roads within the area of barging point for transportation of spoil, all road surfaces should be paved and hourly water spraying should be provided to keep the wet condition as far as practical. ▪ The spoil unloading process should be undertaken within an enclosed tipping hall. Water spraying and 3-sided screen with top 	To minimise dust impacts	Barging Point at Hung Hom Finger Pier	MTR Corporation/ Main Contractor/ Detailed Design Consultant	Air Pollution Control Ordinance	✓	✓		

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Objectives of Measures and Main Concern to Address	Location	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Maintenance Agent
							D	C	O	
		should be provided at the discharge point for dust suppression. <ul style="list-style-type: none"> Vehicle wheel washing facilities should be provided at the exits of the barging point. 								
S.6.7.1.5 & S. 6.7.1.8		Rock crushing equipment at HOM Station and barging point at Hung Hom Finger Pier if operated during construction: <ul style="list-style-type: none"> A dust enclosure with fabric baghouse/cartridge filter type dust extraction and collection system or equivalent system with 99% or more dust removal efficiency for the rock crushing equipment, haul road and unloading location; and Watering of paved roads within the area of the rock crushing facility as good site practice. 	To minimise dust impacts	Rock crushing equipment at HOM Station and Barging Point at Hung Hom Finger Pier	MTR Corporation/ Main Contractor/ Detailed Design Consultant	Air Pollution Control Ordinance	✓	✓		
S.6.7.1.5 & S.6.9.2.2		Tarpaulin covers would be provided on wire mesh covered steel cages to prevent dust emission during open blasting at HOM Station;	To minimise dust impacts	Open blasting area at HOM Station	MTR Corporation/ Main Contractor/ Detailed Design Consultant	EIA recommendation	✓	✓		
S.6.9.2.4		Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: <ul style="list-style-type: none"> Use of regular watering, to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. Use of frequent watering for particularly dusty construction areas and areas close to 	To minimise dust impacts	All works sites	MTR Corporation/ Main Contractor /Detailed Design Consultant	Air Pollution Control Ordinance	✓	✓		

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		ASRs. <ul style="list-style-type: none"> ▪ Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering should be applied to aggregate fines. ▪ Open temporary stockpiles should be avoided or covered. Prevent placing dusty material storage piles near ASRs. ▪ Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. ▪ Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. ▪ Imposition of speed controls for vehicles on unpaved site roads. 8km per hour is the recommended limit. ▪ Routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs. ▪ Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. ▪ Loading, unloading, transfer, handling or storage of large amount of cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter 								

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		or equivalent air pollution control system. <ul style="list-style-type: none"> Covering or enclosing any conveyor belt systems will generally be fully enclosed, depending on the design, materials chosen, and dimension of the conveyor system. 								
Air-borne Noise										
S.7.9.2.6		The following good site practices should be implemented: <ul style="list-style-type: none"> Only well-maintained plant should be operated on-site and plants should be serviced regularly during the construction period; Mobile plant, if any, should be sited as far from NSRs as possible; Plant known to emit noise strongly in one direction should, wherever possible, be properly orientated so that the noise is directed away from the nearby NSRs; Use of site hoarding as a noise barrier to screen noise at low level NSRs; Machines and plant that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum; and Any material stockpiles and other structures should be effectively utilised, wherever practicable, to screen the noise from on-site construction activities. 	To minimise air-borne noise impacts	All works sites	MTR Corporation/ Main Contractor	Noise Control Ordinance		✓		
S.7.9.2.1		The following quiet PME should be used: <ul style="list-style-type: none"> Air compressor Asphalt Paver Breaker Bulldozer Concrete lorry mixer Concrete Pump / Grout Pump 	To minimise air-borne noise impacts	All relevant works sites	MTR Corporation/ Main Contractor	Noise Control Ordinance		✓		

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		<ul style="list-style-type: none"> ▪ Crane ▪ Cutter, circular, steel (electric) ▪ Dump Truck ▪ Backhoe ▪ Generator ▪ Vibrating Poker, hand-held (electric) ▪ Rock Drill ▪ Roller, vibratory ▪ Scraper ▪ Water pump (electric) 								
S.7.9.2.4		Movable or fixed noise barrier should be used for the following PME where practicable: <ul style="list-style-type: none"> ▪ Wheeled Excavator/Loader ▪ Crane ▪ Hydraulic Breaker ▪ Scraper ▪ Breaker, hand-held ▪ Compactor, vibratory ▪ Drill, percussive, hand-held (electric) ▪ Concrete pump ▪ Circular Saw, bench mounted ▪ Truck ▪ Bar bender and cutter (electric) ▪ Conveyor belt ▪ Generator, Super Silenced ▪ Grout Pump ▪ Saw, wire ▪ Water Pump, Submersible (Electric) ▪ Hydraulic Jack with Pump 	To minimise air-borne noise impacts	All relevant works sites	MTR Corporation/ Main Contractor	Noise Control Ordinance		✓		

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S.7.9.2.4		Acoustic fabric should be used for the following PME where practicable: <ul style="list-style-type: none"> ▪ Compressor and Pneumatic Drilling Rig ▪ Piling, vibrating hammer ▪ Rock Drill ▪ Silent Piling System 	To minimise air-borne noise impacts	All relevant works sites	MTR Corporation/ Main Contractor	Noise Control Ordinance		✓		
S.7.9.2.4		Noise enclosure/acoustic shed should be used for the following PME where practicable and will generally be fully enclosed depending on the design, materials chosen, and dimension of the PME: <ul style="list-style-type: none"> ▪ Air Compressor ▪ Rock Crushing Equipment 	To minimise air-borne noise impacts	All relevant works sites	MTR Corporation/ Main Contractor	Noise Control Ordinance		✓		
S.7.9.2.4		Silencer should be used for the ventilation fans.	To minimise air-borne noise impacts	All relevant works sites	MTR Corporation/ Main Contractor	Noise Control Ordinance		✓		
S.7.9.2.6		Use of temporary hoardings along the works boundary.	To minimise air-borne noise impacts	All relevant works sites	MTR Corporation/ Main Contractor	Noise Control Ordinance		✓		
S.7.9.2.2		Noise enclosures should be installed for the muckout points in WS1 (Gascoigne Road Rest Garden), WS7a1 (WAB at Club de Recreio) and WS26a (Fat Kwong Street Playground)	To comply with the criteria of Noise Control Ordinance.	All muckout points at WS1, WS7a1 and WS26a	MTR Corporation/ Main Contractor	Noise Control Ordinance		✓		
S.7.9.2.3		Noise enclosures should be installed for all rock crushing equipment.	To comply with the criteria of Noise Control Ordinance.	All rock crushing equipment	MTR Corporation/ Main Contractor	Noise Control Ordinance		✓		

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S.7.10.1.2		The maximum permissible sound power levels (max SWLs) for the fixed plant should be complied with during the selection of equipment and mitigation measures.	To comply with the criteria of Noise Control Ordinance.	All relevant location of fixed plant	MTR Corporation/ Detailed Design Consultant	Noise Control Ordinance	✓		✓	
S.7.10.2.1		The detailed design for all fixed plant should incorporate the following good practice where practicable: <ul style="list-style-type: none"> ▪ Louvers should be orientated away from adjacent NSRs whenever practicable; ▪ Adequate direct noise mitigation measures including silencers, acoustic louvers or acoustic enclosures should be adopted where necessary; and ▪ Quieter plant should be chosen as far as practical. 	To comply with the criteria of Noise Control Ordinance.	At outlets of fixed plant including ventilation building, ventilation shafts, plant room for chiller plant and cooling towers, etc	MTR Corporation/ Detailed Design Consultant	Noise Control Ordinance	✓		✓	
Ground-borne Noise										
S.8.7.1.2		MTR will further review the proposed mitigation measures for operational ground-borne noise during the construction stage after the tunnel boring.	To comply with the criteria of Noise Control Ordinance.	At suitable location	MTR Corporation/ Main Contractor	-	✓			
S.8.7.1.3		Commissioning test is recommended to ensure compliance of the operational ground-borne noise levels	To comply with the criteria of Noise Control Ordinance.	Designated locations	MTR Corporation/ Main Contractor	Noise Control Ordinance	✓	✓	✓	
Water Quality										
S.9.7.6		Construction site run-off and general construction activities: <ul style="list-style-type: none"> ▪ The mitigation measures as outlined in the ProPECC PN 1/94 Construction Site Drainage should be adopted where applicable. 	To control water quality impact from construction site runoff and general construction	All works sites	MTR Corporation/ Main Contractor	EIAO-TM, Water Pollution Control Ordinance, TM-DSS		✓		

