Highways Department

Contract No. HY/2007/14 Widening of Tuen Mun Road at Tsing Tin Interchange

Monthly Environmental Monitoring and Audit Report - March 2009

Revision 2

Certified by Environmental Team Leader
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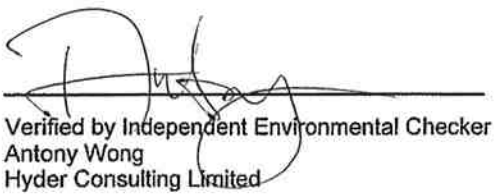


Verified by Independent Environmental Checker
Antony Wong
Hyder Consulting Limited

*SUBJECT TO EXCLUSION OF NOISE MONITORING RESULTS, CALIBRATION OF SOUND LEVEL METER (B&K TYPE 2238) AND CALIBRATION OF ACOUSTIC CALIBRATOR (B&K TYPE 4231)

Contents

Figures

Tables

Appendices

Impact Noise Monitoring Results

Appendix G

Updated Summary of Environmental Mitigation Implementation Schedule

Appendix H

Monthly Summary Waste Flow Table

Appendix I

Environmental Monitoring Programme for Coming Months

Executive Summary

This is the sixth monthly Environmental Monitoring and Audit (EM&A) report prepared by Ove Arup & Partners Hong Kong Limited (Arup), the designated Environmental Team (ET), for the Project "Widening of Tuen Mun Road at Tsing Tin Interchange". This report presents the results of EM&A works conducted in the month of March 2009.

In the reporting month, the following activities took place for the Project:

- Site clearance;
- Re-compaction of fill slope;
- Existing Underground Utilities (UU) lowering;
- Construction of pile cap;
- Construction of noise barrier footing; and
- Road pavement and drainage for widen lane.

Monitoring of 1-hour and 24-hour Total Suspended Particulates (TSP) and noise during non-restricted hours was performed and the results were checked and reviewed. Site audits were conducted on weekly basis. The implementation of the environmental mitigation measures, Event and Action Plans and environmental complaint handling procedures were checked.

Impact monitoring was carried out at three sensitive receivers including AM1(a), AM3(a) and TLLF(a) during the reporting month.

Environmental Monitoring Works – Breaches of Action and Limit Levels

Air Quality

All measured 1-hour and 24-hour TSP concentrations in the reporting month were below the Action and Limit (AL) Levels.

Noise

All noise measurement results were not exceed the Limit Level. Construction works were carried out during the restricted hours, the conditions stipulated in CNPs were followed by the Contractor. No non-compliance was recorded.

Landscape and Visual Audit

In accordance with the Clause 2.7 of the EP, seven numbers of trees within the site shall be transplanted to their designed transplanted locations prior to the operational phase of the Project.

Four (tree no. 1, 16, 35 and 169) out of the seven trees were fell prior to the commencement of the construction due to typhoon. Tree no. 63 was dead after transplanting in March. Interim transplanting of one tree (tree no. 411) was completed and one tree (tree no. 69) was tagged and protected by a fence with radius of 7m.

In accordance with Tree Assessment Schedule in Appendix 10.1 of the EIA Report, forty-seven trees of LR1 and LR2, including the seven trees mentioned above, would be affected as a result of the construction works. In the reporting period, these forty trees have been removed. Twenty-eight of them were already felled. In order to minimize the quantities of felled trees, the remaining twelve trees were transplanted to Siu Lang Shui Road as agreed by LCSD and ER. No significant change on their status was noted during the reporting period.

Thirty-five numbers of trees, which shall be retained in the site according to the Tree Assessment Schedule in Appendix 10.1 of the EIA Report, were damaged due to the typhoons prior to the commencement of the construction.

The design, implementation and maintenance of landscape and mitigation measures, listed in Table 8.2 of the EM&A manual, were checked during the monthly site audit. No non-compliance has been triggered.

Waste Disposal

Inert C&D materials with estimated amount of 645 m^3 were generated in the reporting period and were disposed of at public fill. It was advised from the Contractor that determination of the actual amount of wastes generation is still in progress so the relevant information will be presented on the next EM&A report.

Environmental Licensing and Permitting

Permits or licenses granted to the Project included the Environmental Permit of the Project (EP-302/2008, and EP-302/2008/A), Discharge License under WPCO (EP760/425/013454/I), Construction Noise Permit (GW-RW0044-09) and Chemical Waste Producer Registration (WPN5111-425-C1186-09).

Environmental Auditing

A total of 4 environmental site audits were conducted on a weekly basis in March 2009. No non-conformance to the environmental requirements was identified during the reporting period.

Complaint Log

No complaints in relation to the environmental issues was made against the Project in the reporting period.

Notifications of Summons and Successful Prosecutions

No summonses or prosecutions related to the environmental issues was made against the Project in the reporting period.

Reporting Changes

There were no reporting changes in the reporting month.

Future Key Issues

No future key issue is anticipated.

1 Environmental Status

1.1 Construction Programme

An up-to-date 3-month rolling construction programme to May 2009 is attached in **Appendix A**.

The construction activities were carried out together with all necessary mitigation measures stipulated in the EIA report.

1.2 Work Undertaken During the Month

The major construction activities carried out by the Contractor in the reporting month are summarised in **Table 1-1**. Locations of the construction activities are illustrated in **Figure 1-1**. Contacts of key environmental staff of the Project are shown in **Table 1-2**.

Table 1-1 Major construction activities in March 2009

Construction Activities	Location	Daily Excavation Rate
Site clearance	Whole Site Area	Range: 0 to 25 m^3
Construction of noise barriers footing	Whole Site Area	
Construction of pile cap	Whole Site Area	
Road pavement and drainage for widen lane	Whole Site Area	
Drainage & road re-construction	Whole Site Area	
Existing UU lowering	Bay 1 to 5	
Re-compaction of fill slope	Whole Site Area	Not applicable

Figure 1-1 Locations of the major construction activities

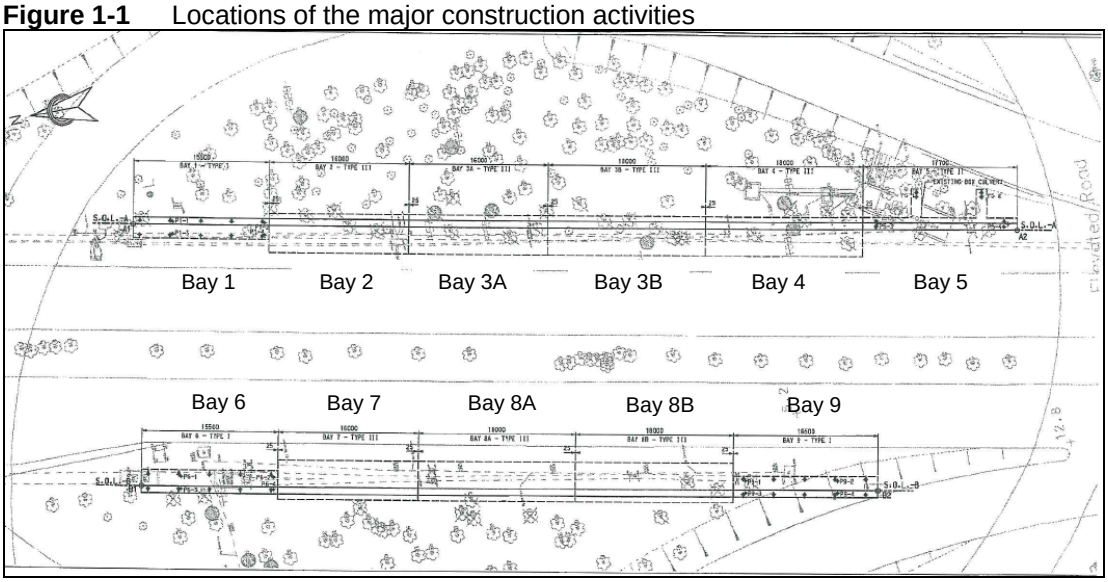


Table 1-2 Contacts of key environmental staff

Organization	Name	Telephone
Environmental Protection Department		
Environmental Protection Officer (Strategic Assessment)22	Thomas To	2835 1103
Engineer's Representative		
Highways Department		
Senior Engineer	K.C. Lai	2762 4951
Independent Environmental Checker		
Hyder Consulting Ltd		
Senior Environmental Consultant	Antony Wong	2911 2744
Environmental Team		
Ove Arup & Partners Hong Kong Ltd		
Environmental Team Leader	Coleman Ng	2268 3097
Contractor		
China Harbour Engineering Company Limited		
Project Manager	Eric Wu	9786 8630
Site Agent	Gordon Ng	9203 7503
Project Engineer	Jeffery Wong	6070 0143
Safety and Environmental Officer	Brian Cheung	5168 7867
Environmental Supervisor	W.P. Wong	9876 2132

1.3 Project Area, Sensitive Receivers and Environmental Monitoring Locations

The project area and the location of the sensitive receivers and monitoring stations are shown in **Figures 1-2 and 1-3** respectively, while **Table 1-3** shows the detail correspondences of monitoring stations.

Figure 1-2 Site location plan

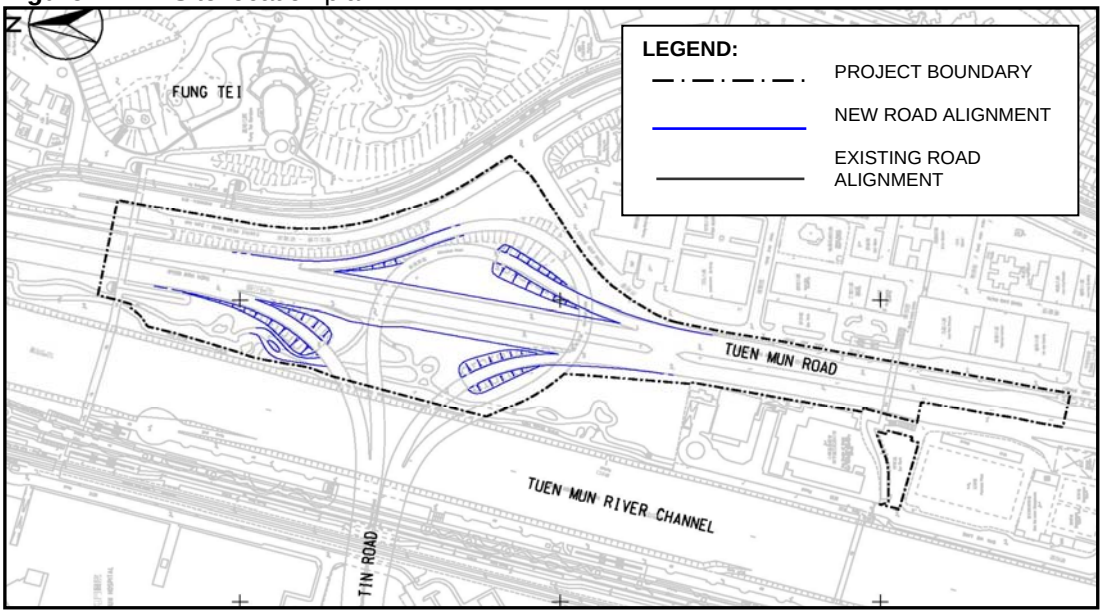


Figure 1-3 Location of environmental sensitive receivers and monitoring stations

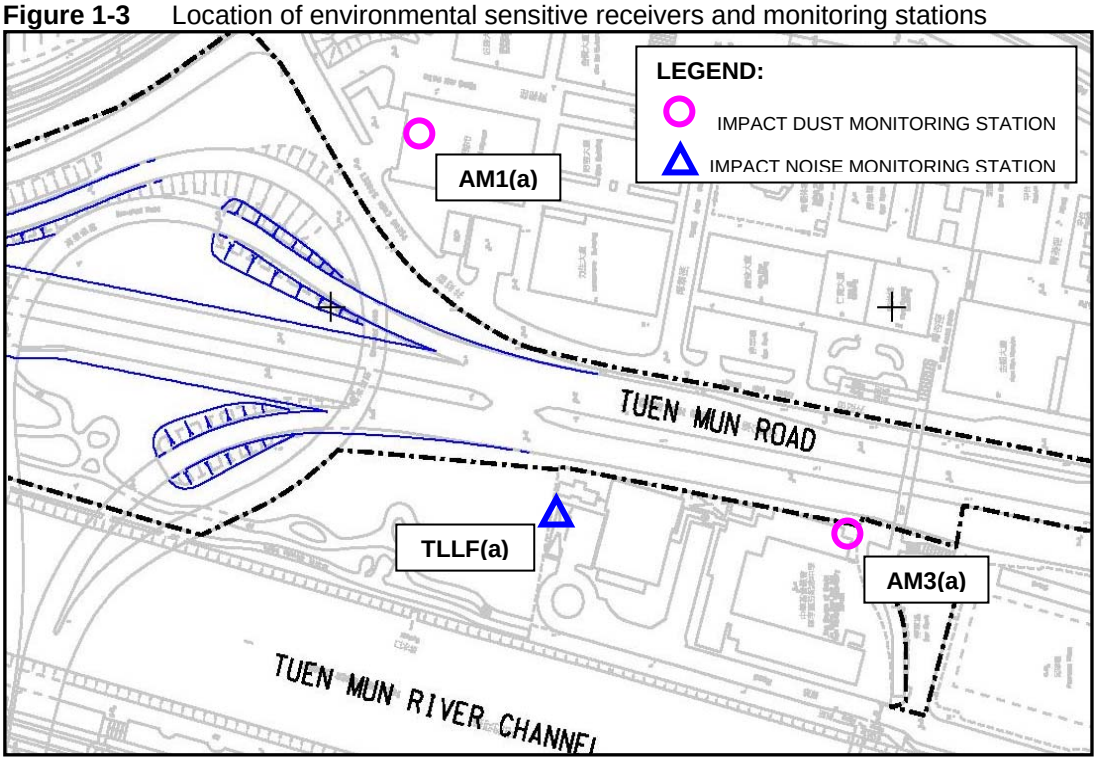


Table 1-3 Summary of impact air quality and noise monitoring stations

ID	Premise	Address	Monitoring Location Detail
Air			
AM1(a)	Kwong Choi Market	2 Tsing Min Path	Roof-top of the market office at the market garden
AM3(a)	The Church of Christ in China Tam Lee Lai Fun Memorial Secondary School	10 San Wo Lane	Ground-floor garden at the corner of the school
Noise			
TLLF(a)	The Church of Christ in China Tam Lee Lai Fun Memorial Secondary School	10 San Wo Lane	Car park of the school, facing to the construction area.

1.4 Status of Environmental Licensing and Permitting

All permits/licences inspected in the reporting month are summarised in **Table 1-4**. They are all properly kept by the contactor at their site office.

Table 1-4 Summary of environmental licensing and permit status

Types of Permits / Licenses	Reference No.	Valid from	Valid to
Environmental Permit	EP-302/2008 EP-302/2008/A	19 February 2008 25 March 2008	N/A N/A
Notification of Construction Work under APCO	001031161	N/A	N/A
Discharge Licence under WPCO	EP760/425/013454/I	1 August 2008	31 August 2013
Construction Noise Permit	GW-RW0044-09	20 February 2009	19 August 2009
Chemical Waste Producer Registration	WPN5111-425-C1186-09	17 July 2008	N/A
Billing account for disposal of construction waste	7007413	N/A	N/A

2 Implementation Status

During weekly site inspections, the environmental protection, and pollution control/mitigation measures in accordance with the requirements stipulated in the EIA report were observed. Here below summarises the key observations and ET's corresponding recommendations while the Contractor's response and follow-up status are described in Section 7.1.

Water Quality Mitigation Measures

- The Contractor was reminded to pump the wastewater of the wheel washing bay to the desilting tank prior discharge in timely basis.
- It is recommended to avoid any water accumulation on the site to minimize the mosquito breeding.

Waste / Chemical Waste Management

- The Contractor was requested to place the wasted battery storage container into the chemical waste storage area.
- It was recommended to relocate the garbage tank.
- The Contractor was reminded to keep the access road to chemical waste storage area clear and avoid blockage.

Landscape and Visual Impact Mitigation Measures

- The Contractor was advised to keep 7m protect zone of tree no.69.
- The Contractor was reminded to keep the fence properly around the tree no.69.
- Damage of tree trunk surface was observed in trees 69, 70, 325, 332 and 335. The Contractor was requested to avoid trunks damage during the construction works and, takes the proper remedial measures immediately when damage was observed.
- The Contractor was reminded to avoid the materials storage too close to the trees.

3 Air Monitoring

3.1 Air Monitoring Requirements

Monitoring Parameters

Air quality monitoring shall be measured in terms of the TSP levels for both 24-hour and 1-hour periods.

Monitoring Frequency

Dust monitoring was carried out during the reporting month. The monitoring parameters and frequency are summarised in **Table 3-1**.

Table 3-1 TSP monitoring parameters and frequency

Parameters	Monitoring Frequency	Time Period	No. of Measurement at each Location
24-hour TSP	Once every six days	0000 – 2400	1
1-hour TSP	Three times every six days	0700 – 1900	1

Monitoring Locations

In accordance with the EM&A Manual and the subsequent Baseline Report, two air quality monitoring locations during construction stage are required, namely:

(i) Kwong Choi Market at 2 Tsing Min Path (AM1(a)); and

(ii) The Church of Christ in China Tam Lee Lai Fun Memorial Secondary School at 10 San Wo Lane (AM3(a)).

Wind Monitoring

Wind monitoring data including wind speed and wind directions shall be collected from Hong Kong Observatory – Tuen Mun Wind Monitoring Station.

Environmental Quality Performance Limits

The monitoring results will be checked against the Action and Limit levels described in the Baseline Report, of which they are excerpted and summarised in **Tables 3-2**.

Table 3-2 Action and Limit levels for air quality

Level	Air Monitoring Stations			
	AM1(a)		AM3(a)	
	1-hour TSP	24-hour TSP	1-hour TSP	24-hour TSP
Action Level, μg/m^3	323	161	305	168
Limit Level, μg/m^3	500	260	500	260

3.2 Air Monitoring Methodology

3.2.1 Monitoring Equipment

High Volume Sampler (HVS) was used to monitor the 24-hour and 1-hour TSP. **Table 3-3** shows the equipment used for the air quality monitoring.

Table 3-3 Air quality equipment list for the air quality monitoring

Equipment	Manufacturer & Model No	Measurement Parameter	Quantity
High Volume Sampler	GS-2310105 & TE-5170	1- hour and 24-hour TSP	2
Fibreglass Filter	G810		40
HVS Calibration Kit	GMW-2535		1

3.2.2 Maintenance and Calibration

The HVSs and their accessories were frequently checked and maintained in accordance with the manufacturer's operation and maintenance manual. The maintenance included checking of supporting screen and gasket, as well as routine replacement of motor carbon brushes for the blower motor. The power cords and power supply were checked each time before sampling to ensure proper operation.

The HVSs were calibrated at 2-month intervals using GMW-2535 calibration kit which is re-calibrated by the manufacturer after one year of use. The calibration spreadsheets of the HVS and calibration certificate of the calibration kit are provided in **Appendix B**.

3.2.3 Monitoring Procedures

Specifications of the HVS are as follows:

- 0.6 – 1.7 m^3/min (20 – 60SCFM);
- Equipped with a timing/control device with +/- 5 minutes accuracy for 24 hours operation;
- Installed with elapsed time meter with +/- 2 minutes accuracy for 24 hours operation;
- Capable of providing a minimum exposed area of 406 cm^2 (63in^2);
- Flow control accuracy: +/-2.5% deviation over 24-hr sampling period;
- Equipped with a shelter to protect the filter and sampler;
- Incorporated with an electronic mass flow rate controller or other equivalent devices;
- Equipped with a flow recorder for continuous monitoring;
- Provided with a peaked roof inlet;
- Incorporated with a manometer;
- Able to hold and seal the filter paper to the sampler housing at horizontal position;
- Easy to change the filter; and
- Capable of operating continuously for 24-hour period.

The HVSs were equipped with an electronic mass flow controller and calibrated against a traceable standard at regular intervals. All equipment, calibration kit and filter papers were clearly labelled.

The relevant data including temperature, pressure, weather conditions, elapsed-time meter reading for the start and stop of the sampler, identification and weight of the filter paper, and other special phenomena observed and work progress of the concerned site were recorded.

A HOKLAS accredited laboratory (ALS Technichem (HK) Pty Ltd (HOKLAS no.: 066)), in accordance with their standard QA/QC procedures, with constant temperature and humidity control as well as equipped with necessary measuring and conditioning instruments to handle the 1-hour and 24-hour TSP samples was employed for sample analysis, and equipment calibration and maintenance. Filter papers of size 8"x10" were labelled before sampling. They were inspected clean with no pin holes and conditioned in a humidity controlled chamber for over 24-hr and be pre-weighed before use for the sampling.

After 1-hour and 24-hour sampling, the filter papers loaded with dust were kept in a clean and tightly sealed plastic bag, and then returned to the laboratory for reconditioning in the humidity controlled chamber followed by accurate weighing by an electronic balance with readout down to 0.1 mg. All the collected samples were kept in a good condition for 6 months before disposal.

3.3 Monitoring Results and Observations

3.3.1 Weather Condition

No adverse weather conditions, in particular adverse wind speed & wind direction and fog & rain that may significantly affect or invalidate the collected monitoring data, were registered during the reporting period.

3.3.2 Air Quality Monitoring Results

Monitoring of 1-hour TSP was conducted at all monitoring stations on 4, 10, 16, 20 and 26 March 2009, while monitoring of 24-hour TSP was conducted on 5, 11, 17, 21 and 27 March 2009. All monitoring data and graphical presentation of the monitoring results are provided in **Appendix C** and are summarised in **Table 3-4**. The graphical presentation of the monitoring results over past four months (December 2008 to March 2009) are provided in **Appendix C**. Wind data during the reporting period is presented in **Appendix D**.

Table 3-4: Summary of impact air quality monitoring results for March 2009

Location	Average 1-hr TSP Concentration, $\mu g/m^3$ (Range)	Average 24-hr TSP Concentration, $\mu g/m^3$ (Range)
AM1(a)	70 (3 – 250)	17 (55 – 90)
AM3(a)	47 (12 – 115)	65 (25 – 96)

All 1-hour and 24-hours measurements during the reporting month were below the Action/Limit Level. No exceedance of action and limit level was found.

3.3.3 General Observations

Major construction works including sheet pile installation for noise barrier footing, excavation for noise barrier footing and UU slewing, fill slope re-compaction and noise barriers footing construction were implemented during the reporting month.

Observable dust generation from activities on-site, such as vehicular movements along unpaved area, excavation and demolition, had been noticed at the monitoring location during the air monitoring period.

4 Noise Monitoring

4.1 Noise Monitoring Requirements

Monitoring Parameters

Construction noise shall be measured in terms of the A-weighted equivalent continuous sound pressure level (L_{eq}). L_{10} and L_{90} shall also be recorded as supplementary reference information for data auditing.

Monitoring Frequency

Noise measurements shall be conducted on a weekly basis. The monitoring time periods, monitoring parameters and frequency are summarised in **Table 4-1**.

Table 4-1 Construction noise monitoring parameters and frequency

Time Period (when construction activity is found)	Parameters	Monitoring Frequency	No. of Measurement at each Location
Between 0700-1900 hours on normal weekdays	$L_{eq(30\ min)}$	Once per week	1
Between 1900-2300 hours on normal weekdays	$L_{eq(5\ min)}$*		3 (consecutive)*
Between 2300-0700 hours of next day			
Between 0700-1900 hours on holidays			

* If works are to be carried out during restricted hours, the conditions stipulated in the Construction Noise Permit (CNP) issued by the Noise Control Authority have to be followed.

Monitoring Location

In accordance with the EM&A Manual and the subsequent Baseline Report, one noise monitoring location during construction stage is required, namely:

(i) The Church of Christ in China Tam Lee Lai Fun Memorial School at 10 San Wo Lane (TLLF(a)).

Environmental Quality Performance Limits

The monitoring results will be checked against the Action and Limit levels described in the Baseline Report, of which they are excerpted and summarised in **Tables 4-2**.

