





大成環境科技拓展有限公司
ENVIRONMENTAL PIONEERS & SOLUTIONS LIMITED
Member of FSE Engineering Holdings (Stock Code: 331)

Proposed Road Improvement Works in West Kowloon Reclamation Development – Phase 1

Environmental Monitoring & Audit Report

01/06/2018 – 30/6/2018

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Executive Summary

This is the twenty-ninth monthly Environmental Monitoring and Audit (EM&A) Report for Proposed Road Improvement Works in West Kowloon Reclamation Development – Phase 1. The project commenced on 6 February 2016. This report documents the finding of EM&A Works conducted from 1 June 2018 to 30 June 2018.

Environmental Monitoring and Audit Progress

Air Quality Monitoring

1-hr Total Suspended Particulates (TSP) monitoring and 24-hr TSP monitoring were carried out on 6, 12, 16, 22 and 28 June 2018.

Noise Monitoring

30-min LAeq noise monitoring was carried out on 6, 12, 16, 22 and 28 June 2018.

Waste Management

According to Contractor's waste flow data, 2833.19 tonnes of inert C&D materials and 20.63 tonnes of general refuse were generated and disposed.

Landscape and Visual Impact

Bi-weekly inspections were conducted on 1, 15 and 29 June 2018. Most of the necessary mitigation measures have been implemented. Details of the audit findings and implementation status are presented in Section 6.

Environmental Site Inspection

Joint weekly inspections were conducted by representatives of the Contract Administrator, Engineer, Contractor and ET on 6, 13, 20 and 27 June 2018. The representative of the IEC conducted the site inspection on 20 June 2018. Details of the audit findings and implementation status are presented in Section 6.

Environmental Exceedance / Non-compliance / Compliant / Summons and Successful Prosecution

No exceedance of action level and limit level was recorded for TSP. Five exceedances were recorded at NM4 on 6, 12, 16, 22 and 28 June 2018 for Noise. No Non-compliance

event, notification of summons and successful prosecution against the Project were received in this reporting month.

EPD received a complaint from Miss Wu of Grand Austin MO about heavy traffic and traffic congestion at Canton Road caused noise nuisance to residents of Grand Austin. Letter from EPD by email was received on 23 May 2018. ET had conducted an investigation with the representatives of the Project Proponent, RE, IEC and the Contractor on 28 May 2018 to review the findings and resolve the concern. Based on the investigation results and the requirements of EIA Report, Environmental Permit and EM&A Manual, the complaint from Miss Wu should not be caused by this Project. The Complaint Investigation Report has been submitted to EPD by the ET on 5 June 2018.

Variation in Construction Method

No variation in construction method from the proposed construction programme was made and affected the EM&A.

Future Key Issues

The major construction works to be undertaken in the next reporting month include:

- Portion I – Pile Cap, Pier and Bridge Deck Construction Works
- Portion I – Utilities Diversion Works
- Portion I – Piling Construction Works
- Portion I – Pile Cap, Pier and Bridge Deck Construction Works
- Portion Q – Road Works
- Portion HA – Underground Investigation Works
- Portion HA – Utilities Diversion Works
- Portion HA – Piling Construction Works
- Portion HA – Pile Cap, Pier and Bridge Deck Construction Works
- Portion HA – E&M Installation and Road Works
- Portion J – Street Furniture Installation

Potential environmental impacts arising from the above construction activities are mainly associated with dust, construction noise, water quality and waste management. The Contractor has been reminded to properly implement dust, construction noise and water quality control measures as well as proper waste management in order to minimize the potential environmental impacts due to the construction works of this Project.

1 Introduction

1.1 The Project

This is a road improvement project in West Kowloon Reclamation Development (WKRD) for completing the developments and the commissioning of the new transport facilities.

Apart from the additional traffic impacts arising from the major development and transport facilities in WKRD, several major junctions in the area are currently operating with insufficient capacity causing serious congestion to some existing major road corridors such as Jordan Road (JRD), Ferry Street (FST) and Canton Road (CRD).

To enhance the road network of the area, Transport Department commissioned the “West Kowloon Reclamation Development Traffic Study” which identified and recommended Core and Additional Schemes together with the improvement works at the junction of CRD/FST/JRD. Implementation of these schemes would enable most of the key road junctions in the study area to operate with spare capacity, and the traffic queue length would also be reduced avoiding blockage to the upstream junctions

The Environmental Team (ET), Environmental Pioneers & Solutions Limited (EPSL), was appointed by Vibro Construction Co. Ltd. to undertake the Environmental Monitoring and Audit (EM&A) programme during construction phase of the Proposed Road Improvement Works in West Kowloon Reclamation Development – Phase 1. The project proponent is Highways Department. This is a Designated Project under the Environmental Impact Assessment Ordinance (Cap.499). The No. of Environment Permit is EP-455/2013.

The construction works and EM&A programme of this project was commenced on 6 February 2016. The construction programme and project layout plan are shown in [Appendix A](#).

1.2 Construction Programme and Activities

A summary of the major construction activities undertaken in this reporting period is shown as follows.

- Portion I – Underground Investigation Works
- Portion I – Utilities Diversion Works
- Portion I – Piling Construction Works
- Portion I – Pile Cap, Pier and Bridge Deck Construction Works
- Portion Q – Road Works
- Portion HA – Underground Investigation Works
- Portion HA – Utilities Diversion Works
- Portion HA – Piling Construction Works
- Portion HA – Pile Cap, Pier and Bridge Deck Construction Works
- Portion HA – E&M Installation and Road Works
- Portion J – Street Furniture Installation

1.3 Project Organization

The project organization chart and contact details are shown in [Appendix B](#).

1.4 Status of Environmental Licences, Notification and Permits

A summary of the relevant permits, licences, and notifications on environmental protection for this Project is presented in [Table 1.4.1](#).

Table 1.4.1 Summary of the Status of Environmental Licences, Notification and Permits

| Permit / License No. | Valid Period | | Status | Remark |
|---|--------------|------------|--------|--------------|
| | From | To | | |
| Notification pursuant to Air Pollution Control (Construction Dust) Regulation | | | | |
| Ref. No. 386894 | 23/03/2015 | N/A | Valid | / |
| Effluent Discharge License | | | | |
| WT00021818-2015 | 18/06/2015 | 30/06/2020 | Valid | Portion I |
| WT00021822-2015 | 18/06/2015 | 30/06/2020 | Valid | Portion HA |
| WT00021825-2015 | 18/06/2015 | 30/06/2020 | Valid | Portion J |
| WT00021826-2015 | 18/06/2015 | 30/06/2020 | Valid | Portion Q |
| WT00021903-2015 | 26/06/2015 | 30/06/2020 | Valid | Works area 1 |

| Waste Disposal (Charges for Disposal of Construction Waste) Regulation | | | | |
|---|------------|------------|--------|------------|
| Billing Account No.7022012 | 31/03/2015 | N/A | Valid | / |
| Registration of Chemical Waste Producer | | | | |
| WPN5213-229-V2215-01 | 01/06/2015 | N/A | Valid | / |
| Construction Noise Permit | | | | |
| GW-RE1183-15 | 04/12/2015 | 03/06/2016 | Expire | Portion HA |
| GW-RE0469-16 | 04/06/2016 | 03/12/2016 | Expire | Portion HA |
| GW-RE0330-17 | 25/04/2017 | 23/10/2017 | Expire | Portion HA |
| PP-RE0029-17 | 18/10/2017 | 16/04/2018 | Expire | Portion HA |

2 Air Quality Monitoring

2.1 Monitoring Locations

According to the EM&A Manual Section 3.5, four impact monitoring locations have been established for air quality monitoring, which are summarized in [Table 2.1.1](#).

Table 2.1.1 Air Quality Monitoring Locations

| Identification No. | Monitoring Location | Description | Parameter |
|--------------------|--|---|-----------------------|
| AM1 | Marine Department New Yau Ma Tei Public Cargo Working Area Administrative Building | Ground Floor Face to Hoi Po Road | 1-hr TSP 24-hr TSP |
| AM2 | Garden Building | Ground Floor Face to Canton Road | 1-hr TSP 24-hr TSP |
| AM3 | The Cullinan I | Ground Floor Face to Nga Cheung Road | 1-hr TSP 24-hr TSP |
| AM4 | Lai Chack Middle School | Ground Floor Face to Canton Road | 1-hr TSP 24-hr TSP |

Due to the rejection from the representatives/ property management of the premises, high volume samplers are not feasible to be installed at AM3 and AM4 for the 24-hr TSP monitoring. Alternative locations AM3-B and AM4-A are proposed accordingly. The monitoring locations are summarized in [Table 2.1.2](#). The details of monitoring location plan are shown in [Appendix C](#).

Alternative monitoring location AM4-A is adjacent to the construction site of Xiqu Centre. Power supply for AM4-A was temporarily provided by the Main Contractor of Xiqu Centre, Hip Hing Engineering Co. Ltd.. Due to the outside surface works and drainage works of Xiqu Centre, the power distribution box under Hip Hing Engineering Co. Ltd. was relocated. The power supply to AM4-A has been cut off from early August 2017. 24hr-TSP monitoring at AM4-A was ceased from August 2017. The Contractor and ET are keeping in search of another alternative location to install the HVS and the power supply for AM4-A. On the other hand, major road works (excavation and utilities diversion) are approximately to be completed in Portion Q (close to AM4-A). The Contractor will review the construction works with ET and ER to deliberate on the

possibility of suspending 24-hr TSP monitoring at AM4/AM4-A.

Table 2.1.2 Air Quality Monitoring Locations

| ID No. | Monitoring Location | Description | Coordinates | Parameter |
|---------------------|--|---|-------------------------------|-----------|
| AM1 | Marine Department New Yau Ma Tei Public Cargo Working Area Administrative Building | Ground Floor Face to Hoi Po Road | 22°18'44.8"N 114°09'37.4"E | 1-hr TSP |
| AM2 | Garden Building | Ground Floor Face to Canton Road | 22°18'12.7"N 114°10'05.7"E | 1-hr TSP |
| AM3 | The Cullinan I | Ground Floor Face to Nga Cheung Road | 22°18'22.0"N 114°09'39.3"E | 1-hr TSP |
| AM4 | Lai Chack Middle School | Ground Floor Face to Canton Road | 22°18'05.4"N 114°10'05.3"E | 1-hr TSP |
| AM1 | Marine Department New Yau Ma Tei Public Cargo Working Area Administrative Building | Rooftop Face to Hoi Po Road | 22°18'44.8"N 114°09'37.4"E | 24-hr TSP |
| AM2 | Garden Building | Ground Floor Face to Canton Road | 22°18'12.7"N 114°10'05.7"E | 24-hr TSP |
| AM3-B ^{*1} | The Cullinan II (W Hong Kong) | Ground Floor Face to The Cullinan II | 22°18'16.3"N 114°09'34.5"E | 24-hr TSP |
| AM4-A | Tsim Sha Tsui Fire Station | Ground Floor Face to Canton Road | 22°18'05.5"N 114°10'04.0"E | 24-hr TSP |

Remark:

^{*1} Monitoring station was amended from AM3-A to AM3-B from October 2016. AM3-B is located at the site boundary of Scheme I. There is no obstacle between the site (dust emission source) and monitoring point. It is more representative for monitoring the dust impact caused by the construction activities.

2.2 Monitoring Frequency

For 1-hr TSP monitoring, the sampling frequency is at least three times in every six days when the highest dust impact occurs.

For 24-hr TSP monitoring, the sampling frequency is once in every six days when the highest dust impact occurs.

Monitoring was carried out on 6, 12, 16, 22 and 28 June 2018.

2.3 Monitoring Equipment

1-hr TSP monitoring was carried out by the portable dust meters. A comparison test for the portable dust meters with the HVS was carried out to ensure the accuracy for direct reading of the portable dust meter. 24-hr TSP monitoring was carried out by the high volume samplers. The monitoring equipment is listed in [Table 2.3.1](#) and Calibration Certificates of the equipment are shown in [Appendix D](#).

Table 2.3.1 Air Quality Monitoring Equipment

| Equipment | Manufacturer & Model No. | Serial No. | Latest Calibration Date | Next Calibration Date |
|------------------------|--------------------------------|------------|-------------------------------|-----------------------------|
| Portable Dust Meter | TSI AM520 | 5201750009 | 15/12/2017 | 14/12/2018 |
| | | 5201750010 | 15/12/2017 | 14/12/2018 |
| | | 5201750011 | 15/12/2017 | 14/12/2018 |
| | | 5201750012 | 15/12/2017 | 14/12/2018 |
| High Volume Sampler | Tisch TE-5170 | 0001 | 06/06/2018 | 05/08/2018 |
| | | 0002 | 06/06/2018 | 05/08/2018 |
| | | 0003 | 06/06/2018 | 05/08/2018 |
| Calibration Kit | Tisch TE-5028A | 2137 | 01/05/2018 | 30/04/2019 |

2.4 Monitoring Methodology and Parameters

Measurements of 1-hr TSP monitoring were taken by a Dust Trak aerosol monitor or its equivalent that is a portable and battery-operated laser photometer capable of performing real time 1-hr TSP measurements.

Field monitoring procedures are as follows:

- The monitoring station was set at a point 1m from the exterior of the sensitive receivers building façade and set at a position 1.2m above the ground.
- The battery condition was checked to ensure good functioning of the dust monitor.
- Zero Cal was conducted to the dust monitor to each test for ensuring more accurate data.
- Logging setup and Instrument setup such as log interval, test length, number of test and impactor adaptor will set as follows:
 - log interval : 1min
 - test length : 60mins
 - number of test : 3
 - Impactor adaptor: 100μ
- Start the monitoring lasting 3 hours for each monitoring location
- At the end of the monitoring period, the Average, Maximum and Minimum of each TSP test shall be recorded. In addition on a standard record sheet.

Measurements of 24-hr TSP monitoring were taken by High Volume Samplers (HVSs).

HVSs fitted with appropriate sampling inlets were employed for air quality monitoring. Each sampler was composed of a motor, a filter holder, a flow controller and a sampling inlet and its performance specification complies with that required by USEPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50).

Installation of HVSs:

- A horizontal platform with appropriate support to secure the samplers against gusty wind should be provided;
- No two samplers should be placed less than 2 meters 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;

- A minimum of 2 meters of separation from walls, parapets and penthouses is required for rooftop samplers;
- A minimum of 2 meters separation from any supporting structure, measured horizontally is required;
- No furnace or incinerator flue is nearby;
- Airflow around the sampler is unrestricted;
- The sampler is more than 20 meters from the dripline;
- 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.

Data of wind speed and wind direction was extracted from King's Park Meteorological Station of Hong Kong Observatory. The collection of wind data meets the prescribed criteria in S.3.4.3 of the EM&A Manual.

Other relevant data such as monitoring location, time, weather conditions and any other special phenomena at the construction site were recorded during the measurement period.

2.5 Maintenance and Calibration

Dust Trak aerosol monitors were calibrated by the manufacturer or a HOKLAS Laboratory for every year and on-site Zero Cal before every monitoring. HVSs were calibrated after installation and re-calibrated on bi-monthly basis.

2.6 Quality Assurance / Quality Control Results and Detection Limits

The portable dust meter was calibrated annually by the manufacturer or a HOKLAS laboratory. HVSs were first been calibrated after installation and repeated on bi-monthly basis. Calibration Kit for HVSs was calibrated annually by the manufacturer or a HOKLAS laboratory. The detection limits of the HVSs meet with the prescribed standard. Calibration details and current Calibration Certificates are shown in [Appendix D](#).

2.7 Action and Limit Level for 1-hr TSP and 24-hr TSP

The Action and Limit levels for air quality impact monitoring results at all monitoring locations are summarized in [Table 2.7.1](#), which would be applied for compliance assessment of air quality for this project. If the air quality monitoring results at any monitoring stations exceeded the criteria, the actions in accordance with the Event and Action Plan in [Table 2.7.2](#) shall be taken.

Table 2.7.1 Established TSP Actions and Limit Level

| Monitoring Locations | Monitoring Parameter | Action Level ($\mu\text{g}/\text{m}^3$) | Limit Level ($\mu\text{g}/\text{m}^3$) |
|----------------------|----------------------|--|---|
| AM1 | 1-hr TSP | 288 | 500 |
| AM2 | | 299 | 500 |
| AM3 | | 299 | 500 |
| AM4 | | 303 | 500 |
| AM1 | 24-hr TSP | 157 | 260 |
| AM2 | | 183 | 260 |
| AM3-B | | 177 | 260 |
| AM4-A | | 176 | 260 |

Table 2.7.2 Event and action Plan for Air Quality

| EVENT | ACTION | | | |
|---|---|--|---|--|
| | ET | IEC | ER | CONTRACTOR |
| ACTION LEVEL | | | | |
| 1. Exceedance for one sample | 1. Inform IEC, ER and Contractor; 2. Identify source, investigate the causes of exceedance and propose remedial measures; 3. Repeat measurement to confirm finding. | 1. Check monitoring data submitted by ET; 2. Check Contractor's working method. | 1. Notify Contractor. | 1. Rectify any unacceptable practice; 2. Amend working methods if appropriate. |
| 2. Exceedance for two or more consecutive samples | 1. Inform IEC, ER and Contractor; 2. Identify source; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC, ER and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER; 8. If exceedance stops, cease additional monitoring. | 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 ET/ER on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. | 1. Submit proposals for remedial to ER and IEC within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate. |

| LIMIT LEVEL | | | | |
|--|---|--|--|--|
| 1.Exceedance for one sample | 1. Inform IEC, ER, Contractor and EPD; 2. Identify source, investigate the causes of exceedance and propose remedial measures; 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. | 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. Supervise implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. | 1. Take immediate action to avoid further exceedance; 2. Discuss with ET and IEC on remedial actions 3. Submit proposals for remedial actions to IEC within 3 working days of notification; 4. Implement the agreed proposals; 5. Amend proposal if appropriate. |
| 2.Exceedance for two or more consecutive samples | 1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and ER and Contractor 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. | 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 5. Supervise the implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to terminate that portion of work until the exceedance ceases. | 1. Take immediate action to avoid further exceedance; 2. Discuss with ET and IEC on remedial actions 3. Submit proposals for remedial actions to ER and IEC within 3 working days of notification; 4. Implement the agreed proposals; 5. Resubmit proposals if problems still not under control; 6. Stop the relevant portion of works as determined by the ER until the exceedance ceases. |

2.8 Monitoring Results and Observations

1-hr TSP monitoring was conducted at four monitoring locations. The monitoring results are summarized in [Table 2.8.1](#). 24-hr TSP monitoring was conducted at three monitoring locations. The monitoring results are summarized in [Table 2.8.2](#). Detailed impact monitoring data of 1-hr TSP, 24-hr TSP and meteorological data are shown in [Appendix E](#).

Table 2.8.1 Summary of average 1-hr TSP monitoring data

| Monitoring Locations | Average 1-hr TSP ($\mu\text{g}/\text{m}^3$) | Range 1-hr TSP ($\mu\text{g}/\text{m}^3$) | Action Level ($\mu\text{g}/\text{m}^3$) | Limit Level ($\mu\text{g}/\text{m}^3$) |
|----------------------|---|---|---|--|
| AM1 | 36 | 15 – 99 | 288 | 500 |
| AM2 | 24 | 10 – 41 | 299 | 500 |
| AM3 | 50 | 11 – 100 | 299 | 500 |
| AM4 | 57 | 38 – 95 | 303 | 500 |

Table 2.8.2 Summary of average 24-hr TSP monitoring data

| Monitoring Locations | Average 24-hr TSP ($\mu\text{g}/\text{m}^3$) | Range 24-hr TSP ($\mu\text{g}/\text{m}^3$) | Action Level ($\mu\text{g}/\text{m}^3$) | Limit Level ($\mu\text{g}/\text{m}^3$) |
|-----------------------------|--|--|---|--|
| AM1 | 49 | 31 – 83 | 157 | 260 |
| AM2 | 37 | 24 – 46 | 183 | 260 |
| AM3-B | 50 | 18 – 88 | 177 | 260 |
| AM4-A | - | - | 176 | 260 |

In accordance with the established action and limited levels for impact monitoring, there was no exceedance recorded in the reporting period.

During the monitoring period, vehicle emissions were identified as one of the dust sources for AM1, AM2, AM3, AM4 and AM3-B. TSP levels of AM2 and AM4 may be affected by the construction activities from other construction sites near Canton Road.

2.9 Monitoring Schedule for Next Reporting Month

TSP monitoring for next reporting month is scheduled on 4, 10, 16, 21 and 27 July 2018.

3 Noise Monitoring

3.1 Monitoring Locations

According to the EM&A Manual Section 4.5, five impact monitoring locations have been established for noise impact monitoring during the construction phase of the project, which are summarized in [Table 3.1.1](#). The details of monitoring location plan are shown in [Appendix C](#).

Table 3.1.1 Noise Monitoring Locations

| Identification No. | Noise Monitoring Location | Description | Measurement Type |
|--------------------|---|---|------------------|
| NM1 | Sorrento - Tower 1 ^{*1} | Podium Level ^{*1} Face to Nga Cheung Road | Façade |
| NM2 | Yau Ma Ti Catholic Primary School (Hoi Wang Road) | Ground Floor Face to Hoi Ting Road | Façade |
| NM3 | The Cullinan I | Ground Floor Face to Nga Cheung Road | Façade |
| NM4 | Lai Chack Middle School | Ground Floor Face to Canton Road | Façade |
| NM5 | Yue Tak Building | Ground Floor Face to Jordan Road | Façade |

Remark:

^{*1} According to EPD's comment and requirement for EM&A Report (February 2016) on 7 April 2016, noise measurement at NM1 was relocated from the ground level (roadside) of Nga Cheung Road to podium level of the Sorrenti Tower 1 starting from June 2016.

3.2 Monitoring Frequency

The regular monitoring for each location was performed on a weekly basis.

Monitoring was carried out on 6, 12, 16, 22 and 28 June 2018.

3.3 Monitoring Equipment

Noise monitoring was conducted by using BSWA 806 / SVANTEK 971 which complied with the International Electrotechnical Commission Publications 61672:2002 (Type 1),

60651:1979 (Type 1) and 60804:1985 (Type 1) Specifications as referred to the Technical Memorandum to the Noise Control Ordinance. The equipment was calibrated and verified by certified laboratory to ensure they can perform to the same level of accuracy as stated in the manufacturer's specification. Before and after the baseline measurement, the reading of sound level meter was checked with the acoustic calibrator and the measurements were accepted as valid if the calibration levels before and after the noise measurement agreed to within 1.0 dB. The measurement equipment is listed in [Table 3.3.1](#) and Calibration Certificates of the equipment are shown in [Appendix D](#).

Table 3.3.1 Equipment List for Noise Monitoring

| Equipment | Manufacturer & Model No. | Precision Grade | Serial No. | Latest Calibration Date | Next Calibration Date |
|-----------------------|--------------------------|-----------------|------------|-------------------------|-----------------------|
| Sound level meter | SVANTEK 971 | IEC61672 Type 1 | 61421 | 28/09/2017 | 27/09/2018 |
| | SVANTEK 971 | IEC61672 Type 1 | 56272 | 11/12/2017 | 10/12/2018 |
| Acoustical calibrator | SVANTEK ST-120 | IEC 942 Type 1 | 150305805 | 19/11/2017 | 18/11/2018 |
| | SVANTEK SV30A | IEC 942 Type 1 | 7908 | 09/12/2017 | 08/12/2018 |

3.4 Monitoring Methodology and Parameters

The construction noise level was measured in terms of the A-weighted equivalent continuous sound pressure level, L_{Aeq} . L_{Aeq} (30minutes) was used as the monitoring parameter for the impact monitoring in the time period between 0700 to 1900 hours on normal weekdays.

In case of non-compliance with the construction noise criteria, more frequent monitoring, as specified in the Action plan in Table 3.6.2, shall be carried out. This additional monitoring shall be carried out until the recorded noise levels are rectified or proved to be irrelevant to the construction activities.

Field monitoring procedures are as follows:

- The monitoring station was set at a point 1m from the exterior of the sensitive receivers building façade and set at a position 1.2m above the ground.
- The battery condition was checked to ensure good functioning of the meter.

- Parameters such as frequency weighting, the time weighting and the measurement time will set as follows:
 - frequency weighting : A
 - time weighting : Fast
- Prior to and after noise measurement, the meter shall be calibrated using the calibrator for 94.0 dB at 1000 Hz. If the difference in the calibration level before and after measurement is more than 1.0 dB, the measurement will be considered invalid and repeat of noise measurement is required after re-calibration or repair of the equipment.
- The wind speed at the monitoring station shall be checked with the portable wind meter.
- Noise monitoring should be cancelled in the presence of fog, rain, and wind with a steady speed exceeding 5 m/s, or wind with gusts exceeding 10 m/s. Noise measurement should be paused during periods of high intrusive noise if possible and observation shall be recorded when intrusive noise is not avoided.
- At the end of the monitoring period, the L_{eq} , L_{10} and L_{90} shall be recorded. In addition, site conditions and noise sources should be recorded on a standard record sheet.

3.5 Maintenance and Calibration

Monitoring equipment was calibrated by the HOKLAS Laboratory for every year and on-site calibrated before and after every monitoring.

3.6 Quality Assurance / Quality Control Results and Detection Limits

The sound level meter and calibrator were calibrated annually by the HOKLAS laboratory. The detection limits of the sound level meter meet with the prescribed standard. Calibration details and current Calibration Certificates are shown in [Appendix D](#).

3.7 Action and Limit Level for Construction Noise

The Action and Limit levels for construction noise are defined in [Table 3.7.1](#). Should exceedance of the criteria occur, action in accordance with the Action Plan in [Table 3.7.2](#) shall be carried out.

Table 3.7.1 Action and Limit Levels for Construction Noise at all Sensitive Receivers

| Monitoring Locations | Building Type | Time Period | Action Level | Limit Level |
|----------------------|---------------|---|--|---------------------|
| NM1 | Residential | Daytime 0700 – 1900 hrs on normal weekdays | When one documented complaint is received | 75 dB(A) |
| NM2 | Education | | | 70 dB(A) / 65dB(A)* |
| NM3 | Residential | | | 75 dB(A) |
| NM4 | Education | | | 70 dB(A) / 65dB(A)* |
| NM5 | Residential | | | 75 dB(A) |

*Remark: 70dB(A) and 65dB(A) for schools during normal teaching periods and school examination periods, respectively.

