



Maeda Corporation

MTRCL Contract C3840-13C Tsim Sha Tsui  
Station Carnarvon Road Subway and Entrances  
Modification Works

Monthly EM&A Report (May 2014) (Version 1)

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MAEDA

## Maeda Corporation

# MTRCL Contract C3840-13C Tsim Sha Tsui Station Carnarvon Road Subway and Entrances Modification Works

## Monthly EM&A Report (May 2014) Version (1)

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**Report No** EB001340R0042-v1

**Date** 6 June 2014

This Monthly EM&A Report is prepared for Maeda Corporation in accordance with the terms and conditions of appointment dated 30 October 2013. Hyder Consulting Limited (Company Number 126012) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.

13 June 2014

By Email and Post

MTR Corporation Limited  
Fo Tan Railway House  
No. 9, Lok King Street, Fo Tan  
Shatin, N.T., Hong Kong

Your reference:

Our reference: 40032976/430059

Attention: Mr. Kenneth Chow / Environmental  
Engineer II

Dear Sir,

**Consultancy Agreement A130-13  
Independent Environmental Checker for CRS and LTS  
Verification for Third Monthly Environmental Monitoring and  
Audit (EM&A) Report (May 2014) (Report No.: EB001340R0042-v1)**

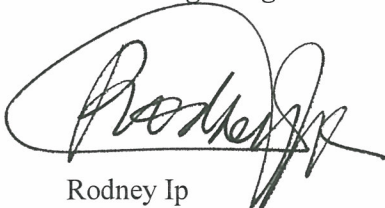
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We refer to the Third Monthly EM&A Report (May 2014) received under cover of the email from the Environmental Team, Hyder Consulting Limited (HCL), dated on 13 June 2014.

Further to our comments provided on 12 June 2014 and subsequent revision of the Report by HCL on 13 June 2014, we have no comment and have verified the captioned report (Report No.: **EB001340R0042-v1**).

Should you have any queries, please feel free to contact the undersigned at 2410 3750 or our Mr. Thomas Wong at 2410 3795.

Yours faithfully  
**URS Hong Kong Ltd**



Rodney Ip  
Independent Environmental Checker

TWKW/wwsc

cc. via email  
Hyder Consulting Limited (Attn.: Mr. F. N. Wong)  
Maeda Corporation (Attn.: Ms. Cecilia Lee)



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## EXECUTIVE SUMMARY

### Breaches of Action and Limit Levels

- ES01 No Notice of Exceedance and the associated investigation and follow-up actions were required as the environmental monitoring results registered no exceedances of Action / Limit Levels of air quality and construction noise during the Reporting Period.
- ES02 No corrective actions were required as the environmental audit during the Reporting Period observed:
- a) No deficiencies with major environmental significance of the required environmental mitigation measures;
  - b) No non-compliance with the required waste management; and
  - c) No adverse environmental impacts on the sensitive receivers environed with the site of the Project.

### Environmental Complaints

- ES03 No environmental complaints were recorded during the Reporting Period.

### Notification of Summons and Successful Prosecutions

- ES04 No notification of summons and successful prosecutions were recorded during the Reporting Period.

### Reporting Changes

- ES05 No major reporting changes were made during the Reporting Period.

### Future Key Issues

#### *General*

- ES06 Full implementation of the environmental mitigation measures, which are required in the EM&A Plan and summarized in Implementation Schedule of Appendix D, is recommended. Where necessary, proper maintenance and improvement of the implemented mitigation measures are reminded.

#### *Air quality*

- ES06 Construction dust is considered to be one of the key issues in the coming construction period, in particular during dusty activities under dry and windy conditions.
- ES07 Where appropriate, construction dust suppression measures including decking over the excavation areas, watering of exposed site surface and covering of all excavated and stockpiles of dusty material by impervious sheeting, etc., are reminded.

#### *Construction Noise*

- ES08 Construction noise is another key issue in the coming construction period. Working method, equipment and noise mitigation should be regularly reviewed to ensure compliance with statutory and non-statutory requirements and guidelines.

#### *Water Quality*

- ES09 As rain season has been approaching, particular attention is drawn to the compliance with water quality mitigation measures.

# 1. INTRODUCTION

## 1.1 REPORTING PERIOD

- 1.1.1 This is the 3<sup>rd</sup> monthly EM&A report (hereinafter referred as 'This Report') covering construction period from 1 to 31 May 2014 (hereinafter referred as 'the Reporting Period').
- 1.1.2 This Report has been written in accordance with the **Environmental Monitoring and Audit Plan** (hereinafter referred as 'the EM&A Plan') enclosed in the **Project Profile – MTR Tsim Sha Tsui Station Carnarvon Road Subway and Entrances Modification Works**, which is registered in the **Environmental Permit No. EP-440/2012** (hereinafter referred as 'the EP') (Register No.: PP-462/2012).

## 1.2 PROJECT BACKGROUND

- 1.2.1 In order to improve the appearance of Carnarvon Road Entrance D1 and D2 of Tsim Sha Tsui (hereafter referred as 'TST') Station and to provide a more comfortable walking environment nearby, MTR Corporation Limited (hereafter referred as 'MTRC' or 'the Corporation') has commissioned Maeda Corporation (hereinafter referred as 'MC') the contract **MTR Tsim Sha Tsui Station Carnarvon Road Subway and Entrances Modification Works** (hereafter referred as 'the Project'). The Project is proposed to rebuild the existing Entrance D1 and D2 and construct a new Entrance D3 at the basement B2 level of the K11 Art Mall to connect to the TST station by a subway, which extends from the Entrance D1 and D2 and runs approximately 80m along Carnarvon Road and across the Bristol Avenue to the Entrance D3. The tentative programme for the Project is approximately 25 months, scheduled to be commenced in March 2014.
- 1.2.2 The existing TST Station had been in operation before the **Environmental Impact Assessment Ordinance** (hereafter referred as 'EIAO') came into effect on 1 April 1998. It constitutes an exempted Designated Project (hereinafter referred as 'DP') according to Section 9(2) (g) of the EIAO (Cap. 499). As the Project involves a material change to an exempted DP which may have potential environmental impacts, an environmental permit is required prior to the commencement of the modification works. The Project Profile has been developed to provide information for direct application of an environmental permit. The EP has been granted since 18 July 2012, where the Project Profile and the associated **EM&A Plan** are registered.
- 1.2.3 Site map, works area and locations of the environmental monitoring under the Project are illustrated in Figure 1.1 Site Location Plan of **Appendix A**.
- 1.2.4 Management structure of the Project, including organization chart, lines of communication and contact names and telephone numbers of key personnel, is demonstrated in **Appendix B**.
- 1.2.5 Construction programme is shown in **Appendix C**, whereas implementation schedule for the recommended environmental mitigation measures (hereinafter referred as 'the Implementation Schedule') is summarized in **Appendix D**, which fine tunes construction activities and shows inter-relationship with environmental protection / mitigation measures for the construction period.

## 1.3 ENVIRONMENTAL STATUS

- 1.3.1 As required in the EP, URS Hong Kong Ltd has been appointed as the Independent Environmental Checker under the Project (hereinafter referred as 'the IEC'), whereas Hyder Consulting Limited has been appointed as the Environmental Team under the Project (hereinafter referred as 'the ET').
- 1.3.2 According to the EP Condition 3.2 (a) under Environmental Monitoring and Audit (EM&A) during the Construction Period, baseline monitoring has been completed and the required Baseline

Monitoring Report has been submitted to EPD on 14 February 2014 prior to commencement of the works under the Project.

- 1.3.3 Status of relevant environmental permits, licences, and/or notifications on environmental protection for the Project is summarized in **Table 1-1** below. They are detailed in **Appendix E**.

**Table 1-1 Summary of Status of Environmental Licenses and Permits**

Item	Description	License/Permit Status
1	Air pollution Control (Construction Dust)	Notification Ref. 365953 acknowledged on 21 Oct 2013.
2	Water Pollution Control Ordinance (Discharge License)	Water Discharge Licence Ref. WT00018229-2014 granted on 4 Mar 2014
3	Billing Account for Disposal of Construction Waste	A/C Ref. 7018523 granted on 25 October 2013
4	Chemical waste Producer Registration	Registration Ref. 5213-2214-M2446-16 granted on 4 Mar 2014

## 1.4 CONSTRUCTION ACTIVITIES

- 1.4.1 Construction activities undertaken during the Reporting Period and the following month are summarized in the following **Table 1-2**:

**Table 1-2 Construction Activities Undertaken during the Reporting Period and Up-Coming Month**

Item	Description
<b><u>Construction Activities Undertaken during the Reporting Period</u></b>	
1	Excavation and exposure of the utility at the southern footpath.
2	Pipe piling for the excavation lateral support.
<b><u>Construction Activities to be Undertaken in the Following Month</u></b>	
3	Excavation and exposure of the utility at the southern footpath.
4	Pipe piling for excavation lateral support.
5	Driving sheet pile.
6	Mobilization of second drill rig and commencement of pipe piling at northern side



## 2. EM&A REQUIREMENTS

### 2.1 Air Quality

#### *Monitoring Parameters and Frequency*

- 2.1.1 24-Hour Total Suspended Particulates (hereinafter referred as '24-Hr TSP') is required to be monitored once a week during construction period of the Project.
- 2.1.2 1-Hour Total Suspended Particulates (hereinafter referred as '1-Hr TSP') is required to be monitored when exceedances of 24-Hr TSP occur, following the Event and Action Plan presented in **Appendix F**.
- 2.1.3 Schedules for 24-Hr TSP monitoring for the Reporting Period and the next Reporting Period are prepared and submitted to MTRC, IEC and MC prior to implementation via e-mail and / or facsimile for ease of necessary inspection. Where amendment is necessary under ad hoc conditions, including actual and broadcast adverse weather, accidental instrument failures, etc., advanced notification is given at least 24 hours prior to implementation or as practical as possible. The Monitoring Schedules are enclosed in **Appendix G**.

#### *Monitoring Location*

- 2.1.4 According to the EM&A Plan, Mirador Mansion was designated to be the air quality monitoring station of the Project. As the access to the air monitoring location designated in the EM&A Plan has been denied by the owner of the property, the ET proposes an alternative monitoring location on the roof-top above the 4/F of the commercial complex of K11 (hereinafter referred as 'K11'), which has been agreed among MTRC, IEC and MC, and the associated access to K11 has been granted by the management office of K11 prior to the commencement of the baseline monitoring in January 2014.
- 2.1.5 Air quality monitoring location is summarized in **Table 2-1-1** below and illustrated in **Appendix A**.

**Table 2-1-1 Air Quality Monitoring Location**

Location ID	Name of Premises	Description
K11	K11 Art Mall	Rooftop, 4/F

#### *Monitoring Equipment*

- 2.1.6 The air quality monitoring equipment to be used for construction air impact monitoring is shown in **Table 2-1-2** below:

**Table 2-1-2 Air Quality Monitoring Equipment**

Equipment Type	Model	Serial Number	Calibration Orifice Number	Location
High Volume Air Sampler	TE5005X	1713	1785	K11
Sibata Digital Dust Monitor	LD-3B	296098	Not Applicable	K11

- 2.1.7 High Volume Air Sampler (hereinafter referred as 'the HVAS') is used to monitor 24-Hr TSP, following the standard sampling method set out in High Volume Method for Total Suspended Particulates, Part 50 Chapter 1 Appendix B, Title 40 of the Code of Federal Regulations of the USEPA.
- 2.1.8 Weather information including wind speeds and wind directions is obtained from King's Park Weather Station (about 1.7 km to the north of the monitoring station) and used as weather conditions during the Reporting Period. They are presented in **Appendix H**.

### *Calibration of Monitoring Equipment*

- 2.1.9 The HVAS is calibrated before commencement of monitoring using standard orifice 5-points calibration method with orifice calibrator to determine the actual flow rate of each HVAS. Calibration Kit Model - TE5025A is used for calibration of the HVAS. Recalibration of the HVAS is carried out after motor maintenance, at least once every six months, which is about the expected life of carbon brush.
- 2.1.10 Calibration of the HVAS is conducted following the instruction manual of the manufacturer. Initial calibration of the dust monitoring equipment is conducted upon installation (and thereafter at bi-monthly intervals during impact monitoring). The transfer standard should be traceable to the internationally recognized primary standard and be calibrated annually.
- 2.1.11 The Sibata Digital Dust Monitor (hereinafter referred as 'the Sibata') is calibrated annually.
- 2.1.12 The calibration certificate of the equipment is shown in **Appendix I**.

### *Monitoring Methodology for 24-Hr TSP*

- 2.1.13 Air quality monitoring will be conducted once a week under typical weather conditions (with no adverse weather such as typhoon signal or rain storm warning).

#### **Installation of HVAS for 24-Hr TSP Monitoring**

- 2.1.14 When positioning the HVAS, the following points will be noted:
- a) A horizontal platform with appropriate support to secure the samplers against gusty wind will be provided;
  - b) No two samplers will be placed less than 2 m apart;
  - c) The distance between the sampler and an obstacle, such as buildings, must be at least twice the height that the obstacle protrudes above the sampler where possible;
  - d) A minimum of 2 m of separation from walls, parapets and penthouses is required for rooftops samplers;
  - e) A minimum of 2 m of separation from any supporting structure, measured horizontally is required;
  - f) No furnace or incinerator flue or building vent is nearby;
  - g) Airflow around the sampler is unrestricted;
  - h) The sampler is more than 20 m from the dripline;
  - i) Any wire fence and gate, to protect the sampler, should not cause any obstruction during monitoring;
  - j) Permission must be obtained to set up the samplers and to obtain access to the monitoring stations; and
  - k) A secured supply of electricity is needed to operate the samplers.

#### **Preparation of Filter Papers and Laboratory Analysis**

- 2.1.15 Sufficient pieces of filter paper should be labelled before sampling. It should be a clean filter paper with no pinholes, and should be conditioned in a humidity-controlled chamber for over 24-hour and be pre-weighed before use for the sampling. The preferred room temperature is

around 25 °C ±3 °C with relative humidity (hereinafter referred as 'the RH') less than 50% ± 5%, preferably 40%.

- 2.1.16 Preparation of filters and subsequent laboratory analysis of the collected 24-Hr TSP samples were performed by ALS Technichem (HK) Pty Ltd (hereinafter referred as 'ALS'), a local laboratory which have been accredited under Hong Kong Laboratory Accreditation Scheme (HOKLAS).
- 2.1.17 All the collected samples should be kept by the ET in standard office conditions for 6 months before disposal.

### **Field Monitoring Procedures**

- 2.1.18 Procedures for field monitoring are as follows:
- a) Check power supply to ensure the HVAS works properly.
  - b) Clean the filter holder and the area surrounding the filter.
  - c) Remove the filter holder by loosening the four bolts and carefully align a new filter, with stamped number upward, on a supporting screen.
  - d) Align the filter properly on the screen so that the gasket forms an airtight seal on the outer edges of the filter.
  - e) Fasten the swing bolts to hold the filter holder down to the frame. The pressure applied should be sufficient to avoid air leakage at the edges.
  - f) Close the shelter lid and secure with the aluminium strip.
  - g) Warmed-up the HVAS for about 5 minutes to establish run-temperature conditions.
  - h) Set a new flow rate record sheet into the flow recorder.
  - i) Checked and adjust the flow rate of the HVAS at around 1.1 m<sup>3</sup> per minute. (The range specified in the EM&A Plan is between 0.6-1.7 m<sup>3</sup> per minute.)
  - j) Set the programmable timer for a sampling period of 24 hours, and record the starting time, weather condition and the filter number.
  - k) Record the initial elapsed time.
  - l) At the end of sampling, remove the sampled filter carefully and fold it in half-length so that only surfaces with collected particulate matter are in contact.
  - m) Place the sampled filter in a clean plastic envelope and seal.
  - n) Record all monitoring information on a Field Data Sheet as shown in **Appendix J**.
  - o) Send the filters to ALS for analysis.

## *Monitoring Methodology for 1-Hr TSP*

### **Field Monitoring**

- 2.1.19 The procedures for measurement of 1-Hr TSP follow Manufacturer's Instruction Manual, which is summarised as follows:
- a) Set power to "ON", push BATTERY button, make sure that the meter's indicator is in the range with a red line and allow the instrument to stand for about 3 minutes (Then, the air sampling inlet has been capped).
  - b) Push the knob at MEASURE position.
  - c) Push "O-ADJ" button. (Then meter's indication is 0).
  - d) Push the knob at SENSI ADJ position and set the meter's indication to S value described on the Test Report using the trimmer for SENSI ADJ.
  - e) Pull out the knob and return it to MEASURE position.
  - f) Push "START" button.
  - g) Record all monitoring information on a Field Data Sheet as shown in **Appendix J**.