Table 4-2 Action and Limit levels for construction noise

Time Period	Action Level	Limit Level dB(A)
0700 - 1900 hours on normal weekdays	When one documented complaint is received	70 / 65 (Note 1)
0700 - 2300 hours on holiday; and 1900 – 2300 hours on all other days		70 (Note 2)
2300 – 0700 hours of next day		55 (Note 2)

Notes:

1. For normal day-time working hours, the noise criteria are 70 dB(A) and 65 dB(A) for normal reaching periods and examination period respectively.
2. If works are to be carried out during restricted hours, the conditions stipulated in the Construction Noise Permit (CNP) issued by the Noise Control Authority have to be followed.

4.2 Noise Monitoring Methodology

4.2.1 Monitoring Equipments

Noise level was measured by a Sound Level Meter (SLM) in terms of A-weighted equivalent continuous sound pressure level. L_{eq}, L_{10} and L_{90} were recorded as supplementary information for data auditing. **Table 4-3** shows the equipment list of the noise monitoring.

Table 4-3 Noise equipment list for noise monitoring

Equipment	Manufacturer & Model No.	Precision Grade	Qty.
Integrated SLM	Brüel & Kjær 2238	IEC 651 Type 1 IEC 804 Type 1	1
½" free-field microphone	Brüel & Kjær 4188		1
Windshield	Brüel & Kjær UA0237		1
Acoustical calibrator	Brüel & Kjær 4231	IEC 942 Type 1	1

4.2.2 Maintenance and Calibration

The SLM and calibrator in compliance with the International Electrotechnical Commission (IEC) Publication 651:1979 (Type 1) specifications as referenced in the Technical Memorandum on Noise from Construction Work other than Percussive Piling (GW-TM) was used. The calibration certificates for the noise equipment are provided in **Appendix E**.

SLM complying with the standards of IEC 651 (Fast, Slow, Impulse rms detector tests) and IEC 804 (L_{eq} functions) and acoustical calibrator model no. 4231 complying with IEC 942 were adopted for the noise measurement. Both equipment are calibrated bi-annually in-house using Brüel & Kjær (B&K) calibrator model no 4226. The calibrator is annually calibrated by its manufacturer under the accreditation of United Kingdom Accreditation Service. All in-house calibrations that have been undertaken can be traced back to the National Physical Laboratory. The calibration certificates for the noise equipment are given in **Appendix E**.

4.2.3 Monitoring Procedures

- The SLM and battery were checked to ensure that they are in proper condition. The SLM was set on a tripod at 1.2m above ground and at least 1m from the exterior of the building façade;
- Before conducting the measurement, the SLM was calibrated by an acoustical calibrator;
- Measurement parameter was set to A-weighted sound pressure level. The time weighting was set in fast response and the time period of measurement at 30 minutes;
- Wind speed was checked during noise monitoring to ensure the steady wind speed does not exceed 5m/s, or wind with gusts does not exceed 10m/s;
- Any abnormal conditions that generated intrusive noise during the measurement was recorded on the field record sheet;
- After each measurement, the equivalent continuous sound pressure level (L_{eq}), L_{10} and L_{90} were recorded on the field record sheet;
- After conducting the measurement, the SLM was calibrated by an acoustical calibrator; and
- The SLM was re-calibrated by the acoustical calibrator to confirm that there is no significant drift of reading. Measurements shall be accepted as valid only if the calibration levels before and after the noise measurement agrees to within 1.0 dB.

4.3 Monitoring Results and Observations

4.3.1 Weather Condition

The weather condition was mainly sunny during the noise monitoring period in the reporting month.

4.3.2 Noise Monitoring Results

Non-restricted Hours

Monitoring of the construction noise level was conducted during non-restricted hours on 4, 10, 16 and 26 March 2009 at TLLF(a). No construction work was carried out during restricted hours. All monitoring data and graphical presentation of the monitoring results are provided in **Appendix F** and are summarised in **Table 4-4**. The graphical presentation of the monitoring results over past four months (December 2008 to March 2009) are also provided in **Appendix F.**

Table 4-4 Summary of impact noise monitoring in the reporting month

Date	Set	Start Time	End Time	Baseline* (Same period of the Day-time) Leq (30-min), dB(A)	Impact Monitoring Result* Leq (30-min), dB(A)	Impact Noise* after baseline correction Leq (30-min), dB(A)	Limit Level dB(A)
4-Mar-09	First	13:30	14:00	75	67	/	70
10-Mar-09	First	14:30	15:00	74	67	/	
16-Mar-09	First	13:30	14:00	75	67	/	
26-Mar-09	First	17:35	18:05	74	68	/	

Note(*): Façade correction was included.

Restricted Hours

In the reporting month, the night work (road marking) activities were carried out during restricted hours between 30 March and 2 April 2009. The granted Construction Noise Permit (CNPs), no.GW-RW0044-09, was issued by EPD for the related activities before the works commencement. According to the EM&A Manual Table 3.2, the conditions stipulated in the CNP issued by the Noise Control Authority shall be followed. Therefore, a ad-hoc inspection for plant inventory counting for compliance of CNPs conditions was carried out on 30 March 2009. Two nos. of powered mechanical machine, lorry and roading marking material boiler, were used during the inspection period which followed the conditions stipulated in the CNP. There was no non-compliance recorded during the reporting month.

4.3.3 Exceedance of Limit Levels for Construction Noise

All noise measurement results during the reporting month were not exceed the Limit Level.

4.3.4 General Observations

The construction site had been under normal operation during the noise monitoring period and no unusual operation was observed. Traffic noise had been noticed at the monitoring location during the noise monitoring period.

5 Landscape and Visual Monitoring

5.1 Landscape and Visual Impact Monitoring Requirements

Monitoring Requirement

In accordance with the EM&A Manual, a landscape auditor, as a member of the ET, is responsible for conducting the baseline review and monitoring the implementation of the landscape and visual mitigation measures during construction phase in accordance with the EIA report. Purposes of the review are:

- to check the status of the landscape resources within, and immediately adjacent to, the construction sites and works areas;
- to determine whether any change has occurred to the status of the landscape resources since the EIA;
- to determine whether amendments in the design of the landscape and visual mitigation measures are required for those changes; and
- to recommend any necessary amendments to the design of the landscape and visual mitigation measures.

The design, implementation and maintenance of landscape and visual mitigation measures shall be checked monthly to ensure that they are fully required. Any potential conflicts between the proposed landscape measures and any other project works or operational requirements shall also be recorded for the Contractor to resolve in early stage, without compromising the intention of the mitigation measures.

Monitoring Parameters

The components of assessed parameter of landscape resource is summarised below:

- Landscape Resource along the roadside planting at Tsing Tin Interchange (LR1); and
- Landscape Resource at Castle Peak Road (San Hui) Park (LR2).

Audit Frequency

The landscape and visual monitoring and audit shall be undertaken once a month throughout the construction period and operational phase.

Audit Location

The landscape and visual monitoring and audit shall be conducted throughout the entire site area.

5.2 Audit Results

In the reporting month, landscape and visual site audit in accordance with the requirements stipulated in the EM&A manual was conducted on 13 March 2009.

In accordance with the Clause 2.7 of the EP, seven numbers of trees (tree no. 1, 16, 35, 63, 69, 169 and 411) within the site shall be transplanted to their designed transplanted locations prior to the operational phase of the Project. Tree no.63 was dead after transplanting in March. Status of other six trees was no significant change during the reporting period and their respective mitigation measures was described in the previous monthly EM&A report. Status of the trees including their respective mitigation measures is summarised in **Table 5-1**.

Table 5-1 Status of tree transplantation

Tree no.	Location	Botanical Name		Status	Measures
1	LR1	*Melaleuca quinquenervia*	白千層	Fell by Typhoon	To be compensated by a tree at designated location

Tree no.	Location	Botanical Name		Status	Measures
16	LR1	*Melaleuca quinquenervia*	白千層	Fell by Typhoon	To be compensated by a tree at designated location
35	LR1	*Melaleuca quinquenervia*	白千層	Fell by Typhoon	To be compensated by a tree at designated location
63	LR1	*Gossampinus malabarica*	木棉	Dead after transplanting	To be compensated by a tree at designated location
69	LR1	*Melia azedarach*	森樹	Tagged and a fence with radius of 7m was erected to protect the tree	Not applicable
169	LR2	*Melaleuca quinquenervia*	白千層	Fell by Typhoon	To be compensated by a tree at designated location
411	LR2	*Melaleuca quinquenervia*	白千層	Completion of interim transplant within the site	To be transplanted at designated location

In accordance with Tree Assessment Schedule in Appendix 10.1 of the EIA Report, forty-seven trees of LR1 and LR2 would be affected as a result of the construction works. Seven of them, as described above, were proposed to be transplanted to their designated locations before operational phase, while the remaining forty trees were proposed to be felled during the construction phase. No significant change on their status was noted during the reporting period.

Compensatory planting of forty-seven number of trees prior the operational phase, as required in the Clause 2.8 of the EP, will be carried out after the consultation by LCSD. Observations during the monthly inspection summarized in **Table 5-2**.

Table 5-2 Status of forty trees to be affected during the construction stage

ID No.	Tree affected			Current Status
	No.	*Botanical Name*		
LR1	9	*Acacia confusa*	台灣相思	Transplanted to Siu Lang Shui Road
	10	*Acacia confusa*	台灣相思	Transplanted to Siu Lang Shui Road
	15	*Acacia confusa*	台灣相思	Transplanted to Siu Lang Shui Road
	17	*Acacia confusa*	台灣相思	Felled
	31	*Acacia confusa*	台灣相思	Felled
	32	*Acacia confusa*	台灣相思	Felled
	33	*Hibiscus tiliaceus*	黃槿	Felled
	34	*Hibiscus tiliaceus*	黃槿	Felled
	45	*Acacia confusa*	台灣相思	Felled
	46	*Thevetia peruviana*	黃花夾竹桃	Felled by Typhoon
	47	*Acacia confusa*	台灣相思	Felled
	48	*Hibiscus tiliaceus*	黃槿	Transplanted to Siu Lang Shui Road
	49	*Acacia confusa*	台灣相思	Felled
	50	*Hibiscus tiliaceus*	黃槿	Transplanted to Siu Lang Shui Road
	51	*Hibiscus tiliaceus*	黃槿	Transplanted to Siu Lang Shui Road

ID No.	Tree affected			Current Status
	No.	*Botanical Name*		
	52	*Hibiscus tiliaceus*	黃槿	Felled
	53	*Acacia confusa*	台灣相思	Transplanted to Siu Lang Shui Road
	54	*Hibiscus tiliaceus*	黃槿	Transplanted to Siu Lang Shui Road
	55	*Hibiscus tiliaceus*	黃槿	Felled
	56	*Hibiscus tiliaceus*	黃槿	Transplanted to Siu Lang Shui Road
	57	*Hibiscus tiliaceus*	黃槿	Transplanted to Siu Lang Shui Road
	58	*Acacia confusa*	台灣相思	Felled
	59	*Hibiscus tiliaceus*	黃槿	Transplanted to Siu Lang Shui Road
	60	*Acacia confusa*	台灣相思	Felled
	61	*Melaleuca quinquenervia*	白千層	Transplanted to Siu Lang Shui Road
	62	*Acacia confusa*	台灣相思	Felled
	64	*Hibiscus tiliaceus*	黃槿	Felled
	65	*Melia azedarach*	森樹	Felled
	293	*Hibiscus tiliaceus*	黃槿	Felled
LR2	155	*Acacia confusa*	台灣相思	Felled
	156	*Acacia confusa*	台灣相思	Felled
	163	*Melaleuca quinquenervia*	白千層	Felled
	165	*Acacia confusa*	台灣相思	Felled
	167	*Acacia confusa*	台灣相思	Felled
	168	*Acacia confusa*	台灣相思	Felled
	170	*Hibiscus tiliaceus*	黃槿	Felled
	171	*Hibiscus tiliaceus*	黃槿	Felled
	172	*Acacia confuse*	台灣相思	Felled
	173	*Acacia confuse*	台灣相思	Felled
	174	*Acacia confuse*	台灣相思	Felled

Thirty-five numbers of trees, which shall be retained in the site according to the Tree Assessment Schedule in Appendix 10.1 of the EIA Report, were damaged due to the typhoons prior to the commencement of the construction.

Based on the updated information provided by the contractor and the site inspections, no significant change on the tree status was noted during the reporting period. However, damage of tree trunk surface on tree 69, 70, 322, 325 and 335 were observed during the inspection from the site audit. The Contractor was requested to avoid trunks damage during the construction works and, take the proper action immediately when damage was observed. The key observations, ET's corresponding recommendations as well as the Contractor's response and follow-up status during the site inspections are described in Section 7.1 of this report.

5.3 Implementation Status of Consultation Phase Landscape and Visual Mitigation Measures

The design, implementation and maintenance of landscape and mitigation measures, listed in Table 8.2 of the EM&A manual, were checked during the monthly site audit. No non-compliance has been triggered. Summary of the implementation status of Construction Phase Landscape and Visual Mitigation Measures is presented in the Environmental Mitigation Implementation Schedule (EMIS) in **Appendix G**.

5.4 Recommendations, Corrective Actions and Outstanding Issues

The recommendations, corrective actions or outstanding issues in relation with the landscape and visual monitoring are as follows:

- Tree Survey and Felling Plans and Tree Schedule should be revised in accordance with actual conditions on site, such as tree location and missing trees, for future monitoring;
- The Contractor was reminded to properly store, segregate and dispose of the felled trees;
- The Contractor was reminded to water and fertilise the trees regularly and submit the records of the works to RE;
- When retained trees were prone to be disturbed by nearby construction works, protective fencing should be erected around the trees before commencement of works;
- Where construction of protective fencing was impractical, the trunks of retained trees should be protected from abrasion by wrapping with hessian sacking, and strapping with pallet timbers secured with wire;
- Any debris and wood produced as a result of pruning, felling and cavity work performed on trees should be collected and removed from site properly; and
- The Contractor was reminded to keep 7m protect zone and properly fenced for tree no.69;
- The Contractor was reminded to avoid trunks damage during the construction works and, takes the proper remedial measures immediately and tree protection when damage was observed; and
- The Contractor was reminded to avoid the materials storage too close to the trees.

6 Waste Disposal

The estimated amounts of different types of waste generated by the activities of the Project in the month are shown in **Table 6-1**. It was advised from the Contractor that determination of the actual amount of wastes generation is still in progress so the relevant information will be presented on the next EM&A report. Actual amounts of waste generated in February 2009 are shown in **Table 6-2**. The monthly summary waste flow table is provided in **Appendix H**.

Table 6-1 Estimated amounts of waste generated in the reporting month

Waste Type	Estimated Amount	Actual Amount	Disposal Locations
Inert C&D Waste	645 m^3	To be presented in next monthly report	Disposal of at fill bank at Tuen Mun Area 38
Metals	4 kg		Recycle collector
Paper/cardboard packaging	10 kg		Recycle collector
Chemical Waste	0		Disposal of at SENT landfill
General Refuse	15 m^3		Disposal of at WENT landfill

Table 6-2 Actual amounts of waste generated in previous month (February 2009)

Waste Type	Estimated Amount	Actual Amount	Disposal Locations
Inert C&D Waste	735 m^3	735 m^3	Disposal of at fill bank at Tuen Mun Area 38
Metals	3 kg	3 kg	Recycle collector
Paper/cardboard packaging	10 kg	10 kg	Recycle collector
Chemical Waste	0 kg	0 kg	Disposal of at SENT landfill
General Refuse	5 m^3	5 m^3	Disposal of at WENT landfill

7 Environmental Performance

7.1 Environmental Site Inspection

Environmental site inspections were carried out on a weekly basis to monitor environmental issues on the construction sites to ensure that all mitigation measures were implemented timely and properly. The site inspections were carried out on 4, 13, 19 and 26 February 2009. A summary of the site inspections is presented in **Table 7-1**.

Table 7-1 Key findings of weekly environmental site audit in the reporting month

Inspection Date	Key Observations and Recommendations	CT's Response / Environmental Outcome	Follow up Status / Closed Date
	Water Quality Mitigation Measures		
4 Mar 09	The Contractor was reminded to pump the wastewater of the wheel washing bay to the desilting tank prior discharge in timely basis.	Agreed with the ET's advice	Wastewater had been removed by pump; closed on 13 Mar 09
4 Mar 09	It is recommended to avoid any water accumulation on the site to minimize the mosquito breeding.	Agreed with the ET's advice	Mosquito control had been implemented; closed on 13 Mar 09
	Waste / Chemical Waste Management		
4 Mar 09	The Contractor was requested to place the wasted battery storage container into the chemical waste storage area	Agreed with the ET's advice	Waste battery had been placed properly immediately; closed on 4 Mar 09
4 Mar 09	It was recommended to relocate the garbage tank	Agreed with the ET's advice	The garbage tank had been relocated; closed on 13 Mar 09
26 Mar 09	The Contractor was reminded to keep the access road to chemical waste storage area clear and avoid blockage.	Agreed with the ET's advice	Access road had been cleared immediately; closed on 26 Mar 09
	Landscape and Visual Impact Mitigation Measures		
4 Mar 09	The Contractor was advised to keep 7m protect zone of tree no.69.	Agreed with the ET's advice	Protection zone had been provided; closed on 13 Mar 09
4 Mar 09	Damage of tree trunk surface was observed in trees 69, 70, 325, 332 and 335. The Contractor was requested to avoid trunks damage during the construction works and, takes the proper remedial measures immediately when damage was observed.	Agreed with the ET's advice	Remedial measures had been taken; closed on 13 Mar 09
4 Mar 09	The Contractor was reminded to avoid the materials storage too close to the trees.	Agreed with the ET's advice	The Contractor committed to place the materials to appropriate area; continues effort
26 Mar 09	The Contractor was reminded to keep the fence properly around the tree no.69.	Agreed with the ET's advice	Fencing had been placed immediately; closed on 26 Mar 09

7.2 Non-Compliance Record

There was no non-compliance record identified in the reporting month.

7.3 Complaint Record

There was no environmental complaint received in the reporting month

7.4 Notification of Summons and Successful Prosecution

No summons or prosecutions related to environmental issues were received or made against the Project in the reporting month.

7.5 Review of Reasons of Non-Compliance

There was no non-compliance identified during the reporting month so review of the non-compliance was not required.

8 Future Key Issues

8.1 Key Issues for the Coming Month

Key issues to be considered in the forth-coming month include:

- Dust generation from activities on-site, such as vehicular movements along unpaved area, excavation and demolition;
- Noise impact from operating equipment and night works activities;
- Uncontrolled water discharge into nearby water body;
- Storage and using of chemicals/fuel and chemical waste/waste oil on site;
- Disposal of construction waste; and
- Tree maintenance.

8.2 Solid and Liquid Waste Management Status

Based on the findings of the weekly site inspection, the contractor's performance in terms of solid and liquid waste management was carried out in accordance with the requirements stipulated in the EIA report. Solid waste and liquid waste were disposed of properly. Existing practices should be continued.

8.3 Effectiveness and Efficiency of Mitigation Measures

Based on the environmental monitoring results, effectiveness and efficiency of the mitigation measures implemented were found satisfactory. Existing practices should be continued.

8.4 Environmental Monitoring Program for the Forth-coming Month

Environmental monitoring and audit will be carried out in accordance with the requirements stipulated in the EM&A manual. Tentative air, noise, landscape and visual monitoring as well as weekly site audit schedule for the forth-coming month with respect to the construction programme is shown in **Appendix I**.

The construction programme for the coming month is shown in **Table 8-1**.

Table 8-1 Tentative programme of construction works

Month	Details of Construction Works	
April 2009	▪ Site clearance ▪ Construction of pile cap ▪ Construct ion of noise barrier footing ▪ Erection the sign gantry	▪ Fill slope re-compaction ▪ Drainage and road re-construction ▪ Road pavement & drainage for widen lane

9 Conclusions and Recommendations

9.1 Conclusions

The construction phase of the Project was commenced on 2 October 2008. The EM&A programme has been implemented since then, including air quality, noise, landscape and visual and environmental site audits.

No complaint, summons or prosecution related to environmental issues was received during the reporting month.

Weekly environmental site audit was carried out during the reporting month. The major environmental concerns were related to air quality, water quality, landscape and visual impact, waste management as well as handling of chemical waste.

9.2 Recommendations

Impact monitoring will be continued to carry out in the following month and followed by the requirement stipulated in the EM&A manual. Attention will be paid to environmental issues identified in EIA report and weekly site audit. Mitigation measures recommended in EIA report and Mitigation Measure Implementation Schedule will be fully implemented.

Construction dust will continue to become a key environmental issue on dry and windy days. The implemented construction dust mitigation measures should also be maintained and improved as necessary. Furthermore, landscape and visual impact mitigation measures such as sufficient protective fencing should be maintained and improved as necessary in order to protect the retained trees.

10 Reference

1) Maunsell Consultants Asia Ltd. December 2007. Quotation Ref No. Hy(S)Q/026/2006 Widening of Tuen Mun Road at Tsing Tin Interchange – Environmental Monitoring & Audit Manual.