Table 3.7.2 Event / Action Plan for Construction Noise

| EVENT | ACTION | | | |
|--------------|--|--|---|--|
| | ET | IEC | ER | CONTRACTOR |
| Action Level | 1. Notify IEC, ER and Contractor of exceedance; 2. Identify source 3. Investigate the causes of exceedance and propose remedial measures; 4. Report the results of investigation to the IEC, ER and Contractor; 5. Discuss with the IEC, ER and Contractor and formulate remedial measures; 6. Increase monitoring frequency to check mitigation effectiveness. | 1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented | 1. Submit noise mitigation proposals to ER with copy to ET and IEC; 2. Implement noise mitigation proposals. |
| Limit Level | 1. Inform IEC, ER, EPD and Contractor; 2. Identify source; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of 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 and ER informed of the results; 8. If exceedance stops, cease additional monitoring. | 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 ER accordingly; 3. Supervise the implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented; 5. If exceedance continues, investigate what portion of the work is responsible and instruct the Contractor to terminate that portion of work until the exceedance ceases. | 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to ER with copy to ET and IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Terminate the relevant portion of works as determined by the ER until the exceedance ceases. |

3.8 Monitoring Results and Observations

Noise impact monitoring was conducted at five monitoring locations. The monitoring results are summarized in [Table 3.8.1](#). Detailed impact monitoring data of noise are shown in [Appendix F1](#).

Table 3.8.1 Summary of average noise monitoring data

| Monitoring Locations | Monitoring Date | Baseline Level (dB(A)) | L _{Aeq} ^{*1} (dB(A)) | Re-M ^{*2} L _{Aeq} (dB(A)) | Action Level (dB(A)) | Limit Level (dB(A)) |
|----------------------|-----------------|------------------------|--|---|---|------------------------|
| NM1 | 6/6/2018 | 75.1 | 63.7 | N/A | When one documented complaint is received | 75 dB(A) |
| | 12/6/2018 | | 62.8 | N/A | | |
| | 16/6/2018 | | 60.3 | N/A | | |
| | 22/6/2018 | | 61.6 | N/A | | |
| | 28/6/2018 | | 61.8 | N/A | | |
| NM2 | 6/6/2018 | 66.5 | 66.8 | N/A | When one documented complaint is received | 70 dB(A) ^{*3} |
| | 12/6/2018 | | 64.3 | N/A | | 65 dB(A) ^{*4} |
| | 16/6/2018 | | 64.7 | N/A | | 70 dB(A) ^{*3} |
| | 22/6/2018 | | 65.2 | N/A | | 70 dB(A) ^{*3} |
| | 28/6/2018 | | 63.3 | N/A | | 70 dB(A) ^{*3} |
| NM3 | 6/6/2018 | 74.5 | 74.1 | N/A | When one documented complaint is received | 75 dB(A) |
| | 12/6/2018 | | 74.2 | N/A | | |
| | 16/6/2018 | | 73.6 | N/A | | |
| | 22/6/2018 | | 74.2 | N/A | | |
| | 28/6/2018 | | 73.7 | N/A | | |
| NM4 | 6/6/2018 | 73.3 | 74.8 | 73.9 | When one documented complaint is received | 65 dB(A) ^{*4} |
| | 12/6/2018 | | 74.1 | 74.6 | | 65 dB(A) ^{*4} |
| | 16/6/2018 | | 74.4 | 74.8 | | 70 dB(A) ^{*3} |
| | 22/6/2018 | | 74.1 | 74.4 | | 70 dB(A) ^{*3} |
| | 28/6/2018 | | 73.1 | 72.5 | | 70 dB(A) ^{*3} |
| NM5 | 6/6/2018 | 71.8 | 73.1 | N/A | When one documented complaint is received | 75 dB(A) |
| | 12/6/2018 | | 72.1 | N/A | | |
| | 16/6/2018 | | 72.7 | N/A | | |
| | 22/6/2018 | | 73.2 | N/A | | |
| | 28/6/2018 | | 74.1 | N/A | | |

Remark:

^{*1} Measured result would be rounded down before comparison with the limit level

^{*2} Repeat noise measurement when exceedance is recorded

^{*3} 70dB(A) for schools during normal teaching periods. School schedule is shown in [Appendix F2](#)

^{*4} 65dB(A) for schools examination periods. School schedule is shown in [Appendix F2](#)

In accordance with the established action and limited levels for impact monitoring, five exceedances were recorded NM4 on 6, 12, 16, 22 and 28 June 2018. Noise measurement was repeated for confirming the findings and identifying the noise source for each exceedance according to the event and action plan.

The noise source for causing exceedances at NM4 was from the traffic of Canton Road. The NM4 was directly affected by the noise generated from the traffic. The recorded monitoring results at the NM4 were near the baseline noise level. The exceedances were not caused by the construction works of this project.

During the monitoring period, traffic noise was identified as one of the noise source for NM2, NM3, NM4 and NM5. Noise levels of NM3 may be influenced by the construction activities from other construction sites near Nga Cheung Road. Noise level of NM2 may be influenced by construction activities from other construction sites near Hoi Ting Road. Noise levels of NM4 and NM5 may be influenced by the construction activities from other construction sites near Canton Road.

3.9 Monitoring Schedule for Next Reporting Month

Noise monitoring for next reporting month is scheduled on 4, 10, 16, 21 and 27 July 2018.

4 Solid and Liquid Waste Management Status

With reference to relevant handling records and trip tickets of this Project, the quantities of different types of waste generated in the reporting month are summarised in [Table 4.1](#). During this reporting month, inert C&D materials and general refuse were generated and disposed. No mixed waste was generated. No chemical waste was generated and collected by licensed collector. No paper, plastic and metal was recycled. Detail of waste management data is presented in [Appendix G](#).

Table 4.1 Quantities of Waste Disposed from the Project

| Reporting Month | Quantity | | | | | | |
|---|--------------------------------------|--|-------------|----------------|--------------------|-------------|-------------|
| | C&D Materials (inert) ^(a) | C&D Materials (non-inert) ^(b) | | | | | |
| | | General Refuse | Mixed Waste | Chemical Waste | Recycled materials | | |
| | | | | | Paper/ cardboard | Plastics | Metals |
| | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) |
| June 2018 | 2833.19 | 20.63 | 0 | 0 | 0 | 0 | 0 |
| Notes: | | | | | | | |
| (a) Inert C&D materials include bricks, concrete, building debris, rubble and excavated soil. | | | | | | | |
| (b) Non-inert C&D materials include steel, paper/cardboard packaging waste, plastics and other wastes such as general refuse and vegetative wastes. Steel metal generated from the Project are grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials. | | | | | | | |

Waste materials were generated during this reporting period, such as excavated waste, demolition waste and general refuse. Contractor handled, stored and disposed in accordance with good waste management practice and EPD's regulation and requirements.

5 Landscape and Visual Impact

In accordance with the EM&A Manual, the landscape and visual mitigation measures shall be implemented to minimize the landscape and visual impacts during the construction works. The proposed monitoring program for landscape and visual impact is detailed in [Table 5.1](#).

Table 5.1 Proposed Monitoring Program

| Stage | Monitoring Task | Frequency | Report | Approval |
|--------------------|------------------------------------|-----------|--|--|
| Construction stage | Mitigation measures implementation | Bi-weekly | Landscape and Visual Impact Assessment Checklist | Registered Landscape Architect & ET Leader |

Bi-weekly site inspections were conducted by representatives of the Engineer, Contractor and ET on 1, 15 and 29 June 2018. The observations, reminders and recommendations made during the site inspections are summarized in Section 6, [Table 6.1](#).

The implementation status of the proposed mitigation measures for landscape and visual impacts is given in [Appendix H](#). Should non-conformity on one occur, action in accordance with the Action Plan in [Table 5.2](#) shall be carried out.

Table 5.2 Event / Action Plan for Landsscape and Visual Impact

| EVENT | ACTION | | | |
|--------------------------------|--|---|--|---|
| | ET | IEC | ER | CONTRACTOR |
| Non-conformity on one occasion | 1. Identify Source 2. Inform IEC and ER 3. Discuss remedial actions with IEC, ER and Contractor 4. Monitor remedial actions until rectification has been completed | 1. Check report 2. Check Contractor's working method 3. Discuss with ET and Contractor on possible remedial measures 4. Advise ER on effectiveness of proposed remedial measures. 5. Check implementation of remedial measures. | 1. Notify Contractor 2. Ensure remedial measures are properly implemented | 1. Amend working methods 2. Rectify damage and undertake any necessary replacement |
| Repeated Non-conformity | 1. Identify Source 2. Inform IEC and ER 3. Increase monitoring frequency 4. Discuss remedial actions with IEC, ER and Contractor 5. Monitor remedial actions until rectification has been completed 6. If non-conformity stops, cease additional monitoring | 1. Check monitoring report 2. Check Contractor's working method 3. Discuss with ET and Contractor on possible remedial measures 4. Advise ER on effectiveness of proposed remedial measures 5. Supervise implementation of remedial measures. | 1. Notify Contractor 2. Ensure remedial measures are properly implemented | 1. Amend working methods 2. Rectify damage and undertake any necessary replacement |

6 Environmental Site Inspection

6.1 Site Audit

Site audit was carried out by ET on weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site.

Joint weekly inspections were conducted by representatives of the Contract Administrator, Engineer, Contractor and ET on 6, 13, 20 and 27 June 2018. The representative of the IEC conducted the site inspection on 20 June 2018. Observations were recorded and summarized in Table 6.1.

During site inspection in the reporting month, no non-compliance was identified.

6.2 Implementation Status of Environmental Mitigation Measures

According to the EM&A Manual of the Project, the mitigation measures detailed in the documents shall be implemented during the construction phase. Updated status summary of the Environmental Mitigation Implementation Schedule is provided in [Appendix H](#).

The observations, reminders and recommendations made during the audit sessions are summarized in [Table 6.1](#).

Table 6.1 Summary results of site inspections findings.

| Date | Findings | Identification | Advice from ET | Action taken | Closing date |
|---|--|----------------|--|---|--------------|
| 30 May 18 | Construction materials were not properly stored. | Observation | Contractor was advised to store the construction materials in designated storage areas. | Unused construction materials were removed. | 6 Jun 18 |
| 6 Jun 18 | C&D waste was observed. | Observation | Contractor was advised to properly collect and dispose the C&D waste. | C&D waste was collected and disposed. | 13 Jun 18 |
| 13 Jun 18 | C&D waste/ debris were observed. | Observation | Contractor was advised to properly collect and dispose the C&D waste. | C&D waste/ debris were collected and disposed. | 20 Jun 18 |
| 13 Jun 18 | General refuse and non-inert C&D waste were not properly stored. | Observation | Contractor was advised to sort out the waste and maintain proper storage. | General refuse was frequently removed and different containers were provided for waste storage. | 20 Jun 18 |
| 20 Jun 18 | Stockpile of dusty materials were not covered. | Observation | Contractor was advised to properly cover the dusty materials by using the tarpaulin. | Stockpile of dusty materials were properly covered. | 27 Jun 18 |
| 20 Jun 18 | Exposed surface was dry and dusty. | Observation | Contractor was advised to frequently implement water spraying. | Water spraying was implemented for keeping the exposed surface wet. | 27 Jun 18 |
| 20 Jun 18 | The channels and manholes were not properly protected. | Observation | Contractor was advised to cover and protect the manholes and regularly clean up the site drainage system. | Site drainage channels was clean up and maintained and the manholes were covered and protected. | 27 Jun 18 |
| 20 Jun 18 | Different types of waste were generated in the construction site. | Reminder | Contractor was reminded to place recycling facilities at prominent locations. | More waste containers were provided. | 27 Jun 18 |
| 20 Jun 18 | Stagnant water was caused at the rain weather. | Reminder | Contractor was reminded to remove the stagnant water. | Stagnant water was removed. | 27 Jun 18 |
| 27 Jun 18 | Stockpile of construction materials were not properly stored. | Observation | Contractor was advised to allocate the construction materials in designated storage area. | The follow-up status will be reported in the next reporting period. | N/A |
| 27 Jun 18 | Stagnant water was observed in the wastewater water collection tank. | Observation | Contractor was advised to regularly pump and direct the collected water to the wastewater treatment plant. | The follow-up status will be reported in the next reporting period. | N/A |
| Landscape and Visual Impact | | | | | |
| 2 Jun 17 16 Jun 17 30 Jun 17 14 Jul 17 28 Jul 17 11 Aug 17 25 Aug 17 8 Sep 17 22 Sep 17 | Tree crown of T11(T), T12(T) and T17(T) were tied. | Observation | Contractor was advised to remove the ties. | The ties were removed. | 1 Jun 18 |

| Date | Findings | Identification | Advice from ET | Action taken | Closing date |
|--|---|----------------|---|---|--------------|
| 6 Oct 17 20 Oct 17 3 Nov 17 17 Nov 17 28 Nov 17 15 Dec 17 29 Dec 17 12 Jan 18 26 Jan 18 9 Feb 18 23 Feb 18 9 Mar 18 23 Mar 18 6 Apr 18 19 Apr 18 4 May 18 18 May 18 | | | | | |
| 3 Nov 17 17 Nov 17 28 Nov 17 15 Dec 17 29 Dec 17 12 Jan 18 26 Jan 18 9 Feb 18 23 Feb 18 9 Mar 18 23 Mar 18 6 Apr 18 19 Apr 18 4 May 18 18 May 18 1 Jun 18 15 Jun 18 29 Jun 18 | Construction materials were piled within the TPZ. | Observation | Contractor was reminded to relocate the construction materials which were piled within the TPZ | The follow-up status will be reported in the next reporting period. | N/A |
| 1 Jun 18 15 Jun 18 29 Jun 18 | Construction works were started within Scheme J, Scheme HA and Scheme Q. | Reminder | Contractor was reminded to provide TPZ with robust fence at the dripline of all retained trees in order to avoid damage to the trees and their root zones. No works were allowed to undertake within the TPZ. | N/A | N/A |
| 1 Jun 18 15 Jun 18 29 Jun 18 | WKI421(R), WKI423(R), WKI424(R) and WKI425(R) with construction undergoing nearby by other parties. | Reminder | Contractor should remind Cheung Hing to provide robust TPZ for the trees and to avoid damaging the root zone under the dripline. | N/A | N/A |
| 29 Jun 18 | Broken branch was found on WKI424(R). | Reminder | Contractor should remind Cheung Hing to fence off the surrounding area and remove the broken branch for the sake of public and workers' safety. | N/A | N/A |

7 Environmental Non-Conformance

7.1 Summary of Environmental Exceedances

No exceedance of action level and limit level was recorded for TSP. Five exceedances were recorded at NM4 on 6, 12, 16, 22 and 28 June 2018 for Noise.

7.2 Summary of Environmental Non-Compliance

No environmental non-compliance was recorded in the reporting month.

7.3 Summary of Environmental Complaint

One environmental project-related complaint was received in late May 2018.

EPD received a complaint from Miss Wu of Grand Austin MO about heavy traffic and traffic congestion at Canton Road caused noise nuisance to residents of Grand Austin. Letter from EPD by email was received on 23 May 2018.

ET had conducted an investigation with the representatives of the Project Proponent, RE, IEC and the Contractor on 28 May 2018 to review the findings and resolve the concern. Based on the investigation results and the requirements of EIA Report, Environmental Permit and EM&A Manual, the complaint from Miss Wu should not be caused by this Project. The Complaint Investigation Report has been submitted to EPD by the ET on 5 June 2018. The details of the investigation report and complaint log are shown in **Appendix I**.

7.4 Summary of Notification of Summons and Successful Prosecution

There was no successful environmental prosecution or notification of summons received since the Project commencement.

The cumulative log for environmental exceedance, non-compliance, complaint and summon and successful prosecution since the commencement of the Project is presented in [Appendix I](#).

8 Future Key Issues

The major construction activities in the coming month will include:

- Portion I – Underground Investigation Works
- Portion I – Utilities Diversion Works
- Portion I – Piling Construction Works
- Portion I – Pile Cap, Pier and Bridge Deck Construction Works
- Portion Q – Road Works
- Portion HA – Underground Investigation Works
- Portion HA – Utilities Diversion Works
- Portion HA – Piling Construction Works
- Portion HA – Pile Cap, Pier and Bridge Deck Construction Works
- Portion HA – E&M Installation and Road Works
- Portion J – Street Furniture Installation

Potential environmental impacts arising from the above construction activities are mainly associated with dust, construction noise, water quality and waste management. The Contractor has been reminded to properly implement dust, construction noise and water quality control measures as well as proper waste management in order to minimize the potential environmental impacts due to the construction works of this Project.

9 Comment, Recommendations and Conclusions

9.1 Comment

The recommended mitigation measures accordance with the EM&A Manual had been effectively implemented to minimize the environmental impacts due to the construction. The contractor had implemented the mitigation measures to control the dust and noise impacts. No dust and noise impacts obviously affected to the environment and sensitive receivers. The follow up actions were not quickly implemented for environmental observations made during the site inspections. The environmental performance during the reporting period was considered satisfactory.

9.2 Recommendations

According to the environmental audit performed in the reporting month, the following recommendation was made:

Water / Wastewater

- To cover and protect the manholes and regularly clean up the site drainage system.
- To remove the stagnant water.
- To regularly pump and direct the collected water to the wastewater treatment plant.

Air Quality

- To properly cover the dusty materials by using the tarpaulin.
- To frequently implement water spraying.

Chemicals / Chemical waste

- N/A

Waste Management / Materials Storage / Others

- To properly collect and dispose the C&D waste.
- To sort out the waste and maintain proper storage.
- To place recycling facilities at prominent locations.
- To allocate the construction materials in designated storage area.

Visual and Landscape Impact

- To relocate the construction materials which were piled within the TPZ.
- To provide TPZ with robust fence at the dripline of all retained trees in order to avoid damage to the trees and their root zones. No works were allowed to undertake within the TPZ.
- To provide robust TPZ for the trees and to avoid damaging the root zone under the dripline.
- To fence off the surrounding area and remove the broken branch for the sake of public and workers' safety.

9.3 Conclusions

This is the monthly Environmental Monitoring and Audit (EM&A) Report presenting the EM&A works undertaken from 1 June 2018 to 30 June 2018 in accordance with the EM&A Manual.

No exceedance of action level and limit level was recorded for TSP. Five exceedances were recorded at NM4 on 6, 12, 16, 22 and 28 June 2018 for Noise. No Non-compliance event, notification of summons and successful prosecution against the Project were received in this reporting month.

One environmental project-related complaint was received in the reporting period. EPD received a complaint from Miss Wu of Grand Austin MO about heavy traffic and traffic congestion at Canton Road caused noise nuisance to residents of Grand Austin. Letter from EPD by email was received on 23 May 2018. ET had conducted an investigation with the representatives of the Project Proponent, RE, IEC and the Contractor on 28 May 2018 to review the findings and resolve the concern. Based on the investigation results and the requirements of EIA Report, Environmental Permit and EM&A Manual, the complaint from Miss Wu should not be caused by this Project. The Complaint Investigation Report has been submitted to EPD by the ET on 5 June 2018. The details of the investigation report and complaint log are shown in **Appendix I**.

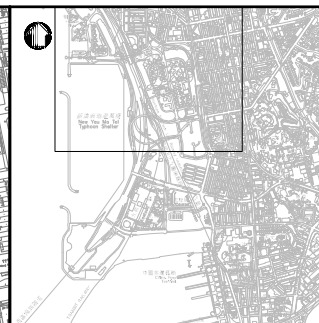
4 nos. of environmental site inspections and 3 nos. of landscape and visual inspections were carried out in this reporting month. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.

ET has reminded the contractor to provided environmental pollution control measures, waste management measures and good site practice.

ET will keep tracking of the EM&A programme to ensure compliance of environmental requirements and the proper implementation of all the necessary mitigation measures.

Appendix A: Construction Programme and Project Layout Plan

| ID | Task Name | Duration | Start | Finish | 2015 | | | | 2016 | | | | 2017 | | | | 2018 | | | |
|----|---|----------|--------------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | | | | Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 | Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 | Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 | Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 |
| 1 | Road Improvement Works in West Kowloon Reclamation Development | 1650 d | Mon 23/3/15 | Fri 27/9/19 | | | | | | | | | | | | | | | | |
| 2 | West Kowloon Highway South Bound near Western Harbour Tunnel at Portion I | 1650 d | Mon 23/3/15 | Fri 27/9/19 | | | | | | | | | | | | | | | | |
| 3 | Site Clearance, set TTA | 250 d | Mon 23/3/15 | Fri 27/11/15 | | | | | | | | | | | | | | | | |
| 4 | Underground investigation, utilities diversion and piling construction | 950 d | Sat 28/11/15 | Wed 4/7/18 | | | | | | | | | | | | | | | | |
| 5 | Pile cap, Pier and Bridge Deck construction | 600 d | Sun 17/12/17 | Thu 8/8/19 | | | | | | | | | | | | | | | | |
| 6 | E&M installation and roadworks | 350 d | Fri 24/8/18 | Thu 8/8/19 | | | | | | | | | | | | | | | | |
| 7 | Road Pavement,Street furniture installation | 250 d | Mon 21/1/19 | Fri 27/9/19 | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | |
| 9 | Canton road at Portion Q | 1250 d | Mon 23/3/15 | Thu 23/8/18 | | | | | | | | | | | | | | | | |
| 10 | Site Clearance, tree felling, TTA application | 320 d | Mon 23/3/15 | Fri 5/2/16 | | | | | | | | | | | | | | | | |
| 11 | Road works at Canton road footpath and utilities diversion | 500 d | Sat 6/2/16 | Mon 19/6/17 | | | | | | | | | | | | | | | | |
| 12 | Construction of sign gantry | 150 d | Tue 20/6/17 | Thu 16/11/17 | | | | | | | | | | | | | | | | |
| 13 | Road works at Ferry Street and Jordan road | 500 d | Mon 16/5/16 | Wed 27/9/17 | | | | | | | | | | | | | | | | |
| 14 | Road works at Wui Cheung road | 450 d | Thu 4/8/16 | Fri 27/10/17 | | | | | | | | | | | | | | | | |
| 15 | Road Works at Austin Road junction | 400 d | Thu 20/7/17 | Thu 23/8/18 | | | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | | | | | | | |
| 17 | Lin Cheung Road North Bound at Portion HA | 1620 d | Mon 23/3/15 | Wed 28/8/19 | | | | | | | | | | | | | | | | |
| 18 | Site Clearance, tree felling | 320 d | Mon 23/3/15 | Fri 5/2/16 | | | | | | | | | | | | | | | | |
| 19 | Underground investigation, utilities diversion and piling construction | 900 d | Sat 6/2/16 | Tue 24/7/18 | | | | | | | | | | | | | | | | |
| 20 | Pile cap, Pier and Bridge Deck construction | 700 d | Tue 20/6/17 | Mon 20/5/19 | | | | | | | | | | | | | | | | |
| 21 | E&M installation and roadworks | 300 d | Sat 6/1/18 | Thu 1/11/18 | | | | | | | | | | | | | | | | |
| 22 | Road Pavement, Street furniture installation | 300 d | Fri 2/11/18 | Wed 28/8/19 | | | | | | | | | | | | | | | | |
| 23 | | | | | | | | | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | | | | | | | | | |
| 25 | Lin Cheung Road South Bound at Portion J | 1240 d | Mon 23/3/15 | Mon 13/8/18 | | | | | | | | | | | | | | | | |
| 26 | Site Clearance, tree felling | 320 d | Mon 23/3/15 | Fri 5/2/16 | | | | | | | | | | | | | | | | |
| 27 | Construction of retaining walls and utilities diversion | 650 d | Sat 6/2/16 | Thu 16/11/17 | | | | | | | | | | | | | | | | |
| 28 | Site formation and roadworks | 150 d | Fri 17/11/17 | Sun 15/4/18 | | | | | | | | | | | | | | | | |
| 29 | Street furniture installation | 120 d | Mon 16/4/18 | Mon 13/8/18 | | | | | | | | | | | | | | | | |



LOCATION PLAN

LEGEND:

- AM1/NM1
(AIR MONITORING STATION/NOISE MONITORING STATION)
- WORKS BOUNDARY

| Rev | Description | By | Date |
|-----|-------------|----|------|
| | | | |
| | | | |