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			activities							
S.9.7.6		In case seepage of uncontaminated groundwater occurs, groundwater should be pumped out from the works areas and discharged into the storm system via silt removal facilities. Uncontaminated groundwater from dewatering process should also be discharged into the storm system via silt traps.	To control water quality impact from groundwater	All works sites	MTR Corporation/ Main Contractor	EIAO-TM, Water Pollution Control Ordinance		✓		
S.9.7.6		At the barging point, mitigation measures for control of water quality impact from surface run-off should be applied and the following good site practices should also be adopted: <ul style="list-style-type: none"> ▪ All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash. ▪ All hopper barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material. ▪ Construction activities should not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site. ▪ Loading of barges and hoppers should be controlled to prevent splashing of material into the surrounding water. Barges or hoppers should not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation. 	To control water quality impact from barging point	Barging point	MTR Corporation/ Main Contractor	EIAO-TM, Water Pollution Control Ordinance		✓		
S.9.7.6		For effluent discharge, there is a need to apply to	To control water	All works sites	MTR	EIAO-TM,		✓		

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Objectives of Measures and Main Concern to Address	Location	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Maintenance Agent
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		EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality should meet the requirements specified in the discharge licence. Minimum distances of 100m should be maintained between the discharge points of construction site effluent and the existing seawater intakes. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring should be carried out in accordance with the WPCO license which is under the ambit of Regional Office of the EPD.	quality impact from effluent discharge from construction site		Corporation/ Main Contractor	Water Pollution Control Ordinance				
S.9.7.6		To prevent the accidental spillage of chemicals, the Contractor should register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.	To control water quality impact from accidental chemical spillage	All works sites	MTR Corporation/ Main Contractor	EIAO-TM, Water Pollution Control Ordinance, Waste Disposal Ordinance		✓		
S.9.7.6		Any service shop and maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges.	To control water quality impact from accidental chemical spillage	All works sites	MTR Corporation/ Main Contractor	EIAO-TM, Water Pollution Control Ordinance, Waste Disposal Ordinance		✓		
S.9.7.6		Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The Code of Practice on the Packaging, Labelling and Storage of Chemical	To control water quality impact from accidental	All works sites	MTR Corporation/ Main	EIAO-TM, Water Pollution Control Ordinance,		✓		

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Objectives of Measures and Main Concern to Address	Location	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Maintenance Agent
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		Wastes published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: <ul style="list-style-type: none"> ▪ Suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport. ▪ Chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents. ▪ Storage area should be selected at a safe location on site and adequate space should be allocated to the storage area. 	chemical spillage		Contractor	Waste Disposal Ordinance				
S.9.7.6		Regarding the hydrogeological impacts in the construction of cut-and-cover tunnels and associated excavations for the WAB / ventilation building, the following measures should be in place in order to mitigate any drawdown effects to the groundwater table during the operation of the temporary dewatering works: <ul style="list-style-type: none"> ▪ Toe grouting should be applied beneath the toe level of the temporary/permanent cofferdam walls as necessary to lengthen the effective flow path of groundwater from outside and thus control the amount of water inflow to the excavation. ▪ Recharge wells should be installed as necessary outside the excavation areas. Water pumped from the excavation areas should be recharged back into the ground. 	To control groundwater hydrogeological impact and groundwater drawdown	All works sites	MTR Corporation/ Main Contractor	EIAO-TM, Water Pollution Control Ordinance		✓		
S.9.8.6		Measures for the tunnel run-off and drainage include:	To control runoff from rail track	Tunnels and rail tracks	MTR Corporation/ Detailed	Water Pollution Control	✓		✓	

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		<ul style="list-style-type: none"> Track drainage channels discharge should pass through oil/grit interceptors/chambers to remove oil, grease and sediment before being pumped to the foul sewer/holding tank for further disposal. The silt traps and oil interceptors should be cleaned and maintained regularly. Oily contents of the oil interceptors should be transferred to an appropriate disposal facility, or to be collected for reuse, if possible. 			Design Consultant	Ordinance				
S.9.8.6		Measures for the control of sewage effluents include: <ul style="list-style-type: none"> Connection of domestic sewage generated from the KTE project should be diverted to the foul sewer wherever possible. If public sewer system is not available, sewage tankering away services or on-site sewage treatment facilities should be provided to prevent direct discharge of sewage to the nearby storm system and all the discharge should comply with the requirements stipulated in the TM-DSS. For handling, treatment and disposal of other operation stage effluent, the practices outlined in ProPECC PN 5/93 should be adopted where applicable. 	To control water quality impact from sewage effluent discharge from the ventilation building and Stations	Ventilation building and Stations	MTR Corporation/ Detailed Design Consultant	EIAO-TM, Water Pollution Control Ordinance, TM-DSS, ProPECC PN 5/93	✓		✓	
Waste Management Implications										
S.10.5.6.1		Recommendations for good site practices: <ul style="list-style-type: none"> Prepare a Waste Management Plan approved by the Engineer/Supervising Officer of the Project based on current practices on construction sites. Training of site personnel in, site cleanliness, 	To implement good site practice for handling, sorting reuse and recycling of C&D materials	All works sites	Main Contractor	Waste Disposal Ordinance, Land (Miscellaneous Provisions) Ordinance, ETWB TC(W)		✓		

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		proper waste management and chemical handling procedures. <ul style="list-style-type: none"> ▪ Provision of sufficient waste disposal points and regular collection of waste. ▪ Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers. ▪ Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors. ▪ Separation of chemical wastes for special handling and appropriate treatment. 				No 31/2004				
S.10.5.6.1		Recommendations for waste reduction measures: <ul style="list-style-type: none"> ▪ Sorting of demolition debris and excavated materials from demolition works to recover reusable/ recyclable portions (i.e. soil, broken concrete, metal etc.). ▪ Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal. ▪ Encourage collection of aluminium cans by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the workforce. ▪ Proper storage and site practices to minimize the potential for damage or contamination of construction materials. ▪ Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste. 	To implement on-site sorting facilitating reuse and recycling of materials as well as proper disposal of waste	All works sites	Main Contractor	Waste Disposal Ordinance, Land (Miscellaneous Provisions) Ordinance		✓		

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		<ul style="list-style-type: none"> Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle. 								
S.10.5.6.1		The Contractor should prepare and implement a Waste Management Plan as a part of the Environmental Management Plan in accordance with ETWB TCW No 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities.	To keep trace of the generation, minimization, reuse and disposal of C&D materials in the Project	All works sites	Main Contractor	ETWB TCW No 19/2005		✓		
S.10.5.6.1		Storage of materials on-site may induce adverse environmental impacts if not properly managed, recommendations to minimise the impacts include: <ul style="list-style-type: none"> Waste, such as soil, should be handled and stored well to ensure secure containment, thus minimising the potential of pollution. Maintain and clean storage areas routinely. Stockpiling area should be provided with covers and water spraying system to prevent materials from wind-blown or being washed away. Different locations should be designated to stockpile each material to enhance reuse. 	To minimise potential impacts of waste storage and enhance reusable volume	All works sites	Main Contractor	-		✓		
S.10.5.6.1		Waste hauliers must hold a valid permit for the collection of waste as stipulated in their permits. Removal of waste should be done in a timely manner.	To collect and remove waste generated	All works sites	Main Contractor	-		✓		
S.10.5.6.1		Implementation of trip-ticket system to monitor waste disposal and control fly-tipping. <ul style="list-style-type: none"> Set up warning signs at vehicular access points reminding drivers of designated 	To monitor disposal of waste and control	All works sites	Main Contractor	ETWB TC(W) No 31/2004		✓		

