



Maeda Corporation

MONTHLY REPORT (DECEMBER 2017)

MTRCL Contract C3840-13C

Tsim Sha Tsui Station Carnarvon Road Subway
and Entrances Modification Works

Your Ref:

Our Ref: 60453136.40032976/2018000018E

By Email and Post

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

Attn.: Mr. Alfa Liu

10 January 2018

Dear Sirs,

**Consultancy Agreement A130-13
Independent Environmental Checker for CRS and LTS
CRS - Verification for 46th Monthly Environmental Monitoring and Audit (EM&A) Report
(December 2017) (Report No.: EB001340R0632)**

We refer to the 46th Monthly EM&A Report (December 2017) received under cover of the email from the Environmental Team, Arcadis Design & Engineering Limited, dated on 8 January 2018.

Further to our comments provided on 9 January 2018 and subsequent revision of the Report by Arcadis Design & Engineering Limited on 9 January 2018, we have no further comment and have verified the captioned report (Report No.: EB001340R0632).

Should you have any queries, please feel free to contact the undersigned at 3922 9366.

Yours faithfully

AECOM Consulting Services Ltd



Y. W. Fung
Independent Environmental Checker

LLMC/wwsc

cc Arcadis Design & Engineering Limited
Maeda Corporation

(Attn.: Mr. F. N. Wong) via email
(Attn.: Ms. Cecilia Lee) via email



Maeda Corporation

Monthly EM&A Report (DECEMBER 2017)

MTRCL Contract C3840-13C

Tsim Sha Tsui Station Carnarvon Road Subway and
Entrances Modification Works

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Report No	EB001340R0632	

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EXECUTIVE SUMMARY

Breaches of Action and Limit Levels

- ES01 No Notice of Exceedance. The environmental monitoring results registered no breaches of Action and Limit Levels of air quality and construction noise during the Reporting Period, therefore, associated investigation and follow-up actions were not required.
- ES02 No major corrective actions were taken as the environmental audit during the Reporting Period observed:
- 1) No deficiencies with major environmental significance of the required environmental mitigation measures;
 - 2) No non-compliance with the required waste management; and
 - 3) 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 Report Period.

Notification of Summons & 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 Construction noise, air quality and water quality are continued to be the key issues for the coming construction period. In order to alleviate potential adverse environmental impacts generated from construction activities to acceptable levels, environmental mitigation measures recommended in the EM&A Plan and summarised in the Implementation Schedule should be fully implemented and improved whenever appropriate.

Construction Noise

- ES07 Particular attention should be paid to construction noise mitigation measures to ensure full compliance with statutory and non-statutory requirements and guidelines. Proactive review of working methods, careful selection and arrangement of the noisy equipment as well as effective noise mitigation measures are strongly recommended.

Water Quality

- ES08 In addition, compliance with water quality mitigation measures remains one of the key environmental issues within the construction period, especially when water usage is high.

Air quality

- ES09 Furthermore, implementation of necessary construction dust suppression measures is recommended during dusty activities under dry and windy conditions.

1 INTRODUCTION

1.1 The Reporting Period

1.1.1 This is the 46th monthly EM&A report (hereinafter referred as 'This Report') covering construction period from 1 to 31 December 2017 (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 Meada 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 Project was commenced in March 2014 and is anticipated to be completed by the end of 2018.

1.2.2 The existing TST Station had been in operation before the **Environmental Impact Assessment Ordinance** (hereafter referred as 'EIAO') comes 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, after the Project Profile and the associated **EM&A Plan** were 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') are summarised in **Appendix D**, which fine tunes the construction activities and shows inter-relationships with the environmental protection/mitigation measures for the construction period. It is being reviewed and will be updated soon upon availability of more solid information.

1.3 Environmental Status

1.3.1 As required in the EP, AECOM Consulting Services Limited has been appointed as the Independent Environmental Checker under the Project (hereinafter referred as 'the IEC'), whereas Arcadis Design and Engineering Limited (formerly known as 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 summarised in **Table 1-3-1** below. They are detailed in **Appendix E**.

Table 1-3-1 Summary of Status of Environmental Licenses and Permits

Item	Description	License/Permit Status
1	Air Pollution Control (Construction Dust)	Notification Ref. 403252 & 421293 acknowledged on 02 Jun 2016 & 18 Sep 2017
2	Water Pollution Control Ordinance (Discharge License)	The discharge license (Ref No. WT00019722-2014) was granted on 01 Sep 2014 superseding the previous license (Ref No. WT00018229-2014)
3	Billing Account for Disposal of Construction Waste	A/C Ref. 7018523 granted on 25 Oct 2013
4	Chemical Waste Producer Registration	Registration Ref. 5213-2214-M2446-16 granted on 4 Mar 2014
5	Construction Noise Permit	GW-RE0807-17 approved on 9 October 2017 for operation of 4 submersible water pump (electric) or 1 drill for 24-hr; 4 drill & 4 grinder for 07:00-23:00 from 9 October 2017 to 31 March 2018.

1.4 Construction Activities

1.4.1 Construction activities undertaken during the Reporting Period and the following month are summarised in **Table 1-4-1**:

Table 1-4-1 Construction Activities

Item	Description
<u>Construction Activities Undertaken during the Reporting Period</u>	
1	Construction of the mined tunnel
2	Construction of the C&C tunnel
3	Laying cable trays and cables for the tunnel
4	Installation of ventilation units, fans and ducting
5	Construction of the ABWF works
6	Construction of Entrance D2
7	Breakthrough of K11
<u>Construction Activities to be Undertaken in the Up-Coming Month</u>	
1	Installation of metal frames, glass and other finishing for Entrance D2
2	Construction of the C&C tunnel
3	Construction of the ABWF works
4	Laying cable trays and cables for the tunnel
5	Installation of ventilation units, fans and ducting
6	Installation of permanent flood gate

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 month were prepared and submitted to MTRC, IEC and MC prior to implementation via e-mail and / or facsimile for ease of necessary inspection. If amendment is necessary under ad hoc conditions, including actual and broadcast adverse weather, accidental instrument failures, etc., notification will be 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 summarised 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
High Volume Air Sampler	TE5170 MFC	0462	1785
Sibata Digital Dust Monitor	LD-3B	456677	Not Applicable

2.1.7 Weather information including wind speeds and wind directions is obtained from King's Park Weather Station. The weather information is used as weather conditions during the Reporting Period. They are presented in **Appendix H**.

Calibration of Monitoring Equipment

2.1.8 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. A calibration Kit (Model - TE5025A) is used for calibration of the HVAS. At least once every 12 months, recalibration of the calibration kit is carried out during its maintenance.

- 2.1.9 Calibration of the HVAS is conducted following the manufacturer's instruction manual. Initial calibration of the equipment is conducted upon installation and thereafter at bi-monthly intervals throughout the period of impact monitoring. The transfer standard should be traceable to the internationally recognised primary standard and be calibrated annually.
- 2.1.10 The Sibata Digital Dust Monitor LD-3B for 1-hour TSP monitoring is calibrated annually and the calibration certificates of the equipment are shown in **Appendix I**.

Monitoring Methodology – 24-Hr TSP

- 2.1.11 Air quality monitoring (24-Hr TSP) 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

- 2.1.12 When positioning the HVAS, the following points will be noted:
- A horizontal platform with appropriate support to secure the samplers against gusty wind will be provided;
 - No two samplers will be placed less than 2 m apart;
 - 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;
 - A minimum of 2 m of separation from walls, parapets and penthouses is required for rooftops samplers;
 - A minimum of 2 m of separation from any supporting structure, measured horizontally is required;
 - No furnace or incinerator flue or building vent is nearby;
 - Airflow around the sampler is unrestricted;
 - The sampler is more than 20 m from the drip line;
 - Any wire fence and gate, to protect the sampler, should not cause any obstruction during monitoring;
 - Permission must be obtained to set up the samplers and to obtain access to the monitoring stations; and
 - A secured supply of electricity is needed to operate the samplers.

Preparation of Filter Papers and Laboratory Analysis

- 2.1.13 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 \pm 3 °C with relative humidity (hereinafter referred as 'the RH') less than 50% \pm 5%, preferably 40%.
- 2.1.14 Preparation of filters and subsequent laboratory analysis of the collected 24-Hr TSP samples were performed by ALS Technetiem (HK) Pty Ltd (hereinafter referred as 'ALS'), a local laboratory which have been accredited under Hong Kong Laboratory Accreditation Scheme (HOKLAS).
- 2.1.15 All the collected samples should be kept by the ET in standard office conditions for 6 months before disposal.

Field Monitoring Procedures

- 2.1.16 Procedures for field monitoring are as follows:
- Check power supply to ensure the HVAS works properly.
 - Clean the filter holder and the area surrounding the filter.
 - Remove the filter holder by loosening the four bolts and carefully align a new filter, with stamped number upward, on a supporting screen.
 - Align the filter properly on the screen so that the gasket forms an airtight seal on the outer edges of the filter.
 - 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.
 - Close the shelter lid and secure with the aluminium strip.

- g) Warmed-up the HVAAS 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 HVAAS at around 1.1 m³ per minute. (The range specified in the EM&A Plan is between 0.6-1.7 m³ 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 – 1-Hr TSP

Field Monitoring

2.1.17 The procedures for measurement of 1-Hr TSP follow Manufacturer's Instruction Manual, which is summarised as follows:

- a) Turn on the power.
- b) Close the air collecting opening cover.
- c) Set the "TIME SETTING" switch to [BG].
- d) Press "START/STOP" switch to perform background measurement.
- e) Turn the knob at SENSI ADJ position.
- f) Leave the equipment upon "SPAN CHECK" is indicated in the display.
- g) Press "START/STOP" switch to perform automatic sensitivity adjustment.
- h) Turn the knob at MEASURE position.
- i) Set time period of 1 hour for the 1-hour TSP measurement.
- j) Press "START/STOP" to start the 1-hour TSP measurement.
- k) Check the time period to ensure monitoring time of 1 hour.
- l) Record all monitoring information on a Field Data Sheet.

Maintenance and Calibration

2.1.18 The procedures for maintenance and calibration of 1-Hr TSP follow Manufacturer's Instruction Manual as follows:

- 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

2.1.19 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, µg/m³

Parameter	Action Level	Limit Level
24-Hr TSP	For baseline level ≤200 µg/m ³ , Action level = (130% of baseline level + Limit level)/2	260
1-Hr TSP	For baseline level ≤384 µg/m ³ , Action level = (130% of baseline level + Limit level)/2 For baseline level >384 µg/m ³ , Action level = Limit level	500

2.1.20 The established A/L Levels for 24-Hr and 1-Hr TSP are summarised 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	221.6	260
1-Hr TSP	373	500

Event and Action Plan

- 2.1.21 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

- 2.1.22 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:
- Decking over the excavation areas;
 - Regular watering to reduce dust emissions from all exposed site surface, particularly during dry weather;
 - Frequent watering for particularly dusty construction areas and areas close to air sensitive receivers;
 - Provision of vehicle washing facilities at the exit points of the site; and
 - Provision of tarpaulin covering for any dusty materials on a vehicle leaving the site.
- 2.1.23 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	Acoustic Calibrator	CAL 200 (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 summarised 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, the measurement time and monitoring frequency are set as follows:
 - i. Frequency weighting: A
 - ii. Time weighting: Fast
 - iii. Time measurement: 30 minutes' intervals (between 0700-1900 on normal weekdays)
 - iv. Monitoring frequency: one set of measurement on a weekly basis
- 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 Leq(30 min) are recorded.
- f) Record all monitoring information on a Field Data Sheet as shown in **Appendix J**.
- g) Maintenance and Calibration.
- h) 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

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

Action and Limit Levels

2.2.8 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: 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

- 2.2.9 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

- 2.2.10 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 summarised 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; and
- i) Material stockpiles and other structures shall be effectively utilised as noise barriers, whenever practicable.

- 2.2.11 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 summarised 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, $\mu\text{g}/\text{m}^3$

Monitoring Date	24-Hr TSP	Action Level	Limit Level
4 December 2017	40.4	221.6	260
11 December 2017	79.6		
18 December 2017	92.4		
27 December 2017	83.3		
Mean (Min – Max)	73.9 (40.4 – 92.4)		

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'). Therefore, the associated NOE Investigation as well as remedial actions were not 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 summarised 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	L_{eq} (30 min)	Action Level	Limit Level
1-Dec-17	67.5	Any documented complaint against construction noise.	75
5-Dec-17	65.8		
12-Dec-17	67.3		
19-Dec-17	65.9		
27-Dec-17	66.6		
Mean (Min – Max), L_{eq} (30 min)	66.7 (65.8-67.5)		

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 were fell below the Limit Level of the parameter. 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.
- 3.2.5 The Contractor's attention is drawn to certain noisy construction activities, which were scheduled to be conducted during the coming month as listed in **Table 1-4-1** under **Section 1.4: Construction Activities Undertaken during the Reporting Period and Up-Coming Month**.
- 3.2.6 Attention is drawn to adequate mitigation measures to be implemented during the noisy construction activities in order to alleviate noise nuisance generated from the Project related construction activities.

Weather Conditions

- 3.2.7 No weather conditions or any other factors were identified to have significant effects on the air and noise monitoring results within the Reporting Period.
- 3.2.8 Weather information during the Reporting Period which is extracted from Hong Kong Observatory King's Park Weather Station and 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 and 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 summarised in Implementation Schedule of **Appendix D**, is recommended. Where necessary, proper maintenance and improvement of the implemented mitigation measures are reminded.
- 3.3.4 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 during the Reporting Period were conducted by MTRC, MC and ET, whereas the monthly site inspection of the Reporting Period was jointly conducted by the IEC, MTRC, MC and ET. The site inspection follows strictly to 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 relevant parties 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 05, 12, 19 and 27 December 2017. A joint site inspection was conducted by IEC, MTRC, MC and ET on 27 December 2017.

4.1.4 As the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation has been enforced since December 2015, particular attention was paid to check EPD's Non-Road Mobile Machinery (NRMM) labels demonstrated on the regulated NRMM, except those which application is in progress. Deficiencies or findings of the site audit and the associated follow up actions are summarised in the following **Table 4-1-1**:

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

Date	Deficiencies or findings	Follow-Up Action
05 - December -2017	Follow-up item(s)	
	No follow-up item.	Not required.
	Observation(s) on the day of inspection	
12 - December -2017	No deficiency was observed on site.	Not required.
	Follow-up item(s)	
	No follow-up item.	Not required.
19 - December -2017	Observation(s) on the day of inspection	
	No deficiency was observed on site.	Not required.
	Follow-up item(s)	
27 - December -2017	No follow-up item.	Not required.
	Observation(s) on the day of inspection	
	No deficiency was observed on site.	Not required.

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

4.2 Compliance with Legal/Contractual Requirement

- 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 4-2-1** summarizes breaches of legal and contractual requirements.

