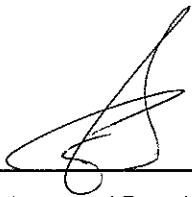


Highways Department

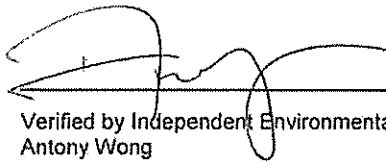
Contract No.
HY/2007/14 Widening of
Tuen Mun Road at
Tsing Tin Interchange

Monthly Environmental
Monitoring and Audit
Report – December 2009

Revision 1



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Executive Summary

This is the fourteen 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 December 2009.

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

- Site clearance;
- Fabrication of the sign gantry;
- Re-compaction of fill slope;
- Drainage & road re-construction; and
- Road pavement & 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 measurements during non-restricted hours in the reporting month were below the Action and Limit (AL) Levels. The construction works carried out by the Contractor within the restricted hours was found to fully comply with the conditions of the CNP.

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 and tree no. 63 was dead after transplanting in March 2009. Interim transplanting of one tree (tree no. 411) was completed and one tree (tree no. 69) was relocated to new transplanting location in April 2009.

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 285 m³ were generated in the reporting month and were disposed of at public fill. It was advised from the Contractor that determination of the actual amount of waste 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/B), Discharge License under WPCO (EP760/425/013454/I), Construction Noise Permit under NCO (GW-RW0379-09 & GW-RW0584-09), Chemical Waste Producer Registration under WDO (WPN5111-425-C1186-09).

Environmental Auditing

A total of 5 environmental site audits were conducted on a weekly basis in December 2009. No non-conformance to the environmental requirements was identified during the reporting period.

Complaint Log

No complaint 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 were made against the Project in the reporting period.

Reporting Changes

There were no reporting changes in the reporting month.

Future Key Issues

Key environmental issues to be considered in the forth-coming month include dust generation from activities on-site, 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. Attention shall be paid to environmental issues identified in EIA report and weekly site audit. Mitigation measures recommended in EIA report and Mitigation Measure Implementation Schedule shall be fully implemented.

1 Environmental Status

1.1 Construction Programme

An up-to-date 3-month rolling construction programme to January 2010 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 the reporting month

| Construction Activities | Location (1) | Daily Excavation Rate |
|---|-----------------|-------------------------------|
| Site clearance | Whole Site Area | Range: 0 to 12 m ³ |
| Fabrication of the sign gantry | Whole Site Area | |
| Re-compaction of fill slope | Whole Site Area | |
| Drainage & road re-construction | Whole Site Area | |
| Road pavement & drainage for widen lane | Whole Site Area | |

Figure 1-1 Locations of the major construction activities

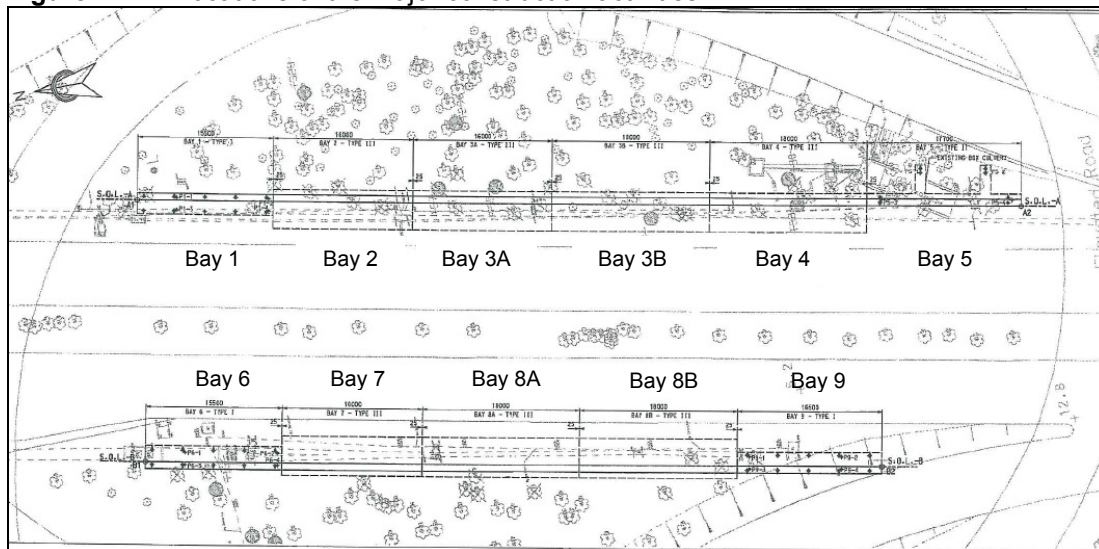


Table 1-2 Contacts of key environmental staff

| Organization | Name | Telephone |
|---|--------------|-----------|
| Environmental Protection Department | | |
| Environmental Protection Officer (Strategic Assessment) ²² | Thomas To | 2835 1103 |
| Engineer's Representative | | |
| Highways Department | | |
| Senior Engineer | C.W. Ng | 2762 4067 |
| Independent Environmental Checker | | |
| Hyder Consulting Ltd | | |
| Principle 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 | Chan Man | 9464 1468 |
| 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

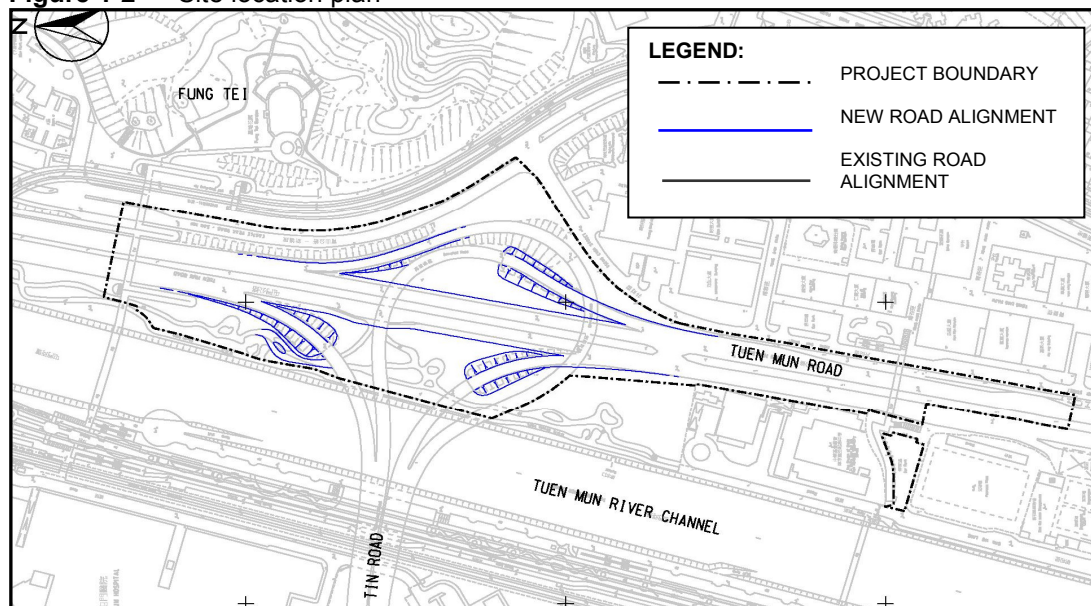


Figure 1-3 Location of environmental sensitive receivers and monitoring stations

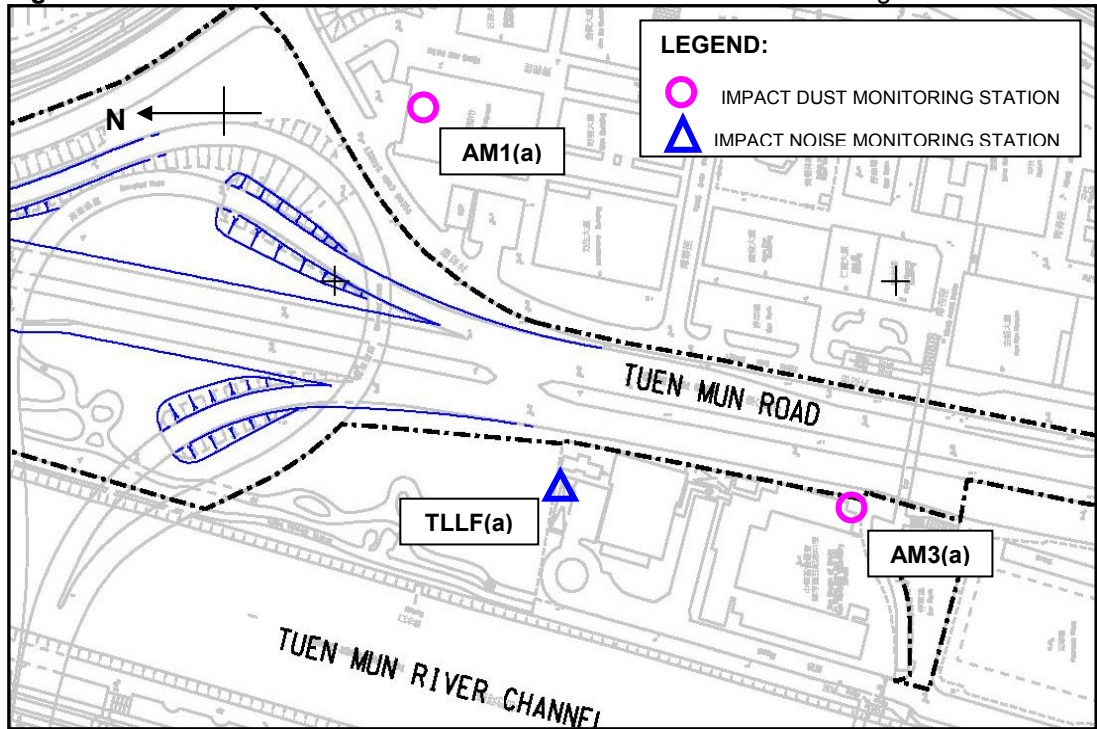


Table 1-3 Summary of impact air quality and noise monitoring stations

| 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 contractor 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 EP-302/2008/B | 19 February 2008 25 March 2008 15 April 2009 | Superseded Superseded 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-RW0379-09* | 5 September 2009 | 20 February 2010 |
| | GW-RW0584-09 | 24 December 2009 | 21 June 2010 |
| 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 |

* GW-RW0379-09 was superseded by GW-RW0584-09 from 24 December 2009.

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

- Stagnant water was observed inside the sedimentation tank. The Contractor shall clear the stagnant water.

Waste / Chemical Waste Management

- The Contractor shall remove the garbage and C&D waste which outside the waste bin and on the ground.

Dust Mitigation Measures

- The Contractor was reminded to continuous carried out water spraying regularly to minimize dust disturbance and cover the exposed soil with tarpaulin or other means after daily works completed.

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, $\mu\text{g}/\text{m}^3$ | 323 | 161 | 305 | 168 |
| Limit Level, $\mu\text{g}/\text{m}^3$ | 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 m³/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 cm² (63in²);
- 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, 22 and 28 December 2009, while monitoring of 24-hour TSP was conducted on 5, 11, 17, 23 and 29 December 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 (September to December 2009) is 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 in the reporting month

| Location | Average 1-hr TSP Concentration, $\mu\text{g}/\text{m}^3$ (Range) | Average 24-hr TSP Concentration, $\mu\text{g}/\text{m}^3$ (Range) |
|----------|---|--|
| AM1(a) | 47 (3 – 131) | 34 (20 – 49) |
| AM3(a) | 36 (3 – 92) | 81 (17 – 160) |

All measured 1-hour and 24-hour TSP concentrations in 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 slope re-compaction and road re-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 | $L_{eq}(30 \text{ min})$ | Once per week | 1 |
| Between 1900-2300 hours on normal weekdays | $L_{eq}(5 \text{ min})^*$ | | 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. | Serial no. | Precision Grade | Qty. |
|--------------------------|--------------------------|------------|-----------------|------|
| Integrated SLM | Brüel & Kjær 2238 | 2562763 | IEC 651 Type 1 | 1 |
| ½" free-field microphone | Brüel & Kjær 4188 | 2658599 | IEC 804 Type 1 | 1 |
| Windshield | Brüel & Kjær UA0237 | N/A | | 1 |
| Acoustical calibrator | Brüel & Kjær 4231 | 2314016 | 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) were used. The calibration certificates for the noise equipments 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. Upon expiry of calibration, both equipments will be calibrated in-house using Brüel & Kjær (B&K) calibrator model no. 4226 annually. The 4226 calibrator is annually calibrated under the accreditation of United Kingdom Accreditation Service. The in-house calibration that has been undertaken can be traced back to the National Physical Laboratory. The calibration certificates for the noise equipments 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, 22 and 28 December 2009 at TLLF(a). 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 (September to December 2009) is 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 Dec 09 | First | 11:10 | 11:40 | 74 | 70 | / | 70 |
| 10 Dec 09 | First | 14:50 | 15:20 | 74 | 70 | / | |
| 16 Dec 09 | First | 10:00 | 10:30 | 74 | 70 | / | |
| 22 Dec 09 | First | 10:30 | 11:00 | 74 | 70 | / | |
| 28 Dec 09 | First | 10:30 | 11:00 | 74 | 70 | / | |

Note (*): Façade correction was included.

Restricted Hours

No night works were carried out 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 Action and 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 10 December 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 2009 and tree no. 69 had been transplanted to new transplanting location in April 2009. 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 | <i>Melaleuca quinquenervia</i> 白千層 | Fell by Typhoon | To be compensated by a tree at designated |

| Tree no. | Location | Botanical Name | | Status | Measures |
|----------|----------|--------------------------------|-----|--|--|
| | | | | | location |
| 16 | LR1 | <i>Melaleuca quinquenervia</i> | 白千層 | Fell by Typhoon | To be compensated by a tree at designated location |
| 35 | LR1 | <i>Melaleuca quinquenervia</i> | 白千層 | Fell by Typhoon | To be compensated by a tree at designated location |
| 63 | LR1 | <i>Gossampinus malabarica</i> | 木棉 | Dead after transplanting | To be compensated by a tree at designated location |
| 69 | LR1 | <i>Melia azedarach</i> | 森樹 | Completion of relocation to new transplanting location | Not applicable |
| 169 | LR2 | <i>Melaleuca quinquenervia</i> | 白千層 | Fell by Typhoon | To be compensated by a tree at designated location |
| 411 | LR2 | <i>Melaleuca quinquenervia</i> | 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 | <i>Acacia confusa</i> | 台灣相思 | Transplanted to Siu Lang Shui Road |
| | 10 | <i>Acacia confusa</i> | 台灣相思 | Transplanted to Siu Lang Shui Road |
| | 15 | <i>Acacia confusa</i> | 台灣相思 | Transplanted to Siu Lang Shui Road |
| | 17 | <i>Acacia confusa</i> | 台灣相思 | Felled |
| | 31 | <i>Acacia confusa</i> | 台灣相思 | Felled |
| | 32 | <i>Acacia confusa</i> | 台灣相思 | Felled |
| | 33 | <i>Hibiscus tiliaceus</i> | 黃槿 | Felled |
| | 34 | <i>Hibiscus tiliaceus</i> | 黃槿 | Felled |
| | 45 | <i>Acacia confusa</i> | 台灣相思 | Felled |
| | 46 | <i>Thevetia peruviana</i> | 黃花夾竹桃 | Felled by Typhoon |
| | 47 | <i>Acacia confusa</i> | 台灣相思 | Felled |
| | 48 | <i>Hibiscus tiliaceus</i> | 黃槿 | Transplanted to Siu Lang Shui Road |