Consultant
**PARSONS
BRINCKERHOFF**

漢
綠 **CINOTECH**

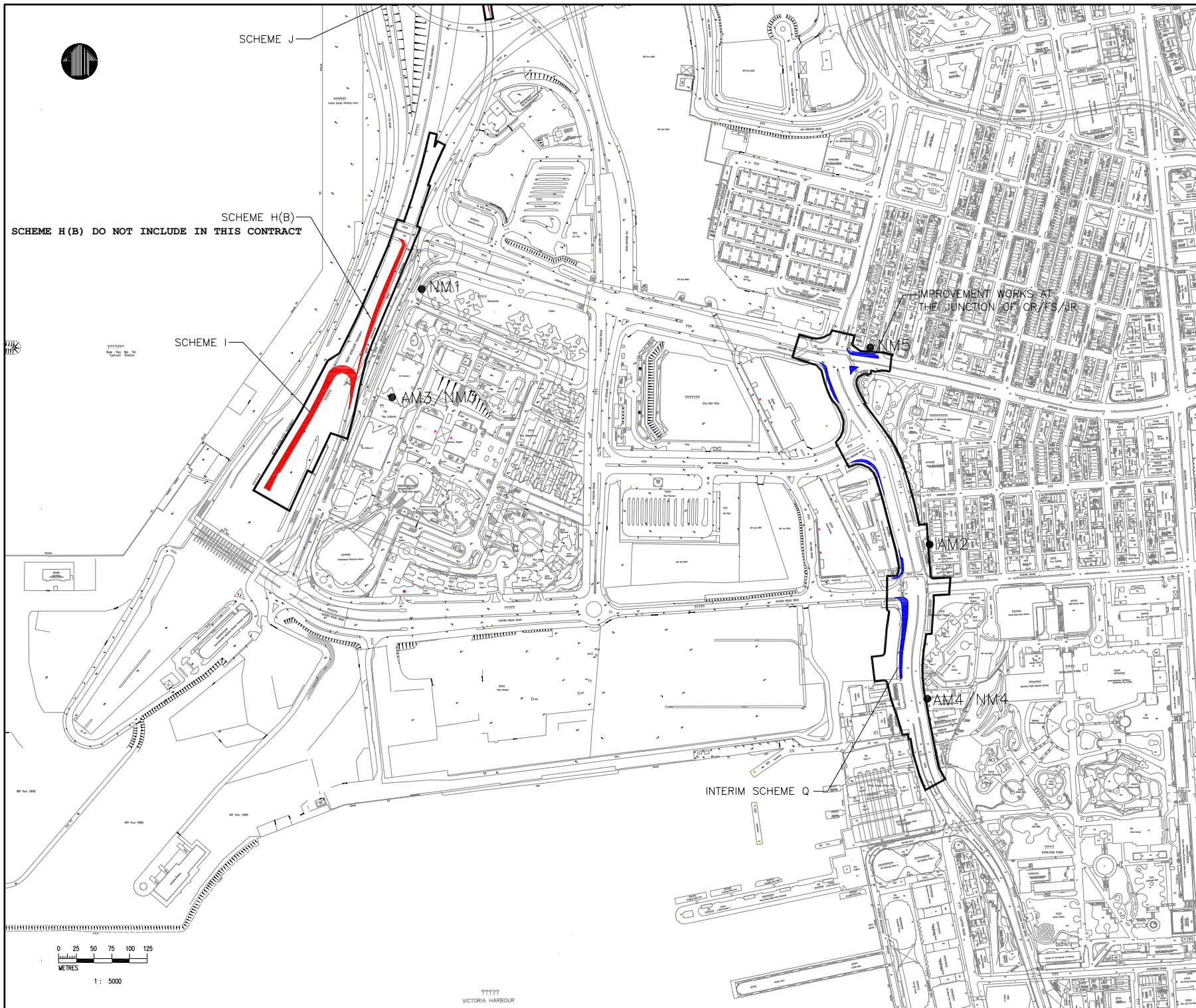
Project title
AGREEMENT NO. CE 44/2011 (HY)
PROPOSED ROAD IMPROVEMENT WORKS IN
WEST KOWLOON RECLAMATION DEVELOPMENT
- PHASE 1 INVESTIGATION,
DESIGN AND CONSTRUCTION

Drawing title
**LOCATION OF MONITORING
STATIONS (PAGE 1 OF 2)**

| | | | | | |
|-------------|----------------|--------|-------------|----------|----|
| Drawing no. | CE44/T/ST/EM03 | | | Rev. | 2 |
| Drawn | MC | Date | AUG13 | Checked | KS |
| Scale | A3 1:5000 | Status | PRELIMINARY | Approved | LC |

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 路政署
HIGHWAYS DEPARTMENT
主要工程管理部
MAJOR WORKS PROJECT MANAGEMENT OFFICE



LOCATION PLAN

LEGEND:

- AM1/NM1
(AIR MONITORING STATION/NOISE MONITORING STATION)
- WORKS BOUNDARY

| Rev | Description | By | Date |
|-----|-------------|----|------|
| | | | |

Consultant

**PARSONS
BRINCKERHOFF**

漢
臻 **CINOTECH**

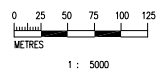
Project title
AGREEMENT NO. CE 44/2011 (HY)
PROPOSED ROAD IMPROVEMENT WORKS IN
WEST KOWLOON RECLAMATION DEVELOPMENT
— PHASE 1 INVESTIGATION,
DESIGN AND CONSTRUCTION

Drawing title
**LOCATION OF MONITORING
STATIONS (PAGE 2 OF 2)**

| | | | | | |
|-------------|----------------|--------|-------------|---------|----|
| Drawing no. | CE44/T/ST/EM04 | | | Rev. | 2 |
| Drawn | MC | Date | AUG13 | Checked | KS |
| Scale | A3 1:5000 | Status | PRELIMINARY | | |

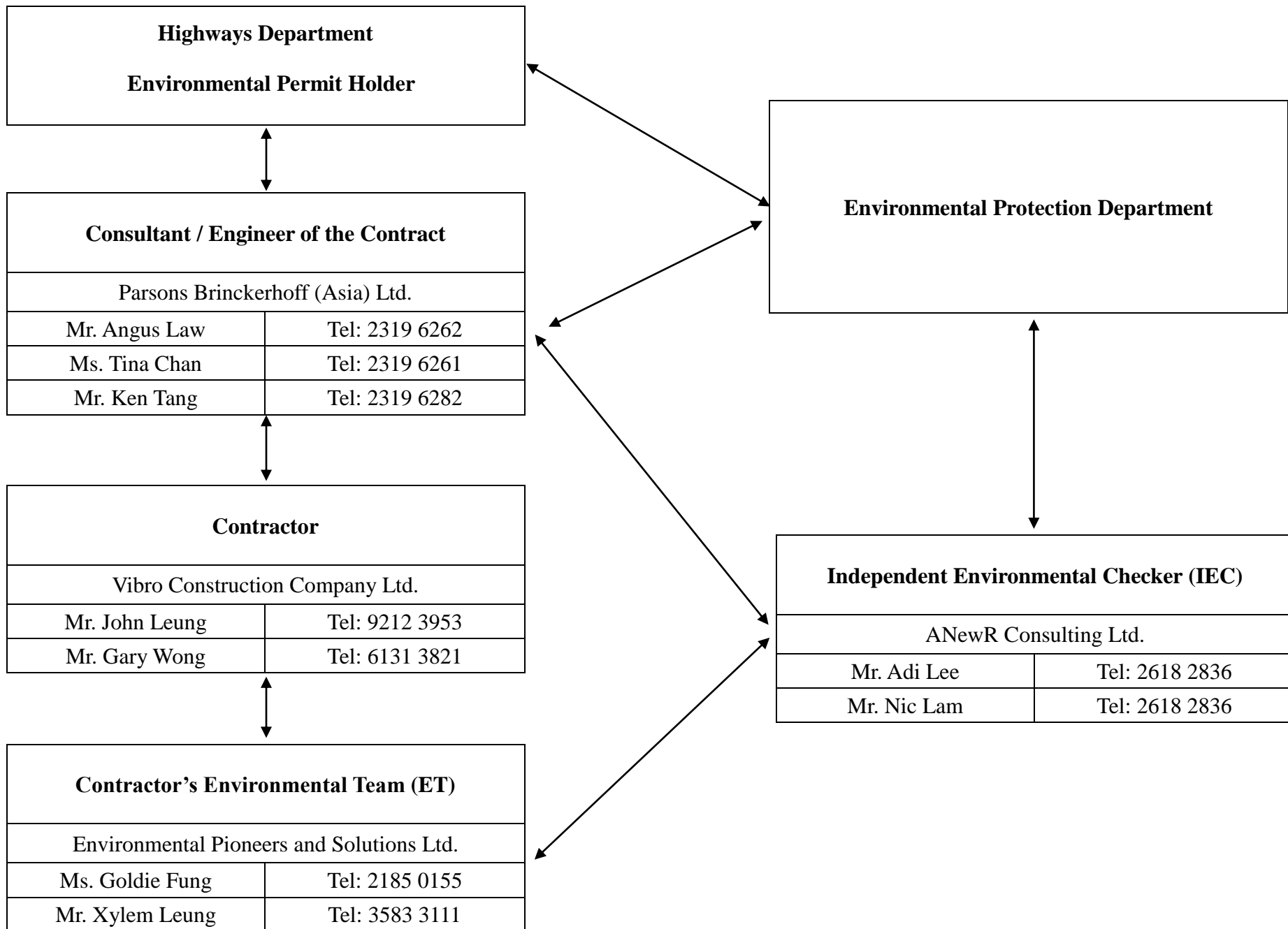
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VICTORIA HARBOUR

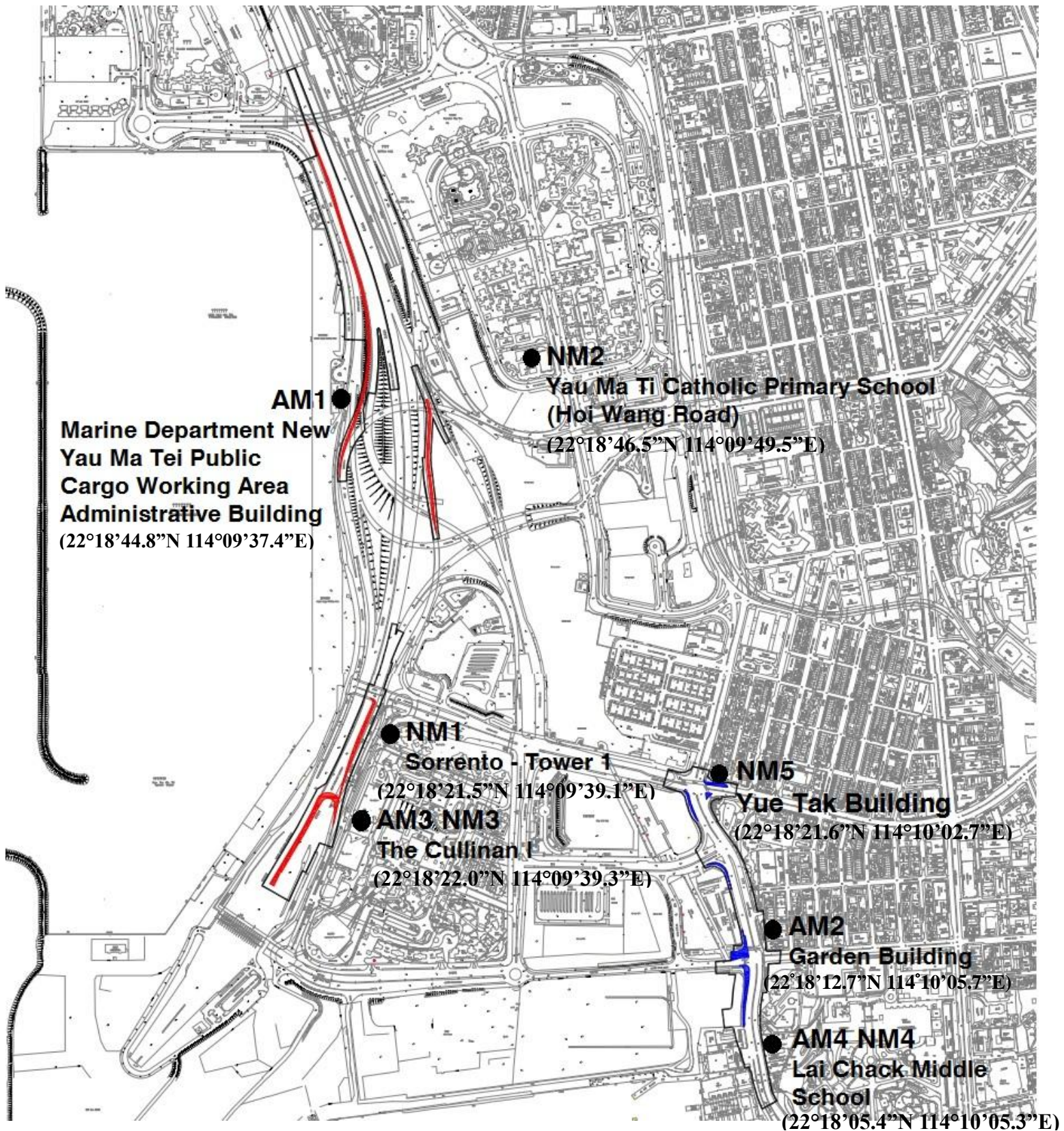
Appendix B: Project Organization Chart












↔ Line of communication

Appendix C: Monitoring Locations

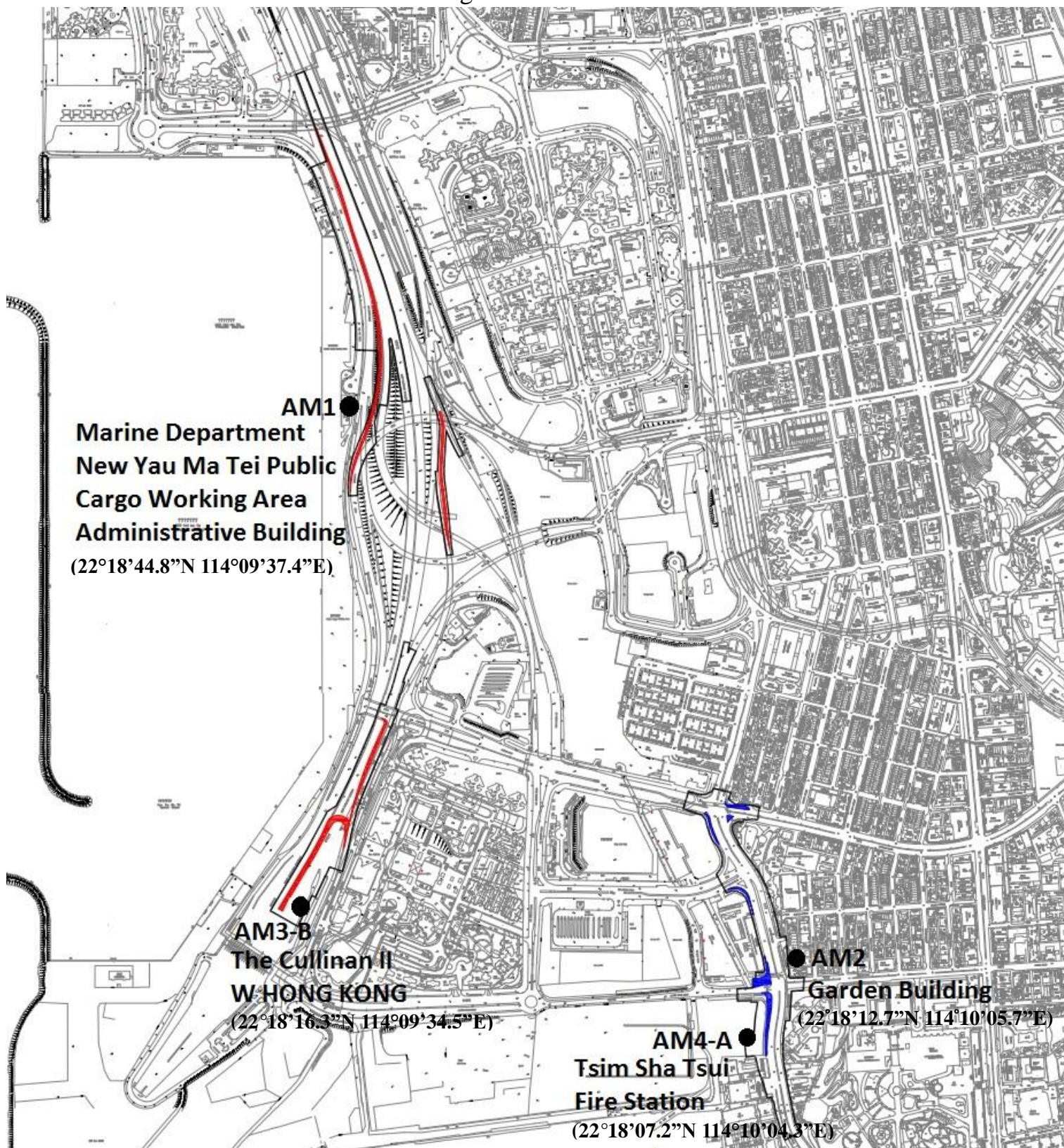
Locations for 1-hr TSP and Noise monitoring



| Monitoring Location | Photo Record |
|--|--|
| <p>AM1</p> <p>Marine Department New Yau Ma Tei Public Cargo Working Area Administrative Building</p> |  |
| <p>AM2</p> <p>Garden Building</p> |  |
| <p>AM3</p> <p>The Cullinan I</p> |  |
| <p>AM4</p> <p>Lai Chack Middle School</p> |  |

| Monitoring Location | Photo Record |
|--|--|
| <p>NM1</p> <p>Sorrento - Tower 1</p> |  |
| <p>NM2</p> <p>Yau Ma Tei Catholic Primary School (Hoi Wang Road)</p> |  |
| <p>NM3</p> <p>The Cullinan I</p> |  |
| <p>NM4</p> <p>Lai Chack Middle School</p> |  |
| <p>NM5</p> <p>Yue Tak Building</p> |  |

Locations for 24-hr TSP monitoring



| Monitoring Location | Photo Record |
|--|--|
| <p>AM1</p> <p>Marine Department New Yau Ma Tei Public Cargo Working Area Administrative Building</p> |  <p>A photograph showing a grey electrical control cabinet with a white door and a small display screen. It is situated on a paved rooftop area next to a white door. A date stamp '2016/11/07' is visible in the bottom right corner.</p> |
| <p>AM2</p> <p>Garden Building</p> |  <p>A photograph showing a grey electrical control cabinet with a white door and a small display screen. It is situated on a paved area near a building entrance. A date stamp '2016/05/18' is visible in the bottom right corner.</p> |
| <p>AM3-B</p> <p>The Cullinan II (W Hong Kong)</p> |  <p>A photograph showing a blue electrical control cabinet with a white door and a small display screen. It is situated on a paved area near a building entrance. A date stamp '2016/09/28' is visible in the bottom right corner.</p> |
| <p>AM4-A</p> <p>Tsim Sha Tsui Fire Station</p> |  <p>A photograph showing a grey electrical control cabinet with a white door and a small display screen. It is situated on a paved area near a building entrance. A date stamp '2016/09/28' is visible in the bottom right corner.</p> |

Appendix D: Calibration Certification



CERTIFICATE OF CALIBRATION AND TESTING

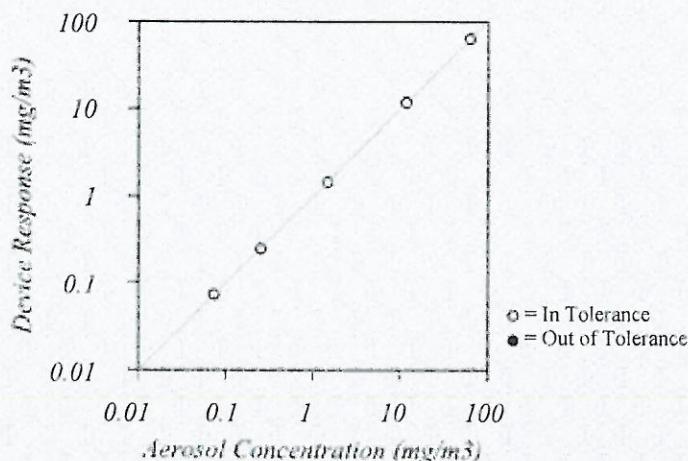
TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

| Environment Conditions | | | Model | AM520 |
|------------------------|---------------|------------|---------------|------------|
| Temperature | 75.7 (24.3) | °F (°C) | Serial Number | 5201750009 |
| Relative Humidity | 26 | %RH | | |
| Barometric Pressure | 28.83 (976.3) | inHg (hPa) | | |

☒ As Left
☐ As Found

☒ In Tolerance
☐ Out of Tolerance

Concentration Linearity Plot



System ID: DTII01-01

| CONCENTRATION | | | | Unit: mg/m ³ | | | |
|---------------|----------|----------|-----------------|-------------------------|----------|----------|-----------------|
| # | STANDARD | MEASURED | ALLOWABLE RANGE | # | STANDARD | MEASURED | ALLOWABLE RANGE |
| 1 | 0.072 | 0.073 | 0.050~0.094 | 4 | 11.745 | 11.665 | 10.571~12.919 |
| 2 | 0.250 | 0.247 | 0.213~0.287 | 5 | 63.293 | 62.903 | 56.964~69.622 |
| 3 | 1.468 | 1.417 | 1.321~1.615 | | | | |

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass per standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 4:1

| Measurement Variable | System ID | Last Cal | Cal Due |
|----------------------|-----------|----------|----------|
| Photometer | E003433 | 09-05-17 | 03-31-18 |
| DC Voltage(Keithley) | E002859 | 09-21-17 | 09-30-18 |
| Temp/Humidity | E005656 | 03-07-17 | 03-31-18 |
| Pressure | E003440 | 07-27-17 | 07-31-18 |

| Measurement Variable | System ID | Last Cal | Cal Due |
|----------------------|-----------|----------|----------|
| Flowmeter | E004570 | 06-19-17 | 06-30-18 |
| Microbalance | M001324 | 11-02-16 | 11-30-18 |
| Temp/Humidity | E005657 | 03-06-17 | 03-31-18 |

Bao Lee

Calibrated

December 15, 2017

Date



REPORT OF EQUIPMENT CALIBRATION

INSTRUMENT DESCRIPTION

It is certified that the calibrated dust meter has been calibrated by the calibrated High Volume Sampler.

Dust Meter

| | |
|-------------------------------------|--------------------------------------|
| Manufacturer & Model No.: TSI AM520 | Date of Calibration: 30/1/2018 |
| Serial No.: 5201750009 | Date of Next Calibration: 14/12/2018 |

High Volume Sampler

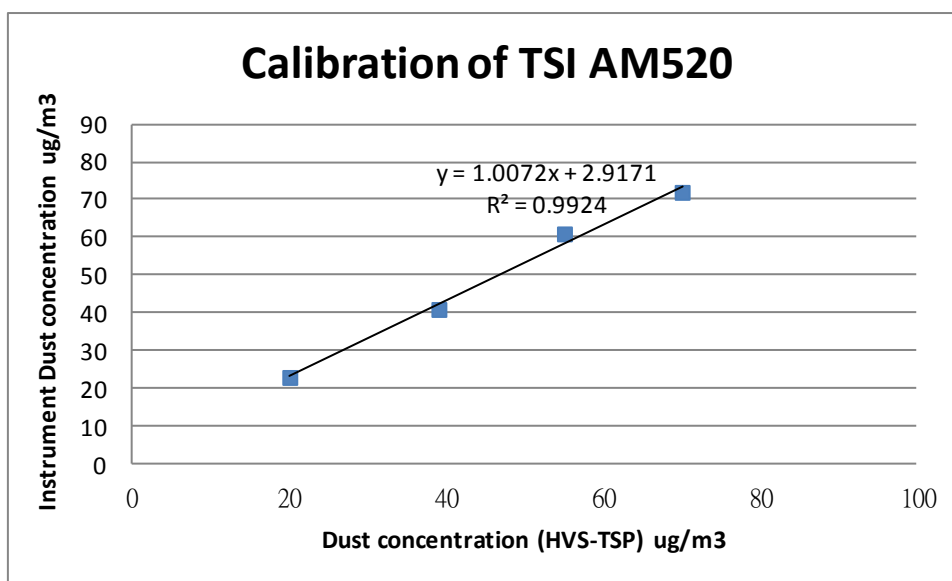
| | |
|---------------------------------------|--------------------------------|
| Manufacturer & Model No.: TE-5170 MFC | Date of Calibration: 30/1/2018 |
| Serial No.: 0005 | |

Calibration Orifice

| | |
|------------------------------------|---------------------------------|
| Manufacturer & Model No.: TE-5028A | Date of Calibration: 30/05/2017 |
| Serial No.: 3371 | |

Calibration Record

| | | | | |
|-----------|----|----|----|----|
| HVS - TSP | 20 | 39 | 55 | 70 |
| TSI AM520 | 23 | 41 | 61 | 72 |



ISSUING ORGANISATION

Environmental Pioneers & Solutions Limited

Flat A 8/F. Chaiwan Industrial Centre
20 Lee Chung Street
Chai Wan, Hong Kong

Phone: 852 - 2556 9172

Fax: 852 - 2856 2010

Date of Issue: 31/1/2018



Mr. Ip Wing Hong, John
Manager



CERTIFICATE OF CALIBRATION AND TESTING

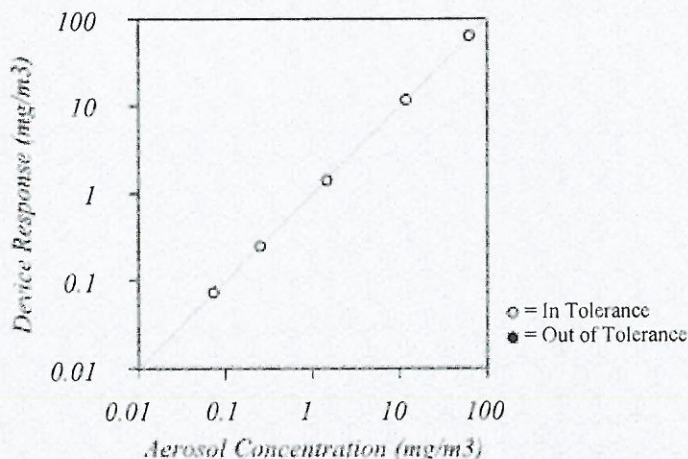
TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

| Environment Conditions | | | Model | AM520 |
|------------------------|---------------|------------|---------------|------------|
| Temperature | 75.7 (24.3) | °F (°C) | Serial Number | 5201750010 |
| Relative Humidity | 26 | %RH | | |
| Barometric Pressure | 28.83 (976.3) | inHg (hPa) | | |

☒ As Left
☐ As Found

☒ In Tolerance
☐ Out of Tolerance

Concentration Linearity Plot



System ID: DTIII01-01

| CONCENTRATION | | | | Unit: mg/m ³ | | | |
|---------------|----------|----------|-----------------|-------------------------|----------|----------|-----------------|
| # | STANDARD | MEASURED | ALLOWABLE RANGE | # | STANDARD | MEASURED | ALLOWABLE RANGE |
| 1 | 0.072 | 0.072 | 0.050~0.094 | 4 | 11.745 | 11.659 | 10.571~12.919 |
| 2 | 0.250 | 0.242 | 0.213~0.287 | 5 | 63.293 | 62.717 | 56.964~69.622 |
| 3 | 1.468 | 1.403 | 1.321~1.615 | | | | |

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| | | | |
|----------------------|-----------|----------|----------|
| Measurement Variable | System ID | Last Cal | Cal. Due |
| Photometer | E003433 | 09-05-17 | 03-31-18 |
| DC Voltage(Keithley) | E002859 | 09-21-17 | 09-30-18 |
| Temp/Humidity | E005656 | 03-07-17 | 03-31-18 |
| Pressure | E003440 | 07-27-17 | 07-31-18 |

| | | | |
|----------------------|-----------|----------|----------|
| Measurement Variable | System ID | Last Cal | Cal. Due |
| Flowmeter | E004570 | 06-19-17 | 06-30-18 |
| Microbalance | M001324 | 11-02-16 | 11-30-18 |
| Temp/Humidity | E005657 | 03-06-17 | 03-31-18 |

Bao Lee

Calibrated

December 15, 2017

Date



REPORT OF EQUIPMENT CALIBRATION

INSTRUMENT DESCRIPTION

It is certified that the calibrated dust meter has been calibrated by the calibrated High Volume Sampler.