### **Maintenance and Calibration**

- a) The Sibata is checked at 3-month intervals and calibrated at 1-year intervals throughout the whole construction period.
- b) Calibration records for the Sibata Digital Dust Monitor direct dust meters are shown in **Appendix I**.

## Action and Limit Levels

2.1.20 The Action and Limit levels (hereinafter referred as 'the A/L Levels) at K11 have been established in the Baseline Monitoring Report in accordance with the derivation criteria specified in Section 3.7 of the EM&A Plan, which are summarised in **Table 2-1-3** as follows:

**Table 2-1-3 Derivation of Action and Limit Levels for Air Quality at K11,  $\mu\text{g}/\text{m}^3$**

Parameter	Action Level	Limit Level
24-Hr TSP	For baseline level $\leq 200 \mu\text{g}/\text{m}^3$ , Action level = (130% of baseline level + Limit level)/2	260
	For baseline level $> 200 \mu\text{g}/\text{m}^3$ , Action level = Limit level	
1-Hr TSP	For baseline level $\leq 384 \mu\text{g}/\text{m}^3$ , Action level = (130% of baseline level + Limit level)/2	500
	For baseline level $> 384 \mu\text{g}/\text{m}^3$ , Action level = Limit level	

2.1.21 The established A/L Levels for 24-Hr and 1-Hr TSP are summarized in **Table 2-1-4** as follows:

**Table 2-1-4 Action & Limit Levels for Air Quality at K11,  $\mu\text{g}/\text{m}^3$**

Parameter	Action Level	Limit Level
24-Hr TSP	222	260
1-Hr TSP	373	500

## Event and Action Plan

2.1.22 In case exceedances of Action and/or Limit levels for air quality occur, **Event and Action Plan** for Air Quality enclosed in **Appendix F** will be implemented.

## Environmental Mitigation Measures for Air Quality

2.1.23 Although most of the construction works would be carried out underground, appropriate dust mitigation measures as stipulated in the EP, Project Profile, related environmental regulation including Air Pollution Control (Construction Dust) Regulation as well as those recommended in the Implementation Schedule should be implemented to control fugitive dust emission. The following key dust suppression measures are recommended:

- a) Decking over the excavation areas;
- b) Regular watering to reduce dust emissions from all exposed site surface, particularly during dry weather;
- c) Frequent watering for particularly dusty construction areas and areas close to air sensitive receivers;
- d) Cover all excavated or stockpiles of dusty material by impervious sheeting or spraying with water to maintain the entire surface wet;
- e) Provision of vehicle washing facilities at the exit points of the site; and
- f) Provision of tarpaulin covering for any dusty materials on a vehicle leaving the site.

2.1.24 Details of the implementation schedule for the required environmental mitigation measures are presented in **Appendix D**.

## 2.2 Construction Noise

### *Monitoring Parameters and Frequency*

2.2.1 **Table 2-2-1** summarizes the monitoring parameters and frequency for construction noise.

**Table 2-2-1 Noise Monitoring Parameters and Frequency**

Parameters	Frequency
$L_{eq}$ in 30 minutes	Once a week

2.2.2 Monitoring schedules for construction noise for the Reporting Period and the next Reporting Period are prepared and submitted to MTRC, IEC and MC prior to implementation via e-mail and / or facsimile for ease of necessary inspection. Where amendment is necessary under ad hoc conditions, including actual and broadcast adverse weather, accidental instrument failures, etc., advanced notification is given at least 24 hours prior to implementation or as practical as possible.

### *Monitoring Equipment*

2.2.3 With reference to the Technical Memorandum (TM) issued under the Noise Control Ordinance (NCO), sound level meters in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications (both publications have been withdrawn and replaced by 61672:2003) are used for carrying out the noise monitoring. The details of the calibration of the sound level meters and their respective calibrators are as shown in the following **Table 2-2-2**.

**Table 2-2-2 Construction Noise Monitoring Equipment**

Item	Equipment Name	Model
1	Sound Level Meter	B&K 2238 (Serial no. 2562782)
2	Larson Davis CAL200 Acoustic Calibrator	(Serial no. 10929)

### *Monitoring Location*

2.2.4 As stated in previous **Section 2.1.4**, the alternative air quality monitoring location K11 which is proposed by the ET and agreed among MTRC, IEC and MC, i.e. on the roof-top above the 4/F of the commercial complex of K11, is used for the construction noise monitoring location. The access to K11 has been granted by the management office of the K11 prior to the commencement of the baseline monitoring in January 2014.

2.2.5 **Table 2-2-3** summarizes the recommended alternative noise monitoring location, which is illustrated in **Appendix A**.

**Table 2-2-3 Noise Monitoring Location**

Location ID	Name of Premises	Description
K11	K11 Art Mall	Rooftop, 4/F

## Monitoring Methodology

### Field Monitoring

2.2.6 Procedures for noise monitoring summarized as follows:

- a) The microphones of the Sound Level Meter are about 1 m from the exterior of the building façade.
- b) The battery condition is checked to ensure the correct functioning of the meter.
- c) Parameters such as frequency weighting, the time weighting and the measurement time are set as follows:
  - i. Frequency weighting: A
  - ii. Time weighting: Fast
  - iii. Time measurement: 30 minutes intervals (0700-1900 daily)
- d) Prior to and after each noise measurement, the meter is calibrated using a Calibrator for 94 dB at 1 kHz. If the difference in the calibration level before and after measurement is more than 1 dB, the measurement should be considered invalid and the measurement repeated after re-calibration or repair of the equipment.
- e) During the monitoring period, the  $L_{eq(30\ min)}$  are recorded.
- f) Record all monitoring information on a **Field Data Sheet** as shown in **Appendix J**.

### Maintenance and Calibration

2.2.7 The meter and calibrator are sent to the supplier or HOKLAS laboratory to check and calibrate prior to the monitoring. Calibration records are presented in **Appendix I**.

### Weather Condition

2.2.8 The wind speeds and directions during the monitoring period are recorded and shown in **Appendix H**.

## Action and Limit Levels

2.2.9 The Action and Limit levels (hereinafter referred as 'the A/L Levels) at K11 have been established in the **Baseline Monitoring Report**. They are summarised in **Table 2-2-4** as follows:

**Table 2-2-4 Action and Limit Levels for Construction Noise**

Time Period	Action Level	Limit Level
0700-1900 hours on normal weekdays	When one valid documented complaint is received.	75*

*Note: \*70 dB(A) for schools and 65 dB(A) during school examination periods. 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.*

## Event and Action Plan

2.2.10 In case exceedances of Action and/or Limit levels for construction noise occur, the Event and Action Plan enclosed in **Appendix F** will be triggered.

## *Mitigation Measures for Construction Noise*

- 2.2.11 Although no residual noise impact would be generated after the proposed mitigation measures are in place, the general construction noise control measures stipulated in the EP, Project Profile as well as those recommended in the Implementation Schedule should be fully implemented in order to minimise noise impacts during the construction phase. They are summarized as follows:
- a) The Code of Practice on Good Management Practice to Prevent Violation of the Noise Control Ordinance (Chapter 400) (for Construction Industry) published by EPD shall be adopted;
  - b) The statutory and non-statutory requirements and guidelines shall be complied with;
  - c) Approval for the method of working, equipment and noise mitigation measures intended to be used at the site shall be granted from the Project Engineer before commencing any work;
  - d) Working methods to minimize the noise impact on the surrounding NSRs shall be formulated and executed, and the implementation of these methods shall be monitored by experienced personnel with suitable training;
  - e) Noisy equipment and noisy activities shall be located as far away from the NSRs as is practical;
  - f) Unused equipment shall be turned off;
  - g) PME should be kept to a minimum and the parallel use of noisy equipment / machinery should be avoided;
  - h) All plant and equipment shall be maintained regularly;
  - i) Material stockpiles and other structures shall be effectively utilized as noise barriers, whenever practicable; and
  - j) Enclosure of Entrance D1 with acoustic mat during demolition.
- 2.2.12 Details of the implementation schedule for the mitigation measures are presented in **Appendix D**.

### 3. MONITORING RESULTS

#### 3.1 Air Quality

##### *Monitoring Results*

- 3.1.1 24-Hr TSP monitoring during the Reporting Period was conducted following the agreed monitoring schedule.
- 3.1.2 24-Hr TSP results of the Reporting Period are summarized in the following **Table 3-1-1**. Graphical plots of the parameter are illustrated in **Appendix K**.

**Table 3-1-1 Summary of 24-Hr TSP Monitoring Results, ug/m<sup>3</sup>**

Monitoring Date	24-Hr TSP	A/L Levels	
7-May-14	42		
13-May-14	42		
20-May-14	34	<b>Action Level:</b> <b>222</b>	<b>Limit Level:</b> <b>260</b>
27-May-14	35		
Mean (Min – Max)	38 (34-42)		

##### *Discussion*

- 3.1.3 **Table 3-1-1** demonstrates that all 24-Hr TSP results of the Reporting Period fluctuated well below the A/L Levels of the parameter, i.e. neither Action Level nor Limit Level exceedances were recorded.
- 3.1.4 No Notice of Exceedances (thereinafter referred as 'NOE') and the associated NOE Investigation as well as remedial actions were required during the Reporting Period.

#### 3.2 Construction Noise

##### *Monitoring Results*

- 3.2.1 Construction noise monitoring during the Reporting Period was conducted following the agreed monitoring schedule.
- 3.2.2 Construction noise monitoring results of the Reporting Period are summarized in the following **Table 3-2-1**. Graphical plots of the parameter are illustrated in **Appendix K**.

**Table 3-2-1 Summary of Construction Noise Monitoring Results at K11, dB(A)**

Monitoring Date	<i>L</i> <sub>eq</sub> (30 min)	A/L Levels
8-May-14	68	<b>Limit Level: 75</b>
13-May-14	66	<b>Action Level:</b>
23-May-14	70	<b>Any documented complaint against construction noise.</b>
27-May-14	65	
Mean (Min – Max), <i>L</i> <sub>eq</sub> (30 min)	67 (65-70)	



## *Discussion*

- 3.2.3 No environmental complaint against construction noise was registered during the Reporting Period, whereas **Table 3-2-1** demonstrates that all construction noise results of the Reporting Period fell below the Limit Level of the parameter, i.e. neither exceedances of Action Level nor exceedances of Limit Level were recorded.
- 3.2.4 Neither NOE nor NOE investigation and the associated remedial actions were required during the Reporting Period.

## *Weather Conditions*

- 3.2.5 No weather conditions and any other factors were identified to have significant effects on the monitoring results of air quality and construction noise during the Reporting Period were identified.
- 3.2.6 Weather information during the Reporting Period which is extracted from Hong Kong Observatory King's Park Weather Station is enclosed for reference in **Appendix H**.

## 3.3 Conclusions and Recommendations

### *Conclusions*

- 3.3.1 No exceedances of A/L Levels of air quality and construction noise were registered during the Reporting Period.
- 3.3.2 No NOE and the associated NOE Investigation as well as the related corrected actions were required during the Reporting Period.

### *Recommendations*

- 3.3.3 Full implementation of the environmental mitigation measures, which are required in the EM&A Plan and summarized in Implementation Schedule of **Appendix D**, is recommended. Where necessary, proper maintenance and improvement of the implemented mitigation measures are reminded.
- 3.3.4 Nevertheless, construction dust shall be suppressed during dusty construction activities under dry and windy conditions.
- 3.3.5 In addition, construction noise shall be eliminated to avoid adverse impacts on the nearby sensitive receivers.

## 4. ENVIRONMENTAL AUDIT

### 4.1 Site Inspection

- 4.1.1 Weekly site inspections are jointly conducted among MTRC, MC and ET. The site inspection follows strictly the agreed Site Inspection Checklist, which covers all the site audit requirements stipulated in the EM&A Plan, PS and all relevant environmental laws.
- 4.1.2 The completed Site Inspection Checklists are distributed to all relevant parties within 48 hours upon completion of the site inspection for agreement and signature of the relevant parties and, where appropriate, for implementation of the recommended corrected actions to promptly rectify the situation.
- 4.1.3 The site inspections during the Reporting Period were conducted on 7, 13, 20 and 27 May 2014. Deficiencies or findings of the site audit and the associated follow up actions are summarized in the following **Table 4-1**:

**Table 4-1 Summary of Findings and Follow-Up Actions of the Site Inspection**

Date	Deficiencies or findings	Follow-Up Action
7-May-2014	No adverse environmental impacts were recorded.	Not required.
13-May-2014	No adverse environmental impacts were recorded.	Not required.
20-May-2014	No adverse environmental impacts were recorded.	Not required.
27-May-2014	No adverse environmental impacts were recorded.	Not required.

- 4.1.4 As shown in **Table 4-1**, no deficiencies or non-compliance of environmental mitigation measures or adverse environmental impacts were observed during the Reporting Period.

### 4.2 Compliance with Legal/Contractual Requirements

- 4.2.1 Construction activities under the Project must comply with all environmental protection and pollution control laws in Hong Kong, as well as the contractual requirements of the Project. **Table 4-2** summarizes breaches of legal and contractual requirements.

**Table 4-2 Summary of Breaches of Legal and Contractual Requirements**

Month	No. of Breaches	Cumulative no. from March to May 2014
May 2014	0	0

### 4.3 Environmental Complaints

- 4.3.1 Environmental complaints are handled following closely the flow chart of complaint response procedure which is enclosed in **Appendix L**.
- 4.3.2 Environmental complaints registered during the Reporting Period are summarised in **Table 4-3** below:

**Table 4-3 Summary of Complaint**

Month	No. of Complaint	Nature	Cumulative no. from March to May 2014
May 2014	0	Not Applicable	0

## 4.4 Notification of Summons /Successful Prosecutions

4.4.1 Notification of summons and successful prosecutions registered during the Reporting Period are summarised in **Table 4-4** below:

**Table 4-4 Summary of Summon and Successful Prosecutions**

Month	Number of Issue	Nature of Issue	Cumulative no. of Issue
May 2014	0	Not Applicable	0

## 4.5 Future key environmental issues

4.5.1 Future key environmental issues include

- a) Air quality in particular construction dust during dusty construction activities, e.g. demolition of the Entrance D1 and excavation works, under dry and windy conditions;
- b) Construction noise during noisy activities; and
- c) Particularly in the approaching rain season, site surface water run-off and construction wastewater discharge.

4.5.2 To avoid potential of adverse environmental impacts of the key environmental issues stated above, full implementation of the mitigation measures as stipulated in the Implementation Schedule shown in **Appendix D** is required, and the mitigation measures for air quality, construction noise and water quality implemented to date shall be properly maintained. Where appropriate, improvement of the implemented mitigation measures is reminded to ensure effectiveness of the mitigation measures.

## 5. WASTE MANAGEMENT

### 5.1 Waste Management

5.1.1 Despite small scale of the Project and the amount of C&D material that needs to be hauled off site and disposed of is anticipated not to be significant, 3-R waste management i.e. Reduce, Reuse and Recycle, is adopted in order to minimize adverse environmental impacts to be generated from construction of the Project.

5.1.2 Waste management under the Project is performed in accordance with the Waste Management Plan, which has been prepared for implementation of the construction waste mitigation measures in compliance with the requirements stipulated in the EM&A Plan, PS, Waste Disposal Ordinance and the associated subsidiary regulations.

### 5.2 Waste Management Record

5.2.1 Updated waste management status is detailed in **Appendix M**, where the 3-R status of the construction waste generated from construction of the Project during the Reporting Period is presented.

## 6. CONCLUSIONS / RECOMMENDATIONS

### 6.1 Conclusions

- 6.1.1 No NOE and the associated NOE investigation and follow-up actions were required as the environmental monitoring results registered no exceedances of A/L Levels of air quality and construction noise during the Reporting Period.
- 6.1.2 No corrective actions were required as the environmental audit during the Reporting Period observed:
- a) No deficiencies with major environmental significance of the required environmental mitigation measures;
  - b) No non-compliance with the required waste management; and
  - c) No adverse environmental impacts on the sensitive receivers environed with the site of the Project.
- 6.1.3 In addition, no remedial actions were required as no environmental complaints, notification of summons and successful prosecutions were reported during the Reporting Period.
- 6.1.4 Nevertheless, occasional observations of inadequacies of proactive environmental mitigation measures were recorded during the regular site inspection and audit. They were rectified in situ or before the following site audit upon identification or notification.