| ID No. | Tree affected | | Current Status |
|--------|---------------|------------------------------------|------------------------------------|
| | No. | Botanical Name | |
| | 49 | <i>Acacia confusa</i> 台灣相思 | Felled |
| | 50 | <i>Hibiscus tiliaceus</i> 黃槿 | Transplanted to Siu Lang Shui Road |
| | 51 | <i>Hibiscus tiliaceus</i> 黃槿 | Transplanted to Siu Lang Shui Road |
| | 52 | <i>Hibiscus tiliaceus</i> 黃槿 | Felled |
| | 53 | <i>Acacia confusa</i> 台灣相思 | Transplanted to Siu Lang Shui Road |
| | 54 | <i>Hibiscus tiliaceus</i> 黃槿 | Transplanted to Siu Lang Shui Road |
| | 55 | <i>Hibiscus tiliaceus</i> 黃槿 | Felled |
| | 56 | <i>Hibiscus tiliaceus</i> 黃槿 | Transplanted to Siu Lang Shui Road |
| | 57 | <i>Hibiscus tiliaceus</i> 黃槿 | Transplanted to Siu Lang Shui Road |
| | 58 | <i>Acacia confusa</i> 台灣相思 | Felled |
| | 59 | <i>Hibiscus tiliaceus</i> 黃槿 | Transplanted to Siu Lang Shui Road |
| | 60 | <i>Acacia confusa</i> 台灣相思 | Felled |
| | 61 | <i>Melaleuca quinquenervia</i> 白千層 | Transplanted to Siu Lang Shui Road |
| | 62 | <i>Acacia confusa</i> 台灣相思 | Felled |
| | 64 | <i>Hibiscus tiliaceus</i> 黃槿 | Felled |
| | 65 | <i>Melia azedarach</i> 森樹 | Felled |
| | 293 | <i>Hibiscus tiliaceus</i> 黃槿 | Felled |
| LR2 | 155 | <i>Acacia confusa</i> 台灣相思 | Felled |
| | 156 | <i>Acacia confusa</i> 台灣相思 | Felled |
| | 163 | <i>Melaleuca quinquenervia</i> 白千層 | Felled |
| | 165 | <i>Acacia confusa</i> 台灣相思 | Felled |
| | 167 | <i>Acacia confusa</i> 台灣相思 | Felled |
| | 168 | <i>Acacia confusa</i> 台灣相思 | Felled |
| | 170 | <i>Hibiscus tiliaceus</i> 黃槿 | Felled |
| | 171 | <i>Hibiscus tiliaceus</i> 黃槿 | Felled |
| | 172 | <i>Acacia confusa</i> 台灣相思 | Felled |
| | 173 | <i>Acacia confusa</i> 台灣相思 | Felled |
| | 174 | <i>Acacia confusa</i> 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 month.

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 November 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 | 285 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 | 300 kg | | Disposal of at Dunwell Ind. Ltd. |
| General Refuse | 5 m ³ | | Disposal of at WENT landfill |

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

| Waste Type | Estimated Amount | Actual Amount | Disposal Locations |
|---------------------------|--------------------|--------------------|--|
| Inert C&D Waste | 775 m ³ | 775 m ³ | Disposal of at fill bank at Tuen Mun Area 38 |
| Metals | 4 kg | 4 kg | Recycle collector |
| Paper/cardboard packaging | 8 kg | 8 kg | Recycle collector |
| Chemical Waste | 0 kg | 0 kg | Disposal of at SENT landfill |
| General Refuse | 20 m ³ | 20 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 2, 10, 17, 24 and 29 December 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 |
|-----------------|---|---------------------------------------|---|
| 2 Dec 09 | Stagnant water was observed inside the sedimentation tank. The Contractor shall clear the stagnant water. | Agreed with the ET's advice | Stagnant water had been cleaned; closed on 10 Dec 09 |
| | The Contractor was reminded to continuous carried out water spraying regularly to minimize dust disturbance and cover the exposed soil with tarpaulin or other means after daily works completed. | Agreed with the ET's advice | Water spraying had been continuous carried out; closed on 10 Dec 09 |
| 10 Dec 09 | The Contractor shall remove the garbage and C&D waste which outside the waste bin and on the ground. | Agreed with the ET's advice | Garbage and C&D waste had been removed; closed on 17 Dec 09 |
| 17 Dec 09 | The site condition was generally satisfactory. | - | - |
| 24 Dec 09 | The site condition was generally satisfactory. | - | - |
| 29 Dec 09 | The site condition was generally satisfactory. | - | - |

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 | |
|--------------|--|---|
| January 2010 | <ul style="list-style-type: none"> ▪ Site clearance ▪ Fabrication of the sign gantry | <ul style="list-style-type: none"> ▪ Road re-construction ▪ Re-compaction of fill slope |

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 season. 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

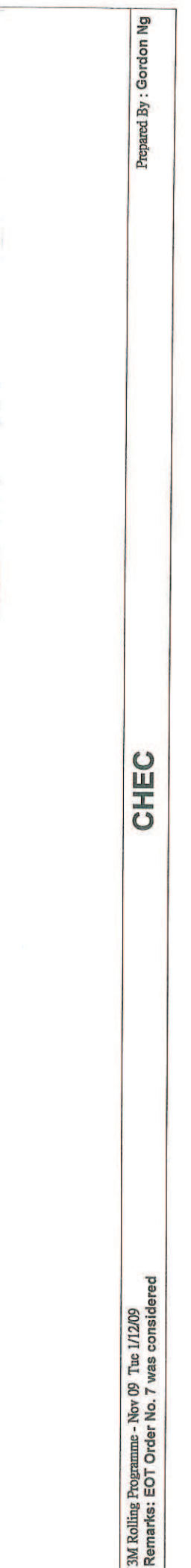
- 1) Maunsell Consultants Asia Ltd. December 2007. Quotation Ref No. Hy(S)Q/026/2006 Widening of Tuen Mun Road at Tsing Tin Interchange – Environmental Monitoring & Audit Manual.
- 2) Ove Arup & Partners Hong Kong Limited. September 2008. Contract No. HY/2007/14 Widening of Tsing Tin Interchange – Baseline Monitoring Report (Revision_6)

Appendix A

**Construction
Programme**

3 Month Rolling Programme

| ID | Task Name | Duration | Start | Finish | Predecessors | % Complete |
|-----|---|----------|--------------|--------------|----------------|------------|
| 1 | Letter of Acceptance | 0 days | Fri 30/5/08 | Fri 30/5/08 | | 0% |
| 2 | Project Commencement | 0 days | Fri 6/6/08 | Fri 6/6/08 | | 0% |
| 3 | Revised SECTION 1 Completion | 0 days | Tue 15/12/09 | Tue 15/12/09 | | 0% |
| 4 | Revised SECTION 3 Completion | 0 days | Thu 24/12/09 | Thu 24/12/09 | | 0% |
| 5 | Permanent Works Design | 232 days | Fri 6/6/08 | Wed 11/3/09 | | 100% |
| 21 | TTA & General Submission | 322 days | Fri 6/6/08 | Thu 2/7/09 | | 99% |
| 31 | SECTION 1 | 450 days | Sat 26/7/08 | Thu 21/1/10 | | 99% |
| 32 | Tuen Mun Road South Bound | 450 days | Sat 26/7/08 | Thu 21/1/10 | | 89% |
| 33 | Noise Barrier Foundation | 241 days | Sat 26/7/08 | Sat 16/5/09 | | 100% |
| 46 | Road Works | 203 days | Mon 18/5/09 | Thu 14/1/10 | | 69% |
| 47 | Road pavement & drainage for widen lane (lane 1) | 60 days | Mon 18/5/09 | Tue 28/7/09 | 45 | 100% |
| 48 | Re-construct existing slow lane (lane 2) | 15 days | Sun 29/11/09 | Wed 16/12/09 | 48,96,100 | 50% |
| 49 | Re-construct existing flat lane (lane 3) | 23 days | Thu 17/12/09 | Thu 14/1/10 | 49 | 0% |
| 51 | Sign Gantry | 294 days | Mon 2/2/09 | Thu 21/1/10 | | 86% |
| 52 | Construct eastern sign gantry footing (SG1) | 30 days | Mon 2/2/09 | Sat 7/3/09 | | 100% |
| 53 | Construct middle sign gantry footing (SG1) | 25 days | Mon 2/2/09 | Mon 2/3/09 | | 100% |
| 54 | Construct western sign gantry footing (SG1) | 25 days | Thu 17/12/09 | Sat 16/1/10 | 40 | 100% |
| 55 | Fabrication of sign gantry (SG1) | 90 days | Sun 27/9/09 | Wed 13/1/10 | 29 | 75% |
| 56 | Erection the sign gantry (Slip D) | 2 days | Mon 18/1/10 | Tue 19/1/10 | 56,55,53,54 | 100% |
| 57 | Erection the sign gantry (TMR SB) | 2 days | Wed 20/1/10 | Thu 21/1/10 | 56,55,53,54,57 | 0% |
| 59 | Tuen Mun Road North Bound | 394 days | Wed 3/9/08 | Wed 23/12/09 | | 97% |
| 60 | Noise Barrier Foundation | 134 days | Mon 15/9/08 | Wed 25/2/09 | | 100% |
| 72 | Road Works | 262 days | Thu 12/2/09 | Wed 23/12/09 | | 95% |
| 73 | Existing UJ diversion | 12 days | Thu 12/2/09 | Wed 25/2/09 | 69FS,9 days | 100% |
| 74 | Road pavement & drainage for widen lane (lane 1) | 88 days | Thu 26/2/09 | Mon 15/6/09 | 74,71 | 100% |
| 75 | Re-construct existing slow lane (lane 2) & 450mm pipe | 50 days | Sat 22/8/09 | Tue 20/10/09 | 75,114,118,86 | 100% |
| 76 | Re-construct existing fast lane (lane 3) & 450mm pipe | 40 days | Sat 7/11/09 | Wed 23/12/09 | 76 | 75% |
| 77 | High Mast Lighting and CCTV | 177 days | Wed 3/9/08 | Mon 6/4/09 | | 91% |
| 78 | SECTION 3 | 318 days | Mon 29/12/08 | Wed 20/1/10 | | 96% |
| 79 | Tuen Mun Road South Bound | 318 days | Mon 29/12/08 | Wed 20/1/10 | | 93% |
| 91 | Slip Road D | 196 days | Mon 16/3/09 | Sat 7/11/09 | | 100% |
| 92 | Slip Road C | 254 days | Mon 29/12/08 | Wed 4/11/09 | | 100% |
| 93 | Sign Gantry | 67 days | Mon 2/11/09 | Wed 20/1/10 | | 45% |
| 101 | Fabrication of sign gantry (SG2) | 60 days | Mon 2/11/09 | Tue 12/1/10 | | 50% |
| 102 | Erection the sign gantry (TMR SB) | 7 days | Wed 13/1/10 | Wed 20/1/10 | 102 | 0% |
| 103 | Noise Barrier Erection | 30 days | Fri 7/8/09 | Thu 10/9/09 | | 100% |
| 104 | Tuen Mun Road North Bound | 191 days | Mon 29/12/08 | Fri 21/8/09 | | 100% |
| 109 | Slip Road A | 184 days | Mon 29/12/08 | Thu 13/8/09 | | 100% |
| 110 | Slip Road B | 191 days | Mon 29/12/08 | Fri 21/8/09 | | 100% |
| 111 | Noise Barrier Erection | 25 days | Fri 29/5/09 | Fri 26/6/09 | | 100% |



Appendix B

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



TISCH ENVIRONMENTAL, INC.
 145 SOUTH MIAMI AVE.
 VILLAGE OF CLEVELAND, 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 -. Feb 23, 2009 Rootsometer S/N 9833620 Ta (K) - 293
 Operator Tisch Orifice I.D. - 1378 Pa (mm) - 765.81

| 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 | 1.4180 | 3.2 | 2.00 |
| 2 | NA | NA | 1.00 | 0.9970 | 6.4 | 4.00 |
| 3 | NA | NA | 1.00 | 0.8930 | 7.9 | 5.00 |
| 4 | NA | NA | 1.00 | 0.8520 | 8.8 | 5.50 |
| 5 | NA | NA | 1.00 | 0.7030 | 12.8 | 8.00 |

DATA TABULATION

| Vstd | (x axis) Qstd | (y axis) | Va | (x axis) Qa | (y axis) |
|-------------------------------------|---------------|----------|---------------------------|-------------|----------|
| 1.0205 | 0.7197 | 1.4317 | 0.9958 | 0.7022 | 0.8748 |
| 1.0162 | 1.0192 | 2.0247 | 0.9915 | 0.9945 | 1.2371 |
| 1.0142 | 1.1357 | 2.2637 | 0.9896 | 1.1082 | 1.3831 |
| 1.0130 | 1.1890 | 2.3742 | 0.9885 | 1.1602 | 1.4506 |
| 1.0077 | 1.4334 | 2.8633 | 0.9832 | 1.3987 | 1.7495 |
| Qstd slope (m) = 2.00826 | | | Qa slope (m) = 1.25754 | | |
| intercept (b) = -0.01649 | | | intercept (b) = -0.01008 | | |
| coefficient (r) = 0.99995 | | | coefficient (r) = 0.99995 | | |
| 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

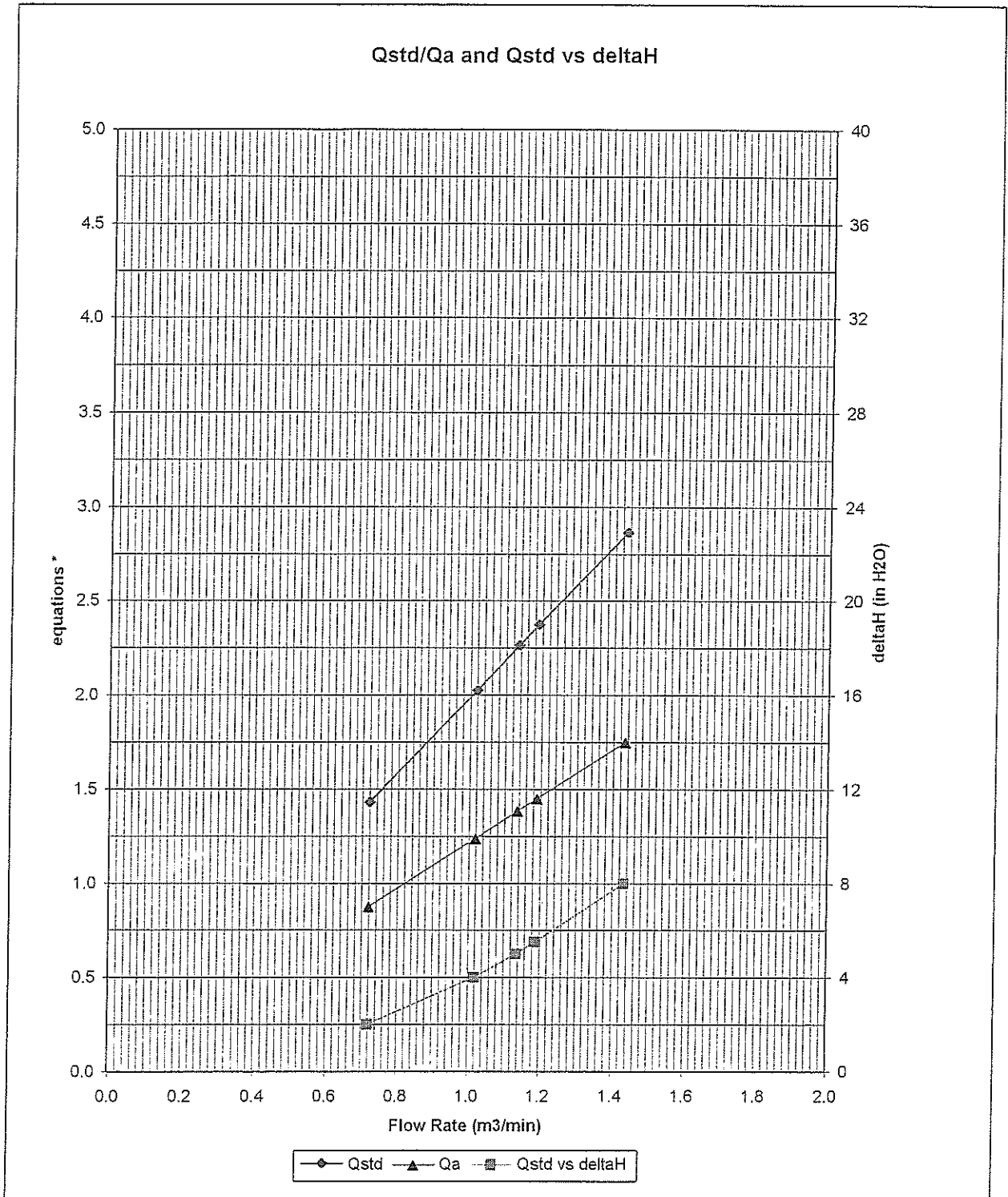
For subsequent flow rate calculations:

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



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AIR POLLUTION MONITORING EQUIPMENT



* y-axis equations:

Qstd series:
$$\sqrt{\Delta H \left(\frac{P_a}{P_{std}} \right) \left(\frac{T_{std}}{T_a} \right)}$$

Qa series:
$$\sqrt{(\Delta H (T_a / P_a))}$$

1378

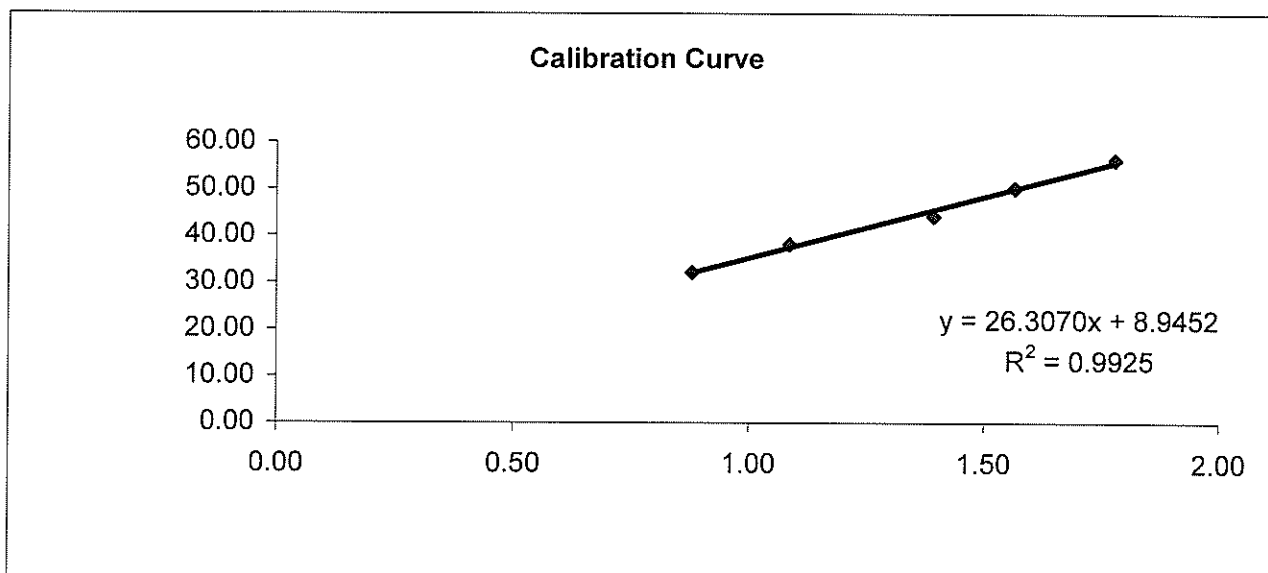
Ove Arup Partners (Hong Kong) Limited

High Volume Air Sampler Calibration Worksheet

| | | | |
|-----------------------|-----------------------------|---------------------|-----------|
| Calibration date | 26-Nov-09 | Barometric pressure | 762 mm Hg |
| Calibration due date | 25-Jan-10 | Temperature (°C) | 23 °C |
| Sampler location | TT1-Roof, Kwong Choi Market | Temperature (K) | 296 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 ₂ O) | Flow Recorder Reading (CFM) | Calculated Q _{std} (m ³ /min) | Continuous Flow Recorder Reading IC (CFM) |
|----------------------|---|-----------------------------|---|---|
| 5 | 3.00 | 32.00 | 0.88 | 32.15 |
| 7 | 4.60 | 38.00 | 1.09 | 38.18 |
| 10 | 7.60 | 44.00 | 1.39 | 44.21 |
| 13 | 9.60 | 50.00 | 1.57 | 50.23 |
| 18 | 12.40 | 56.00 | 1.78 | 56.26 |



Linear Regression

Sampler slope (m) : **26.3070**
 Sampler intercept (b) : **8.9452**
 Correlation coefficient (R²) : **0.9925**

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

Performed by:

Date: 26/11/09

Checked by: Kam

Date: 26/11/09

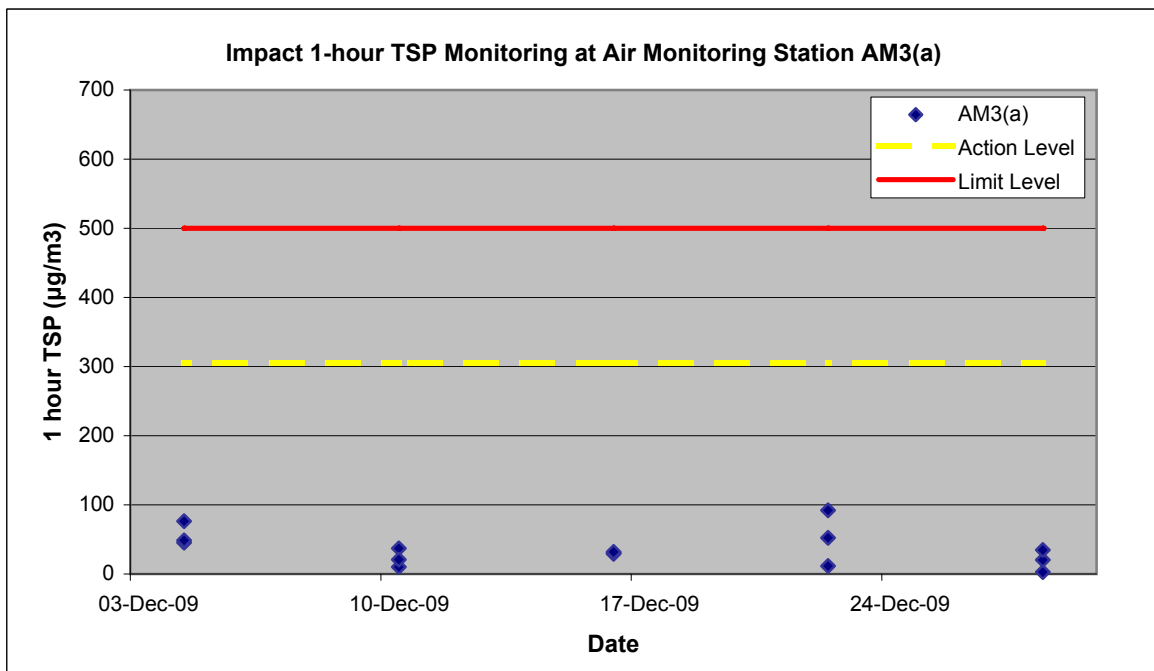
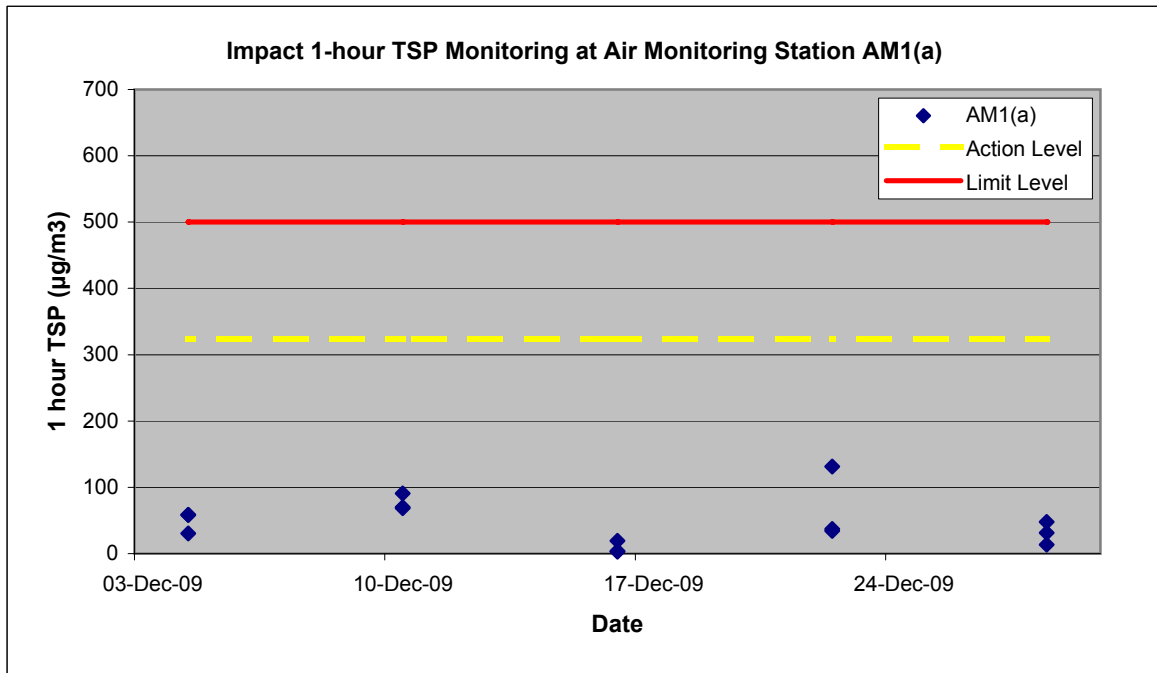
Appendix C

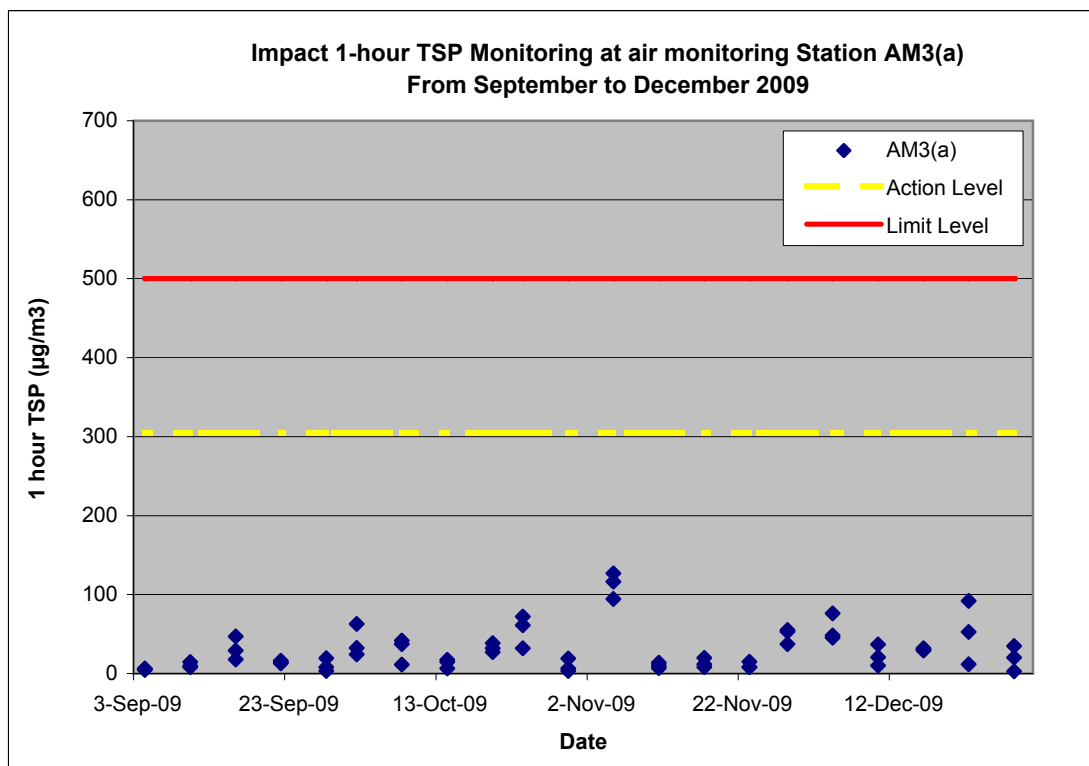
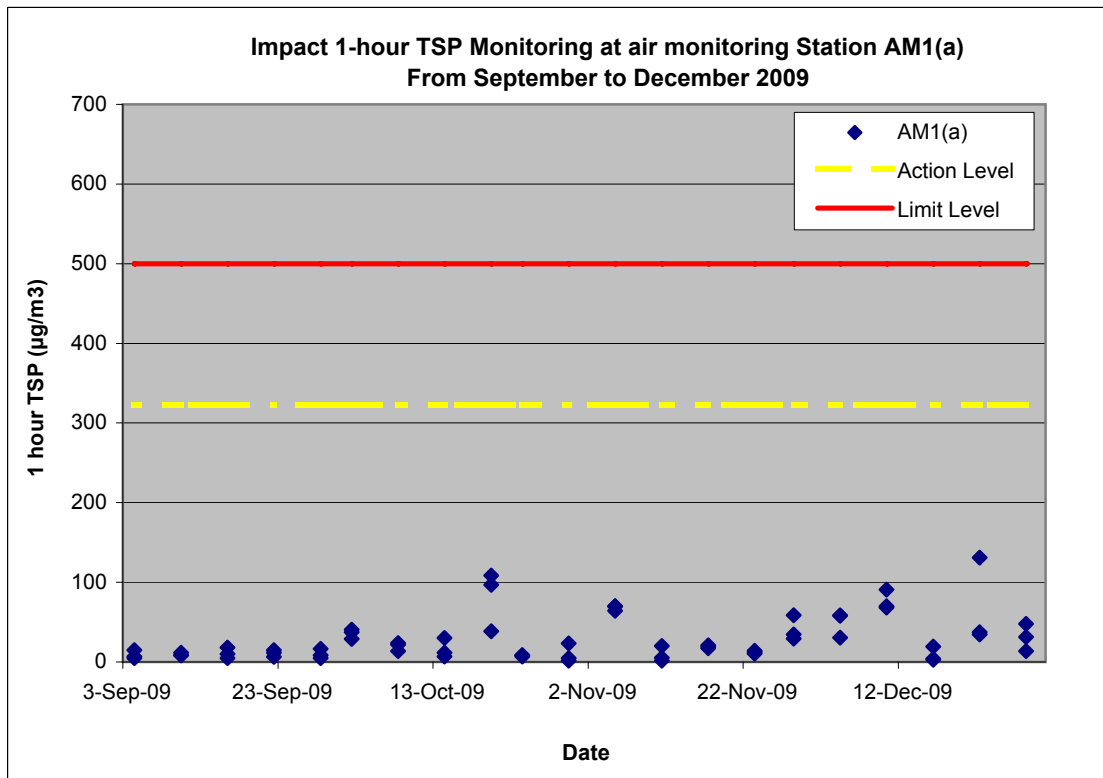
**Impact Air Monitoring
Results**