Table 4-2-1 Summary of Breaches of Legal and Contractual Requirements

Month	No. of Breach(s)	Cumulative no. from March 2014 to the Reporting Period
December 2017	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 4-3-1** below:

Table 4-3-1 Summary of Complaint

Month	No. of Complaint(s)	Cumulative no. from March 2014 to the Reporting Period
December 2017	0	6

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 4-4-1** below:

Table 4-4-1 Summary of Summon and Successful Prosecutions

Month	No. of Breach(s)	Cumulative no. from March 2014 to the Reporting Period
December 2017	0	0

5 CONSTRUCTION WASTE

5.1 Waste Management

5.1.1 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 Status and 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.

5.2.2 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.

6 FUTURE ENVIRONMENTAL ISSUES

6.1 Key Environmental Issues

6.1.1 Future key environmental issues include:

- 1) Air quality, in particular construction dust during dusty construction activities, e.g. handling of dusty materials under dry and windy conditions;
- 2) Construction noise during noisy activities; and
- 3) Site surface water run-off and construction wastewater discharge.

6.2 Mitigation Measures

6.2.1 To avoid potential adverse environmental impacts to be generated from future key environmental issues as stated above, full implementation of the mitigation measures as stipulated in the Implementation Schedule in **Appendix D** is required.

6.2.2 Mitigation measures for air quality, construction noise and water quality implemented to date shall be properly maintained.

6.2.3 Where appropriate, improvement of the implemented mitigation measures is reminded to ensure effectiveness of the mitigation measures.

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

- 7.1.1 EM&A results during the Reporting Period showed that adverse environmental impacts generated from construction activities under the Project was alleviated to acceptable levels via implementation of the environmental mitigation measures recommended in the EM&A Plan and summarised in the Implementation Schedule.
- 7.1.2 Neither NOE & the associated NOE investigation nor 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.
- 7.1.3 No corrective actions were required as the environmental audit during the Reporting Period observed:
- 1) No deficiencies with major environmental significance of the required environmental mitigation measures;
 - 2) No non-compliance with the required waste management; and
 - 3) No adverse environmental impacts on the sensitive receivers environed with the site of the Project.
- 7.1.4 In addition, no remedial actions were required as no notification of summons and successful prosecutions were reported during the Reporting Period.
- 7.1.5 Although inadequacies of proactive environmental mitigation measures were occasionally observed during the regular site inspection and audit, they were rectified in situ upon identification or notification or timely before the following site audit.

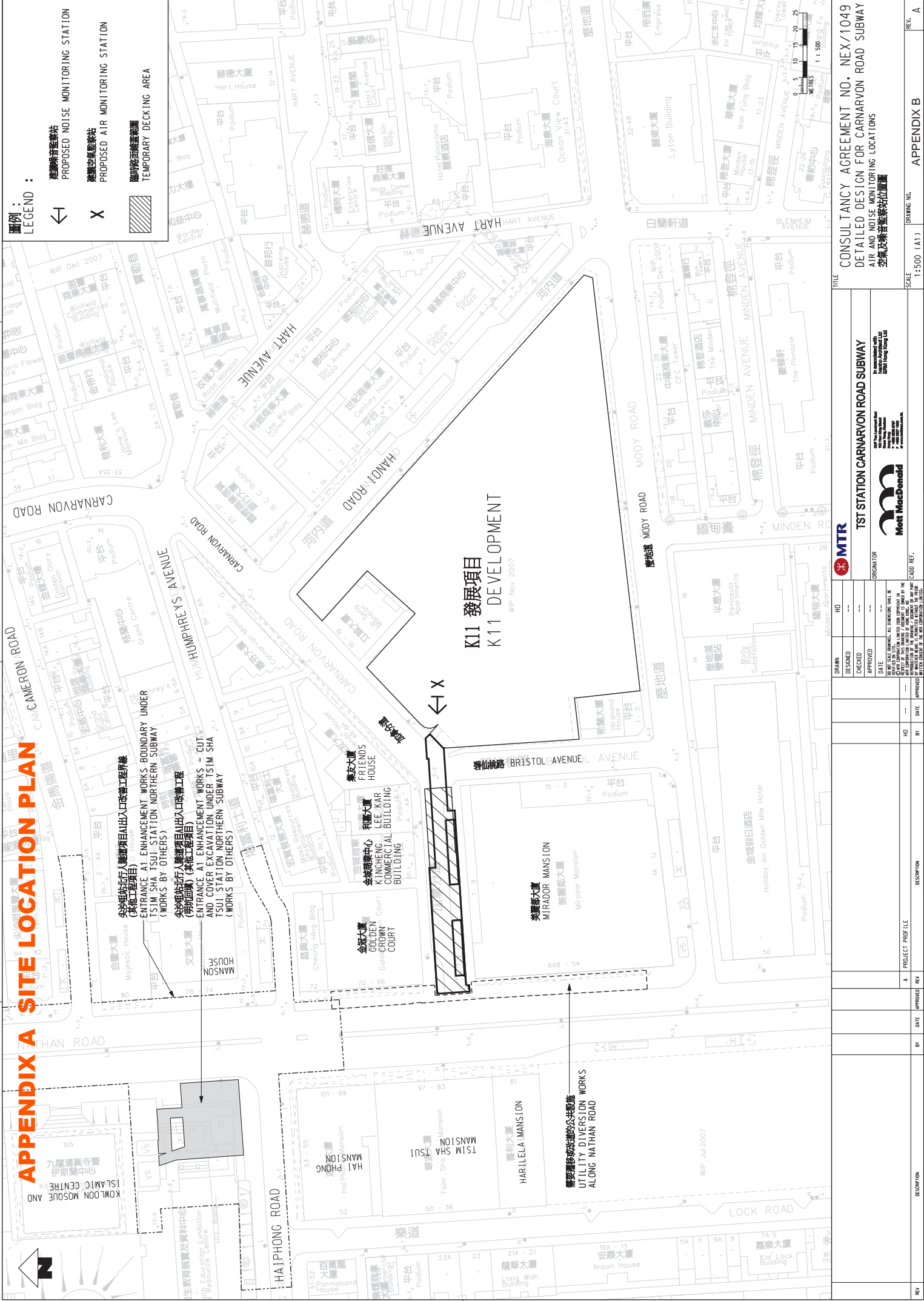
7.2 Recommendations

- 7.2.1 The existing environmental mitigation measures have been proven to be effective. They should be properly maintained.
- 7.2.2 Where appropriate, additional or improvement of the environmental mitigation measures should be implemented.
- 7.2.3 Particular attention should be paid to construction noise mitigation measures to ensure full compliance with statutory and non-statutory requirements and guidelines. Proactive review of working methods, careful selection and arrangement of the noisy equipment as well as effective noise mitigation measures are strongly recommended.
- 7.2.4 In addition, suppression of construction dust is reminded during dusty construction activities under dry and windy conditions.
- 7.2.5 Furthermore, monitoring of site water runoff is reminded to prevent any direct water discharge off site, especially when water usage is high during the construction period. When necessary, the Contractor is reminded to apply additional precautionary measures to prevent any possible environmental deficiency.

APPENDIX A SITE LOCATION PLAN

圖例 :
LEGEND :

- ← 建議噪音監測站
PROPOSED NOISE MONITORING STATION
- X 建議空氣監測站
PROPOSED AIR MONITORING STATION
- ▨ 臨時路面範圍
TEMPORARY DECKING AREA



圖例 :
LEGEND :

- ← 建議噪音監測站
PROPOSED NOISE MONITORING STATION
- X 建議空氣監測站
PROPOSED AIR MONITORING STATION
- ▨ 臨時路面範圍
TEMPORARY DECKING AREA

圖例 :
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PROPOSED NOISE MONITORING STATION
- X 建議空氣監測站
PROPOSED AIR MONITORING STATION
- ▨ 臨時路面範圍
TEMPORARY DECKING AREA

NO.	DATE	BY	DESCRIPTION
A			PROJECT PROFILE
			ESCRPTION

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

FOR ALL DRAWINGS, ALL DIMENSIONS SHALL BE IN METRES UNLESS OTHERWISE SPECIFIED. DIMENSIONS SHOWN ON THIS DRAWING TAKE PRECEDENCE OVER ANY OTHER INFORMATION. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS OF THE SITE PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE RELEVANT AUTHORITIES.

MTR **Mott MacDonald**

TST STATION CARNARVON ROAD SUBWAY
Air and Noise Monitoring Locations

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

SCALE: 1:500 (A1) APPENDIX B REV. A

APPENDIX B MANAGEMENT STRUCTURE

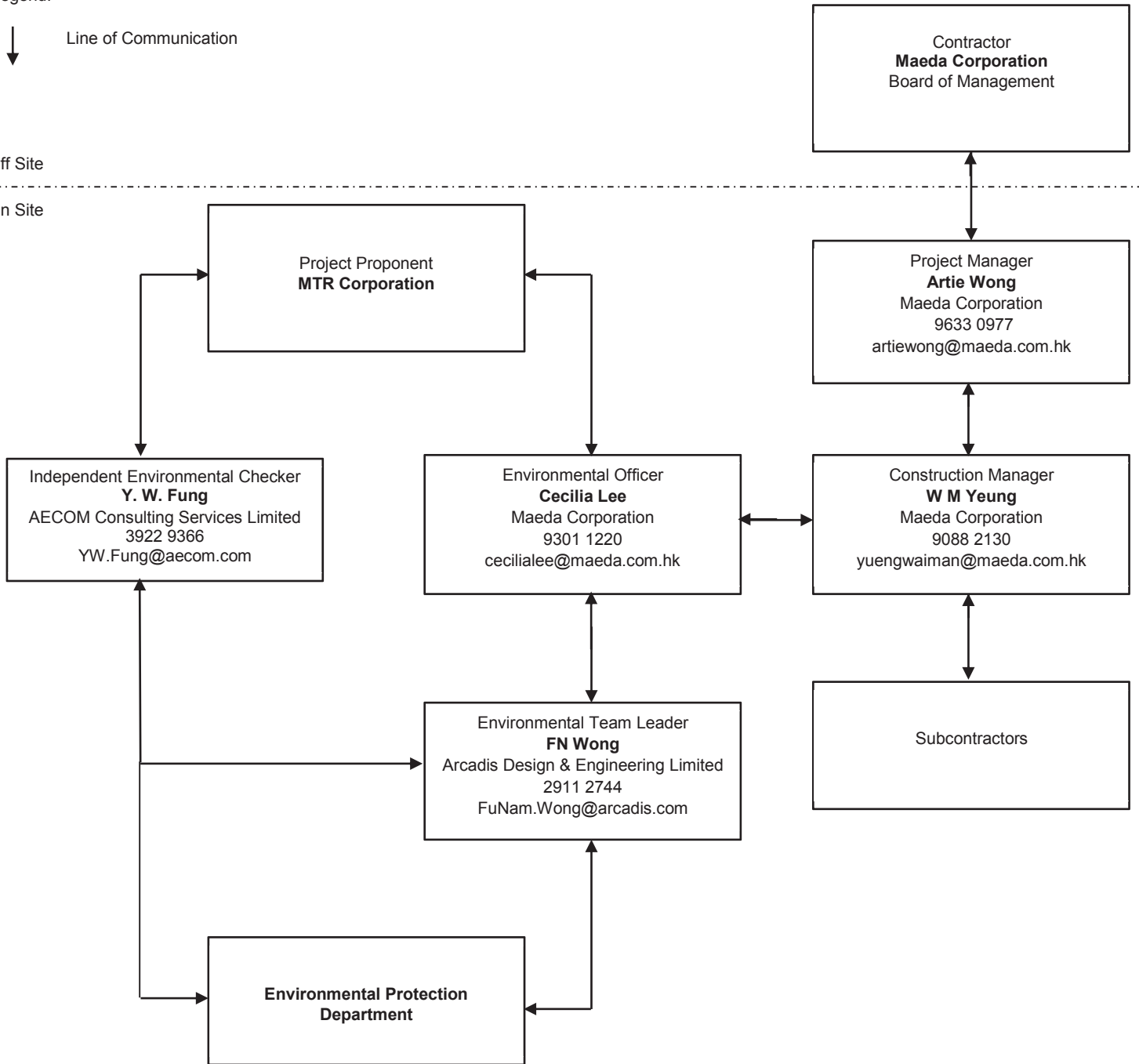
Project Organization Chart in Environmental Management (Rev.04)

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

CONSTRUCTION PROGRAMME*

***The Preliminary Master Programme (Revision 2) is under review and the latest construction programme will be provided once approved.**

APPENDIX D 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	<p>Use of noise enclosure and movable barrier</p> <ul style="list-style-type: none"> • movable barrier can achieve a 5 dB(A) reduction for movable PME and 10 dB(A) reduction for stationary PME; • noise enclosure can achieve 15dB(A) reduction for PME; • 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; • Barrier material of surface mass in excess of 7kg/m² shall be required to achieve the maximum screening effect (and minimum 10kg/m² for noise enclosure); • 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. 	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	<p>General Construction Noise Control Measures</p> <ul style="list-style-type: none"> • The Code of Practice on Good Management Practice 	To minimize construction noise emissions	Contractor	Work site	Construction Stage	ProPECC PN2/93 and Noise Control Ordinance
	<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"> • The statutory and non-statutory requirements and guidelines shall be complied with; • 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; • 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; • Noisy equipment and noisy activities shall be located as far away from the NSRs as is practical; • Unused equipment shall be turned off; • PME should be kept to a minimum and the parallel use of noisy equipment / machinery should be avoided; • All plant and equipment shall be maintained regularly; and • Material stockpiles and other structures shall be effectively utilized as noise barriers, whenever practicable. 					
	Air Quality Impact					
S.3.2	<p>Construction Dust Control Measures</p> <ul style="list-style-type: none"> • Decking will be provided subsequent to the completion of surface excavation works. The duration 	To minimise the dust impacts arising from the construction works	Contractor	Work site	Construction Stage	Air Pollution Control (Construction
	<p>of decking is around 13 months after surface excavation works;</p> <ul style="list-style-type: none"> • Regular watering to reduce dust emissions from all exposed site surface, particularly during dry weather; • Frequent watering for particularly dusty construction areas and areas close to air sensitive receivers; • Cover all excavated or stockpile of dusty material by impervious sheeting or spraying with water to maintain the entire surface wet; • Provision of vehicle washing facilities at the exit points of the site; and • Provision of tarpaulin covering of any dusty materials on a vehicle leaving the site. 					Dust) Regulation

APPENDIX D 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
Water Quality Impact						
S.3.3	<p>Construction Water Quality Impact Measures</p> <ul style="list-style-type: none"> 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. 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. 	To reduce water quality impact induced by the construction work	Contractor	Work Site	Construction Stage	ProPECC PN1/94; Water Pollution Control Ordinance
	<ul style="list-style-type: none"> 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. Site toilet facilities, if needed, should be chemical toilets or should have the foul water effluent directed to a foul sewer. 					
Waste Management						
S.3.4	<p>Construction Waste Management Measures</p> <ul style="list-style-type: none"> 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. Waste arising should be kept to a minimum and be handled, transported and disposed of in a suitable manner. The Contractor should adopt a trip ticket system for the disposal of C&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. Chemical waste shall be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes. 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 	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.
	recycling of materials and their proper disposal.					
Landscape and Visual Impact						
S.3.5	<p>Landscape and Visual Measures</p> <ul style="list-style-type: none"> Screening of construction works by hoardings/noise barriers around works area with visually unobtrusive colours 	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"> Reinstating the affected amenity planting area at Salisbury Road after the completion of works 	To prevent loss of planter after construction	Contractor	Temporary Storage Area at Salisbury Road	Operation Stage	ETWB TCW No. 2/2004