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		disposal sites and penalties of an offence. <ul style="list-style-type: none"> Installation of close-circuited television at access points of vehicles to monitor and prevent illegal dumping. 	fly-tipping							
S.10.5.6.1		Wheel washing facilities should be provided before the trucks leave the works area.	To minimise dust impact	All works sites	Main Contractor	-		✓		
S.10.5.6.1		The Contractor should ensure the on-site separation from inert portion. The waste delivered to landfill should not contain any free water or have water content more than 70% by weight. The haulier must ensure suitable amount of waste would be loaded on different types of trucks used. A one-week notice should be given to EPD with information on Contractor's name and respective contact details.	To meet the requirement for disposal at landfill	All works sites	Main Contractor	-		✓		
S.10.5.6.1		If chemical wastes are produced at the construction site, the Contractor would be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Containers used for storage of chemical waste should : <ul style="list-style-type: none"> Be compatible with the chemical wastes being stored, maintained in good condition and securely sealed. Have a capacity of less than 450 litres unless the specifications have been approved by EPD; and Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Waste Disposal (Chemical Waste) (General) Regulation. 	To properly store the chemical waste within works sites and works areas	All works sites	Main Contractor	Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes		✓		

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S.10.5.6.1		The chemical storage areas should: <ul style="list-style-type: none"> ▪ Be clearly labelled to indicate corresponding chemical characteristics of the chemical waste and used for storage of chemical waste only. ▪ Be enclosed on at least 3 sides. ▪ Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest. ▪ Have adequate ventilation. ▪ Be covered to prevent rainfall from entering. ▪ Be properly arranged so that incompatible materials are adequately separated. 	To prepare appropriate storage areas for chemical waste at works areas	All works sites	Main Contractor	Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes		✓		
S.10.5.6.1		Lubricants, waste oils and other chemical wastes would be generated during the maintenance of vehicles and mechanical equipments. Used lubricants should be collected and stored in individual containers which are fully labelled in English and Chinese and stored in a designated secure place.	To clearly label the chemical waste at works areas	All works sites	Main Contractor	Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes		✓		
S.10.5.6.1		A trip-ticket system should be operated in accordance with the Waste Disposal (Chemical Waste) (General) Regulation to monitor all movements of chemical waste. The Contractor should employ a licensed collector to transport and dispose of the chemical wastes, to either the approved CWTC at Tsing Yi, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.	To monitor the generation, reuse and disposal of chemical waste	All works sites	Main Contractor	Waste Disposal (Chemical Waste) (General) Regulation		✓		
S.10.5.6.1		General refuse should be stored in enclosed bins or compaction units separate from C&D	To properly store and separate from	All works sites	Main Contractor	-		✓		

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Objectives of Measures and Main Concern to Address	Location	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Maintenance Agent
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		materials and chemical waste. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D materials and chemical wastes.	other C&D materials for subsequent collection and disposal							
S.10.5.6.1		The recyclable component of general refuse, such as aluminium cans, paper and cleansed plastic containers should be separated from other waste. Provision and collection of recycling bins for different types of recyclable waste should be set up by the Contractor. The Contractor should also be responsible for arranging recycling companies to collect these materials.	To facilitate recycling of recyclable portions of refuse	All works sites	Main Contractor	-		✓		
S.10.5.6.1		The Contractor should carry out a training programme for workers in avoiding, reducing, reusing and recycling of materials generation. Posters and leaflets advising on the use of the bins should also be provided in the sites as reminders.	To raise workers' awareness on recycling issue	All works sites	Main Contractor	-		✓		
S.10.6.4		Chemical waste during the operation of the KTE project: <ul style="list-style-type: none"> ▪ The requirements stipulated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes should be followed in handling of chemical waste as in construction phase. ▪ A trip-ticket system should be operated in accordance with the Waste Disposal (Chemical Waste) (General) Regulation to monitor all movements of chemical wastes which would be collected by a licensed collector to a licensed facility for final 	To avoid environmental impacts in handling, storage and disposal of chemical waste	Ventilation building and Stations	MTR Corporation	Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes, Waste Disposal (Chemical Waste) (General) Regulation			✓	

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		treatment and disposal. <ul style="list-style-type: none"> The recommendations proposed for the mitigation of impacts from chemical waste in construction phase should also be followed. 								
S.10.6.4		General refuse during the operation of the KTE project: <ul style="list-style-type: none"> Provide recycling bins at designated areas for proper recycling of papers, aluminium cans and plastics bottles. Separation from other waste types and collected by licensed collectors at daily basis to minimize the potential impacts from odour and vermin. 	To separate the general refuse from other waste types and proper disposal of the refuse	Ventilation building and Stations	MTR Corporation	-			✓	
S.10.6.4		Industrial waste during the operation of the KTE project: <ul style="list-style-type: none"> Separation of reusable components like steel before collection by licensed collector 	To recycle useful materials from industrial waste and proper disposal	Ventilation building and Stations	MTR Corporation	-			✓	
Hazard to Life										
S.12.12.1, S.12.12.6	Section 12.10.2.1, Section 12.10.2.4	Improved truck design to reduce the amount of combustibles in, front exhaust spark arrester, 1 x 9 kg water based and 1 x 9 kg dry chemical powder fire extinguishers. This should be combined with monthly vehicle inspection.	To meet the ALARP requirement.	Temporary explosives magazine	MTR Corporation/ Main Contractor	-		✓		-
S.12.12.1	Section 12.10.2.1	The explosive truck accident frequency should be minimized by implementing a dedicated training programme for both the driver and his attendants, including regular briefing sessions, implementation of a defensive driving attitude. In addition, drivers should be selected based on good safety record, and medical checks.	To meet the ALARP requirement.	-	MTR Corporation/ Main Contractor	-		✓		-
S.12.12.1	Section 12.10.2.1	The contractor should as far as practicable combine the explosive deliveries for a given work	To meet the ALARP	-	MTR Corporation/	-		✓		-

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		area.	requirement.		Main Contractor					
S.12.12.1	Section 12.10.2.1	The explosive truck fire involvement frequency should be minimized by implementing a better emergency response and training to make sure the adequate fire extinguishers are used and attempt is made to evacuate the area of the incident or securing the explosive load if possible. All explosive vehicles should also be equipped with bigger capacity AFFF-type extinguishers.	To meet the ALARP requirement.	-	MTR Corporation/ Main Contractor	-		✓		-
S.12.12.1	Section 12.10.2.1	A minimum headway between two consecutive truck conveys of at least 10 min is recommended	To meet the ALARP requirement.	Along explosives transport routes	MTR Corporation/ Main Contractor	-		✓		-
S.12.12.2	Section 12.10.2.2	Blasting activities including storage and transport of explosives should be supervised and audited by competent site staff to ensure strict compliance with the blasting permit conditions.	To ensure that the risks from the proposed explosives storage would not be unacceptable	Works areas at which explosives would be stored and/or used.	MTR Corporation/ Main Contractor	Dangerous Goods Ordinance		✓		-
S.12.12.1 & S.12.12.7.2	Section 12.10.2.1 & Section 12.10.2.5	Only the required quantity of explosives for a particular blast should be transported to avoid the return of unused explosives to the temporary magazine. The number of return trips to the temporary magazine with the full load of explosives or partial load should be minimised by proper co-ordination between blasting and delivery. If disposal is required for small quantities,	To reduce the risk during explosives transport.	Works areas at which explosives would be stored and/ or used.	MTR Corporation/ Main Contractor	-		✓		-