**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 (m³/min) | | Average Flow Rate (m³/min) | Elapse Time | | Sampling Time | Total vol. (m³) | AM1(a) | AM3(a) |
|------------|--------|-----------|--------------|-------------------|------------------|-----------------|-------|------------------|-------|-----------------------------|-------|-------------------|--------|----------------|--------------------|--------|----------------------------|-------------|----------|---------------|-----------------|--------|--------|
| | | | | | | Initial | Final | Initial | Final | Initial | Final | Initial | Final | | Initial | Final | | Start | Finish | | | | |
| 100605 | Dec-09 | 4-Dec-09 | TT1-1 | Fine | Normal Operation | 765.0 | 765.0 | 19.0 | 19.0 | 40.0 | 40.0 | 2.8242 | 2.8284 | 0.0042 | 1.2010 | 1.2010 | 1.2010 | 10593.31 | 10594.31 | 60.00 | 72.06 | 58.3 | |
| 100606 | Dec-09 | 4-Dec-09 | TT1-2 | Fine | Normal Operation | 765.0 | 765.0 | 19.0 | 19.0 | 40.0 | 40.0 | 2.8131 | 2.8173 | 0.0042 | 1.2010 | 1.2010 | 1.2010 | 10594.31 | 10595.31 | 60.00 | 72.06 | 58.3 | |
| 100607 | Dec-09 | 4-Dec-09 | TT1-3 | Fine | Normal Operation | 765.0 | 765.0 | 19.0 | 19.0 | 40.0 | 40.0 | 2.8391 | 2.8413 | 0.0022 | 1.2010 | 1.2010 | 1.2010 | 10595.31 | 10596.31 | 60.00 | 72.06 | 30.5 | |
| 100608 | Dec-09 | 4-Dec-09 | TT2-1 | Fine | Normal Operation | 765.0 | 765.0 | 19.0 | 19.0 | 40.0 | 40.0 | 2.8148 | 2.8200 | 0.0052 | 1.1373 | 1.1373 | 1.1373 | 10169.18 | 10170.18 | 60.00 | 68.24 | | 76.2 |
| 100609 | Dec-09 | 4-Dec-09 | TT2-2 | Fine | Normal Operation | 765.0 | 765.0 | 19.0 | 19.0 | 40.0 | 40.0 | 2.8101 | 2.8132 | 0.0031 | 1.1373 | 1.1373 | 1.1373 | 10170.18 | 10171.18 | 60.00 | 68.24 | | 45.4 |
| 100610 | Dec-09 | 4-Dec-09 | TT2-3 | Fine | Normal Operation | 765.0 | 765.0 | 19.0 | 19.0 | 40.0 | 40.0 | 2.8100 | 2.8133 | 0.0033 | 1.1373 | 1.1373 | 1.1373 | 10171.18 | 10172.18 | 60.00 | 68.24 | | 48.4 |
| 100524 | Dec-09 | 10-Dec-09 | TT1-1 | Fine | Normal Operation | 761.0 | 761.0 | 21.0 | 21.0 | 40.0 | 40.0 | 2.8205 | 2.8254 | 0.0049 | 1.1918 | 1.1918 | 1.1918 | 10620.31 | 10621.31 | 60.00 | 71.51 | 68.5 | |
| 100525 | Dec-09 | 10-Dec-09 | TT1-2 | Fine | Normal Operation | 761.0 | 761.0 | 21.0 | 21.0 | 40.0 | 40.0 | 2.8418 | 2.8468 | 0.0050 | 1.1918 | 1.1918 | 1.1918 | 10621.31 | 10622.31 | 60.00 | 71.51 | 69.9 | |
| 100526 | Dec-09 | 10-Dec-09 | TT1-3 | Fine | Normal Operation | 761.0 | 761.0 | 21.0 | 21.0 | 40.0 | 40.0 | 2.8448 | 2.8513 | 0.0065 | 1.1918 | 1.1918 | 1.1918 | 10622.31 | 10623.31 | 60.00 | 71.51 | 90.9 | |
| 100497 | Dec-09 | 10-Dec-09 | TT2-1 | Fine | Normal Operation | 761.0 | 761.0 | 21.0 | 21.0 | 40.0 | 40.0 | 2.8095 | 2.8120 | 0.0025 | 1.1294 | 1.1294 | 1.1294 | 10196.18 | 10197.18 | 60.00 | 67.76 | | 36.9 |
| 100498 | Dec-09 | 10-Dec-09 | TT2-2 | Fine | Normal Operation | 761.0 | 761.0 | 21.0 | 21.0 | 40.0 | 40.0 | 2.8285 | 2.8292 | 0.0007 | 1.1294 | 1.1294 | 1.1294 | 10197.18 | 10198.18 | 60.00 | 67.76 | | 10.3 |
| 100499 | Dec-09 | 10-Dec-09 | TT2-3 | Fine | Normal Operation | 761.0 | 761.0 | 21.0 | 21.0 | 40.0 | 40.0 | 2.7785 | 2.7799 | 0.0014 | 1.1294 | 1.1294 | 1.1294 | 10198.18 | 10199.18 | 60.00 | 67.76 | | 20.7 |
| 100529 | Dec-09 | 16-Dec-09 | TT1-1 | Fine | Normal Operation | 766.0 | 766.0 | 14.0 | 14.0 | 40.0 | 40.0 | 2.8385 | 2.8387 | 0.0002 | 1.2154 | 1.2154 | 1.2154 | 10647.31 | 10648.31 | 60.00 | 72.92 | 2.7 | |
| 100544 | Dec-09 | 16-Dec-09 | TT1-2 | Fine | Normal Operation | 766.0 | 766.0 | 14.0 | 14.0 | 40.0 | 40.0 | 2.8981 | 2.8984 | 0.0003 | 1.2154 | 1.2154 | 1.2154 | 10648.31 | 10649.31 | 60.00 | 72.92 | 4.1 | |
| 100545 | Dec-09 | 16-Dec-09 | TT1-3 | Fine | Normal Operation | 766.0 | 766.0 | 14.0 | 14.0 | 40.0 | 40.0 | 2.8831 | 2.8845 | 0.0014 | 1.2154 | 1.2154 | 1.2154 | 10649.31 | 10650.31 | 60.00 | 72.92 | 19.2 | |
| 100548 | Dec-09 | 16-Dec-09 | TT2-1 | Fine | Normal Operation | 766.0 | 766.0 | 14.0 | 14.0 | 40.0 | 40.0 | 2.8694 | 2.8715 | 0.0021 | 1.1494 | 1.1494 | 1.1494 | 10223.18 | 10224.18 | 60.00 | 68.96 | | 30.5 |
| 100549 | Dec-09 | 16-Dec-09 | TT2-2 | Fine | Normal Operation | 766.0 | 766.0 | 14.0 | 14.0 | 40.0 | 40.0 | 2.9080 | 2.9100 | 0.0020 | 1.1494 | 1.1494 | 1.1494 | 10224.18 | 10225.18 | 60.00 | 68.96 | | 29.0 |
| 100550 | Dec-09 | 16-Dec-09 | TT2-3 | Fine | Normal Operation | 766.0 | 766.0 | 14.0 | 14.0 | 40.0 | 40.0 | 2.8812 | 2.8834 | 0.0022 | 1.1494 | 1.1494 | 1.1494 | 10225.18 | 10226.18 | 60.00 | 68.96 | | 31.9 |
| 100597 | Dec-09 | 22-Dec-09 | TT1-1 | Fine | Normal Operation | 766.0 | 766.0 | 17.0 | 17.0 | 40.0 | 40.0 | 2.8912 | 2.8937 | 0.0025 | 1.2074 | 1.2074 | 1.2074 | 10674.31 | 10675.31 | 60.00 | 72.44 | 34.5 | |
| 100598 | Dec-09 | 22-Dec-09 | TT1-2 | Fine | Normal Operation | 766.0 | 766.0 | 17.0 | 17.0 | 40.0 | 40.0 | 2.8761 | 2.8856 | 0.0095 | 1.2074 | 1.2074 | 1.2074 | 10675.31 | 10676.31 | 60.00 | 72.44 | 131.1 | |
| 100599 | Dec-09 | 22-Dec-09 | TT1-3 | Fine | Normal Operation | 766.0 | 766.0 | 17.0 | 17.0 | 40.0 | 40.0 | 2.8390 | 2.8417 | 0.0027 | 1.2074 | 1.2074 | 1.2074 | 10676.31 | 10677.31 | 60.00 | 72.44 | 37.3 | |
| 100600 | Dec-09 | 22-Dec-09 | TT2-1 | Fine | Normal Operation | 766.0 | 766.0 | 17.0 | 17.0 | 40.0 | 40.0 | 2.8801 | 2.8864 | 0.0063 | 1.1426 | 1.1426 | 1.1426 | 10250.18 | 10251.18 | 60.00 | 68.56 | | 91.9 |
| 100601 | Dec-09 | 22-Dec-09 | TT2-2 | Fine | Normal Operation | 766.0 | 766.0 | 17.0 | 17.0 | 40.0 | 40.0 | 2.8431 | 2.8439 | 0.0008 | 1.1426 | 1.1426 | 1.1426 | 10251.18 | 10252.18 | 60.00 | 68.56 | | 11.7 |
| 100602 | Dec-09 | 22-Dec-09 | TT2-3 | Fine | Normal Operation | 766.0 | 766.0 | 17.0 | 17.0 | 40.0 | 40.0 | 2.8261 | 2.8297 | 0.0036 | 1.1426 | 1.1426 | 1.1426 | 10252.18 | 10253.18 | 60.00 | 68.56 | | 52.5 |
| 100591 | Dec-09 | 28-Dec-09 | TT1-1 | cloudy | Normal Operation | 763.0 | 763.0 | 13.0 | 13.0 | 40.0 | 40.0 | 2.8051 | 2.8074 | 0.0023 | 1.2151 | 1.2151 | 1.2151 | 10701.31 | 10702.31 | 60.00 | 72.91 | 31.5 | |
| 100618 | Dec-09 | 28-Dec-09 | TT1-2 | cloudy | Normal Operation | 763.0 | 763.0 | 13.0 | 13.0 | 40.0 | 40.0 | 2.8500 | 2.8535 | 0.0035 | 1.2151 | 1.2151 | 1.2151 | 10702.31 | 10703.31 | 60.00 | 72.91 | 48.0 | |
| 100620 | Dec-09 | 28-Dec-09 | TT1-3 | cloudy | Normal Operation | 763.0 | 763.0 | 13.0 | 13.0 | 40.0 | 40.0 | 2.8550 | 2.8560 | 0.0010 | 1.2151 | 1.2151 | 1.2151 | 10703.31 | 10704.31 | 60.00 | 72.91 | 13.7 | |
| 100789 | Dec-09 | 28-Dec-09 | TT2-1 | cloudy | Normal Operation | 763.0 | 763.0 | 13.0 | 13.0 | 40.0 | 40.0 | 2.8701 | 2.8703 | 0.0002 | 1.1491 | 1.1491 | 1.1491 | 10277.18 | 10278.18 | 60.00 | 68.95 | | 2.9 |
| 100619 | Dec-09 | 28-Dec-09 | TT2-2 | cloudy | Normal Operation | 763.0 | 763.0 | 13.0 | 13.0 | 40.0 | 40.0 | 2.8410 | 2.8424 | 0.0014 | 1.1491 | 1.1491 | 1.1491 | 10278.18 | 10279.18 | 60.00 | 68.95 | | 20.3 |
| 100621 | Dec-09 | 28-Dec-09 | TT2-3 | cloudy | Normal Operation | 763.0 | 763.0 | 13.0 | 13.0 | 40.0 | 40.0 | 2.8491 | 2.8515 | 0.0024 | 1.1491 | 1.1491 | 1.1491 | 10279.18 | 10280.18 | 60.00 | 68.95 | | 34.8 |

| | | |
|----------------|-------|------|
| Average | 46.6 | 36.2 |
| Max | 131.1 | 91.9 |
| Min | 2.7 | 2.9 |

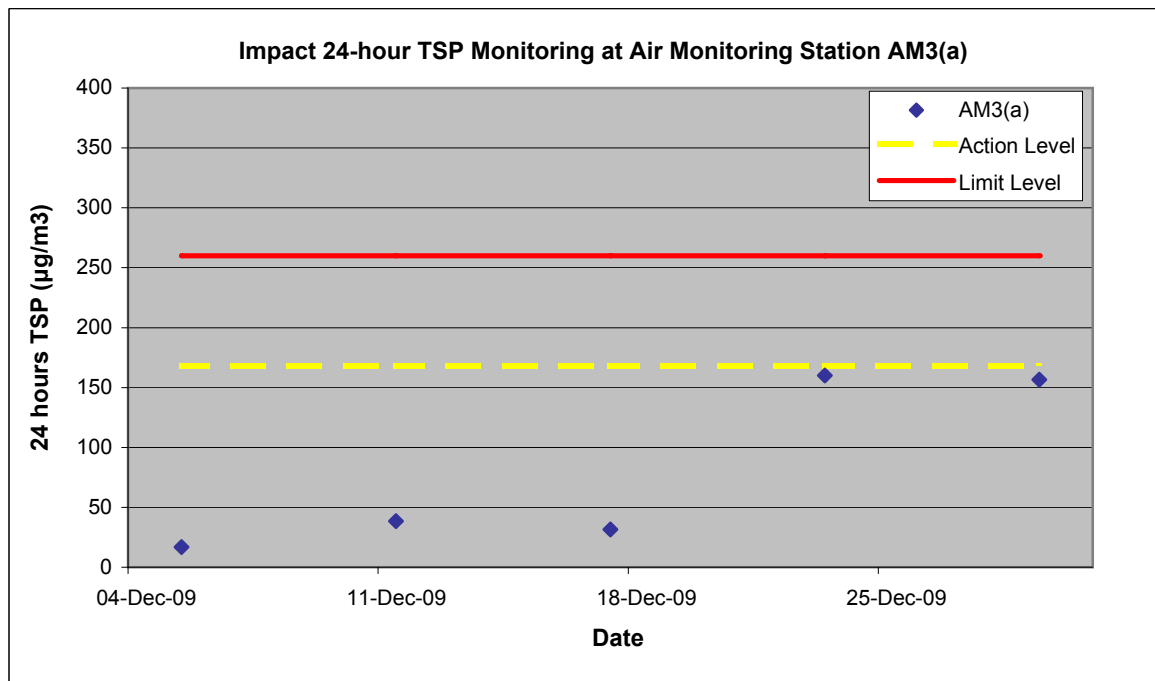
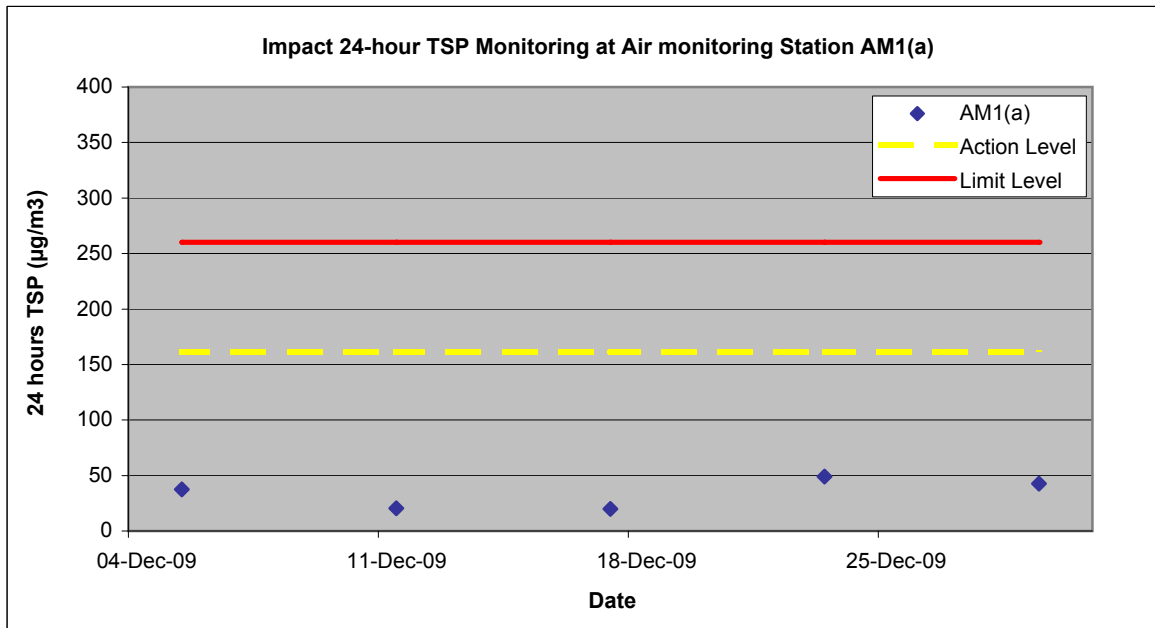