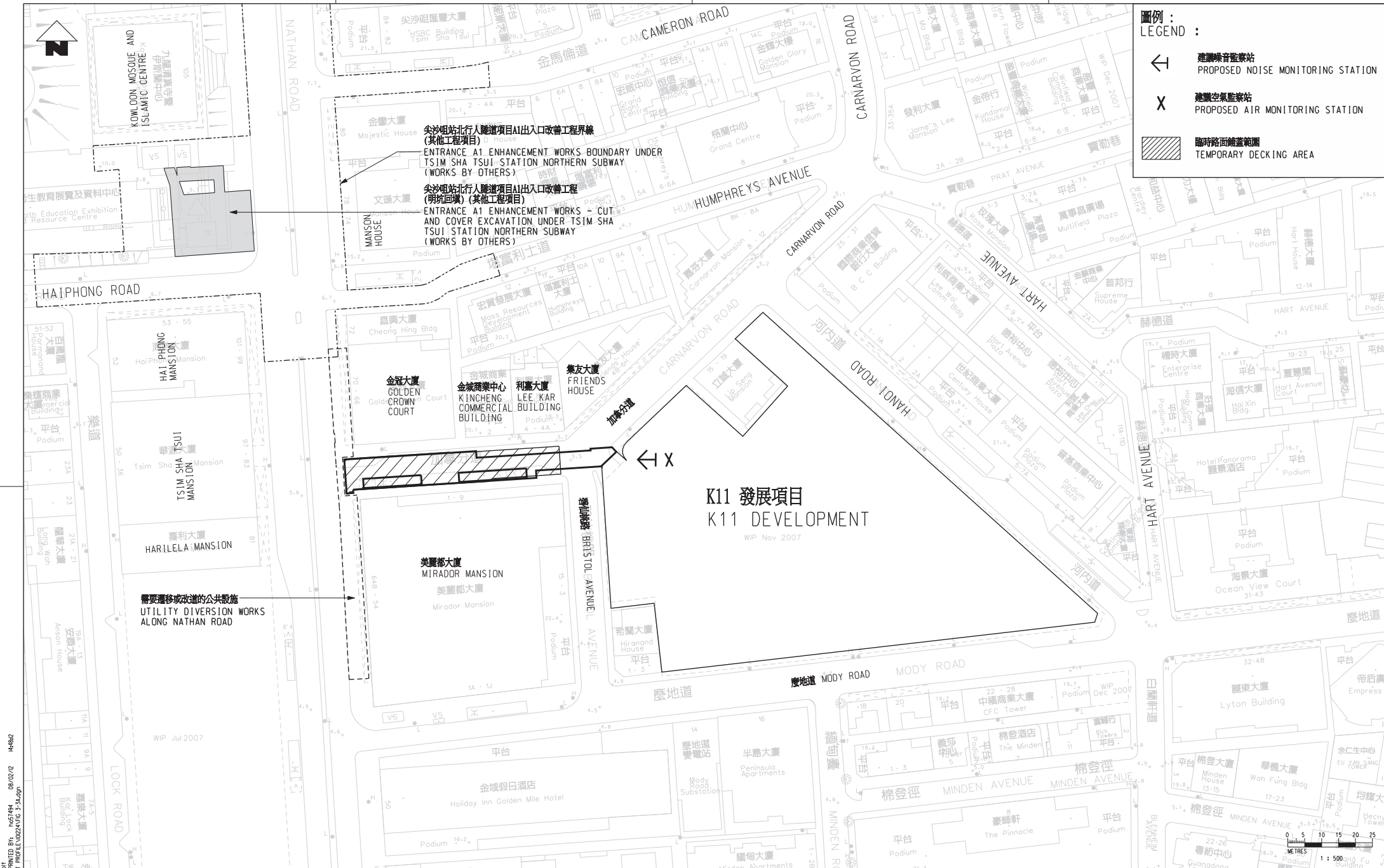
### 6.2 Recommendations

- 6.2.1 Full implementation of the environmental mitigation measures stipulated in the EM&A Plan and summarized in **Implementation Schedule** of **Appendix D** is required. Where necessary, proper maintenance and improvement of the implemented mitigation measures are reminded.
- 6.2.2 Particular attention is drawn to the compliance with water quality mitigation measures during the approaching rain season.
- 6.2.3 In addition, suppression of construction dust is required during dusty construction activities under dry and windy conditions.
- 6.2.4 Furthermore, construction noise shall be eliminated to avoid adverse impacts on the nearby sensitive receivers.

Appendix A



Site Location Plan



**圖例 :**  
**LEGEND :**

← 建議噪音監察站  
PROPOSED NOISE MONITORING STATION

X 建議空氣監察站  
PROPOSED AIR MONITORING STATION

▨ 臨時路面鋪蓋範圍  
TEMPORARY DECKING AREA

尖沙咀站北行人隧道項目A1出入口改善工程界線  
(其他工程項目)  
ENTRANCE A1 ENHANCEMENT WORKS BOUNDARY UNDER  
TSM SHA TSUI STATION NORTHERN SUBWAY  
(WORKS BY OTHERS)

尖沙咀站北行人隧道項目A1出入口改善工程  
(明坑回填) (其他工程項目)  
ENTRANCE A1 ENHANCEMENT WORKS - CUT  
AND COVER EXCAVATION UNDER TSM SHA  
TSUI STATION NORTHERN SUBWAY  
(WORKS BY OTHERS)

需要遷移或改道的公共設施  
UTILITY DIVERSION WORKS  
ALONG NATHAN ROAD

**K11 發展項目**  
**K11 DEVELOPMENT**  
WIP Nov 2007

G:\MTR\_A3.BW.COL.dwg 08/02/07 44682  
 PLOT 0101: FILENAME: A320208-KEN-PROJECT\_PROFILE-022-AUSG-3-M.dgn

REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED
A	PROJECT PROFILE				HO				

DRAWN	HO
DESIGNED	--
CHECKED	--
APPROVED	--
DATE	--

**MTR**

**TST STATION CARNARVON ROAD SUBWAY**

ORIGINATOR

**Mott MacDonald**

30/F The Landmark, 100 Hong Kong Street, Hong Kong  
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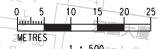
TITLE

**CONSULTANCY AGREEMENT NO. NEX/1049**  
**DETAILED DESIGN FOR CARNARVON ROAD SUBWAY**  
**AIR AND NOISE MONITORING LOCATIONS**  
**空氣及噪音監察站位置圖**

SCALE: 1:500 (A1)

DRAWING NO. **APPENDIX B**

REV. **A**



Appendix B



# Management Structure

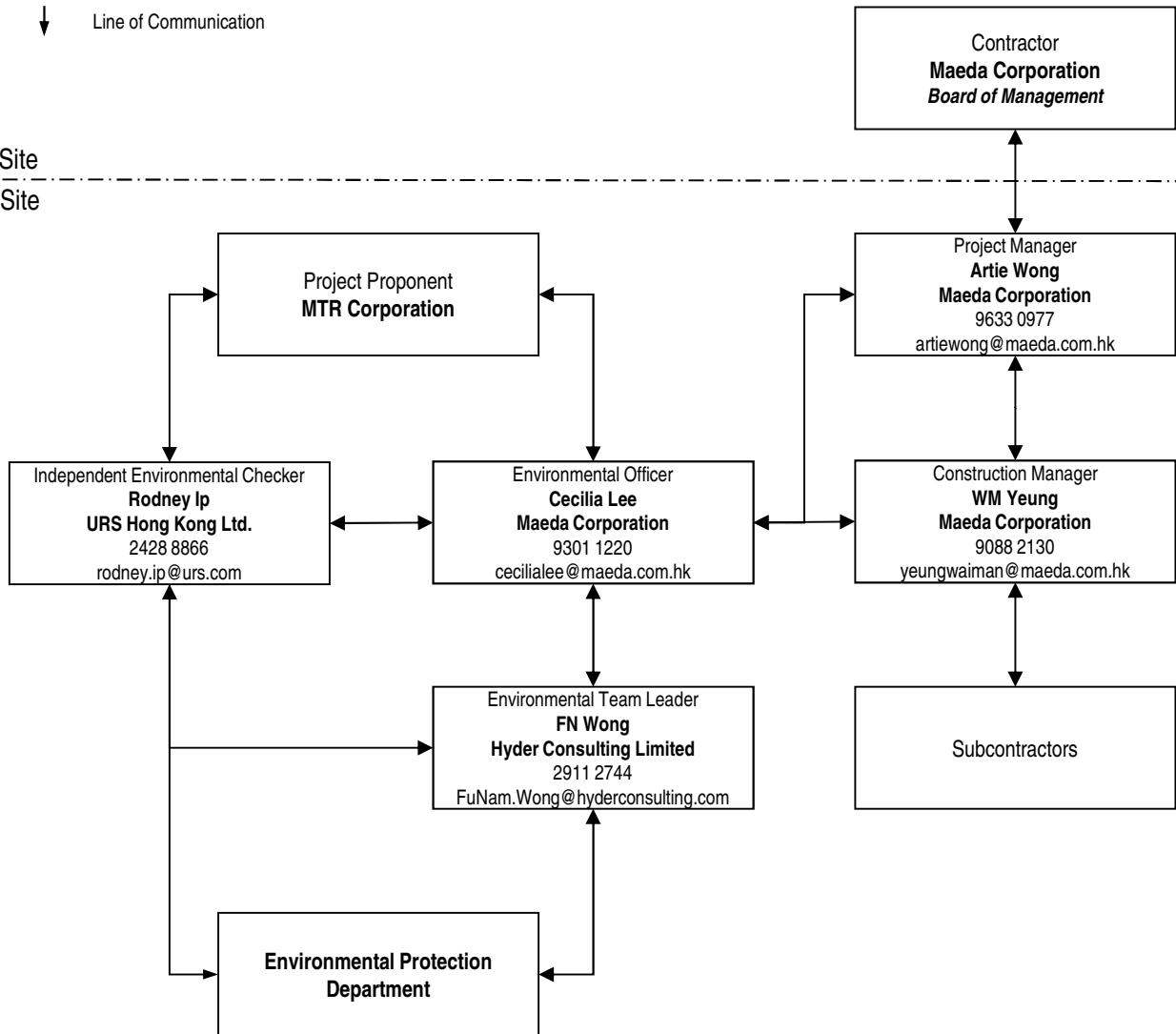
# Project Organization Chart in Environmental Management (Rev.01)

Effective Date: 2 Apr 2014

**Legend :**

↓ Line of Communication

Off Site  
-----  
On Site



Note: In compliance with

i) Clause.1.3 of Environmental Monitoring and Audit Manual (Appendix VII of Project Profile PP462/2012)



Appendix C

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## Construction Programme















CONTRACT C3840-13C Tsim Sha Tsui Station, Carnarvon Road Subway



- Actual Work
- Remaining Work
- Critical Remaining Work
- ◆ Milestone

Data Date: 11-Oct-13

Preliminary Master Programme

Extract Critical Path 2

Maeda/P/PMP/2

Date	Revision	Checked	Approved
27-Feb-14	REV 2	BG	AW





Activity ID	Activity Name	Orig Dur	Planned Start	Planned Finish	Total Float	2014					2015					2016					2017					2018								
						Oct	N	D	Jan	F	M	Apr	M	J	Jul	A	S	Oct	N	D	Jan	F	M	Apr	M	J	Jul	A	S	Oct	N	D	Jan	
C3840-BSM-120	Complete all BS works in TER	0d		22-Oct-16	0d																													

Actual Work      ◆      ◆ Milestone  
 Remaining Work  
 Critical Remaining Work

Data Date: 11-Oct-13

Page 5 of 5

Preliminary Master Programme

Extract Critical Path 2

Maeda/P/PMP/2

Date	Revision	Checked	Approved
27-Feb-14	REV 2	BG	AW

Appendix D

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## Implementation Schedule

## Appendix VIII

### Implementation Schedule

Project Profile Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Parties	Location of the measure	When to implement the measure	Relevant requirements or standards for the measure to achieve
	Noise Impact					
S.3.1	Use of quieter plant	To minimise construction noise emissions	Contractor	Work site	Construction Stage	ProPECC PN2/93 and Noise Control Ordinance
S.3.1	Use of noise enclosure and movable barrier <ul style="list-style-type: none"> <li>• movable barrier can achieve a 5 dB(A) reduction for movable PME and 10 dB(A) reduction for stationary PME;</li> <li>• noise enclosure can achieve 15dB(A) reduction for PME;</li> <li>• A typical design barrier with a steel frame of vertical / cantilever type would be adopted and located close to the noise generating part of PME;</li> <li>• Barrier material of surface mass in excess of 7kg/m<sup>2</sup> shall be required to achieve the maximum screening effect (and minimum 10kg/m<sup>2</sup> for noise enclosure);</li> <li>• The length of barrier should generally be at least five times greater than its height and the minimum height of a barrier should be such that no part of the noise source will be visible from the noise sensitive receiver being protected.</li> </ul>	To minimize construction noise emissions	Contractor	Work site	Construction Stage	ProPECC PN2/93, Noise Control Ordinance and EIAO Guidance Note NO. 9/2010
S.3.1	General Construction Noise Control Measures <ul style="list-style-type: none"> <li>• The Code of Practice on Good Management Practice</li> </ul>	To minimize construction noise	Contractor	Work site	Construction Stage	ProPECC PN2/93 and Noise Control

Project Profile Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Parties	Location of the measure	When to implement the measure	Relevant requirements or standards for the measure to achieve
	<p>to Prevent Violation of the Noise Control Ordinance (Chapter 400) (for Construction Industry) published by EPD shall be adopted;</p> <ul style="list-style-type: none"> <li>• The statutory and non-statutory requirements and guidelines shall be complied with;</li> <li>• Approval for the method of working, equipment and noise mitigation measures intended to be used at the site shall be granted from the Project Engineer before commencing any work;</li> <li>• Working methods to minimize the noise impact on the surrounding NSRs shall be formulated and executed, and the implementation of these methods shall be monitored by experienced personnel with suitable training;</li> <li>• Noisy equipment and noisy activities shall be located as far away from the NSRs as is practical;</li> <li>• Unused equipment shall be turned off;</li> <li>• PME should be kept to a minimum and the parallel use of noisy equipment / machinery should be avoided;</li> <li>• All plant and equipment shall be maintained regularly; and</li> <li>• Material stockpiles and other structures shall be effectively utilized as noise barriers, whenever practicable.</li> </ul>	emissions				Ordinance
	Air Quality Impact					
S.3.2	<p>Construction Dust Control Measures</p> <ul style="list-style-type: none"> <li>• Decking will be provided subsequent to the completion of surface excavation works. The duration</li> </ul>	To minimise the dust impacts arising from the	Contractor	Work site	Construction Stage	Air Pollution Control (Construction

Project Profile Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Parties	Location of the measure	When to implement the measure	Relevant requirements or standards for the measure to achieve
	<p>of decking is around 13 months after surface excavation works;</p> <ul style="list-style-type: none"> <li>• Regular watering to reduce dust emissions from all exposed site surface, particularly during dry weather;</li> <li>• Frequent watering for particularly dusty construction areas and areas close to air sensitive receivers;</li> <li>• Cover all excavated or stockpile of dusty material by impervious sheeting or spraying with water to maintain the entire surface wet;</li> <li>• Provision of vehicle washing facilities at the exit points of the site; and</li> <li>• Provision of tarpaulin covering of any dusty materials on a vehicle leaving the site.</li> </ul>	construction works				Dust) Regulation
	Water Quality Impact					
S.3.3	<p>Construction Water Quality Impact Measures</p> <ul style="list-style-type: none"> <li>• The Contractor should design and implement all the mitigation measures and practices specified in the ProPECC PN 1/94 “Construction Site Drainage” and “Recommended Pollution Control Clauses for Construction Contracts” issued by EPD.</li> <li>• All runoffs arising from the construction site should be properly collected and treated to ensure the discharge standards as stipulated in WPCO are met. Silt trap and oil interceptor should be provided to remove the oil, lubricants, grease, silt, grit and debris from the wastewater before being pumped to the public stormwater drainage system. The silt traps and oil interceptors should be cleaned and maintained regularly.</li> </ul>	To reduce water quality impact induced by the construction work	Contractor	Work Site	Construction Stage	ProPECC PN1/94; Water Pollution Control Ordinance

Project Profile Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Parties	Location of the measure	When to implement the measure	Relevant requirements or standards for the measure to achieve
	<ul style="list-style-type: none"> <li>Any foul effluent should not be discharged into any public sewer and stormwater drain, unless an effluent discharge permit is obtained under the WPCO by the Contractor.</li> <li>Site toilet facilities, if needed, should be chemical toilets or should have the foul water effluent directed to a foul sewer.</li> </ul>					
	Waste Management					
S.3.4	<p>Construction Waste Management Measures</p> <ul style="list-style-type: none"> <li>Excavated material should be reused on site as far as possible to minimise off-site disposal. Scrap metals or abandoned equipment should be recycled if possible.</li> <li>Waste arising should be kept to a minimum and be handled, transported and disposed of in a suitable manner.</li> <li>The Contractor should adopt a trip ticket system for the disposal of C&amp;D materials to any designated public filling facility and/or landfill. Independent audits of the Contractor and resident site staff will be undertaken to ensure that the correct procedures are being followed.</li> <li>Chemical waste shall be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes.</li> <li>All general refuse should be segregated and stored in enclosed bins or compaction units and waste separation facilities for paper, aluminium cans, plastic bottles etc. should be provided to facilitate reuse or</li> </ul>	To adopt waste management measures in the way of avoiding, minimising, reusing and recycling so as to reduce waste generation	Contractor	Work Site	Construction Stage	Waste Disposal Ordinance (Cap. 54); Waste Disposal (Chemical Waste) (General) Regulation; ETWB TCW No. 31/2004; ETWB TCW No. 19/2005.