Dust Meter

| | |
|-------------------------------------|--------------------------------------|
| Manufacturer & Model No.: TSI AM520 | Date of Calibration: 30/1/2018 |
| Serial No.: 5201750010 | Date of Next Calibration: 14/12/2018 |

High Volume Sampler

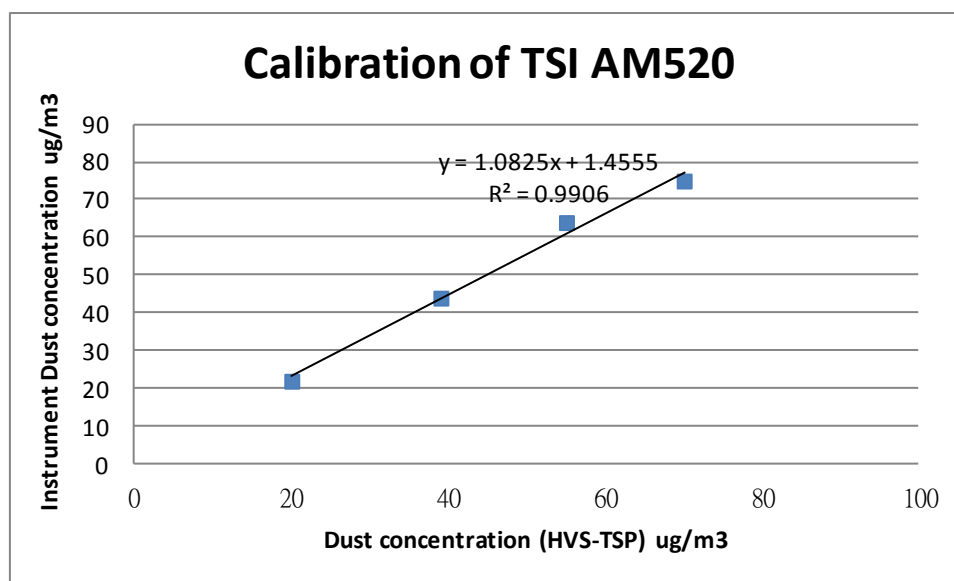
| | |
|---------------------------------------|--------------------------------|
| Manufacturer & Model No.: TE-5170 MFC | Date of Calibration: 30/1/2018 |
| Serial No.: 0005 | |

Calibration Orifice

| | |
|------------------------------------|---------------------------------|
| Manufacturer & Model No.: TE-5028A | Date of Calibration: 30/05/2017 |
| Serial No.: 3371 | |

Calibration Record

| | | | | |
|-----------|----|----|----|----|
| HVS - TSP | 20 | 39 | 55 | 70 |
| TSI AM520 | 22 | 44 | 64 | 75 |



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Date of Issue: 31/1/2018



Mr. Ip Wing Hong, John
Manager



CERTIFICATE OF CALIBRATION AND TESTING

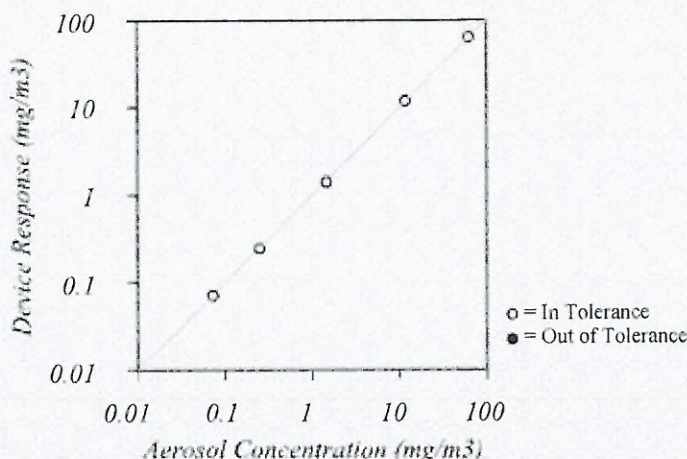
TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

| Environment Conditions | | | Model | AM520 |
|------------------------|---------------|------------|---------------|------------|
| Temperature | 75.7 (24.3) | °F (°C) | Serial Number | 5201750011 |
| Relative Humidity | 26 | %RH | | |
| Barometric Pressure | 28.83 (976.3) | inHg (hPa) | | |

☒ As Left
☐ As Found

☒ In Tolerance
☐ Out of Tolerance

Concentration Linearity Plot



System ID: DTH01-01

| CONCENTRATION | | | | Unit: mg/m ³ | | | |
|---------------|----------|----------|-----------------|-------------------------|----------|----------|-----------------|
| # | STANDARD | MEASURED | ALLOWABLE RANGE | # | STANDARD | MEASURED | ALLOWABLE RANGE |
| 1 | 0.072 | 0.071 | 0.050~0.094 | 4 | 11.745 | 11.649 | 10.571~12.919 |
| 2 | 0.250 | 0.245 | 0.213~0.287 | 5 | 63.293 | 62.844 | 56.964~69.622 |
| 3 | 1.468 | 1.402 | 1.321~1.615 | | | | |

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| | | | |
|----------------------|-----------|----------|----------|
| Measurement Variable | System ID | Last Cal | Cal Due |
| Photometer | E003433 | 09-05-17 | 03-31-18 |
| DC Voltage(Keithley) | E002859 | 09-21-17 | 09-30-18 |
| Temp/Humidity | E005656 | 03-07-17 | 03-31-18 |
| Pressure | E003440 | 07-27-17 | 07-31-18 |

| | | | |
|----------------------|-----------|----------|----------|
| Measurement Variable | System ID | Last Cal | Cal Due |
| Flowmeter | E004570 | 06-19-17 | 06-30-18 |
| Microbalance | M001324 | 11-02-16 | 11-30-18 |
| Temp/Humidity | E005657 | 03-06-17 | 03-31-18 |

Bao Lee
Calibrated

December 15, 2017

Date



REPORT OF EQUIPMENT CALIBRATION

INSTRUMENT DESCRIPTION

It is certified that the calibrated dust meter has been calibrated by the calibrated High Volume Sampler.

Dust Meter

| | |
|-------------------------------------|--------------------------------------|
| Manufacturer & Model No.: TSI AM520 | Date of Calibration: 30/1/2018 |
| Serial No.: 5201750011 | Date of Next Calibration: 14/12/2018 |

High Volume Sampler

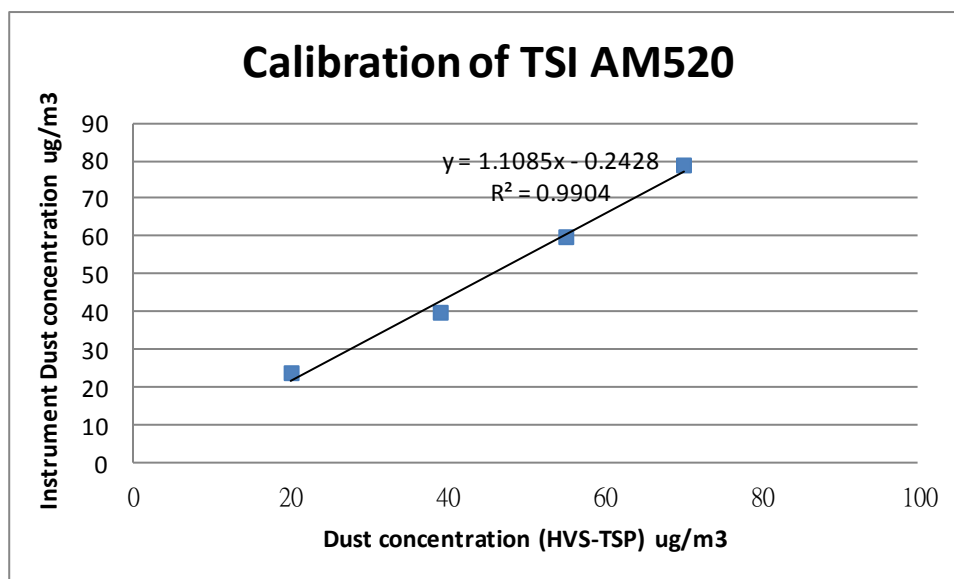
| | |
|---------------------------------------|--------------------------------|
| Manufacturer & Model No.: TE-5170 MFC | Date of Calibration: 30/1/2018 |
| Serial No.: 0005 | |

Calibration Orifice

| | |
|------------------------------------|---------------------------------|
| Manufacturer & Model No.: TE-5028A | Date of Calibration: 30/05/2017 |
| Serial No.: 3371 | |

Calibration Record

| | | | | |
|-----------|----|----|----|----|
| HVS - TSP | 20 | 39 | 55 | 70 |
| TSI AM520 | 24 | 40 | 60 | 79 |



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Chai Wan, Hong Kong

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Fax: 852 - 2856 2010

Date of Issue: 31/1/2018



Mr. Ip Wing Hong, John
Manager



CERTIFICATE OF CALIBRATION AND TESTING

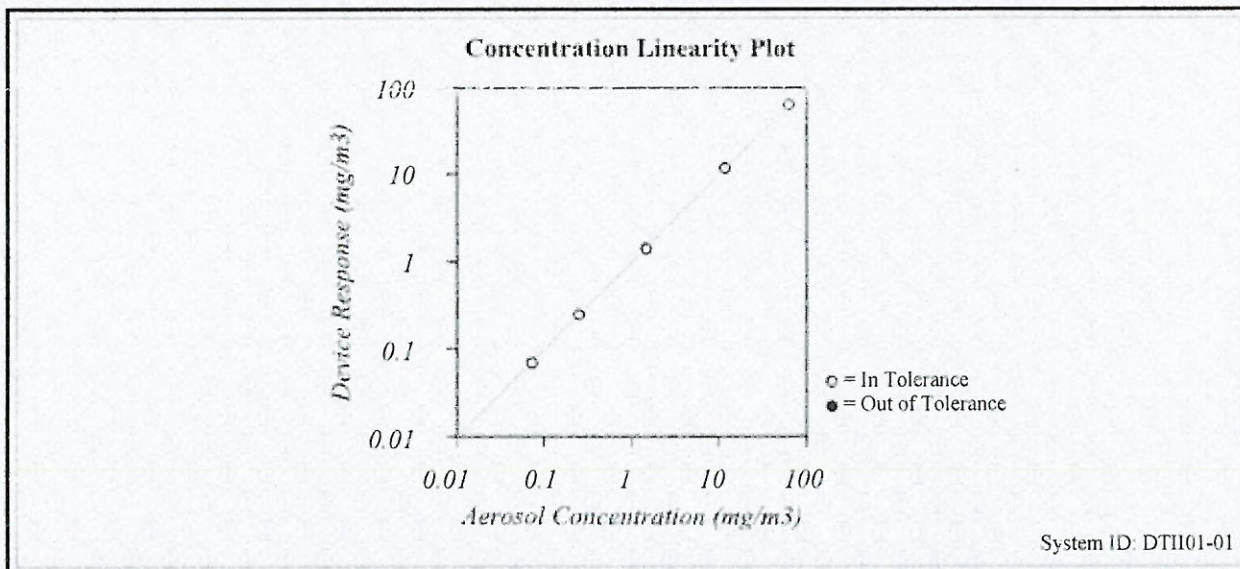
TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

| Environment Conditions | | |
|------------------------|---------------|------------|
| Temperature | 75.7 (24.3) | °F (°C) |
| Relative Humidity | 26 | %RH |
| Barometric Pressure | 28.83 (976.3) | inHg (hPa) |

| | |
|---------------|------------|
| Model | AM520 |
| Serial Number | 5201750012 |

☒ As Left
☐ As Found

☒ In Tolerance
☐ Out of Tolerance



| CONCENTRATION | | | | Unit: mg/m ³ | | | |
|---------------|----------|----------|-----------------|-------------------------|----------|----------|-----------------|
| # | STANDARD | MEASURED | ALLOWABLE RANGE | # | STANDARD | MEASURED | ALLOWABLE RANGE |
| 1 | 0.072 | 0.070 | 0.050~0.094 | 4 | 11.745 | 11.612 | 10.571~12.919 |
| 2 | 0.250 | 0.246 | 0.213~0.287 | 5 | 63.293 | 63.376 | 56.964~69.622 |
| 3 | 1.468 | 1.403 | 1.321~1.615 | | | | |

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| | | | |
|----------------------|-----------|-----------|----------|
| Measurement Variable | System ID | Last Cal. | Cal. Due |
| Photometer | E003433 | 09-05-17 | 03-31-18 |
| DC Voltage(Keithley) | E002859 | 09-21-17 | 09-30-18 |
| Temp/Humidity | E005656 | 03-07-17 | 03-31-18 |
| Pressure | E003440 | 07-27-17 | 07-31-18 |

| | | | |
|----------------------|-----------|-----------|----------|
| Measurement Variable | System ID | Last Cal. | Cal. Due |
| Flowmeter | E004570 | 06-19-17 | 06-30-18 |
| Microbalance | M001324 | 11-02-16 | 11-30-18 |
| Temp/Humidity | E005657 | 03-06-17 | 03-31-18 |

Bao Lee

Calibrated

December 15, 2017

Date



REPORT OF EQUIPMENT CALIBRATION

INSTRUMENT DESCRIPTION

It is certified that the calibrated dust meter has been calibrated by the calibrated High Volume Sampler.

Dust Meter

| | |
|-------------------------------------|--------------------------------------|
| Manufacturer & Model No.: TSI AM520 | Date of Calibration: 30/1/2018 |
| Serial No.: 5201750012 | Date of Next Calibration: 14/12/2018 |

High Volume Sampler

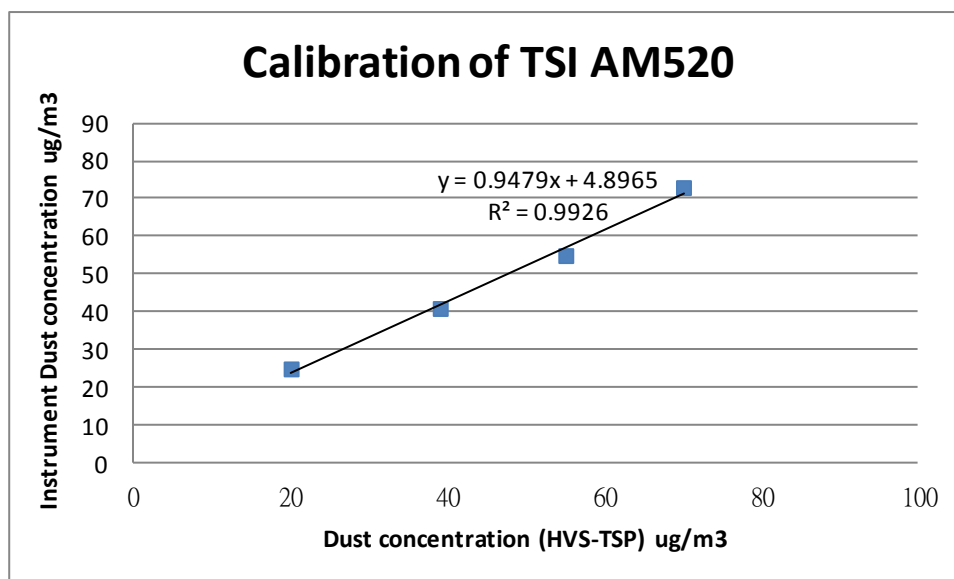
| | |
|---------------------------------------|--------------------------------|
| Manufacturer & Model No.: TE-5170 MFC | Date of Calibration: 30/1/2018 |
| Serial No.: 0005 | |

Calibration Orifice

| | |
|------------------------------------|---------------------------------|
| Manufacturer & Model No.: TE-5028A | Date of Calibration: 30/05/2017 |
| Serial No.: 3371 | |

Calibration Record

| | | | | |
|-----------|----|----|----|----|
| HVS - TSP | 20 | 39 | 55 | 70 |
| TSI AM520 | 25 | 41 | 55 | 73 |



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Phone: 852 - 2556 9172

Fax: 852 - 2856 2010

Date of Issue: 31/1/2018



Mr. Ip Wing Hong, John
Manager

Certificate of Calibration

Calibration Certification Information

Cal. Date: May 1, 2018 Rootsmeter S/N: 438320 Ta: 294 °K
Operator: Jim Tisch Pa: 755.65 mm Hg
Calibration Model #: TE-5028A Calibrator S/N: **2137**

| Run | Vol. Init (m3) | Vol. Final (m3) | ΔVol. (m3) | ΔTime (min) | ΔP (mm Hg) | ΔH (in H2O) |
|-----|-------------------|--------------------|---------------|----------------|---------------|----------------|
| 1 | 1 | 2 | 1 | 1.3280 | 4.2 | 1.50 |
| 2 | 3 | 4 | 1 | 1.0410 | 6.8 | 2.50 |
| 3 | 5 | 6 | 1 | 0.9470 | 8.3 | 3.00 |
| 4 | 7 | 8 | 1 | 0.8710 | 9.7 | 3.50 |
| 5 | 9 | 10 | 1 | 0.6640 | 16.5 | 6.00 |

Data Tabulation

| Vstd (m3) | Qstd (x-axis) | $\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)}$ (y-axis) | Va | Qa (x-axis) | $\sqrt{\Delta H \left(\frac{Ta}{Pa} \right)}$ (y-axis) |
|--------------|------------------|---|-----------|----------------|--|
| 1.0022 | 0.7547 | 1.2295 | 0.9944 | 0.7488 | 0.7639 |
| 0.9987 | 0.9594 | 1.5873 | 0.9910 | 0.9520 | 0.9862 |
| 0.9967 | 1.0525 | 1.7388 | 0.9890 | 1.0444 | 1.0804 |
| 0.9949 | 1.1422 | 1.8781 | 0.9872 | 1.1334 | 1.1669 |
| 0.9858 | 1.4846 | 2.4590 | 0.9782 | 1.4731 | 1.5279 |
| QSTD | m= | 1.67739 | QA | m= | 1.05036 |
| | b= | -0.03083 | | b= | -0.01916 |
| | r= | 0.99989 | | r= | 0.99989 |

Calculations

| | | | |
|---|---|-----|--|
| Vstd= | $\Delta Vol((Pa-\Delta P)/Pstd)(Tstd/Ta)$ | Va= | $\Delta Vol((Pa-\Delta P)/Pa)$ |
| Qstd= | Vstd/ΔTime | Qa= | Va/ΔTime |
| For subsequent flow rate calculations: | | | |
| Qstd= | $1/m \left(\left(\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)} \right) - b \right)$ | Qa= | $1/m \left(\left(\sqrt{\Delta H \left(\frac{Ta}{Pa} \right)} \right) - b \right)$ |

Standard Conditions

Tstd: 298.15 °K
Pstd: 760 mm Hg

Key

ΔH: calibrator manometer reading (in H2O)
ΔP: rootsmeter manometer reading (mm Hg)
Ta: actual absolute temperature (°K)
Pa: actual barometric pressure (mm Hg)
b: intercept
m: slope

RECALIBRATION

US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30.



TE-5170 Calibration Worksheet

Site Information

Location: **YMT Public Cargo Working Area**
Location ID: **AM1**
Sampler: **TE-5170 MFC (0001)**

Date: **6-Jun-18**
Tech: **Hendry Chan**

Site Conditions

Barometric Pressure (in Hg): **29.50**
Temperature (deg F): **68**
Average Press. (in Hg): **29.65**
Average Temp. (deg F): **68**

Corrected Pressure (mm Hg): 749
Temperature (deg K): 293
Corrected Average (mm Hg): 753
Average Temp. (deg K): 293

Calibration Orifice

Make: **Tisch**
Model: **TE-5028A**
Serial#: **2137**

Qstd Slope: **1.67739**
Qstd Intercept: **-0.03083**
Date Certified: **1-May-18**

Calibration Information

| Plate or Test # | H2O (in) | Qstd (m3/min) | I (chart) | IC (corrected) | Linear Regression |
|--------------------|-------------|------------------|--------------|-------------------|----------------------|
| 1 | 2.20 | 0.904 | 22.0 | 22.03 | Slope: 38.5514 |
| 2 | 3.40 | 1.119 | 32.0 | 32.04 | Intercept: -12.2660 |
| 3 | 5.00 | 1.353 | 40.0 | 40.05 | Corr. Coeff: 0.9948 |
| 4 | 7.20 | 1.620 | 48.0 | 48.07 | |
| 5 | 8.80 | 1.789 | 58.0 | 58.08 | # of Observations: 5 |

Calculations

$$Qstd = 1/m[\text{Sqrt}(H_2O(P_a/P_{std})(T_{std}/T_a))-b]$$
$$IC = I[\text{Sqrt}(P_a/P_{std})(T_{std}/T_a)]$$

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:

$$1/m((I[\text{Sqrt}(298/T_{av})(P_{av}/760)]-b)$$

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

Average I (chart): **50.0**

Average Flow Calculation m3/min

1.62021645

Average Flow Calculation in CFM

57.20984284

Sample Time (Hrs): **24.0**

Total Flow/Volume in m3

2333.111687

Total Flow in CFM

82382.17369



TE-5170 Calibration Worksheet

Site Information

Location: **Canton Road Garden Building**
Location ID: **AM2**
Sampler: **TE-5170 MFC (0002)**

Date: **6-Jun-18**
Tech: **Hendry Chan**

Site Conditions

Barometric Pressure (in Hg): **29.50**
Temperature (deg F): **68**
Average Press. (in Hg): **29.65**
Average Temp. (deg F): **68**

Corrected Pressure (mm Hg): 749
Temperature (deg K): 293
Corrected Average (mm Hg): 753
Average Temp. (deg K): 293

Calibration Orifice

Make: **Tisch**
Model: **TE-5028A**
Serial#: **2137**

Qstd Slope: **1.67739**
Qstd Intercept: **-0.03083**
Date Certified: **1-May-18**

Calibration Information

| Plate or Test # | H2O (in) | Qstd (m3/min) | I (chart) | IC (corrected) | Linear Regression |
|--------------------|-------------|------------------|--------------|-------------------|----------------------|
| 1 | 2.40 | 0.943 | 22.0 | 22.03 | Slope: 51.1070 |
| 2 | 3.80 | 1.182 | 31.0 | 31.04 | Intercept: -27.7123 |
| 3 | 5.00 | 1.353 | 40.0 | 40.05 | Corr. Coeff: 0.9952 |
| 4 | 6.20 | 1.505 | 50.0 | 50.07 | |
| 5 | 7.80 | 1.686 | 59.0 | 59.08 | # of Observations: 5 |

Calculations

$$Qstd = 1/m[\text{Sqrt}(H_2O(P_a/P_{std})(T_{std}/T_a))-b]$$
$$IC = I[\text{Sqrt}(P_a/P_{std})(T_{std}/T_a)]$$

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:

$$1/m((I[\text{Sqrt}(298/T_{av})(P_{av}/760)]-b)$$

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

Average I (chart): **50.0**

Average Flow Calculation m3/min

1.52441014

Average Flow Calculation in CFM

53.82692204

Sample Time (Hrs): **24.0**

Total Flow/Volume in m3

2195.150601

Total Flow in CFM

77510.76774



TE-5170 Calibration Worksheet

Site Information

Location: **Nga Cheung Road Portion I**
Location ID: **AM3-B**
Sampler: **TE-5170 MFC (0003)**

Date: **6-Jun-18**
Tech: **Hendry Chan**

Site Conditions

Barometric Pressure (in Hg): **29.50**
Temperature (deg F): **68**
Average Press. (in Hg): **29.65**
Average Temp. (deg F): **68**

Corrected Pressure (mm Hg): 749
Temperature (deg K): 293
Corrected Average (mm Hg): 753
Average Temp. (deg K): 293

Calibration Orifice

Make: **Tisch**
Model: **TE-5028A**
Serial#: **2137**

Qstd Slope: **1.67739**
Qstd Intercept: **-0.03083**
Date Certified: **1-May-18**

Calibration Information

| Plate or Test # | H2O (in) | Qstd (m3/min) | I (chart) | IC (corrected) | Linear Regression |
|--------------------|-------------|------------------|--------------|-------------------|----------------------|
| 1 | 2.40 | 0.943 | 20.0 | 20.03 | Slope: 48.2187 |
| 2 | 3.20 | 1.086 | 30.0 | 30.04 | Intercept: -24.7674 |
| 3 | 5.00 | 1.353 | 38.0 | 38.05 | Corr. Coeff: 0.9912 |
| 4 | 6.40 | 1.529 | 48.0 | 48.07 | |
| 5 | 7.80 | 1.686 | 58.0 | 58.08 | # of Observations: 5 |

Calculations

$$Qstd = 1/m[\text{Sqrt}(H_2O(P_a/P_{std})(T_{std}/T_a))-b]$$
$$IC = I[\text{Sqrt}(P_a/P_{std})(T_{std}/T_a)]$$

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:

$$1/m((I[\text{Sqrt}(298/T_{av})(P_{av}/760)]-b)$$

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

Average I (chart): **50.0**

Average Flow Calculation m3/min

1.554647082

Average Flow Calculation in CFM

54.89458848

Sample Time (Hrs): **24.0**

Total Flow/Volume in m3

2238.691799

Total Flow in CFM

79048.20741



CERTIFICATE OF CALIBRATION

Certificate No.: 17CA1206 02-01

Page 1 of 2

Item tested

| | | |
|-----------------------|----------------------------|------------|
| Description: | Sound Level Meter (Type 1) | Microphone |
| Manufacturer: | SVANTEK, Poland | ACO, Japan |
| Type/Model No.: | 971 | 7052E |
| Serial/Equipment No.: | 56272 | 65172 |
| Adaptors used: | - | - |