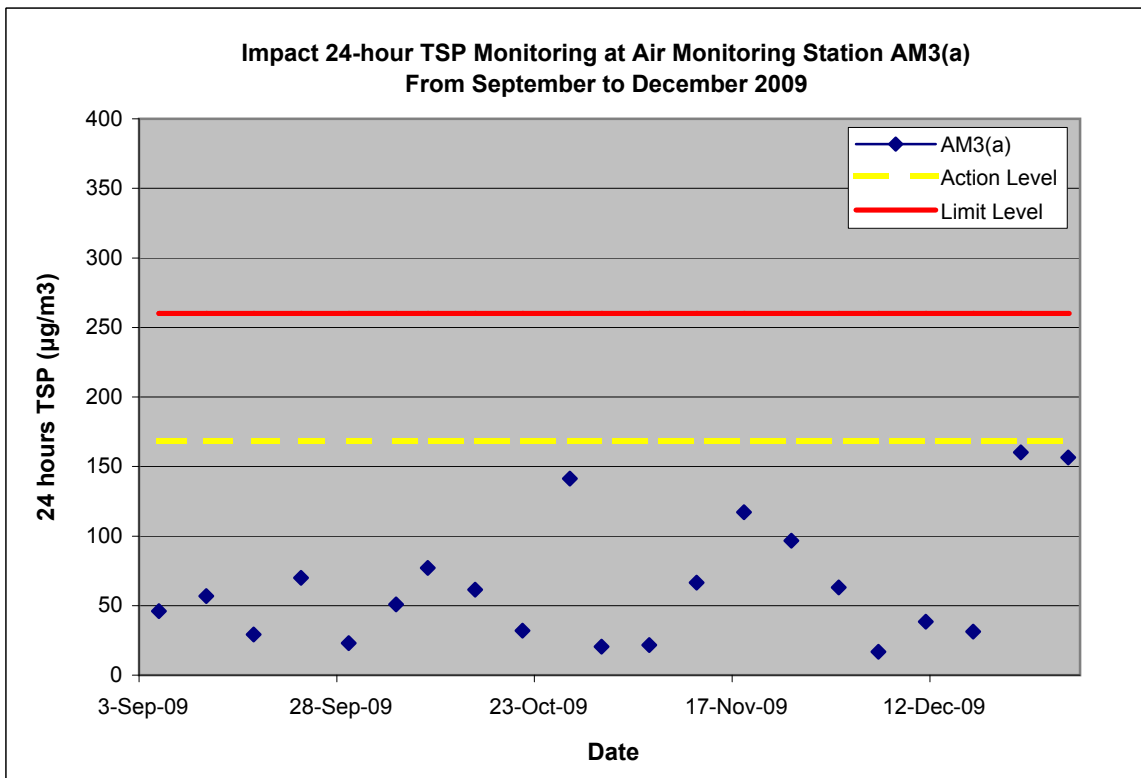
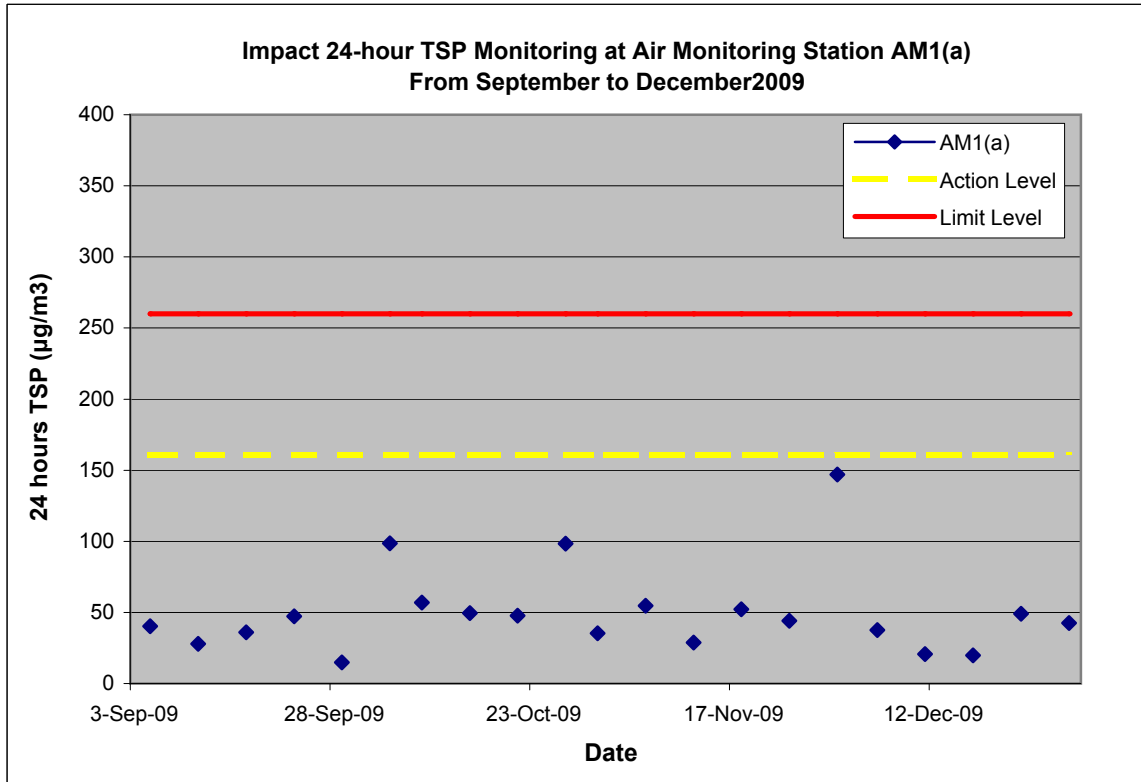


**Contract No. Hy/2007/14 - Widening of Tuen Mun Road at Tsing Tin Interchange
Impact Air Monitoring Result - 24 hours TSP**

| Filter No. | Month | Date | Receptor No. | Weather condition | Site condition | Pressure (mmHg) | | Temperature (oC) | | Flow Recorder Reading (CFM) | | Weight (g) | | TSP weight (g) | 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 | | | | |
| 100496 | Dec-09 | 5-Dec-09 | TT1 | Fine | Normal Operation | 764.0 | 763.0 | 15.0 | 17.0 | 40.0 | 40.0 | 2.8278 | 2.8931 | 0.0653 | 1.2107 | 1.2043 | 1.2075 | 10596.31 | 10620.31 | 1440.00 | 1738.80 | 37.6 | |
| 100495 | Dec-09 | 5-Dec-09 | TT2 | Fine | Normal Operation | 764.0 | 763.0 | 15.0 | 17.0 | 40.0 | 40.0 | 2.8426 | 2.8702 | 0.0276 | 1.1454 | 1.1400 | 1.1427 | 10172.18 | 10196.18 | 1440.00 | 1645.49 | | 16.8 |
| 100527 | Dec-09 | 11-Dec-09 | TT1 | Fine | Normal Operation | 762.0 | 761.0 | 20.0 | 20.0 | 40.0 | 40.0 | 2.8468 | 2.8823 | 0.0355 | 1.1954 | 1.1944 | 1.1949 | 10623.31 | 10647.31 | 1440.00 | 1720.66 | 20.6 | |
| 100528 | Dec-09 | 11-Dec-09 | TT2 | Fine | Normal Operation | 762.0 | 761.0 | 20.0 | 20.0 | 40.0 | 40.0 | 2.8552 | 2.9180 | 0.0628 | 1.1325 | 1.1317 | 1.1321 | 10199.18 | 10223.18 | 1440.00 | 1630.22 | | 38.5 |
| 100604 | Dec-09 | 17-Dec-09 | TT1 | Fine | Normal Operation | 767.0 | 768.0 | 12.0 | 12.0 | 40.0 | 40.0 | 2.8582 | 2.8930 | 0.0348 | 1.2219 | 1.2229 | 1.2224 | 10650.31 | 10674.31 | 1440.00 | 1760.26 | 19.8 | |
| 100603 | Dec-09 | 17-Dec-09 | TT2 | Fine | Normal Operation | 767.0 | 768.0 | 12.0 | 12.0 | 40.0 | 40.0 | 2.8221 | 2.8744 | 0.0523 | 1.1548 | 1.1557 | 1.1553 | 10226.18 | 10250.18 | 1440.00 | 1663.56 | | 31.4 |
| 100623 | Dec-09 | 23-Dec-09 | TT1 | Fine | Normal Operation | 764.0 | 762.0 | 15.0 | 18.0 | 40.0 | 40.0 | 2.8573 | 2.9424 | 0.0851 | 1.2107 | 1.2007 | 1.2057 | 10677.31 | 10701.31 | 1440.00 | 1736.21 | 49.0 | |
| 100685 | Dec-09 | 23-Dec-09 | TT2 | Fine | Normal Operation | 764.0 | 762.0 | 15.0 | 18.0 | 40.0 | 40.0 | 2.7500 | 3.0131 | 0.2631 | 1.1454 | 1.1370 | 1.1412 | 10253.18 | 10277.18 | 1440.00 | 1643.33 | | 160.1 |
| 100626 | Dec-09 | 29-Dec-09 | TT1 | Cloudy | Normal Operation | 761.0 | 761.0 | 15.0 | 17.0 | 40.0 | 40.0 | 2.8582 | 2.9322 | 0.0740 | 1.2076 | 1.2023 | 1.2050 | 10704.31 | 10728.31 | 1440.00 | 1735.13 | 42.6 | |
| 100627 | Dec-09 | 29-Dec-09 | TT2 | Cloudy | Normal Operation | 761.0 | 761.0 | 15.0 | 17.0 | 40.0 | 40.0 | 2.8288 | 3.0860 | 0.2572 | 1.1428 | 1.1383 | 1.1406 | 10280.18 | 10304.18 | 1440.00 | 1642.39 | | 156.6 |

| | | |
|----------------|------|-------|
| Average | 33.9 | 80.7 |
| Max | 49.0 | 160.1 |
| Min | 19.8 | 16.8 |

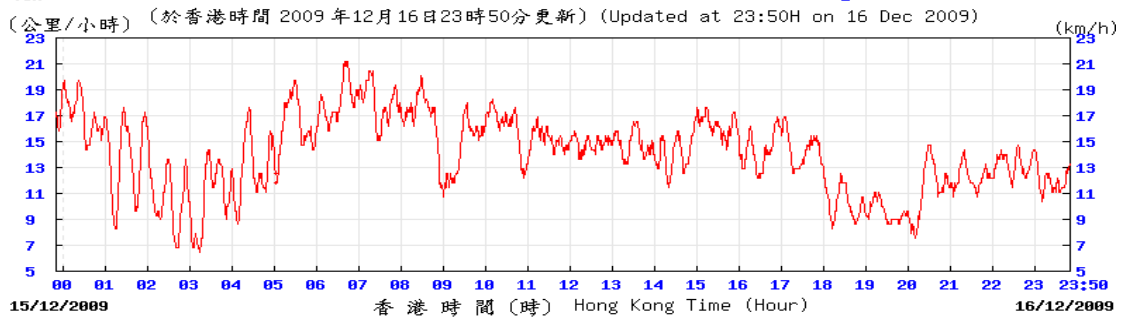
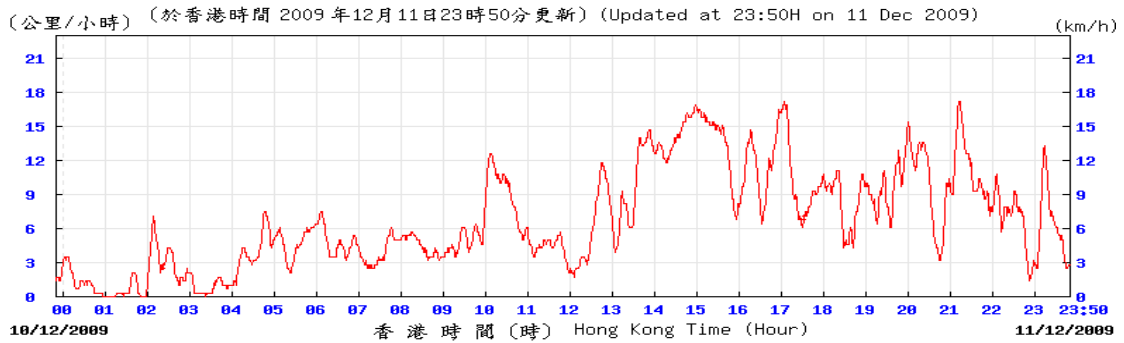
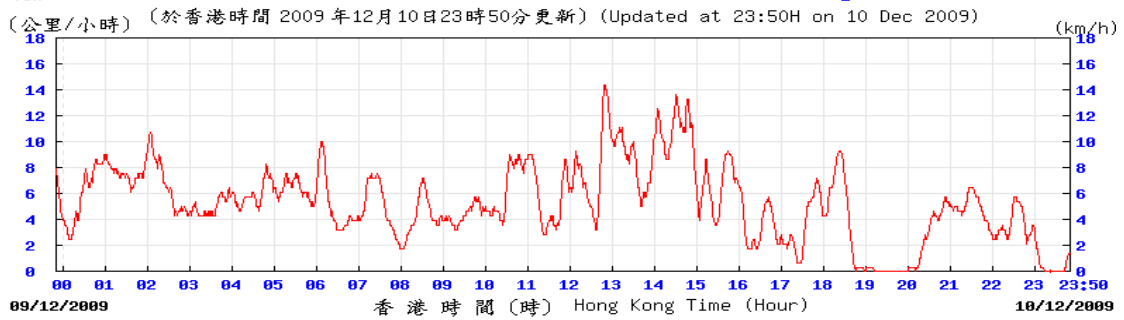
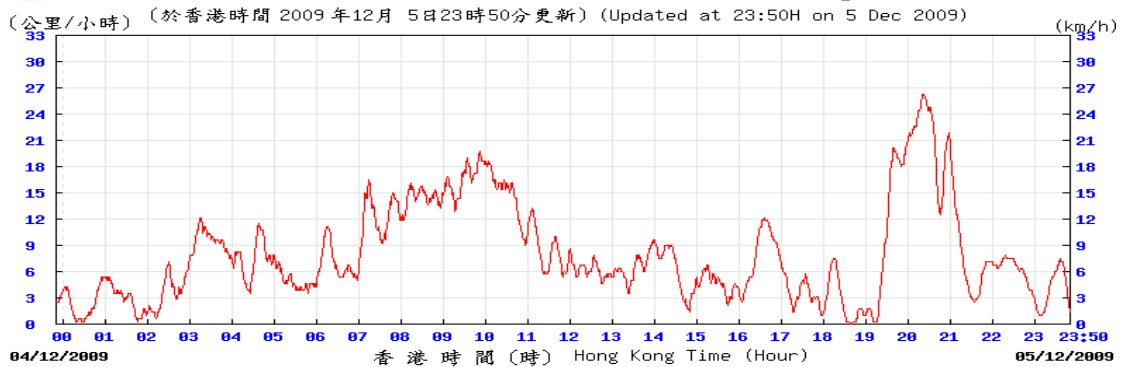
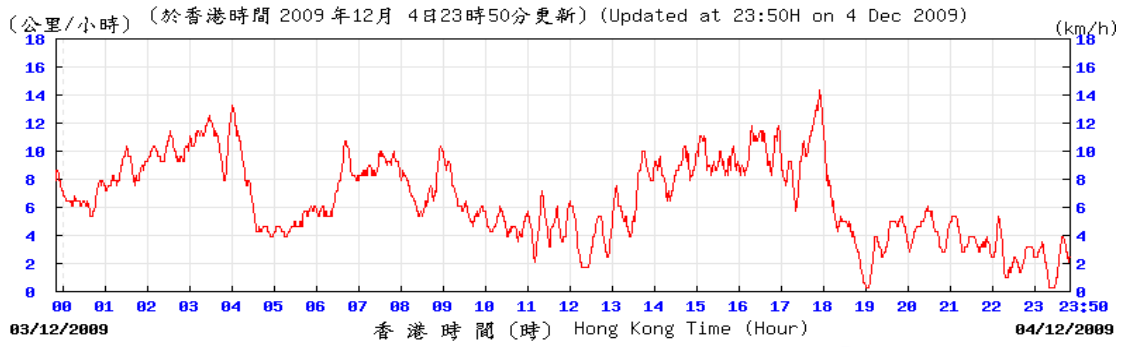