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Objectives of Measures and Main Concern to Address	Location	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Maintenance Agent
							D	C	O	
		disposal should be made in a controlled and safe manner by a Registered Shotfirer.								
S.12.12.5	Section 12.10.2.4	Use only experienced driver(s) with good safety record for explosive vehicle(s). Training should be provided to ensure it covers all major safety subjects.	To ensure safe transport of explosives.	At suitable location	MTR Corporation/ Main Contractor	-		✓		-
S.12.12.5	Section 12.10.2.4	Develop procedure to ensure that parking space on the site is available for the explosives truck. Confirmation of parking space should be communicated to truck drivers before delivery.	To ensure that the risks from the proposed explosives storage would not be unacceptable	Temporary explosives magazine	MTR Corporation/ Main Contractor	-		✓		-
S.12.12.3	Section 12.10.2.3	Delivery vehicles shall not be permitted to remain unattended within the temporary magazine site (or appropriately wheel-locked).	To reduce the risk of fire within the magazine	Temporary explosives magazine	MTR Corporation/ Main Contractor	-		✓		-
S.12.12.3	Section 12.10.2.3	Good house-keeping within and outside of the temporary magazine to ensure that combustible materials (including vegetation) are removed and not allowed to accumulate.	To reduce the risk of fire within the magazine	Temporary explosives magazine	MTR Corporation/ Main Contractor	-		✓		-
S.12.12.5	Section 12.10.2.4	Detonators shall not be transported in the same vehicle with other Class 1 explosives.	To reduce the risk of explosion during the transport of cartridged emulsion	-	MTR Corporation/ Main Contractor	-		✓		-
S.12.12.2	Section 12.10.2.2	Emergency plan (i.e. temporary magazine operational manual) shall be developed to address uncontrolled fire in temporary magazine	To reduce the risk	Temporary explosives magazine and	MTR Corporation/ Main	-		✓		-

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Objectives of Measures and Main Concern to Address	Location	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Maintenance Agent
							D	C	O	
		area. The case of fire near an explosive carrying truck in jammed traffic should also be covered. Drill of the emergency plan should be carried out at regular intervals.	of fire.	along explosives transport routes	Contractor					
S.12.12.2	Section 12.10.2.2	Adverse weather working guideline should be developed to clearly define procedure for transport explosives during thunderstorm.	To ensure safe transport of explosives.	Along explosives transport routes	MTR Corporation/ Main Contractor	-		✓		-
S.12.12.2	Section 12.10.2.2	The magazine storage quantities need to be reported on a monthly basis to ensure that the two day storage capacity is not exceeded.	To reduce the risk within the magazine	Temporary explosives magazine	MTR Corporation/ Main Contractor	-		✓		-
S.12.12.5	Section 12.10.2.4	During transport of the explosives within the tunnel, hot work should not be permitted in the vicinity of the explosives offloading or charging activities.	To ensure safe transport of explosives.	Along explosives transport routes	MTR Corporation/ Main Contractor	-		✓		-
S.12.12.5	Section 12.10.2.4	Ensure that UN 1.4B packaging of detonators remains intact until handed over at blasting site.	To reduce the risk of explosion during the transport of detonator.	-	MTR Corporation/ Main Contractor	-		✓		-
S.12.12.6	Section 12.10.2.4	Steel vehicle tray welded to a steel vertical fire screen should be mounted at least 150 mm behind the drivers cab and 100 mm from the steel cargo compartment, the vertical screen shall protrude 150 mm in excess of all three (3) sides of the steel cargo compartment	To reduce the risk during explosives transport.	-	MTR Corporation/ Main Contractor	-		✓		-
S.12.12.10	Section 12.10.2.5	Ensure cartridge emulsion with high water content should be preferred. Also, the emulsion	To ensure safe explosives to be	-	MTR Corporation/	-		✓		-

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Objectives of Measures and Main Concern to Address	Location	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Maintenance Agent
							D	C	O	
		with perchlorate formulation should be avoided.	used.		Main Contractor					
S.12.12.3	Section 12.10.2.3	Traffic Management should be implemented within the temporary magazine site, to ensure that no more than 1 vehicle will be loaded at any time, in order to avoid accidents involving multiple vehicles within the site boundary. Based on the construction programme, considering that 6 trucks could be loaded over a peak 2 hour period, this is considered feasible.	To ensure that the risks from the proposed explosives storage and transport would not be unacceptable	Temporary explosives magazine	MTR Corporation/ Main Contractor	-		✓		-
S.12.12.3	Section 12.10.2.3	The design of the fill slope close to the temporary magazine site should consider potential washout failures and incorporate engineering measures to prevent a washout causing damage to the temporary magazine stores	To ensure that the risks from the proposed explosives storage would not be unacceptable	Temporary explosives magazine	MTR Corporation/ Main Contractor/ Fill Bank Office	-		✓		-
S.12.12.2	Section 12.10.2.2	The security plan should address different alert security level to reduce opportunity for arson / deliberate initiation of explosives. The corresponding security procedure should be implemented with respect to prevailing security alert status announced by the Government.	To ensure that the risks from the proposed explosives storage would not be unacceptable	Temporary explosives magazine	MTR Corporation/ Main Contractor	-		✓		-
S.12.12.3	Section 12.10.2.3	A suitable work control system should be introduced, such as an operational manual including Permit-to-Work system.	To ensure that the risks from the proposed explosives storage would not be unacceptable	Temporary explosives magazine	MTR Corporation/ Main Contractor	-		✓		-
S.12.12.3	Section 12.10.2.3	The magazine building shall be regularly checked for water seepage through the roof,	To ensure that the risks from the	Temporary explosives	MTR Corporation/	-		✓		-



EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Objectives of Measures and Main Concern to Address	Location	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Maintenance Agent
							D	C	O	
		walls or floor.	proposed explosives storage would not be unacceptable	magazine	Main Contractor					

Note: D = Design
 C = Construction
 O = Operation

Appendix E

Calibration Details

ANDERSEN INSTRUMENTS INC.

GS2310 Series Sampler Calibration

(Dickson Recorder)

Customer -> MTRC

SITE

Location -> Yee Fu Building

Date -> 4-Aug-11

Sampler -> 1294-1109

Tech -> Chan Kin Fung

CONDITIONS

Sea Level Pressure	(hpa)	1002.9	Sampler Elevation	(feet)	200
Sea Level Pressure	(in Hg)	29.62	Corrected Pressure	(mm Hg)	747.12
Temperature	(deg C)	32	Temperature	(deg K)	305.00
Seasonal SL Pressure	(in Hg)	29.62	Corrected Seasonal	(mm Hg)	747.12
Seasonal Temperature	(deg C)	32.00	Seasonal Temperature	(deg K)	305.00

CALIBRATION ORIFICE

Make ->	Andersen Instruments Inc.	Qstd Slope ->	2.0075
Model ->	G25A	Qstd Intercept ->	-0.038138
Serial# ->	1436	Date Certified ->	

CALIBRATION

	Plate or	H ₂ O	Qstd	I	IC	LINEAR	
	Test #	(in)	(M ³ /min)	(chart)	(corrected)	REGRESSION	
1	18	11.7	1.689	60	58.803	Slope =	38.8760
2	13	9.8	1.547	54	52.923	Intercept =	-6.7613
3	10	7.5	1.356	47	46.062	Corr. Coeff. =	0.9976
4	7	5.1	1.121	39	38.222		
5	5	3.1	0.879	27	26.461		

Calculations

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

$$IC = I [\text{Sqrt} (Pa/Pstd) (Tstd/Ta)]$$

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:

$$1/m ((I) [\text{Sqrt} (298/Tav) (Pav/760)] - b)$$

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



This is to certify that the above equipment has been calibrated in accordance with manufacturer's procedure.

ANDERSEN INSTRUMENTS INC.

GS2310 Series Sampler Calibration

(Dickson Recorder)

Customer -> MTRC

SITE

Location -> Fung Kei MPS

Date -> 4-Aug-11

Sampler -> 1294-1110

Tech -> Chan Kin Fung

CONDITIONS

Sea Level Pressure	(hpa)	1002.9	Sampler Elevation	(feet)	100
Sea Level Pressure	(in Hg)	29.62	Corrected Pressure	(mm Hg)	749.65
Temperature	(deg C)	34	Temperature	(deg K)	307.00
Seasonal SL Pressure	(in Hg)	29.62	Corrected Seasonal	(mm Hg)	749.65
Seasonal Temperature	(deg C)	34.00	Seasonal Temperature	(deg K)	307.00

CALIBRATION ORIFICE

Make -> Andersen Instruments Inc.