2) Ove Arup & Partners Hong Kong Limited. September 2008. Contract No. HY/2007/14 Widening of Tsing Tin Interchange – Baseline Monitoring Report (Revision_6)

Appendix A

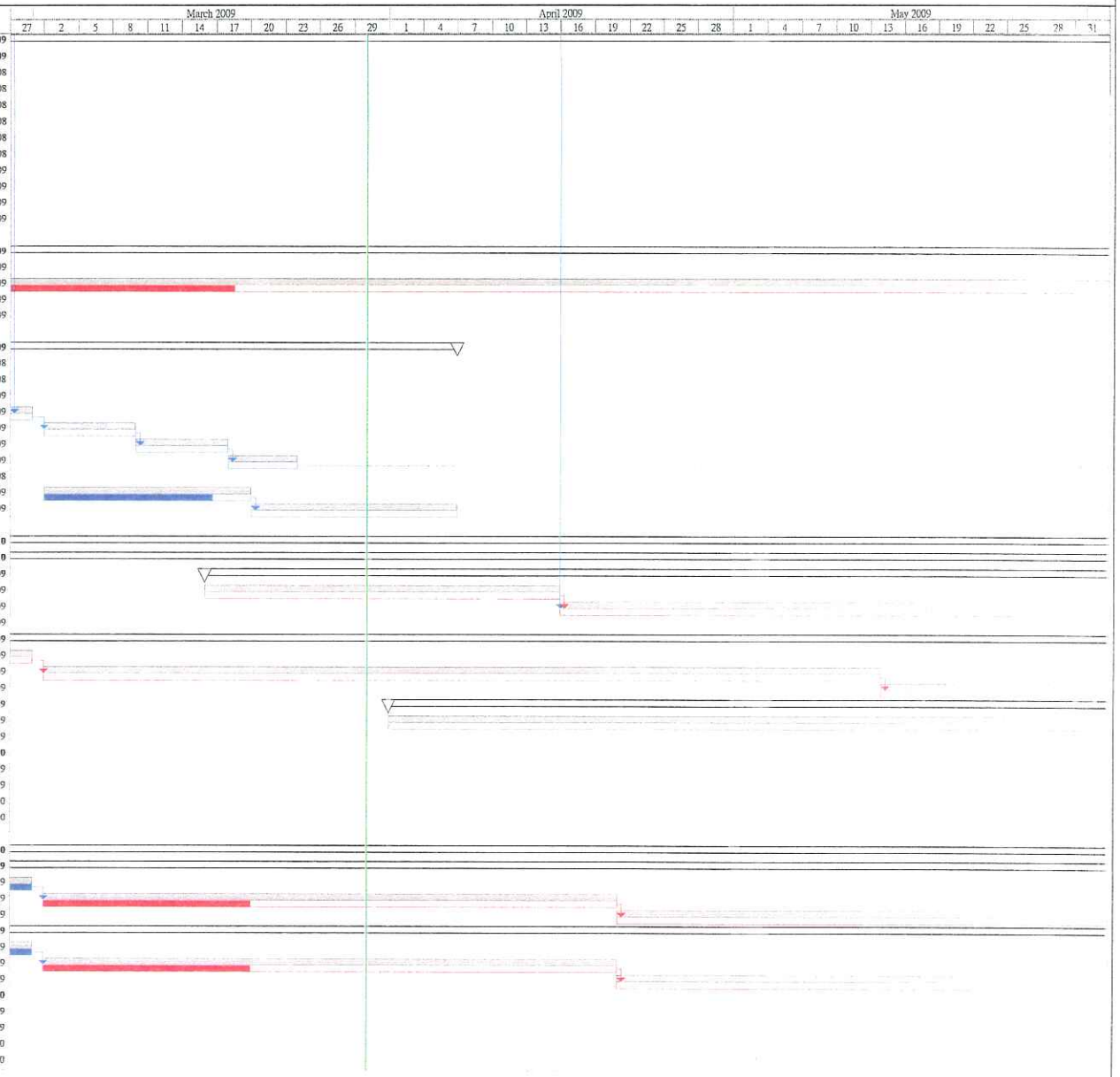
Construction Programme

Contract No. HY/2007/14
Title : Widening of Tuen Mun Road at Tsing Tin Interchange

3 Month Rolling Programme

Programmed Date : 30-03-2009
Revision : 0

ID	Task Name	Duration	Start	Finish
60	**Tuen Mun Road North Bound**	**358 days**	**Wed 3/9/08**	**Wed 11/11/09**
61	**Noise Barrier Foundation**	**134 days**	**Mon 15/9/08**	**Wed 25/2/09**
62	Install sheetpile for noise barrier footing (NB)	40 days	Mon 15/9/08	Thu 30/10/08
63	Excavation for NB footing & UU diversion	43 days	Thu 18/9/08	Thu 6/11/08
64	Construct NB noise barrier footing	43 days	Fri 7/11/08	Mon 29/12/08
65	Install mini pile for NB (20nos.)	25 days	Fri 7/11/08	Fri 5/12/08
66	Install sheet pile for NB pile cap & UU diversion	22 days	Mon 13/10/08	Thu 6/11/08
67	Excavation for NB pile cap	15 days	Wed 3/12/08	Fri 19/12/08
68	Construct NB pile cap	15 days	Sat 20/12/08	Fri 9/1/09
69	Construct drainage system	74 days	Thu 20/11/08	Sat 21/2/09
70	Existing UU diversion	21 days	Mon 12/1/09	Mon 9/2/09
71	Backfill for footing and pile cap and remove sheet pile	51 days	Sat 20/12/08	Wed 25/2/09
72				
73	**Road Works**	**226 days**	**Thu 12/2/09**	**Wed 11/11/09**
74	Existing UU diversion	12 days	Thu 12/2/09	Wed 25/2/09
75	Road pavement & drainage for widen lane (lane 1)	88 days	Thu 26/2/09	Mon 15/6/09
76	Re-construct existing slow lane (lane 2) & 450mm pipe	63 days	Tue 16/6/09	Fri 28/8/09
77	Re-construct existing fast lane (lane 3) & 450mm pipe	63 days	Sat 29/8/09	Wed 11/11/09
78				
79	**High Mast Lighting and CCTV**	**177 days**	**Wed 3/9/08**	**Mon 6/4/09**
80	Construct high mast lighting footing	35 days	Wed 3/9/08	Mon 13/10/08
81	Existing high mast lighting cable diversion	28 days	Fri 3/10/08	Tue 4/11/08
82	Construct high mast lighting ducting and drawpits	31 days	Wed 7/1/09	Mon 16/2/09
83	Erect high mast	2 days	Fri 27/2/09	Sat 28/2/09
84	E&M connection for high mast lighting	7 days	Mon 2/3/09	Mon 9/3/09
85	T&C high mast lighting	7 days	Tue 10/3/09	Tue 17/3/09
86	Remove existing high mast light	5 days	Wed 18/3/09	Mon 23/3/09
87	Construct the CCTV camera mast footing	10 days	Mon 20/10/08	Thu 30/10/08
88	Construct civil provision for CCTV camera mast	16 days	Mon 2/3/09	Thu 19/3/09
89	Erect and E&M connection for CCTV camera mast	14 days	Fri 20/3/09	Mon 6/4/09
90				
91	**SECTION 3**	**337 days**	**Mon 29/12/08**	**Thu 11/2/10**
92	**Tuen Mun Road South Bound**	**337 days**	**Mon 29/12/08**	**Thu 11/2/10**
93	**Slip Road D**	**109 days**	**Mon 16/3/09**	**Tue 28/7/09**
94	Stage 0 - TTA implementation and temporary road construction	24 days	Mon 16/3/09	Wed 15/4/09
95	Stage 1 - Road re-construction stage 1 (Full Depth Re-construction)	40 days	Thu 16/4/09	Thu 4/6/09
96	Stage 2 - Road re-construction stage 2 (Full Depth Re-construction)	45 days	Fri 5/6/09	Tue 28/7/09
97	**Slip Road C**	**170 days**	**Mon 29/12/08**	**Tue 28/7/09**
98	Stage 0 - TTA approval, implementation and temporary road construction	49 days	Mon 29/12/08	Sat 28/2/09
99	Stage 1 - Drainage & Road re-construction stage 1 (Full Depth Re-construction)	58 days	Mon 2/3/09	Wed 13/5/09
100	Stage 2 - Drainage & Road re-construction stage 2 (Full Depth Re-construction)	63 days	Thu 14/5/09	Tue 28/7/09
101	**Sign Gantry**	**67 days**	**Wed 1/4/09**	**Wed 24/6/09**
102	Fabrication of sign gantry (SG2)	60 days	Wed 1/4/09	Tue 16/6/09
103	Erection the sign gantry (TMR SB)	7 days	Wed 17/6/09	Wed 24/6/09
104	**Noise Barrier Erection**	**77 days**	**Thu 12/11/09**	**Thu 11/2/10**
105	Erect working platform for NB erection	10 days	Thu 12/11/09	Mon 23/11/09
106	Erect NB main & sub frame	30 days	Tue 24/11/09	Wed 30/12/09
107	Erect NB panel	26 days	Thu 31/12/09	Fri 29/1/10
108	Remove temporary works and TTA	11 days	Sat 30/1/10	Thu 11/2/10
109				
110	**Tuen Mun Road North Bound**	**337 days**	**Mon 29/12/08**	**Thu 11/2/10**
111	**Slip Road A**	**134 days**	**Mon 29/12/08**	**Mon 15/6/09**
112	Stage 0 - TTA approval, implementation and temporary road construction	49 days	Mon 29/12/08	Sat 28/2/09
113	Stage 1 - Drainage & Road re-construction stage 1 (Full Depth Re-construction)	40 days	Mon 2/3/09	Mon 20/4/09
114	Stage 2 - Drainage & Road re-construction stage 2 (Full Depth Re-construction)	45 days	Tue 21/4/09	Mon 15/6/09
115	**Slip Road B**	**134 days**	**Mon 29/12/08**	**Mon 15/6/09**
116	Stage 0 - TTA approval, implementation and temporary road construction	49 days	Mon 29/12/08	Sat 28/2/09
117	Stage 1 - Drainage & Road re-alignment stage 1 (Full Depth Re-construction)	40 days	Mon 2/3/09	Mon 20/4/09
118	Stage 2 - Drainage & Road re-alignment stage 2 (Full Depth Re-construction)	45 days	Tue 21/4/09	Mon 15/6/09
119	**Noise Barrier Erection**	**77 days**	**Thu 12/11/09**	**Thu 11/2/10**
120	Erect working platform for NB erection	10 days	Thu 12/11/09	Mon 23/11/09
121	Erect NB main & sub frame	30 days	Tue 24/11/09	Wed 30/12/09
122	Erect NB panel	26 days	Thu 31/12/09	Fri 29/1/10
123	Remove temporary works and TTA	11 days	Sat 30/1/10	Thu 11/2/10



Project: Project_1
Date: Mon 30/3/09

Task
Task Progress
Critical Task
Critical Task Progress
Baseline
Milestone
Baseline Milestone
Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone
Baseline Summary
Rolled Up Baseline
Rolled Up Baseline Milestone
Rolled Up Progress
Split
Baseline Split
External Tasks
Project Summary
Group By Summary
Deadline

3 Month Rolling - Mar 09 Mon 30/3/09
Remarks: EOT from claim no. 8 & 10 was considered

CHEC

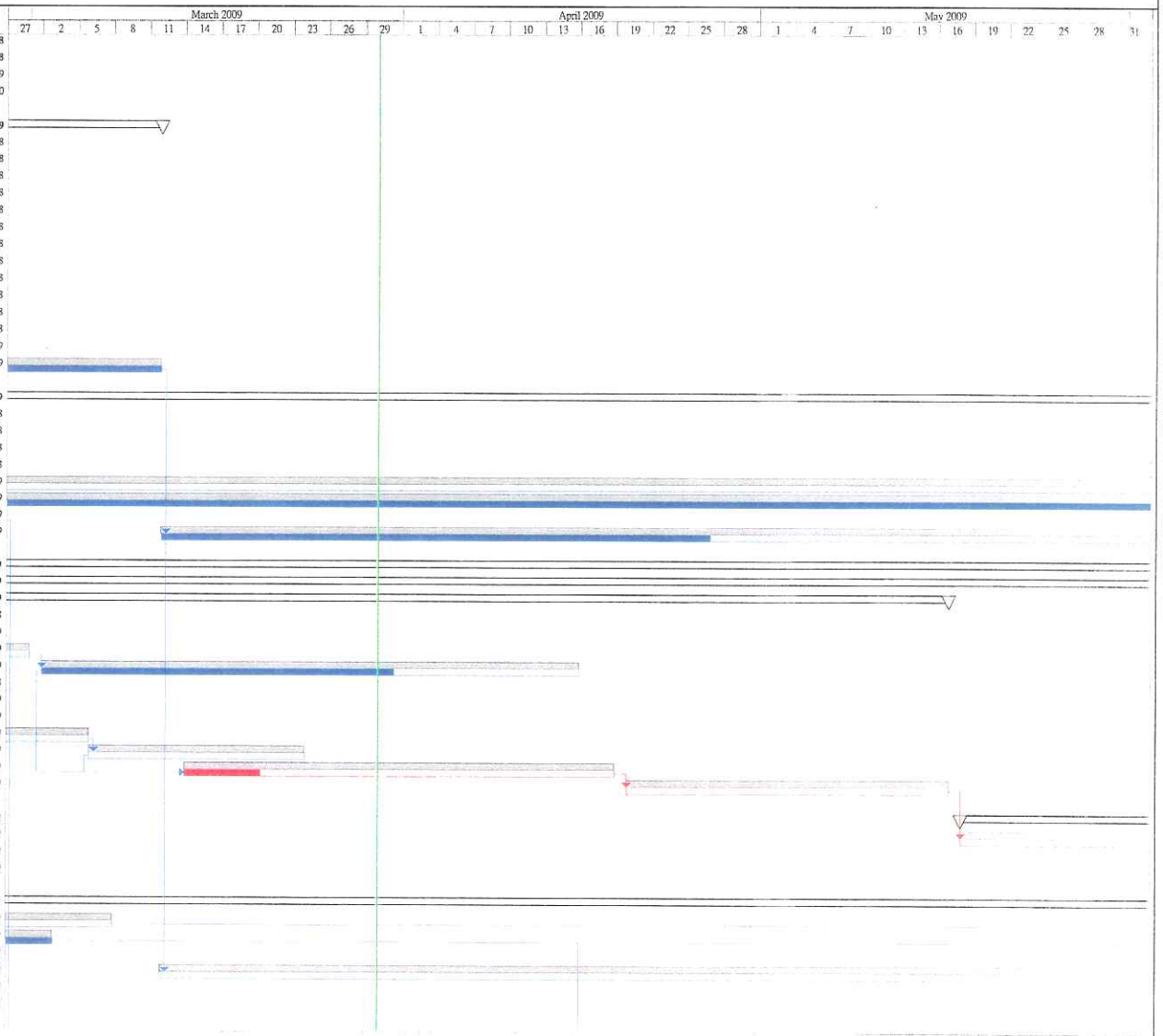
Prepared By : CK Yiu

Contract No. HY/2007/14
Title : Widening of Tuen Mun Road at Tsing Tin Interchange

3 Month Rolling Programme

Programmed Date : 30-03-2009
Revision : 0

ID	Task Name	Duration	Start	Finish
1	Letter of Acceptance	0 days	Fri 30/5/08	Fri 30/5/08
2	Project Commencement	0 days	Fri 6/6/08	Fri 6/6/08
3	Revised SECTION 1 Completion	0 days	Wed 7/10/09	Wed 7/10/09
4	Revised SECTION 3 Completion	0 days	Thu 7/1/10	Thu 7/1/10
5				
6	**Permanent Works Design**	**232 days**	**Fri 6/6/08**	**Wed 11/3/09**
7	Prepare noise barrier foundation design	60 days	Fri 6/6/08	Thu 14/8/08
8	ICE check for noise barrier foundation design	57 days	Fri 15/8/08	Mon 20/10/08
9	Submit for the Engineer approval	48 days	Tue 21/10/08	Mon 15/12/08
10	Prepare noise barrier steel frame design	71 days	Fri 6/6/08	Wed 27/8/08
11	ICE check for noise barrier steel frame design	37 days	Thu 28/8/08	Thu 9/10/08
12	Submit for the Engineer approval	19 days	Fri 10/10/08	Fri 31/10/08
13	Prepare high mast lighting foundation design	63 days	Fri 6/6/08	Mon 18/8/08
14	ICE check for high mast lighting foundation design	17 days	Tue 19/8/08	Sat 6/9/08
15	Submit for the Engineer approval	53 days	Mon 8/9/08	Fri 7/11/08
16	Prepare high mast lighting design	28 days	Fri 6/6/08	Tue 8/7/08
17	Submit for the Engineer approval	122 days	Wed 9/7/08	Thu 27/11/08
18	Prepare sign gantry and foundation design	122 days	Fri 1/8/08	Sat 20/12/08
19	ICE check for gantry sign and foundation design	15 days	Mon 22/12/08	Sat 10/1/09
20	Submit for the Engineer approval	47 days	Mon 12/1/09	Wed 11/3/09
21				
22	**TTA & General Submission**	**322 days**	**Fri 6/6/08**	**Thu 2/7/09**
23	Submit and approve TTA for site access	56 days	Fri 6/6/08	Sat 9/8/08
24	Implement TTA for site access	2 days	Mon 11/8/08	Tue 12/8/08
25	Tree felling and transplant	56 days	Wed 13/8/08	Thu 16/10/08
26	Trial pit and site investigation	62 days	Thu 24/7/08	Fri 3/10/08
27	Fabrication noise barier main frame	193 days	Sat 1/11/08	Mon 29/6/09
28	NB panel order and delivery	192 days	Mon 3/11/08	Mon 29/6/09
29	High mast lighting order and delivery	81 days	Mon 17/11/08	Thu 26/2/09
30	Sign gantry order and delivery	90 days	Thu 12/3/09	Thu 2/7/09
31				
32	**SECTION 1**	**391 days**	**Sat 26/7/08**	**Wed 11/11/09**
33	**Tuen Mun Road South Bound**	**391 days**	**Sat 26/7/08**	**Wed 11/11/09**
34	**Noise Barrier Foundation**	**241 days**	**Sat 26/7/08**	**Sat 16/5/09**
35	Existing UU diversion	21 days	Sat 26/7/08	Tue 19/8/08
36	Install sheetpile for noise barrier footing (SB)	31 days	Tue 13/1/09	Sat 21/2/09
37	Excavation and wailing for SB footing	34 days	Fri 16/1/09	Sat 28/2/09
38	Construct SB noise barrier footing	36 days	Mon 2/3/09	Wed 15/4/09
39	Install mini pile for SB (20nos.)	23 days	Mon 10/11/08	Fri 5/12/08
40	Pile testing	5 days	Fri 2/1/09	Wed 7/1/09
41	Install sheet pile for SB pile cap	5 days	Fri 20/2/09	Wed 25/2/09
42	Excavation for SB pile cap	10 days	Mon 23/2/09	Thu 5/3/09
43	Construct SB pile cap	15 days	Fri 6/3/09	Mon 23/3/09
44	Construct 450mm dia pipe	28 days	Sat 14/3/09	Sat 18/4/09
45	Backfill for footing and pile cap	22 days	Mon 20/4/09	Sat 16/5/09
46				
47	**Road Works**	**150 days**	**Mon 18/5/09**	**Wed 11/11/09**
48	Road pavement & drainage for widen lane (lane 1)	60 days	Mon 18/5/09	Tue 28/7/09
49	Re-construct existing slow lane (lane 2)	45 days	Wed 29/7/09	Fri 18/9/09
50	Re-construct existing fast lane (lane 3)	45 days	Sat 19/9/09	Wed 11/11/09
51				
52	**Sign Gantry**	**219 days**	**Mon 2/2/09**	**Fri 23/10/09**
53	Construct eastern sign gantry footing (SG1)	30 days	Mon 2/2/09	Sat 7/3/09
54	Construct middle sign gantry footing (SG1)	25 days	Mon 2/2/09	Mon 2/3/09
55	Construct western sign gantry footing (SG1)	25 days	Sat 19/9/09	Mon 19/10/09
56	Fabrication of sign gantry (SG1)	90 days	Thu 12/3/09	Thu 2/7/09
57	Erection the sign gantry (Slip D)	2 days	Tue 20/10/09	Wed 21/10/09
58	Erection the sign gantry (TMR SB)	2 days	Thu 22/10/09	Fri 23/10/09
59				



Project: Project_1
Date: Mon 30/3/09

Task
Task Progress
Critical Task
Critical Task Progress
Baseline
Milestone
Baseline Milestone
Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone
Baseline Summary
Rolled Up Baseline
Rolled Up Baseline Milestone
Rolled Up Progress
Split
Baseline Split
External Tasks
Project Summary
Group By Summary
Deadline

3 Month Rolling - Mar 09 Mon 30/3/09
Remarks: EOT from claim no. 8 & 10 was considered

CHEC

Prepared By : CK Yiu

Appendix B

Calibration Spreadsheets of the High Volume Samplers and Calibration Certificate of Calibration Kit

TISCH ENVIROMENTAL, INC.
145 SOUTH MIAMI AVE.
VILLAGE OF CLEVES, OH 45002
513.467.9000
877.263.7610 TOLL FREE
513.467.9009 FAX
WWW.TISCH-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Mar 20, 2008 Rootsmeter S/N 9833620 Ta (K) - 292
Operator Tisch Orifice I.D. - 1378 Pa (mm) - 746.76

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg- (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.3650	3.2	2.00
2	NA	NA	1.00	0.9560	6.3	4.00
3	NA	NA	1.00	0.8580	7.8	5.00
4	NA	NA	1.00	0.8140	8.6	5.50
5	NA	NA	1.00	0.6730	12.5	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
0.9985	0.7315	1.4162		0.9957	0.7294	0.8843
0.9943	1.0401	2.0028		0.9916	1.0372	1.2506
0.9922	1.1564	2.2392		0.9894	1.1532	1.3983
0.9912	1.2177	2.3485		0.9884	1.2143	1.4665
0.9859	1.4650	2.8323		0.9832	1.4609	1.7687
Qstd slope (m) =		1.93144		Qa slope (m) =		1.20944
intercept (b) =		0.00037		intercept (b) =		0.00023
coefficient (r) =		0.99991		coefficient (r) =		0.99991
y axis = SQRT[H2O(Pa/760)(298/Ta)]				y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

Vstd = Diff. Vol[(Pa-Diff. Hg)/760](298/Ta)
Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]
Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m{[SQRT(H2O(Pa/760)(298/Ta))]- b}
Qa = 1/m{[SQRT H2O(Ta/Pa)]- b}

TISCH ENVIROMENTAL, INC.
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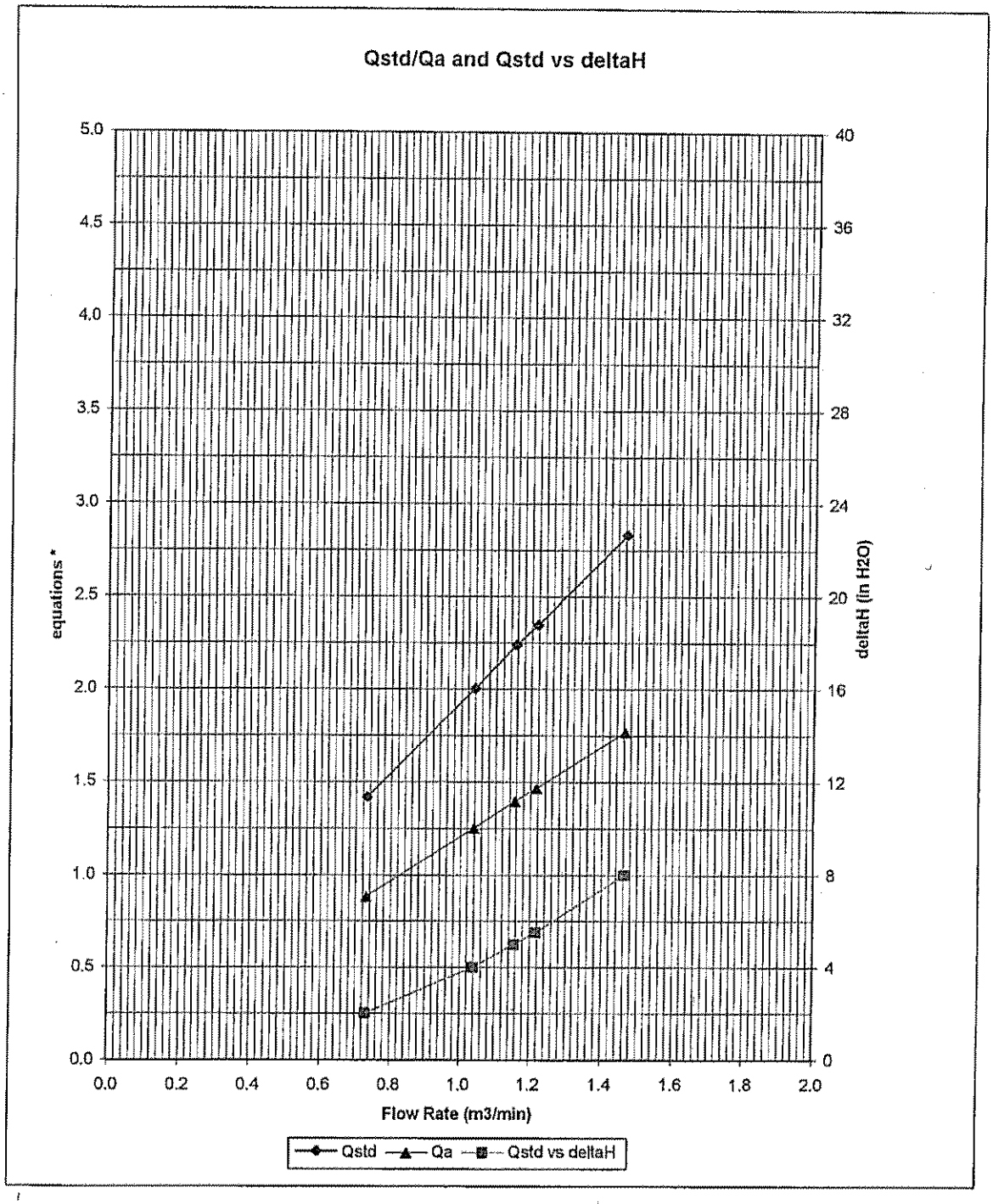
WWW.TISCH-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT



*** y-axis equations:**

Qstd series: $\sqrt{\Delta H \left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$

Qa series: $\sqrt{(\Delta H\ (Ta\ /\ Pa))}$

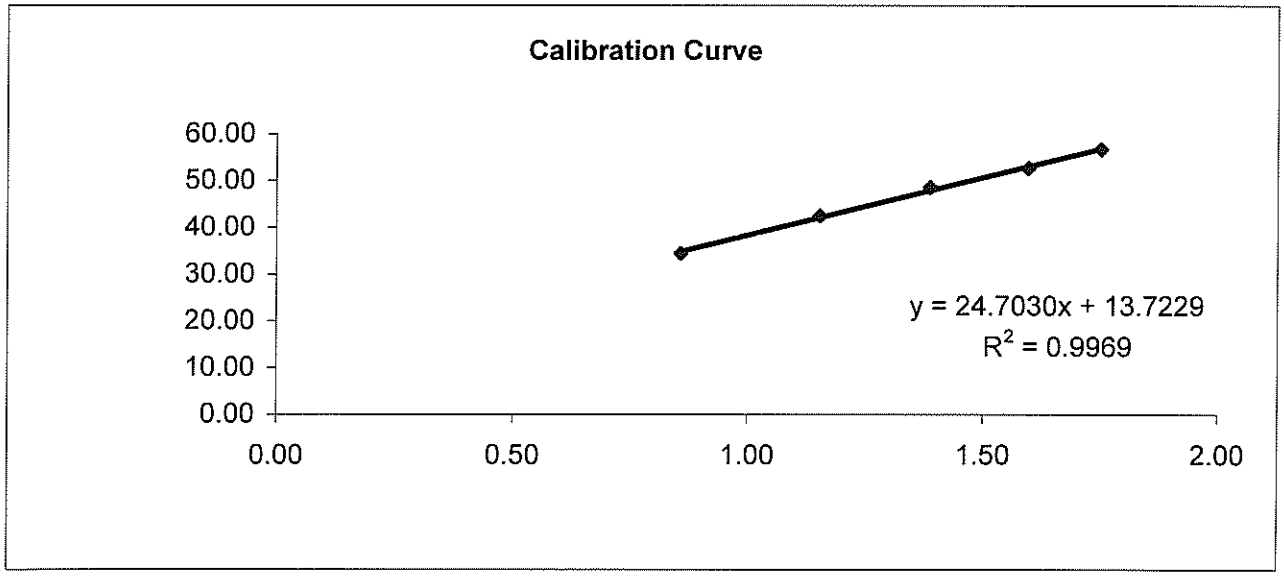
Ove Arup Partners (Hong Kong) Limited

High Volume Air Sampler Calibration Worksheet

Calibration date	31-Jan-09	**Barometric pressure**	763 mm Hg
Calibration due date	1-Apr-09	**Tempature (°C)**	18 °C
Sampler location	TT1-Roof,Kwong Choi Market	**Tempature (K)**	291 K
Sampler model	TE-5170	**P_{std}**	760 mm Hg
Sampler serial number	0521	**T_{std}**	298 K

Calibrator model	GMW-2535
Calibrator serial number	1378
Slope of the standard curve, m_s	2.00216
Intercept of the standard curve, b_s	-0.02053

Resistance Plate No.	Manometer Reading (inch H_2O)	Flow Recorder Reading (CFM)	Calculated Q_{std} (m^3/min)	Continuous Flow Recorder Reading IC (CFM)
5	2.80	34.00	0.86	34.47
7	5.10	42.00	1.15	42.59
10	7.40	48.00	1.39	48.67
13	9.80	52.00	1.60	52.73
18	11.80	56.00	1.75	56.78



Linear Regression

Sampler slope (m) :	**24.7030**
Sampler intercept (b) :	**13.7229**
Correlation coefficient (R^2) :	**0.9969**

Correlation coefficient is greater than 0.9900 and the calibration result is accepted.