Item submitted by

| | |
|----------------------|---|
| Customer Name: | Environmental Pioneers & Solutions Limited |
| Address of Customer: | Flat A, 19/F, Chaiwan Industrial Centre, 20 Lee Chung Street, Chai Wan, Hong Kong |
| Request No.: | - |
| Date of receipt: | 06-Dec-2017 |

Date of test: 11-Dec-2017

Reference equipment used in the calibration

| Description: | Model: | Serial No. | Expiry Date: | Traceable to: |
|---------------------------------|----------|------------|--------------|---------------|
| Multi function sound calibrator | B&K 4226 | 2288444 | 08-Sep-2018 | CIGISMEC |
| Signal generator | DS 360 | 33873 | 25-Apr-2018 | CEPREI |
| Signal generator | DS 360 | 61227 | 01-Apr-2018 | CEPREI |

Ambient conditions

| | |
|--------------------|--------------|
| Temperature: | 21 ± 1 °C |
| Relative humidity: | 50 ± 10 % |
| Air pressure: | 1000 ± 5 hPa |

Test specifications

- 1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
- 2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.
- 3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsiveness of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory:

Feng Jun Qi

Date: 11-Dec-2017

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

**CERTIFICATE OF CALIBRATION**

(Continuation Page)

Certificate No.: 17CA1206 02-01

Page 2 of 2

1, Electrical Tests

The electrical tests were performed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

| Test: | Subtest: | Status: | Expanded Uncertainty (dB) | Coverage Factor |
|-------------------------|--|---------|---------------------------|-----------------|
| Self-generated noise | A | Pass | 0.3 | 2.1 |
| | C | Pass | 0.8 | |
| | Lin | Pass | 1.6 | |
| Linearity range for Leq | At reference range, Step 5 dB at 4 kHz | Pass | 0.3 | 2.2 |
| | Reference SPL on all other ranges | Pass | 0.3 | |
| | 2 dB below upper limit of each range | Pass | 0.3 | |
| | 2 dB above lower limit of each range | Pass | 0.3 | |
| | At reference range, Step 5 dB at 4 kHz | Pass | 0.3 | |
| Linearity range for SPL | A | Pass | 0.3 | |
| | C | Pass | 0.3 | |
| | Lin | Pass | 0.3 | |
| Time weightings | Single Burst Fast | Pass | 0.3 | |
| | Single Burst Slow | Pass | 0.3 | |
| | Single 100µs rectangular pulse | Pass | 0.3 | |
| Peak response | Crest factor of 3 | Pass | 0.3 | |
| R.M.S. accuracy | Single burst 5 ms at 2000 Hz | Pass | 0.3 | |
| Time weighting I | Repeated at frequency of 100 Hz | Pass | 0.3 | |
| | 1 ms burst duty factor 1/10 ³ at 4kHz | Pass | 0.3 | |
| Time averaging | 1 ms burst duty factor 1/10 ⁴ at 4kHz | Pass | 0.3 | |
| | Single burst 10 ms at 4 kHz | Pass | 0.4 | |
| Pulse range | Single burst 10 ms at 4 kHz | Pass | 0.4 | |
| Sound exposure level | SPL | Pass | 0.3 | |
| Overload indication | Leq | Pass | 0.4 | |

2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

| Test: | Subtest | Status | Expanded Uncertainty (dB) | Coverage Factor |
|-------------------|------------------------|--------|---------------------------|-----------------|
| Acoustic response | Weighting A at 125 Hz | Pass | 0.3 | |
| | Weighting A at 8000 Hz | Pass | 0.5 | |

3, Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

Calibrated by:

Date:

Fung Chi Yip
11-Dec-2017

- End -

Checked by:

Date:

Lam Tze Wai
11-Dec-2017

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

FACTORY CALIBRATION DATA OF THE SVAN 971 No. 61421

with preamplifier SVANTEK type SV18 No. 64658 and with microphone ACO type 7052E No. 67606

1. CALIBRATION* (acoustical)

LEVEL METER function; Range: Low; Reference frequency: 1000Hz; Sound Pressure Level: 113.93 dB.

| Characteristic | Correct value [dB] | Indication [dB] | Error [dB] |
|----------------|--------------------|-----------------|------------|
| Z | 113.93 | 113.79 | -0.14 |
| A | 113.93 | 113.79 | -0.14 |
| C | 113.93 | 113.79 | -0.14 |

Calibration measured with the microphone ACO type 7052E No. 67606. Calibration factor: 0.77 dB.

2. LINEARITY TEST* (electrical)

LEVEL METER function; Range: Low; Characteristic: A; $f_{\text{ref}} = 31.5$ Hz

| Nominal result LEQ [dB] | 24.0 | 25.0 | 26.0 | 28.0 | 30.0 | 40.0 | 60.0 | 83.0 |
|-------------------------|------|------|------|------|------|------|------|------|
| Error [dB] | 0.1 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |

LEVEL METER function; Range: Low; Characteristic: A; $f_{\text{ref}} = 1000$ Hz

| Nominal result LEQ [dB] | 24.0 | 25.0 | 26.0 | 28.0 | 30.0 | 40.0 | 60.0 | 80.0 | 100.0 | 123.0 |
|-------------------------|------|------|------|------|------|------|------|------|-------|-------|
| Error [dB] | 0.0 | 0.1 | 0.1 | 0.0 | -0.0 | -0.0 | -0.0 | 0.0 | 0.0 | -0.0 |

LEVEL METER function; Range: Low; Characteristic: A; $f_{\text{ref}} = 8000$ Hz

| Nominal result LEQ [dB] | 24.0 | 25.0 | 26.0 | 28.0 | 30.0 | 40.0 | 60.0 | 80.0 | 100.0 | 122.0 |
|-------------------------|------|------|------|------|------|------|------|------|-------|-------|
| Error [dB] | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | -0.0 | -0.0 | -0.0 | -0.0 | -0.0 |

LEVEL METER function; Range: High; Characteristic: A; $f_{\text{ref}} = 31.5$ Hz

| Nominal result LEQ [dB] | 34.0 | 35.0 | 36.0 | 38.0 | 40.0 | 60.0 | 80.0 | 97.0 |
|-------------------------|------|------|------|------|------|------|------|------|
| Error [dB] | 0.0 | 0.0 | 0.0 | -0.0 | 0.0 | 0.0 | -0.0 | 0.0 |

LEVEL METER function; Range: High; Characteristic: A; $f_{\text{ref}} = 1000$ Hz

| Nominal result LEQ [dB] | 34.0 | 35.0 | 36.0 | 38.0 | 40.0 | 60.0 | 80.0 | 100.0 | 120.0 | 137.0 |
|-------------------------|------|------|------|------|------|------|------|-------|-------|-------|
| Error [dB] | 0.0 | -0.0 | 0.0 | -0.0 | -0.0 | -0.0 | -0.0 | -0.0 | -0.0 | -0.0 |

LEVEL METER function; Range: High; Characteristic: A; $f_{\text{ref}} = 8000$ Hz

| Nominal result LEQ [dB] | 34.0 | 35.0 | 36.0 | 38.0 | 40.0 | 60.0 | 80.0 | 100.0 | 120.0 | 136.0 |
|-------------------------|------|------|------|------|------|------|------|-------|-------|-------|
| Error [dB] | 0.0 | 0.0 | 0.0 | 0.0 | -0.0 | -0.0 | 0.0 | 0.0 | -0.0 | -0.0 |

1/3 OCTAVE (1kHz); Range: Low; $f_{\text{ref}} = 1000$ Hz

| Nominal result [dB] | 25.0 | 30.0 | 40.0 | 60.0 | 80.0 | 100.0 | 120.0 | 123.0 |
|---------------------|------|------|------|------|------|-------|-------|-------|
| Error [dB] | 0.1 | -0.0 | -0.0 | -0.0 | -0.0 | -0.0 | -0.0 | -0.0 |

3. TONE BURST RESPONSE*

LEVEL METER function; Characteristic: A; $f_{\text{ref}} = 4000$ Hz; Burst duration: 2s

Range: Low; Steady level nominal result = 120dB

| Result | Detector | Duration [ms] | 1000 | 500 | 200 | 100 | 50 | 20 | 10 | 5 | 2 | 1 | 0.5 | 0.25 |
|--------|----------|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|
| MAX | Fast | Indication [dB] | 120.0 | 119.9 | 119.0 | 117.4 | 115.1 | 111.6 | 108.8 | 105.9 | 101.9 | 98.9 | 95.9 | 92.8 |
| | | Error [dB] | 0.0 | 0.0 | 0.0 | 0.0 | -0.0 | -0.0 | -0.1 | 0.0 | -0.0 | -0.0 | -0.1 | -0.1 |
| | Slow | Indication [dB] | 117.9 | 115.8 | 112.4 | 109.6 | 106.7 | 102.8 | 99.8 | 96.8 | 92.8 | - | - | - |
| | | Error [dB] | -0.0 | -0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | - | - | - |
| SEL | - | Indication [dB] | 120.0 | 116.9 | 113.0 | 110.0 | 106.9 | 103.0 | 99.9 | 96.9 | 92.9 | 89.9 | 86.8 | 83.8 |
| | | Error [dB] | 0.0 | -0.0 | 0.0 | 0.0 | -0.0 | 0.0 | -0.0 | -0.0 | -0.0 | -0.0 | -0.1 | -0.1 |

Range: Low; Steady level nominal result = 60dB

| Result | Detector | Duration [ms] | 1000 | 500 | 200 | 100 | 50 | 20 | 10 | 5 | 2 | 1 | 0.5 |
|--------|----------|-----------------|------|------|------|------|------|------|------|------|------|------|------|
| MAX | Fast | Indication [dB] | 60.0 | 59.9 | 59.0 | 57.4 | 55.1 | 51.6 | 48.8 | 45.9 | 41.9 | 38.9 | 35.9 |
| | | Error [dB] | 0.0 | 0.0 | 0.0 | 0.0 | -0.0 | -0.0 | -0.1 | 0.0 | -0.0 | -0.0 | -0.1 |
| | Slow | Indication [dB] | 57.9 | 55.8 | 52.4 | 49.6 | 46.7 | 42.8 | 39.8 | 36.8 | 32.8 | - | - |
| | | Error [dB] | -0.1 | -0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | - | - |
| SEL | - | Indication [dB] | 60.0 | 56.9 | 53.0 | 50.0 | 46.9 | 43.0 | 40.0 | 36.9 | 33.0 | 30.0 | 27.0 |
| | | Error [dB] | 0.0 | -0.0 | 0.0 | 0.0 | -0.0 | 0.0 | 0.0 | -0.0 | 0.0 | 0.0 | 0.0 |

Range: Low; Steady level nominal result = 35dB

| Result | Detector | Duration [ms] | 1000 | 500 | 200 |
|--------|----------|-----------------|------|------|------|
| MAX | Fast | Indication [dB] | 35.0 | 34.9 | 34.0 |
| | | Error [dB] | 0.0 | 0.0 | 0.0 |
| | Slow | Indication [dB] | 32.9 | 30.9 | 27.5 |
| | | Error [dB] | -0.0 | -0.0 | -0.1 |
| SEL | - | Indication [dB] | 35.0 | 32.0 | 28.1 |
| | | Error [dB] | 0.0 | 0.0 | 0.1 |

Range: High; Steady level nominal result = 134dB

| Result | Detector | Duration [ms] | 1000 | 500 | 200 | 100 | 50 | 20 | 10 | 5 | 2 | 1 | 0.5 | 0.25 |
|--------|----------|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| MAX | Fast | Indication [dB] | 133.9 | 133.9 | 133.0 | 131.3 | 129.1 | 125.6 | 122.8 | 119.9 | 115.9 | 112.9 | 109.8 | 106.8 |
| | | Error [dB] | -0.0 | 0.0 | 0.0 | 0.0 | -0.0 | -0.0 | -0.0 | 0.0 | -0.0 | -0.0 | -0.1 | -0.1 |
| | Slow | Indication [dB] | 131.9 | 129.8 | 126.4 | 123.6 | 120.7 | 116.8 | 113.8 | 110.8 | 106.8 | - | - | - |
| | | Error [dB] | -0.1 | -0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | - | - | - |
| SEL | - | Indication [dB] | 133.9 | 130.9 | 127.0 | 123.9 | 120.9 | 116.9 | 113.9 | 110.9 | 106.9 | 103.9 | 100.8 | 97.8 |
| | | Error [dB] | 0.0 | -0.0 | 0.0 | 0.0 | -0.0 | 0.0 | -0.0 | -0.0 | -0.0 | -0.1 | -0.1 | -0.1 |

Range: High; Steady level nominal result = 54dB

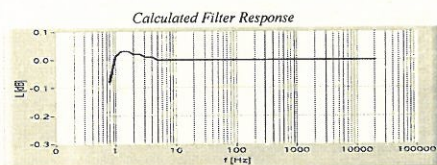
| Result | Detector | Duration [ms] | 1000 | 500 | 200 | 100 | 50 |
|--------|----------|-----------------|------|------|------|------|------|
| MAX | Fast | Indication [dB] | 53.9 | 53.9 | 53.0 | 51.4 | 49.1 |
| | | Error [dB] | -0.0 | 0.0 | 0.0 | 0.0 | -0.0 |
| | Slow | Indication [dB] | 51.9 | 49.8 | 46.5 | 43.6 | 40.8 |
| | | Error [dB] | -0.1 | -0.0 | -0.1 | -0.1 | -0.1 |
| SEL | - | Indication [dB] | 53.9 | 50.9 | 47.0 | 44.0 | 41.0 |
| | | Error [dB] | -0.0 | -0.0 | 0.0 | 0.0 | 0.0 |

Range: High; Steady level nominal result = 45dB

| Result | Detector | Duration [ms] | 1000 | 500 | 200 |
|--------|----------|-----------------|------|------|------|
| MAX | Fast | Indication [dB] | 45.0 | 44.9 | 44.0 |
| | | Error [dB] | 0.0 | 0.0 | 0.0 |
| | Slow | Indication [dB] | 42.9 | 40.8 | 37.4 |
| | | Error [dB] | -0.1 | -0.0 | -0.1 |
| SEL | - | Indication [dB] | 45.0 | 41.9 | 38.0 |
| | | Error [dB] | 0.0 | -0.0 | 0.0 |

4. FREQUENCY RESPONSE* (electrical)

LEVEL METER function; Characteristic: Z; Range: Low; Input signal = 120 dB;



Measured Filter Response with Preamplifier SV18
(f-frequency, L-level)

| f [Hz] | L [dB] | f [Hz] | L [dB] | f [Hz] | L [dB] |
|--------|--------|--------|--------|--------|--------|
| 10 | -0.1 | 63 | 0.0 | 4000 | 0.0 |
| 12.5 | 0.0 | 125 | 0.0 | 8000 | 0.0 |
| 16 | 0.0 | 250 | 0.0 | 16000 | 0.0 |
| 20 | 0.0 | 500 | 0.0 | 20000 | 0.0 |
| 25 | 0.0 | 1000 | 0.0 | | |
| 31.5 | 0.0 | 2000 | 0.0 | | |

All frequencies are nominal center values for the 1/3 octave bands

5. INTERNAL NOISE LEVEL* (electrical - compensated)

LEVEL METER function; Range: Low; (Back-light - off); Calibration factor: 0dB

| Characteristic | Z | A | C |
|----------------|-----|-----|-----|
| Level [dB] | ≤20 | ≤12 | ≤12 |

* measured with preamplifier SVANTEK type SV18 No. 64658.

6. INTERNAL NOISE LEVEL (acoustical - compensated)

LEVEL METER function; Characteristic: A; (Backlight - off)

| Range | Low | High |
|-----------------|-----|------|
| Indication [dB] | ≤15 | 20.7 |

Noise measured in special chamber, with reference microphone G.R.A.S type 40AN No. 73421

ENVIRONMENTAL CONDITIONS

| Temperature | Relative humidity | Ambient pressure |
|-------------|-------------------|------------------|
| 23 °C | 36% | 1021 hPa |

TEST EQUIPMENT

| Item | Manufacturer | Model | Serial no. | Description |
|------|--------------|-----------|------------|---|
| 1. | SVANTEK | SVAN 401 | 87 | Signal generator |
| 2. | SVANTEK | SVAN 912A | 6120 | Sound & Vibration Analyser |
| 3. | KEITHLEY | 2000 | 0910165 | Digital multimeter |
| 4. | SVANTEK | SV33 | 48878 | Acoustic calibrator |
| 5. | SVANTEK | ST02 | - | Microphone equivalent electrical impedance (18pF) |

CONFORMITY & TEST DECLARATION

1. Herewith Svantek company declares that this instrument has been calibrated and tested in compliance with the internal ISO9001 procedures and meets all specification given in the Manual(s) or respectively surpass them.
2. The acoustic calibration was performed using the Sound Calibrator and is traceable to the GUM (Central Office of Measures) reference standard - sound level calibrator type 4231 No 2292773.
3. The vibrational calibration was performed using the Back-to-Back Comparison method and is traceable to the GUM (Central Office of Measures) reference standard - accelerometer type 8305 No 1435233.
4. The information appearing on this sheet has been compiled specifically for this instrument. This form is produced with advanced equipment & procedures which permit comprehensive quality assurance verification of all data supplied herein.
5. This calibration sheet shall not be reproduced except in full, without written permission of the SVANTEK Ltd.

Calibration specialist: Krzysztof Czachor

Test date: 2017-09-28



輝創工程有限公司

Sun Creation Engineering Limited

Calibration and Testing Laboratory

Certificate of Calibration

校正證書

Certificate No. : C176441

證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC17-2589) Date of Receipt / 收件日期 : 8 November 2017

Description / 儀器名稱 : Sound Calibrator
Manufacturer / 製造商 : Soundtek
Model No. / 型號 : ST-120
Serial No. / 編號 : 150305805
Supplied By / 委託者 : Environmental Pioneers & Solutions Limited
Flat A, 8/F., Chai Wan Industrial Centre,
20 Lee Chung Street, Chai Wan, Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : $(23 \pm 2)^{\circ}\text{C}$

Relative Humidity / 相對濕度 : $(55 \pm 20)\%$

Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration

DATE OF TEST / 測試日期 : 19 November 2017

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.

The results are detailed in the subsequent page(s).

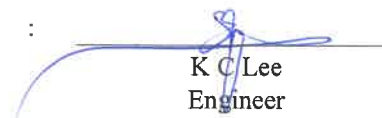
The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By
測試


H T Wong
Technical Officer

Certified By
核證


K C Lee
Engineer

Date of Issue : 22 November 2017
簽發日期

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校準用之測試器材均可溯源至國際標準。 同意複印本證書需先獲本實驗室書面批准。

Sun Creation Engineering Limited - Calibration & Testing Laboratory

c/o 4/F. Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

輝創工程有限公司 - 校正及檢測實驗室

c/o 香港新界屯門興安里一號青山灣機樓四樓

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E-mail: 電郵: call@suncreation.com

Website: 網址: www.suncreation.com

Certificate of Calibration

校正證書

Certificate No. : C176441
證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

| Equipment ID | Description | Certificate No. |
|--------------|-----------------------------------|-----------------|
| CL130 | Universal Counter | C173864 |
| CL281 | Multifunction Acoustic Calibrator | PA160023 |
| TST150A | Measuring Amplifier | C161175 |

- Test procedure : MA100N.

- Results :

5.1 Sound Level Accuracy

5.1.1 Before Adjustment

| UUT Nominal Value | Measured Value (dB) | Uncertainty of Measured Value (dB) |
|----------------------|------------------------|---------------------------------------|
| 94 dB, 1 kHz | 95.0 | ± 0.2 |
| 114 dB, 1 kHz | 114.8 | ± 0.3 |

5.1.2 After Adjustment

| UUT Nominal Value | Measured Value (dB) | Uncertainty of Measured Value (dB) |
|----------------------|------------------------|---------------------------------------|
| 94 dB, 1 kHz | 94.1 | ± 0.2 |
| 114 dB, 1 kHz | 114.6 | ± 0.3 |

5.2 Frequency Accuracy

5.2.1 Before Adjustment

| UUT Nominal Value (kHz) | Measured Value (kHz) | Uncertainty of Measured Value (Hz) |
|----------------------------|-------------------------|---------------------------------------|
| 1 | 1.000 | ± 1 |

5.2.2 After Adjustment

| UUT Nominal Value (kHz) | Measured Value (kHz) | Uncertainty of Measured Value (Hz) |
|----------------------------|-------------------------|---------------------------------------|
| 1 | 1.000 | ± 1 |

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration 校正證書

Certificate No. : C176441
證書編號

Remark : The uncertainties are for a confidence probability of not less than 95 %.

Note :

Only the original copy or the laboratory's certified true copy is valid.

The values given in this 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 environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited 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 the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。

Sun Creation Engineering Limited – Calibration & Testing Laboratory

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CERTIFICATE OF CALIBRATION

Certificate No.: 17CA1206 02-02

Page: 1 of 2

Item tested

Description: Acoustical Calibrator (Type 1)
Manufacturer: SVANTEK
Type/Model No.: SV30A
Serial/Equipment No.: 7908
Adaptors used: -

Item submitted by

Customer: Environmental Pioneers & Solutions Limited
Address of Customer: Flat A, 19/F, Chaiwan Industrial Centre, 20 Lee Chung Street, Chai Wan, Hong Kong
Request No.: -
Date of receipt: 06-Dec-2017

Date of test: 09-Dec-2017

Reference equipment used in the calibration

| Description: | Model: | Serial No. | Expiry Date: | Traceable to: |
|-------------------------|----------|------------|--------------|---------------|
| Lab standard microphone | B&K 4180 | 2341427 | 11-Apr-2018 | SCL |
| Preamplifier | B&K 2673 | 2743150 | 05-May-2018 | CEPREI |
| Measuring amplifier | B&K 2610 | 2346941 | 03-May-2018 | CEPREI |
| Signal generator | DS 360 | 61227 | 01-Apr-2018 | CEPREI |
| Digital multi-meter | 34401A | US36087050 | 25-Apr-2018 | CEPREI |
| Audio analyzer | 8903B | GB41300350 | 21-Apr-2018 | CEPREI |
| Universal counter | 53132A | MY40003662 | 22-Apr-2018 | CEPREI |

Ambient conditions

Temperature: 21 ± 1 °C
Relative humidity: 50 ± 10 %
Air pressure: 1000 ± 5 hPa

Test specifications

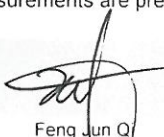
- 1, The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- 2, The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- 3, The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

Details of the performed measurements are presented on page 2 of this certificate.