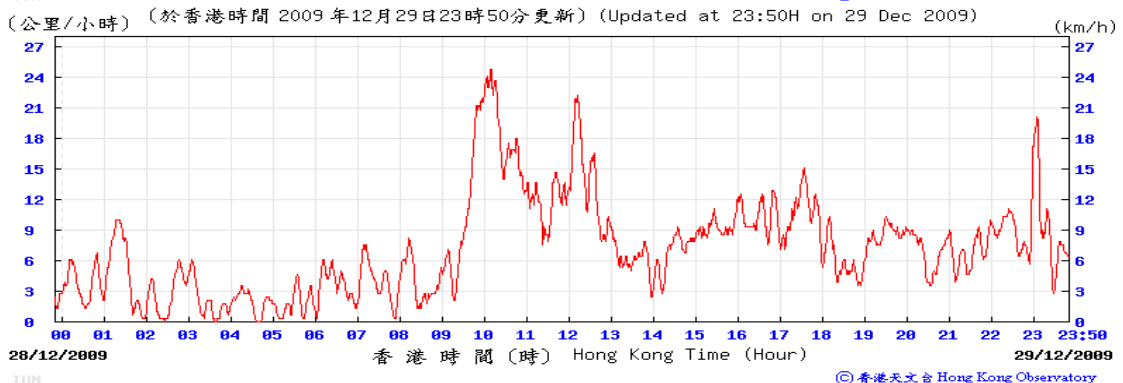
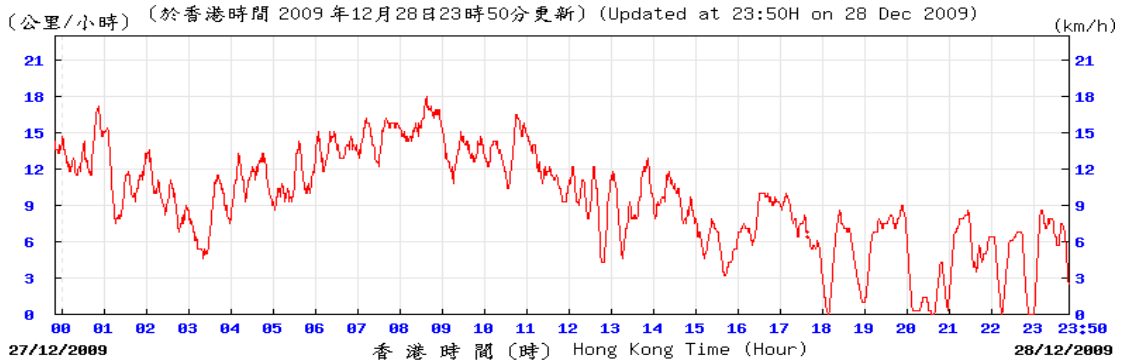
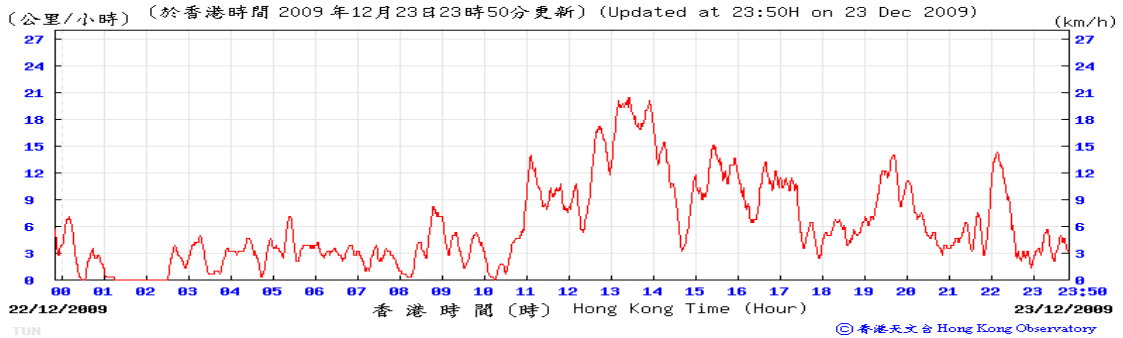
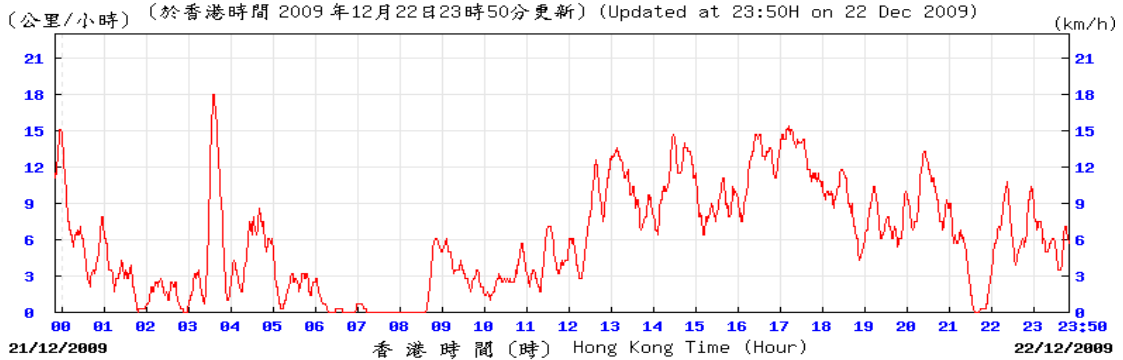
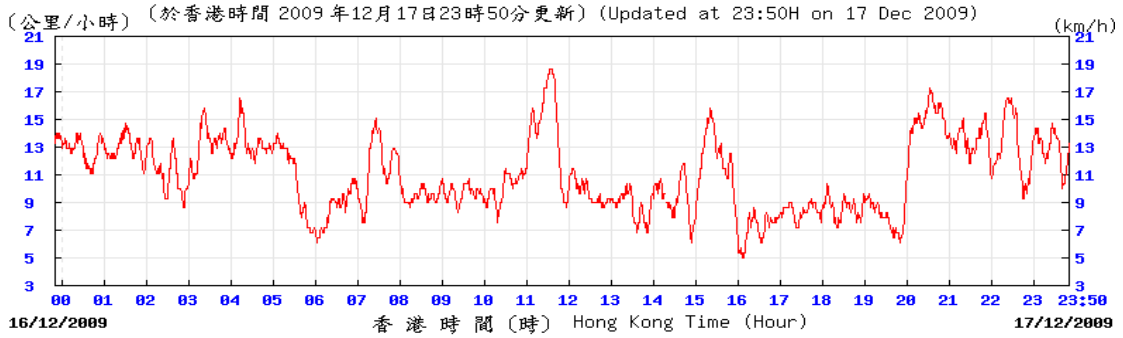


Appendix D

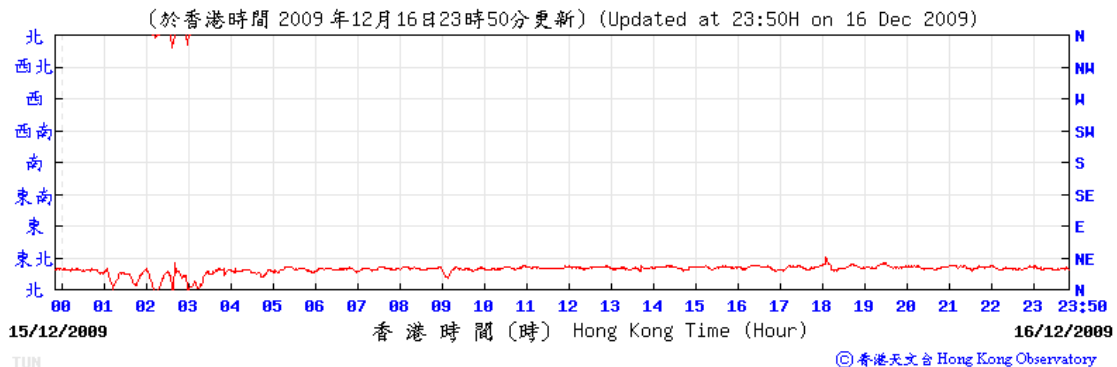
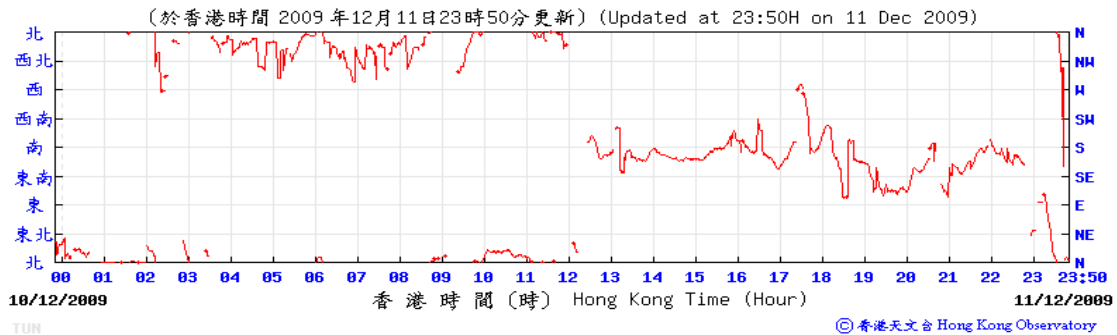
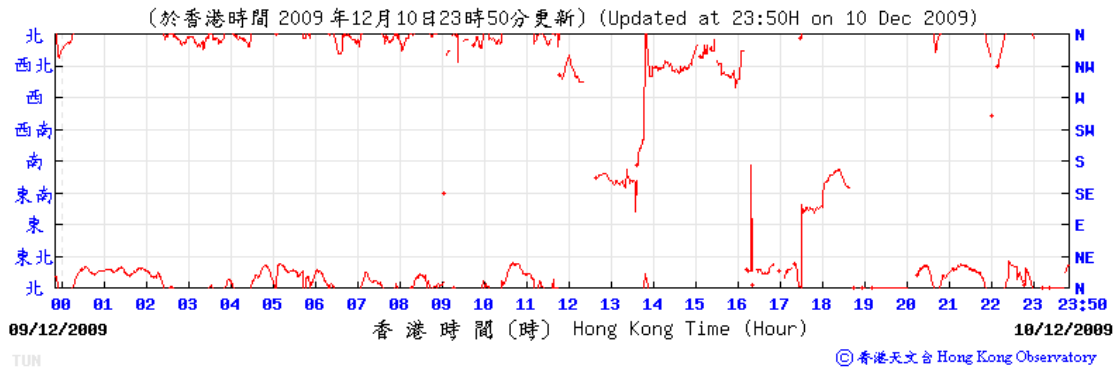
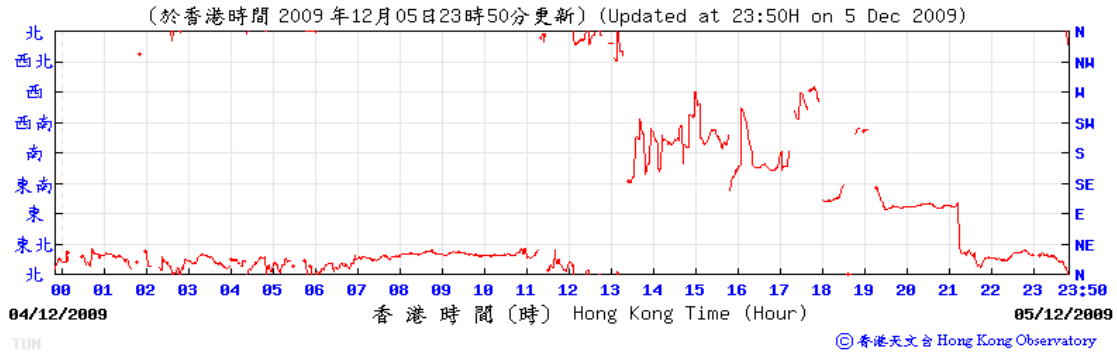
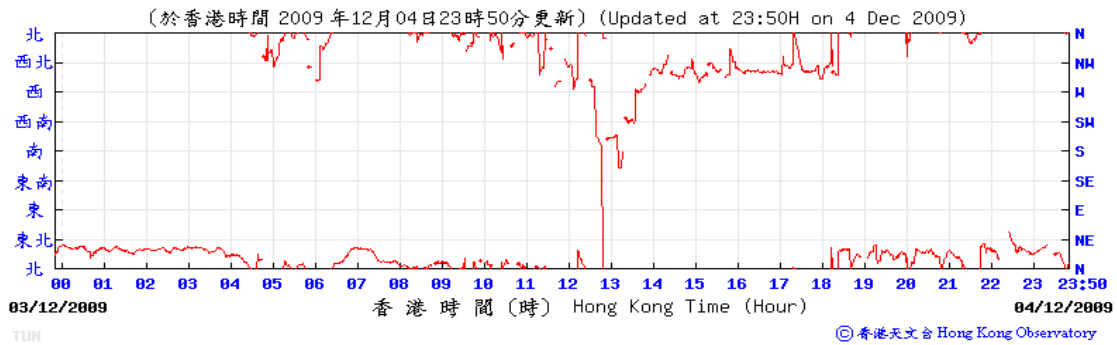
Wind Data