Performed by: _____ Date: 31/1/09

Checked by: Lam Date: 31/1/09

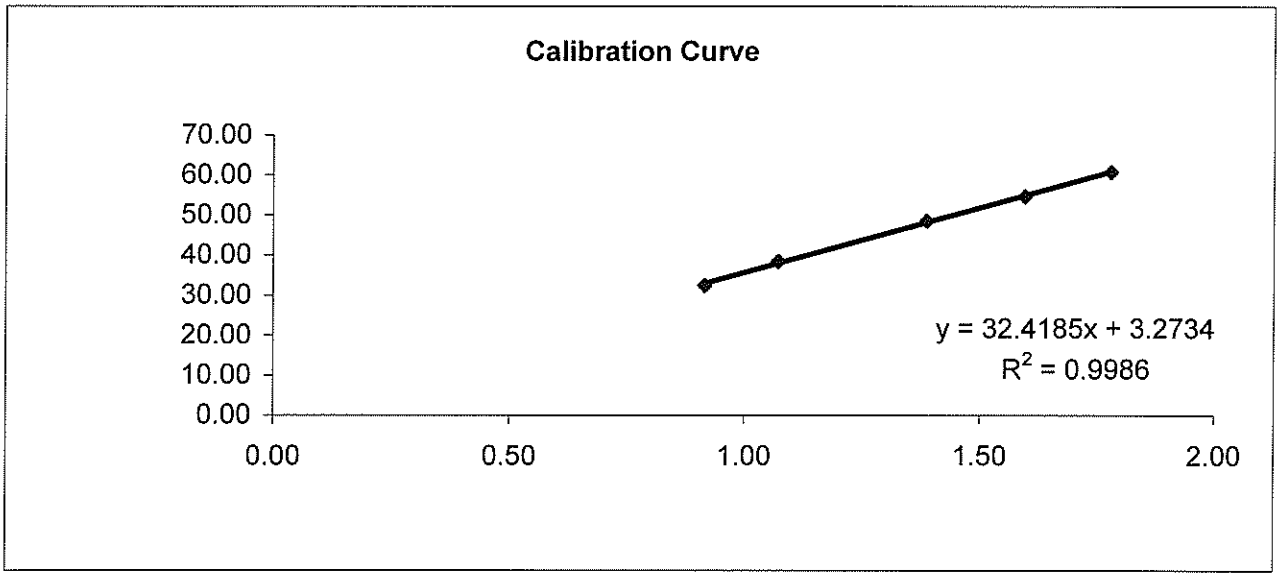
Ove Arup Partners (Hong Kong) Limited

High Volume Air Sampler Calibration Worksheet

Calibration date	31-Jan-09	**Barometric pressure**	763 mm Hg
Calibration due date	1-Apr-09	**Tempature (°C)**	18 °C
Sampler location	TT2 - G/F Tam Lee Lai Fun Memorial School	**Tempature (K)**	291 K
Sampler model	TE-5170	P_{std}	760 mm Hg
Sampler serial number	0523	T_{std}	298 K

Calibrator model	GMW-2535
Calibrator serial number	1378
Slope of the standard curve, m_s	2.00216
Intercept of the standard curve, b_s	-0.02053

Resistance Plate No.	Manometer Reading (inch H_2O)	Flow Recorder Reading (CFM)	Calculated Q_{std} (m^3/min)	Continuous Flow Recorder Reading IC (CFM)
5	3.20	32.00	0.92	32.45
7	4.40	38.00	1.07	38.53
10	7.40	48.00	1.39	48.67
13	9.80	54.00	1.60	54.75
18	12.20	60.00	1.78	60.84



Linear Regression

Sampler slope (m) :	**32.4185**
Sampler intercept (b) :	**3.2734**
Correlation coefficient (R^2) :	**0.9986**

Correlation coefficient is greater than 0.9900 and the calibration result is accepted.

Performed by: _____ Date: 31/1/09

Checked by: Kam Date: 31/1/09

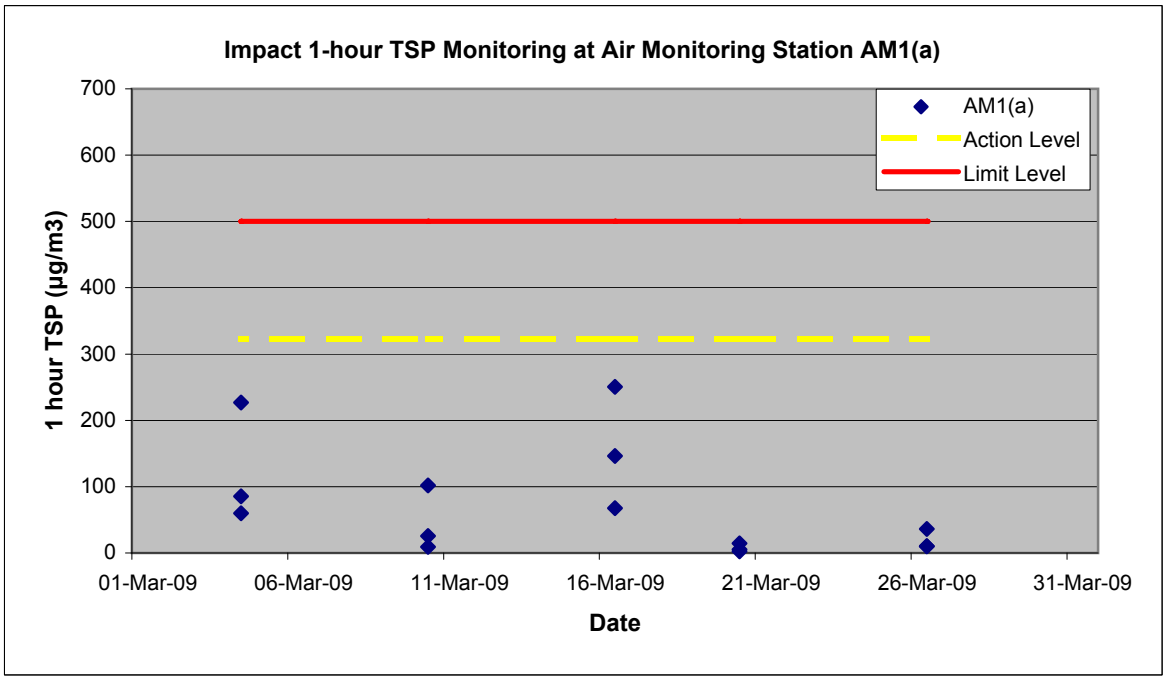
Appendix C

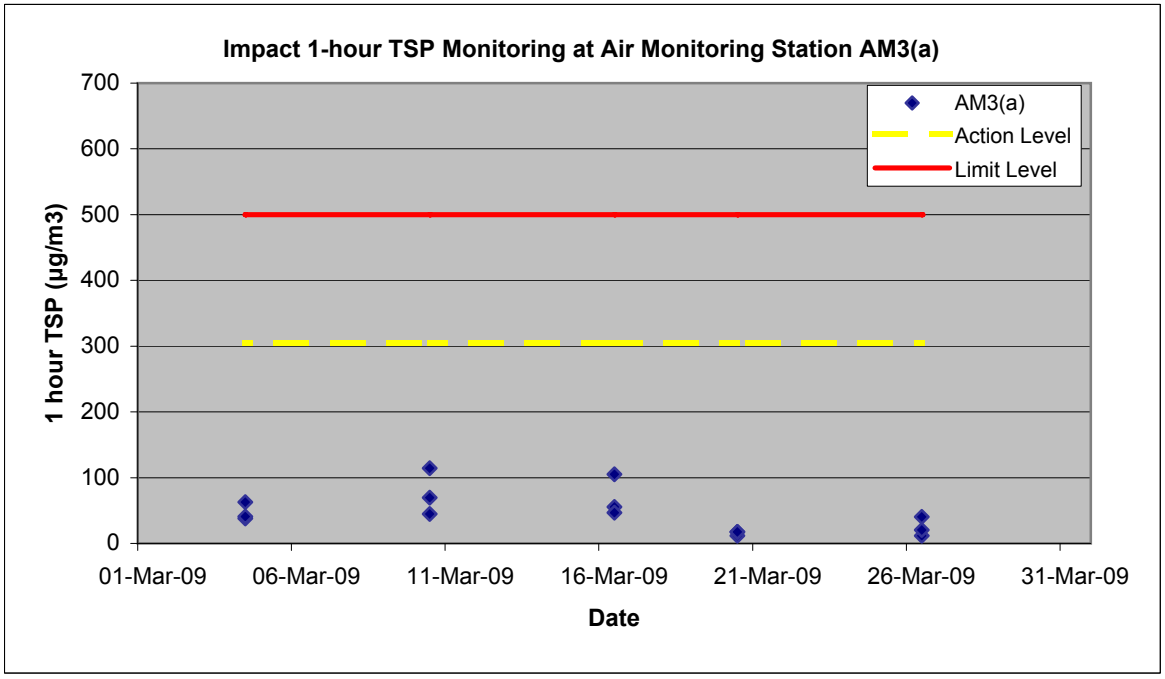
Impact Air Monitoring Results

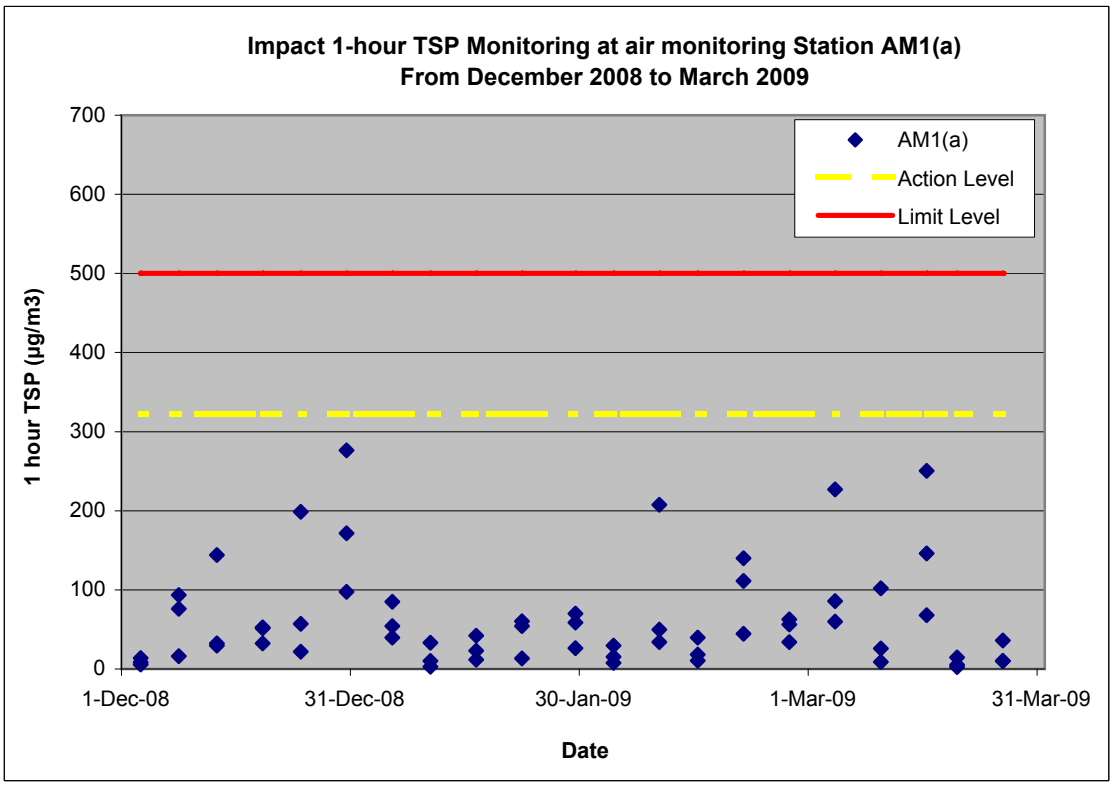
Contract No. Hy/2007/14 - Widening of Tuen Mun Road at Tsing Tin Interchange
Impact Air Monitoring Result - 1 hour TSP

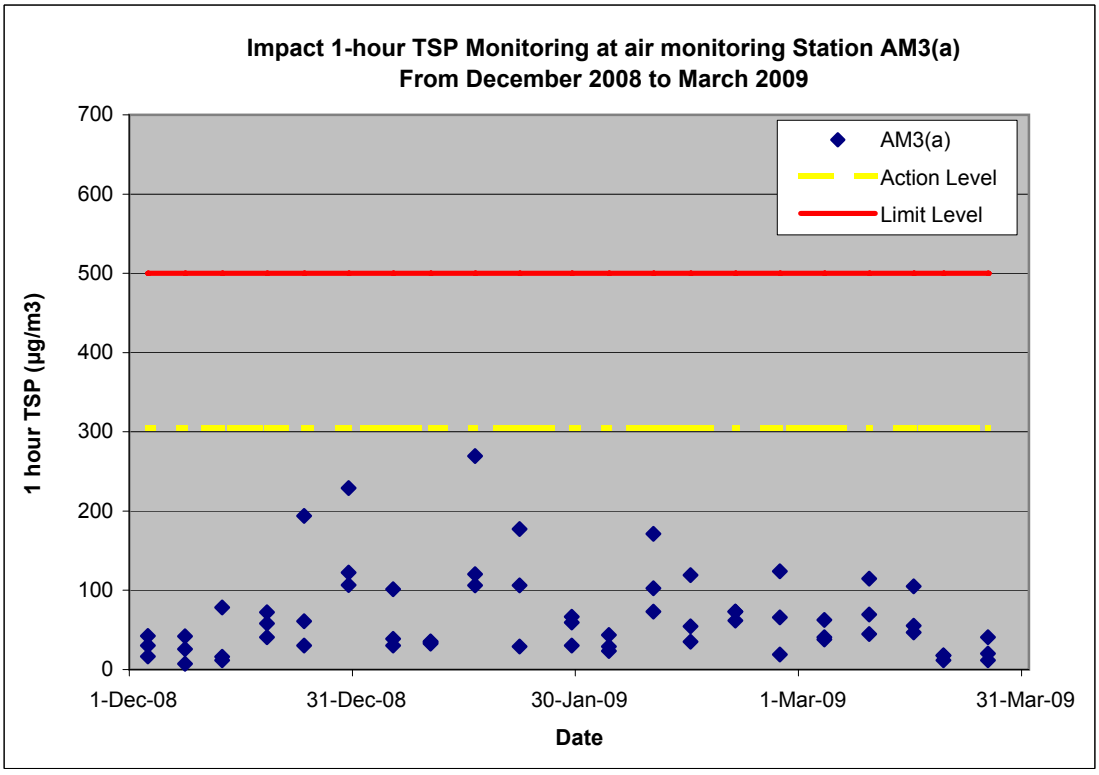
Filter No.	Month	Date	Receptor No.	Weather condition	Site condition	Pressure (mmHg)		Temperature (oC)		Flow Recorder Reading (CFM)		Filter Weight (g)		TSP weight (g)	Flow Rate (m^3/min)		Average Flow Rate (m^3/min)	Elapse Time		Sampling Time	Total vol. (m^3)	AM1(a)	AM3(a)
						Initial	Final	Initial	Final	Initial	Final	Initial	Final		Initial	Final		Start	Finish				
OW67	Mar-09	4-Mar-09	TT1-1	cloudy	Normal Operation	760.0	760.0	19.0	19.0	45.0	45.0	2.8330	2.8505	0.0175	1.2847	1.2847	1.2847	9289.43	9290.43	60.00	77.08	227.0	
OW34	Mar-09	4-Mar-09	TT1-2	cloudy	Normal Operation	760.0	760.0	19.0	19.0	45.0	45.0	2.7746	2.7812	0.0066	1.2847	1.2847	1.2847	9290.43	9291.43	60.00	77.08	85.6	
OW62	Mar-09	4-Mar-09	TT1-3	cloudy	Normal Operation	760.0	760.0	19.0	19.0	45.0	45.0	2.8629	2.8675	0.0046	1.2847	1.2847	1.2847	9291.43	9292.43	60.00	77.08	59.7	
OW13	Mar-09	4-Mar-09	TT2-1	cloudy	Normal Operation	760.0	760.0	19.0	19.0	40.0	40.0	2.7940	2.7966	0.0026	1.1455	1.1455	1.1455	8874.14	8875.14	60.00	68.73		37.8
OW14	Mar-09	4-Mar-09	TT2-2	cloudy	Normal Operation	760.0	760.0	19.0	19.0	40.0	40.0	2.7653	2.7696	0.0043	1.1455	1.1455	1.1455	8875.14	8876.14	60.00	68.73		62.6
OW63	Mar-09	4-Mar-09	TT2-3	cloudy	Normal Operation	760.0	760.0	19.0	19.0	40.0	40.0	2.8482	2.8510	0.0028	1.1455	1.1455	1.1455	8876.14	8877.14	60.00	68.73		40.7
OW68	Mar-09	10-Mar-09	TT1-1	cloudy	Normal Operation	762.0	762.0	18.0	18.0	45.0	45.0	2.8337	2.8357	0.0020	1.2903	1.2903	1.2903	9316.43	9317.43	60.00	77.42	25.8	
OW19	Mar-09	10-Mar-09	TT1-2	cloudy	Normal Operation	762.0	762.0	18.0	18.0	45.0	45.0	2.7917	2.7924	0.0007	1.2903	1.2903	1.2903	9317.43	9318.43	60.00	77.42	9.0	
OW81	Mar-09	10-Mar-09	TT1-3	cloudy	Normal Operation	762.0	762.0	18.0	18.0	45.0	45.0	2.8256	2.8335	0.0079	1.2903	1.2903	1.2903	9318.43	9319.43	60.00	77.42	102.0	
OW82	Mar-09	10-Mar-09	TT2-1	cloudy	Normal Operation	762.0	762.0	18.0	18.0	40.0	40.0	2.8538	2.8617	0.0079	1.1493	1.1493	1.1493	8901.14	8902.14	60.00	68.96		114.6
OW83	Mar-09	10-Mar-09	TT2-2	cloudy	Normal Operation	762.0	762.0	18.0	18.0	40.0	40.0	2.8180	2.8228	0.0048	1.1493	1.1493	1.1493	8902.14	8903.14	60.00	68.96		69.6
OW84	Mar-09	10-Mar-09	TT2-3	cloudy	Normal Operation	762.0	762.0	18.0	18.0	40.0	40.0	2.8156	2.8187	0.0031	1.1493	1.1493	1.1493	8903.14	8904.14	60.00	68.96		45.0
OX05	Mar-09	16-Mar-09	TT1-1	Fine	Normal Operation	762.0	762.0	22.0	22.0	45.0	45.0	2.8427	2.8619	0.0192	1.2778	1.2778	1.2778	9343.43	9344.43	60.00	76.67	250.4	
OX06	Mar-09	16-Mar-09	TT1-2	Fine	Normal Operation	762.0	762.0	22.0	22.0	45.0	45.0	2.8508	2.8620	0.0112	1.2778	1.2778	1.2778	9344.43	9345.43	60.00	76.67	146.1	
OX08	Mar-09	16-Mar-09	TT1-3	Fine	Normal Operation	762.0	762.0	22.0	22.0	45.0	45.0	2.9049	2.9101	0.0052	1.2778	1.2778	1.2778	9345.43	9346.43	60.00	76.67	67.8	
OX07	Mar-09	16-Mar-09	TT2-1	Fine	Normal Operation	762.0	762.0	22.0	22.0	40.0	40.0	2.8743	2.8815	0.0072	1.1408	1.1408	1.1408	8928.14	8929.14	60.00	68.45		105.2
OX09	Mar-09	16-Mar-09	TT2-2	Fine	Normal Operation	762.0	762.0	22.0	22.0	40.0	40.0	2.8458	2.8496	0.0038	1.1408	1.1408	1.1408	8929.14	8930.14	60.00	68.45		55.5
OX10	Mar-09	16-Mar-09	TT2-3	Fine	Normal Operation	762.0	762.0	22.0	22.0	40.0	40.0	2.8278	2.8310	0.0032	1.1408	1.1408	1.1408	8930.14	8931.14	60.00	68.45		46.7
OW87	Mar-09	20-Mar-09	TT1-1	cloudy	Normal Operation	759.0	759.0	26.0	26.0	45.0	45.0	2.8346	2.8357	0.0011	1.2619	1.2619	1.2619	9370.43	9371.43	60.00	75.71	14.5	
OW92	Mar-09	20-Mar-09	TT1-2	cloudy	Normal Operation	759.0	759.0	26.0	26.0	45.0	45.0	2.8464	2.8466	0.0002	1.2619	1.2619	1.2619	9371.43	9372.43	60.00	75.71	2.6	
OW94	Mar-09	20-Mar-09	TT1-3	cloudy	Normal Operation	759.0	759.0	26.0	26.0	45.0	45.0	2.8646	2.8650	0.0004	1.2619	1.2619	1.2619	9372.43	9373.43	60.00	75.71	5.3	
OW91	Mar-09	20-Mar-09	TT2-1	cloudy	Normal Operation	759.0	759.0	26.0	26.0	40.0	40.0	2.8357	2.8365	0.0008	1.1301	1.1301	1.1301	8955.14	8956.14	60.00	67.81		11.8
OW93	Mar-09	20-Mar-09	TT2-2	cloudy	Normal Operation	759.0	759.0	26.0	26.0	40.0	40.0	2.8449	2.8461	0.0012	1.1301	1.1301	1.1301	8956.14	8957.14	60.00	67.81		17.7
OW95	Mar-09	20-Mar-09	TT2-3	cloudy	Normal Operation	759.0	759.0	26.0	26.0	40.0	40.0	2.8354	2.8366	0.0012	1.1301	1.1301	1.1301	8957.14	8958.14	60.00	67.81		17.7
OW96	Mar-09	26-Mar-09	TT1-1	cloudy	Normal Operation	762.0	762.0	18.0	18.0	45.0	45.0	2.8340	2.8368	0.0028	1.2903	1.2903	1.2903	9397.43	9398.43	60.00	77.42	36.2	
OX35	Mar-09	26-Mar-09	TT1-2	cloudy	Normal Operation	762.0	762.0	18.0	18.0	45.0	45.0	2.8507	2.8515	0.0008	1.2903	1.2903	1.2903	9398.43	9399.43	60.00	77.42	10.3	
OX41	Mar-09	26-Mar-09	TT1-3	cloudy	Normal Operation	762.0	762.0	18.0	18.0	45.0	45.0	2.8456	2.8464	0.0008	1.2903	1.2903	1.2903	9399.43	9400.43	60.00	77.42	10.3	
OX13	Mar-09	26-Mar-09	TT2-1	cloudy	Normal Operation	762.0	762.0	18.0	18.0	40.0	40.0	2.8401	2.8409	0.0008	1.1493	1.1493	1.1493	8982.14	8983.14	60.00	68.96		11.6
OX14	Mar-09	26-Mar-09	TT2-2	cloudy	Normal Operation	762.0	762.0	18.0	18.0	40.0	40.0	2.8569	2.8597	0.0028	1.1493	1.1493	1.1493	8983.14	8984.14	60.00	68.96		40.6
OX38	Mar-09	26-Mar-09	TT2-3	cloudy	Normal Operation	762.0	762.0	18.0	18.0	40.0	40.0	2.8554	2.8568	0.0014	1.1493	1.1493	1.1493	8984.14	8985.14	60.00	68.96		20.3