Approved Signatory:


Feng Jun Q

Date: 11-Dec-2017

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 17CA1206 02-02

Page: 2 of 2

1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

| Frequency Shown Hz | Output Sound Pressure Level Setting dB | Measured Output Sound Pressure Level dB | (Output level in dB re 20 μ Pa) Estimated Expanded Uncertainty dB |
|--------------------------|--|---|--|
| 1000 | 94.00 | 94.12 | 0.10 |

2, Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz STF = 0.017dB

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz Actual Frequency = 1000.0Hz

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz TND = 0.4 %

Estimated expanded uncertainty 0.7 %

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by:

Fung Chi Yip

Date: 09-Dec-2017

Checked by:

Lam Tze Wai

Date: 11-Dec-2017

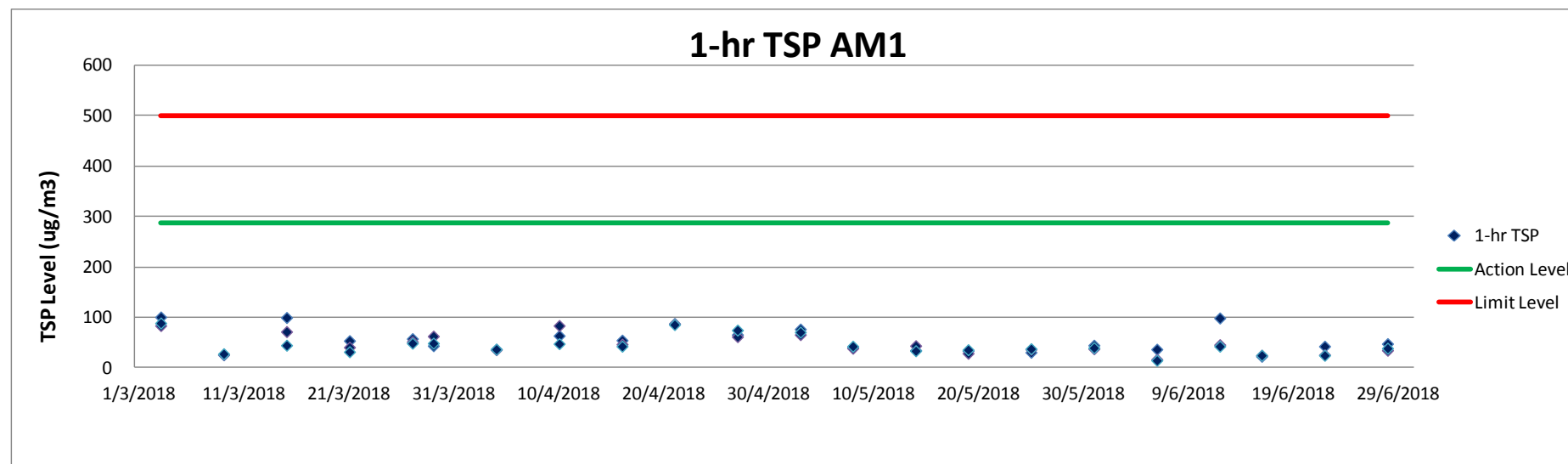
The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

Appendix E: TSP Monitoring Data

1-hr TSP Monitoring Result for AM1

| Date | Weather | Temperature (°C) * | Wind Direction * | Wind Speed (m/s) * | Sampling Time | | | Reading (µg/m ³) | | | |
|-----------|---------|-----------------------|---------------------|-----------------------|---------------|-------|-------|------------------------------|----|----|---------|
| | | | | | 1 | 2 | 3 | 1 | 2 | 3 | Average |
| 6/6/2018 | Cloudy | 22.9 - 33.5 | E | <5m/s | 15:09 | 16:10 | 17:11 | 37 | 17 | 15 | 23 |
| 12/6/2018 | Cloudy | 23.3 - 27.2 | SE | <5m/s | 10:24 | 11:25 | 12:26 | 99 | 46 | 43 | 63 |
| 16/6/2018 | Sunny | 25.9 - 31.3 | W | <5m/s | 10:58 | 11:59 | 13:00 | 23 | 25 | 25 | 24 |
| 22/6/2018 | Sunny | 25.0 - 30.4 | W | <5m/s | 14:35 | 15:36 | 16:37 | 43 | 26 | 25 | 31 |
| 28/6/2018 | Sunny | 27.1 - 32.2 | W | <5m/s | 11:03 | 12:04 | 13:05 | 48 | 35 | 39 | 41 |

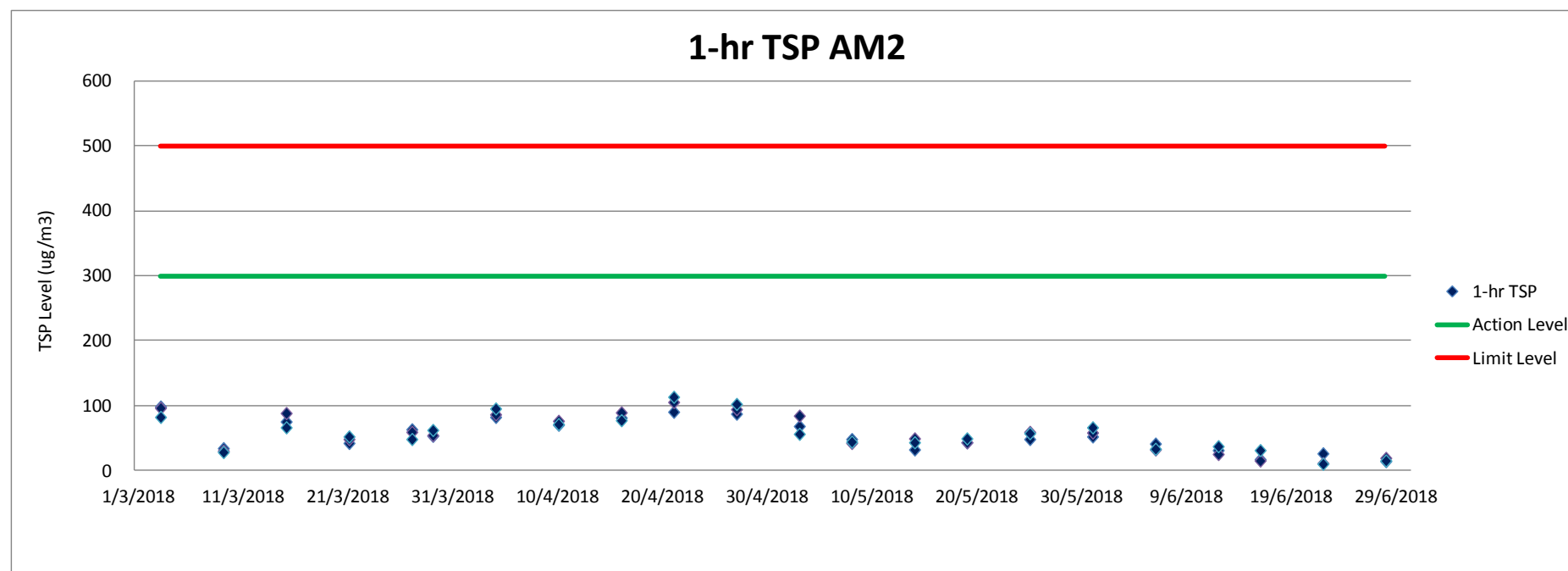
*Remark: Data of temperature, wind direction and wind speed was extracted from King's Park Meteorological Station of HKO



1-hr TSP Monitoring Result for AM2

| Date | Weather | Temperature (°C) * | Wind Direction * | Wind Speed (m/s) * | Sampling Time | | | Reading (µg/m ³) | | | |
|-----------|---------|-----------------------|---------------------|-----------------------|---------------|-------|-------|------------------------------|----|----|---------|
| | | | | | 1 | 2 | 3 | 1 | 2 | 3 | Average |
| 6/6/2018 | Cloudy | 22.9 - 33.5 | E | <5m/s | 9:00 | 10:01 | 11:02 | 41 | 32 | 33 | 35 |
| 12/6/2018 | Cloudy | 23.3 - 27.2 | SE | <5m/s | 9:00 | 10:01 | 11:02 | 31 | 25 | 37 | 31 |
| 16/6/2018 | Sunny | 25.9 - 31.3 | W | <5m/s | 9:00 | 10:01 | 11:02 | 17 | 15 | 31 | 21 |
| 22/6/2018 | Sunny | 25.0 - 30.4 | W | <5m/s | 9:00 | 10:01 | 11:02 | 26 | 11 | 10 | 16 |
| 28/6/2018 | Sunny | 27.1 - 32.2 | W | <5m/s | 9:00 | 10:01 | 11:02 | 14 | 19 | 15 | 16 |

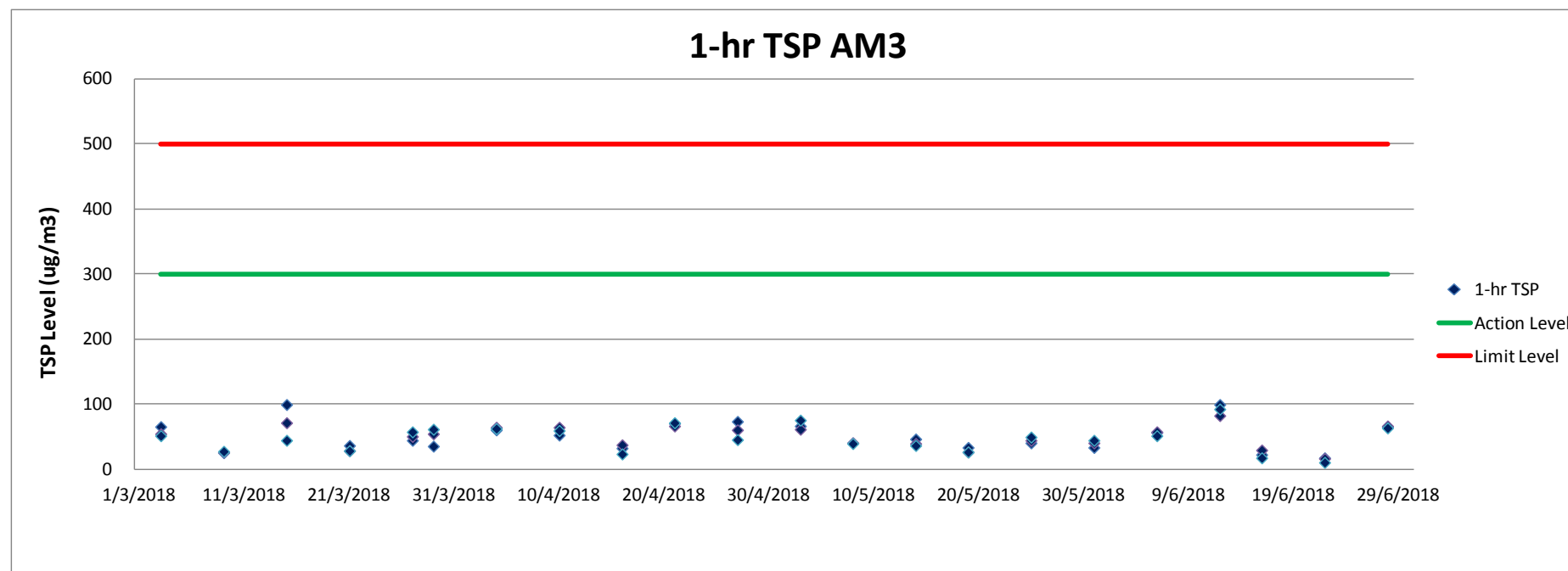
*Remark: Data of temperature, wind direction and wind speed was extracted from King's Park Meteorological Station of HKO



1-hr TSP Monitoring Result for AM3

| Date | Weather | Temperature (°C) * | Wind Direction * | Wind Speed (m/s) * | Sampling Time | | | Reading (µg/m ³) | | | |
|-----------|---------|-----------------------|---------------------|-----------------------|---------------|-------|-------|------------------------------|----|----|---------|
| | | | | | 1 | 2 | 3 | 1 | 2 | 3 | Average |
| 6/6/2018 | Cloudy | 22.9 - 33.5 | E | <5m/s | 15:35 | 16:36 | 17:37 | 57 | 58 | 52 | 56 |
| 12/6/2018 | Cloudy | 23.3 - 27.2 | SE | <5m/s | 10:48 | 11:49 | 12:50 | 100 | 83 | 93 | 92 |
| 16/6/2018 | Sunny | 25.9 - 31.3 | W | <5m/s | 11:25 | 12:26 | 13:27 | 23 | 30 | 18 | 24 |
| 22/6/2018 | Sunny | 25.0 - 30.4 | W | <5m/s | 14:42 | 15:43 | 16:44 | 18 | 17 | 11 | 15 |
| 28/6/2018 | Sunny | 27.1 - 32.2 | W | <5m/s | 11:44 | 12:45 | 13:46 | 66 | 67 | 64 | 66 |

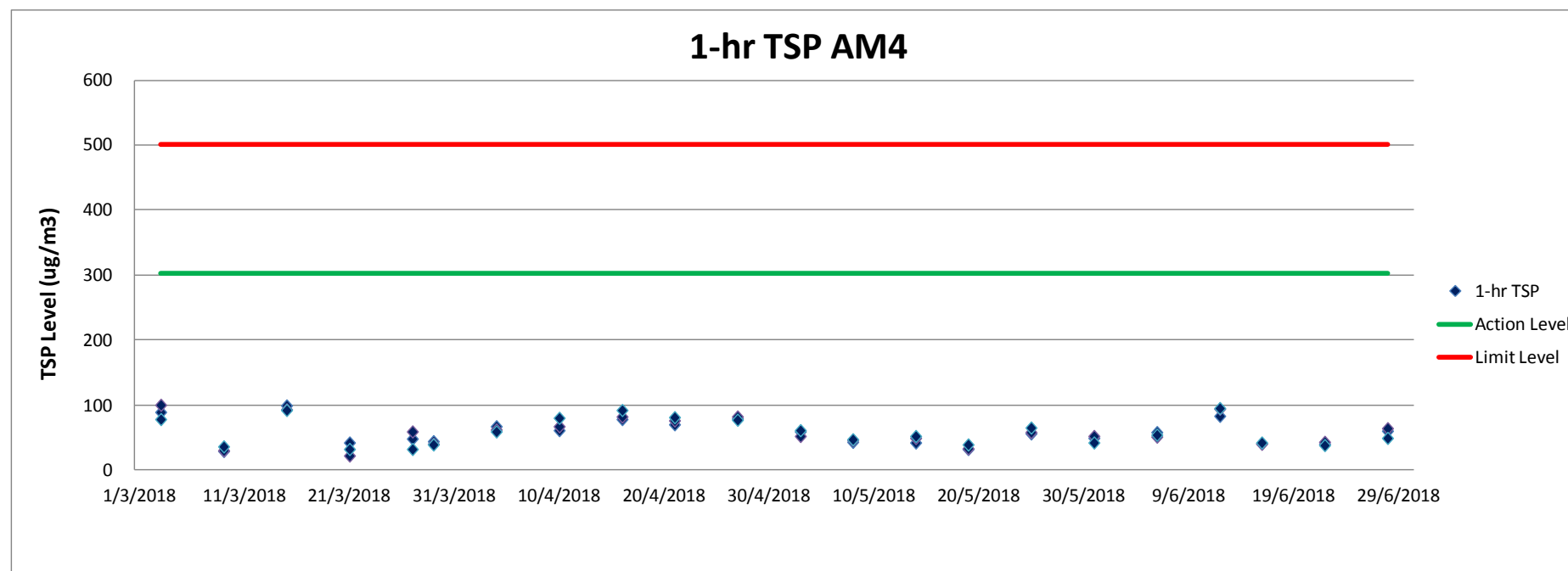
*Remark: Data of temperature, wind direction and wind speed was extracted from King's Park Meteorological Station of HKO



1-hr TSP Monitoring Result for AM4

| Date | Weather | Temperature (°C) * | Wind Direction * | Wind Speed (m/s) * | Sampling Time | | | Reading (µg/m ³) | | | |
|-----------|---------|-----------------------|---------------------|-----------------------|---------------|-------|-------|------------------------------|----|----|---------|
| | | | | | 1 | 2 | 3 | 1 | 2 | 3 | Average |
| 6/6/2018 | Cloudy | 22.9 - 33.5 | E | <5m/s | 9:30 | 10:31 | 11:32 | 58 | 51 | 54 | 54 |
| 12/6/2018 | Cloudy | 23.3 - 27.2 | SE | <5m/s | 9:30 | 10:31 | 11:32 | 83 | 94 | 95 | 91 |
| 16/6/2018 | Sunny | 25.9 - 31.3 | W | <5m/s | 9:30 | 10:31 | 11:32 | 41 | 40 | 42 | 41 |
| 22/6/2018 | Sunny | 25.0 - 30.4 | W | <5m/s | 9:30 | 10:31 | 11:32 | 40 | 43 | 38 | 40 |
| 28/6/2018 | Sunny | 27.1 - 32.2 | W | <5m/s | 9:30 | 10:31 | 11:32 | 60 | 64 | 49 | 58 |

*Remark: Data of temperature, wind direction and wind speed was extracted from King's Park Meteorological Station of HKO

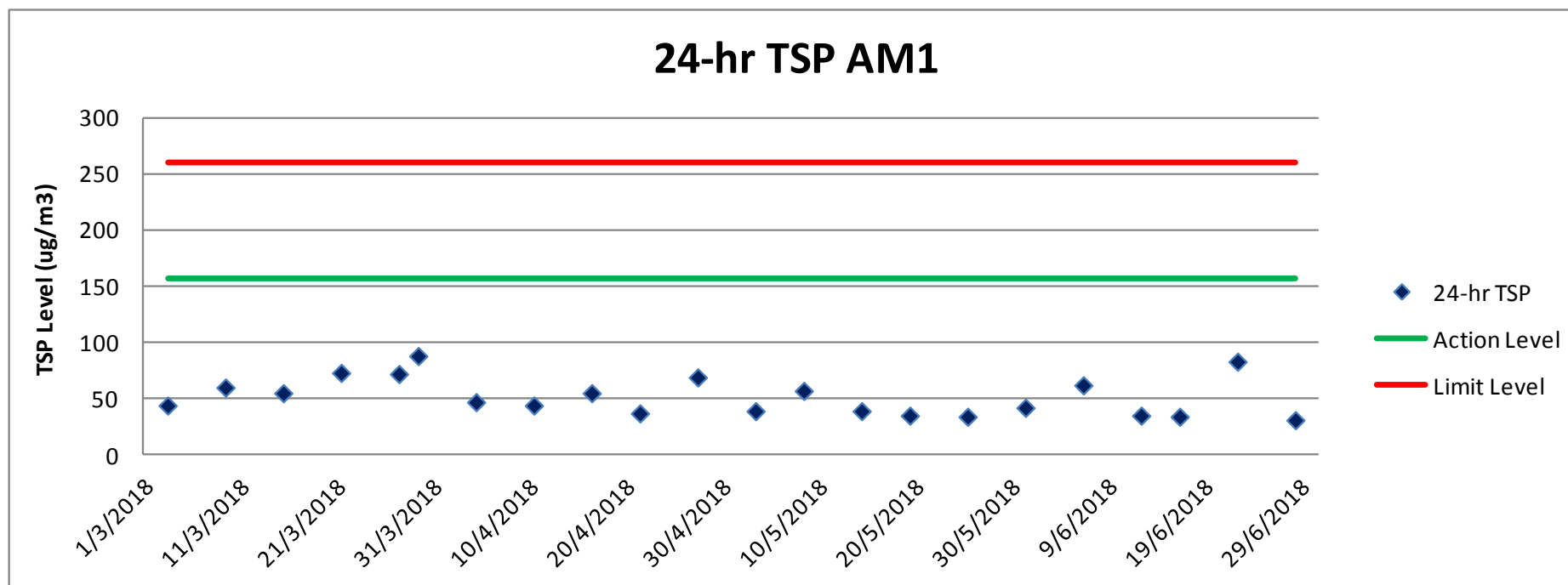


24-hr TSP Monitoring Result for AM1

| Sampling ID & Paper No. | Temperature (°C) * ¹ | Wind Direction * ¹ | Wind Speed (m/s) * ¹ | Sampling Date | Wt. of paper (g) | | | Flow Rate (CFM) | Total Volume * ² (m ³) | TSP Concentration (µg/m ³) |
|-------------------------|------------------------------------|----------------------------------|---------------------------------|---------------|------------------|-----------|-------------|-----------------|---|--|
| | | | | | Initial Wt. | Final Wt. | Wt. of dust | | | |
| AM10606 205409 | 26.0 - 28.4 | SE | <5m/s | 6/6/2018 | 2.6684 | 2.8134 | 0.1450 | 50.0 | 2333.11 | 62 |
| AM10612 205410 | 25.2 - 30.1 | E | <5m/s | 12/6/2018 | 2.6739 | 2.7549 | 0.0810 | 50.0 | 2333.11 | 35 |
| AM10616 205411 | 26.9 - 31.5 | NE | <5m/s | 16/6/2018 | 2.6725 | 2.7524 | 0.0799 | 50.0 | 2333.11 | 34 |
| AM10622 204502 | 25.4 - 30.4 | SW | <5m/s | 22/6/2018 | 2.6840 | 2.8787 | 0.1947 | 50.0 | 2333.11 | 83 |
| AM10628 205405 | 27.7 - 32.6 | SW | <5m/s | 28/6/2018 | 2.6847 | 2.7580 | 0.0733 | 50.0 | 2333.11 | 31 |

*¹ Remark: Data of temperature, wind direction and wind speed was extracted from King's Park Meteorological Station of HKO

*² Remark: Total volume of the 24 hrs sampling was calculated from the Calibration worksheet (refer to Appendix D)

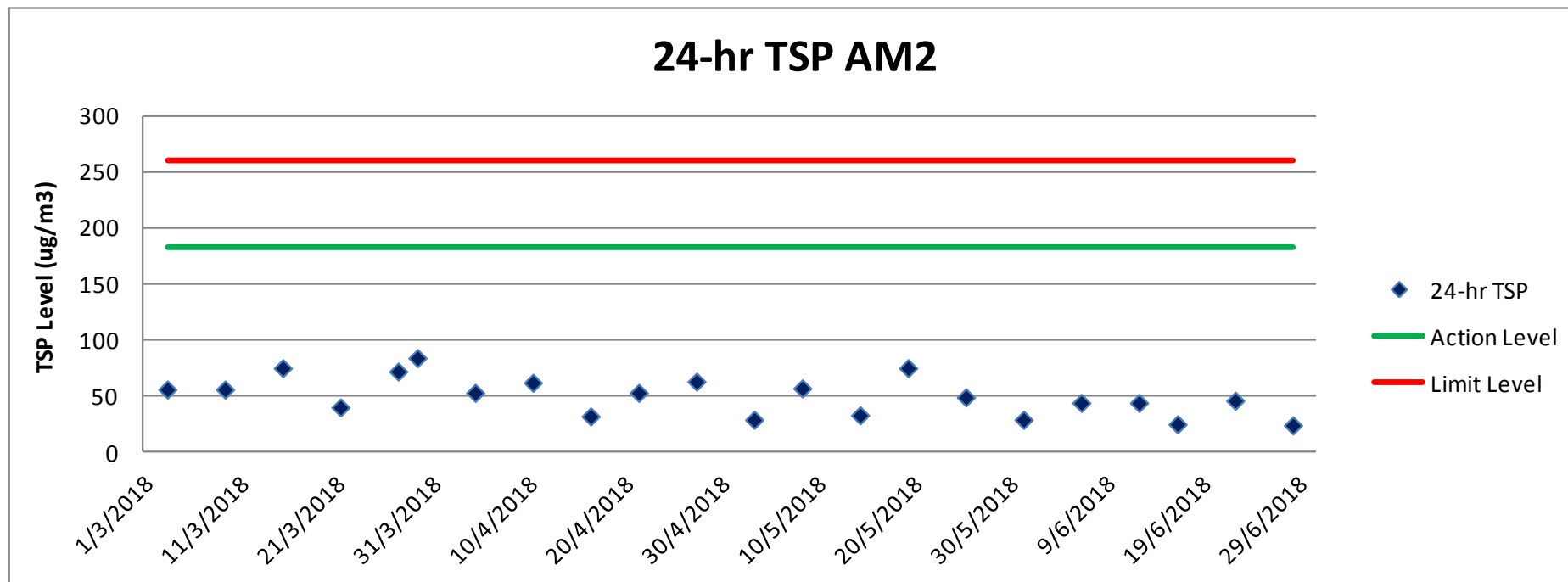


24-hr TSP Monitoring Result for AM2

| Sampling ID & Paper No. | Temperature (°C) * ¹ | Wind Direction * ¹ | Wind Speed (m/s) * ¹ | Sampling Date | Wt. of paper (g) | | | Flow Rate (CFM) | Total Volume * ² (m ³) | TSP Concentration (µg/m ³) |
|-------------------------|------------------------------------|----------------------------------|---------------------------------|---------------|------------------|-----------|-------------|-----------------|---|--|
| | | | | | Initial Wt. | Final Wt. | Wt. of dust | | | |
| AM20606 204514 | 26.0 - 28.4 | SE | <5m/s | 6/6/2018 | 2.5716 | 2.6685 | 0.0969 | 50.0 | 2195.15 | 44 |
| AM20612 204523 | 25.2 - 30.1 | E | <5m/s | 12/6/2018 | 2.5744 | 2.6714 | 0.0970 | 50.0 | 2195.15 | 44 |
| AM20616 203325 | 26.9 - 31.5 | NE | <5m/s | 16/6/2018 | 2.8173 | 2.8717 | 0.0544 | 50.0 | 2195.15 | 25 |
| AM20622 203324 | 25.4 - 30.4 | SW | <5m/s | 22/6/2018 | 2.8262 | 2.9280 | 0.1018 | 50.0 | 2195.15 | 46 |
| AM20628 205404 | 27.7 - 32.6 | SW | <5m/s | 28/6/2018 | 2.6555 | 2.7085 | 0.0530 | 50.0 | 2195.15 | 24 |

*¹ Remark: Data of temperature, wind direction and wind speed was extracted from King's Park Meteorological Station of HKO

*² Remark: Total volume of the 24 hrs sampling was calculated from the Calibration worksheet (refer to Appendix D)

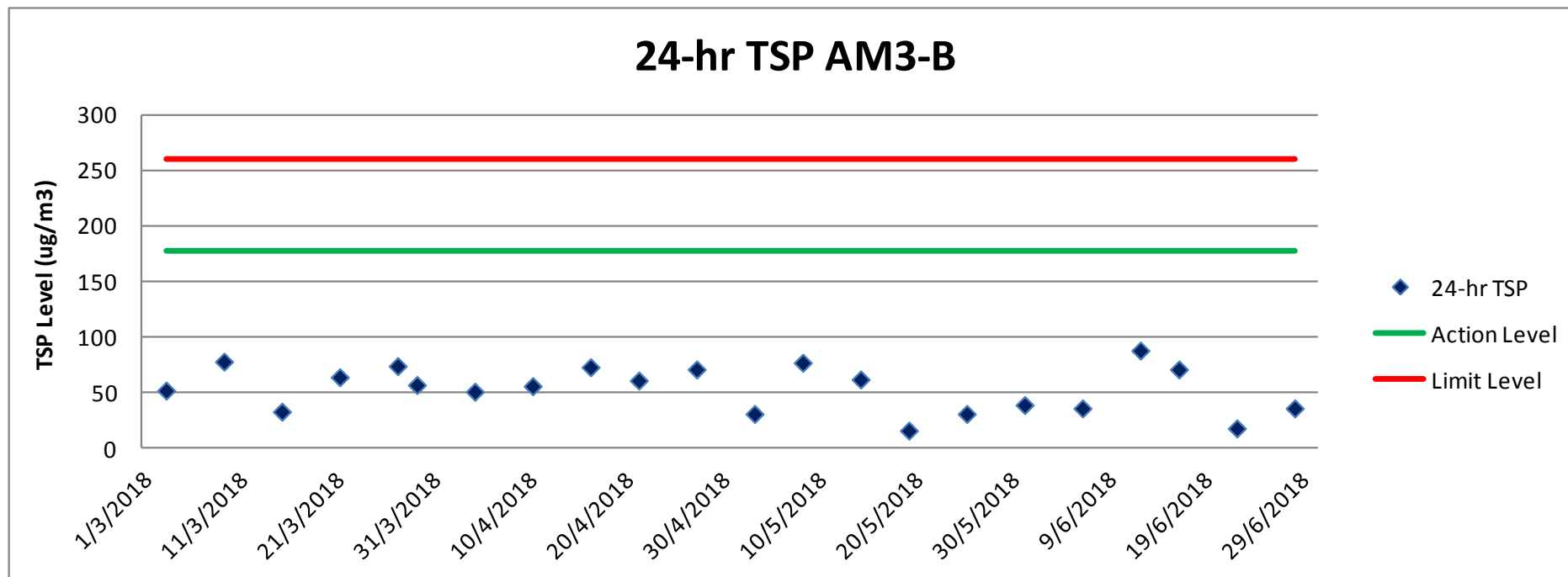


24-hr TSP Monitoring Result for AM3-B

| Sampling ID & Paper No. | Temperature (°C) * ¹ | Wind Direction * ¹ | Wind Speed (m/s) * ¹ | Sampling Date | Wt. of paper (g) | | | Flow Rate (CFM) | Total Volume * ² (m ³) | TSP Concentration (µg/m ³) |
|-------------------------|------------------------------------|----------------------------------|---------------------------------|---------------|------------------|-----------|-------------|-----------------|---|--|
| | | | | | Initial Wt. | Final Wt. | Wt. of dust | | | |
| AM3-B0606 204503 | 26.0 - 28.4 | SE | <5m/s | 6/6/2018 | 2.6746 | 2.7555 | 0.0809 | 50.0 | 2238.69 | 36 |
| AM3-B0612 205412 | 25.2 - 30.1 | E | <5m/s | 12/6/2018 | 2.6007 | 2.7987 | 0.1980 | 50.0 | 2238.69 | 88 |
| AM3-B0616 205413 | 26.9 - 31.5 | NE | <5m/s | 16/6/2018 | 2.5960 | 2.7548 | 0.1588 | 50.0 | 2238.69 | 71 |
| AM3-B0622 204522 | 25.4 - 30.4 | SW | <5m/s | 22/6/2018 | 2.5647 | 2.6056 | 0.0409 | 50.0 | 2238.69 | 18 |
| AM3-B0628 205415 | 27.7 - 32.6 | SW | <5m/s | 28/6/2018 | 2.6214 | 2.7022 | 0.0808 | 50.0 | 2238.69 | 36 |

*¹ Remark: Data of temperature, wind direction and wind speed was extracted from King's Park Meteorological Station of HKO

*² Remark: Total volume of the 24 hrs sampling was calculated from the Calibration worksheet (refer to Appendix D)





CERTIFICATE OF ANALYSIS

| | | | | | |
|--------------|---|--------------|---|-------------------------|---------------|
| Client | : ENVIRONMENTAL PIONEERS & SOLUTION LTD | Laboratory | : ALS Technichem (HK) Pty Ltd | Page | : 1 of 3 |
| Contact | : MR ANDY TSANG | Contact | : Richard Fung | Work Order | : HK1836445 |
| Address | : FLAT A, G/F., HOP SHI FTY BUILDING, 22-24 CHEUNG LEE STREET, CHAI WAN HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : kytsang@fsenv.com.hk | E-mail | : richard.fung@alsglobal.com | | |
| Telephone | : +852 2185 0159 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2258 0568 | Facsimile | : +852 2610 2021 | | |
| Project | : PROPOSED ROAD IMPROVEMENT WORKS IN WEST KOWLOON RECLAMATION DEVELOPMENT - PHASE 1 | | | Date Samples Received | : 28-Jun-2018 |
| Order number | : --- | Quote number | : HKE/3000/2017 | Issue Date | : 03-Jul-2018 |
| C-O-C number | : --- | | | No. of samples received | : 5 |
| Site | : --- | | | No. of samples analysed | : 5 |

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

| <u>Signatories</u> | <u>Position</u> | <u>Authorised results for</u> |
|------------------------|-----------------|-------------------------------|
| Fung Lim Chee, Richard | General Manager | Inorganics |



General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 28-Jun-2018 to 29-Jun-2018.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1836445

Sample(s) were received in ambient condition.