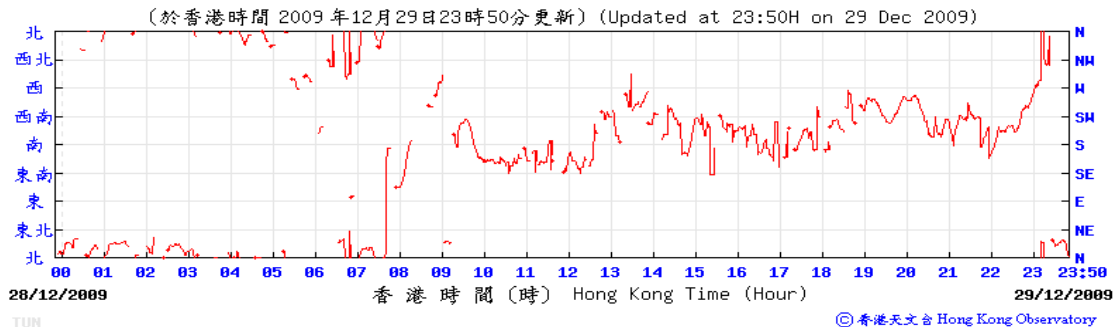
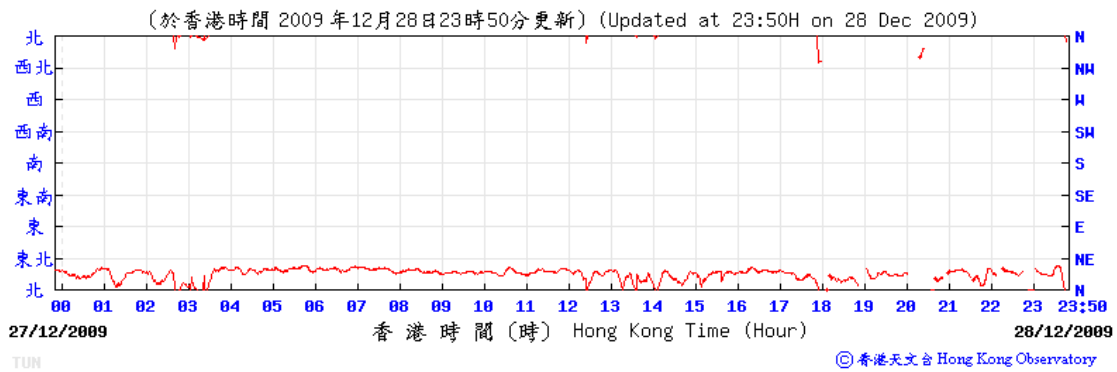
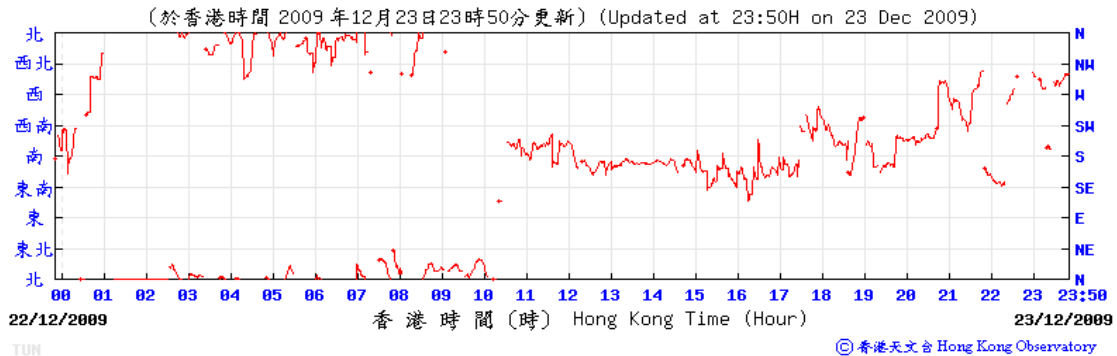
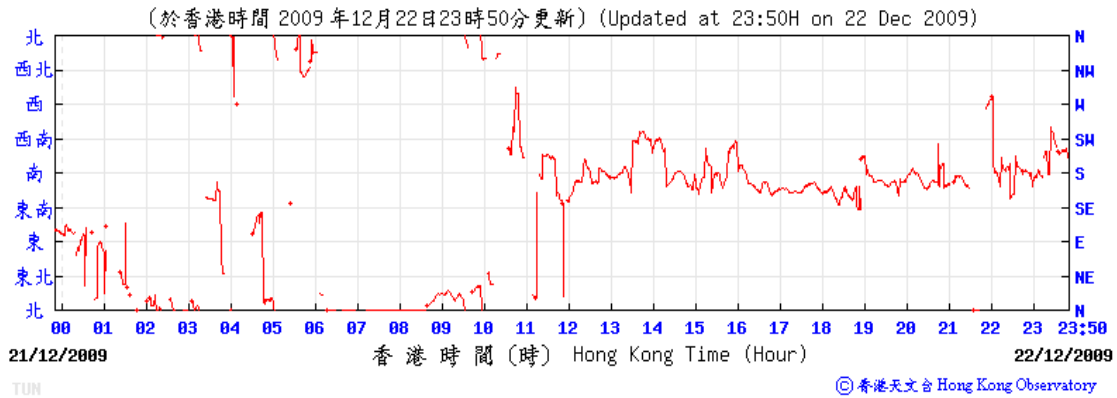
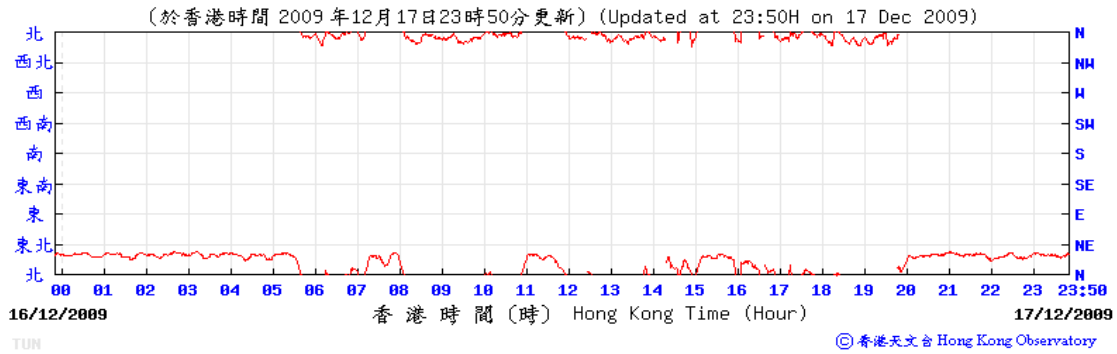
Wind Monitoring Data – Wind Speed during Air Quality Monitoring in December 2009





Wind Monitoring Data – Wind Direction during Air Quality Monitoring in December 2009





Appendix E

**Calibration Certificate
of Sound Level Meter
and Acoustical
Calibrator**

Campbell Associates Ltd
 5b Chelmsford Road Industrial Estate
 GREAT DUNMOW, Essex, CM6 1HD
 www.campbell-associates.co.uk



Certificate of Calibration

Certificate No.: U4212

CALIBRATION

0789

Test object : Sound Calibrator
Manufacturer: Brüel and Kjær
Type : 4226
Serial no: 1531372

Customer: Ove Arup & Partners Ltd
 Acoustics
 Saint Giles Hall, Pound Hill
 Cambridge, Cambridgeshire, CB3 0AE

Order No: Verbal

| Measurement Results: | Level | Level Stability | Frequency | Frequency Stability | Distortion |
|--------------------------|-----------------|-----------------|------------------|---------------------|---------------|
| 1: | 93.98 dB | 0.06 dB | 251.27 Hz | 0.01 % | 0.20 % |
| 2: | 93.98 dB | 0.06 dB | 251.27 Hz | 0.01 % | 0.20 % |
| 3: | 93.98 dB | 0.06 dB | 251.27 Hz | 0.01 % | 0.20 % |
| Result (Average): | 93.98 dB | 0.06 dB | 251.27 Hz | 0.01 % | 0.20 % |
| Expanded Uncertainty: | 0.10 dB | 0.02 dB | 0.25 Hz | 0.01 % | 0.10 % |
| Degree of Freedom: | >100 | >100 | >100 | >100 | >100 |
| Coverage Factor: | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |

The stated level is relative to 20µPa.

The stated level is valid at reference conditions. The following correction factors have been applied during the measurement:

Pressure : 0.00055 dB/kPa Temperature : 0.002 dB/°C Relative humidity : 0.000 dB/%RH Load volume : 0.000 dB/mm³

The reported expanded uncertainty of measurements is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%. Where the degrees of freedom are insufficient to maintain this confidence level then the coverage factor is increased to maintain this confidence level. The uncertainty has been calculated in accordance with UKAS requirements.

Records : K:\C\Calibration\Nor-1504\Nor-1018 CalCal\2008\BNK4226_250Hz_1531372_M1.nmf

| | | | |
|---------------------------|---------------------|---------------|---------------------|
| Environmental conditions: | Pressure : | Temperature : | Relative humidity : |
| Reference conditions: | 101,325 kPa | 23,0 °C | 50 %RH |
| Measurement conditions : | 100.503 ± 0.009 kPa | 22.3 ± 2.7 °C | 55.9 ± 11.8 %RH |

Date received : 15/08/2008
 Date of calibration: 20/08/2008
 Date of issue: 31/10/2008
 Engineer

 David Egan

Supervisor

 Ian Campbell MSc MIOA

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to recognised national standards, and to the units of measurement realised at the National Physical Laboratory or other recognised national standards laboratories. This certificate may not be reproduced other than in full without the prior written approval of the issuing laboratory.

Certificate number: U 4212

Preconditioning

The equipment was preconditioned for more than 4 hours in the specified calibration environment

Calibration and verification performed

The calibrator has been tested as described in the following annexes to BS EN IEC60942:2003 Sound Calibrators; B3.4 for sound pressure level, B3.5 for frequency, B3.6 for total distortion and A4.4 for short term stability of the pressure level.

Method of Calibration

Calibration has been performed as set out in the CA Technical procedures TP01 & 2 as appropriate.

Instruments and Program

A complete list of instruments, hardware and software that has been used for this calibration is available from the calibration laboratory on request.

Traceability

The measured values are traceable to the following laboratories:

Sound Pressure Level: National Physical Laboratory United Kingdom

Voltage: National Physical Laboratory United Kingdom

Frequency: National Physical Laboratory United Kingdom

Ambient Pressure: National Physical Laboratory United Kingdom

Temperature & Relative Humidity: National Physical Laboratory United Kingdom

Comment


Calibrated as received, no adjustments made

Other levels at this frequency produce 104 dB = 103.8 dB and 114 dB – 113.97 (non UKAS data)

Notes:

The sound pressure level generated by the calibrator in its WS2 configuration was measured five times by a GRAS-40AG microphone and averaged. The results of three replications and the mean of the mean of the measurements obtained are given in the measurement results table in this certificate. The frequency and distortion were measured in a similar manner. The figures in **BOLD** are the final results; a small correction factor may need to be added to the sound pressure level quoted here if the device is used to calibrate a sound level meter that is fitted with a free field response microphone. See manufacturer's handbooks for full details of this and other corrections that may be applicable.

Measurements performed by

 Campbell
Associates

Sonitus House, 5b Chelmsford Road Industrial Estate, Great Dunmow, GB-CM6 1HD

Tel (+44) 01371 871030 Fax (+47) 01371 879106
email calibration@campbell-associates.co.uk

Page 2 of 2

Campbell Associates Ltd
 5b Chelmsford Road Industrial Estate
 GREAT DUNMOW, Essex, CM6 1HD
 www.campbell-associates.co.uk



Certificate of Calibration

Certificate No.: U4213

CALIBRATION

0789

Test object : Sound Calibrator
 Manufacturer: Brüel and Kjær
 Type : 4226
 Serial no: 1531372

Customer: Ove Arup & Partners Ltd
 Acoustics
 Saint Giles Hall, Pound Hill
 Cambridge, Cambridgeshire, CB3 0AE
 Order No: Verbal

| Measurement Results: | Level | Level Stability | Frequency | Frequency Stability | Distortion |
|--------------------------|-----------------|-----------------|-------------------|---------------------|---------------|
| 1: | 94.00 dB | 0.06 dB | 1005.07 Hz | 0.00 % | 0.20 % |
| 2: | 94.00 dB | 0.06 dB | 1005.07 Hz | 0.00 % | 0.20 % |
| 3: | 94.00 dB | 0.06 dB | 1005.08 Hz | 0.00 % | 0.20 % |
| Result (Average): | 94.00 dB | 0.06 dB | 1005.07 Hz | 0.00 % | 0.20 % |
| Expanded Uncertainty: | 0.10 dB | 0.02 dB | 1.01 Hz | 0.01 % | 0.01 % |
| Degree of Freedom: | >100 | >100 | >100 | 57 | >100 |
| Coverage Factor: | 2.00 | 2.00 | 2.00 | 2.05 | 2.00 |

The stated level is relative to 20µPa.

The stated level is valid at reference conditions. The following correction factors have been applied during the measurement:

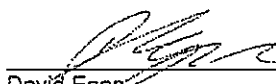
Pressure : 0.00055 dB/kPa Temperature : 0.002 dB/°C Relative humidity : 0.000 dB/%RH Load volume : 0.000 dB/mm³

The reported expanded uncertainty of measurements is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%. Where the degrees of freedom are insufficient to maintain this confidence level then the coverage factor is increased to maintain this confidence level. The uncertainty has been calculated in accordance with UKAS requirements.

Records : K:\C\Calibration\Nor-1504\Nor-1018 CalCal\2008\BNK4226_1K_1531372_M2.nmf

| | | | |
|---------------------------|---------------------|---------------|---------------------|
| Environmental conditions: | Pressure : | Temperature : | Relative humidity : |
| Reference conditions: | 101,325 kPa | 23,0 °C | 50 %RH |
| Measurement conditions : | 100.513 ± 0.003 kPa | 22.1 ± 2.3 °C | 57.2 ± 9.9 %RH |

Date received : 15/08/2008
 Date of calibration: 20/08/2008
 Date of issue: 31/10/2008
 Engineer



 David Egan

Supervisor



 Ian Campbell MSc MIOA

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to recognised national standards, and to the units of measurement realised at the National Physical Laboratory or other recognised national standards laboratories. This certificate may not be reproduced other than in full without the prior written approval of the issuing laboratory.



Certificate number: U 4213

Preconditioning

The equipment was preconditioned for more than 4 hours in the specified calibration environment

Calibration and verification performed

The calibrator has been tested as described in the following annexes to BS EN IEC60942:2003 Sound Calibrators; B3.4 for sound pressure level, B3.5 for frequency, B3.6 for total distortion and A4.4 for short term stability of the pressure level.

Method of Calibration

Calibration has been performed as set out in the CA Technical procedures TP01 & 2 as appropriate.

Instruments and Program

A complete list of instruments, hardware and software that has been used for this calibration is available from the calibration laboratory on request.

Traceability

The measured values are traceable to the following laboratories:

Sound Pressure Level: National Physical Laboratory United Kingdom

Voltage: National Physical Laboratory United Kingdom

Frequency: National Physical Laboratory United Kingdom

Ambient Pressure: National Physical Laboratory United Kingdom

Temperature & Relative Humidity: National Physical Laboratory United Kingdom

Comment


Calibrated as received, no adjustments made

Other levels at this frequency give 104 dB = 104.0 dB and 114 dB = 113.98 dB (Non UKAS data)

Notes:

The sound pressure level generated by the calibrator in its WS2 configuration was measured five times by a GRAS-40AG microphone and averaged. The results of three replications and the mean of the mean of the measurements obtained are given in the measurement results table in this certificate. The frequency and distortion were measured in a similar manner. The figures in **BOLD** are the final results; a small correction factor may need to be added to the sound pressure level quoted here if the device is used to calibrate a sound level meter that is fitted with a free field response microphone. See manufacturer's handbooks for full details of this and other corrections that may be applicable.

Measurements performed by

 Campbell Associates

Sonitus House, 5b Chelmsford Road Industrial Estate, Great Dunmow, GB-CM8 1HD

Tel (+44) 01371 871030 Fax (+47) 01371 879106

email calibration@campbell-associates.co.uk

Page 2 of 2

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

AAc Certificate No. 2009001

Tel: +852 2268 3216

Fax: +852 2268 3950

CERTIFICATE OF CONFORMITY

| <u>Description of Test Instrument</u> | <u>Type No</u> | <u>Serial No</u> |
|---------------------------------------|----------------|------------------|
| Bruel & Kjaer 4231Acoustic Calibrator | 4231 | 2314016 |

Date of Test: 05 August 2009

Carried out by: Mitch Law

Approved by: William Ng

Signature: 

Signature: 

| Ambient Conditions During Test | |
|--------------------------------|------|
| Atmospheric Pressure: | 1KPa |
| Air Temperature: | 22°C |
| Relative Humidity: | 60% |

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.

| <u>Description of Reference Calibrator</u> | <u>Type No</u> | <u>Serial No</u> |
|--|----------------|------------------|
| Brüel & Kjær Multi Frequency Calibrator | 4226 | 1531372 |
| Brüel & Kjær Coupler | UA0915 | 1531372 |

| | |
|--|----------------|
| Certificate of Calibration Serial No. | U4212, U4213 |
| By Campbell Associates Ltd Calibration Date: | 20 August 2008 |
| NAMAS Accredited Calibration Laboratory No. | 0789 |

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.