Average	70.2	46.5
Max	250.4	114.6
Min	2.6	11.6


Impact 1-hour TSP Monitoring at Air Monitoring Station AM1(a)
1 hour TSP (µg/m3)
700
600
500
400
300
200
100
0
01-Mar-09
06-Mar-09
11-Mar-09
16-Mar-09
21-Mar-09
26-Mar-09
31-Mar-09
Date
AM1(a)
Action Level
Limit Level


Impact 1-hour TSP Monitoring at Air Monitoring Station AM3(a)
1 hour TSP (µg/m3)
700
600
500
400
300
200
100
0
01-Mar-09
06-Mar-09
11-Mar-09
16-Mar-09
21-Mar-09
26-Mar-09
31-Mar-09
Date
AM3(a)
Action Level
Limit Level

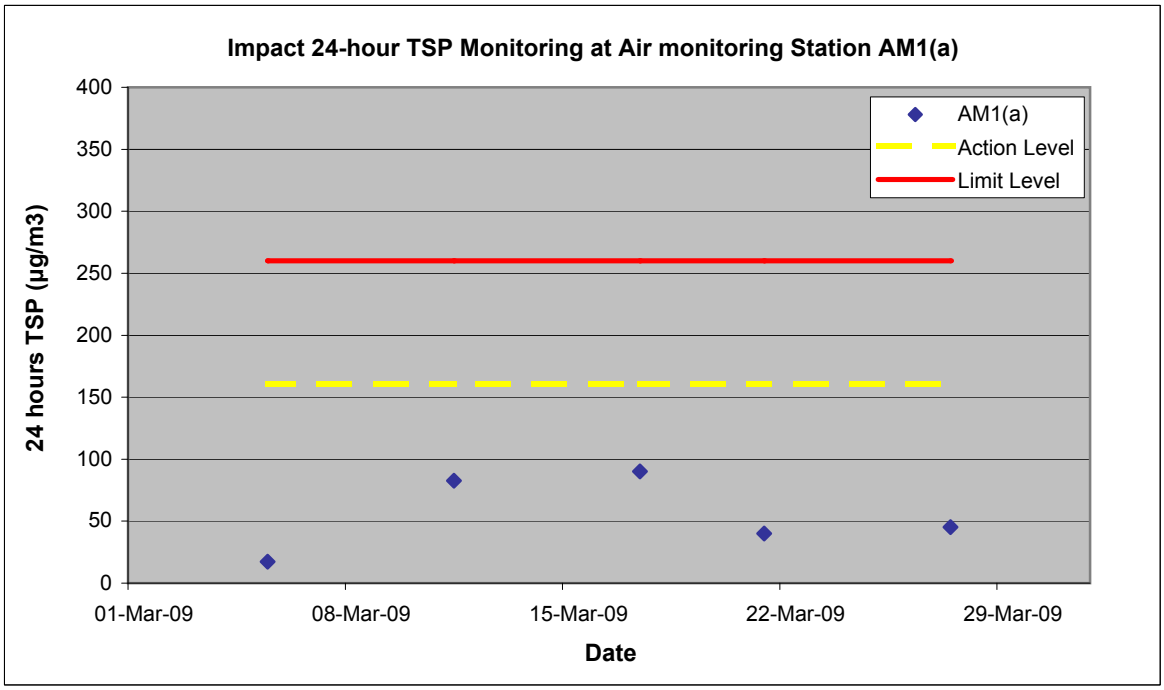

Impact 1-hour TSP Monitoring at air monitoring Station AM1(a)
From December 2008 to March 2009
AM1(a)
Action Level
Limit Level
1 hour TSP (µg/m3)
700
600
500
400
300
200
100
0
1-Dec-08
31-Dec-08
30-Jan-09
1-Mar-09
31-Mar-09
Date

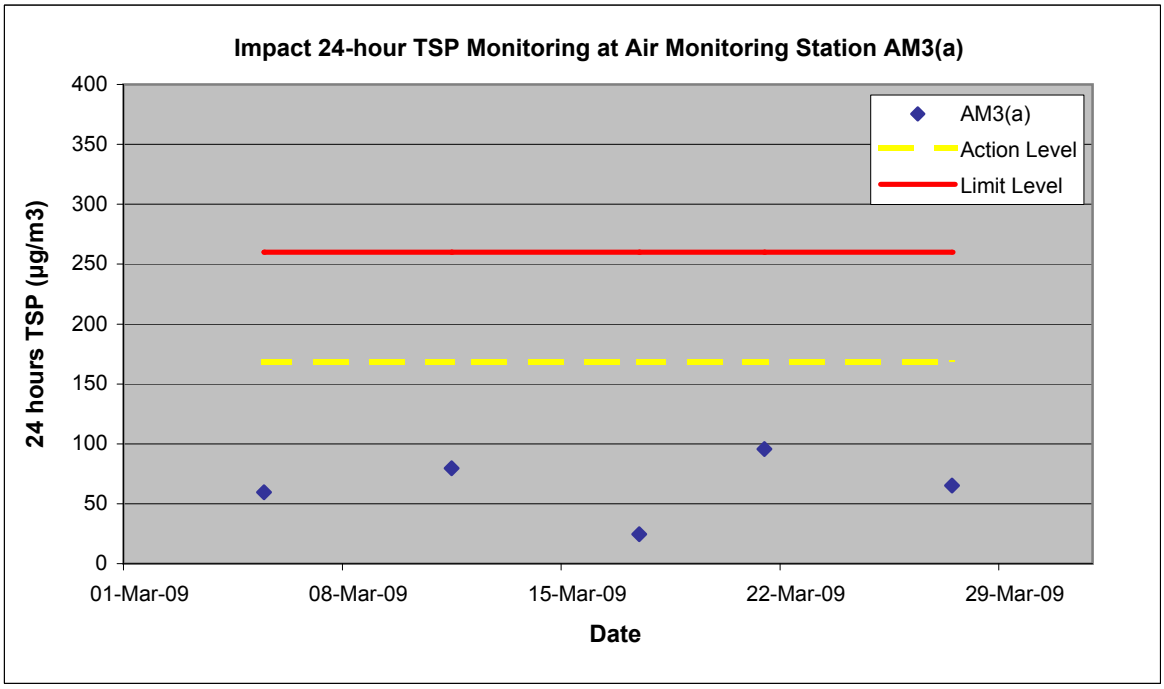

Impact 1-hour TSP Monitoring at air monitoring Station AM3(a)
From December 2008 to March 2009
AM3(a)
Action Level
Limit Level
1 hour TSP (µg/m3)
700
600
500
400
300
200
100
0
1-Dec-08
31-Dec-08
30-Jan-09
1-Mar-09
31-Mar-09
Date

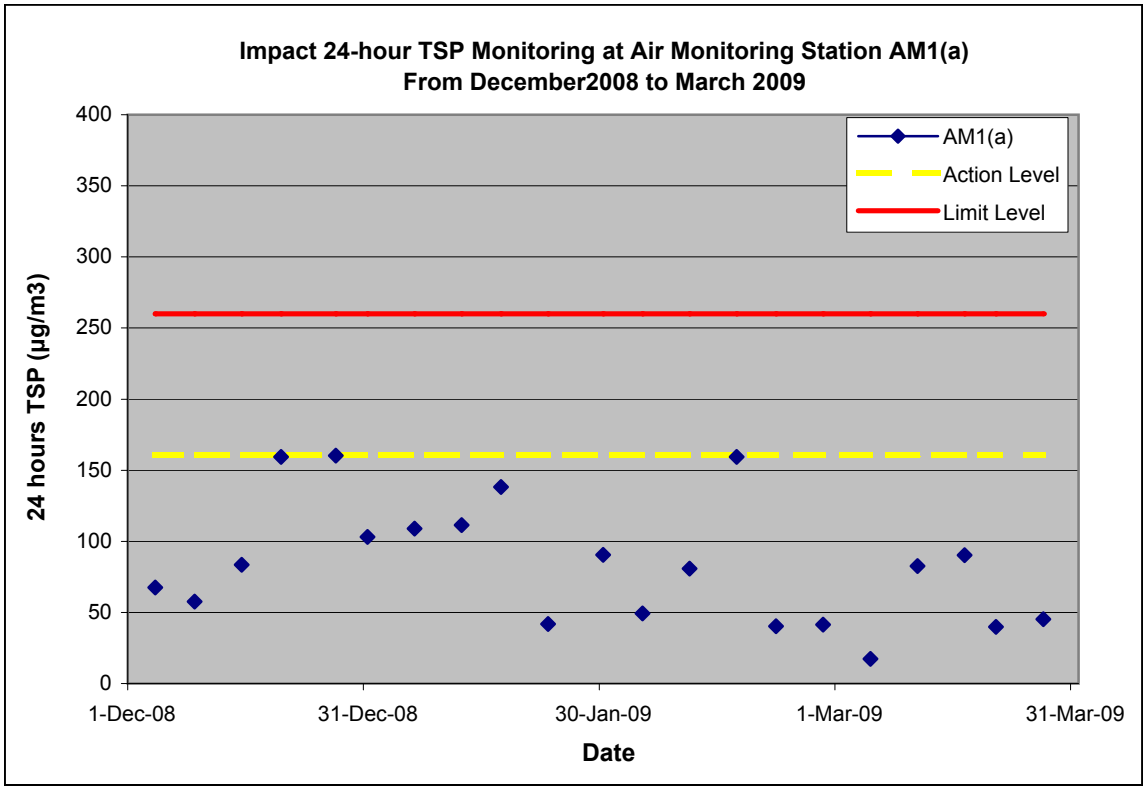
Contract No. Hy/2007/14 - Widening of Tuen Mun Road at Tsing Tin Interchange
Impact Air Monitoring Result - 24 hours TSP

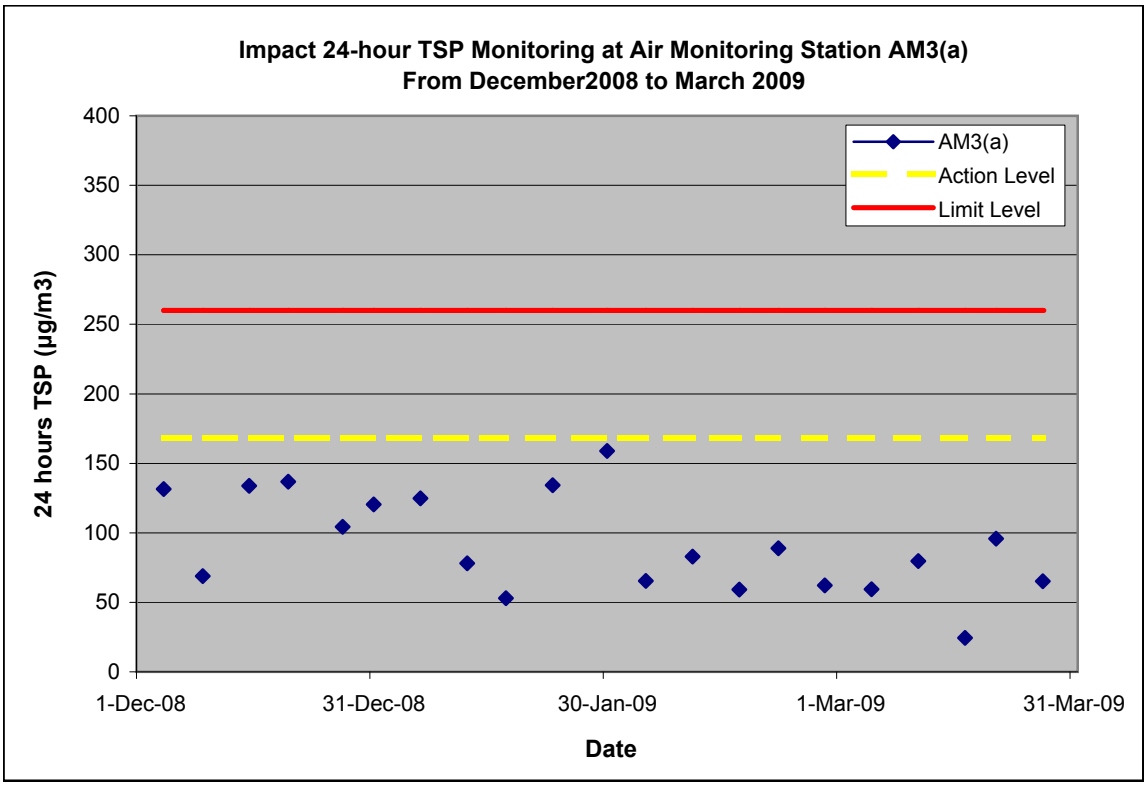
Filter No.	Month	Date	Receptor No.	Weather condition	Site condition	Pressure (mmHg)		Temperature (oC)		Flow Recorder Reading (CFM)		Filter Weight (g)		TSP weight (g)	Flow Rate (m^3/min)		Average Flow Rate (m^3/min)	Elapse Time		Sampling Time	Total vol. (m^3)	AM1(a)	AM3(a)
						Initial	Final	Initial	Final	Initial	Final	Initial	Final		Initial	Final		Start	Finish				
OW76	Mar-09	5-Mar-09	TT1	Cloudy	Normal Operation	758.0	758.0	20.0	20.0	45.0	45.0	2.8300	2.8618	0.0318	1.2792	1.2792	1.2792	9292.43	9316.43	1440.00	1842.05	17.3	
OW15	Mar-09	5-Mar-09	TT2	Cloudy	Normal Operation	758.0	758.0	20.0	20.0	40.0	40.0	2.7926	2.8905	0.0979	1.1418	1.1418	1.1418	8877.14	8901.14	1440.00	1644.19		59.5
OW80	Mar-09	11-Mar-09	TT1	Cloudy	Normal Operation	761.0	761.0	20.0	20.0	45.0	45.0	2.8498	3.0023	0.1525	1.2828	1.2828	1.2828	9319.43	9343.43	1440.00	1847.23	82.6	
OW78	Mar-09	11-Mar-09	TT2	Cloudy	Normal Operation	761.0	761.0	20.0	20.0	40.0	40.0	2.8212	2.9525	0.1313	1.1442	1.1442	1.1442	8904.14	8928.14	1440.00	1647.65		79.7
OW86	Mar-09	17-Mar-09	TT1	Fine	Normal Operation	760.0	760.0	24.0	24.0	45.0	45.0	2.8386	3.0035	0.1649	1.2692	1.2692	1.2692	9346.43	9370.43	1440.00	1827.65	90.2	
OW79	Mar-09	17-Mar-09	TT2	Fine	Normal Operation	760.0	760.0	24.0	24.0	40.0	40.0	2.8395	2.8796	0.0401	1.1350	1.1350	1.1350	8931.14	8955.14	1440.00	1634.40		24.5
OX40	Mar-09	21-Mar-09	TT1	Cloudy	Normal Operation	758.0	758.0	23.0	23.0	45.0	45.0	2.8334	2.9063	0.0729	1.2699	1.2699	1.2699	9373.43	9397.43	1440.00	1828.66	39.9	
OU98	Mar-09	21-Mar-09	TT2	Cloudy	Normal Operation	758.0	758.0	23.0	23.0	40.0	40.0	2.8696	3.0261	0.1565	1.1355	1.1355	1.1355	8958.14	8982.14	1440.00	1635.12		95.7
OW98	Mar-09	27-Mar-09	TT1	Cloudy	Normal Operation	760.0	760.0	19.0	19.0	45.0	45.0	2.8150	2.8987	0.0837	1.2847	1.2847	1.2847	9400.43	9424.43	1440.00	1849.97	45.2	
OW99	Mar-09	27-Mar-09	TT2	Cloudy	Normal Operation	760.0	760.0	19.0	19.0	40.0	40.0	2.8262	2.9337	0.1075	1.1455	1.1455	1.1455	8985.14	9009.14	1440.00	1649.52		65.2

Average	55.0	64.9
Max	90.2	95.7
Min	17.3	24.5


Impact 24-hour TSP Monitoring at Air monitoring Station AM1(a)
24 hours TSP (µg/m3)
400
350
300
250
200
150
100
50
0
01-Mar-09
08-Mar-09
15-Mar-09
22-Mar-09
29-Mar-09
Date
AM1(a)
Action Level
Limit Level


Impact 24-hour TSP Monitoring at Air Monitoring Station AM3(a)
24 hours TSP (µg/m3)
400
350
300
250
200
150
100
50
0
01-Mar-09
08-Mar-09
15-Mar-09
22-Mar-09
29-Mar-09
Date
AM3(a)
Action Level
Limit Level

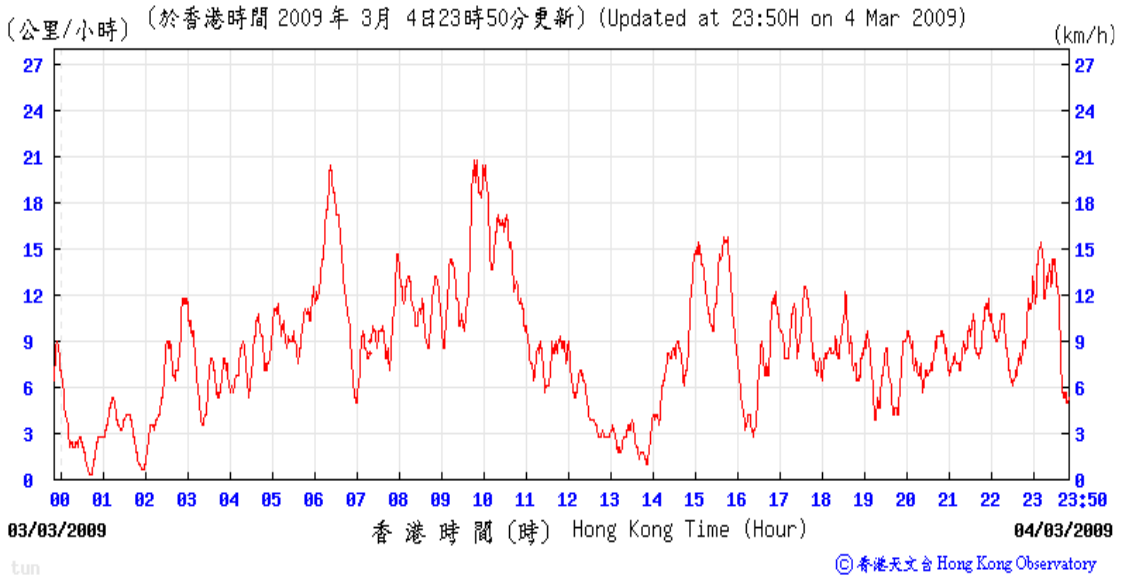

Impact 24-hour TSP Monitoring at Air Monitoring Station AM1(a)
From December2008 to March 2009
24 hours TSP (µg/m3)
400
350
300
250
200
150
100
50
0
1-Dec-08
31-Dec-08
30-Jan-09
1-Mar-09
31-Mar-09
Date
AM1(a)
Action Level
Limit Level

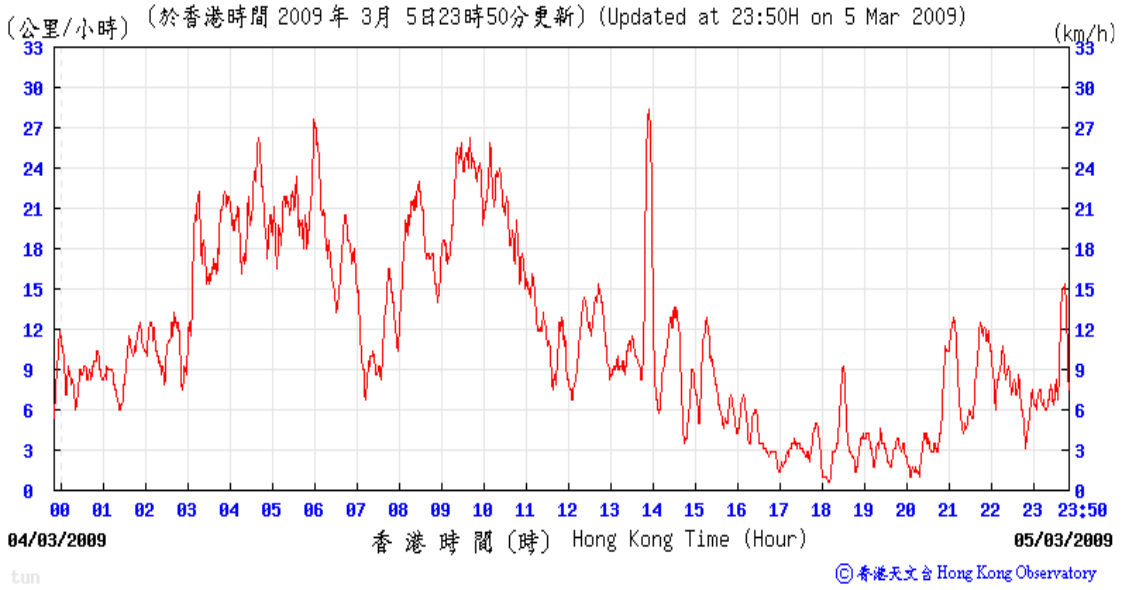

Impact 24-hour TSP Monitoring at Air Monitoring Station AM3(a)
From December2008 to March 2009
24 hours TSP (µg/m3)
400
350
300
250
200
150
100
50
0
1-Dec-08
31-Dec-08
30-Jan-09
1-Mar-09
31-Mar-09
Date
AM3(a)
Action Level
Limit Level