Qstd Slope -> 2.0075

Model -> G25A

Qstd Intercept -> -0.038138

Serial# -> 1436

Date Certified ->

CALIBRATION

	Plate or	H ₂ O	Qstd	I	IC	LINEAR	
	Test #	(in)	(M ³ /min)	(chart)	(corrected)	REGRESSION	
1	18	11.9	1.700	63	61.646	Slope =	35.8801
2	13	9.6	1.529	57	55.775	Intercept =	0.5775
3	10	7.7	1.372	50	48.925	Corr. Coeff. =	0.9987
4	7	5	1.109	42	41.097		
5	5	3.2	0.891	33	32.291		

Calculations

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

$$IC = I [\text{Sqrt} (Pa/Pstd) (Tstd/Ta)]$$

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:

$$1/m ((I) [\text{Sqrt} (298/Tav) (Pav/760)] - b)$$

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



This is to certify that the above equipment has been calibrated in accordance with manufacturer's procedure.

ANDERSEN INSTRUMENTS INC.

GS2310 Series Sampler Calibration

(Dickson Recorder)

Customer -> MTRC

SITE

Location -> Queen Elizabeth Hospital

Date -> 4-Aug-11

Sampler -> 1294-1112

Tech -> Chan Kin Fung

CONDITIONS

Sea Level Pressure	(hpa)	1001	Sampler Elevation	(feet)	60
Sea Level Pressure	(in Hg)	29.56	Corrected Pressure	(mm Hg)	749.23
Temperature	(deg C)	32	Temperature	(deg K)	305.00
Seasonal SL Pressure	(in Hg)	29.56	Corrected Seasonal	(mm Hg)	749.23
Seasonal Temperature	(deg C)	32.00	Seasonal Temperature	(deg K)	305.00

CALIBRATION ORIFICE

Make -> Andersen Instruments Inc.

Qstd Slope -> 2.0075

Model -> G25A

Qstd Intercept -> -0.038138

Serial# -> 1436

Date Certified ->

CALIBRATION

	Plate or	H ₂ O	Qstd	I	IC	LINEAR	
	Test #	(in)	(M ³ /min)	(chart)	(corrected)	REGRESSION	
1	18	11.7	1.691	58	56.923	Slope =	27.9622
2	13	9.3	1.510	50	49.072	Intercept =	8.4492
3	10	7.4	1.349	47	46.127	Corr. Coeff. =	0.9942
4	7	4.8	1.090	40	39.257		
5	5	2.9	0.852	33	32.387		

Calculations

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

$$IC = I [\text{Sqrt} (Pa/Pstd) (Tstd/Ta)]$$

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:

$$1/m ((I) [\text{Sqrt} (298/Tav) (Pav/760)] - b)$$

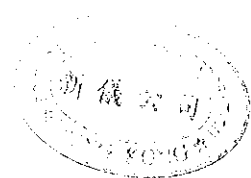
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



This is to certify that the above equipment has been calibrated in accordance with manufacturer's procedure.

ANDERSEN INSTRUMENTS INC.

GS2310 Series Sampler Calibration

(Dickson Recorder)

Customer -> MTRC

SITE

Location -> Finger Pier

Date -> 4-Aug-11

Sampler -> 694-0665

Tech -> Chan Kin Fung

CONDITIONS

Sea Level Pressure	(hpa)	1002.9	Sampler Elevation	(feet)	10
Sea Level Pressure	(in Hg)	29.62	Corrected Pressure	(mm Hg)	751.92
Temperature	(deg C)	30	Temperature	(deg K)	303.00
Seasonal SL Pressure	(in Hg)	29.62	Corrected Seasonal	(mm Hg)	751.92
Seasonal Temperature	(deg C)	30.00	Seasonal Temperature	(deg K)	303.00

CALIBRATION ORIFICE

Make ->	Andersen Instruments Inc.	Qstd Slope ->	2.0075
Model ->	G25A	Qstd Intercept ->	-0.038138
Serial# ->	1436	Date Certified ->	

CALIBRATION

	Plate or	H ₂ O	Qstd	I	IC	LINEAR	
	Test #	(in)	(M ³ /min)	(chart)	(corrected)	REGRESSION	
1	18	12.6	1.763	64	63.132	Slope =	31.5141
2	13	10.2	1.588	59	58.199	Intercept =	7.8340
3	10	8	1.409	53	52.281	Corr. Coeff. =	0.9998
4	7	5.4	1.161	45	44.389		
5	5	3.3	0.912	37	36.498		

Calculations

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

$$IC = I [\text{Sqrt} (Pa/Pstd) (Tstd/Ta)]$$

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:

$$1/m ((I) [\text{Sqrt} (298/Tav) (Pav/760)] - b)$$

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



This is to certify that the above equipment has been calibrated in accordance with manufacturer's procedure.

ANDERSEN INSTRUMENTS INC.

GS2310 Series Sampler Calibration

(Dickson Recorder)

Customer -> MTRC

SITE

Location -> No. 238 Chatham Road Nort

Date -> 4-Aug-11

Sampler -> 894-0835

Tech -> Chan Kin Fung

CONDITIONS

Sea Level Pressure	(hpa)	1002.9	Sampler Elevation	(feet)	60
Sea Level Pressure	(in Hg)	29.62	Corrected Pressure	(mm Hg)	750.66
Temperature	(deg C)	32	Temperature	(deg K)	305.00
Seasonal SL Pressure	(in Hg)	29.62	Corrected Seasonal	(mm Hg)	750.66
Seasonal Temperature	(deg C)	32.00	Seasonal Temperature	(deg K)	305.00

CALIBRATION ORIFICE

Make -> Andersen Instruments Inc.

Qstd Slope -> 2.0075

Model -> G25A

Qstd Intercept -> -0.038138

Serial# -> 1436

Date Certified ->

CALIBRATION

	Plate or	H ₂ O	Qstd	I	IC	LINEAR	
	Test #	(in)	(M ³ /min)	(chart)	(corrected)	REGRESSION	
1	18	11.3	1.664	57	55.995	Slope =	33.3418
2	13	9.1	1.495	52	51.083	Intercept =	1.0208
3	10	7.3	1.341	47	46.171	Corr. Coeff. =	0.9991
4	7	4.7	1.080	38	37.330		
5	5	3	0.867	30	29.471		

Calculations

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

$$IC = I [\text{Sqrt} (Pa/Pstd) (Tstd/Ta)]$$

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:

$$1/m ((I) [\text{Sqrt} (298/Tav) (Pav/760)] - b)$$

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



This is to certify that the above equipment has been calibrated in accordance with manufacturer's procedure.

ANDERSEN INSTRUMENTS INC.

GS2310 Series Sampler Calibration

(Dickson Recorder)

Customer -> MTRC

SITE

Location -> Ka Fu Building

Date -> 4-Aug-11

Sampler -> 994-0874

Tech -> Chan Kin Fung

CONDITIONS

Sea Level Pressure	(hpa)	1002.9	Sampler Elevation	(feet)	100
Sea Level Pressure	(in Hg)	29.62	Corrected Pressure	(mm Hg)	749.65
Temperature	(deg C)	34	Temperature	(deg K)	307.00
Seasonal SL Pressure	(in Hg)	29.62	Corrected Seasonal	(mm Hg)	749.65
Seasonal Temperature	(deg C)	34.00	Seasonal Temperature	(deg K)	307.00

CALIBRATION ORIFICE

Make -> Andersen Instruments Inc.