<b>Project Profile Ref.</b>	<b>Recommended Mitigation Measures</b>	<b>Objectives of the Recommended Measures &amp; Main Concerns to address</b>	<b>Implementation Parties</b>	<b>Location of the measure</b>	<b>When to implement the measure</b>	<b>Relevant requirements or standards for the measure to achieve</b>
	recycling of materials and their proper disposal.					
	Landscape and Visual Impact					
S.3.5	Landscape and Visual Measures <ul style="list-style-type: none"> <li>• Screening of construction works by hoardings/noise barriers around works area with visually unobtrusive colours</li> </ul>	To reduce visual impact by construction works.	Contractor	Temporary Storage Area at Salisbury Road	Construction Stage	EIAO
S.3.5	<ul style="list-style-type: none"> <li>• Reinstating the affected amenity planting area at Salisbury Road after the completion of works</li> </ul>	To prevent loss of planter after construction	Contractor	Temporary Storage Area at Salisbury Road	Operation Stage	ETWB TCW No. 2/2004

## Appendix E

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# Status of Environmental Licenses and Permits





**Maeda Corporation**

**Contract No. C3840-13C**

**Tsim Sha Tsui Station Carnarvon Road Subway**

Last Update: 10-March-2014

## Licence Summary

Item No.	Govt. Ord.	Type? (License / Permit / Account / Notification / Registration & etc.)	Description	Submission	Ref. No	Date of Submission (to EPD) (DD-MM-YYYY)	Date of Approval / Receipt (from EPD) (DD-MM-YYYY)	Date of Activation (DD-MM-YYYY)	Date of Expiry (DD-MM-YYYY) Green = expire next mth; Yellow = expire this wk; Red = Expired	Description	Remarks
000	EIAO	Permit	Environmental Permit	N/A	AEP-440/2012	N/A	N/A	18 - 07 - 2012	N/A	Baseline, Air & Noise Impact Monitoring	
001	APCO	Notification	Construction Dust Notification	Form NA – Notification S3(1) of APCO (Construction Dust)	365953	18 - 10 - 2013	21 - 10 - 2013	01 - 11 - 2013	01 - 12 - 2014	Site Formation	
001	APCO	Notification	Construction Dust Notification	Form NA – Notification S3(1) of APCO (Construction Dust)	365953	18 - 10 - 2013	21 - 10 - 2013	01 - 02 - 2014	01 - 10 - 2016	Demolition of a Building	
001	APCO	Notification	Construction Dust Notification	Form NA – Notification S3(1) of APCO (Construction Dust)	365953	18 - 10 - 2013	21 - 10 - 2013	01 - 08 - 2014	01 - 08 - 2016	Work carried out in any part of a tunnel that is within 100m of any exit to the open air	
001	APCO	Notification	Construction Dust Notification	Form NA – Notification S3(1) of APCO (Construction Dust)	365953	18 - 10 - 2013	21 - 10 - 2013	01 - 01 - 2016	01 - 03 - 2017	Construction of the Superstructure of a Building	
001	APCO	Notification	Construction Dust Notification	Form NA – Notification S3(1) of APCO (Construction Dust)	365953	18 - 10 - 2013	21 - 10 - 2013	01 - 11 - 2016	10 - 09 - 2017	Road Construction Work	
002	WDO	Account	Construction Waste Billing Account	EPD-211 (Form 1) Application for a Billing Account for Disposal of Construction Waste	7018523	18 - 10 - 2013	25 - 10 - 2013	25 - 10 - 2013	N/A	Disposal of C&D Waste	Application No. WFG12765
003	WPCO	Licence	Water Discharge Licence	EPD-117 (Form A) Application for a Licence of Water Discharge	WT00018229-2014	09 - 01 - 2014	04 - 03 - 2014	04 - 03 - 2014	31 - 03 - 2019	Self Monitoring Only FlowRate 9m3/d, pH 6-9, SS 50mg/L, COD 100mg/L	
004	WDO	Registration	Chemical Waste Producer	EPD-129 Application for Registration as a Chemical Waste Producer	5213-2214-M2446-16	15 - 01 - 2014	04 - 03 - 2014	04 - 03 - 2014	N/A	Surplus paint, spent lubricating oil, spent battery	

Appendix F

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Event and Action Plan

# Event and Action Plan for Air Quality

In case the Action and Limit Levels are not complied during construction stage, the Event and Action Plan shown below should be followed.

Event / Action	ET	IEC	ER	Contractor
<b>Action Level</b>				
Exceedance for one sample	<ol style="list-style-type: none"> <li>1. Identify source;</li> <li>2. If valid, inform IEC and ER;</li> <li>3. Repeat measurement to confirm finding;</li> <li>4. Increase monitoring frequency to daily.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check Contractor's working method.</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify Contractor</li> </ol>	<ol style="list-style-type: none"> <li>1. Rectify any unacceptable practice;</li> <li>2. Amend working methods if appropriate</li> </ol>
Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>1. Identify source;</li> <li>2. Inform IEC and EPD;</li> <li>3. Repeat measurements to confirm findings;</li> <li>4. Increase monitoring frequency to daily;</li> <li>5. Discuss with IEC and Contractor on remedial action required;</li> <li>6. If exceedance continues, arrange meeting with IEC and ER;</li> <li>7. If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check Contractor's working method;</li> <li>3. Discuss with ET and Contractor on possible remedial measures;</li> <li>4. Advise the ER on the effectiveness of the proposed remedial measures;</li> <li>5. Supervise implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. Ensure remedial measure properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit proposals for remedial action to IEC within 3 working days of notification;</li> <li>2. Implement the agreed proposals;</li> <li>3. Amend proposal if appropriate.</li> </ol>
<b>Limit Level</b>				
Exceedance for one sample	<ol style="list-style-type: none"> <li>1. Identify source;</li> <li>2. Inform ER and EPD;</li> <li>3. Repeat measurement to confirm finding;</li> <li>4. Increase</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check Contractor's working</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. Ensure remedial</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance;</li> <li>2. Submit proposals for remedial actions to IEC</li> </ol>

Event / Action	ET	IEC	ER	Contractor
	<p>monitoring frequency to daily;</p> <p>5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.</p>	<p>method;</p> <p>4. Discuss with ET and the Contractor on possible remedial measures;</p> <p>5. Advise the ER on the effectiveness of the proposed remedial measures;</p> <p>6. Supervise implementation of remedial measures.</p>	<p>measures properly implemented.</p>	<p>within 3 working days of notification;</p> <p>3. Implement the agreed proposals;</p> <p>4. Amend proposal if appropriate.</p>
Exceedance for two or more consecutive samples	<p>1. Notify IEC, ER, Contractor and EPD;</p> <p>2. Identify sources;</p> <p>3. Repeat measurement to confirm findings;</p> <p>4. Increase monitoring frequency to daily;</p> <p>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;</p> <p>6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken;</p> <p>7. Assess the effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the</p>	<p>1. Discuss amongst ER, ET and Contractor on the potential remedial actions;</p> <p>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ET accordingly.</p> <p>3. Supervise the implementation of remedial measures.</p>	<p>1. Confirm receipt of notification of failure in writing;</p> <p>2. Notify Contractor;</p> <p>3. In consultation with IEC, agree with the Contractor on the remedial measures to be implemented;</p> <p>4. Ensure remedial measures properly implemented;</p> <p>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.</p>	<p>1. Take immediate action to avoid further exceedance;</p> <p>2. Submit proposals for remedial actions to IEC within 3 working days of notification;</p> <p>3. Implement the agreed proposals;</p> <p>4. Resubmit proposals if problem still not under control;</p> <p>5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.</p>

Event / Action	ET	IEC	ER	Contractor
	results; 8. If exceedance stops, cease additional monitoring.			

# Event and Action Plan for Construction Noise

In case the Action and Limit Levels are not complied during the construction stage, the Event and Action Plan shown below should be followed.

Event / Action	ET	IEC	ER	Contractor
Action Level	<ol style="list-style-type: none"> <li>1. Notify IEC and Contractor.</li> <li>2. Carry out investigation.</li> <li>3. Report the results of investigation to the IEC and Contractor.</li> <li>4. Discuss with the Contractor and formulate remedial measures</li> <li>5. Increase monitoring frequency to check mitigation effectiveness.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review the analyzed result submitted by ET.</li> <li>2. Review the proposed remedial measures by the Contractor and advise the ER accordingly.</li> <li>3. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance</li> <li>2. Notify Contractor</li> <li>3. Require Contractor to propose remedial measures for the analysed noise problem</li> <li>4. Ensure remedial measures are properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit noise mitigation proposals to IEC</li> <li>2. Implement noise mitigation proposals</li> </ol>
Limit Level	<ol style="list-style-type: none"> <li>1. Notify IEC, ER, EPD and Contractor, and follow other actions</li> <li>2. Identify source</li> <li>3. Repeat measurement to confirm findings</li> <li>4. Increase monitoring frequency</li> <li>5. Check Contractor's working procedures to determine possible mitigation to be implemented</li> <li>6. Inform IEC, ER and EPD the causes and actions taken for the exceedances</li> <li>7. Assess effectiveness of Contractor's</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst ER, ET and Contractor on the potential remedial actions</li> <li>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ET accordingly</li> <li>3. Supervise the implementation of remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedances</li> <li>2. Notify Contractor</li> <li>3. Require Contractor to propose remedial measures</li> <li>4. Ensure remedial measures are properly implemented</li> <li>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance</li> <li>2. Submit proposals for remedial actions to IEC within 3 working days of notifications</li> <li>3. Implement the agreed proposals</li> <li>4. Revise and resubmit proposals if problem still not under control</li> <li>5. Stop the relevant portion of works as determined by the ER until the exceedance is abated</li> </ol>

Event / Action	ET	IEC	ER	Contractor
	remedial actions and keep IEC, EPD, ER informed of the results 8. If exceedance stops, cease additional monitoring			

## Appendix G

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### Monitoring Schedule



**C3840-13C MTRCL Tsim Sha Tsui Station Carnarvon Road Subway and Entrances Modification Works  
Tentative Monitoring Schedule for May 2014**

# MAY 2014

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday																																																																																				
				1	2	3																																																																																				
4	5	6	7 Weekly Site Audit 24-hr TSP	8 Noise	9	10																																																																																				
11	12	13 Noise Weekly Site Audit 24-hr TSP	14	15	16	17																																																																																				
18	19	20 Weekly Site Audit 24-hr TSP	21	22	23 Noise	24																																																																																				
25	26	27 Noise Weekly Site Audit 24-hr TSP	28	29	30	31																																																																																				
		<p><b>April 2014</b></p> <table border="1"> <thead> <tr><th>Su</th><th>M</th><th>Tu</th><th>W</th><th>Th</th><th>F</th><th>Sa</th></tr> </thead> <tbody> <tr><td></td><td></td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td></tr> <tr><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td></tr> <tr><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td></tr> <tr><td>27</td><td>28</td><td>29</td><td>30</td><td></td><td></td><td></td></tr> </tbody> </table>		Su	M	Tu	W	Th	F	Sa			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				<p><b>June 2014</b></p> <table border="1"> <thead> <tr><th>Su</th><th>M</th><th>Tu</th><th>W</th><th>Th</th><th>F</th><th>Sa</th></tr> </thead> <tbody> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr> <tr><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td></tr> <tr><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td></tr> <tr><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td></tr> <tr><td>29</td><td>30</td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		Su	M	Tu	W	Th	F	Sa	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30						
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[Monthly Calendar](#)

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**C3840-13C MTRCL Tsim Sha Tsui Station Carnarvon Road Subway and Entrances Modification Works  
Tentative Monitoring Schedule for June 2014**

<h1>JUNE 2014</h1>																																																																																								
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday																																																																																		
1	2	3 24-hr TSP Noise Weekly Site Audit	4	5	6	7																																																																																		
8	9 24-hr TSP	10 Noise Weekly Site Audit	11	12	13	14																																																																																		
15	16 24-hr TSP	17 Noise Weekly Site Audit	18	19	20	21																																																																																		
22	23 24-hr TSP	24 Noise Weekly Site Audit	25	26	27	28																																																																																		
29	30																																																																																							
		<b>May 2014</b> <table border="1"> <tr><td>Su</td><td>M</td><td>Tu</td><td>W</td><td>Th</td><td>F</td><td>Sa</td></tr> <tr><td></td><td></td><td></td><td></td><td>1</td><td>2</td><td>3</td></tr> <tr><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td></tr> <tr><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td></tr> <tr><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td></tr> </table>	Su	M	Tu	W	Th	F	Sa					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	<b>July 2014</b> <table border="1"> <tr><td>Su</td><td>M</td><td>Tu</td><td>W</td><td>Th</td><td>F</td><td>Sa</td></tr> <tr><td></td><td></td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td></tr> <tr><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td></tr> <tr><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td></tr> <tr><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td><td></td><td></td></tr> </table>	Su	M	Tu	W	Th	F	Sa			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
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27	28	29	30	31																																																																																				

[Monthly Calendar](#)

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This schedule may be subject to change due to unexpected circumstances (e.g. adverse weather)

## Appendix H

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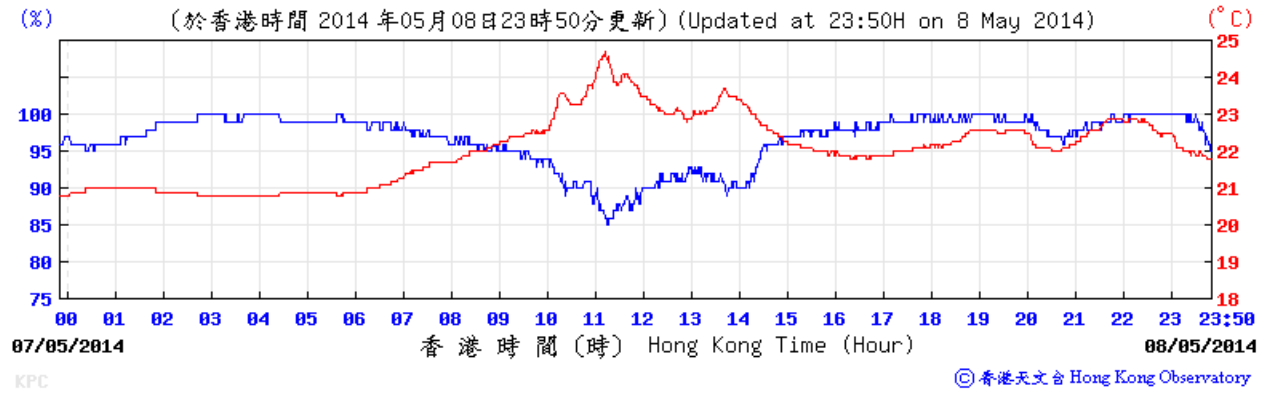
### Weather Information Extracted from HK Observatory

Daily Total Rainfall (mm) at King's Park HKO Weather Monitoring Station in May 2014