APPENDIX E STATUS OF ENVIRONMENTAL LICENSES AND PERMITS



Maeda Corporation

Contract No. C3840-13C

Tsim Sha Tsui Station Carnarvon Road Subway

Last Update: 06-October-2017

Licence Summary

Item No.	Our Ref.	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	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 #003	APCO	Notification	Construction Dust Notification	Form NB – Notification S3(3) of APCO (Construction Dust)	421293	13 - 09 - 2017	18 - 09 - 2017	01 - 02 - 2014	30 - 06 - 2018	Demolition of a Building	Change of anticipated date of completion is notified
001	APCO #002	APCO	Notification	Construction Dust Notification	Form NB – Notification S3(3) of APCO (Construction Dust)	403252	27 - 05 - 2016	02 - 06 - 2016	01 - 08 - 2014	31 - 08 - 2018	Work carried out in any part of a tunnel that is within 100m of any exit to the open air	Change of anticipated date of completion is notified
001	APCO #002	APCO	Notification	Construction Dust Notification	Form NB – Notification S3(3) of APCO (Construction Dust)	403252	27 - 05 - 2016	02 - 06 - 2016	01 - 01 - 2016	31 - 08 - 2018	Construction of the Superstructure of a Building	Change of anticipated date of completion is notified
001	APCO #002	APCO	Notification	Construction Dust Notification	Form NB – Notification S3(3) of APCO (Construction Dust)	403252	27 - 05 - 2016	02 - 06 - 2016	01 - 11 - 2016	28 - 02 - 2019	Road Construction Work	Change of anticipated date of completion is notified
002	APCO #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 #002	WPCO	Licence	Water Discharge Licence	EPD-117 (Form A) Application for a Licence of Water Discharge	WT00019722-2014	24 - 07 - 2014	01 - 09 - 2014	01 - 09 - 2014	31 - 03 - 2019	Quarterly Report FlowRate 25m3/d, pH 6-9, SS 30mg/L, COD 80mg/L	
004	CWP #001	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	
005	CNP#009	NCO	Permit	Construction Noise Permit	EPD74A(s) Form 1 - Application for a Construction Noise Permit	OSS Ref: 002064379 Permit: GW-RE0807-17	22 - 09 - 2017	06 - 10 - 2017	09 - 10 - 2017	31 - 03 - 2018	4nos Submersible Water pump (Electric) or 1 drill for 24-hr; 4 drill & 4 grinder for 07:00-23:00	

APPENDIX F EVENT AND ACTION PLAN

Event and Action Plan for Construction Noise				
Event	ET	IEC	ER	Action Contractor
Action Level	<ol style="list-style-type: none"> 1. Notify IEC and Contractor. 2. Carry out investigation. 3. Report the results of investigation to the IEC and Contractor. 4. Discuss with the Contractor and formulate remedial measures 5. Increase monitoring frequency to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Review the analyzed result submitted by ET. 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly. 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance 2. Notify Contractor 3. Require Contractor to propose remedial measures for the analysed noise problem 4. Ensure remedial measures are properly implemented. 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC 2. Implement noise mitigation proposals
Limit Level	<ol style="list-style-type: none"> 1. Notify IEC, ER, EPD and Contractor, and follow other actions 2. Identify source 3. Repeat measurement to confirm findings 4. Increase monitoring frequency 5. Check Contractor's working procedures to determine possible mitigation to be implemented 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD, 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET and Contractor on the potential remedial actions 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ET accordingly 3. Supervise the implementation of remedial measures 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedances 2. Notify Contractor 3. Require Contractor to propose remedial measures 4. Ensure remedial measures are properly implemented 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 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to IEC within 3 working days of notifications 3. Implement the agreed proposals 4. Revise and resubmit proposals if problem still not under control 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated
	<ol style="list-style-type: none"> 8. If exceedance stops, cease additional monitoring 		abated.	

Event and Action Plan for Air Quality

Action Level				
Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source; 2. If valid, inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method. 	<ol style="list-style-type: none"> 1. Notify Contractor 	<ol style="list-style-type: none"> 1. Rectify any unacceptable practice; 2. Amend working methods if appropriate

APPENDIX F EVENT AND ACTION PLAN

Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Identify source; 2. Inform IEC and EPD; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency to daily; 5. Discuss with IEC and Contractor on remedial action required; 6. If exceedance continues, arrange meeting with IEC and ER; 7. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervisor implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measure properly implemented. 	<ol style="list-style-type: none"> 1. Submit proposals for remedial action to IEC within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.
Limit Level				
Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source; 2. Inform ER and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and the Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Notify IEC, ER, Contractor and EPD; 2. Identify sources; 3. Repeat measurement to confirm findings; 4. Increase monitoring 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consultation with IEC, agree with the Contractor on 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of
	<ol style="list-style-type: none"> 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 4. Ensure remedial measures properly implemented; 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. 	<ol style="list-style-type: none"> 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

APPENDIX G

ENVIRONMENTAL MONITORING SCHEDULE

Environmental Monitoring & Audit Schedule						
December 2017						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 Noise	2
3	4 24-hr TSP	5 Noise Weekly Site Audit	6	7	8	9
10	11 24-hr TSP	12 Noise Weekly Site Audit	13	14	15	16
17	18 24-hr TSP	19 Noise Weekly Site Audit	20	21	22	23
24	25	26	27 24-hr TSP Weekly Site Audit Noise	28	29	30
31						

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

Environmental Monitoring & Audit Schedule						
January 2018						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2 24-hr TSP Noise Weekly Site Audit	3	4	5	6
7	8 24-hr TSP	9 Noise Weekly Site Audit	10	11	12	13
14	15 24-hr TSP	16 Noise Weekly Site Audit	17	18	19	20
21	22 24-hr TSP	23 Noise Weekly Site Audit	24	25	26	27
28	29 24-hr TSP	30 Noise Weekly Site Audit	31			
31						

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

APPENDIX H

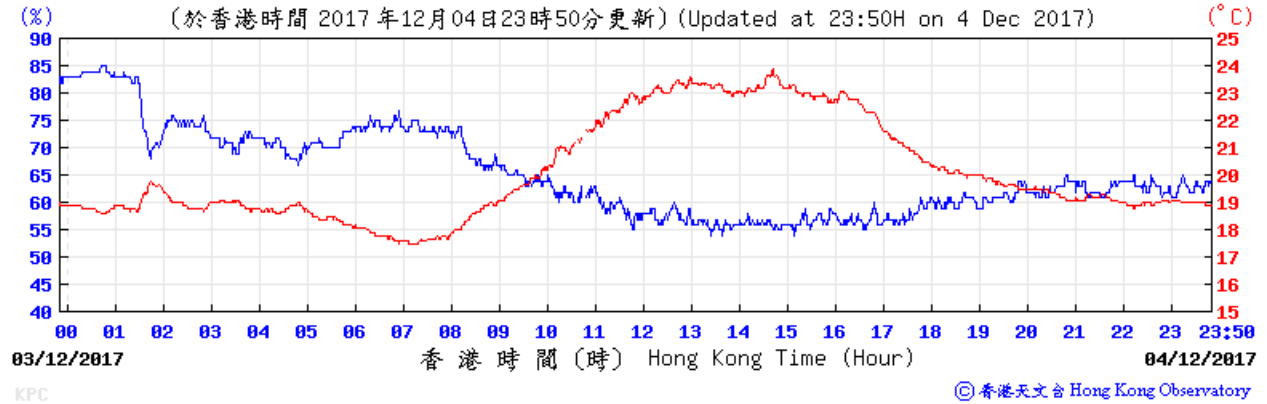
WEATHER INFORMATION EXTRACTED FROM HK OBSERVATORY

Daily Total Rainfall at King's Park HKO Weather Monitoring Station - December 2017

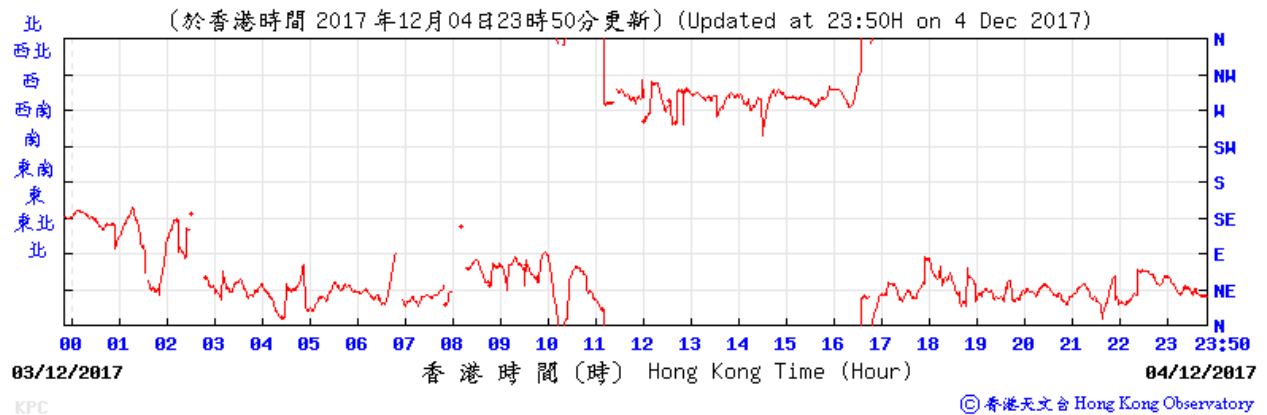
Day	Total Rainfall, mm	24-hr TSP	Noise	Remarks
1	Trace		✓	No significant rainfall during noise measurement
2	0			
3	0			
4	0	✓		
5	0		✓	No significant rainfall during noise measurement
6	0			
7	0			
8	0			
9	0			
10	0			
11	0	✓		
12	Trace		✓	No significant rainfall during noise measurement
13	Trace			
14	Trace			
15	0			
16	0			
17	0			
18	0	✓		
19	0		✓	No significant rainfall during noise measurement
20	0			
21	0			
22	0			
23	0			
24	0			
25	0			
26	0			
27	0	✓	✓	No significant rainfall during noise measurement
28	Trace			
29	0			
30	0			
31	Trace			
Mean/Total	Trace			
Normal	26.8			

King's Park Weather Station – 04 December 2017

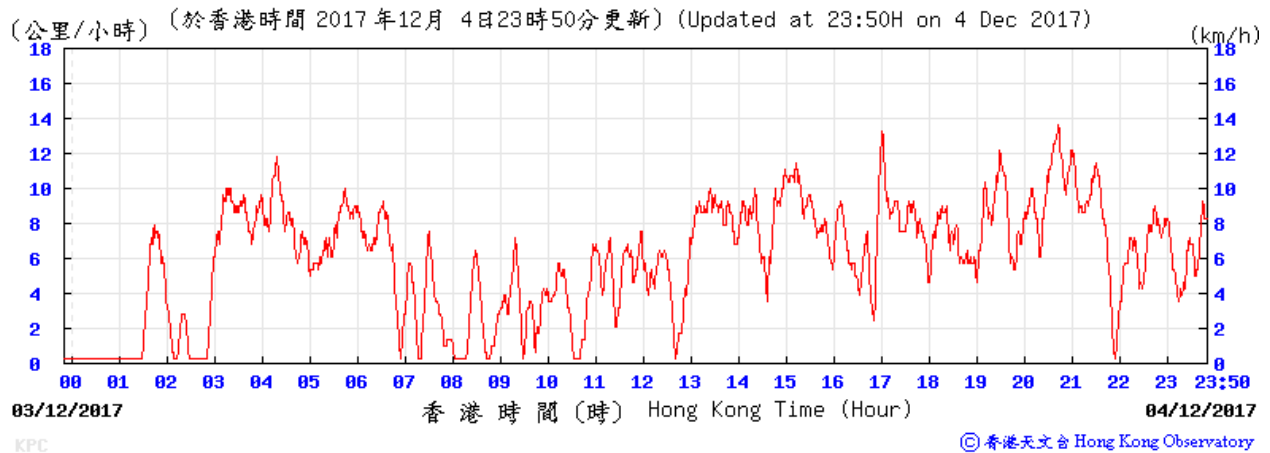
Temperature/Humidity:



Wind Direction:

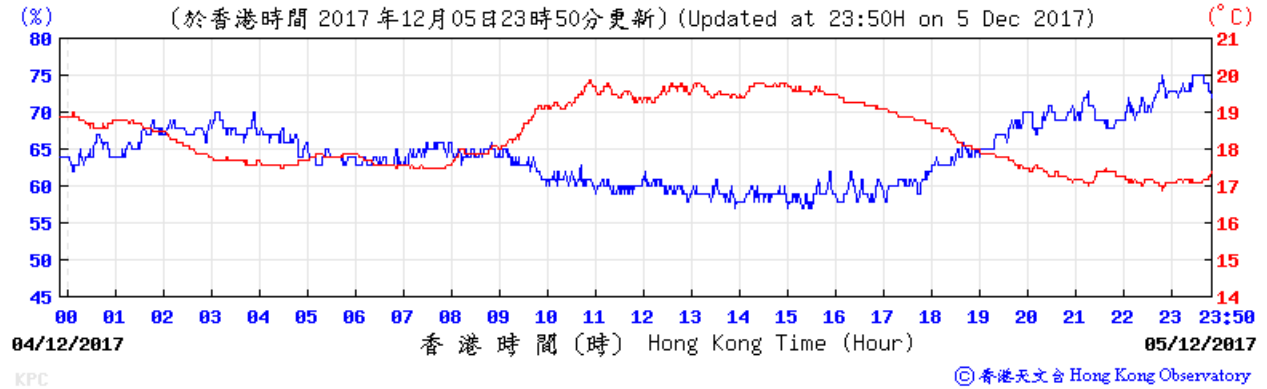


Wind Speed:

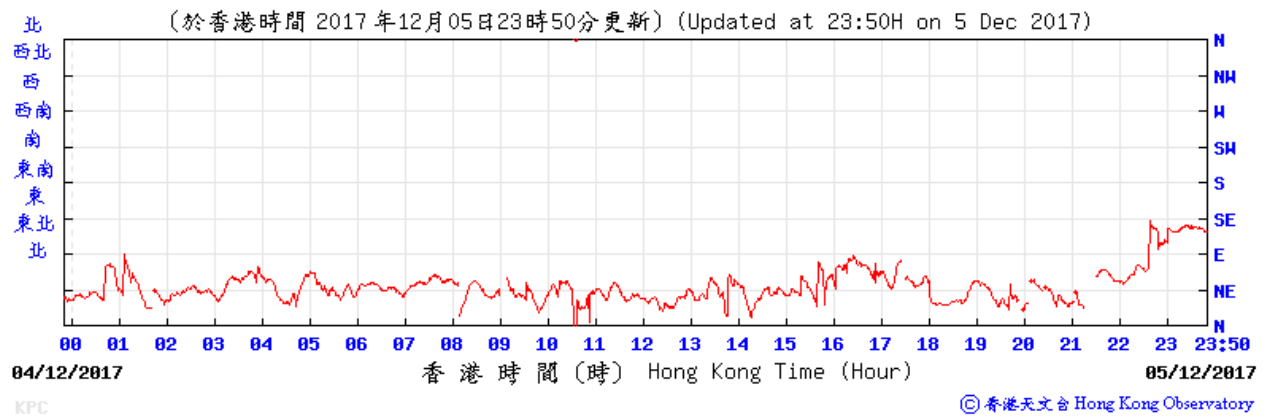


King's Park Weather Station – 05 December 2017

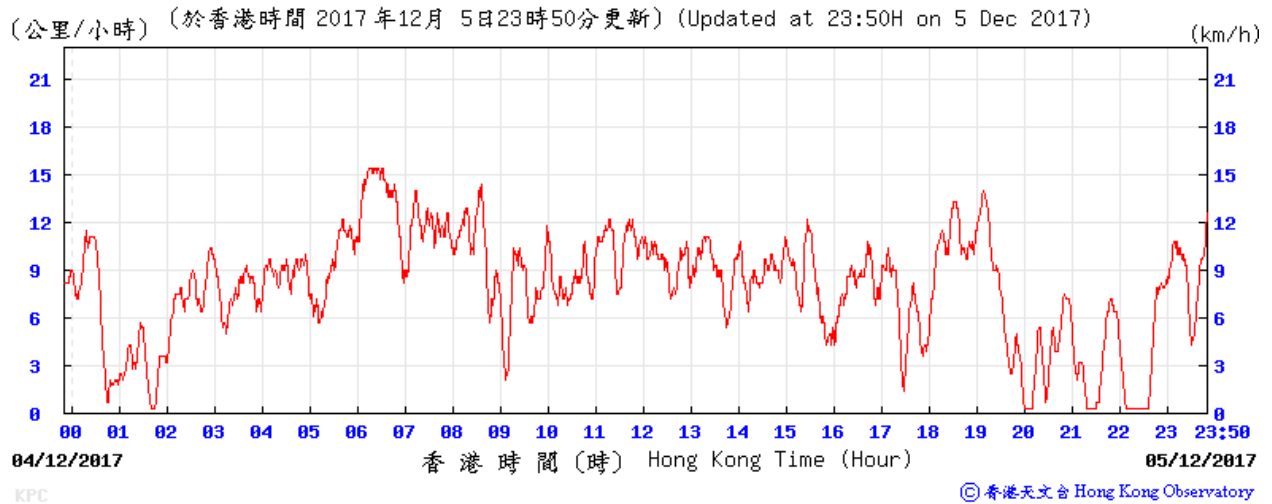
Temperature/Humidity:



Wind Direction:

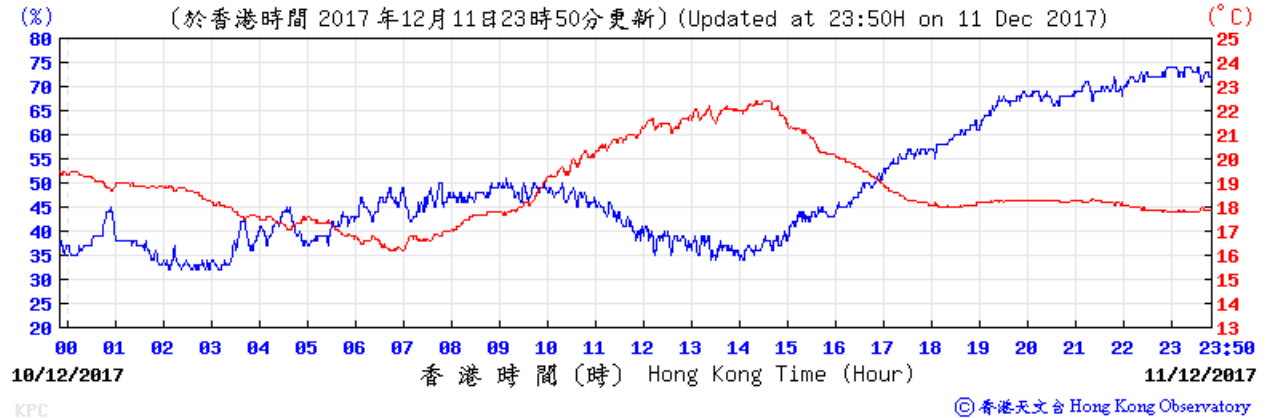


Wind Speed:

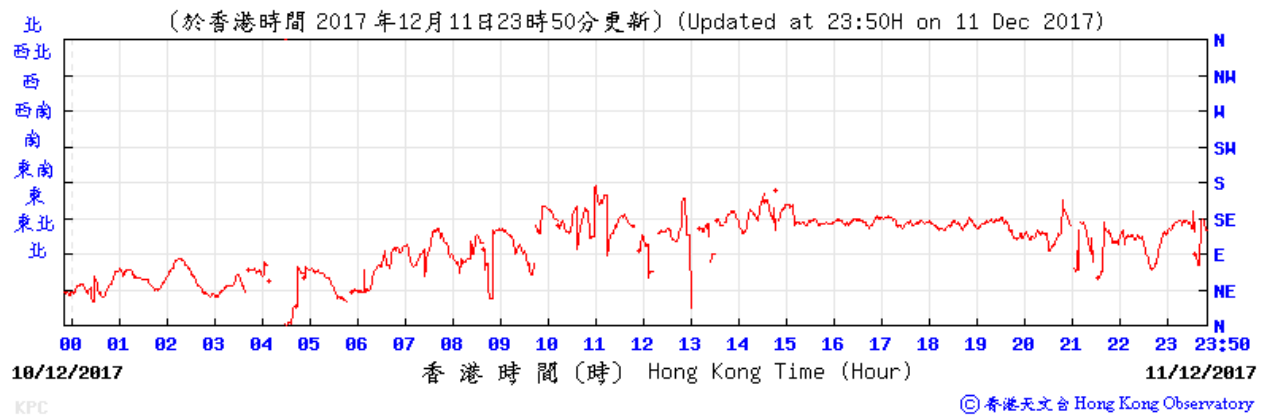


King's Park Weather Station – 11 December 2017

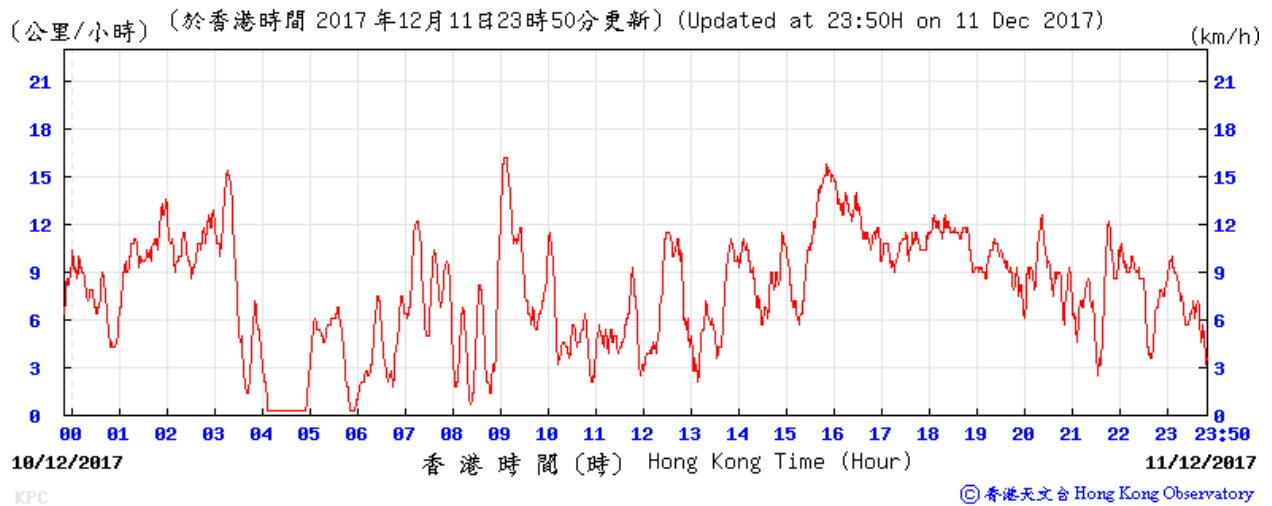
Temperature/Humidity:



Wind Direction:

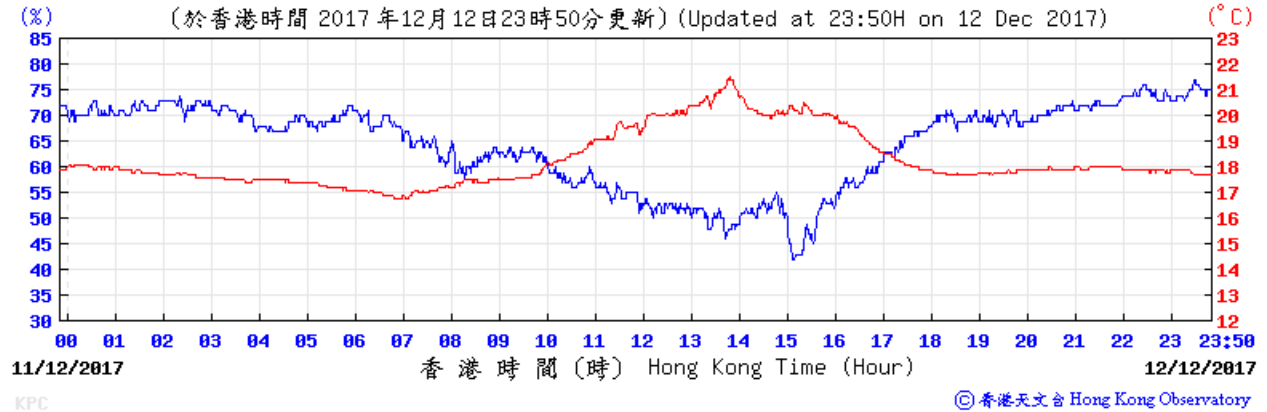


Wind Speed:

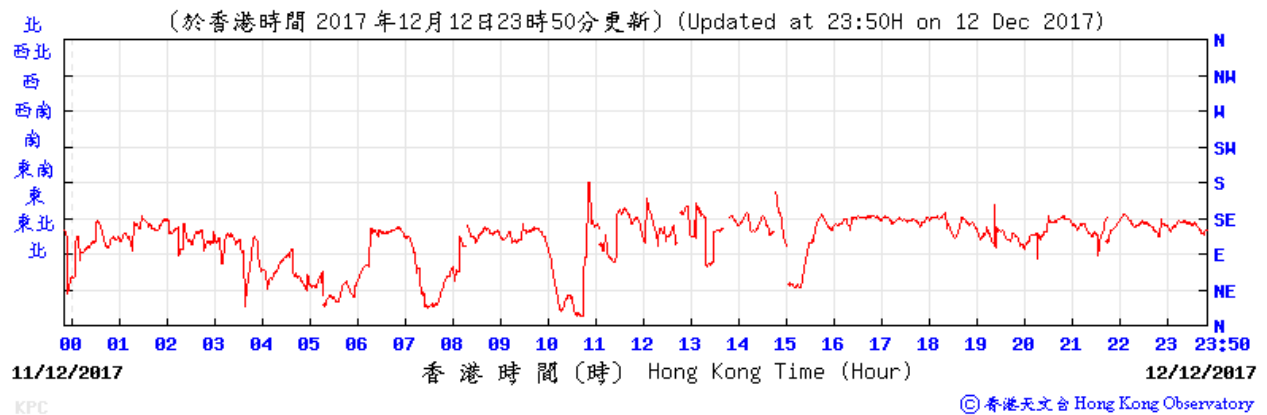


King's Park Weather Station – 12 December 2017

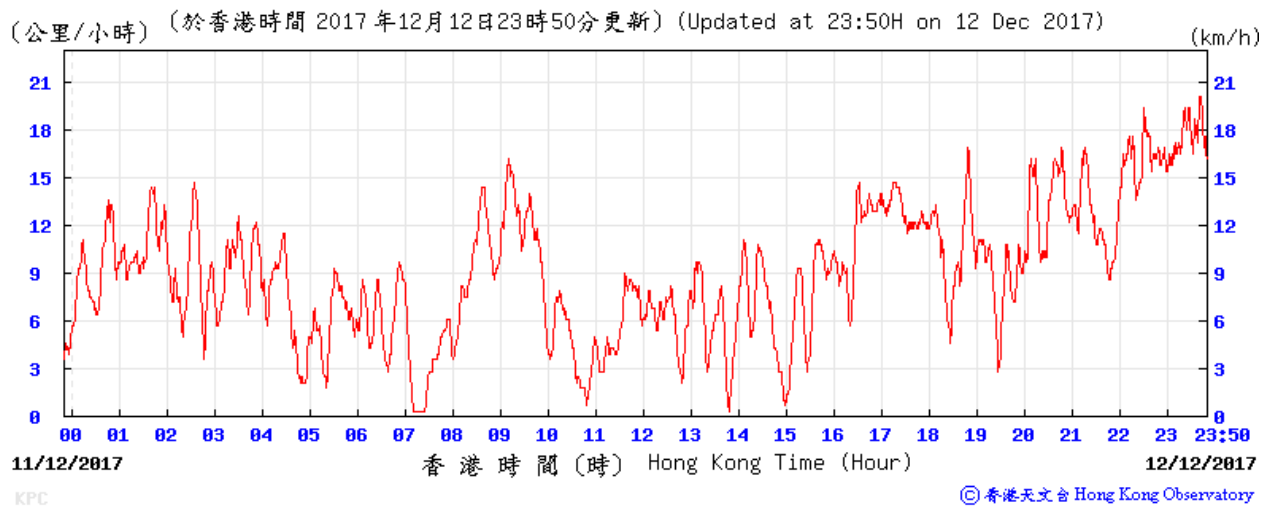
Temperature/Humidity:



Wind Direction:

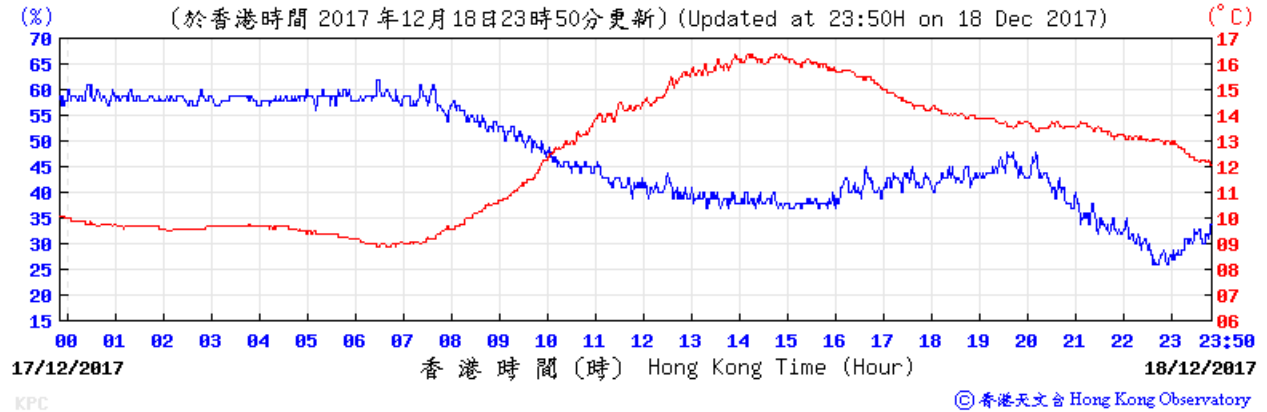


Wind Speed:

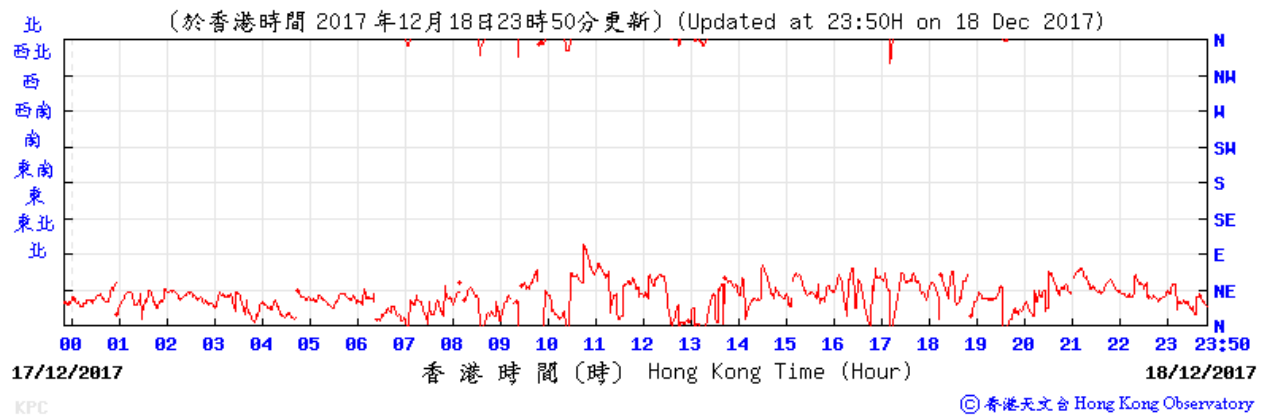


King's Park Weather Station – 18 December 2017

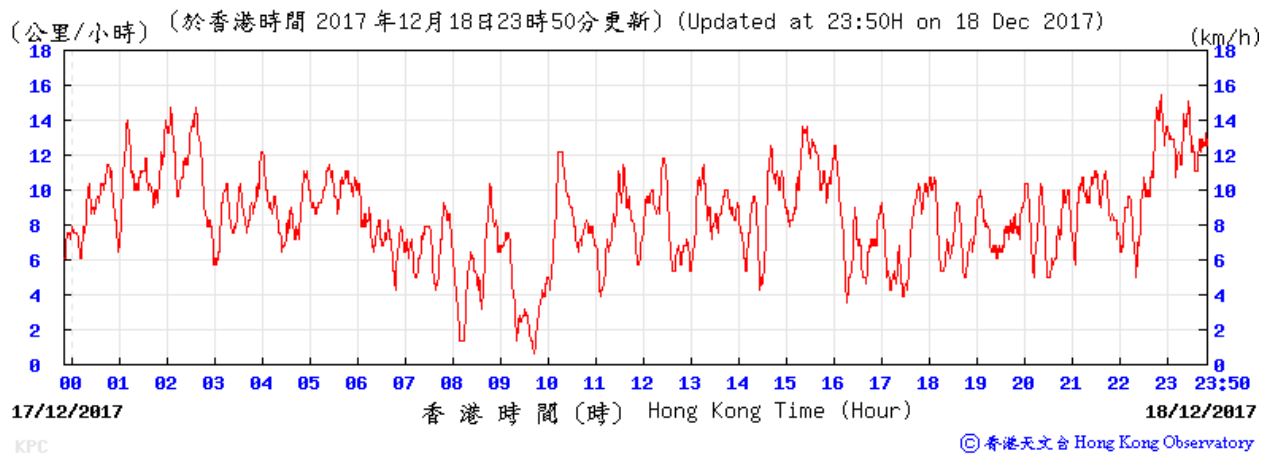
Temperature/Humidity:



Wind Direction:

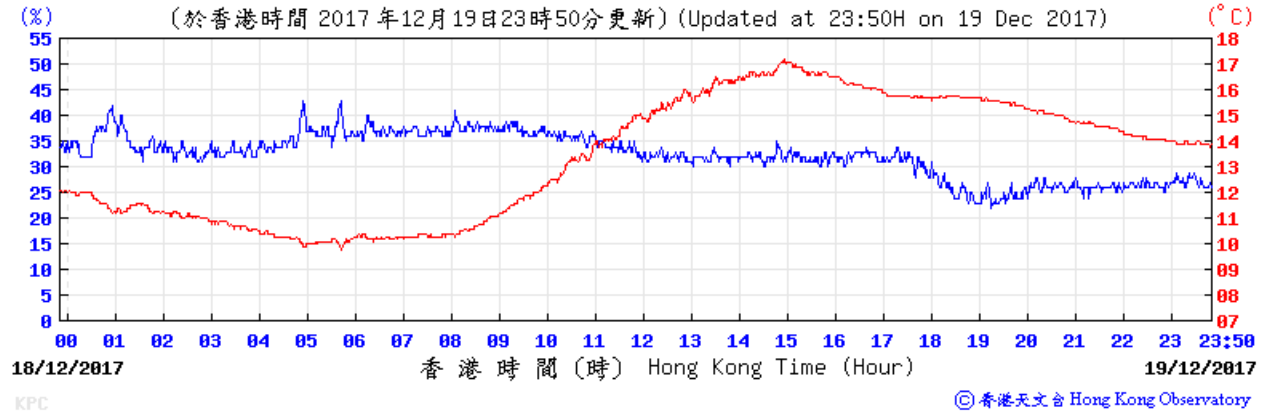


Wind Speed:

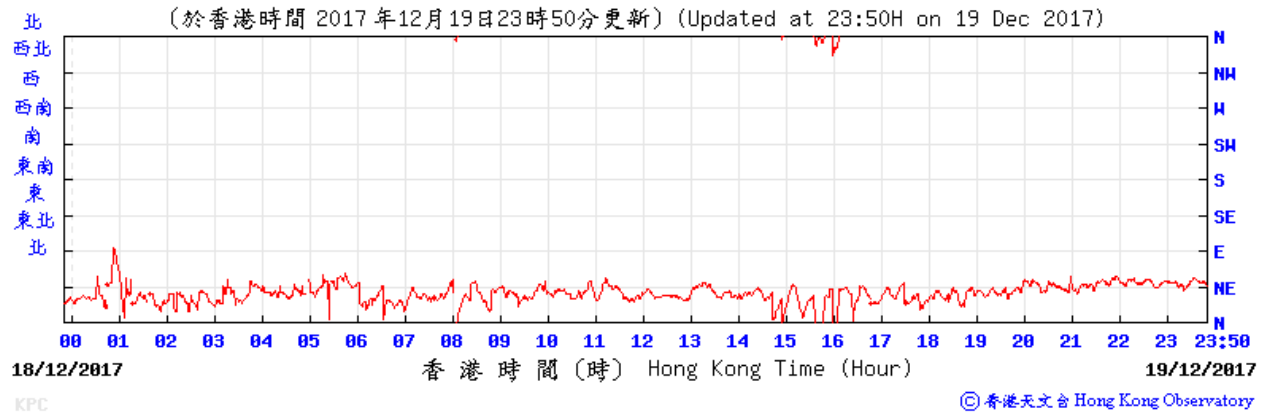


King's Park Weather Station – 19 December 2017

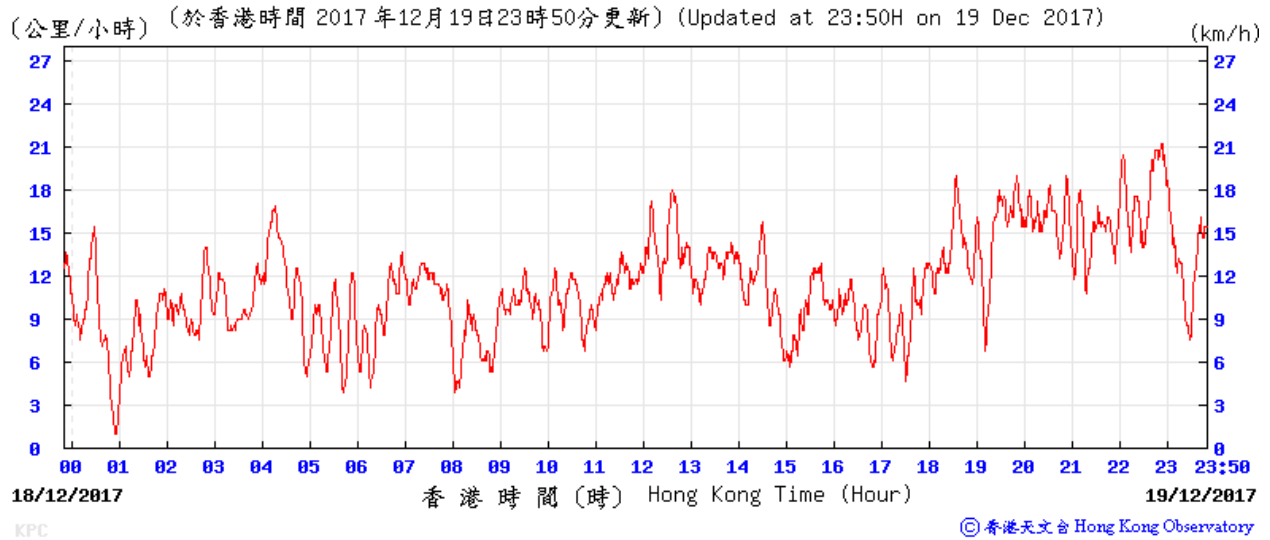
Temperature/Humidity:



Wind Direction:

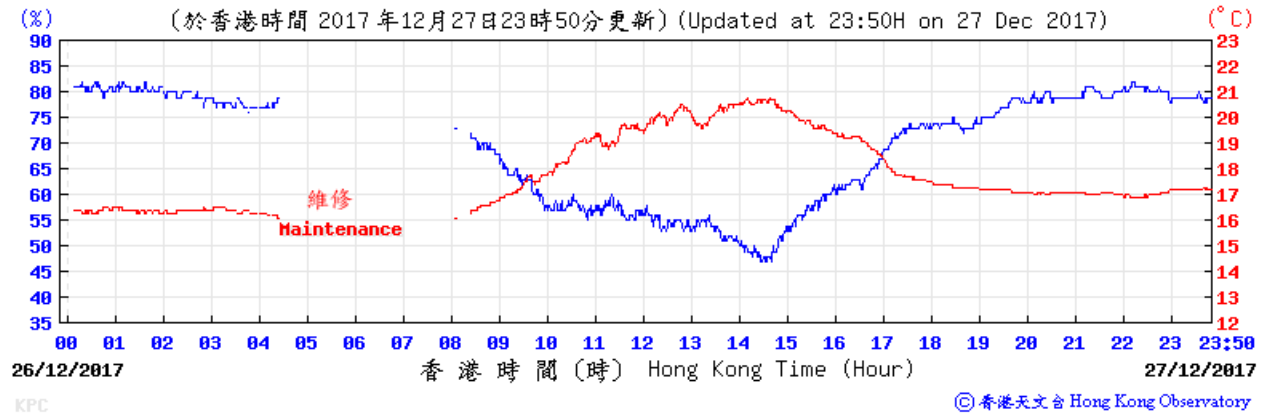


Wind Speed:

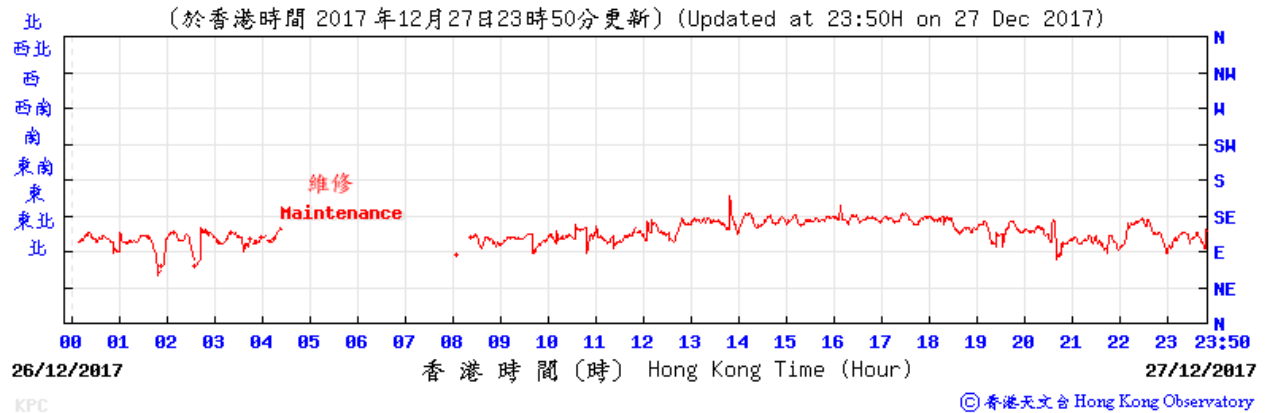


King's Park Weather Station – 27 December 2017

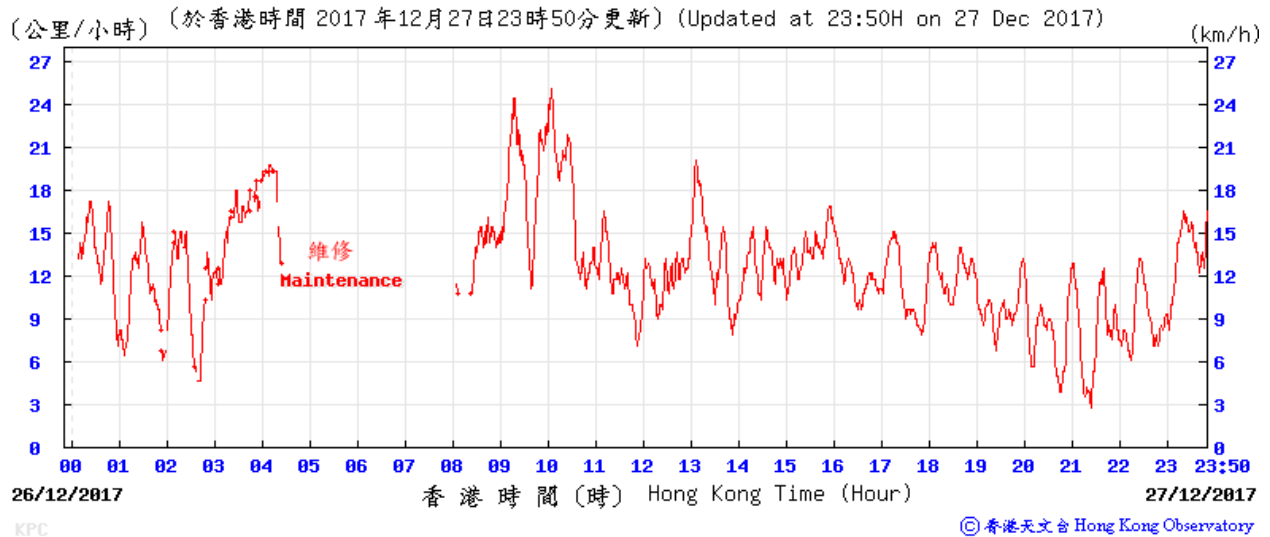
Temperature/Humidity:



Wind Direction:

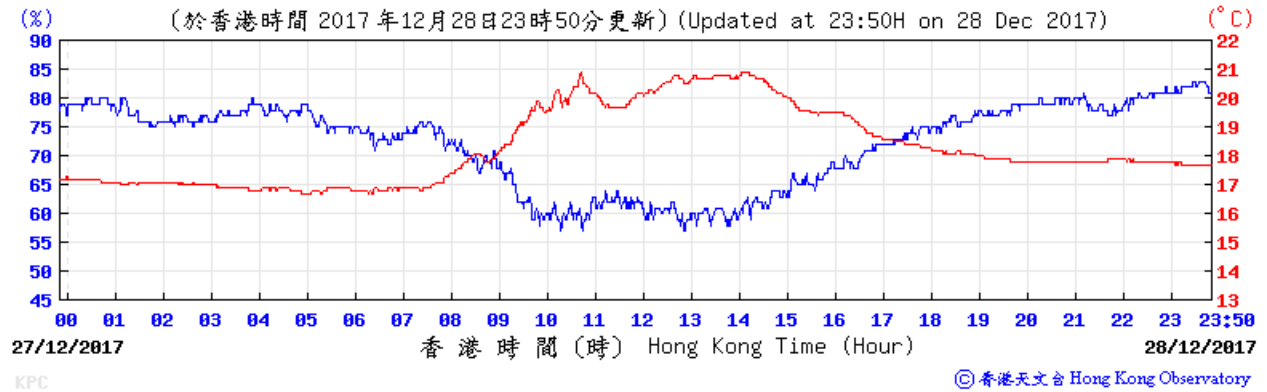


Wind Speed:

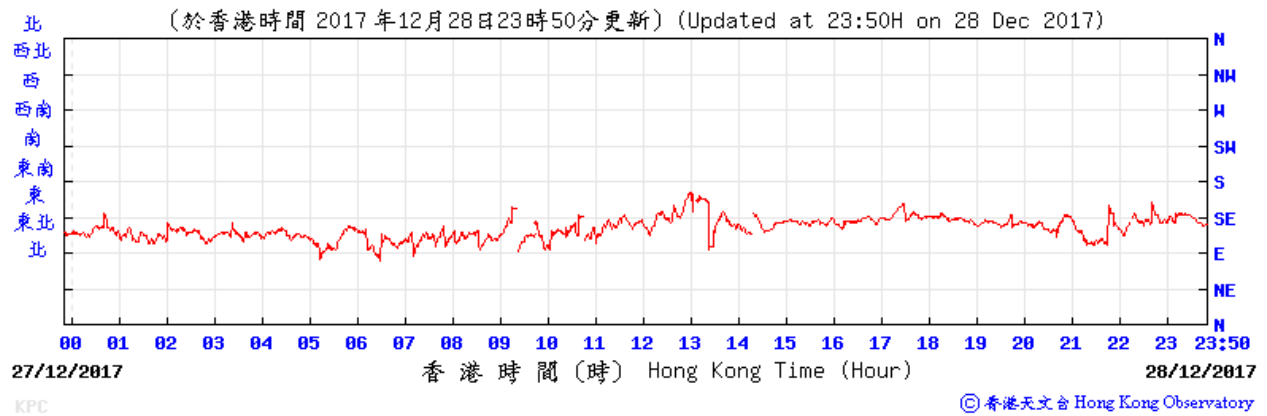


King's Park Weather Station – 28 December 2017

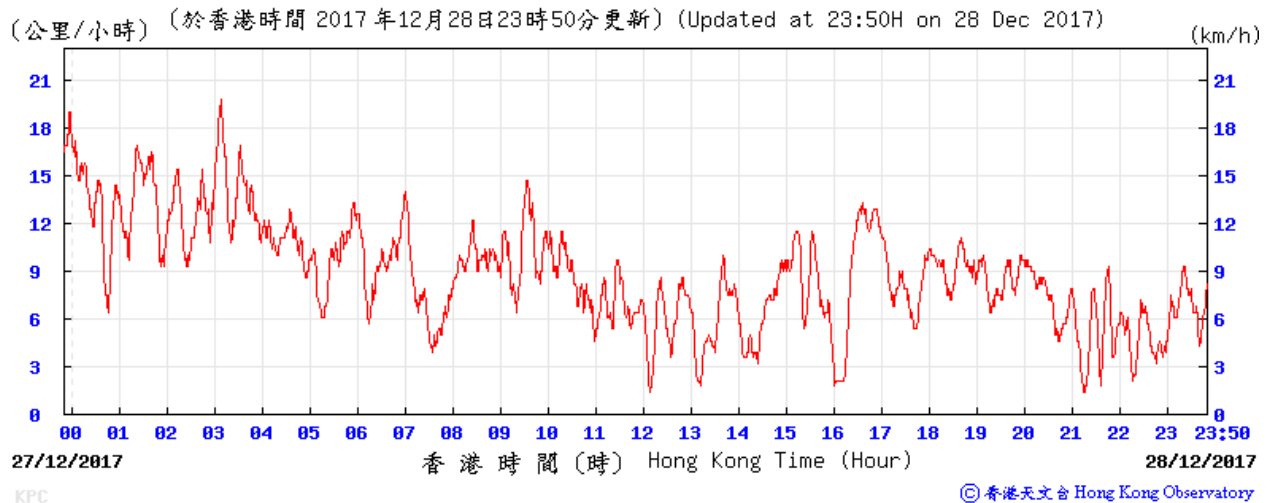
Temperature/Humidity:



Wind Direction:



Wind Speed:



APPENDIX I

CERTIFICATE OF LABORATORY AND EQUIPMENT CALIBRATION



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

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - May 19, 2017 Rootmeter S/N 0438320 Ta (K) - 296
 Operator Tisch Orifice I.D. - 1785 Pa (mm) - 750.57

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER	ORFICE
					DIFF Hg (mm)	DIFF H2O (in.)
1	NA	NA	1.00	1.3960	3.2	2.00
2	NA	NA	1.00	0.9790	6.4	4.00
3	NA	NA	1.00	0.8760	7.9	5.00
4	NA	NA	1.00	0.8390	8.8	5.50
5	NA	NA	1.00	0.6900	12.6	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
0.9900	0.7092	1.4102	0.9957	0.7133	0.8881
0.9858	1.0070	1.9943	0.9915	1.0128	1.2560
0.9837	1.1230	2.2296	0.9894	1.1294	1.4042
0.9826	1.1712	2.3385	0.9883	1.1779	1.4728
0.9775	1.4167	2.8203	0.9832	1.4249	1.7762
Qstd slope (m) = 1.99748			Qa slope (m) = 1.25079		
intercept (b) = -0.00957			intercept (b) = -0.00603		
coefficient (r) = 0.99985			coefficient (r) = 0.99985		
y axis = SQRT[H2O(Pa/760)(298/Ta)]			y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

$$Vstd = \text{Diff. Vol} [(Pa - \text{Diff. Hg}) / 760] (298 / Ta)$$

$$Qstd = Vstd / \text{Time}$$

$$Va = \text{Diff Vol} [(Pa - \text{Diff Hg}) / Pa]$$

$$Qa = Va / \text{Time}$$

For subsequent flow rate calculations:

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

$$Qa = 1/m \{ [\text{SQRT}(\text{H2O}(\text{Ta}/\text{Pa}))] - b \}$$



ARCADIS

Design & Consultancy
for natural and
built assets

Location :	4/F Roof top, K11 Commercial Complex
Sampler and Serial No.	TE-5170 MFC (0462)
Calibration Date & Time :	2017/12/01, 2:56 p.m.

Model :	TE-5025A
Calibrator Orifice no.:	1785
Slope (m):	1.99748
Intercept (b):	-0.00957
Date Certified :	19-May-17

Standard Temperature (Tstd)	298.00 K
Ambient Temperature (Ta)	296.70 K
Standard Pressure (Pstd)	760.00 mmHg
Ambient Pressure (Pa)	763.00 mmHg

Sample no.	H ₂ O (in)	Qstd (m ³ /min)	I (Flow Chat)	IC (corrected)
1	10.4	1.626	54.0	54.22
2	8.5	1.470	49.0	49.20
3	6.9	1.325	45.0	45.19
4	4.2	1.035	35.0	35.15
5	2.9	0.861	30.0	30.12

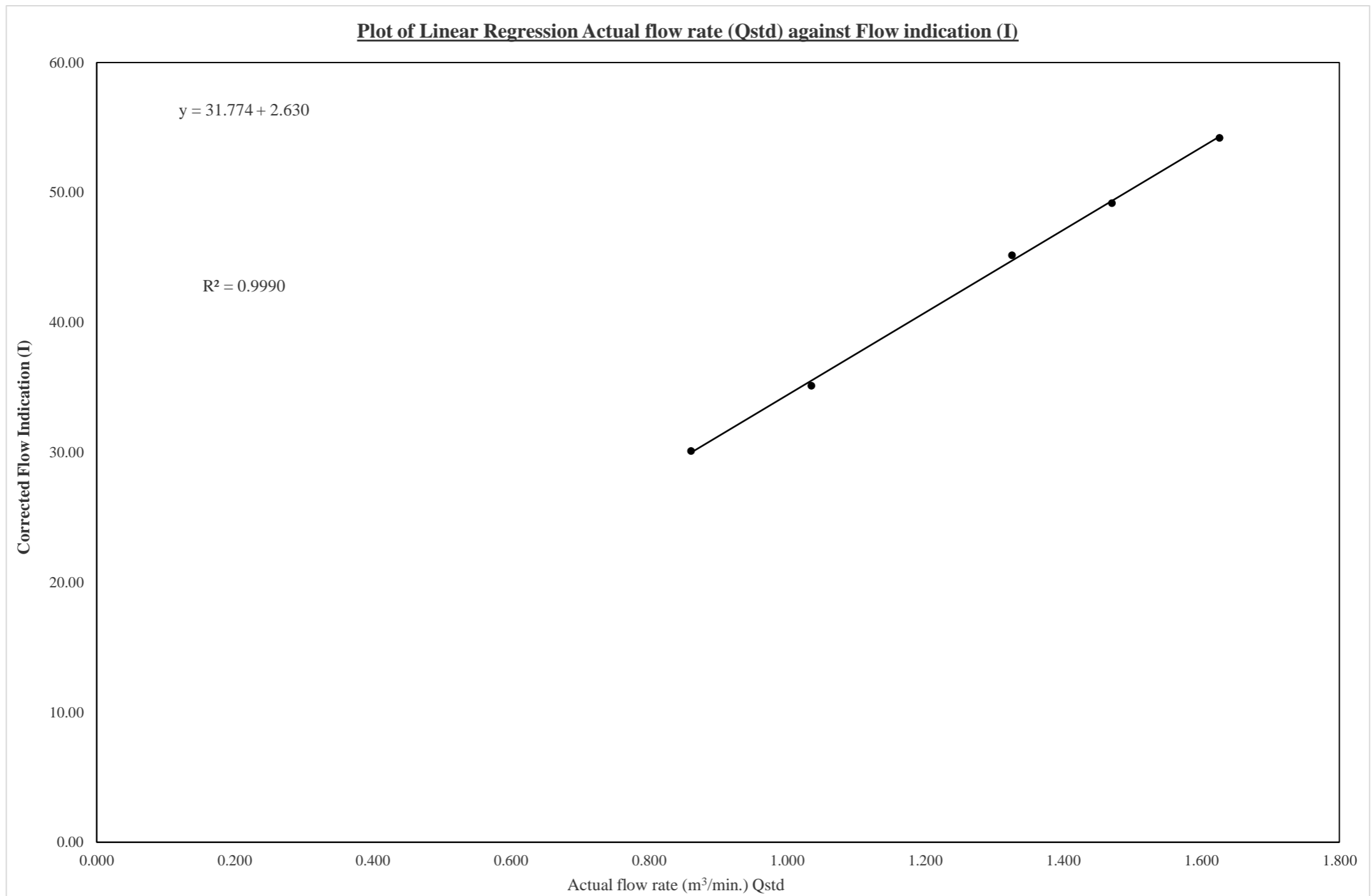
Linear Regression	
Slope (m) =	31.774
Intercept (b) =	2.630
Correlation Coefficient =	0.9990

Calibrations

$$Q_{std} = 1/m(\sqrt{(H_2O(Pa/P_{std})(T_{std}/T_a))}-b)$$

$$IC = I(\sqrt{(Pa/P_{std})(T_{std}/T_a)})$$

- Qstd = actual flow rate as indicated by the calibrator orifice
- H₂O = orifice manometer reading during calibration
- T_a = ambient temperature during calibration, K = 273 + °C
- T_{std} = standard temperature, a constant that never changes, 298 K
- P_a = ambient barometric pressure during calibration, mmHg
- P_{std} = standard barometric pressure, a constant that never changes, 760 mm Hg
- m = Qstandard slope of orifice calibrator relationship
- b = Qstandard intercept of orifice calibrator relationship
- IC = continuous flow recorder readings corrected to current T_a and P_a
- I = continuous flow recorder readings during calibration



Calibrated by : *Sun* Tung Chi Sun

Date : 01 December 2017

Checked by : *Wong Fu Nam* Wong Fu Nam

Date : 04 December 2017

ALS Technichem (HK) Pty Ltd



ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

SUB-CONTRACTING REPORT

CONTACT	: FU NAM WONG	WORK ORDER	: HK1710103
CLIENT	: ARCADIS DESIGN & ENGINEERING LIMITED		
ADDRESS	: 20/F AXA TOWER, LANDMARK EAST, 100 HOW MING STREET, KWUN TONG HONG KONG	SUB-BATCH	: 1
		DATE RECEIVED	: 9-MAR-2017
		DATE OF ISSUE	: 28-MAR-2017
PROJECT	: ----	NO. OF SAMPLES	: 1
		CLIENT ORDER	: ----

General Comments

- Sample(s) were received in ambient condition.
- Sample(s) analysed and reported on an as received basis.
- Calibration was subcontracted to and analysed by Action United Environment Services and Consulting.