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

AAc Certificate No. 2009006

Tel: +852 2268 3216

Fax: +852 2268 3950

CERTIFICATE OF CONFORMITY

| <u>Description of Test Instrument</u> | <u>Type No</u> | <u>Serial No</u> |
|---------------------------------------|----------------|------------------|
| Brüel & Kjær Sound Level Meter Kit | 2238 | 2562763 |
| Brüel & Kjær ½ " Microphone Kit | 4188 | 2658599 |

Date of Test: 05 August 2009

Carried out by: Mitch Law

Approved by: William Ng

Signature: 

Signature: 

| Ambient Conditions During Test | |
|--------------------------------|------|
| Atmospheric Pressure: | 1KPa |
| Air Temperature: | 21°C |
| Relative Humidity: | 60% |

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.

| <u>Description of Reference Calibrator</u> | <u>Type No</u> | <u>Serial No</u> |
|--|----------------|------------------|
| Brüel & Kjær Multi Frequency Calibrator | 4226 | 1531372 |
| Brüel & Kjær Coupler | UA0915 | 1531372 |

Certificate of Calibration Serial No. U4212, U4213
By Campbell Associates Ltd Calibration Date: 20 August 2008
NAMAS Accredited Calibration Laboratory No. 0789

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.

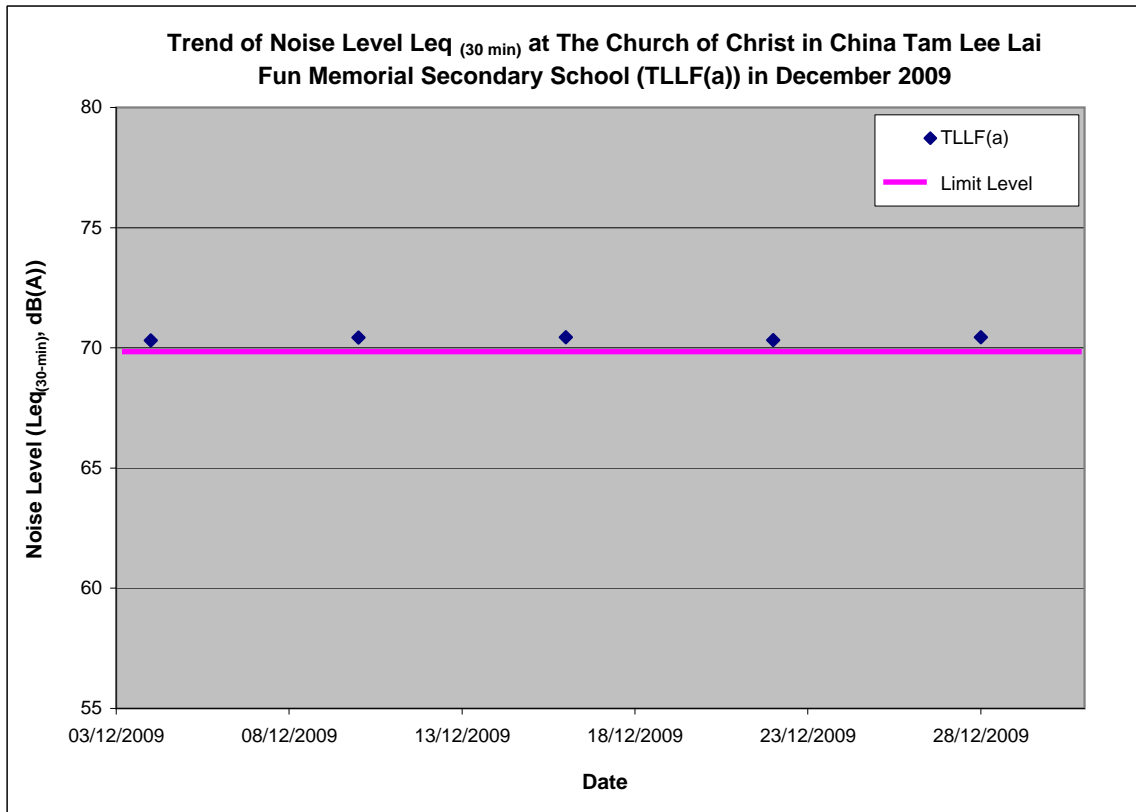
Appendix F

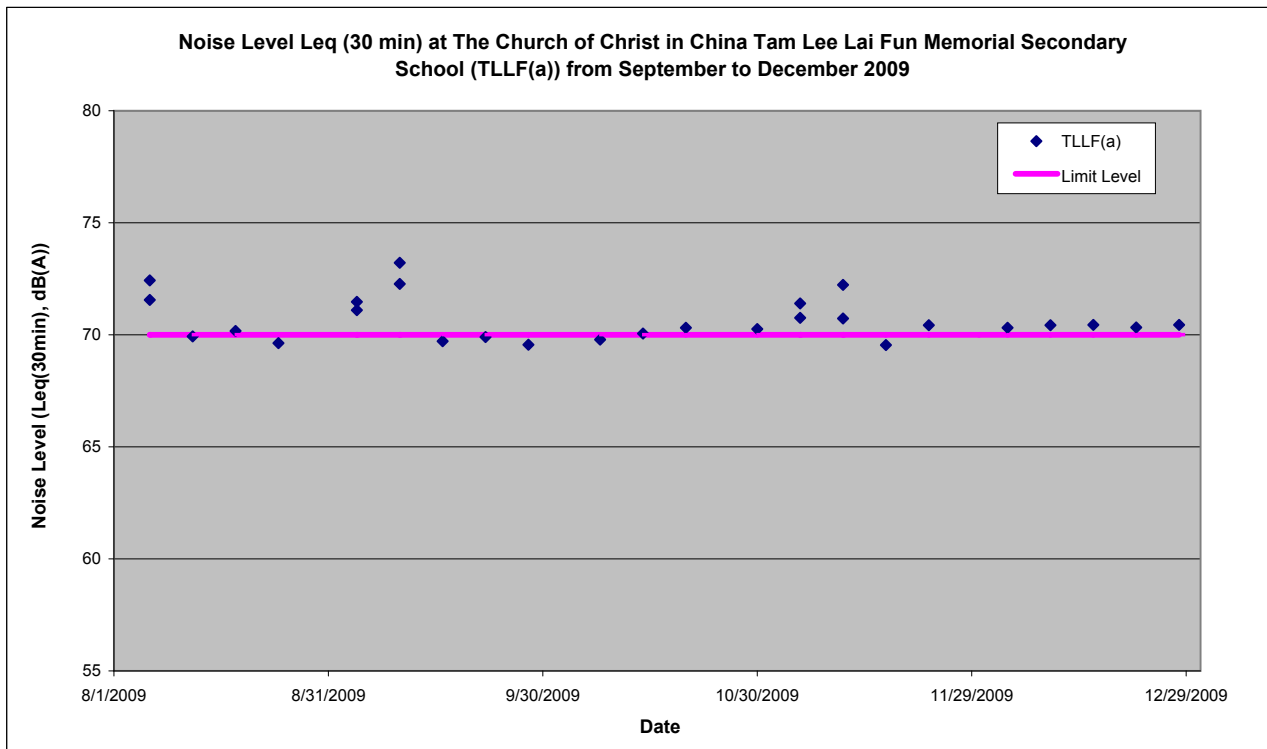
**Impact Noise
Monitoring Results**

**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-min), dB(A) | L _{eq} (30-min), dB(A)* | L10 (5min), dB(A) | L10 (5-min), dB(A)* | L ₉₀ (5min), dB(A) | L ₉₀ (5min), dB(A)* |
|----------------|------------|--------------------------------|----------------------------------|-------------------|---------------------|-------------------------------|--------------------------------|
| 4-Dec-09 | 11:10 AM | 67.7 | 70.3 | 70.0 | 73.4 | 63.0 | 66.8 |
| | 11:15 AM | 67.3 | | 70.5 | | 63.5 | |
| | 11:20 AM | 67.6 | | 71.0 | | 64.0 | |
| | 11:25 AM | 67.0 | | 70.0 | | 64.0 | |
| | 11:30 AM | 67.0 | | 70.5 | | 64.0 | |
| | 11:35 AM | 67.2 | | 70.5 | | 64.0 | |
| 10-Dec-09 | 2:50 PM | 67.4 | 70.4 | 68.5 | 72.0 | 63.5 | 66.9 |
| | 2:55 PM | 67.3 | | 69.0 | | 64.0 | |
| | 3:00 PM | 67.0 | | 69.5 | | 64.0 | |
| | 3:05 PM | 67.1 | | 68.2 | | 63.5 | |
| | 3:10 PM | 67.8 | | 69.0 | | 64.0 | |
| | 3:15 PM | 67.9 | | 69.5 | | 64.5 | |
| 16-Dec-09 | 10:00 AM | 67.9 | 70.4 | 69.5 | 72.8 | 63.5 | 66.8 |
| | 10:05 AM | 67.3 | | 70.0 | | 63.5 | |
| | 10:10 AM | 67.0 | | 69.5 | | 63.5 | |
| | 10:15 AM | 67.7 | | 70.0 | | 64.0 | |
| | 10:20 AM | 67.6 | | 70.0 | | 64.0 | |
| | 10:25 AM | 67.1 | | 69.5 | | 64.0 | |
| 22-Dec-09 | 10:30 AM | 67.8 | 70.3 | 72.0 | 73.3 | 65.5 | 67.7 |
| | 10:35 AM | 67.2 | | 69.5 | | 66.0 | |
| | 10:40 AM | 67.6 | | 70.0 | | 64.0 | |
| | 10:45 AM | 67.3 | | 70.0 | | 64.5 | |
| | 10:50 AM | 67.0 | | 69.5 | | 64.0 | |
| | 10:55 AM | 67.0 | | 70.0 | | 63.5 | |
| 28-Dec-09 | 10:30 AM | 67.7 | 70.4 | 70.5 | 72.9 | 64.5 | 67.0 |
| | 10:35 AM | 67.5 | | 70.0 | | 64.0 | |
| | 10:40 AM | 67.1 | | 69.5 | | 63.5 | |
| | 10:45 AM | 67.7 | | 70.0 | | 64.0 | |
| | 10:50 AM | 67.4 | | 69.5 | | 64.0 | |
| | 10:55 AM | 67.2 | | 70.0 | | 64.0 | |
| Average | | | 70.4 | | 72.9 | | 67.0 |
| Minimum | | | 70.3 | | 72.0 | | 66.8 |
| Maximum | | | 70.4 | | 73.4 | | 67.7 |





Notes:

(1) All noise results exceeding limit level were not project-related.

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. <ul style="list-style-type: none"> • 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 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 | 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 * |
|------------------------------|---|--|--|
| | 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 | <p><i>Good Site Practice:</i></p> <ul style="list-style-type: none"> • 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 | <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>N/O</p> <p>N/A</p> <p>N/A</p> |
| 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 | <p><i>Measures for Tuen Mun River Channel</i></p> <ul style="list-style-type: none"> • 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 | <p>✓</p> <p>N/A</p> <p>✓</p> <p>✓</p> |
| S5.7.3 | <p><i>Construction Runoff and Drainage</i></p> <p>The site practices outlined in ProPECC PN 1/94 "Construction Site Drainage" shall be implemented including:</p> <ul style="list-style-type: none"> • 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 | <p>✓</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> |

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 | <p><i>Sewage from General Construction Activities</i></p> <p>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.</p> <p>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.</p> | Work site / During the construction period | <p>✓</p> <p>✓</p> |
| S5.7.6 | <p><i>Sewage Effluent</i></p> <p>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.</p> | Work site and adjacent water / During the design and construction period. | ✓ |
| Waste Management | | | |
| S6.6.1 | <p><i>Good Site Practices</i></p> <p>Recommendations for good site practices during the construction activities include:</p> <ul style="list-style-type: none"> • 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 | <p>N/O</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> |
| S6.6.2 | <p><i>Waste Reduction Measures</i></p> <p>Waste reduction is best achieved at the planning and design stage, as well as by</p> | 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 * |
|-----------|---|--|---|
| | <p>ensuring the implementation of good site practices. Recommendations to achieve waste reduction include:</p> <ul style="list-style-type: none"> • 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; • 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; • any unused chemicals or those with remaining functional capacity shall be recycled; • use of reusable non-timber formwork to reduce the amount of C&D material. • 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; • proper storage and site practices to minimise the potential for damage or contamination of construction materials; and • plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste. | stage, and construction stage | <p>N/A</p> <p>N/O</p> <p>N/O</p> <p>N/O</p> <p>N/O</p> <p>N/O</p> |
| S6.6.4 | <p><i>General Refuse</i></p> <p>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.</p> <p>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.</p> | Work site / During the construction period | <p>✓</p> <p>N/O</p> |
| S6.6.5 | <p><i>Chemical Wastes</i></p> <p>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.</p> | Work site / During the construction period | <p>✓</p> |

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 | <p><i>Construction and Demolition Material</i></p> <p>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.</p> | Work site / During the construction period | ✓ |
| Hazard to Life | | | |
| S8.8.4 | <ul style="list-style-type: none"> • 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, quiet mechanical plants and well-maintained plants should be used wherever possible. Noise-emitting construction plant should be installed away from the egret 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 | <p>Noise barrier should also be implemented to mitigate the noise impact in operation phase. To minimize the bird collision impact, precautionary and bird-friendly approach to noise barrier design should be implemented:</p> <ul style="list-style-type: none"> • 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 | <p>N/O</p> <p>N/O</p> <p>N/O</p> |
| S9.7.7 | <p>Standard good site practice measures should be implemented throughout the construction phase. The measures should include:</p> <ul style="list-style-type: none"> • 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 | <p>N/A</p> <p>✓</p> <p>N/O</p> <p>✓</p> <p>N/O</p> <p>✓</p> |
| 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 * |
|-----------------------------|---|--|--------------------|
| | <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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 | 0.330 | 0 | 0 | 0 | 0.330 | 0 | 0.004 | 0.015 | 0 | 0.5 | 0.005 | |
| May | 0.820 | 0 | 0 | 0 | 0.820 | 0 | 0.004 | 0.012 | 0 | 0 | 0.025 | |
| June | 1.160 | 0 | 0 | 0 | 1.160 | 0 | 0.003 | 0.013 | 0 | 0.8 | 0.015 | |
| Sub-total | 3.750 | 0 | 0 | 0 | 3.750 | 0 | 0.020 | 0.075 | 0 | 1.8 | 0.075 | |
| July | 0.490 | 0 | 0 | 0 | 0.490 | 0 | 0.002 | 0.010 | 0 | 0 | 0.015 | |
| Aug | 0.765 | 0 | 0 | 0 | 0.765 | 0 | 0.003 | 0.015 | 0 | 0.5 | 0.035 | |
| Sept | 1.125 | 0 | 0 | 0 | 1.125 | 0 | 0.003 | 0.008 | 0 | 0.32 | 0.030 | |
| Oct | 0.510 | 0 | 0 | 0 | 0.510 | 0 | 0.004 | 0.007 | 0 | 0.7 | 0.010 | |
| Nov | 0.775 | 0 | 0 | 0 | 0.775 | 0 | 0.004 | 0.008 | 0 | 0 | 0.020 | |
| Dec | 0.285 | 0 | 0 | 0 | 0.285 | 0 | 0.004 | 0.010 | 0 | 0.3 | 0.005 | |
| Total | 7.700 | 0 | 0 | 0 | 7.700 | 0 | 0.040 | 0.118 | 0 | 3.620 | 0.190 | |

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 (Jan 2010) Revision 1**

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

| | |
|--|----------------|
| | Public Holiday |
| | Monitoring Day |