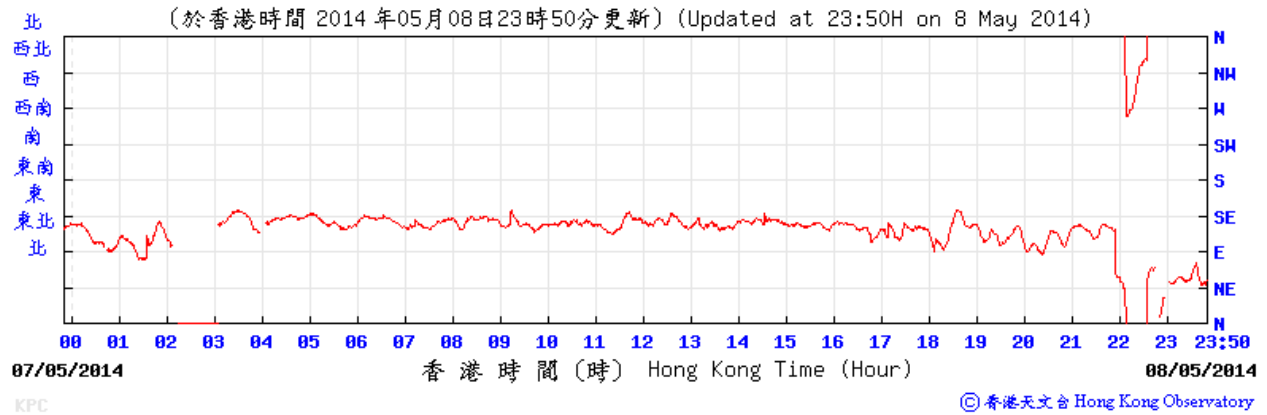
Day	May	24-hr TSP	Noise	Remarks
1	2.5			
2	-			
3	-			
4	5.4			
5	29.1			
6	1.2			
7	3.7	✓		
8	99.6		✓	No rainfall recorded on site during Noise Monitoring
9	93.2			
10	11.6			
11	165.1			
12	37.7			
13	56.2	✓	✓	No rainfall recorded on site during Noise Monitoring
14	4.5			
15	2.5			
16	14.1			
17	11.5			
18	3.1			
19	2.7			
20	60.1	✓		
21	43.3			
22	0.3			
23	23.5		✓	No rainfall recorded on site during Noise Monitoring
24	-			
25	0.3			
26	-			
27	-	✓	✓	No rainfall recorded on site during Noise Monitoring
28	-			
29	-			
30	2.8			
31	-			
<b>Total</b>	<b>674.0</b>			

# King's Park Weather Station – 08 May 2014

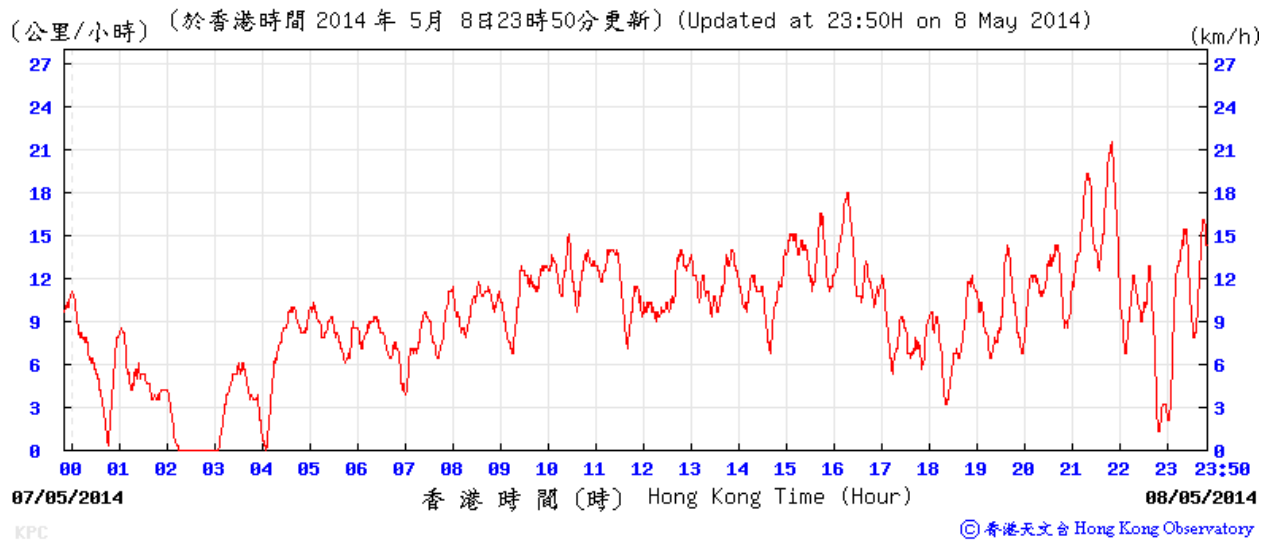
## Temperature and Humidity:



## Wind Direction:

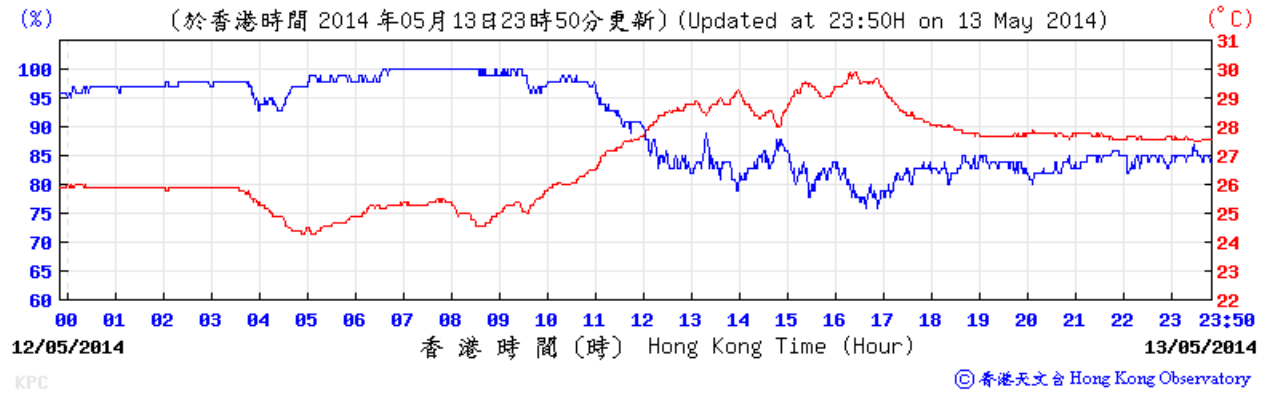


## Wind Speed:

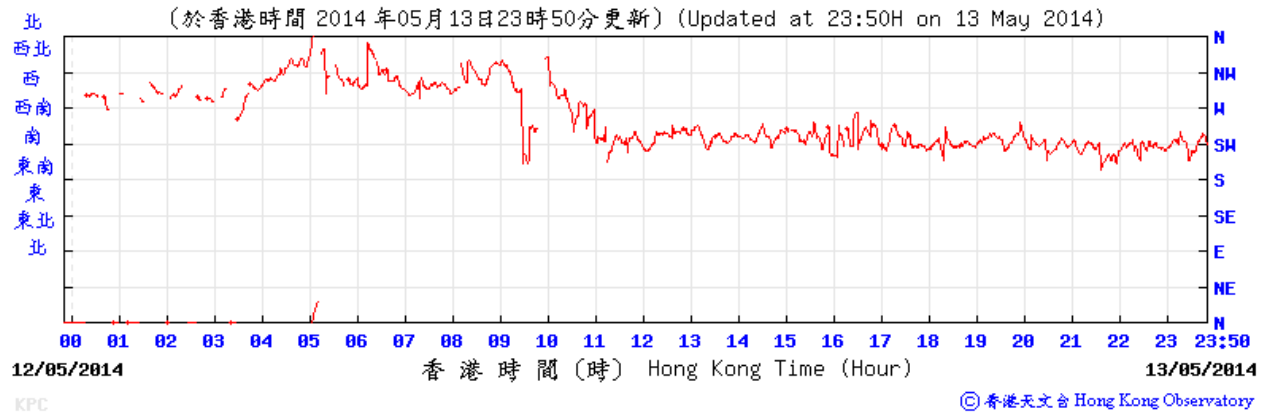


# King's Park Weather Station – 13 May 2014

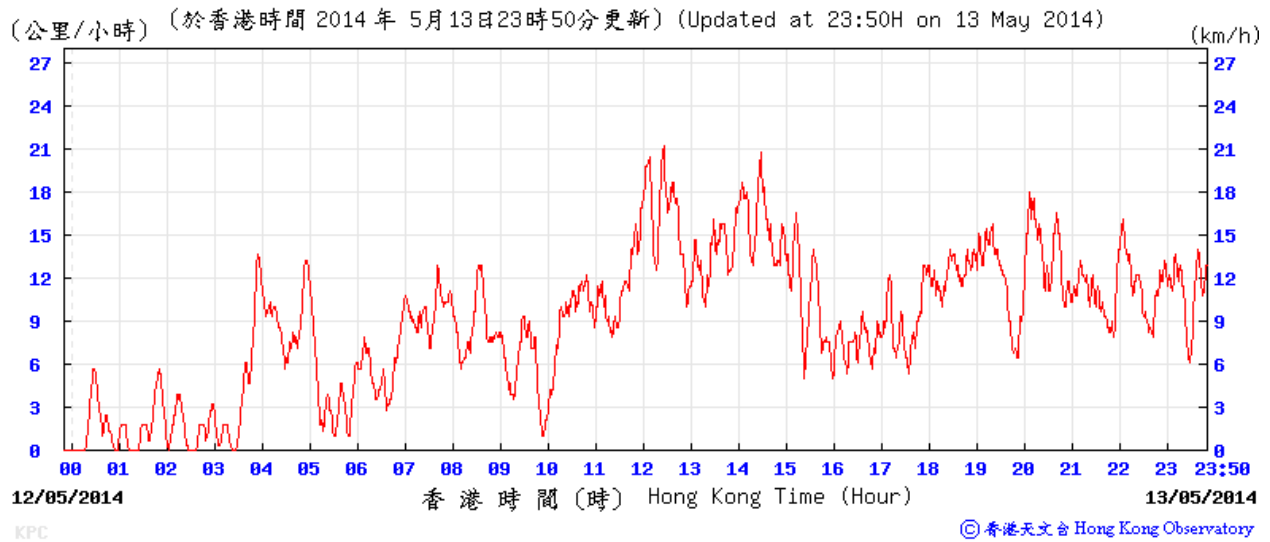
## Temperature and Humidity:



## Wind Direction:

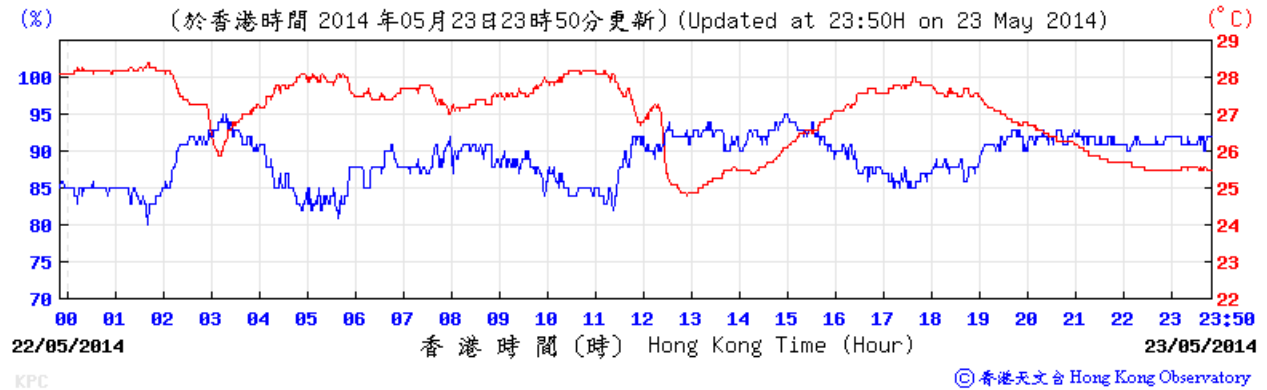


## Wind Speed:

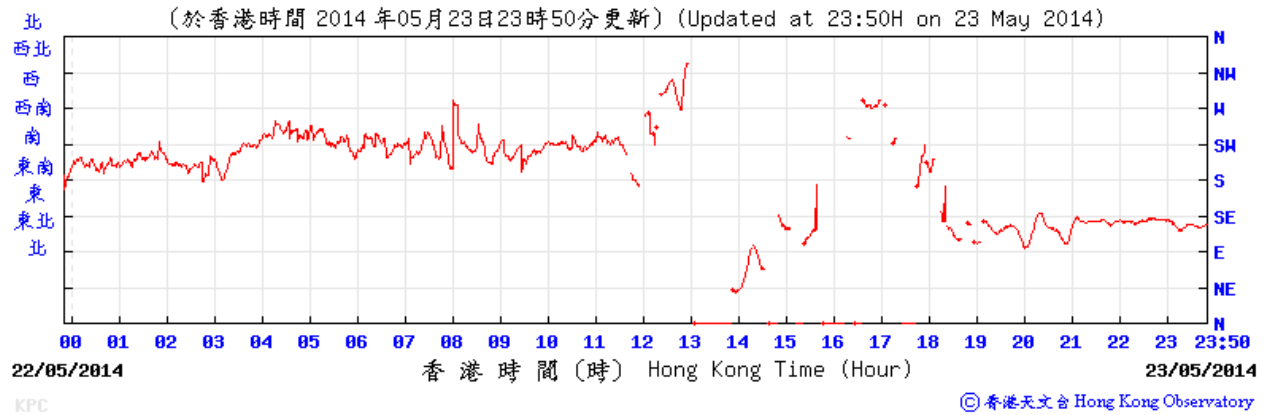


# King's Park Weather Station – 23 May 2014

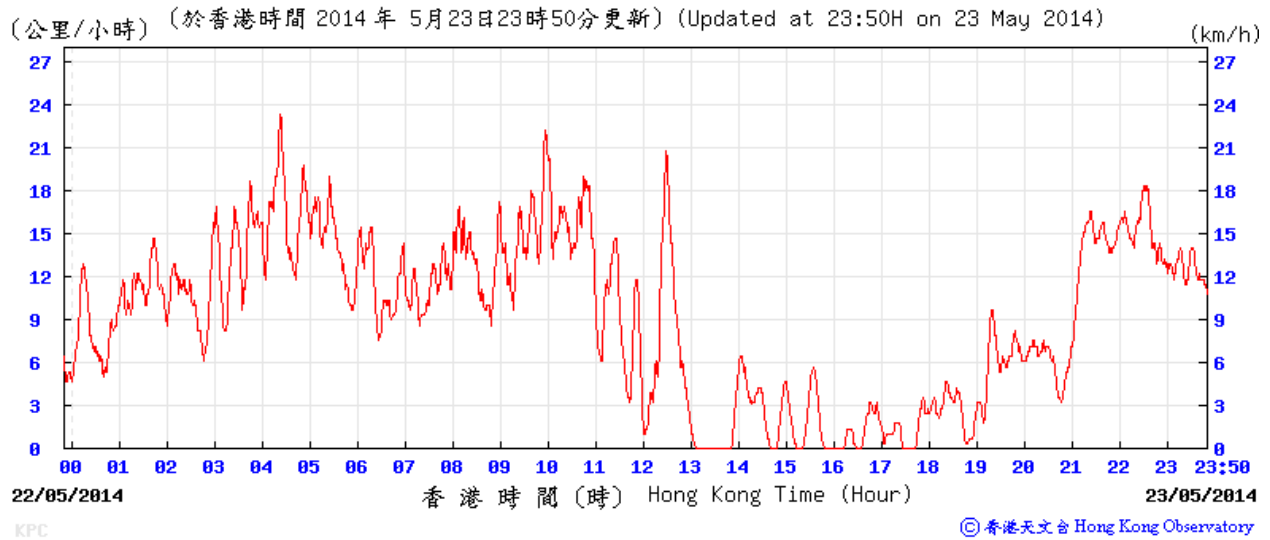
## Temperature and Humidity:



## Wind Direction:

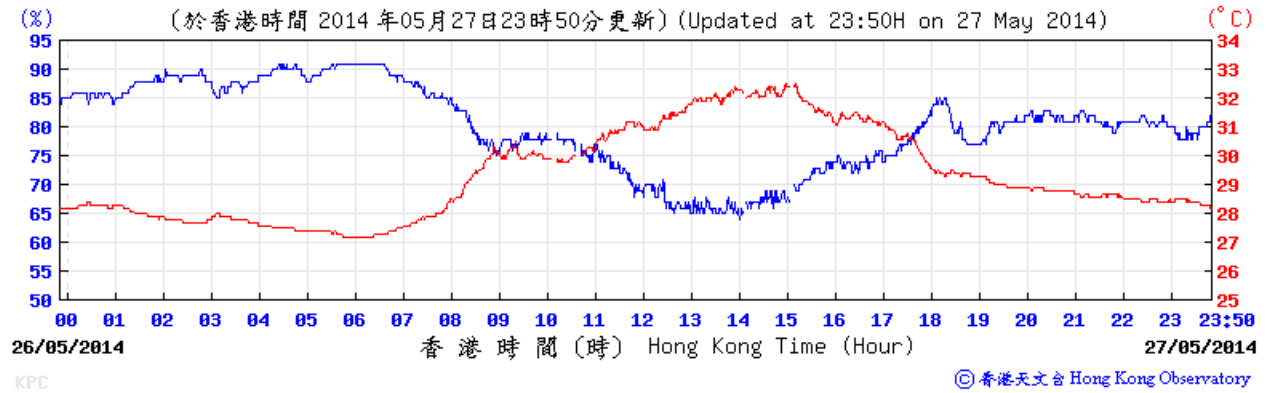


## Wind Speed:

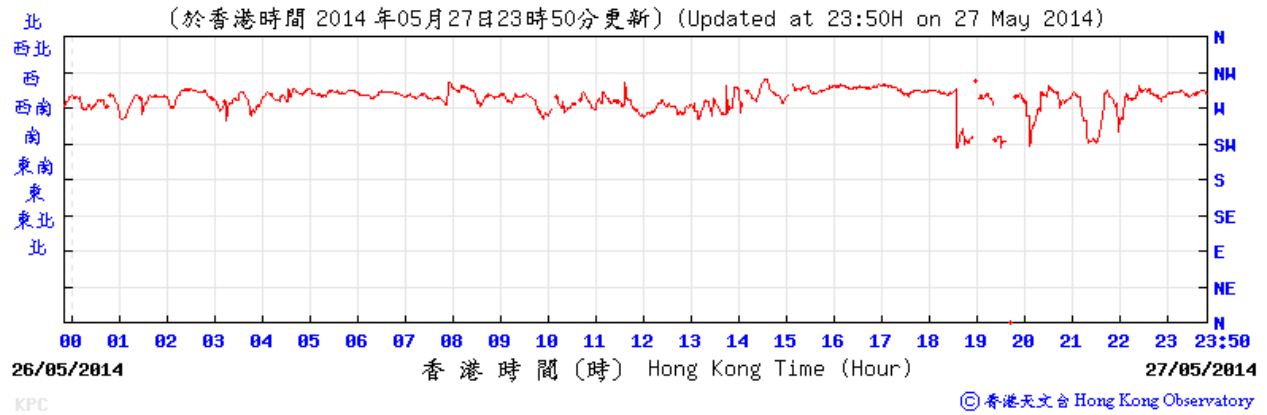


# King's Park Weather Station – 27 May 2014

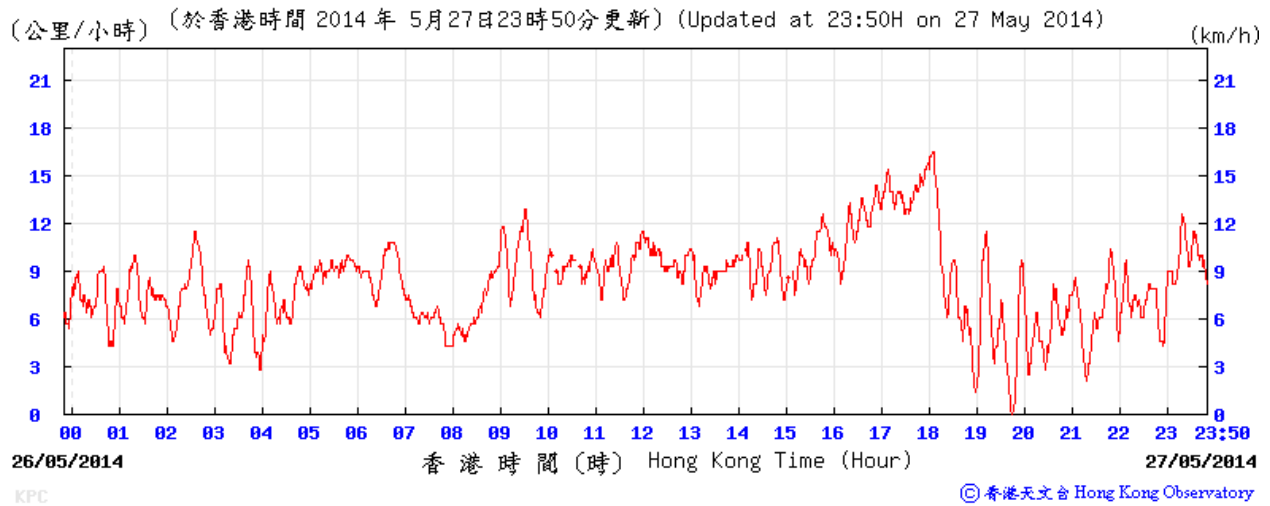
## Temperature and Humidity:



## Wind Direction:



## Wind Speed:





Appendix I

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Certificate of Laboratory and Equipment Calibration



TISCH ENVIRONMENTAL, INC.  
 145 SOUTH MIAMI AVE  
 VILLAGE OF CLEVELS, OH  
 45002  
 513.467.9000  
 877.263.7610 TOLL FREE  
 513.467.9009 FAX

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Mar 24, 2014 Rootmeter S/N 0438320 Ta (K) - 293  
 Operator Tisch Orifice I.D. - 1785 Pa (mm) - 758.19

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	1.4150	3.2	2.00
2	NA	NA	1.00	0.9940	6.4	4.00
3	NA	NA	1.00	0.8890	7.9	5.00
4	NA	NA	1.00	0.8490	8.7	5.50
5	NA	NA	1.00	0.7020	12.6	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
1.0103	0.7140	1.4245	0.9958	0.7037	0.8791
1.0061	1.0122	2.0146	0.9916	0.9976	1.2433
1.0040	1.1293	2.2524	0.9895	1.1130	1.3900
1.0030	1.1814	2.3623	0.9885	1.1643	1.4579
0.9977	1.4213	2.8491	0.9833	1.4008	1.7583
Qstd slope (m) = 2.01484			Qa slope (m) = 1.26166		
intercept (b) = -0.01898			intercept (b) = -0.01171		
coefficient (r) = 0.99991			coefficient (r) = 0.99991		
y axis = SQRT[H2O(Pa/760) (298/Ta)]			y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

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

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

For subsequent flow rate calculations:

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

**TSP Sampler Calibration**

**SITE**

Location: Tsim Sha Tsui  
Sampler:

Date: January 10, 2014  
Tech: Sam Wong

**CONDITIONS**

Barometric Pressure (in Hg):	40.35	Corrected Pressure (mm Hg):	1025
Temperature (deg F):	59	Temperature (deg K):	288
Average Press. (in Hg):	40.35	Corrected Average (mm Hg):	1025
Average Temp. (deg F):	59	Average Temp. (deg K):	288

**CALIBRATION ORIFICE**

Make: Tisch  
Model: TE-5025A  
Serial#: 1785

Qstd Slope: 2.00979  
Qstd Intercept: -0.01403  
Date Certified: April 9, 2013

**CALIBRATIONS**

Plate or Test #	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION
1	12.60	2.093	56.0	66.15	Slope = 30.5358
2	9.80	1.847	50.0	59.06	Intercept = 2.6204
3	7.30	1.595	44.0	51.98	Corr. coeff.= 0.9995
4	4.60	1.268	35.0	41.34	
5	2.90	1.008	28.0	33.08	# of Observations: 5

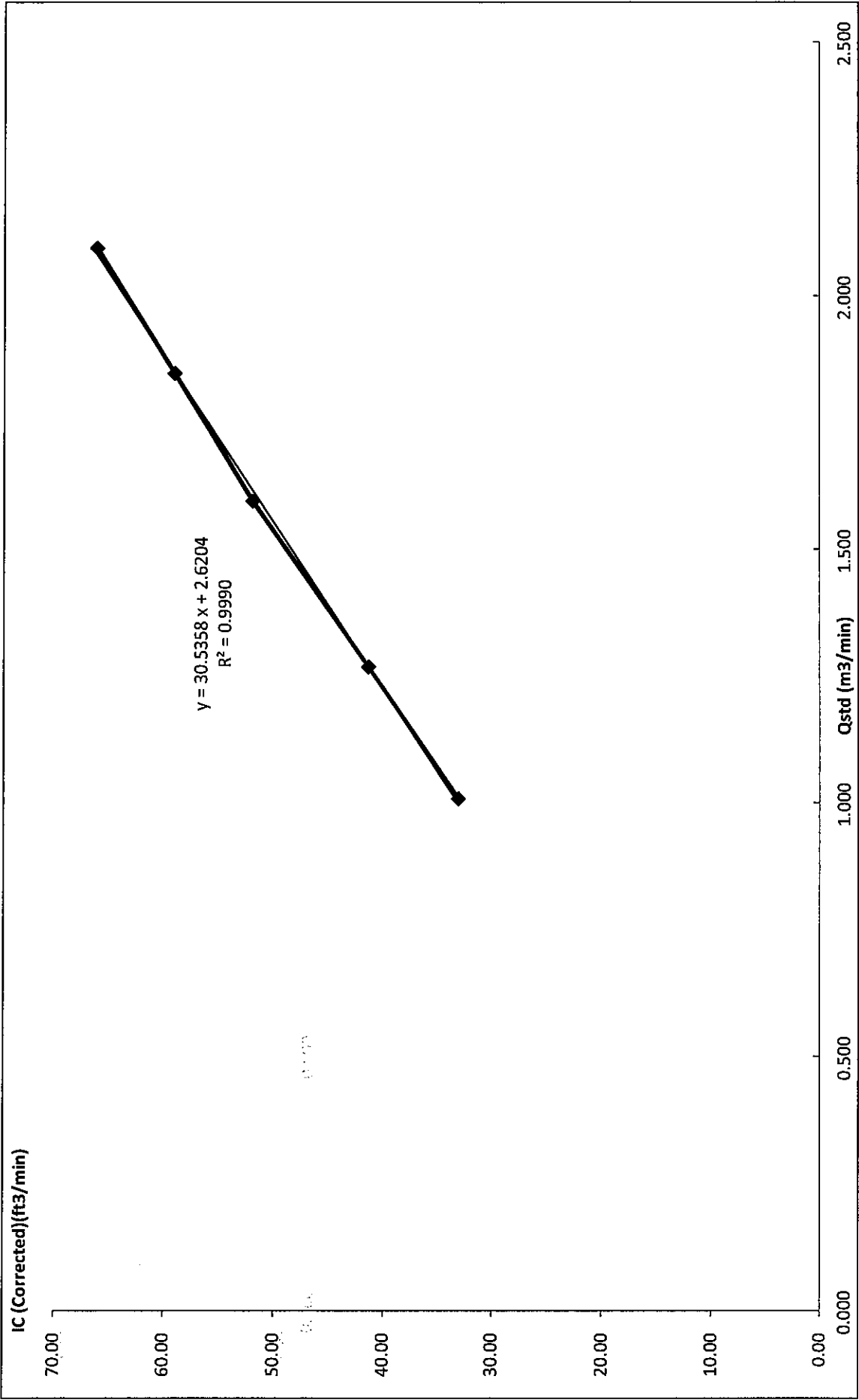
**Calculations**

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$
$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate  
IC = corrected chart response  
I = actual chart response  
m = calibrator Qstd slope  
b = calibrator Qstd intercept  
Ta = actual temperature during calibration (deg K)  
Pa = actual pressure during calibration (mm Hg)  
Tstd = 298 deg K  
Pstd = 760 mm Hg

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

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



**High Volume Air Sampler Calibration Worksheet**

Project Title: MTR Tsim Sha Tsui Station Carnarvon Road Subway and Entrances Modification Works  
 Monitoring Location: K11 Commercial Complex  
 Calibration Date: 11-Mar-14  
 Calibration Due Date: 10-May-14  
 Time: 11:30

Sampler Model:	TES005X
Serial No.:	1713
Calibrator Orifice no.:	1785
Slope (m):	2.00979
Intercept (b):	-0.01403
Correction coeff. (r):	0.99995

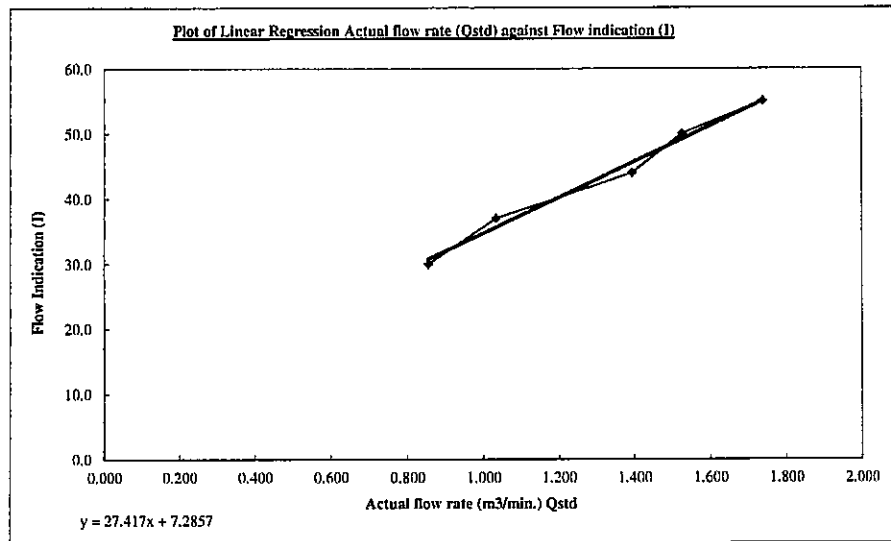
$$Flow (corrected) = \sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}}$$

$$Q_{std} = \frac{1}{m} \times \left( \sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}} - b \right)$$

Standard pressure (mmHg) Pstd:	763.9
Standard temp. (K) Tstd:	290.8
Calibration pressure (mmHg) Pa:	766.4
Calibration temp. (K) Ta:	288.3

Sample no.	Pressure Drop (H), Inch	Flow (corrected), m <sup>3</sup> /min	Actual flow rate (Qstd), m <sup>3</sup> /min	Flow indication (I), arbitrary
1	11.7	3.483	1.740	55.0
2	9.0	3.055	1.527	50.0
3	7.5	2.789	1.395	44.0
4	4.1	2.062	1.033	37.0
5	2.8	1.704	0.855	30.0

Correlation Coefficient : 0.9931



Remark  
 1 hPa = 0.750062 mmHg

Calibrated by: Kelvin Chiang  
 ( *Kelvin Chiang* )

Date: 11 March 2014

Checked by: F.N. Wong  
 ( *F.N. Wong* )

Date: 08 April 2014

**High Volume Air Sampler Calibration Worksheet**

Project Title: MTR Tsim Sha Tsui Station Carnarvon Road Subway and Entrances Modification Works  
 Monitoring Location: K11 Commercial Complex  
 Calibration Date: 12-May-14  
 Calibration Due Date: 12-Jul-14  
 Time: 11:05

Sampler Model:	TE5005X
Serial No.:	1713
Calibrator Orifice no.:	1785
Slope (m):	2.01484
Intercept (b):	-0.01898
Correction coeff. (r)	0.99991

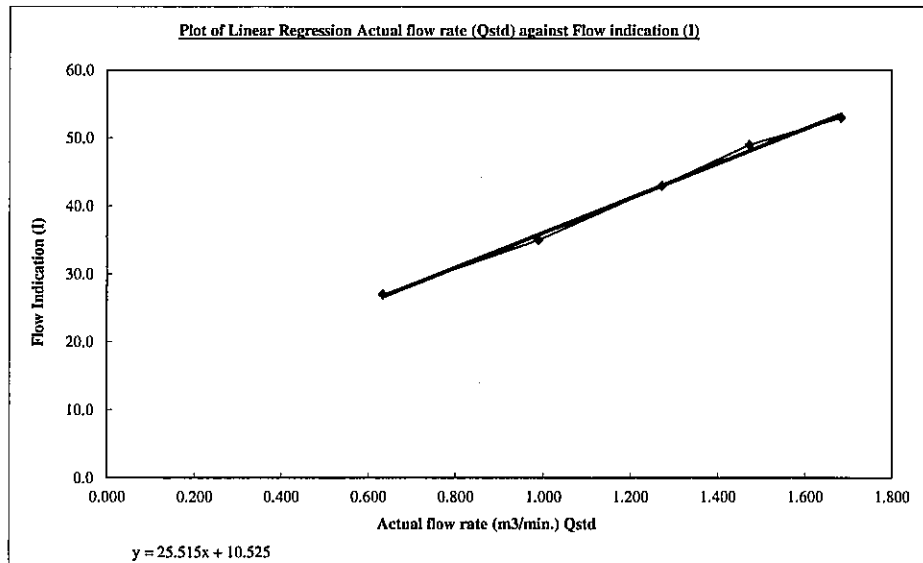
$$\text{Flow (corrected)} = \sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}}$$

Standard pressure (mmHg) Pstd:	752.3
Standard temp. (K) Tstd:	302.1
Calibration pressure (mmHg) Pa:	766.4
Calibration temp. (K) Ta:	288.3

$$Qstd = \frac{1}{m} \times (\sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}} - b)$$

Sample no.	Pressure Drop (H), inch	Flow (corrected), m <sup>3</sup> /min	Actual flow rate (Qstd), m <sup>3</sup> /min	Flow indication (I), arbitrary
1	10.8	3.372	1.683	53.0
2	8.3	2.947	1.472	49.0
3	6.2	2.545	1.272	43.0
4	3.7	1.974	0.989	35.0
5	1.5	1.257	0.633	27.0

Correlation Coefficient : 0.9980



Remark  
 1 hPa = 0.750062 mmHg

Calibrated by: Kelvin Chiang  
 ( *Kelvin Chiang* )

Date: 12 May 2014

Checked by: F.N. Wong  
 ( *F.N. Wong* )

Date: 12 May 2014

# Certificate of Calibration and Conformance

Certificate Number 2014-185777

Instrument Model CAL200, Serial Number 10929, was calibrated on 29 Jan 2014. The instrument meets factory specifications per Procedure D0001.8190, IEC 60942:2003.