Signatories

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories

Position

Richard Fung

General Manager

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ALS Technichem (HK) Pty Ltd
Part of the ALS Laboratory Group

11/F, Chung Shun Knitting Centre 1 - 3 Wing Yip Street Kwai Chung N.T. Hong Kong
Tel. +852 2610 1044 Fax. +852 2610 2021 www.alsglobal.com

WORK ORDER : HK1710103
SUB-BATCH : 1
CLIENT : ARCADIS DESIGN & ENGINEERING LIMITED
PROJECT : ----



ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK1710103-001	S/N: 456677	AIR	09-MAR-2017	S/N: 456677

Equipment Verification Report (TSP)

Equipment Calibrated:

Type: Laser Dust monitor
 Manufacturer: Sibata LD-3B
 Serial No. 456677
 Equipment Ref: Nil
 Job Order HK1710103

Standard Equipment:

Standard Equipment: Higher Volume Sampler
 Location & Location ID: AUES office (calibration room)
 Equipment Ref: HVS 018
 Last Calibration Date: 23 February 2017

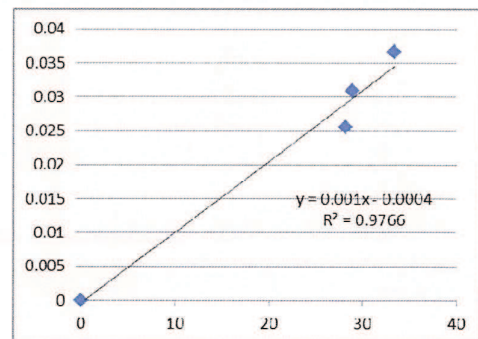
Equipment Verification Results:

Testing Date: 16 March 2017

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m ³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr02min	09:58 ~ 12:00	17.8	1016.4	0.037	4070	33.4
2hr07min	12:05 ~ 14:12	17.8	1016.4	0.031	3678	28.9
2hr02min	14:20 ~ 16:22	17.8	1016.4	0.026	3451	28.2

Linear Regression of Y or X

Slope (K-factor): 0.0010
 Correlation Coefficient 0.9882
 Date of Issue 20 March 2017



Remarks:

- Strong** Correlation ($R > 0.8$)
- Factor 0.0010 should be apply for TSP monitoring

*If $R < 0.5$, repair or re-verification is required for the equipment

Operator : Martin Li Signature : [Signature] Date : 20 March 2017

QC Reviewer : Ben Tam Signature : [Signature] Date : 20 March 2017



Calibration Certificate

Certificate No. **702493**

Page 1 of 2 Pages

Customer : ARCADIS Design & Engineering Limited

Address : 20/F, AXA Tower, Landmark East, 100 How Ming Street, Kwun Tong, Kowloon, Hong Kong.

Order No. : Q71021

Date of receipt : 17-Mar-17

Item Tested

Description : Precision Acoustic Calibrator

Manufacturer : Larson Davis

I.D. : --

Model : CAL200

Serial No. : 10929

Test Conditions

Date of Test : 20-Mar-17

Supply Voltage : --

Ambient Temperature : (23 ± 3)°C

Relative Humidity : (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure : IEC 60942, F20, Z02.

Test Results

All results were within the IEC 60942 Class 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>
S014	Spectrum Analyzer	605758	NIM-PRC & SCL-HKSAR
S240	Sound Level Calibrator	701036	NIM-PRC & SCL-HKSAR
S041	Universal Counter	607883	SCL-HKSAR
S206	Sound Level Meter	605757	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), or by reference to a natural constant.
The test results apply to the above Unit-Under-Test only

Calibrated by : 
Kin Wong

Approved by : 
Steve Kwan

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

Date: 20-Mar-17



Calibration Certificate

Certificate No. 702493

Page 2 of 2 Pages

Results :

1. Generated Sound Pressure Level

UUT Nominal Value (dB)	Measured Value (dB)	IEC 60942 Class 1 Spec.
94	93.8	± 0.4 dB
114	113.8	

Uncertainty : ± 0.1 dB

2. Short-term Level Fluctuation : 0.0 dB

IEC 60942 Class 1 Spec. : ± 0.1 dB

Uncertainty : ± 0.01 dB

3. Frequency

UUT Nominal Value (kHz)	Measured Value (kHz)	IEC 60942 Class 1 Spec.
1	1.000	± 1 %

Uncertainty : ± 3.6 x 10⁻⁶

4. Total Distortion : < 0.5 %

IEC 60942 Class 1 Spec. : < 3 %

Uncertainty : ± 2.3 % of reading

Remark : 1. UUT : Unit-Under-Test

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

3. Atmospheric Pressure : 1023 hPa.

----- END -----



Calibration Certificate

Certificate No. **702990**

Page 1 of 3 Pages

Customer : Hyder Consulting Limited

Address : 20/F, AXA Tower, Landmark East, 100 How Ming Street, Kwun Tong, HK

Order No. : Q71166

Date of receipt : 30-Mar-17

Item Tested

Description : Sound Level Meter

Manufacturer : B&K

I.D. : --

Model : 2238

Serial No. : 2562782

Test Conditions

Date of Test : 6-Apr-17

Supply Voltage : --

Ambient Temperature : (23 ± 3)°C

Relative Humidity : (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure: Z01, IEC 60651, IEC 60804.

Test Results

All results were within the IEC 60651 Type1 and IEC 60804 Type1 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	C170120	SCL-HKSAR
S240	Sound Level Calibrator	701036	NIM-PRC & 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), or by reference to a natural constant. The test results apply to the above Unit-Under-Test only

Calibrated by : 
Kin Wong

Approved by : 
Steve Kwan

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 8846

Date: 6-Apr-17



Calibration Certificate

Certificate No. 702990

Page 2 of 3 Pages

Results :

1. SPL Accuracy

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

IEC 60651 Type 1 Spec. : ± 0.7 dB
Uncertainty : ± 0.1 dB

2. Level Stability : 0.0 dB

IEC 60651 Type 1 Spec. : ± 0.3 dB
Uncertainty : ± 0.1 dB

3. Linearity

3.1 Level Linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 60651 Type 1 Spec. (Primary Indicator Range)
140	114.0	114.0	0.0	± 0.7 dB
130	104.0	104.0	0.0	
120	94.0	94.0 (Ref.)	--	
110	84.0	84.0	0.0	
100	74.0	74.0	0.0	
90	64.0	64.0	0.0	
80	54.0	54.0	0.0	

Uncertainty : ± 0.1 dB



Calibration Certificate

Certificate No. 702990

Page 3 of 3 Pages

3.2 Differential level linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 60651 Type 1 Spec.
120	84.0	84.0	0.0	± 0.4 dB
	94.0	94.0 (Ref.)	--	
	95.0	95.0	0.0	± 0.2 dB

Uncertainty : ± 0.1 dB

4. Frequency Weighting

A weighting

Frequency	Attenuation (dB)	IEC 60651 Type 1 Spec.
31.5 Hz	-39.3	- 39.4 dB, ± 1.5 dB
63 Hz	-26.2	- 26.2 dB, ± 1.5 dB
125 Hz	-16.2	- 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	+1.0	+ 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 60804 Type 1 Spec.
continuous	40.0	40.0	--
1/10	40.0	39.8	± 0.5 dB
1/10 ²	40.0	39.8	
1/10 ³	40.0	39.8	± 1.0 dB
1/10 ⁴	40.0	39.9	

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 : 1 025 hPa.

4. The UUT was adjusted with the laboratory's sound calibrator at the reference sound pressure level before the calibration.



----- END -----

APPENDIX J

SAMPLE DATA RECORD SHEET


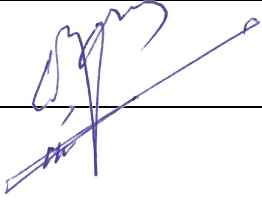
APPENDIX J - 24-hr TSP Monitoring Field Record Sheet

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

Monitoring Location		4/F Roof top, K11
Sampler Identification		TE-5170 MFC
Start date & time of sampling		2017/12/04, 07:15
Elapsed-time Meter Reading	Start (Hours)	8855.09
	Stop (Hours)	8882.67
Total Sampling Time (min.)		1654.8 (27.58 Hours)
Weather Conditions		Cloudy
Abnormal Site Conditions		Nil
Initial Flow Rate, Qsi	Pi (mm Hg)	764.9
	Ti (°C)	17.6
	Hi (cfm)	33
	Qsi (Std. m ³)	1.32
Final Flow Rate, Qsf	Pi (mm Hg)	764.9
	Ti (°C)	17.6
	Hf (cfm)	37
	Qsf (Std. m ³)	1.46
Average Flow Rate (Std. m ³)		1.39
Total Volume (Std. m ³)		2300.2
Initial Weight of Filter (g)		2.6496
Final Weight of Filter (g)		2.7426
Different Weight of Filter (g)		0.0930
Measured TSP Level (µg/m ³)		40.4
Action Level (µg/m ³)		221.6
Limit Level (µg/m ³)		260.0
<u>Name & Designation</u>	<u>Date</u>	<u>Signature</u>
Record by: Tung Chi Sun	2017/12/18	
Checked by: Wong Fu Nam	2017/12/18	



APPENDIX J - 24-hr TSP Monitoring Field Record Sheet

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

Monitoring Location		4/F Roof top, K11
Sampler Identification		TE-5170 MFC
Start date & time of sampling		2017/12/11, 07:04
Elapsed-time Meter Reading	Start (Hours)	8882.67
	Stop (Hours)	8909.51
Total Sampling Time (min.)		1610.4 (26.84 Hours)
Weather Conditions		Overcast
Abnormal Site Conditions		Nil
Initial Flow Rate, Qsi	Pi (mm Hg)	764.4
	Ti (°C)	16.2
	Hi (cfm)	37
	Qsi (Std. m ³)	1.25
Final Flow Rate, Qsf	Pi (mm Hg)	764.4
	Ti (°C)	16.2
	Hf (cfm)	38
	Qsf (Std. m ³)	1.28
Average Flow Rate (Std. m ³)		1.26
Total Volume (Std. m ³)		2383.4
Initial Weight of Filter (g)		2.6250
Final Weight of Filter (g)		2.8147
Different Weight of Filter (g)		0.1897
Measured TSP Level (µg/m ³)		79.6
Action Level (µg/m ³)		221.6
Limit Level (µg/m ³)		260.0
<u>Name & Designation</u>	<u>Date</u>	<u>Signature</u>
Record by: Tung Chi Sun	2017/12/18	
Checked by: Wong Fu Nam	2017/12/18	



APPENDIX J - 24-hr TSP Monitoring Field Record Sheet

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

Monitoring Location		4/F Roof top, K11
Sampler Identification		TE-5170 MFC
Start date & time of sampling		2017/12/18, 08:18
Elapsed-time Meter Reading	Start (Hours)	8909.51
	Stop (Hours)	8934.96
Total Sampling Time (min.)		1527.0 (25.45 Hours)
Weather Conditions		Sunny
Abnormal Site Conditions		Nil
Initial Flow Rate, Qsi	Pi (mm Hg)	770.3
	Ti (°C)	9.6
	Hi (cfm)	37
	Qsi (Std. m ³)	1.25
Final Flow Rate, Qsf	Pi (mm Hg)	770.3
	Ti (°C)	9.6
	Hf (cfm)	37
	Qsf (Std. m ³)	1.25
Average Flow Rate (Std. m ³)		1.25
Total Volume (Std. m ³)		1908.8
Initial Weight of Filter (g)		2.6536
Final Weight of Filter (g)		2.8300
Different Weight of Filter (g)		0.1764
Measured TSP Level (µg/m ³)		92.4
Action Level (µg/m ³)		221.6
Limit Level (µg/m ³)		260.0
<u>Name & Designation</u>	Date	<u>Signature</u>
Record by: Tung Chi Sun	2017/12/22	
Checked by: Wong Fu Nam	2017/12/27	



APPENDIX J - 24-hr TSP Monitoring Field Record Sheet

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

Monitoring Location		4/F Roof top, K11
Sampler Identification		TE-5170 MFC
Start date & time of sampling		2017/12/27, 07:18
Elapsed-time Meter Reading	Start (Hours)	8934.96
	Stop (Hours)	8961.75
Total Sampling Time (min.)		1607.4 (26.79 Hours)
Weather Conditions		Sunny
Abnormal Site Conditions		Nil
Initial Flow Rate, Qsi	Pi (mm Hg)	765.8
	Ti (°C)	16.0
	Hi (cfm)	35
	Qsi (Std. m ³)	1.18
Final Flow Rate, Qsf	Pi (mm Hg)	765.8
	Ti (°C)	16.0
	Hf (cfm)	35
	Qsf (Std. m ³)	1.18
Average Flow Rate (Std. m ³)		1.18
Total Volume (Std. m ³)		1896.7
Initial Weight of Filter (g)		2.6520
Final Weight of Filter (g)		2.8100
Different Weight of Filter (g)		0.1580
Measured TSP Level (µg/m ³)		83.3
Action Level (µg/m ³)		221.6
Limit Level (µg/m ³)		260.0
<u>Name & Designation</u>	Date	<u>Signature</u>
Record by: Tung Chi Sun	2018/01/02	
Checked by: Wong Fu Nam	2018/01/02	



APPENDIX J - Noise Monitoring Field Record Sheet

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

Monitoring Location		4/F Roof top, K11
Date of Monitoring		01 December 2017
Monitoring Start Time		10:48
Monitoring Stop Time		11:18
Measurement Time Length		30 mins
Weather Condition		Sunny
Wind Speed		0.1 m/s
Noise Meter Model (Serial Number)		BK 2238 (2562782)
Calibrator Model (Serial Number)		CAL 200 (10929)
Measurement Results	L _{eq}	67.5 dB(A)
	L ₁₀	69.5 dB(A)
	L ₉₀	64.0 dB(A)
Limit Level		75.0 dB(A)
Major Construction Noise Source(s) During Monitoring		On-site powered mechanical equipment
Other Noise Source(s) During Monitoring		Traffic, Aircraft and Neighbor noise
<u>Name & Designation</u>	<u>Date</u>	<u>Signature</u>
Record by: Tung Chi Sun	01 December 2017	
Checked by: Wong Fu Nam	04 December 2017	



APPENDIX J - Noise Monitoring Field Record Sheet

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

Monitoring Location		4/F Roof top, K11
Date of Monitoring		05 December 2017
Monitoring Start Time		10:08
Monitoring Stop Time		10:38
Measurement Time Length		30 mins
Weather Condition		Cloudy
Wind Speed		2.5 m/s
Noise Meter Model (Serial Number)		BK 2238 (2562782)
Calibrator Model (Serial Number)		CAL 200 (10929)
Measurement Results	L _{eq}	65.8 dB(A)
	L ₁₀	67.5 dB(A)
	L ₉₀	63.5 dB(A)
Limit Level		75.0 dB(A)
Major Construction Noise Source(s) During Monitoring		On-site powered mechanical equipment
Other Noise Source(s) During Monitoring		Traffic noise
<u>Name & Designation</u>	<u>Date</u>	<u>Signature</u>
Record by: Tung Chi Sun	05 December 2017	
Checked by: Wong Fu Nam	05 December 2017	