Qstd Slope -> 2.0075

Model -> G25A

Qstd Intercept -> -0.038138

Serial# -> 1436

Date Certified ->

CALIBRATION

	Plate or	H ₂ O	Qstd	I	IC	LINEAR	
	Test #	(in)	(M ³ /min)	(chart)	(corrected)	REGRESSION	
1	18	12	1.707	58	56.753	Slope =	33.5735
2	13	9.5	1.521	53	51.861	Intercept =	0.2244
3	10	7.5	1.354	47	45.990	Corr. Coeff. =	0.9977
4	7	5	1.109	39	38.162		
5	5	3.2	0.891	30	29.355		

Calculations

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

$$IC = I [\text{Sqrt} (Pa/Pstd) (Tstd/Ta)]$$

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:

$$1/m ((I) [\text{Sqrt} (298/Tav) (Pav/760)] - b)$$

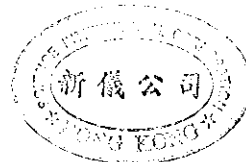
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



This is to certify that the above equipment has been calibrated in accordance with manufacturer's procedure.

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

Laboratory Equipment Identification Number			BA0011		
Manufacturer	Sartorius	Model	A200S-**DIB	Serial No.	1065989
Capacity	120g	Discrimination	0.1mg	Type	Top Loading
Location	Concrete Testing Area		Temperature	24°C	

Reference Mass Set Used (Equip. ID. No.)		RM001	
Manufacturer	Troemner	OIML Classification	F1
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	±0.000301
19.9980	0.00025	
29.9999	0.00015	
39.9997	0.00043	
49.9998	0.00017	
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

(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 (g)	Hysteresis (g)
50	0.000367

(5) **Limit of Performance of the Balance = ± 0.000783 g**

Checked by : Dick Lee Certified by : *[Signature]*

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.



CALIBRATION CERTIFICATE

Certificate Information

Date of Issue 15th June, 2011 Certificate Number MLCN110666S

Customer Information

Company Name MTR Corporation Limited
Address MTR Tower, Telford Plaza,
33 Wai Yip St., Kowloon Bay,
Kowloon,
Hong Kong

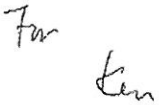
Unit Under Test (UUT)

Description Handheld Analyzer
Manufacturer Brüel & Kjær
Model Number Type 2250
Serial Number 2731886
Equipment Number -

Calibration Result

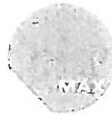
- * The exact manufacturer's specification is not available from the customer.
- * Calibration data are detailed on the attached sheet(s).

Approved By



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.
- * 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.



MAXLAB

CALIBRATION CERTIFICATE

Certificate Information

Date of Issue 15th June, 2011 **Certificate Number** MLCN110666S

Calibration Status

Date of Calibration 15th June, 2011
Calibration Equipment Used 4231 (MLTE008)/ C1002184/ 8th Mar 2012
Calibration Procedure MLCG00 & MLCG15.
Calibration Uncertainty ±0.2 dB

Calibration Condition	Lab	Temperature	23 °C ± 5 °C
		Relative Humidity	55% ± 25%
	UUT	Stabilizing Time	Over 3 hours
		Warm-up Time	10 minutes
		Supply Voltage	Internal battery

Calibration Data

UUT Setting				UUT Rdg	Std Rdg	UUT Error
Frequency Weighted	Parameter	Response	Range (dB)			
A (1 kHz Input)	SPL	F	Auto	93.8 dB	94 dB	-0.2 dB
		S		93.8 dB	94 dB	-0.2 dB
		I		93.8 dB	94 dB	-0.2 dB
C (1 kHz Input)		F		93.8 dB	94 dB	-0.2 dB
		S		93.8 dB	94 dB	-0.2 dB
		I		93.8 dB	94 dB	-0.2 dB
A (1 kHz Input)		F		113.8 dB	114 dB	-0.2 dB
		S		113.8 dB	114 dB	-0.2 dB
		I		113.8 dB	114 dB	-0.2 dB
C (1 kHz Input)	F	113.8 dB	114 dB	-0.2 dB		
	S	113.8 dB	114 dB	-0.2 dB		
	I	113.8 dB	114 dB	-0.2 dB		

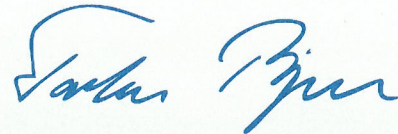
MANUFACTURER'S CERTIFICATE OF CONFORMANCE

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

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



MAXLAB

12 AUG 2011

CALIBRATION CERTIFICATE

Certificate Information

Date of Issue 15th June, 2011 **Certificate Number** MLCN110664S

Customer Information

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

Fw
Ken
 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.
- * 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.



MAXLAB

CALIBRATION CERTIFICATE

Certificate Information

Date of Issue 15th June, 2011

Certificate Number MLCN110664S

Calibration Status

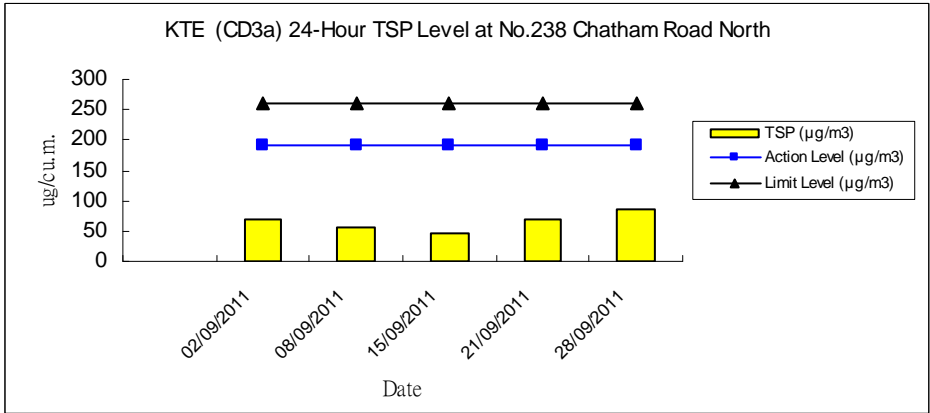
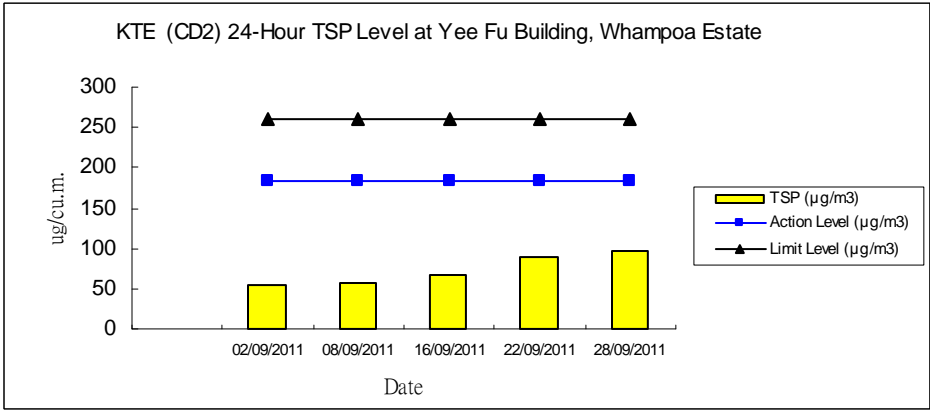
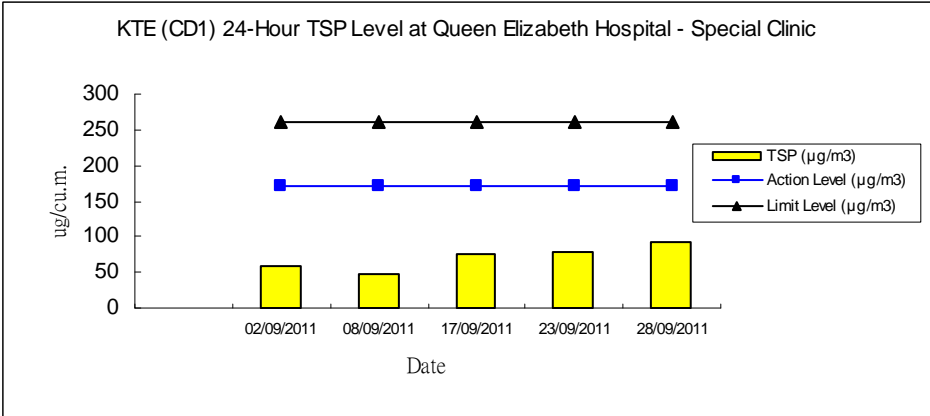
Date of Calibration	15 th June, 2011		
Calibration Equipment Used	4231 (MLTE008)/ C1002184/ 8 th Mar 2012 1351 (MLTE049)/ MLEC11/06/04/ 15 th Jun 2012		
Calibration Procedure	MLCG00 & MLCG15.		
Calibration Uncertainty	± 0.1 dB		
Calibration Condition	Lab	Temperature	23 °C ± 5 °C
		Relative Humidity	55% ± 25%
	UUT	Stabilizing Time	Over 3 hours
		Warm-up Time	Not applicable
		Supply Voltage	Internal battery