**New Instrument**

**Date Calibrated: 29 Jan 2014**

**Calibration due:**

## Calibration Standards Used

MANUFACTURER	MODEL	SERIAL NUMBER	INTERVAL	CAL. DUE	TRACEABILITY NO.
Larson Davis	2900	0661	12 Months	8 Apr 2014	2013-172252
Larson Davis	2559	2506	12 Months	13 Jun 2014	29027
Larson Davis	MTS1000/2201	0111	12 Months	22 Aug 2014	SM082213
Larson Davis	PRM902	0480	12 Months	23 Aug 2014	2013-178669
Hewlett Packard	34401A	3146A10352	12 Months	3 Sep 2014	6214490
PCB	1502C02FJ15PSIA	1429	12 Months	2 Oct 2014	3463562806
Larson Davis	PRM915	0112	12 Months	9 Oct 2014	2013-180644

Reference Standards are traceable to the National Institute of Standards and Technology (NIST)

## Calibration Environmental Conditions

Environmental test conditions as shown on calibration report.

## Affirmations

This Certificate attests that this instrument has been calibrated under the stated conditions with Measurement and Test Equipment (M&TE) Standards traceable to the U.S. National Institute of Standards and Technology (NIST). All of the Measurement Standards have been calibrated to their manufacturers' specified accuracy / uncertainty. Evidence of traceability and accuracy is on file at Provo Engineering & Manufacturing Center. An acceptable accuracy ratio between the Standard(s) and the item calibrated has been maintained. This instrument meets or exceeds the manufacturer's published specification unless noted.

The collective uncertainty of the Measurement Standard used does not exceed 25% of the applicable tolerance for each characteristic calibrated unless otherwise noted.

The results documented in this certificate relate only to the item(s) calibrated or tested. A one year calibration is recommended, however calibration interval assignment and adjustment are the responsibility of the end user. This certificate may not be reproduced, except in full, without the written approval of the issuer.

Signed:   
Technician: Scott Montgomery

**Larson Davis CAL200 Acoustic Calibrator, SN: 10929**  
**Certificate of Measured Output**

**Performance at Reference Conditions**

Nominal Level (dB SPL):	94	114
Measured Level (dB SPL):	<b>94.01</b>	<b>114.02</b>
Expanded Uncertainty (dB):	0.137	0.135
Level Error Limit (dB):	±0.34	±0.33
Nominal Frequency (Hz):	1000	1000
Measured Frequency (Hz):	<b>1000.2</b>	<b>1000.2</b>
Expanded Uncertainty (Hz):	0.2	0.2
Frequency Error Limit (Hz):	±10.0	±10.0
Measured Distortion (%):	0.43	0.34
Expanded Uncertainty (%):	0.25	0.25
Distortion Limit (%):	2.0	2.0

The data is acquired by the insert voltage calibration method using the reference microphone's open circuit sensitivity.

**Environmental Conditions**

Temperature (°C):	25	24
Relative Humidity (%):	31	32
Static Pressure (kPa):	101.2	101.0

**Reference Microphone**

Model: Larson Davis 2559  
Serial Number: 2506  
Open Circuit Sensitivity: 12.230 mV/Pascal  
Uncertainty: 0.110 dB

**Influence of Static Pressure**

Nominal Level (dB SPL):		114		
Nominal Pressure (kPa)	Pressure (kPa)	Level Change (dB)	Frequency Change (Hz)	Distortion (%)
108.0	108.1	-0.02	-0.00	0.34
101.3	101.5	0.00	0.00	0.33
92.0	91.9	0.02	0.00	0.33
83.0	83.1	0.01	-0.00	0.34
74.0	74.1	-0.02	-0.01	0.37
65.0	65.0	-0.10	-0.01	0.42
Expanded Uncertainty:	1.0	0.04	0.20	0.25
Limit:		±0.30	±10.0	2.0

Reference microphone corrections applied.

**Environmental Conditions**

Temperature (°C):	23
Relative Humidity (%):	33

**Reference Microphone**

Model: Larson Davis 2559  
Serial Number: 2506

Static pressure was measured with a calibrated Motorola pressure sensor MPX2100AP.  
Temperature and humidity was measured with a calibrated Fluke 1620A sensor.  
Expanded uncertainty of environmental measurements: 0.3 °C, 3 %RH, 1.0 kPa  
Uncertainty values are given at 95% confidence level (k = 2).

A Sound Level Meter can be calibrated to a level (L) defined as: L = measured level + pressure sensitivity  
or if a Sound Level Meter is calibrated using the nominal level, the adjustments to data (X) are defined as:  
X = measured level - nominal level - pressure sensitivity



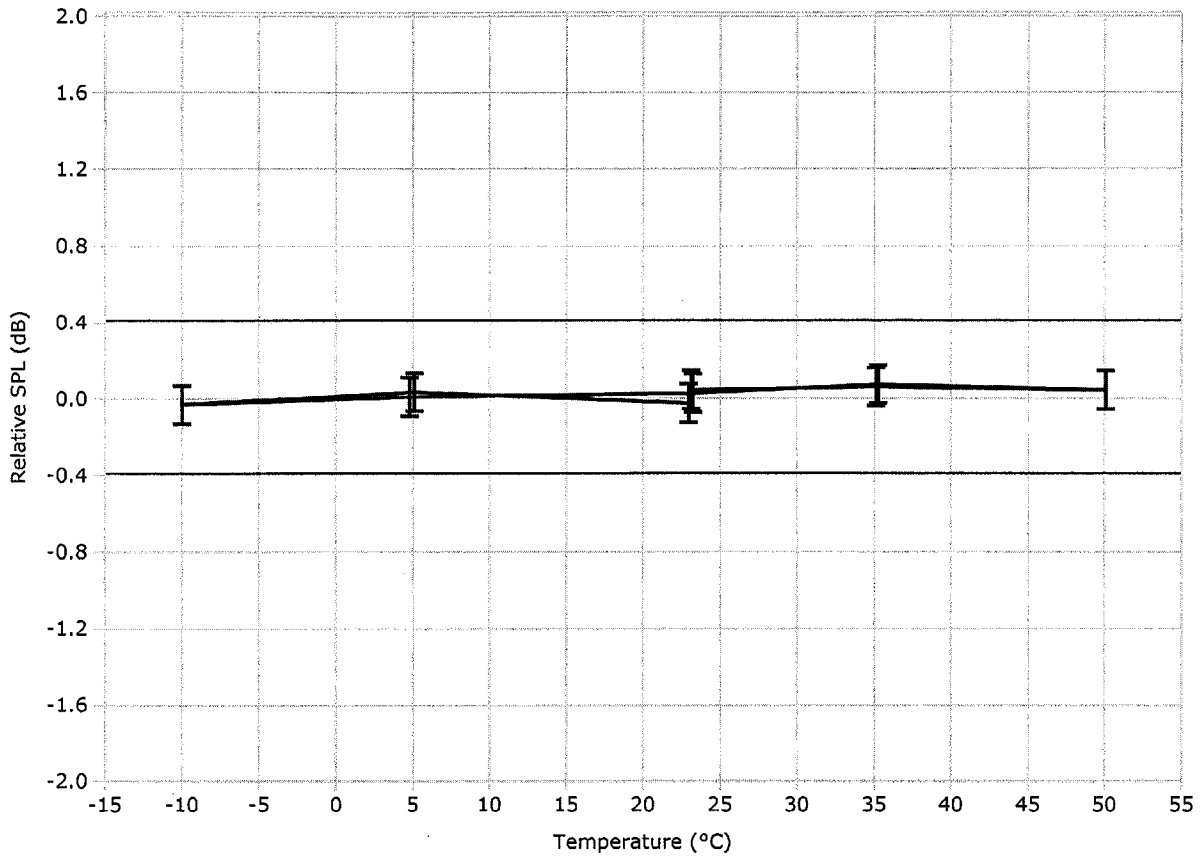


# Model CAL200 Relative SPL vs. Temperature

Larson Davis Model CAL200 Serial Number: 10929

Model CAL200 Relative SPL vs. Temperature at 50% RH.  
A 2559 Mic (SN: 2980) with a PRM901 Preamp (SN: 0205), station 24 was used to check the levels.

Test Date: 09 Jan 2014 1:22:36 PM



0.1dB expanded uncertainty at ~95% confidence level (k=2)

Test Location: Larson Davis, a division of PCB Piezotronics, Inc.  
1681 West 820 North, Provo, Utah 84601  
Tel: 716 684-0001 [www.LarsonDavis.com](http://www.LarsonDavis.com)

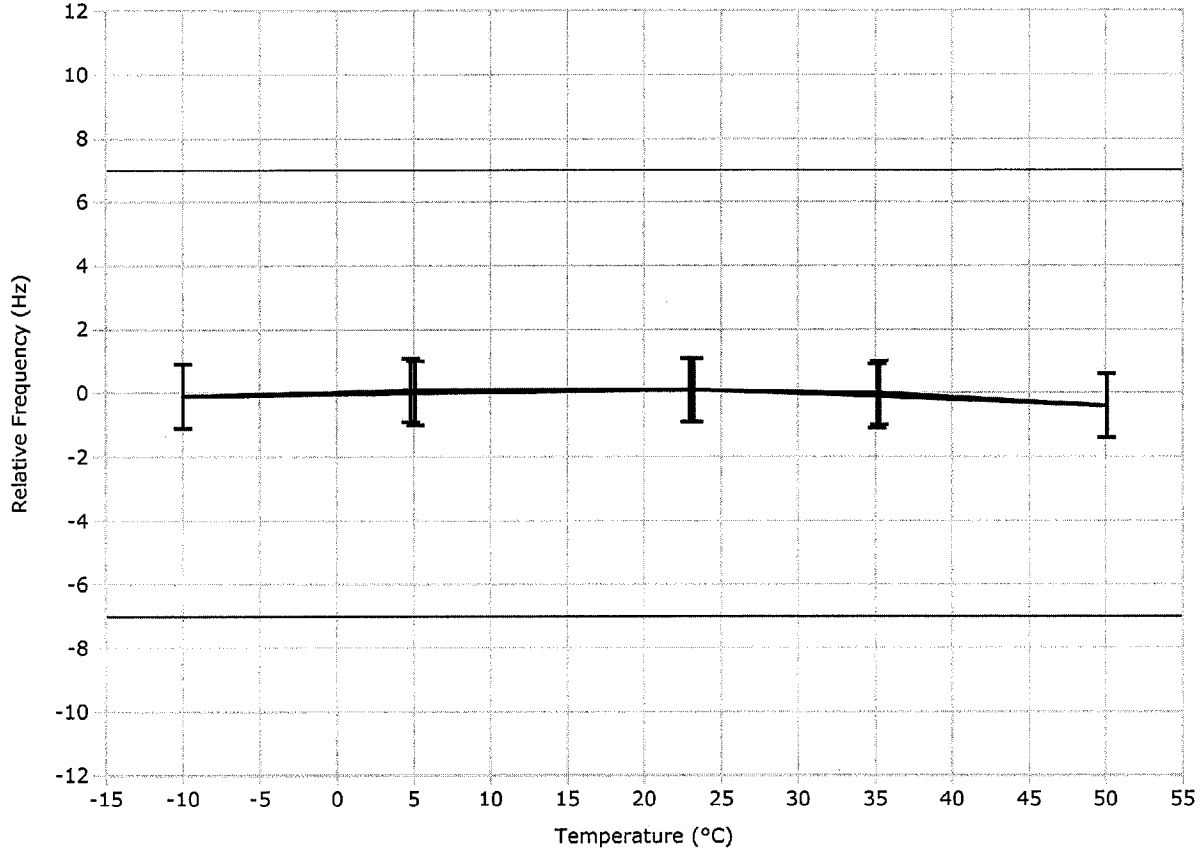


# Model CAL200 Relative Frequency vs. Temperature

Larson Davis Model CAL200 Serial Number: 10929

Model CAL200 Relative Frequency vs. Temperature at 50% RH.  
A 2559 Mic (SN: 2980) with a PRM901 Preamp (SN: 0205), station 24 was used to check the levels.

Test Date: 09 Jan 2014 1:22:36 PM



1.0 Hz expanded uncertainty at ~95% confidence level (k=2)

Test Location: Larson Davis, a division of PCB Piezotronics, Inc.  
1681 West 820 North, Provo, Utah 84601  
Tel: 716 684-0001 [www.LarsonDavis.com](http://www.LarsonDavis.com)



# Calibration Certificate

Certificate No. **401114**

Page 1 of 3 Pages

**Customer :** Hyder Consulting Limited

**Address :** 47/F., Hopewell Centre, 183 Queens Road East, Wanchai, Hong Kong

**Order No. :** Q40515

**Date of receipt :** 25-Feb-14

## Item Tested

**Description :** Sound Level Meter

**Manufacturer :** B&K

**Model :** 2238

**Serial No. :** 2562782

## Test Conditions

**Date of Test :** 6-Mar-14

**Supply Voltage :** --

**Ambient Temperature :** (23 ± 3)°C

**Relative Humidity :** (50 ± 25) %

## Test Specifications

Calibration check.

Ref. Document/Procedure: Z01, IEC 651, IEC 804.

## Test Results

All results were within the IEC 651 Type 1, IEC 804 Type 1 specification.

The results are shown in the attached page(s).

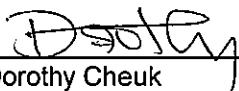
Main Test equipment used:

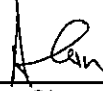
<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Traceable to</u>
S017	Multi-Function Generator	C127181	SCL-HKSAR
S205	Ref. Sound Level Calibrator	PHCO40002	SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI).