APPENDIX J - Noise Monitoring Field Record Sheet

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

Monitoring Location		4/F Roof top, K11
Date of Monitoring		12 December 2017
Monitoring Start Time		10:32
Monitoring Stop Time		11:02
Measurement Time Length		30 mins
Weather Condition		Overcast
Wind Speed		1.2 m/s
Noise Meter Model (Serial Number)		BK 2238 (2562782)
Calibrator Model (Serial Number)		CAL 200 (10929)
Measurement Results	L _{eq}	67.3 dB(A)
	L ₁₀	69.0 dB(A)
	L ₉₀	64.5 dB(A)
Limit Level		75.0 dB(A)
Major Construction Noise Source(s) During Monitoring		On-site powered mechanical equipment
Other Noise Source(s) During Monitoring		Traffic and Aircraft noise
<u>Name & Designation</u>	<u>Date</u>	<u>Signature</u>
Record by: Tung Chi Sun	12 December 2017	
Checked by: Wong Fu Nam	12 December 2017	



APPENDIX J - Noise Monitoring Field Record Sheet

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

Monitoring Location		4/F Roof top, K11
Date of Monitoring		19 December 2017
Monitoring Start Time		10:17
Monitoring Stop Time		10:47
Measurement Time Length		30 mins
Weather Condition		Sunny
Wind Speed		1.2 m/s
Noise Meter Model (Serial Number)		BK 2238 (2562782)
Calibrator Model (Serial Number)		CAL 200 (10929)
Measurement Results	Leq	65.9 dB(A)
	L10	67.5 dB(A)
	L90	63.0 dB(A)
Limit Level		75.0 dB(A)
Major Construction Noise Source(s) During Monitoring		On-site powered mechanical equipment
Other Noise Source(s) During Monitoring		Traffic noise
<u>Name & Designation</u>	<u>Date</u>	<u>Signature</u>
Record by: Tung Chi Sun	19 December 2017	
Checked by: Wong Fu Nam	19 December 2017	

APPENDIX J - Noise Monitoring Field Record Sheet

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

Monitoring Location		4/F Roof top, K11
Date of Monitoring		27 December 2017
Monitoring Start Time		10:40
Monitoring Stop Time		11:10
Measurement Time Length		30 mins
Weather Condition		Sunny
Wind Speed		4.3 m/s
Noise Meter Model (Serial Number)		BK 2238 (2562782)
Calibrator Model (Serial Number)		CAL 200 (10929)
Measurement Results	L _{eq}	66.6 dB(A)
	L ₁₀	68.0 dB(A)
	L ₉₀	64.0 dB(A)
Limit Level		75.0 dB(A)
Major Construction Noise Source(s) During Monitoring		On-site powered mechanical equipment
Other Noise Source(s) During Monitoring		Wind noise
<u>Name & Designation</u>	<u>Date</u>	<u>Signature</u>
Record by: Tung Chi Sun	27 December 2017	
Checked by: Wong Fu Nam	27 December 2017	

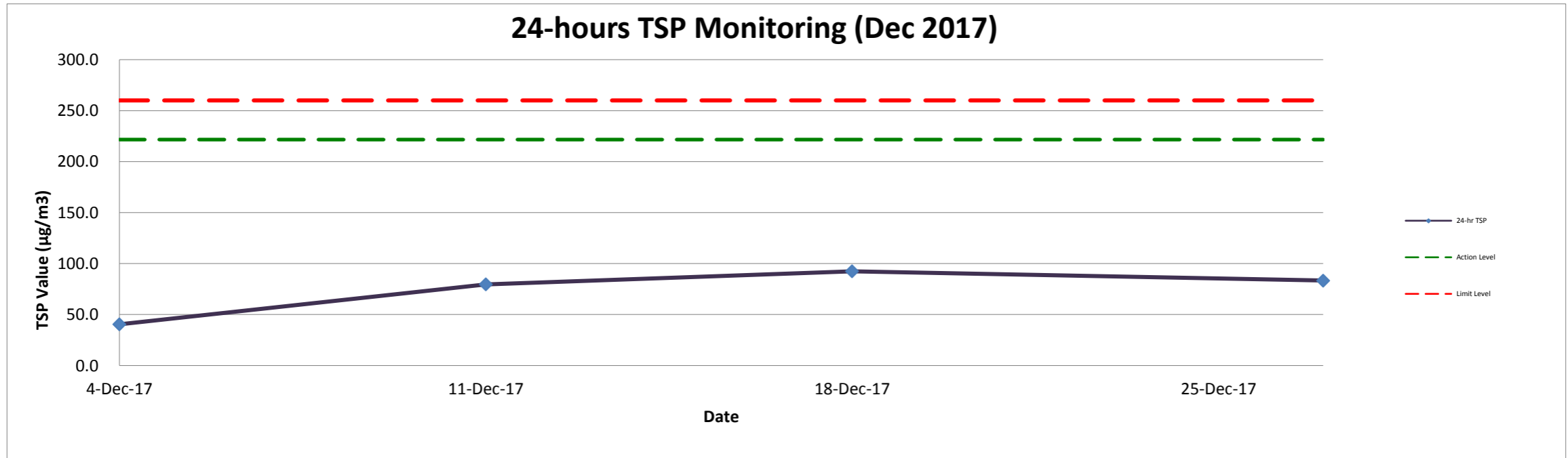
APPENDIX K

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)			Average Flow Rate	TSP Concentration (µg/m3)	Action/Limit Levels
					Initial	Final	Sampling Hours	Initial	Final			
K11 Art Mall	4-Dec-17	7:15	Cloudy	17.6	8855.09	8882.67	27.58	33	37	35	40.4	221.6/260
	11-Dec-17	7:04	Overcast	16.2	8882.67	8909.51	26.84	37	38	38	79.6	221.6/260
	18-Dec-17	8:18	Sunny	9.6	8909.51	8934.96	25.45	37	37	37	92.4	221.6/260
	27-Dec-17	7:18	Sunny	16.0	8934.96	8961.75	26.79	35	35	35	83.3	221.6/260

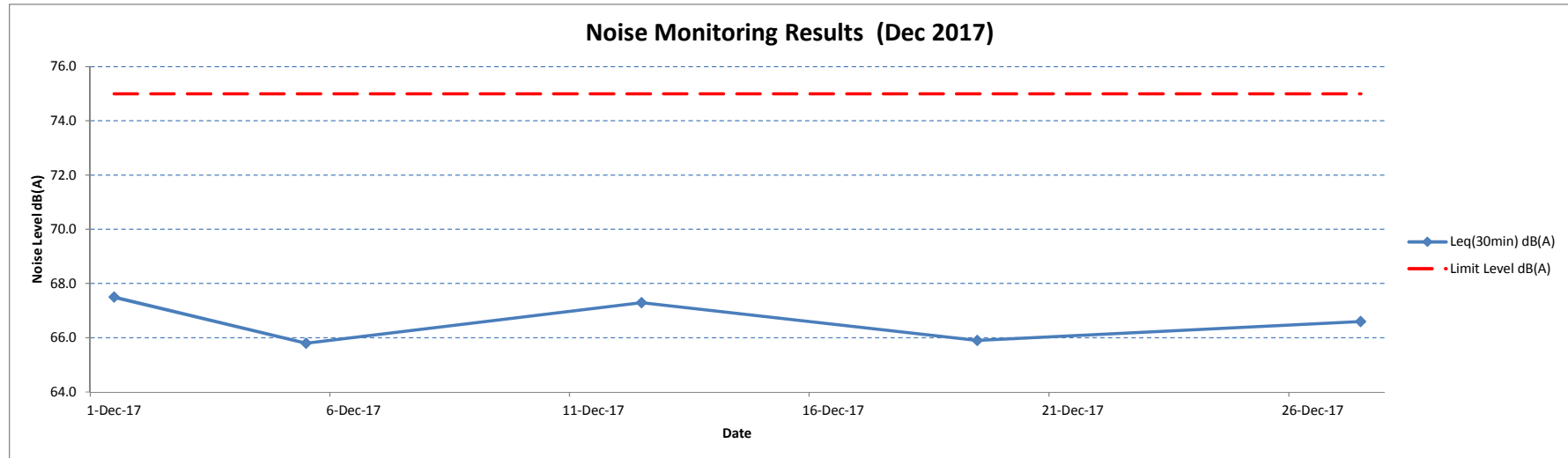
24-hours TSP Monitoring (Dec 2017)



Noise Impact Monitoring Results at K11

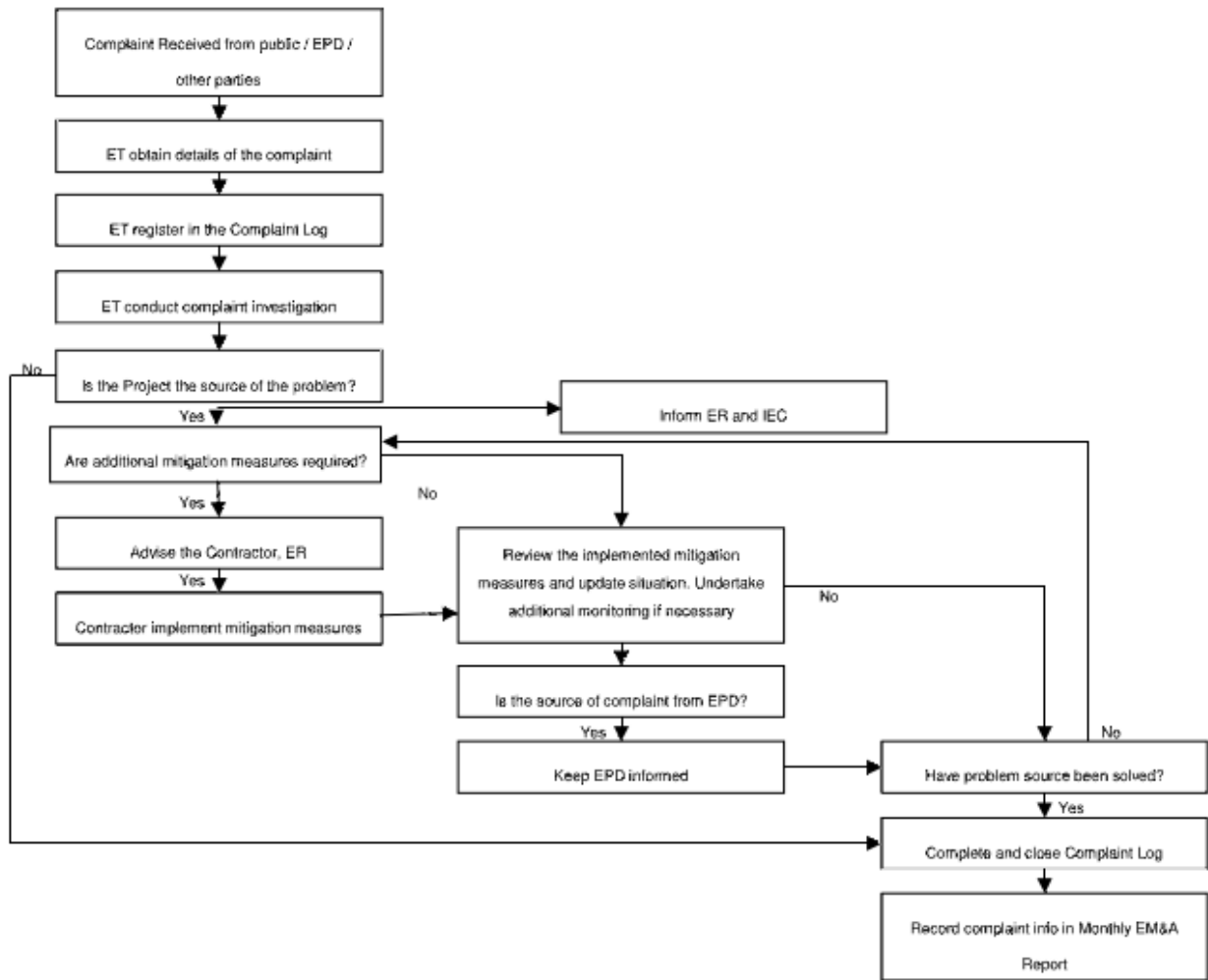
Monitoring Locations	Date	Weather Conditions	Wind Speed (m/s)	Start Time	End Time	Background Level dB(A)	Limit Level dB(A)	Leq(30min) dB(A)	L10(30min) dB(A)	L90(30min) dB(A)
K11 Art Mall	1-Dec-17	Sunny	0.1	10:48	11:18	65.3	75	67.5	69.5	64.0
	5-Dec-17	Cloudy	2.5	10:08	10:38	65.3	75	65.8	67.5	63.5
	12-Dec-17	Overcast	1.2	10:32	11:02	65.3	75	67.3	69.0	64.5
	19-Dec-17	Sunny	1.2	10:17	10:47	65.3	75	65.9	67.5	63.0
	27-Dec-17	Sunny	4.3	10:40	11:10	65.3	75	66.6	68.0	64.0

Red Bold indicates an exceedance of Limit Level



APPENDIX L

Complaint Response Procedure



APPENDIX M WASTE MANAGEMENT RECORDS

Monthly Summary Waste Flow Table for 2017 (year)

Contract No: C3840-13C Tsim Sha Tsui Station Carnarvon Road Subway

Date Reported: 8-January-2018

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 ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³ /tonne)
Carried from Project Start	4.9473	-	-	-	4.9473	-	-	-	-	-	0.0387
Jan	0.6189	-	-	-	0.6189	-	-	-	-	-	0.0017
Feb	0.9219	-	-	-	0.9219	-	-	-	-	-	0.0021
Mar	1.2994	-	-	-	1.2994	-	-	-	-	-	0.0045
Apr	0.6942	-	-	-	0.6942	-	-	-	-	-	0.0048
May	0.5717	-	-	-	0.5717	-	-	-	-	-	0.0034
June	0.4316	-	-	-	0.4316	-	-	-	-	-	0.0020
Sub-total	4.5377	-	-	-	4.5377	-	-	-	-	-	0.0185
July	0.0801	-	-	-	0.0801	-	-	-	-	-	0.0145
Aug	0.0274	-	-	-	0.0274	-	-	-	-	-	0.0056
Sept	0.0000	-	-	-	0.0000	-	-	-	-	-	0.0303
Oct	0.0000	-	-	-	0.0000	-	-	-	-	-	0.0413
Nov	0.0116	-	-	-	0.0116	-	-	-	-	-	0.0165
Dec	0.0187	-	-	-	0.0187	-	-	-	-	-	0.0276
Total	4.6755	-	-	-	4.6755	-	-	-	-	-	0.1543
Acc. Total	9.6228	(accumulated quantity of the project = carried amount + this year amount)									0.1930

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.