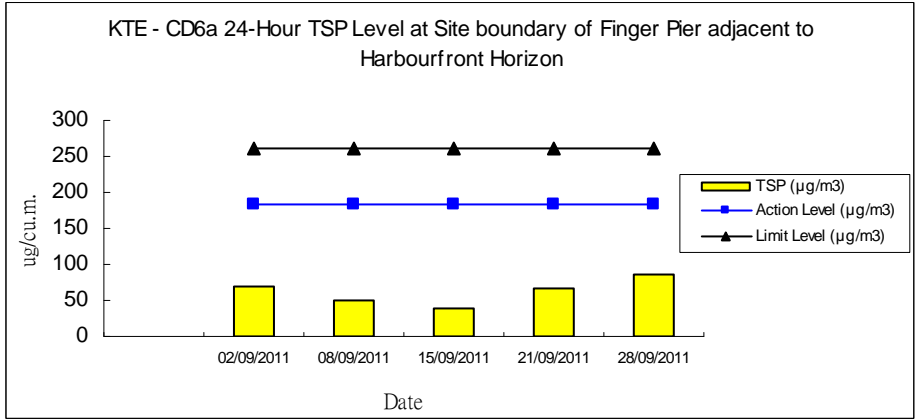
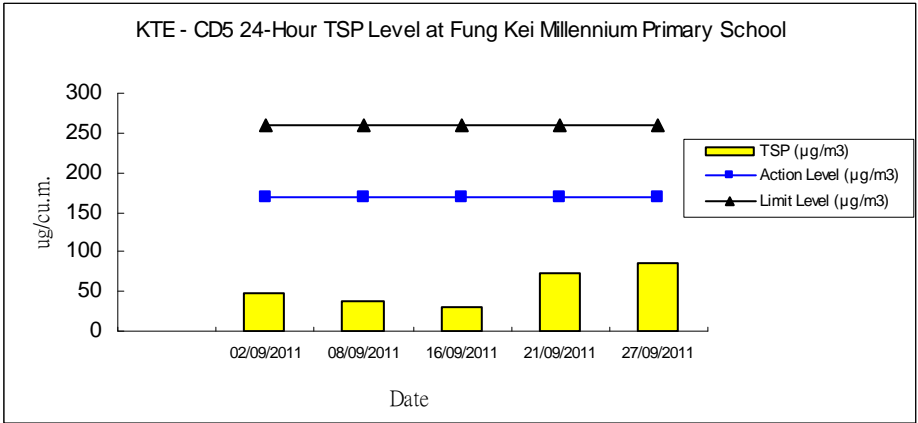
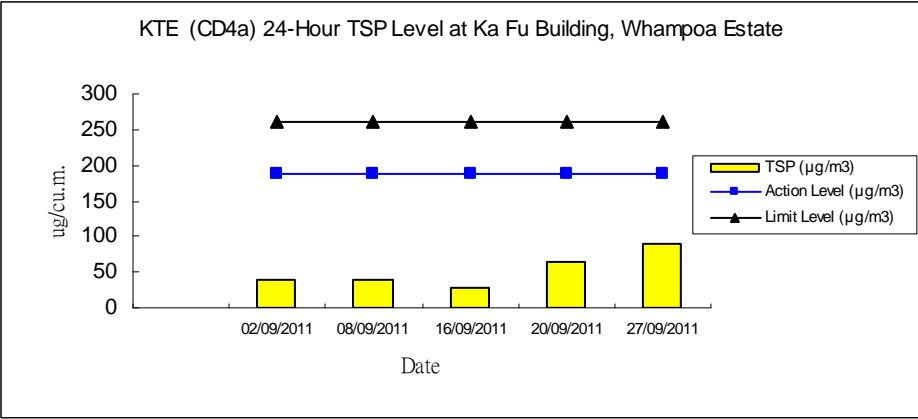
Calibration Data

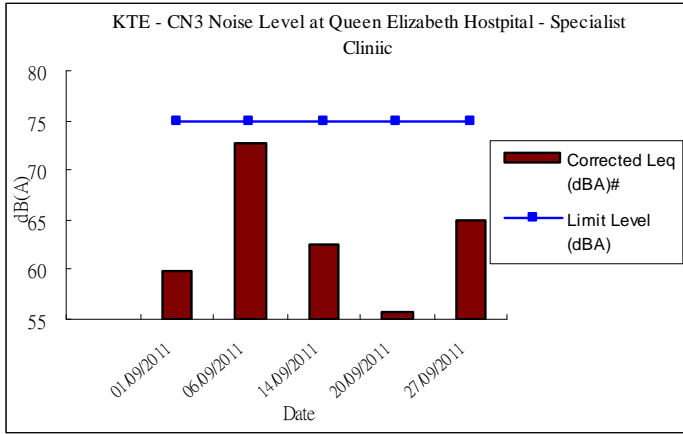
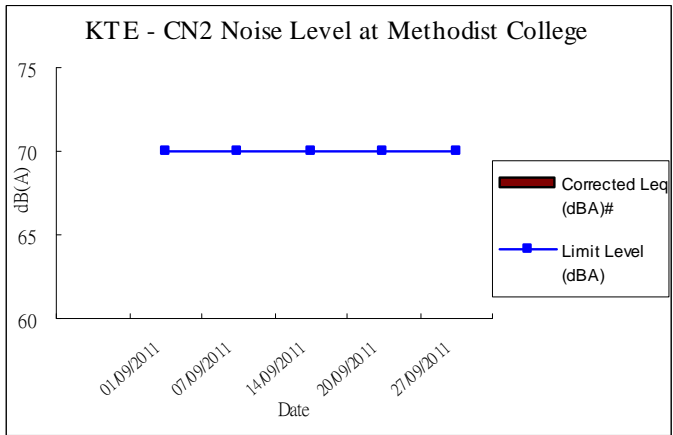
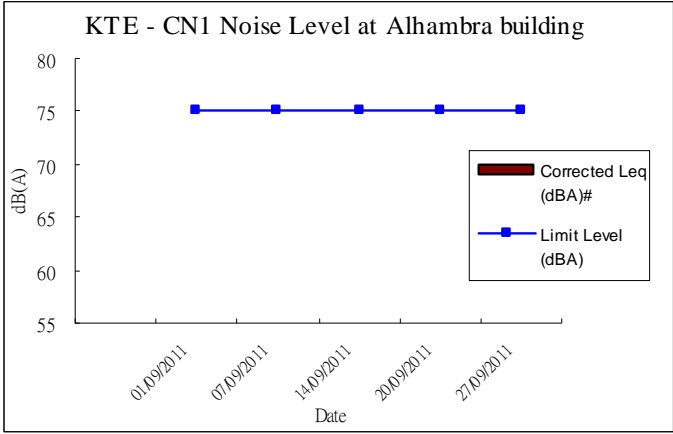
UUT Setting	STD Rdg	UUT Error	UUT Error Limit
94 dB	94.0 dB	0.0 dB	0.2 dB
114 dB	114.0 dB	0.0 dB	0.2 dB