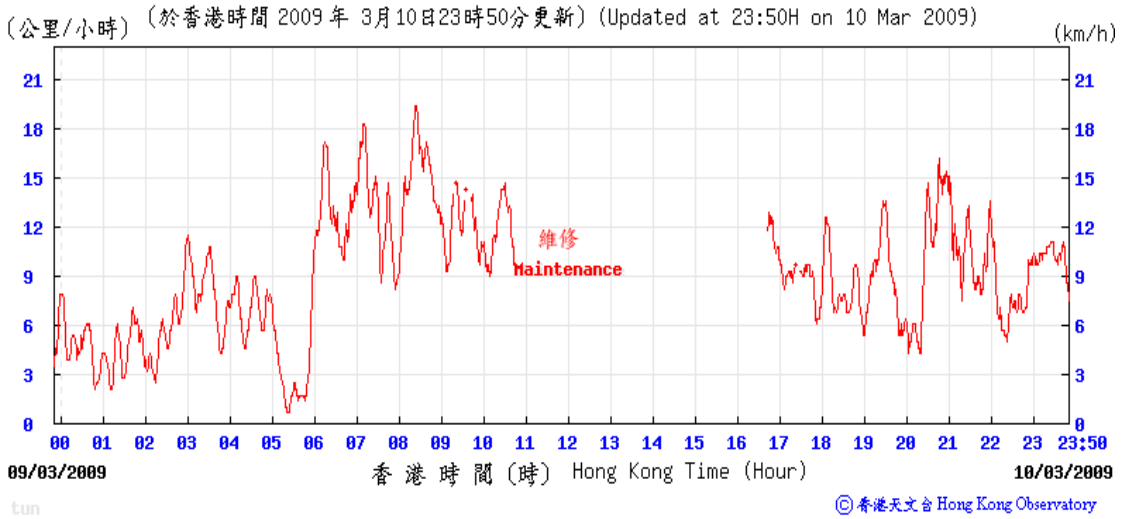
Appendix D

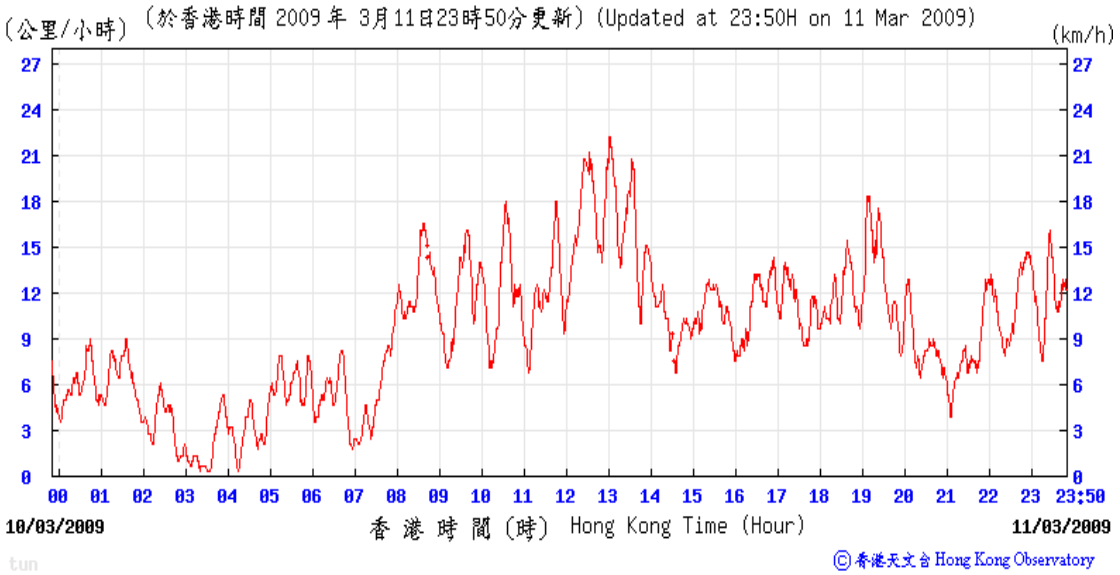
Wind Data

Wind Monitoring Data – Wind Speed during Air Quality Monitoring in March 2009








(公里/小時) (於香港時間 2009 年 3月11日23時50分更新) (Updated at 23:50H on 11 Mar 2009)
(km/h)
27
24
21
18
15
12
9
6
3
0
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 23:50
10/03/2009
香 港 時 間 (時) Hong Kong Time (Hour)
11/03/2009
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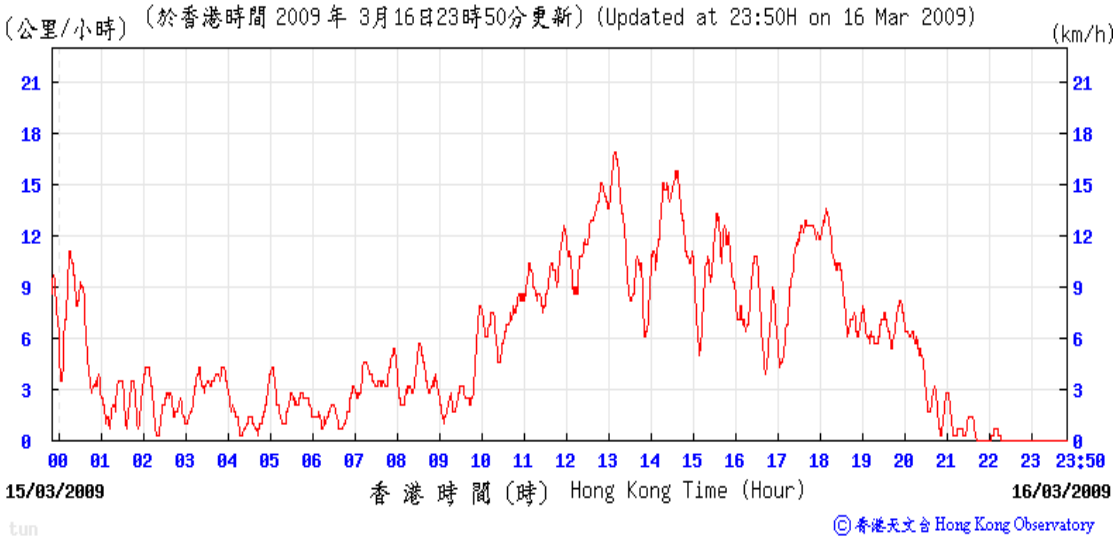
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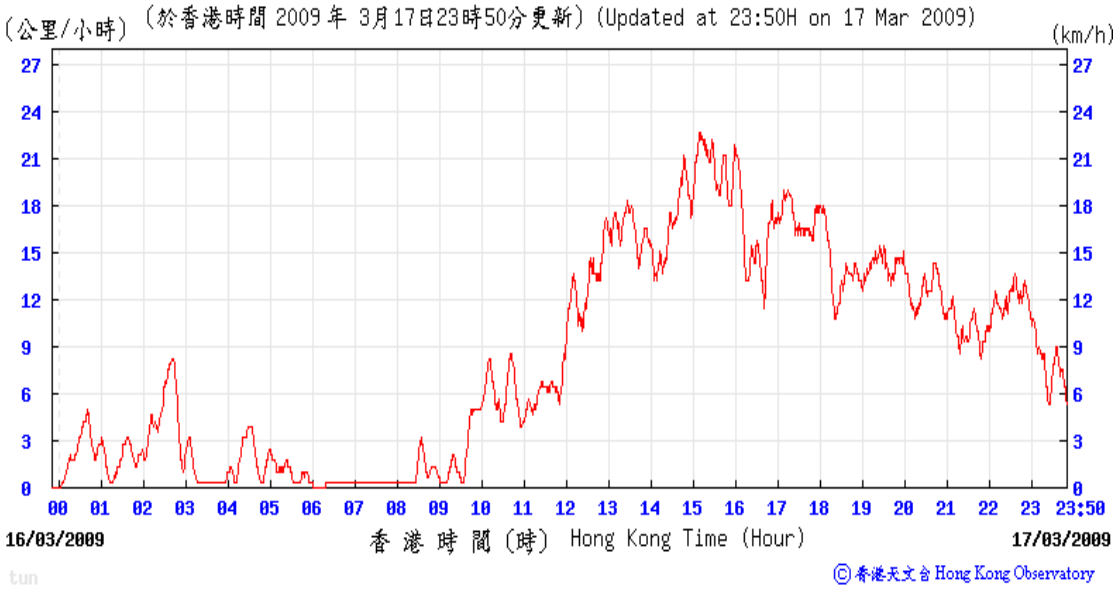
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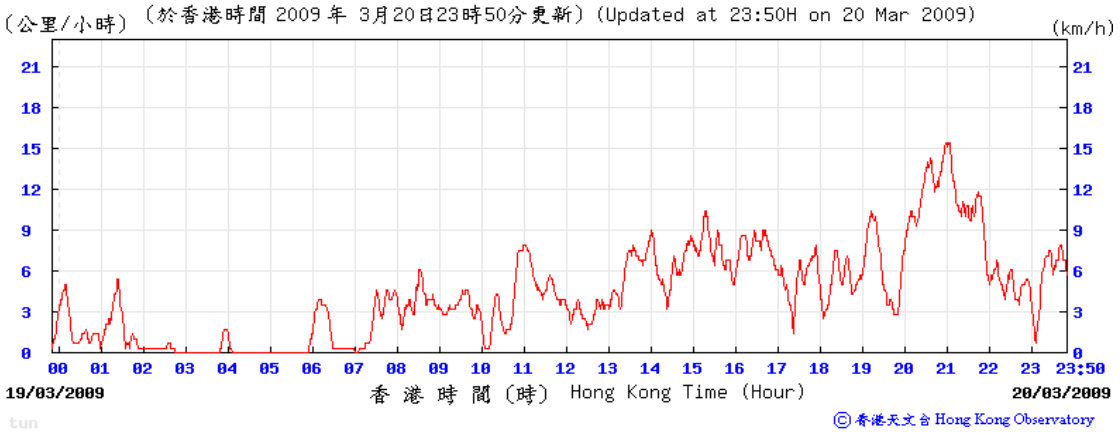
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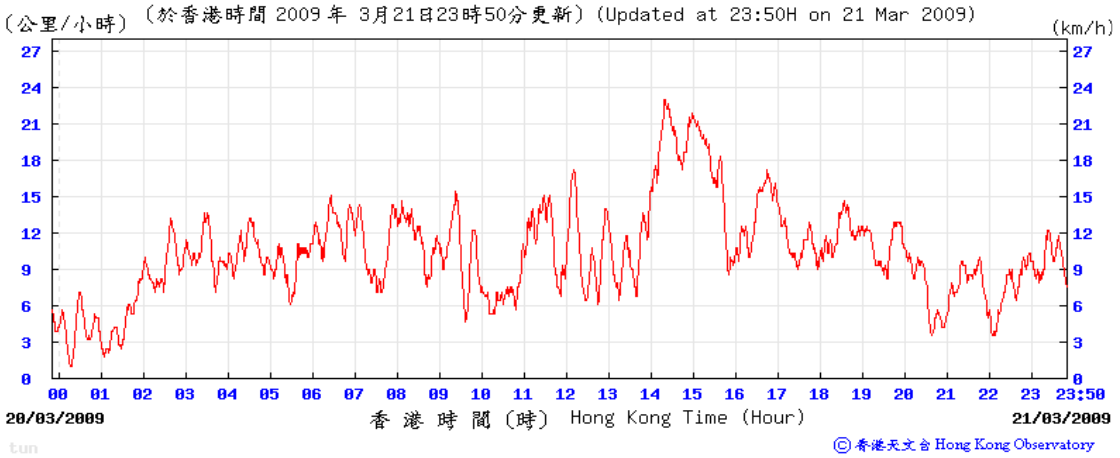
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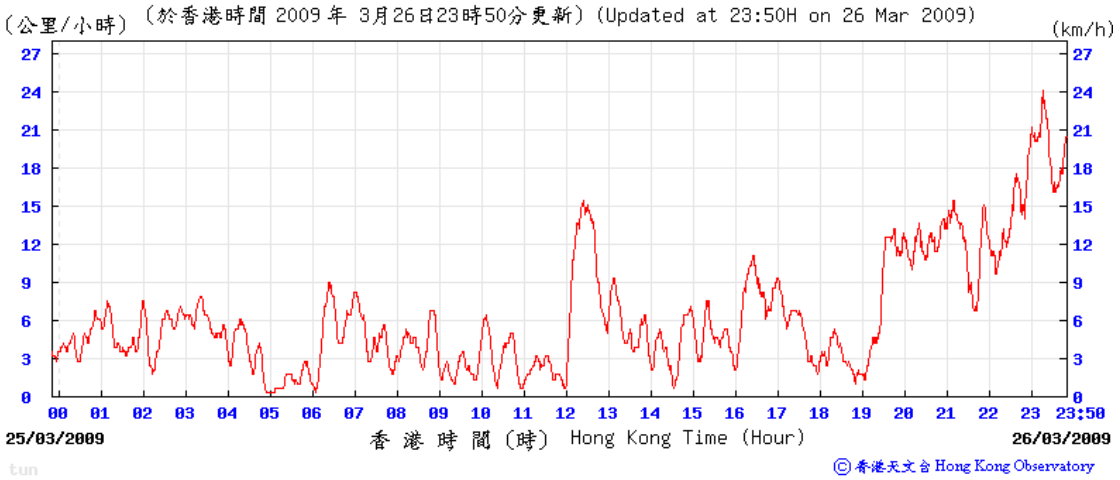
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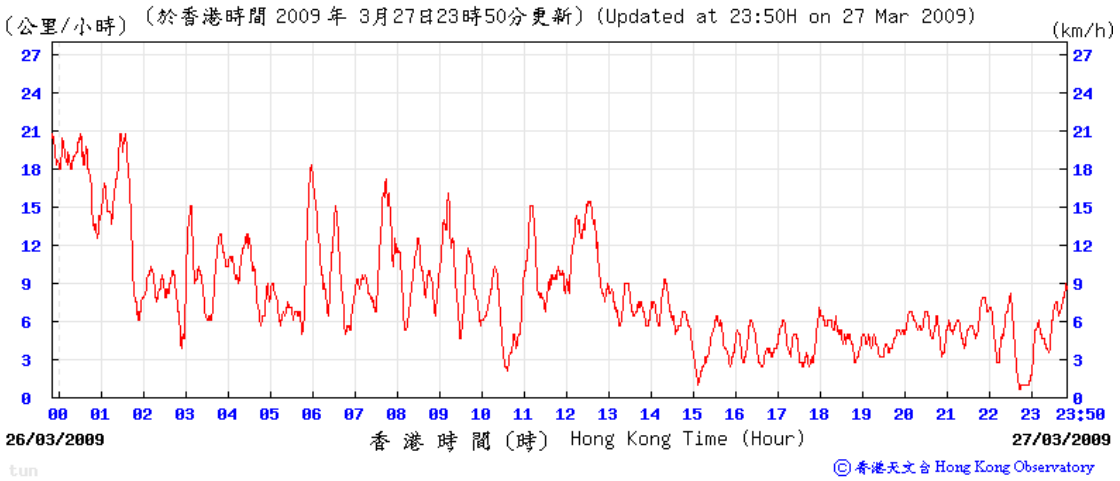
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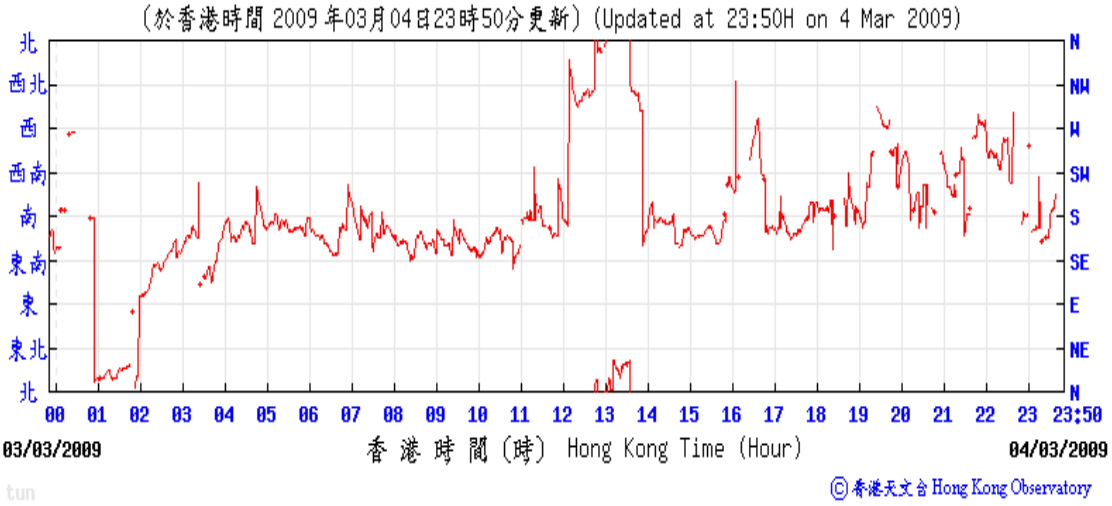
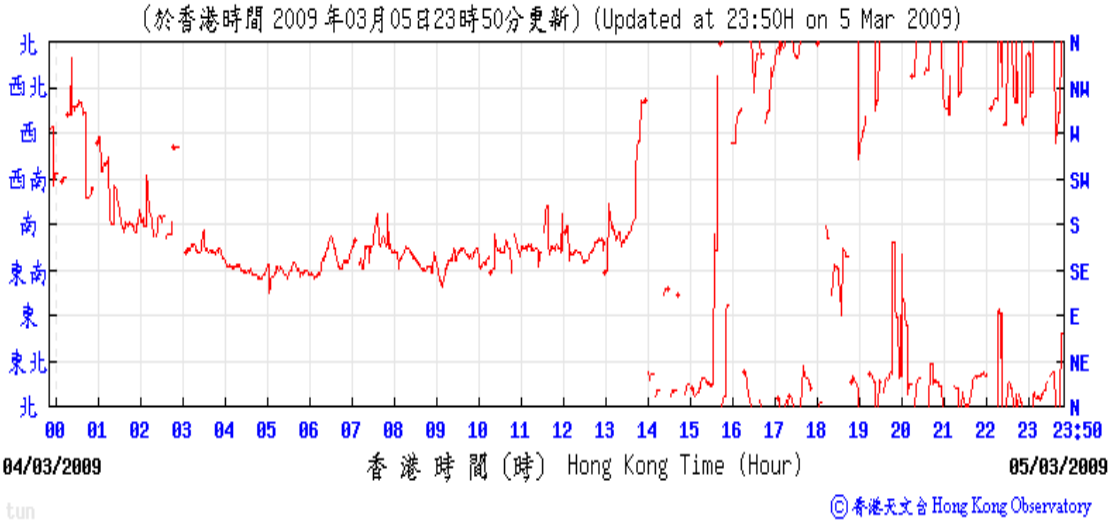
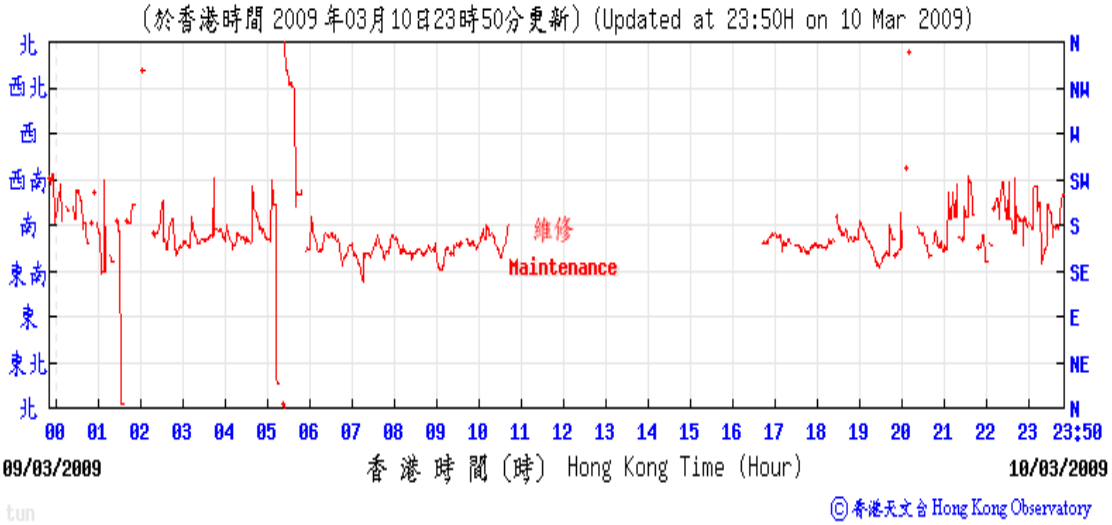
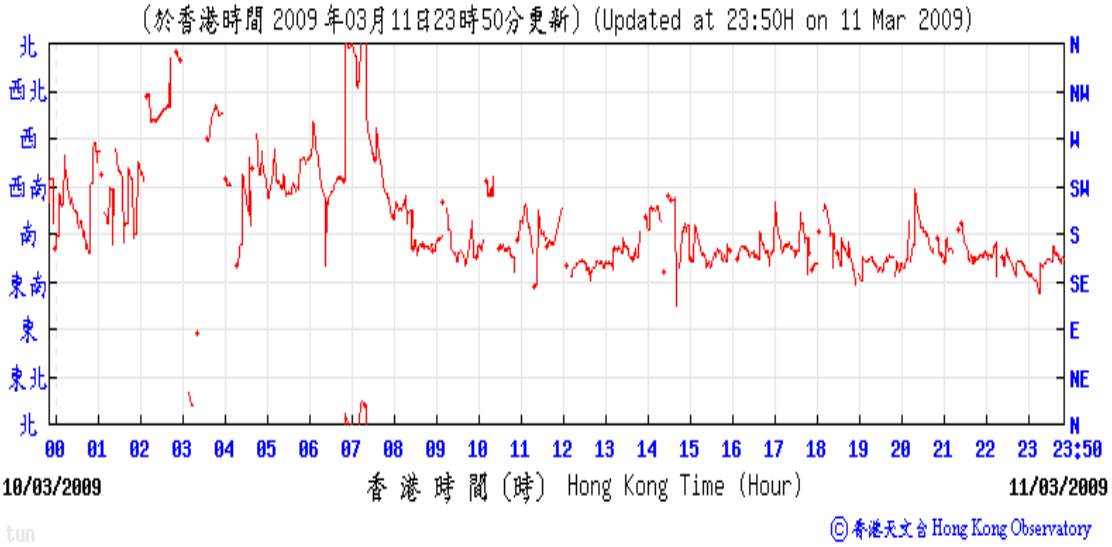
Wind Monitoring Data – Wind Direction during Air Quality Monitoring in March 2009