Sample(s) analysed and reported on an as received basis.



Analytical Results

Sub-Matrix: FILTER (TSP/RSP)

Client sample ID

| | | | | AM10606 205409 | AM10612 205410 | AM10616 205411 | AM10622 204502 | AM10628 205405 |
|--|------------|--------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | | | | 06-Jun-2018 | 12-Jun-2018 | 16-Jun-2018 | 22-Jun-2018 | 28-Jun-2018 |
| Compound | CAS Number | LOR | Unit | HK1836445-001 | HK1836445-002 | HK1836445-003 | HK1836445-004 | HK1836445-005 |
| EA/ED: Physical and Aggregate Properties | | | | | | | | |
| HK-TSP: Total Suspended Particulates | ---- | 0.0010 | g | 0.1450 | 0.0810 | 0.0799 | 0.1947 | 0.0733 |
| HK-TSP: Initial Weight | ---- | 0.0010 | g | 2.6684 | 2.6739 | 2.6725 | 2.6840 | 2.6847 |
| HK-TSP: Final Weight | ---- | 0.0010 | g | 2.8134 | 2.7549 | 2.7524 | 2.8787 | 2.7580 |



CERTIFICATE OF ANALYSIS

| | | | | | |
|--------------|---|--------------|---|-------------------------|---------------|
| Client | : ENVIRONMENTAL PIONEERS & SOLUTION LTD | Laboratory | : ALS Technichem (HK) Pty Ltd | Page | : 1 of 3 |
| Contact | : MR ANDY TSANG | Contact | : Richard Fung | Work Order | : HK1836437 |
| Address | : FLAT A, G/F., HOP SHI FTY BUILDING, 22-24 CHEUNG LEE STREET, CHAI WAN HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : kytsang@fsenv.com.hk | E-mail | : richard.fung@alsglobal.com | | |
| Telephone | : +852 2185 0159 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2258 0568 | Facsimile | : +852 2610 2021 | | |
| Project | : PROPOSED ROAD IMPROVEMENT WORKS IN WEST KOWLOON RECLAMATION DEVELOPMENT - PHASE 1 | | | Date Samples Received | : 28-Jun-2018 |
| Order number | : --- | Quote number | : HKE/3000/2017 | Issue Date | : 03-Jul-2018 |
| C-O-C number | : --- | | | No. of samples received | : 5 |
| Site | : --- | | | No. of samples analysed | : 5 |

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

| <u>Signatories</u> | <u>Position</u> | <u>Authorised results for</u> |
|------------------------|-----------------|-------------------------------|
| Fung Lim Chee, Richard | General Manager | Inorganics |



General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 28-Jun-2018 to 29-Jun-2018.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1836437

Sample(s) were received in ambient condition.

Sample(s) analysed and reported on an as received basis.



Analytical Results

Sub-Matrix: FILTER (TSP/RSP)

Client sample ID

| | | | | AM20606 204514 | AM20612 204523 | AM20616 203325 | AM20622 203324 | AM20628 205404 |
|--|------------|--------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | | | | 06-Jun-2018 | 12-Jun-2018 | 16-Jun-2018 | 22-Jun-2018 | 28-Jun-2018 |
| Compound | CAS Number | LOR | Unit | HK1836437-001 | HK1836437-002 | HK1836437-003 | HK1836437-004 | HK1836437-005 |
| EA/ED: Physical and Aggregate Properties | | | | | | | | |
| HK-TSP: Total Suspended Particulates | ---- | 0.0010 | g | 0.0969 | 0.0970 | 0.0544 | 0.1018 | 0.0530 |
| HK-TSP: Initial Weight | ---- | 0.0010 | g | 2.5716 | 2.5744 | 2.8173 | 2.8262 | 2.6555 |
| HK-TSP: Final Weight | ---- | 0.0010 | g | 2.6685 | 2.6714 | 2.8717 | 2.9280 | 2.7085 |



CERTIFICATE OF ANALYSIS

| | | | | | |
|--------------|---|--------------|---|-------------------------|---------------|
| Client | : ENVIRONMENTAL PIONEERS & SOLUTION LTD | Laboratory | : ALS Technichem (HK) Pty Ltd | Page | : 1 of 3 |
| Contact | : MR ANDY TSANG | Contact | : Richard Fung | Work Order | : HK1836425 |
| Address | : FLAT A, G/F., HOP SHI FTY BUILDING, 22-24 CHEUNG LEE STREET, CHAI WAN HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : kytsang@fsenv.com.hk | E-mail | : richard.fung@alsglobal.com | | |
| Telephone | : +852 2185 0159 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2258 0568 | Facsimile | : +852 2610 2021 | | |
| Project | : PROPOSED ROAD IMPROVEMENT WORKS IN WEST KOWLOON RECLAMATION DEVELOPMENT - PHASE 1 | | | Date Samples Received | : 28-Jun-2018 |
| Order number | : --- | Quote number | : HKE/3000/2017 | Issue Date | : 03-Jul-2018 |
| C-O-C number | : --- | | | No. of samples received | : 5 |
| Site | : --- | | | No. of samples analysed | : 5 |

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

| <u>Signatories</u> | <u>Position</u> | <u>Authorised results for</u> |
|------------------------|-----------------|-------------------------------|
| Fung Lim Chee, Richard | General Manager | Inorganics |



General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 28-Jun-2018 to 29-Jun-2018.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1836425

Sample(s) were received in ambient condition.

Sample(s) analysed and reported on an as received basis.



Analytical Results

Sub-Matrix: FILTER (TSP/RSP)

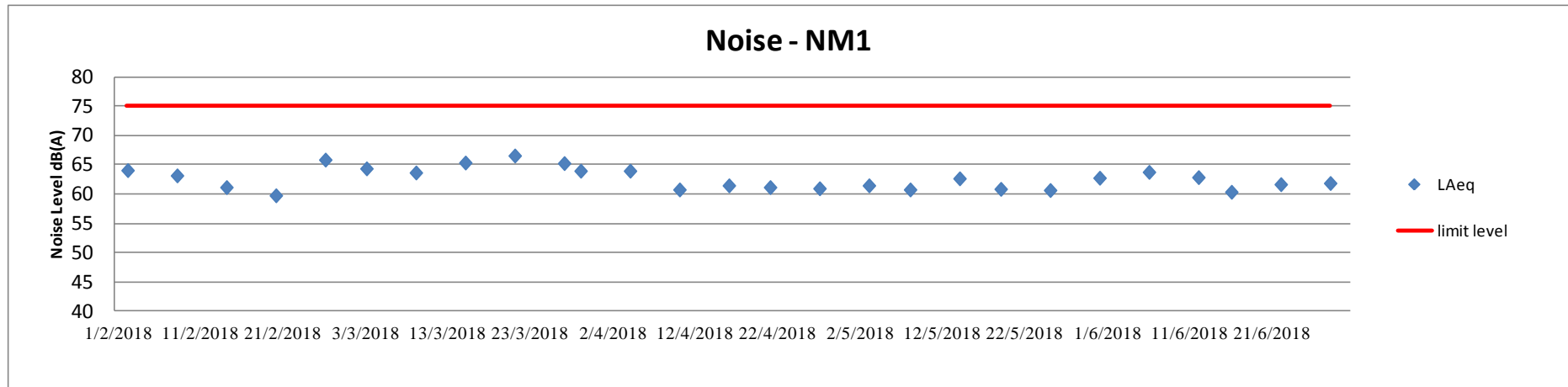
Client sample ID

| | | | | AM3-B0606 204503 | AM3-B0612 205412 | AM3-B0616 205413 | AM3-B0622 204522 | AM3-B0628 205415 |
|--|------------|--------|------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Client sampling date / time | | | | 06-Jun-2018 | 12-Jun-2018 | 16-Jun-2018 | 22-Jun-2018 | 28-Jun-2018 |
| Compound | CAS Number | LOR | Unit | HK1836425-001 | HK1836425-002 | HK1836425-003 | HK1836425-004 | HK1836425-005 |
| EA/ED: Physical and Aggregate Properties | | | | | | | | |
| HK-TSP: Total Suspended Particulates | ---- | 0.0010 | g | 0.1357 | 0.0863 | 0.0671 | 0.1470 | 0.0840 |
| HK-TSP: Initial Weight | ---- | 0.0010 | g | 2.5860 | 2.6734 | 2.6720 | 2.5779 | 2.6722 |
| HK-TSP: Final Weight | ---- | 0.0010 | g | 2.7217 | 2.7597 | 2.7391 | 2.7249 | 2.7562 |

Appendix F1: Noise Monitoring Data

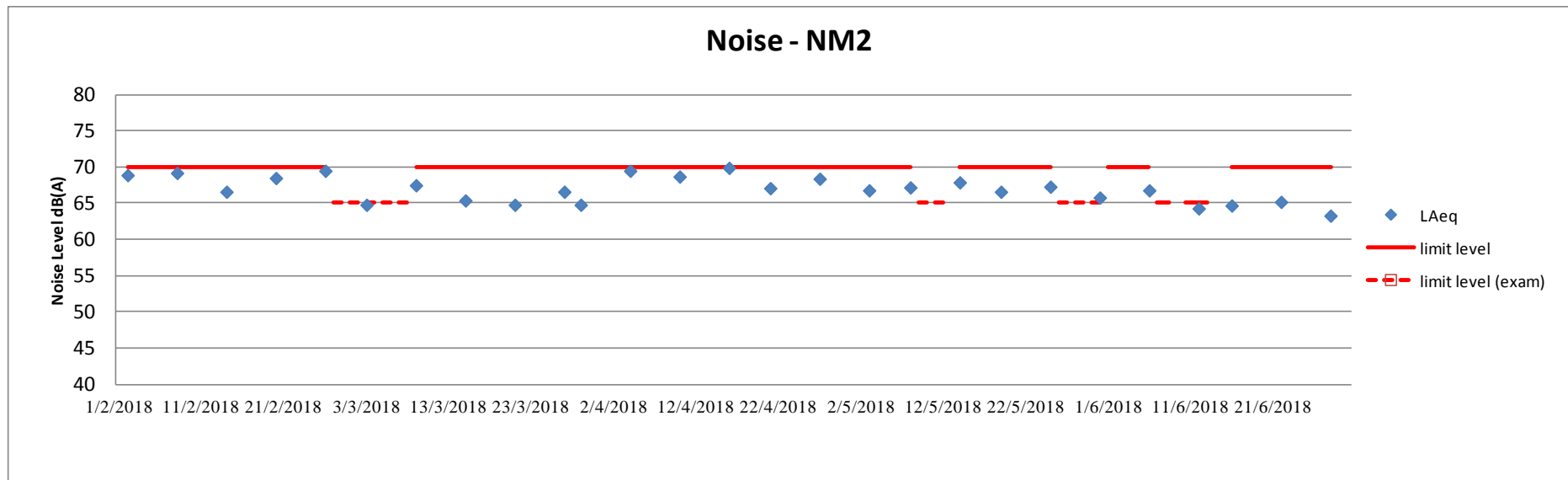
Noise Monitoring Result for NM1

| Location | NM1 | | | | |
|--------------------|----------|-----------|-----------|-----------|-----------|
| Date | 6/6/2018 | 12/6/2018 | 16/6/2018 | 22/6/2018 | 28/6/2018 |
| Weather Condition | Cloudy | Cloudy | Sunny | Sunny | Sunny |
| Start Time | 16:42 | 15:15 | 11:24 | 16:01 | 13:48 |
| Measurement Period | 30min | 30min | 30min | 30min | 30min |
| Baseline Level | 75.1 | | | | |
| L _{Aeq} | 63.7 | 62.8 | 60.3 | 61.6 | 61.8 |
| L ₁₀ | 65.3 | 64.3 | 61.8 | 62.7 | 63.1 |
| L ₉₀ | 59.5 | 59.7 | 58.1 | 60.2 | 58.9 |



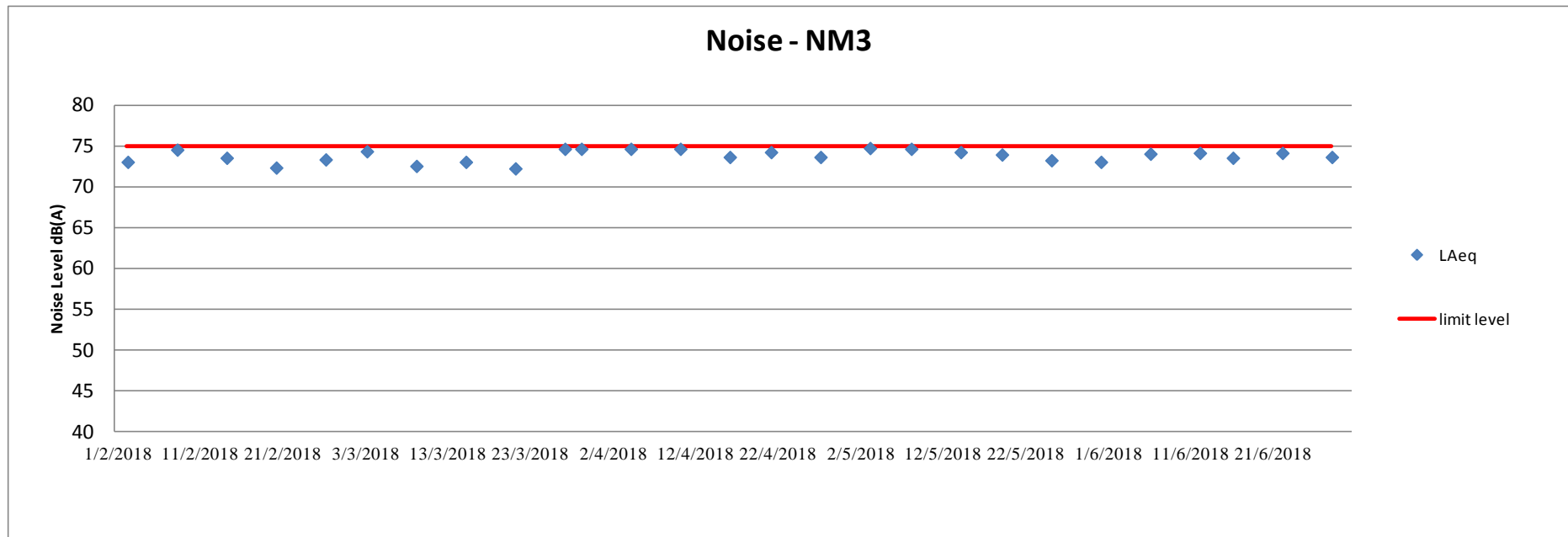
Noise Monitoring Result for NM2

| Location | NM2 | | | | |
|--------------------|----------|-----------|-----------|-----------|-----------|
| Date | 6/6/2018 | 12/6/2018 | 16/6/2018 | 22/6/2018 | 28/6/2018 |
| Weather Condition | Cloudy | Cloudy | Sunny | Sunny | Sunny |
| Start Time | 9:00 | 9:00 | 9:00 | 9:00 | 9:00 |
| Measurement Period | 30min | 30min | 30min | 30min | 30min |
| Baseline Level | 66.5 | | | | |
| L _{Aeq} | 66.8 | 64.3 | 64.7 | 65.2 | 63.3 |
| L ₁₀ | 67.7 | 66.5 | 66.7 | 65.8 | 65.1 |
| L ₉₀ | 64.6 | 61.1 | 60.9 | 61.4 | 60.7 |



Noise Monitoring Result for NM3

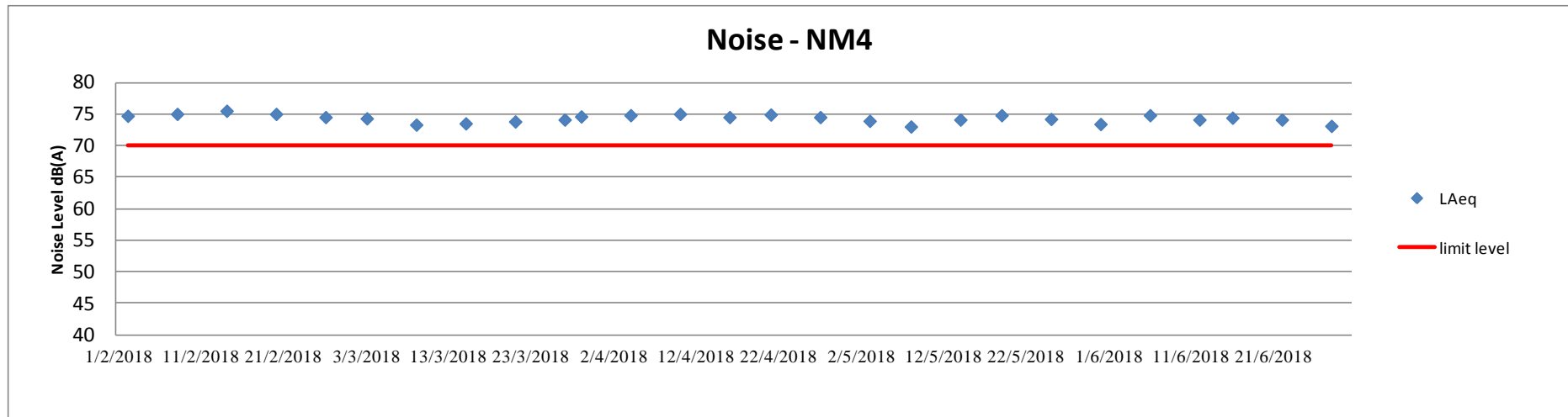
| Location | NM3 | | | | |
|--------------------|----------|-----------|-----------|-----------|-----------|
| Date | 6/6/2018 | 12/6/2018 | 16/6/2018 | 22/6/2018 | 28/6/2018 |
| Weather Condition | Cloudy | Cloudy | Sunny | Sunny | Sunny |
| Start Time | 15:57 | 14:36 | 10:52 | 15:27 | 13:06 |
| Measurement Period | 30min | 30min | 30min | 30min | 30min |
| Baseline Level | 74.5 | | | | |
| L _{Aeq} | 74.1 | 74.2 | 73.6 | 74.2 | 73.7 |
| L ₁₀ | 76.9 | 77.4 | 76.3 | 77.1 | 76.7 |
| L ₉₀ | 68.3 | 68.8 | 67.8 | 68.4 | 68.4 |



Noise Monitoring Result for NM4

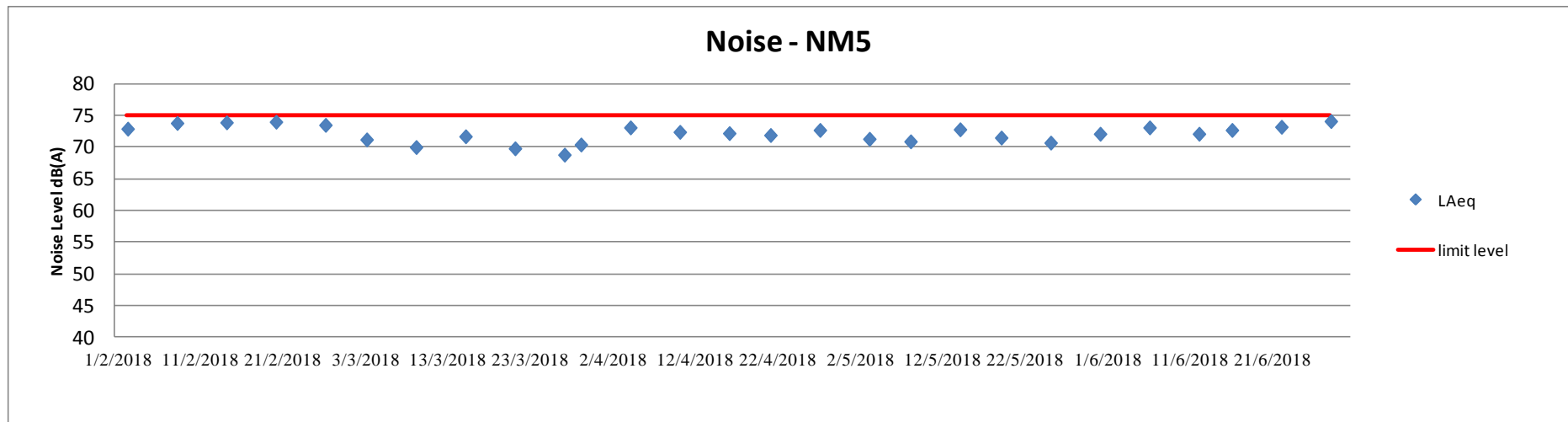
| Location | NM4 | | | | | NM4 (Re-measurement) * | | | | |
|--------------------|----------|-----------|-----------|-----------|-----------|------------------------|-----------|-----------|-----------|-----------|
| Date | 6/6/2018 | 12/6/2018 | 16/6/2018 | 22/6/2018 | 28/6/2018 | 6/6/2018 | 12/6/2018 | 16/6/2018 | 22/6/2018 | 28/6/2018 |
| Weather Condition | Cloudy | Cloudy | Sunny | Sunny | Sunny | Cloudy | Cloudy | Sunny | Sunny | Sunny |
| Start Time | 13:00 | 13:00 | 13:00 | 13:00 | 13:00 | 13:31 | 13:31 | 13:31 | 13:31 | 13:31 |
| Measurement Period | 30min | 30min | 30min | 30min | 30min | 30min | 30min | 30min | 30min | 30min |
| Baseline Level | 73.3 | | | | | 73.3 | | | | |
| L _{Aeq} | 74.8 | 74.1 | 74.4 | 74.1 | 73.1 | 73.9 | 74.6 | 74.8 | 74.4 | 72.5 |
| L ₁₀ | 78.0 | 74.4 | 76.1 | 76.7 | 75.8 | 77.3 | 77.1 | 76.0 | 77.4 | 75.1 |
| L ₉₀ | 68.1 | 67.3 | 70.1 | 69.4 | 68.9 | 66.9 | 70.5 | 69.7 | 69.1 | 68.1 |

* Repeat noise measurement when exceedance is recorded. The result is used to confirm the findings and it would not be showed on the graph plot



Noise Monitoring Result for NM5

| Location | NM5 | | | | |
|--------------------|----------|-----------|-----------|-----------|-----------|
| Date | 6/6/2018 | 12/6/2018 | 16/6/2018 | 22/6/2018 | 28/6/2018 |
| Weather Condition | Cloudy | Cloudy | Sunny | Sunny | Sunny |
| Start Time | 15:00 | 15:00 | 15:00 | 15:00 | 15:00 |
| Measurement Period | 30min | 30min | 30min | 30min | 30min |
| Baseline Level | 71.8 | | | | |
| L _{Aeq} | 73.1 | 72.1 | 72.7 | 73.2 | 74.1 |
| L ₁₀ | 74.6 | 74.4 | 74.5 | 74.7 | 77.2 |
| L ₉₀ | 66.7 | 67.3 | 67.1 | 70.5 | 68.9 |