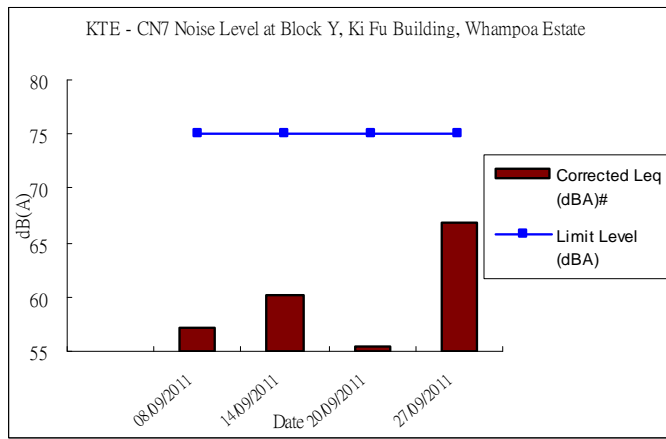
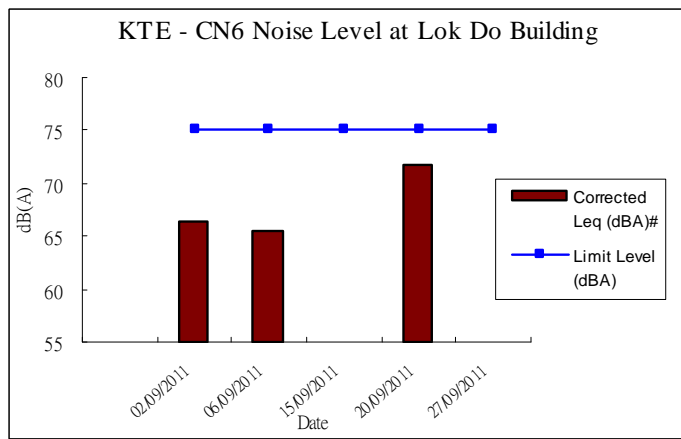
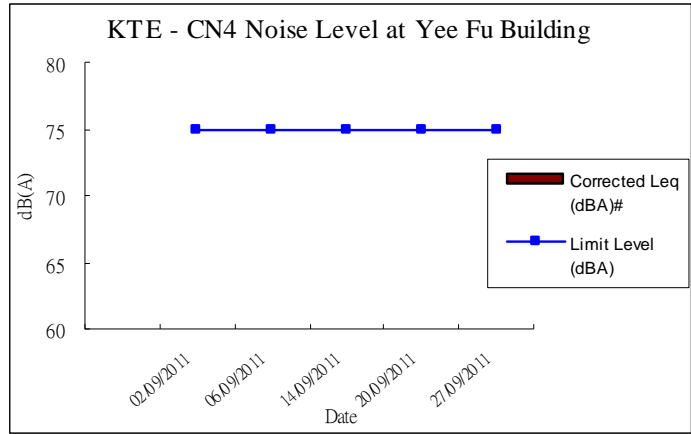
Appendix F

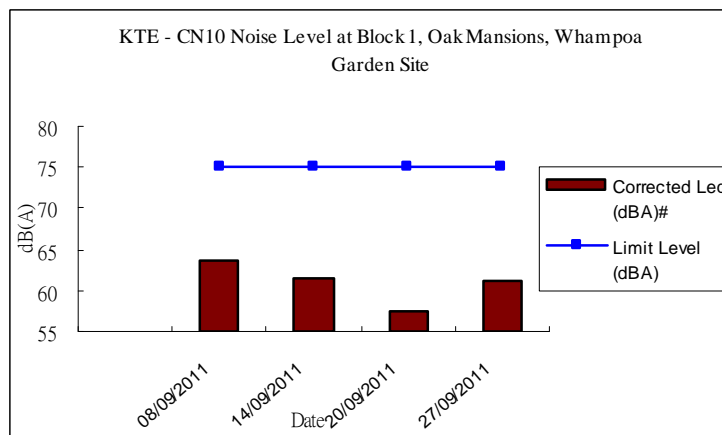
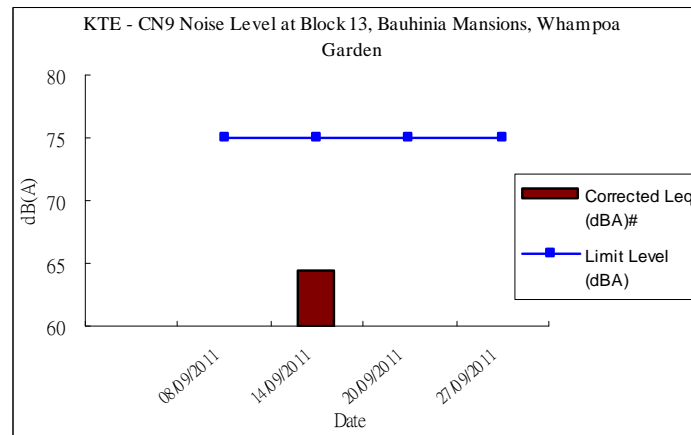
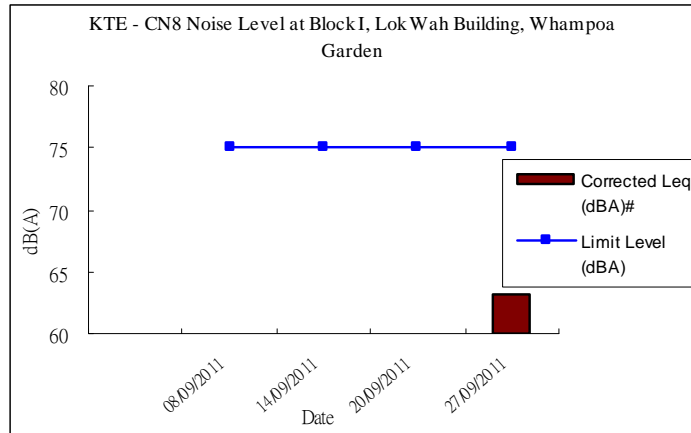
Impact Monitoring Graphical Plots

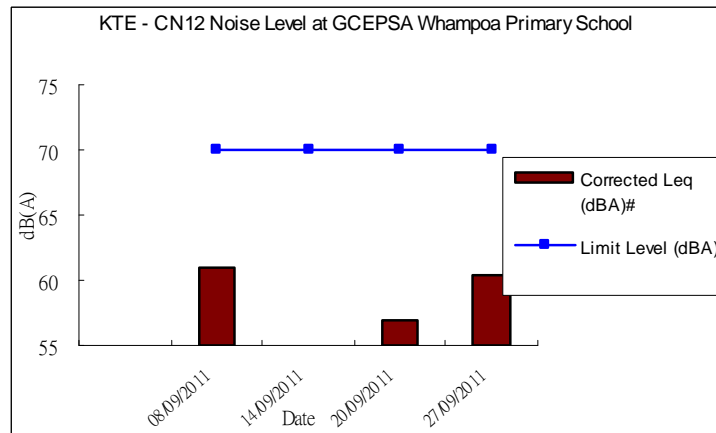
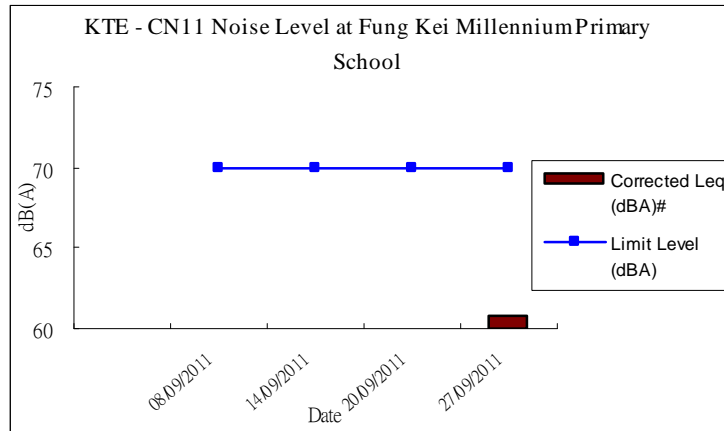












As some of the measured Leq is lower than the baseline level, correction against baseline level cannot be applied.

Appendix G

Monitoring Schedule for the Present and Next Reporting Period