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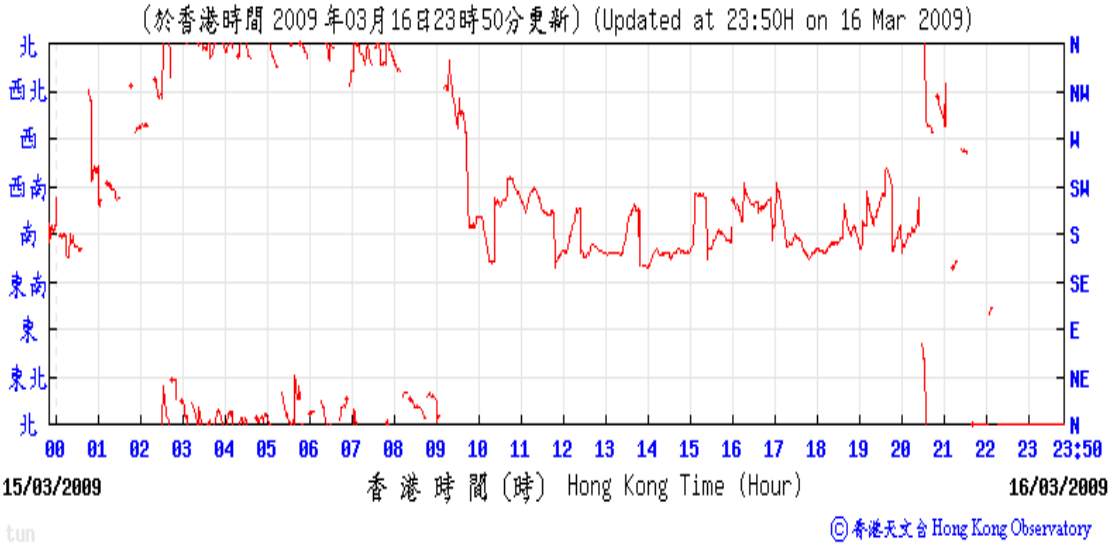
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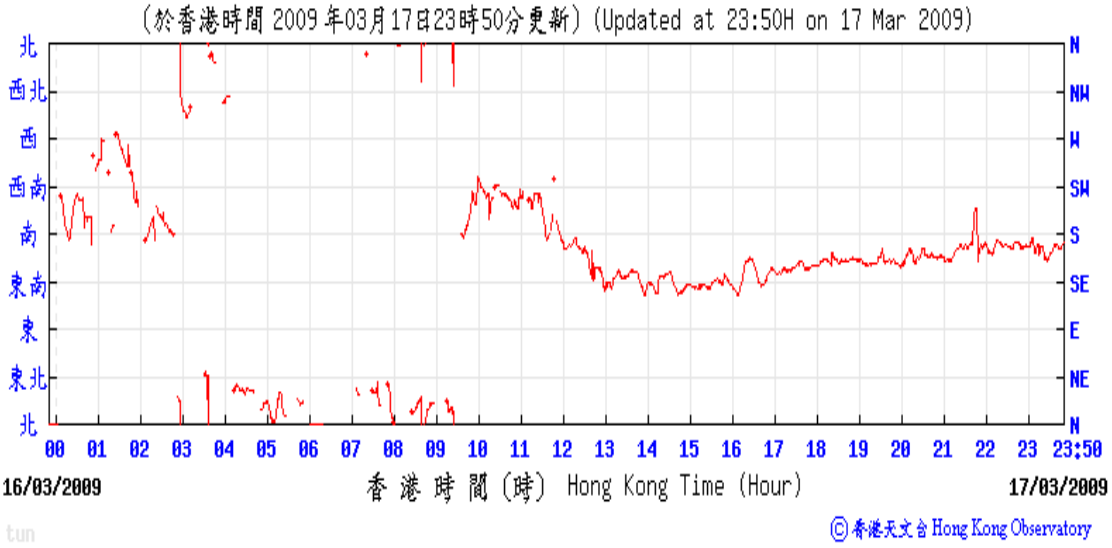
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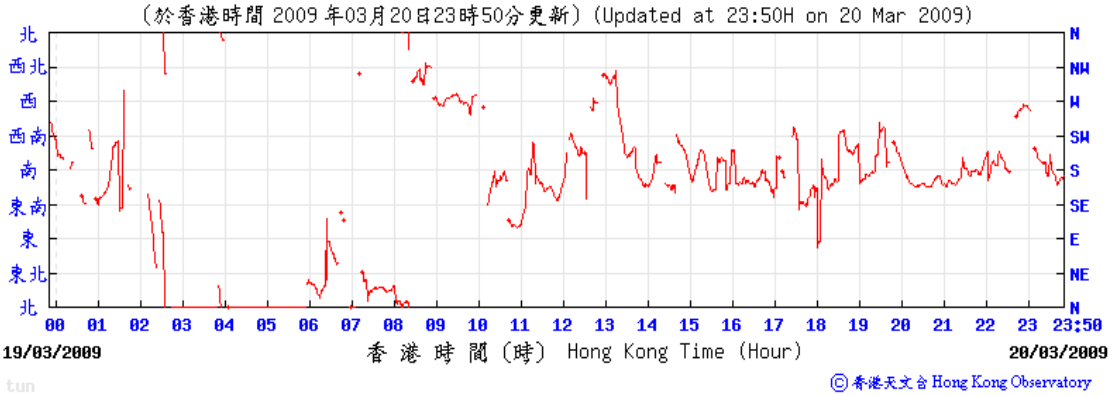
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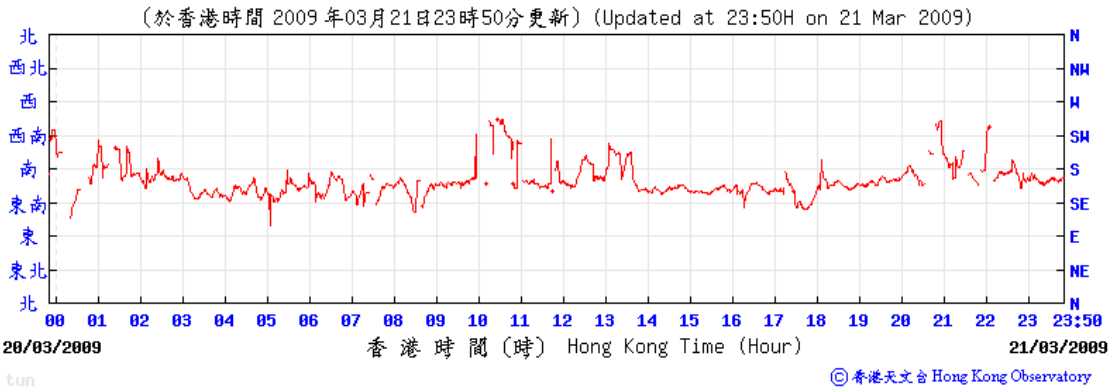
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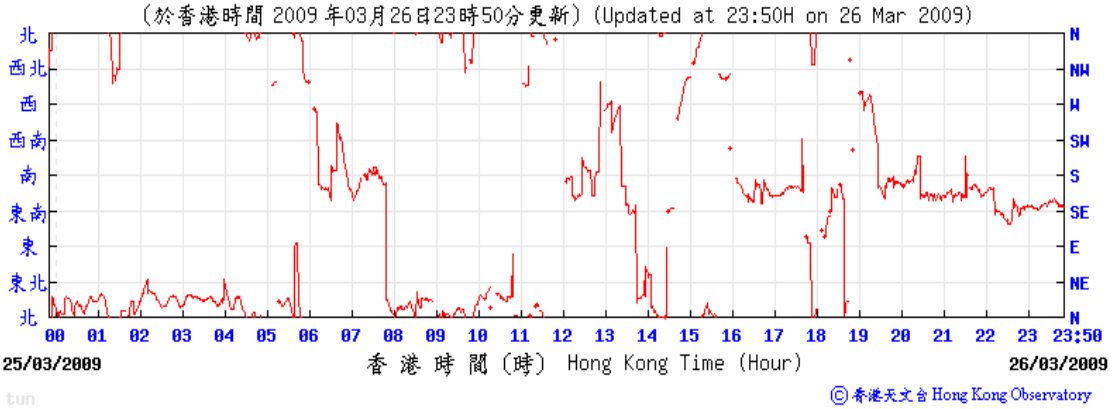
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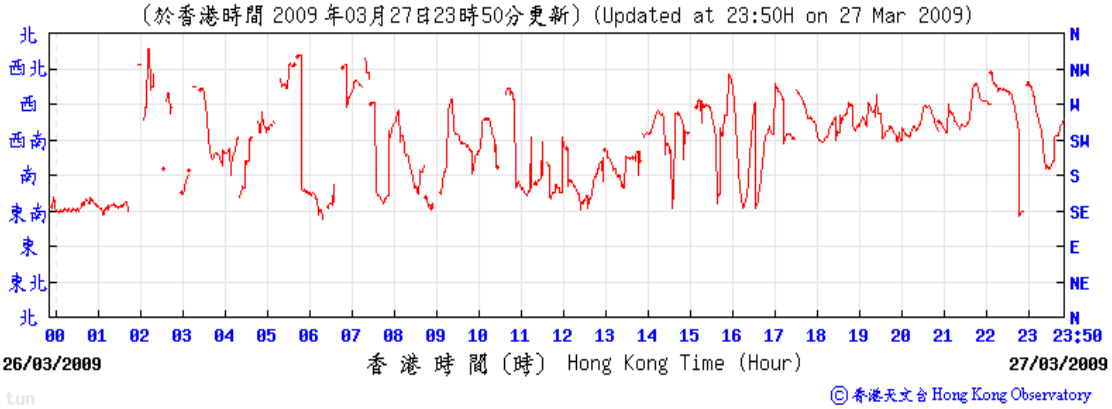
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Appendix E

Calibration Certificate of Sound Level Meter and Acoustical Calibrator

CERTIFICATE OF CALIBRATION

Issued by: **Brüel & Kjær UK Ltd.**

Date of Issue: 01 FEB 2007 Certificate Number: 15784

UKAS CALIBRATION

0174

Brüel & Kjær

Bedford House, Rutherford Close, Stevenage.
Hertfordshire. SG1 2ND
Telephone: 01438 739100 Fax.: 01438 739199
E-Mail : ukservice@bksv.com

Approved signatory

Name: A.M. HAMM

Signature: A M Hamm

CALIBRATION OF MULTI FREQUENCY CALIBRATOR TYPE 4226

("Free Field and Random" version)

Client: ARUP ACOUSTICS
PARKIN HOUSE
8 ST. THOMAS STREET
WINCHESTER SO23 9HE

Calibrator Type 4226, S/No: 1531372

With Coupler UA0915, S/No: 1531372

Client Inventory Number: -

Manufacturer: Brüel & Kjær

Equipment Received on: 23 JAN 2007

Calibration Date: 01 FEB 2007

Brüel & Kjær Reference No: 1-97267724

Measurement Method

The Calibration was performed to Laboratory Procedure TWI-103.

Sound pressure level in the 1/2 inch coupler of the calibrator was measured with a laboratory grade condenser microphone Type 4180, used as a working standard, calibrated by the National Physical Laboratory.

CERTIFICATE OF CALIBRATION

UKAS Accredited Calibration Laboratory No. 0174

Certificate Number

15784

The measured sound pressure was compared with that generated in the coupler of a working standard pistonphone calibrated by the National Physical Laboratory whose output was cross checked against a reference standard pistonphone, also calibrated by the National Physical Laboratory, using the same microphone and at the same ambient conditions. Appropriate corrections for atmospheric pressure conditions during calibration and for the measurement frequency and level response were taken into account.

Sound pressure level results are the mean of 5 measurements.

Results apply directly to the following settings on the calibrator, pressure, linear, calibration, 94dB, microphone group a, b, c.

Results for frequency and distortion are the result of a single measurement.

Results for 104 and 114dB are only at 125Hz, 1kHz and 8kHz, compared with the output at 94dB.

Calibration results apply at ambient conditions during the process of calibration.

Calibrations marked (Not UKAS Accredited) in this certificate have been included for completeness.

CALIBRATION RESULTS

4226 Settings: Linear, Pressure, 94dB, Microphone Group c.

Frequency Setting Hz	Sound Pressure Level in dB re 20μPa	Frequency Hz (Not UKAS Accredited)	Distortion % (Not UKAS Accredited)
31.5	94.13	31.63	0.5
63	94.07	63.13	0.2
125	94.04	125.9	0.2
250	94.02	251.3	0.2
500	94.00	502.5	0.2
1k	94.04	1.005 k	0.2
2k	94.02	1.979 k	0.4
4k	94.07	3.957k	0.7
8k	94.16	7.915k	0.3
12.5k	94.08	12.66 k	0.2

CERTIFICATE OF CALIBRATION

UKAS Accredited Calibration Laboratory No. 0174

Certificate Number

15784

Expanded uncertainty of calibration:

Sound Pressure Level:	±0.15dB from 31.5Hz to 2kHz, ±0.20dB at 4kHz and 8kHz, ±0.25dB at 12.5kHz
Frequency:	±1 last significant digit reported.
Distortion:	±0.3% distortion.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k*=2, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

ADDITIONAL TESTS

Sound Pressure Levels at Settings of 94, 104 and 114 dB

Frequency	Difference 104-94dB	Difference 114-94dB
125 Hz	9.99	19.97
1kHz	10.00	19.98
8kHz	9.96	19.93

Result of a single measurement, expanded uncertainty ±0.15dB

Inverted "A" Weighting, Readings Relative to 1kHz in dB

Frequency Hz	31.5	63	125	250	500	1 k	2 k	4 k	8 k	12.5 k
Target Value	+39.4	+26.2	+16.1	+8.6	+3.2	0	-1.2	-1.0	+1.1	+4.3
Reading	39.6	26.2	16.1	8.6	3.2	0.0	-1.2	-1.0	1.2	4.3

Target values according to BS EN 60651 - 1994 - results of a single measurement, values rounded to 0.1 dB, expanded uncertainty ±0.3dB.

CERTIFICATE OF CALIBRATION

UKAS Accredited Calibration Laboratory No. 0174

Certificate Number

15784

Free Field and Random settings

	Free Field Setting						Random	
	Microphone Group a		Microphone Group b		Microphone Group c		Microphone Group b	
Freq. Hz	Target Value dB	Reading dB	Target Value dB	Reading dB	Target Value dB	Reading dB	Target Value dB	Reading dB
250	0	0.00	0	0.00	0	0.00	0	0.00
500	0	0.00	0	0.00	0	0.00	0	0.00
1k	+0.15	0.15	+0.20	0.19	+0.10	0.10	+0.05	0.03
2k	+0.50	0.49	+0.45	0.44	+0.35	0.34	+0.10	0.09
4k	+1.35	1.34	+1.05	1.04	+0.95	0.93	+0.15	0.13
8k	+4.50	4.47	+2.80	2.78	+2.60	2.58	+0.40	0.38
12.5k	+7.35	7.29	+5.60	5.54	+5.05	5.00	+1.50	1.48

Target values as specified in the manufacturer's manual, result of a single measurement, expanded uncertainty ±0.2dB.

Ambient conditions during calibration were:

Atmospheric Pressure ..... 101.7 .....kPa

Temperature ..... 23 .....° C

Relative Humidity ..... 47 .....%

Checked by:

ArupAcoustics

ARUP

Level 5 Festival Walk
80 Tat Chee Avenue
Kowloon Tong, Kowloon
HONG KONG

Tel: +852 2268 3216

Fax: +852 2268 3950

AAc Certificate No. 2007001

CERTIFICATE OF CONFORMITY

Description of Test Instrument	Type No	Serial No
Bruel & Kjaer 4231Acoustic Calibrator	4231	2314016

Date of Test: 01 September 2007

Carried out by: Raymond Liu

Signature: Raymond

Approved by: William Ng

Signature: Wilm Ng

Ambient Conditions During Test	
Atmospheric Pressure:	1KPa
Air Temperature:	21°C
Relative Humidity:	58%

This document is to certify that the above Test Instrumentation did conform to the manufacturer's original specification on the date of the test. Any adjustments that were required to bring the instrumentation back into specification are duly noted in this document. The tests were carried out using the reference calibrator described below.

Description of Reference Calibrator	Type No	Serial No
Brüel & Kjær Multi Frequency Calibrator	4226	1531372
Brüel & Kjær Coupler	UA0915	1531372

Certificate of Calibration Serial No.	15784
By Brüel & Kjær (UK) Ltd Calibration Date:	01 February 2007
NAMAS Accredited Calibration Laboratory No.	0174

The reference calibrator, Type 4226, has traceable calibration back to National Measurement Standards. As such it is used as Arup Acoustics own 'Primary Standard' and is used only for controlled laboratory calibration tests on all sound measuring equipment owned by Arup Acoustics.

Footnote:

AAc IN-HOUSE SPECIFICATION TEST RESULTS

(for Brüel & Kjær 4231 Acoustic Calibrator)

4231 Serial No: 2314016 Calibrated By: RL

Date of Test: 1 September 2007 Checked By: WN

Atmospheric Pressure: 774.75 kPa approx

* Air Temperature: 21 °C approx (room temperature)

** Relative Humidity: 58 % approx

* and ** measured using Nagretti and Zambria Whirling Hygrometer or Radio Spares Temperature and Humidity Meter.

SOUND PRESSURE LEVEL TEST – Part 1

	4226 Primary Standard	1st set of free field readings		94 . 1 dB
*	4231 Under Test	1st set of free field readings		94 . 1 dB
*	(before any required level adjustment made)			
	Calibration Error of 4231	Within specification	YES/~~NO~~	___ . _ dB
		Outside specification	~~YES~~/NO	___ . _ dB

NOTE: Each set of readings comprises three individual readings, which are arithmetically averaged together

SOUND PRESSURE LEVEL TEST – Part 2

	4226 Primary Standard	2nd set of free field readings	94 . 1 dB
⊙	4231 Under Test	2nd set of free field readings	94 . 1 dB
⊙	(after corrective adjustment made)		

SPECIFICATION TOLERANCE FOR THE 4231 SOUND LEVEL CALIBRATOR IS
±0.3dB AT 23°C AND +0.5dB between 0 - 50°C

HARMONIC DISTORTION TEST

Maximum permitted harmonic distortion is 1% (53.8dB) of the SPL produced by the 4230 at 1kHz.

Measured Harmonic Distortion: 20.9 dB

0.04 %

CALIBRATION ACCURACY
THE ACCURACY OF THE AAc IN-HOUSE CALIBRATION SET UP FOR 4231 CALIBRATORS IS BETTER THAN: +0.43dB 95% CONFIDENCE LEVEL +0.3dB 80% CONFIDENCE LEVEL

ArupAcoustics

ARUP

Level 5 Festival Walk
80 Tat Chee Avenue
Kowloon Tong, Kowloon
HONG KONG

Tel: +852 2268 3216

Fax: +852 2268 3950

AAc Certificate No. 2007006

CERTIFICATE OF CONFORMITY

Description of Test Instrument	Type No	Serial No
Brüel & Kjær Sound Level Meter Kit	2238	2320707
Brüel & Kjær ½ " Microphone Kit	4188	2179479

Date of Test: 01 September 2007

Carried out by: Raymond Liu

Signature: Raymond

Approved by: William Ng

Signature: William Ng

Ambient Conditions During Test	
Atmospheric Pressure:	1KPa
Air Temperature:	21°C
Relative Humidity:	58%

This document is to certify that the above Test Instrumentation did conform to the manufacturer's original specification on the date of the test. Any adjustments that were required to bring the instrumentation back into specification are duly noted in this document. The tests were carried out using the reference calibrator described below.

Description of Reference Calibrator	Type No	Serial No
Brüel & Kjær Multi Frequency Calibrator	4226	1531372
Brüel & Kjær Coupler	UA0915	1531372

Certificate of Calibration Serial No.	15784
By Brüel & Kjær (UK) Ltd Calibration Date:	01 February 2007
NAMAS Accredited Calibration Laboratory No.	0174

The reference calibrator, Type 4226, has traceable calibration back to National Measurement Standards. As such it is used as Arup Acoustics own 'Primary Standard' and is used only for controlled laboratory calibration tests on all sound measuring equipment owned by Arup Acoustics.

Footnote:

AAc SOUND LEVEL METER CALIBRATION DOCUMENT ARUP

INSTRUMENT UNDER TEST:

SLM Type No.:	2238	Date:	01 September 2007
Serial No.:	2320707	Calibrated by:	RL
Mic. Type No.:	4188	Checked by:	WN
Serial No.:	2179479	Applies to AAc Certificate No.:	2007001

AMBIENT CONDITIONS DURING TEST:

Temperature 22 °C

Relative Humidity: 60 %

NOTE: Before commencing calibration tests, check that SLM meter displays 94dB when set to internal 'REF'erence, and the Ko factor is set to 0.0dB. If adjustment is required, use the "adj" pot at the side of the meter casing, then apply a 'VOID IF BROKEN' calibration sticker over hole.

TEST 1: LINEAR FREQUENCY RESPONSE TEST @ 94dB (RANDOM)

SLM set to 120dB/"L_{Π}"/SPL/FAST/RANDOM/RMS

4226 set to Mic b/RANDOM/94dB/LIN/CAL

	Octave Band Centre Frequency, Hz										
	31.5	63	125	250	500	1k	2k	4k	8k	12.5kHz	
Target Values, dB	94.13	94.07	94.04	94.02	94.00	94.04	94.02	94.07	94.16	94.08	
Actual Values, dB	94.50	94.30	94.10	94.00	93.90	94.00	93.80	93.60	93.90	93.60	**PASS/~~FAIL~~**
Tolerance, ±dB	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	1.00	

TEST 2: LINEAR FREQUENCY RESPONSE TEST @ 94dB (FREE FIELD)

SLM set to 120dB/"L_{Π}"/SPL/FAST/FRONTAL/RMS

4226 SET TO Mic b/FREE FIELD/94dB/LIN/CAL

	Octave Band Centre Frequency, Hz										
	31.5	63	125	250	500	1k	2k	4k	8k	12.5kHz	
Target Values, dB	94.13	94.07	94.04	94.02	94.00	94.04	94.02	94.07	94.16	94.08	
Actual Values, dB	94.40	94.30	94.10	94.00	93.90	94.00	94.10	94.00	93.70	93.20	**PASS/~~FAIL~~**
Tolerance, ±dB	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	1.00	

TEST 3: SLM LINEARITY TEST

SLM set to 120dB/SPL/RANDOM/LINEAR NARROW/FAST/RMS

4226 set to Mic b/RANDOM/LIN/CAL

4226 SPL: 104dB	Octave Band Centre Frequency, Hz									
	31.5	63	125	250	500	1k	2k	4k	8k	
Target Values, dB	104.12	104.02	104.01	104.01	104.0	104.05	104.04	104.04	104.11	
Actual Values, dB	104.50	104.20	104.10	104.00	103.90	103.90	103.70	103.60	103.70	**PASS/~~FAIL~~**
Tolerance, ±dB	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	

4226 SPL: 114dB	Octave Band Centre Frequency, Hz									
	31.5	63	125	250	500	1k	2k	4k	8k	
Target Values, dB	114.12	114.02	114.01	114.01	114.0	114.05	114.04	114.04	114.11	
Actual Values, dB	113.90	113.90	113.90	113.80	113.80	113.80	113.70	113.70	113.70	**PASS/~~FAIL~~**
Tolerance, ±dB	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	

TEST 4: SLM 'A' WEIGHTING RESPONSE

SLM set to 120dB/RANDOM/'A'WEIGHTING/FAST/RMS

4426 set to Mic b/RANDOM/INV'A'/94dB/CAL

	Octave Band Centre Frequency, Hz										
	31.5	63	125	250	500	1k	2k	4k	8k	12.5kHz	
Target Values, dB	94.12	94.02	94.01	94.01	94.0	94.05	94.04	94.04	94.11	94.08	
Actual Values, dB	95.10	94.00	94.10	94.00	94.00	94.00	93.90	93.40	94.70	94.00	**PASS/~~FAIL~~**
Tolerance, ±dB	±1.50	±1.50	±1.00	±1.00	±1.00	±1.00	±1.00	±1.00	+1.5 -3.0	+3 -6	

TEST 5: SLM TIME WEIGHTING TESTS

SLM set to 100dB/SPL/RANDOM/LINEAR Narrow/FAST-SLOW/RMS

4226 set to Mic b/RANDOM/LIN/TIME WEIGHTING FAST-SLOW (2kHz) TEST LEVEL

Test level adjusted for 96dB before commencing test **PASS/~~FAIL~~**

Response	Target, dB	Actual, dB	TOLERANCE
FAST	95.0	94.6	±1.0
SLOW	91.9	91.4	±1.0

TEST 6: **CREST FACTOR (SLM set to FAST)**

Test level set for 96dB before commencing test

SLM READING: 96 dB TARGET: 96.0 dB TOLERANCE: 0.0 dB

TEST 7: **INTERNAL ELECTRICAL NOISE LEVELS (using 100pf glass capacitor across SLM input stage)**