The test results apply to the above Unit-Under-Test only

**Calibrated by :**   
Dorothy Cheuk

**Approved by :**   
Alan Chu

**Date:** 6-Mar-14

This Certificate is issued by:  
Hong Kong Calibration Ltd.  
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.  
Tel: 2425 8801 Fax: 2425 8646



# Calibration Certificate

Certificate No. 401114

Page 2 of 3 Pages

Results :

## 1. SPL Accuracy

Range	UUT Setting			Applied Value (dB)	UUT Reading (dB)
	Freq. Wgt.	Bandwith	Center Freq.		
20 ~ 100	A	BB/F	--	94.0	94.1
	A	BB/S	--		94.1
	C	BB/F	--		94.1
40 ~ 120	A	BB/F	--	94.0	94.1
	A	BB/F	--	114.0	114.1

IEC 651 Type 1 Spec. :  $\pm 0.7$  dB

Uncertainty :  $\pm 0.1$  dB

## 2. Level Stability : 0.0 dB

IEC 651 Type 1 Spec. :  $\pm 0.3$  dB

Uncertainty :  $\pm 0.01$  dB

## 3. Linearity

### 3.1 Level Linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec. (Primary Indicator Range)
140	114.0	114.1	0.0	$\pm 0.7$ dB
130	104.0	104.1	0.0	
120	94.0	94.1 (Ref.)	--	
110	84.0	84.1	0.0	
100	74.0	74.1	0.0	
90	64.0	64.1	0.0	
80	54.0	54.1	0.0	

Uncertainty :  $\pm 0.1$  dB



# Calibration Certificate

Certificate No. 401114

Page 3 of 3 Pages

## 3.2 Differential level linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec.
120	84.0	84.0	-0.1	± 0.4 dB
	94.0	94.1 (Ref.)	--	
	95.0	95.0	0.0	± 0.2 dB

Uncertainty : ± 0.1 dB

## 4. Frequency Weighting

A weighting

Frequency	Attenuation (dB)	IEC 651 Type 1 Spec.
31.5 Hz	-39.4	- 39.4 dB, ± 1.5 dB
63 Hz	-26.2	- 26.2 dB, ± 1.5 dB
125 Hz	-16.3	- 16.1 dB, ± 1 dB
250 Hz	-8.7	- 8.6 dB, ± 1 dB
500 Hz	-3.3	- 3.2 dB, ± 1 dB
1 kHz	0.0 (Ref)	0 dB, ± 1 dB
2 kHz	+1.2	+ 1.2 dB, ± 1 dB
4 kHz	+0.9	+ 1.0 dB, ± 1 dB
8 kHz	-1.2	- 1.1 dB, + 1.5 dB ~ -3 dB
16 kHz	-6.7	- 6.6 dB, + 3 dB ~ - ∞

Uncertainty : ± 0.1 dB

## 5. Time Averaging

Applied Burst duty Factor	Applied Leq Value (dB)	UUT Reading (dB)	IEC 804 Type 1 Spec.
continuous	40.0	40.0	--
1/10	40.0	40.0	± 0.5 dB
1/10 <sup>2</sup>	40.0	39.9	
1/10 <sup>3</sup>	40.0	40.0	± 1.0 dB
1/10 <sup>4</sup>	40.0	40.0	

Uncertainty : ± 0.1 dB

Remarks : 1. UUT : Unit-Under-Test

2. The uncertainty claimed is for a confidence probability of not less than 95%.

3. Atmospheric pressure : 1 007 hPa.

----- END -----

## Appendix J

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### Sample Data Record Sheet

**C3840-13C MTRCL Tsim Sha Tsui Station Carnarvon Road Subway and Entrances Modification Works**

**Noise Monitoring Field Record Sheet**

Monitoring Location		
Description of Location		
Date of Monitoring		
Measurement Start Time (hh:mm)		
Measurement Time Length (min.)		
Noise Meter Model / Identification		
Calibrator Model / Identification		
Measurement Results	L <sub>90</sub> (dB (A))	
	L <sub>10</sub> (dB (A))	
	L <sub>eq</sub> (dB (A))	
Major Construction Noise Source(s) during Monitoring		
Other Noise Source(s) during Monitoring		
Remarks		

Name & Designation

Signature

Date

Recorded By :

\_\_\_\_\_

Checked by :

\_\_\_\_\_

**C3840-13C MTRCL Tsim Sha Tsui Station Carnarvon Road Subway and Entrances Modification Works**

**Data Sheet for TSP Monitoring**

Monitoring Location		
Details of Location		
Sampler Identification		
Date & Time of Sampling		
Elapsed-time Meter Reading	Start (min.)	
	Stop (min.)	
Total Sampling Time (min.)		
Weather Conditions		
Site Conditions		
Initial Flow Rate, Qsi	Pi (mm Hg)	
	Ti (°C)	
	Hi (in.)	
	Qsi (Std. m <sup>3</sup> )	
Final Flow Rate, Qsf	Pf (mm Hg)	
	Tf (°C)	
	Hf (in.)	
	Qsf (Std. m <sup>3</sup> )	
Average Flow Rate (Std. m <sup>3</sup> )		
Total Volume (Std. m <sup>3</sup> )		
Filter Identification No.		
Initial Weight. of Filter (g)		
Final Weight of Filter (g)		
Measured TSP Level (µg/m <sup>3</sup> )		

Name & Designation

Signature

Date

Field Operator :

Laboratory  
Staff :

Checked by :

_____	_____	_____
_____	_____	_____
_____	_____	_____



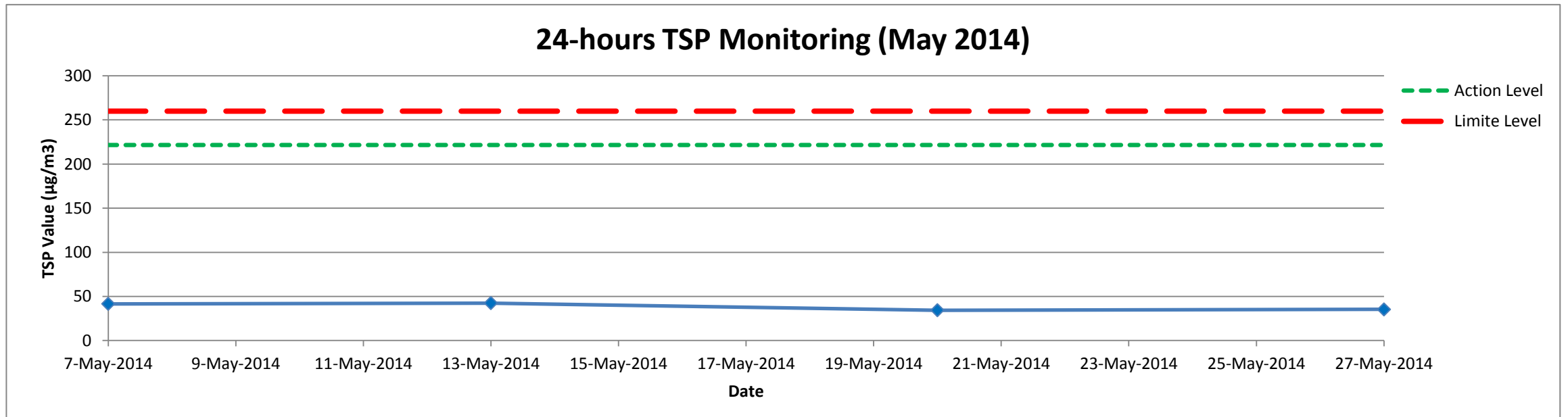
## Appendix K

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### Monitoring Results and Plots

**Impact Air Quality Monitoring : 24-hour TSP at K11**

Location	Monitoring Date	Start Time	Weather Conditions	Temperature	Elapse Time			Flow Rate (CFM)			TSP Concentration (µg/m3)	Action/Limit Levels
					Initial	Final	Sampling Hours	Initial	Final	Average Flow Rate		
K11 Art Mall	7-May-14	11:05	Overcast	20	678301	680701	24	34	40	37.0	41.5511	221.6/260
	13-May-14	12:20	Overcast	28	680702	683102	24	40	40	40.0	42.4275	221.6/260
	20-May-14	12:16	Overcast	26	683102	685502	24	40	45	42.5	34.3959	221.6/260
	27-May-14	11:45	Sunny	31	685502	687902	24	39	40	39.5	35.3604	221.6/260

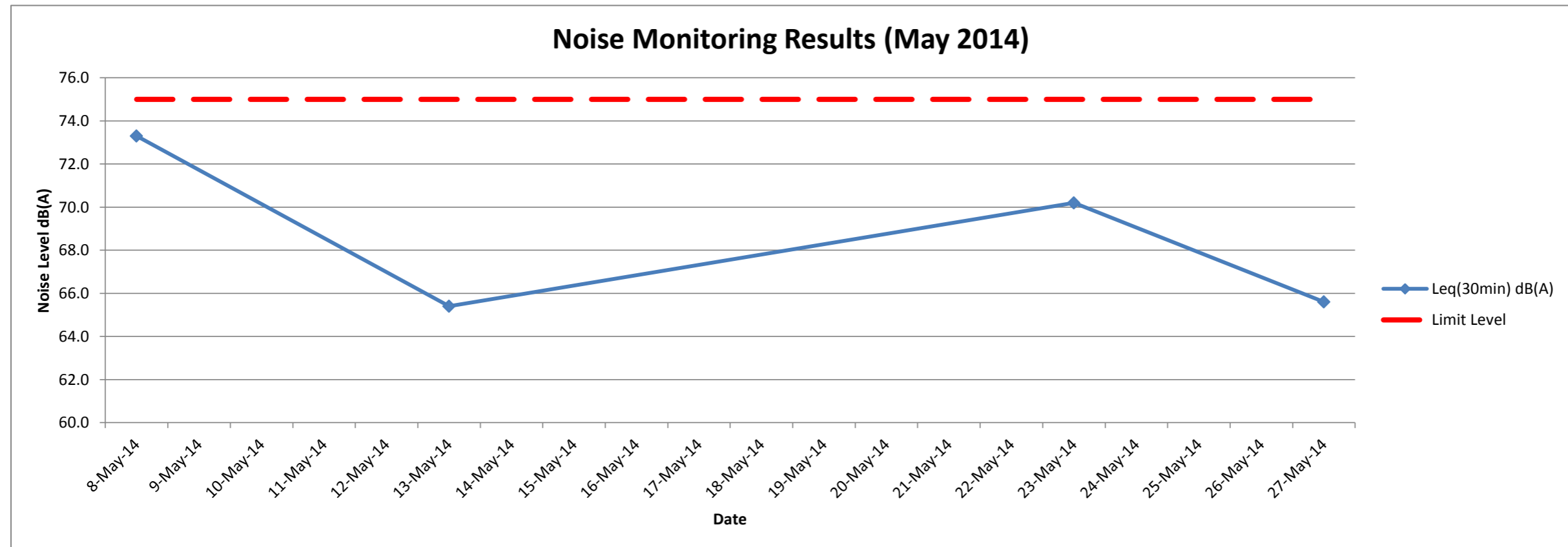


### Noise Impact Monitoring Results at K11

Monitoring Locations	Date	Weather Conditions	Temperature	Wind Speed (m/s)	Start Time	End Time	Background Level dB(A)	Limit Level dB(A)	Leq(30min) dB(A)	L10(30min) dB(A)	L90(30min) dB(A)
11 Art Mall	8-May-14	Overcast	23	0.9	10:45	11:15	65.3	75	73.3	73.5	67.0
	13-May-14	Overcast	28	2.3	11:45	12:15	65.3	75	65.4	66.5	63.0
	23-May-14	Overcast	28	2.1	16:10	16:40	65.3	75	70.2	71.5	67.0
	27-May-14	Sunny	31	1.5	11:35	12:05	65.3	75	65.6	67.2	63.4

Note:  
The limit level of NSR1 is 65dB(A) during school examination period.

**Red Bold indicates an exceedance of Limit Level**

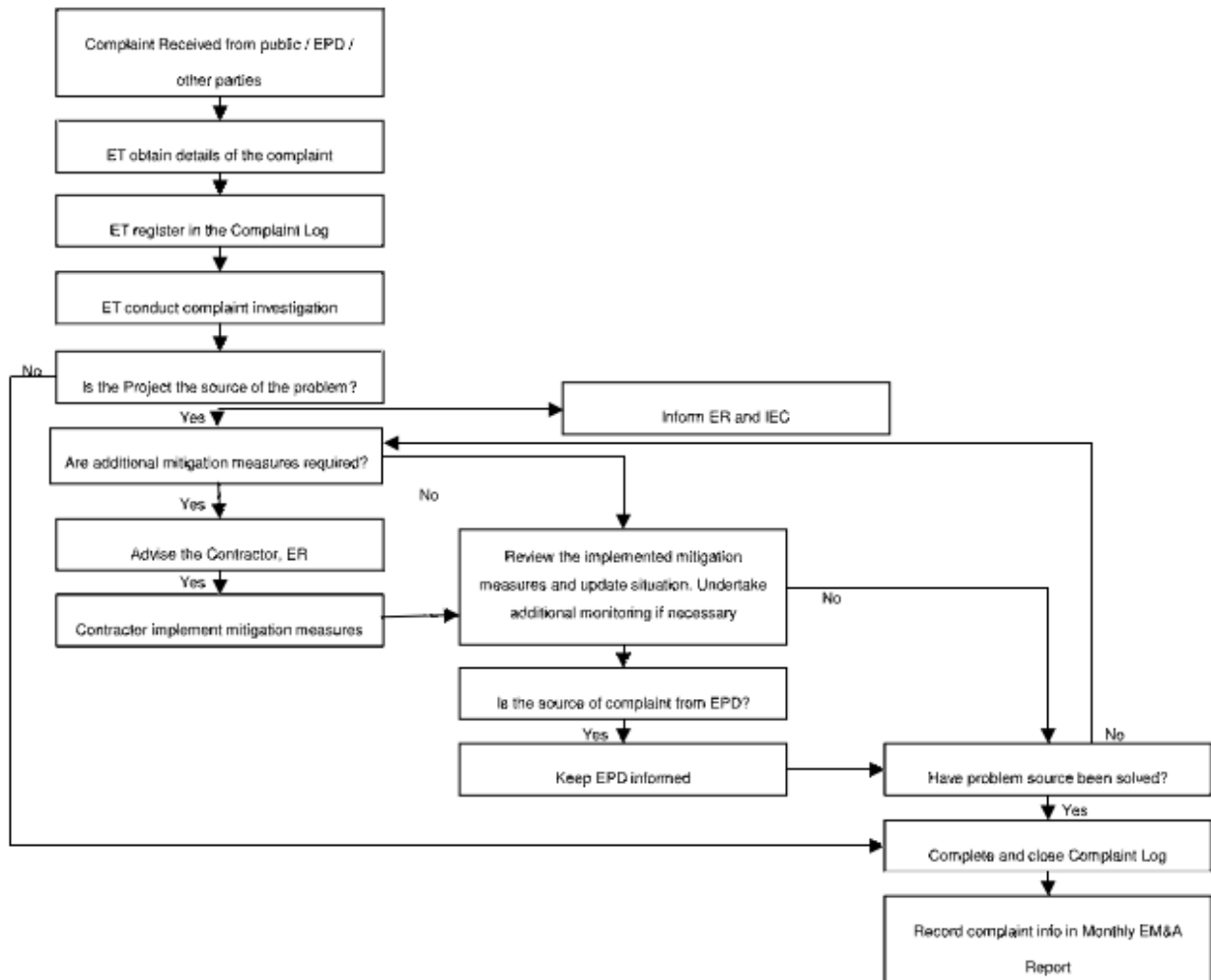


# Appendix L

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## Flow Chart for Handling Environmental Complaints

# Complaint Response Procedure



## Appendix M

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### Waste Management Records

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## Monthly Summary Waste Flow Table for 2014 (year)

**Contract No:** C3840-13C Tsim Sha Tsui Station Carnarvon Road Subway  
**Date Reported:** 2-June-2014

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of Non-inert 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	Chemical Waste	Others, e.g. general refuse
		(See Note 3)							(see Note 2)		
(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m <sup>3</sup> /tonne)
Jan	0.0206	-	-	-	0.0206	-	-	-	-	-	-
Feb	0.0233	-	-	-	0.0233	-	-	-	-	-	-
Mar	0.0120	-	-	-	0.0120	-	-	-	-	-	-
Apr	0.0281	-	-	-	0.0281	-	-	-	-	-	0.0035
May	0.0059	-	-	-	0.0059	-	-	-	-	-	-
June	-	-	-	-	-	-	-	-	-	-	-
Sub-total	0.0899	-	-	-	0.0899	-	-	-	-	-	0.0035
July	-	-	-	-	-	-	-	-	-	-	-
Aug	-	-	-	-	-	-	-	-	-	-	-
Sept	-	-	-	-	-	-	-	-	-	-	-
Oct	-	-	-	-	-	-	-	-	-	-	-
Nov	-	-	-	-	-	-	-	-	-	-	-
Dec	-	-	-	-	-	-	-	-	-	-	-
Total	0.0899	-	-	-	0.0899	-	-	-	-	-	0.0035

Notes:

- (1) The performance targets are given below:
  - All excavated materials to be sorted for recovering the inert portion of C&D materials, e.g. hard rocks, soil and broken concrete, for reuse on the Site or disposal to designated outlets;
  - All metallic waste to be recovered for collection by recycling contractors;
  - All cardboard and paper packaging (for plant, equipment and materials) to be recovered, properly stockpiled in dry and covered condition to prevent cross contamination;
  - All chemical wastes to be collected and properly disposed of by specialist contractors; and
  - All demolition debris to be stored to recover broken concrete, reinforcement bars, mechanical and electrical fittings, hardware as well as other fitting / materials that have established recycling outlets.
- (2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
- (3) Broken concrete for recycling into aggregates.
- (4) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.