SLM set to 60dB/L"п"/L_{eq}/SLOW/RANDOM/RMS

	Actual Level
'A' Weighted	11.5
Linear Band	17.2

COMMENTS

GENERAL CONDITION OKAY	**YES**	~~**NO**~~

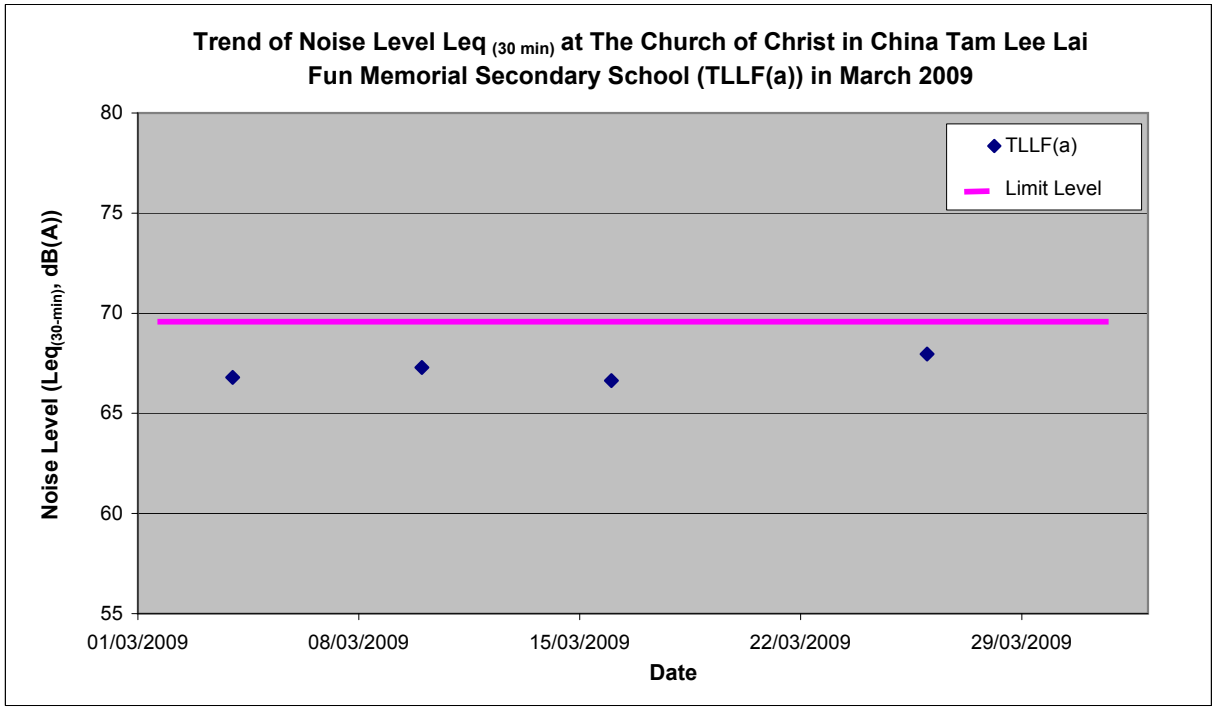
Appendix F

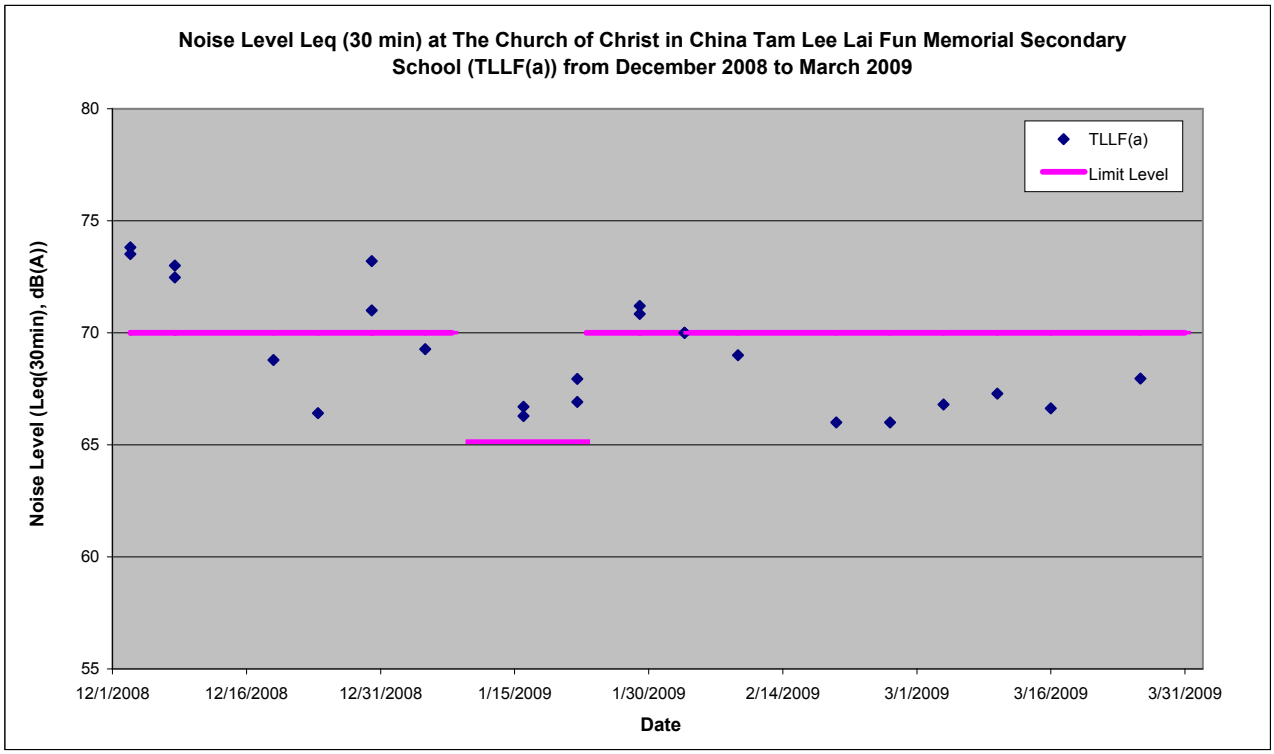
Impact Noise Monitoring Results

The Church of Christ in China Tam Lee Lai Fun Memorial Secondary School, TLLF(a)
Day-time Noise Monitoring Data

Note (*): Façade correction is included.

Date	Start Time	$L_{eq\ (5\text{-}min)}$, dB(A)	$L_{eq\ (30\text{-}min)}$, dB(A)*	$L10_{\ (5min)}$, dB(A)	$L10_{\ (5\text{-}min)}$, dB(A)*	$L_{90\ (5min)}$, dB(A)	$L_{90\ (5min)}$, dB(A)*
4-Mar-09	1:30 PM	62		68		58	
	1:35 PM	63		68		58	
	1:40 PM	63	67	69	72	60	61
	1:45 PM	64		70		58	
	1:50 PM	65		69		59	
	1:55 PM	65		69		57	
10-Mar-09	2:30 PM	64		70		60	
	2:35 PM	64		71		59	
	2:40 PM	64	67	69	73	58	63
	2:45 PM	64		71		62	
	2:50 PM	64		71		60	
	2:55 PM	65		71		61	
16-Mar-09	1:30 PM	64		70		60	
	1:35 PM	64		71		59	
	1:40 PM	64	67	71	74	61	62
	1:45 PM	63		73		60	
	1:50 PM	63		71		59	
	1:55 PM	64		72		59	
26-Mar-09	5:35 PM	65		72		60	
	5:40 PM	64		72		61	
	5:45 PM	65	68	71	74	59	63
	5:50 PM	66		71		61	
	5:55 PM	66		72		61	
	6:00 PM	65		72		62	
Average			**67**		**73**		**63**
Minimum			67		72		61
Maximum			68		74		63


Trend of Noise Level Leq (30 min) at The Church of Christ in China Tam Lee Lai Fun Memorial Secondary School (TLLF(a)) in March 2009
Noise Level (Leq(30-min), dB(A))
80
75
70
65
60
55
01/03/2009
08/03/2009
15/03/2009
22/03/2009
29/03/2009
Date
TLLF(a)
Limit Level


Noise Level Leq (30 min) at The Church of Christ in China Tam Lee Lai Fun Memorial Secondary School (TLLF(a)) from December 2008 to March 2009
Noise Level (Leq(30min), dB(A))
80
75
70
65
60
55
12/1/2008
12/16/2008
12/31/2008
1/15/2009
1/30/2009
2/14/2009
3/1/2009
3/16/2009
3/31/2009
Date
TLLF(a)
Limit Level

Appendix G

Updated Summary of Environmental Mitigation Implementation Schedule

Summary of Environmental Mitigation Implementation Schedule

EIA Ref #	Mitigation Measures	Location / Timing	Status *
Air Quality Control			
S3.8.1	Implementation of dust suppression measures stipulated in Air Pollution Control (Construction Dust) Regulation. • skip hoist for material transport should be totally enclosed by impervious sheeting • every vehicle should be washed to remove any dusty materials from its body and wheels before leaving a construction site • the area where vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores • where a site boundary adjoins a road, streets or other accessible to the public, hording of not less than 2.4m high from ground level should be provided along the entire length except for a site entrance or exit • every stack of more than 20 bags of cement should be covered entirely by impervious sheeting places in an area sheltered on the top and the 3 sides • all dusty materials should be sprayed with water prior to any loading, unloading or transfer operation so as to maintain the dusty materials wet • the height from which excavated materials are dropped should be controlled to a minimum practical height to limit fugitive dust generation from unloading • the load of dusty materials carried by vehicle leaving a construction site should be covered entirely by clean impervious sheeting to ensure dust materials do not leak from the vehicle • instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise	Work site / during construction	✓ ✓ ✓ ✓ N/A ✓ N/A N/A N/A
Noise Control			
S4.8.1	Use of quiet powered mechanical equipment	Work Sites / During Construction	N/A
S4.8.5 – S4.8.6	Road paving - Adoption of quiet PMEs, movable noise barrier and scheduling of PMEs during normal teaching period, only one PME to be operated and the work area not less than 22m from NSR TLLF or cease operation of PMEs if work area less than 30m from NSR TLLF during examination period. The barrier material shall have a surface mass of	Work Site for road paving, road marking and construction of noise barrier in the vicinity of	✓

Notes (*): ✓ – Compliance; N/A - Not Applicable; N/O – Not Observed; Rdr – Reminder; Obs – Observation; N/C - Non Compliance

EIA Ref #	Mitigation Measures	Location / Timing	Status *
	not less than 14 kg/m^2 on skid footing with 25mm thick internal sound absorptive lining.	NSR TLFF (The Church of Christ in China Tam Lee Lai Fun Memorial Secondary School) / During Construction	
S4.8.5 & S4.8.7	Road marking - Adoption of quiet PMEs and movable noise barrier during normal teaching period and examination period. The work area should be located not less than 18m from NSR TLLF during examination period. The barrier material shall have a surface mass of not less than 14 kg/m^2 on skid footing with 25mm thick internal sound absorptive lining.	Work Site for road marking in the vicinity of NSR TLFF / During Construction	N/A
S4.8.5 & S4.8.8	Construction of noise barrier - Adoption of quiet PMEs and movable noise barrier during examination period, piling operation for construction of noise barrier would also be ceased during examination period. The barrier material shall have a surface mass of not less than 14 kg/m^2 on skid footing with 25mm thick internal sound absorptive lining.	Work Site for construction of noise barrier in the vicinity of NSR TLFF / During Construction	N/A
S4.9.2	*Good Site Practice:* • Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program. • Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program. • Mobile plant, if any, should be sited as far away from NSRs as possible. • Machines and plant (such as trucks) that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum. • Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs. • Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities. • Scheduling the noisy work to be conducted in non-school hours or long holiday such as summer vacation as possible.	Work Sites / During Construction	✓ ✓ ✓ ✓ N/O N/A N/A
Water Quality Control			

Notes (*): ✓ – Compliance; N/A - Not Applicable; N/O – Not Observed; Rdr – Reminder; Obs – Observation; N/C - Non Compliance

EIA Ref #	Mitigation Measures	Location / Timing	Status *
S5.7.2	*Measures for Tuen Mun River Channel* • Site runoff would be directed towards regularly cleaned and maintained sand traps, silt traps and where appropriate. • Oil/grease separators to minimise risk of sedimentation and pollution to the River Channel. • Debris and rubbish generated on-site would be collected, handled and disposed of properly. • The stockpile or temporary storage area and chemical waste storage area shall be located at least 30m away from Tuen Mun River Channel.	Work site / During the construction period	✓ N/A ✓ ✓
S5.7.3	*Construction Runoff and Drainage* The site practices outlined in ProPECC PN 1/94 "Construction Site Drainage" shall be implemented including: • Sand/silt removal facilities such as sand traps, silt traps or sediment basins shall be provided to remove sand/silt particles from runoff to meet the requirements of the Technical Memorandum standard under the Water Pollution Control Ordinance. The design of silt removal facilities should be based on the guidelines provided in ProPECC PN 1/94. All drainage facilities and erosion and sediment control structures should be inspected monthly and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. • Water pumped out from foundation excavations should be discharged into silt removal facilities. • Careful programming of the works to minimise surface excavations during the rainy season. If excavation of soil cannot be avoided during the rainy season, or at any time of year when rainstorms are likely, exposed slope surfaces should be covered by a tarpaulin or other means. Other measures that need to be implemented before, during, and after rainstorms are summarized in ProPECC PN 1/94. • Exposed soil surface shall be protected by paving as soon as possible to reduce the potential of soil erosion. • Open stockpiles of construction materials on site shall be covered with tarpaulin or similar fabric during rainstorms.	Work site / During the construction period	✓ ✓ N/A N/A ✓

Notes (*): ✓ – Compliance; N/A - Not Applicable; N/O – Not Observed; Rdr – Reminder; Obs – Observation; N/C - Non Compliance

EIA Ref #	Mitigation Measures	Location / Timing	Status *
S5.7.4 – S5.7.5	*Sewage from General Construction Activities* Debris and rubbish generated on-site shall be collected, handled and disposed of properly to avoid entering the nearby nullah and stormwater drains. Stockpiles of cement and other construction material should be kept covered when not being used. Oils and fuels should only be used and stored in designated areas which have pollution prevention facilities. All fuel tanks and storage areas shall be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund should be drained of rainwater after a rain event.	Work site / During the construction period	✓ ✓
S5.7.6	*Sewage Effluent* Temporary sanitary facilities, such as portable toilets, shall be employed on-site. A licensed contractor would be responsible for appropriate disposal and maintenance of these facilities.	Work site and adjacent water / During the design and construction period.	✓
Waste Management			
S6.6.1	*Good Site Practices* Recommendations for good site practices during the construction activities include: • nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site; • training of site personnel in proper waste management and chemical waste handling procedures; • provision of sufficient waste disposal points and regular collection for disposal; • 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; and • recording system for the amount of wastes generated, recycled and disposed of (including the disposal sites).	Work site / During the construction period	N/O ✓ ✓ ✓ ✓ ✓
S6.6.2	*Waste Reduction Measures* Waste reduction is best achieved at the planning and design stage, as well as by	Work site / During planning and design	

Notes (*): ✓ – Compliance; N/A - Not Applicable; N/O – Not Observed; Rdr – Reminder; Obs – Observation; N/C - Non Compliance

EIA Ref #	Mitigation Measures	Location / Timing	Status *
	ensuring the implementation of good site practices. Recommendations to achieve waste reduction include:	stage, and construction stage	
	• 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;		N/A
	• to encourage collection of aluminium cans, PET bottles and paper, separate labelled bins shall be provided to segregate these wastes from other general refuse generated by the work force;		N/O
	• any unused chemicals or those with remaining functional capacity shall be recycled;		N/O
	• use of reusable non-timber formwork to reduce the amount of C&D material.		N/O
	• prior to disposal of C&D waste, it is recommended that wood, steel and other metals shall be separated for re-use and / or recycling to minimise the quantity of waste to be disposed of to landfill;		N/O
	• proper storage and site practices to minimise the potential for damage or contamination of construction materials; and		N/O
	• plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.		N/O
S6.6.4	*General Refuse* General refuse should be stored in enclosed bins or compaction units separate from C&D material. A licensed waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material.	Work site / During the construction period	✓
	A collection area should be provided where wastes can be stored and loaded prior to removal from site. An enclosed and covered area is recommended to reduce the occurrence of 'wind blow' light material.		N/O
S6.6.5	*Chemical Wastes* After use, chemical wastes (for example, cleaning fluids, solvents, lubrication oil and fuel) should be handled according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Spent chemicals should be collected by a licensed collector for disposal at the CWTF or other licensed facility in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.	Work site / During the construction period	✓

Notes (*): ✓ – Compliance; N/A - Not Applicable; N/O – Not Observed; Rdr – Reminder; Obs – Observation; N/C - Non Compliance

EIA Ref #	Mitigation Measures	Location / Timing	Status *
S6.6.6 & 6.6.7	*Construction and Demolition Material* Excavated fill material shall be reused on-site as backfill material as far as possible. The material to be disposed at public fill reception facility shall be free from marine mud, household refuse, plastic, metals, industrial and chemical waste, animal and vegetable matter, and other material considered to be unsuitable by the Filling Supervisor.	Work site / During the construction period	✓
Hazard to Life			
S8.8.4	• The number of workers on site during construction stage should be kept as the level as assessed in this report. • Emergency evacuation procedures should be formulated and Highways Department (HyD) should ensure all workers on site should be familiar with these procedures as well as the route to escape in case of gas release incident occur. Relevant Departments, such as Water Supplies Department and Fire Services Department, should be consulted during the development of Emergency procedures. Diagram showing the escape routes to a safe place should be posted in the site notice boards and at the entrance/exit of site. • The emergency procedures should specify means of providing a rapid and direct warning (e.g. Siren and Flashing Light) to construction workers in the event of chlorine gas release in the Tuen Mun Water Treatment Works (TMWTW). • The construction site officer of HyD should establish a communication channel with the TMWTW operation personnel during construction stage. In case of any hazardous incidents in the treatment works, operation personnel of TMWTW should advise the site officer to evacuate the construction workers.	Works area/ During construction phase	N/O N/O N/O
S8.8.5	Induction Training should be provided to any staff before working on site at the Tsing Tin Interchange work site.	Works area/During construction phase	N/O
S8.8.6	Periodic drills should be coordinated and conducted to ensure all construction staffs are familiar with the evacuation procedures. Upon completion of the drills, a review on every step taken should be conducted to identify area of improvement.	Works area/ During construction phase	N/O
Ecology			
S9.7.2	Construction activities would be confined to developed areas of low ecological value, and there would be no direct impact to other habitats within the Assessment Area.	Works area / During construction phase	✓
S9.7.4	To mitigate the noise impacts to habitats and associated wildlife within and adjacent to	Works area / During	✓

Notes (*): ✓ – Compliance; N/A - Not Applicable; N/O – Not Observed; Rdr – Reminder; Obs – Observation; N/C - Non Compliance

EIA Ref #	Mitigation Measures	Location / Timing	Status *
	the proposed works area, quite mechanical plants and well-maintained plants should be used wherever possible. Noise-emitting construction plant should be installed away from the egretry as far as practical. Schedule of construction programme should be carefully planned to avoid noise-generating construction activities with high disturbance impact during the breeding seasons of the ardeids (i.e. mid-March to August).	construction phase	
S9.7.5	Noise barrier should also be implemented to mitigate the noise impact in operation phase. To minimize the bird collision impact, pprecautionary and bird-friendly approach to noise barrier design should be implemented: • The transparent materials of the noise barriers would be non-glaring and not light-reflective. • Noise barrier panels would be with either tinted materials, embedded opaque stripes or superimposed patterns of thin opaque stripes. • Noise barrier would be made visible to birds, such as putting falcon stickers on the transparent panels.	Works area / during construction phase	N/O N/O N/O
S9.7.7	Standard good site practice measures should be implemented throughout the construction phase. The measures should include: • Placement of equipment in designated works areas selected on existing disturbed land. • Construction activities should be restricted to the proposed works area that would be clearly demarcated. • The proposed works area should be reinstated immediately after completion of the works. • Open burning on proposed works sites is illegal, and should be strictly enforced. • Waste skips should be provided to collect general refuse and construction wastes. The wastes should be disposed of timely and properly off-site. • Any soil contamination with fuel leaked from construction plants should be removed off-site.	Works area / during construction phase	N/A ✓ N/O ✓ N/O ✓
S9.7.8	To minimize the construction dust impact to the vegetation within and in vicinity of the proposed works area, the following mitigation measures as listed below should be implemented:	Works area / During construction phase	

Notes (*): ✓ – Compliance; N/A - Not Applicable; N/O – Not Observed; Rdr – Reminder; Obs – Observation; N/C - Non Compliance

EIA Ref #	Mitigation Measures	Location / Timing	Status *
	• Regular watering should be used during the construction stage. • Any aggregate or dusty material storage piles should be completely covered. • Minimum practical height for dropping of excavated material should be applied.		✓ N/O N/O
S9.7.9	To minimize the indirect impacts to the nearby Tuen Mun River Channel, the following measures should be implemented: • Any runoff and drainage water with high levels of suspended solids should be prevented from entering the nearby water-bodies. • Site runoff should be directed towards regularly cleaned and maintained silt traps and oil/grease separators to avoid and minimise the risk of sedimentation and pollution of the nearby stream courses and drainage culvert. • The silt and oil/grease separators should be appropriately designed for the local drainage and ground conditions. • Debris and rubbish generated on-site should be collected, handled and disposed of properly.	Works area / during construction phase	 ✓ ✓ N/O ✓
S9.7.10	Compensatory planting of a ratio not less than 1:1 ratio in terms of quality and quantity should be provided to compensate for the loss of roadside trees due to the construction works.	Works area / during construction phase	✓
Landscape and Visual			
Table 10.6	CM1 Topsoil, where identified and practical, should be stripped and stored for re-use in the construction of the soft landscape works.	Work site / During Construction Phase	N/O
Table 10.6	CM2 Existing trees to be retained on site should be carefully protected during construction.	Work site / During Construction Phase	✓
Table 10.6	CM3 Trees unavoidably affected by the works should be transplanted where practical.	Work site / During Construction Phase	✓
Table 10.6	CM4 Compensatory tree planting should be provided to compensate for felled trees.	Work site / During Construction Phase	✓
Table 10.6	CM5 Control of night-time lighting.	Work site / During Construction Phase	✓
Table 10.6	CM6 Erection of decorative screen hoarding compatible with the surrounding setting.	Work site / During Construction Phase	N/O

Notes (*): ✓ – Compliance; N/A - Not Applicable; N/O – Not Observed; Rdr – Reminder; Obs – Observation; N/C - Non Compliance

Appendix H

Monthly Summary Waste Flow Table

Name of Department : HyD

Contract No. : HY/2007/14

Monthly Summary Waste Flow Table for 2009 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rocks and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
Jan	0.060	0	0	0	0.060	0	0.002	0.010	0	0.5	0.010
Feb	0.735	0	0	0	0.735	0	0.003	0.010	0	0	0.005
Mar	0.645	0	0	0	0.645	0	0.004	0.015	0	0	0.015
Apr											
May											
June											
Sub-total											
July											
Aug											
Sept											
Oct											
Nov											
Dec											
Total											

Notes: (1) Not Used.
(2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material

Appendix I

Environmental Monitoring Programme for Coming Months

Contract No. HY/2007/14 Widening of Tuen Mun Road at Tsing Tin Interchange
Tentative Impact Monitoring Schedule (April 2009) Revision 1

Date		Air Quality		Noise	Landscape & Visual	Weekly Site Inspection
		1-hour TSP	24-hours TSP	L_{Aeq}, 30 min		
1-Apr-09	Wed	AM1(a) & AM3(a)		TLLF(a)		SSEMC
2-Apr-09	Thu		AM1(a) & AM3(a)			
3-Apr-09	Fri					
4-Apr-09	Sat					
5-Apr-09	Sun					
6-Apr-09	Mon	AM1(a) & AM3(a)		TLLF(a)		
7-Apr-09	Tue		AM1(a) & AM3(a)			
8-Apr-09	Wed					
9-Apr-09	Thu					
10-Apr-09	Fri					
11-Apr-09	Sat					
12-Apr-09	Sun					
13-Apr-09	Mon					
14-Apr-09	Tue	AM1(a) & AM3(a)		TLLF(a)		
15-Apr-09	Wed		AM1(a) & AM3(a)			
16-Apr-09	Thu					
17-Apr-09	Fri					
18-Apr-09	Sat					
19-Apr-09	Sun					
20-Apr-09	Mon	AM1(a) & AM3(a)		TLLF(a)		
21-Apr-09	Tue		AM1(a) & AM3(a)			
22-Apr-09	Wed					
23-Apr-09	Thu				Monthly	
24-Apr-09	Fri					
25-Apr-09	Sat	AM1(a) & AM3(a)				
26-Apr-09	Sun					
27-Apr-09	Mon		AM1(a) & AM3(a)			
28-Apr-09	Tue					
29-Apr-09	Wed					
30-Apr-09	Thu	AM1(a) & AM3(a)		TLLF(a)		

	Public Holiday
	Monitoring Day

Contract No. HY/2007/14 Widening of Tuen Mun Road at Tsing Tin Interchange
Tentative Impact Monitoring Schedule (May 2009) Revision 1

Date		Air Quality		Noise	Landscape & Visual	Weekly Site Inspection
		1-hour TSP	24-hours TSP	L_{Aeq}, 30 min		
1-May-09	Fri					
2-May-09	Sat					
3-May-09	Sun					
4-May-09	Mon		AM1(a) & AM3(a)			
5-May-09	Tue					
6-May-09	Wed	AM1(a) & AM3(a)		TLLF(a)		SSEMC
7-May-09	Thu		AM1(a) & AM3(a)			
8-May-09	Fri					
9-May-09	Sat					
10-May-09	Sun					
11-May-09	Mon					
12-May-09	Tue					
13-May-09	Wed	AM1(a) & AM3(a)		TLLF(a)		
14-May-09	Thu		AM1(a) & AM3(a)			
15-May-09	Fri					
16-May-09	Sat					
17-May-09	Sun					
18-May-09	Mon					
19-May-09	Tue	AM1(a) & AM3(a)		TLLF(a)		
20-May-09	Wed		AM1(a) & AM3(a)			
21-May-09	Thu				Monthly	
22-May-09	Fri					
23-May-09	Sat					
24-May-09	Sun					
25-May-09	Mon	AM1(a) & AM3(a)		TLLF(a)		
26-May-09	Tue		AM1(a) & AM3(a)			
27-May-09	Wed					
28-May-09	Thu					
29-May-09	Fri					
30-May-09	Sat					
31-May-09	Sun					

	Public Holiday
	Monitoring Day