Appendix F2: School Schedule

油蔴地天主教小學(海泓道)
二零一七至二零一八年度校曆表(三月至八月)

| | | | | | | | | | |
|--------|----|----|------|------|------|------|------|----|---|
| 三 月 | | | | | | 1 S | 2 S | 3 | 1/3-6/3 J.1-6 第二段考(J.6呈分試) |
| | 廿四 | 4 | 5 S | 6 S | 7 D | 8 E | 9 F | 10 | 7/3-9/3 J.5教育營 7/3-16/3 全方位學習周 |
| | 廿五 | 11 | 12 A | 13 B | 14 C | 15 D | 16 E | 17 | |
| | 廿六 | 18 | 19 F | 20 A | 21 | 22 B | 23 C | 24 | 21/3教師發展日(2) |
| | 廿七 | 25 | 26 D | 27 E | 28 F | 29 | 30 | 31 | 28/3四旬期祈禱聚會暨頒獎禮 29/3-8/4復活節假期 30/3耶穌受難節 |
| 四 月 | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1/4復活主日 5/4 清明節 |
| | 廿八 | 8 | 9 A | 10 B | 11 C | 12 S | 13 | 14 | 12/4 陸運會 13/4 陸運會翌日 14/4 成長見證日及J6升中座談會(2) |
| | 廿九 | 15 | 16 D | 17 E | 18 F | 19 A | 20 B | 21 | |
| | 卅 | 22 | 23 C | 24 D | 25 E | 26 F | 27 A | 28 | |
| | 卅一 | 29 | 30 B | | | | | | |
| 五 月 | | | | 1 | 2 C | 3 D | 4 E | 5 | 1/5勞動節 4/5 J.5升中座談會 |
| | 卅二 | 6 | 7 F | 8 A | 9 B | 10 C | 11 D | 12 | 9/5或10/5 J.6說話及視訊評估 |
| | 卅三 | 13 | 14 E | 15 F | 16 S | 17 S | 18 | 19 | 16/5 50周年匯演綵排 17/5 50周年匯演 18/5 匯演翌日假期 |
| | 卅四 | 20 | 21 A | 22 | 23 B | 24 C | 25 D | 26 | 22/5佛誕 |
| | 卅五 | 27 | 28 E | 29 F | 30 S | 31 S | | | 31/5-5/6 J.1-4 期終考(J.5呈分試/J.6畢業試) |
| 六 月 | | | | | | | 1 S | 2 | |
| | 卅六 | 3 | 4 S | 5 S | 6 A | 7 B | 8 C | 9 | |
| | 卅七 | 10 | 11 D | 12 E | 13 F | 14 A | 15 B | 16 | 12/6及13/6 J.6 TSA紙筆評估 15/6 J.6畢業感恩祭 |
| | 卅八 | 17 | 18 | 19 S | 20 S | 21 S | 22 S | 23 | 18/6端午節 21/6-22/6 畢業營 23/6 小一面見及聖保祿堂主保瞻禮 |
| | 卅九 | 24 | 25 | 26 S | 27 S | 28 S | 29 S | 30 | 25/6主保瞻禮假期 28/6 畢業禮綵排 29/6 畢業禮暨晚宴 |
| 七 月 | 四十 | 1 | 2 | 3 S | 4 S | 5 S | 6 S | 7 | 2/7 香港特區成立紀念日翌日 6/7 散學祈禱聚會 7/7 J1新生家長會、編班試、J2-J6 抽班試 |
| | 四一 | 8 | 9 S | 10 S | 11 S | 12 S | 13 S | 14 | 9/7 頒獎禮 10/7 升中派位 12/7-13/7 中學註冊 |
| | | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 16/7-31/8 暑假 |
| | | 22 | 23 | 24 | 25 | 26 | 27 | 28 | |
| | | 29 | 30 | 31 | | | | | |
| 八 月 | | | | 1 | 2 | 3 | 4 | | 16/7-31/8 暑假 |
| | | 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 | | |

麗澤中學 6 月校曆表

| | | 2018.6 | | | | | | |
|----|----|----------|----------|----------|----------|----------|----------|----------|
| 周次 | | 日 | 一 | 二 | 三 | 四 | 五 | 六 |
| B | 42 | | | | | | 1 十八 | 2 十九 |
| | | 3 二十 | 4 廿一 | 5 廿二 | 6 芒種 | 7 廿四 | 8 廿五 | 9 廿六 |
| A | 43 | 10 廿七 | 11 廿八 | 12 廿九 | 13 三十 | 14 五月 | 15 初二 | 16 初三 |
| | | 17 初四 | 18 初五 | 19 初六 | 20 初七 | 21 夏至 | 22 初九 | 23 初十 |
| | | 24 十一 | 25 十二 | 26 十三 | 27 十四 | 28 十五 | 29 十六 | 30 十七 |

應行事項

- 6月2日：畢業典禮
- 6月5日：教師發展日
- 6月6日至6月15日：下學期考試
- 6月18日：端午節假期
- 6月25日：全方位學習日
- 6月29日：歌唱比賽

Appendix G: Waste Management Record

Monthly Summary Waste Flow Table for 2016 (year)

| Month | <u>Actual Quantities of Inert C&D Materials Generated Monthly</u> | | | | | <u>Actual Quantities of Non-inert C&D Wastes Generated Monthly</u> | | | | | |
|-----------|---|------------------------------|------------------------|--------------------------|-------------------------|--|-------------|-----------------------------|-------------|----------------|-------------------------|
| | Total Quantity Generated | Hard Rocks & Broken Concrete | Reused in the Contract | Reused in other Projects | Disposed as Public Fill | Mixed Waste Disposal at Sorting Facility | Metals | Paper / cardboard packaging | Plastics | Chemical Waste | Others (general refuse) |
| | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) |
| Jan | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Feb | 521.76 | 0 | 0 | 0 | 521.76 | 0 | 0 | 0 | 0 | 0 | 38.34 |
| Mar | 1527.37 | 0 | 0 | 0 | 1527.37 | 0 | 0 | 0 | 0 | 0 | 188.63 |
| Apr | 2676.73 | 0 | 0 | 0 | 2676.73 | 0 | 0 | 0 | 0 | 0 | 87.72 |
| May | 2028.43 | 0 | 0 | 0 | 2028.43 | 0 | 0 | 0 | 0 | 0 | 47.78 |
| Jun | 2058.16 | 0 | 0 | 0 | 2058.16 | 0 | 0 | 0 | 0 | 0 | 81.13 |
| Sub-total | 8812.45 | 0 | 0 | 0 | 8812.45 | 0 | 0 | 0 | 0 | 0 | 443.6 |
| Jul | 5031.54 | 0 | 0 | 0 | 5031.54 | 0 | 0 | 0 | 0 | 0 | 17.12 |
| Aug | 1026.39 | 0 | 0 | 0 | 1026.39 | 0 | 0 | 0 | 0 | 0 | 52.44 |
| Sep | 1833.94 | 0 | 0 | 0 | 1833.94 | 0 | 0 | 0 | 0 | 0 | 7.14 |
| Oct | 785.58 | 0 | 0 | 0 | 785.58 | 0 | 0 | 0 | 0 | 0 | 16.77 |
| Nov | 832.23 | 0 | 0 | 0 | 832.23 | 0 | 0 | 0 | 0 | 0 | 48.09 |
| Dec | 2183.48 | 0 | 0 | 0 | 2183.48 | 0 | 0 | 0 | 0 | 0 | 19.96 |
| Total | 20505.61 | 0 | 0 | 0 | 20505.61 | 0 | 0 | 0 | 0 | 0 | 605.12 |

Monthly Summary Waste Flow Table for 2017 (year)

| Month | <u>Actual Quantities of Inert C&D Materials Generated Monthly</u> | | | | | <u>Actual Quantities of Non-inert C&D Wastes Generated Monthly</u> | | | | | |
|----------------------------|--|------------------------------|------------------------|--------------------------|-------------------------|---|-------------|-----------------------------|-------------|----------------|-------------------------|
| | Total Quantity Generated | Hard Rocks & Broken Concrete | Reused in the Contract | Reused in other Projects | Disposed as Public Fill | Mixed Waste Disposal at Sorting Facility | Metals | Paper / cardboard packaging | Plastics | Chemical Waste | Others (general refuse) |
| | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) |
| Jan | 717.69 | 0 | 0 | 0 | 717.69 | 0 | 0 | 0 | 0 | 0 | 7.57 |
| Feb | 2721.53 | 0 | 0 | 0 | 2721.53 | 0 | 0 | 0 | 0 | 0 | 13.08 |
| Mar | 2504.26 | 0 | 0 | 0 | 2504.26 | 0 | 0 | 0 | 0 | 0 | 5.55 |
| Apr | 2006.4 | 0 | 0 | 0 | 2006.4 | 0 | 0 | 0 | 0 | 0 | 10.43 |
| May | 1083.4 | 0 | 0 | 0 | 1083.4 | 0 | 0 | 0 | 0 | 0 | 10.04 |
| Jun | 840.63 | 0 | 0 | 0 | 840.63 | 0 | 0 | 0 | 0 | 0 | 12.53 |
| Sub-total | 9873.91 | 0 | 0 | 0 | 9873.91 | 0 | 0 | 0 | 0 | 0 | 59.2 |
| Jul | 1115.46 | 0 | 0 | 0 | 1115.46 | 0 | 0 | 0 | 0 | 0 | 19.58 |
| Aug | 1061.18 | 0 | 0 | 0 | 1061.18 | 0 | 0 | 0 | 0 | 0 | 25.19 |
| Sep | 3410.43 | 0 | 0 | 0 | 3410.43 | 0 | 0 | 0 | 0 | 0 | 30.62 |
| Oct | 2213.94 | 0 | 0 | 0 | 2213.94 | 0 | 0 | 0 | 0 | 0 | 30.56 |
| Nov | 2961.95 | 0 | 0 | 0 | 2961.95 | 0 | 0 | 0 | 0 | 0 | 26.85 |
| Dec | 3174.36 | 0 | 0 | 0 | 3174.36 | 0 | 0 | 0 | 0 | 0 | 35.72 |
| Total | 23811.23 | 0 | 0 | 0 | 23811.23 | 0 | 0 | 0 | 0 | 0 | 227.72 |
| Grand Total (2016&2017) | 44316.84 | 0 | 0 | 0 | 44316.84 | 0 | 0 | 0 | 0 | 0 | 832.84 |

Monthly Summary Waste Flow Table for 2018 (year)

| Month | <u>Actual Quantities of Inert C&D Materials Generated Monthly</u> | | | | | <u>Actual Quantities of Non-inert C&D Wastes Generated Monthly</u> | | | | | |
|----------------------------|--|---------------------------------------|------------------------------|--------------------------------|-------------------------------|---|-------------|-----------------------------------|----------------|-------------------|-------------------------------|
| | Total Quantity Generated | Hard Rocks & Broken Concrete | Reused in the Contract | Reused in other Projects | Disposed as Public Fill | Mixed Waste Disposal at Sorting Facility | Metals | Paper / cardboard packaging | Plastics | Chemical Waste | Others (general refuse) |
| | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000kg) |
| Jan | 3371.25 | 0 | 0 | 0 | 3371.25 | 0 | 0 | 0 | 0 | 0 | 31.67 |
| Feb | 1886.48 | 0 | 0 | 0 | 1886.48 | 0 | 0 | 0 | 0 | 0 | 11.76 |
| Mar | 2844.68 | 0 | 0 | 0 | 2844.68 | 0 | 0 | 0 | 0 | 0 | 14.42 |
| Apr | 3279.44 | 0 | 0 | 0 | 3279.44 | 0 | 0 | 0 | 0 | 0 | 23.84 |
| May | 2375.34 | 0 | 0 | 0 | 2375.34 | 0 | 0 | 0 | 0 | 0 | 26.76 |
| Jun | 2833.19 | 0 | 0 | 0 | 2833.19 | 0 | 0 | 0 | 0 | 0 | 20.63 |
| Sub-total | 16590.38 | 0 | 0 | 0 | 16590.38 | 0 | 0 | 0 | 0 | 0 | 129.08 |
| Jul | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Aug | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sep | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Oct | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Nov | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Dec | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 16590.38 | 0 | 0 | 0 | 16590.38 | 0 | 0 | 0 | 0 | 0 | 129.08 |
| Grand Total (2016-2018) | 60907.22 | 0 | 0 | 0 | 60907.22 | 0 | 0 | 0 | 0 | 0 | 961.92 |

Appendix H: Environmental Mitigation Implementation Schedule

Implementation Schedule for Environmental Mitigation Measures

| EIA Ref. | EM&A Ref. | Recommended Mitigation Measures | Objectives of the Recommended Measure & Main Concerns to address | Who to Implement the measure | Location of the measure | When to implement the measure | What requirements or standard for the measure to achieve | Implementation Status |
|---|----------------------|--|---|-------------------------------------|--------------------------------|--------------------------------------|---|------------------------------|
| Air Quality Impact (Construction Phase) | | | | | | | | |
| 4.8 | A1 | housekeeping to minimize dust generation, e.g. by properly handling and storing dusty materials | To minimize dust generation | HyD's Contractor | Whole construction site | Throughout construction phase | EIAO-TM, APCO | ✓ |
| 4.8 | A2 | Adopt dust control measures, such as dust suppression using water spray on exposed soil (at least 8 times per day), in areas with dusty construction activities and during material handling | To minimize dust generation due to erosion | HyD's Contractor | Whole construction site | Throughout construction phase | EIAO-TM, APCO | * |
| 4.8 | A3 | Store cement bags in shelter with 3 sides and the top covered by impervious materials if the stack exceeds 20 bags | To prevent leakage of cement | HyD's Contractor | Whole construction site | Throughout construction phase | EIAO-TM, APCO | ✓ |
| 4.8 | A4 | Maintain a reasonable height when dropping excavated materials to limit dust generation | To minimize dust generation during movement of excavated materials | HyD's Contractor | Whole construction site | Throughout construction phase | EIAO-TM, APCO | ✓ |
| 4.8 | A5 | Limit vehicle speed within site to 10km/hr and confine vehicle movement in haul road | To minimize dust generation due to traffic movement | HyD's Contractor | Whole construction site | Throughout construction phase | EIAO-TM, APCO | ✓ |

| | | | | | | | | |
|-----|-----|---|---|------------------|-------------------------|-------------------------------|---------------|---|
| 4.8 | A6 | Minimize exposed earth after completion of work in a certain area by hydroseeding, vegetating, soil compacting or covering with bitumen | To minimize dust generation due to erosion | HyD's Contractor | Whole construction site | Throughout construction phase | EIAO-TM, APCO | ✓ |
| 4.8 | A7 | Provide wheel washing at site exit to clean the vehicle body and wheel | To prevent dust from being brought offsite | HyD's Contractor | Whole construction site | Throughout construction phase | EIAO-TM, APCO | ✓ |
| 4.8 | A8 | Hard pave the area at site exit with concrete, bitumen or hardcores | To prevent dust from being brought offsite | HyD's Contractor | Whole construction site | Throughout construction phase | EIAO-TM, APCO | ✓ |
| 4.8 | A9 | Cover materials on trucks before leaving the site to prevent debris from dropping during traffic movement or being blown away by wind | To prevent falling of debris during traffic movement and by wind | HyD's Contractor | Whole construction site | Throughout construction phase | EIAO-TM, APCO | ✓ |
| 4.8 | A11 | Regular maintenance of plant equipment to prevent black smoke emission | To minimize black smoke emission | HyD's Contractor | Whole construction site | Throughout construction phase | EIAO-TM, APCO | ✓ |
| 4.8 | A12 | Throttle down or switch off unused machines or machine in intermittent use | To minimize unnecessary emission | HyD's Contractor | Whole construction site | Throughout construction phase | EIAO-TM, APCO | ✓ |
| 4.8 | A13 | Carry out regular site inspection to audit the implementation of mitigation measures | To check the implementation status and effectiveness of mitigation measures | HyD's Contractor | Whole construction site | Throughout construction phase | EIAO-TM, APCO | ✓ |

| | | | | | | | | |
|-----------------------------------|-----|---|---|------------------|-------------------------|--|-------------|-----|
| 4.8 | A14 | Carry out air quality monitoring throughout the construction period | To monitor construction dust level | HyD's Contractor | At representative ASRs | Prior to and throughout construction phase | EIAO-TM | ✓ |
| Noise Impact (Construction Phase) | | | | | | | | |
| 3.8 | N1 | Adopt good site practice, such as regular maintenance of plant equipment, throttle down unused machines | To minimize construction noise level | HyD's Contractor | Whole construction site | Throughout construction phase | NCO,EIAO-TM | ✓ |
| 3.8 | N2 | Use Quality Powered Mechanical Equipment (QPME) which produces lower noise level (e.g. Excavator/Loader (EPD-01431), Asphalt Paver (EPD-01226), Road Roller (EPD-00244) and Mobile Crane (EPD-01477)) | To minimize construction noise level | HyD's Contractor | Whole construction site | Throughout construction phase | NCO,EIAO-TM | ✓ |
| 3.8 | N3 | Erect movable noise barrier at significant noise source(e.g. Concrete Pump, Concrete Lorry Mixer, Excavator/Loader, Road Sweeper, Asphalt Paver, Road Roller, Lorry, Breaker and Poker) | To lower noise transmission | HyD's Contractor | Whole construction site | Throughout construction phase | NCO,EIAO-TM | ✓ |
| 3.8 | N5 | Regular maintenance of plant equipment to prevent noise emission due to impair | To prevent noise emission due to impair | HyD's Contractor | Whole construction site | Throughout construction phase | NCO,EIAO-TM | ✓ |
| 3.8 | N6 | Position mobile noisy equipment in location and direction away from NSR | To minimize noise transmission to NSR | HyD's Contractor | Whole construction site | Throughout construction phase | NCO,EIAO-TM | N/A |

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|-----------------------------------|-----|---|---|------------------|-------------------------|--|--------------------------|-----|
| 3.8 | N7 | Use silencer or muffler on plant equipment and should be properly maintained | To minimize noise transmission | HyD's Contractor | Whole construction site | Throughout construction phase | NCO,EIAO-TM | ✓ |
| 3.8 | N8 | Throttle down or switch off unused machines or machine in intermittent use between work | To minimize noise production | HyD's Contractor | Whole construction site | Throughout construction phase | NCO,EIAO-TM | ✓ |
| 3.8 | N9 | Make good use of stockpiles or other structures for noise screening | To minimize noise transmission | HyD's Contractor | Whole construction site | Throughout construction phase | NCO,EIAO-TM | N/A |
| 3.8 | N10 | Avoid carrying out noisy activities at the same time | To minimize noise production | HyD's Contractor | Whole construction site | Throughout construction phase | NCO,EIAO-TM | ✓ |
| 3.8 | N11 | Reduce the percentage on-time for some noisy PME's | To minimize noise production | HyD's Contractor | Whole construction site | Throughout construction phase | NCO,EIAO-TM | ✓ |
| 3.8 | N12 | Carry out noise monitoring | To monitor construction noise level | HyD's Contractor | At representative NSRs | Prior to and throughout construction phase | EIAO-TM | ✓ |
| Water Impact (Construction Phase) | | | | | | | | |
| 5.8 | W1 | Recirculate settled water for ground boring and drilling during site investigation or rock/soil anchoring. | To minimize wastewater generation | HyD's Contractor | Whole construction site | Throughout construction phase | ProPECC PN 1/94, EIAO-TM | ✓ |
| 5.8 | W2 | Set up sedimentation tank for settling suspended solids in wastewater before discharge into storm drains. Sand/silt | To reduce the amount of suspended solid in wastewater | HyD's Contractor | Whole construction site | Throughout construction phase | ProPECC PN 1/94, EIAO-TM | # |

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| | | removal facilities such as sand traps, silt traps and sedimentation basin should be provided with adequate capacity. | | | | | | |
| 5.8 | W3 | Pave the construction road between the wheel washing bay and the public road with backfall | To prevent soil and site runoff from leaving the site | HyD's Contractor | Whole construction site | Throughout construction phase | ProPECC PN 1/94, EIAO-TM | ✓ |
| 5.8 | W4 | Follow ProPECC PN 1/94 "Construction Site Drainage" as far as practicable | To minimize surface runoff and chance of erosion | HyD's Contractor | Whole construction site | Throughout construction phase | ProPECC PN 1/94, EIAO-TM | ✓ |
| 5.8 | W5 | Provide perimeter channels at site boundaries. | To stop offsite storm runoff from entering the site | HyD's Contractor | Whole construction site | Throughout construction phase | ProPECC PN 1/94, EIAO-TM | ✓ |
| 5.8 | W6 | Construct catchpits and perimeter channels prior to commencement of site formation works and earthworks. | To stop runoff from flowing across the site | HyD's Contractor | Whole construction site | Throughout construction phase | ProPECC PN 1/94, EIAO-TM | ✓ |
| 5.8 | W7 | Maintain silt removal facilities, channels, manholes before and after rainstorm. | To prevent failure that may lead to flooding | HyD's Contractor | Whole construction site | Throughout construction phase | ProPECC PN 1/94, EIAO-TM | # |
| 5.8 | W8 | Remove sediment from silt and grit at regular interval. | To prevent blockage the may lead to flooding | HyD's Contractor | Whole construction site | Throughout construction phase | ProPECC PN 1/94, EIAO-TM | ✓ |
| 5.8 | W9 | Consider environmental requirements when diverting or realigning drainage. | To ensure adequate hydraulic capacity of all drains | HyD's Contractor | Whole construction site | Throughout construction phase | ProPECC PN 1/94, EIAO-TM | ✓ |

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| 5.8 | W10 | Maintain a minimum distance of 100m between discharge point of construction site runoff and the existing saltwater intakes. No effluent will be discharged into typhoon shelter. (for loations of seawater intakes, please refer to Figure 5.1 in EIA Report) | To prevent mixing | HyD's Contractor | Whole construction site | Throughout construction phase | ProPECC PN 1/94, EIAO-TM | ✓ |
| 5.8 | W11 | Arrange soil excavation works outside rainy seasons (April to September) as far as possible. If this cannot beachieved, the following measures should be implemented: | To minimize surface runoff and chance of erosion | HyD's Contractor | Whole construction site | Throughout construction phase | ProPECC PN 1/94, EIAO-TM | |
| | | -Cover temporary exposed slope surfaces with impermeable materials, e.g. tarpaulin | | | | | | ✓ |
| | | - Protect temporary access roads by crushed stone or gravel | | | | | | N/A |
| | | - Proved intercepting channels along crest/edge of excavation | | | | | | ✓ |
| | | - Carry out adequate surface protection measures well before the arrival of a rainstorm | | | | | | ✓ |
| 5.8 | W12 | Compact soil after earthwork. Provide permanent work or surface protection with appropriate drainage channels immediately after forming the final surfaces. | To prevent soil erosion under rainstorm | HyD's Contractor | Whole construction site | Throughout construction phase | ProPECC PN 1/94, EIAO-TM | ✓ |
| 5.8 | W13 | Prevent rainwater from entering trenches. Excavation of trenches should be dug and backfilled in short sections during rainy | To prevent soil erosion under rainstorm | HyD's Contractor | Whole Construction site | Throughout construction phase | ProPECC PN 1/94, EIAO-TM | ✓ |

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| | | seasons. Remove silt in rainwater collected from the trenches or foundation excavations prior to discharge to storm drains. | | | | | | |
| 5.8 | W14 | Cover open stockpiles of construction materials (e.g. aggregates, sand and fill materials) with impermeable materials such as tarpaulin during rainstorms. | To prevent soil erosion under rainstorm | HyD's Contractor | Whole construction site | Throughout construction phase | ProPECC PN 1/94, EIAO-TM | * |
| 5.8 | W15 | Cover and temporary seal manholes (including newly constructed ones) to prevent silt, construction materials or debris and surface runoff from entering foul sewers. | To prevent overloading of foul sewers | HyD's Contractor | Whole construction site | Throughout construction phase | ProPECC PN 1/94, EIAO-TM | * |
| 5.8 | W16 | Remove waste from the site regularly. | To prevent waste accumulation | HyD's Contractor | Whole construction site | Throughout construction phase | ProPECC PN 1/94, EIAO-TM | ✓ |
| 5.8 | W17 | Apply discharge license for effluent discharge. Treat the discharge to comply with the requirement in TM-DSS. | To ensure compliance with effluent discharge requirement | HyD's Contractor | Whole construction site | Throughout construction phase | WPCO,TM-DSS, EIAO-TM | ✓ |
| 5.8 | W18 | Reuse treated effluent onsite, e.g. dust suppression, wheel washing and general cleaning. | To minimize wastewater generation | HyD's Contractor | Whole construction site | Throughout construction phase | Waste Disposal Ordinance, EIAO-TM | ✓ |
| 5.8 | W19 | Monitor effluent water quality. | To ensure compliance with effluent discharge requirement | HyD's Contractor | Whole construction site | Throughout construction phase | WPCO, EIAO-TM | ✓ |
| 5.8 | W20 | Register as chemical waste producer if chemical waste will be generated. | To control chemical waste | HyD's Contractor | Whole construction site | Throughout construction phase | Waste Disposal (Chemical Waste) (General) | ✓ |

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| | | | | | | | Regulation, EIAO-TM | |
| 5.8 | W21 | Perform maintenance of vehicles and equipment that have oil leakage and spillage potential on hard standings within a bunded area with sumps and oil interceptors. | To prevent oil leakage or spillage | HyD's Contractor | Whole construction site | Throughout construction phase | Waste Disposal (Chemical Waste) (General) Regulation, EIAO-TM | ✓ |
| 5.8 | W22 | <p>Dispose chemical waste in accordance to Waste Disposal Ordinance. Follow the <i>Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes</i> ,examples as follows:</p> <ul style="list-style-type: none"> - Store chemical wastes with suitable containers to avoid leakage or spillage during storage, handling and transport - Label chemical waste containers according to the CoP to notify and warn the waste handlers - Store chemical wastes at designated safe location with adequate space | To avoid accident in waste storage and handling | HyD's Contractor | Whole construction site | Throughout construction phase | Waste Disposal Ordinance, EIAO-TM | ✓ |

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|---------------------------------------|-----|--|---|------------------|-------------------------|-------------------------------|-----------------------------------|---|
| 5.8 | W23 | Provide sufficient chemical toilets with regular maintenance by licensed chemical waste collector | To proper collection of taskforce waste | HyD's Contractor | Whole construction site | Throughout construction phase | Waste Disposal Ordinance, EIAO-TM | ✓ |
| Water Impact (Operational Phase) | | | | | | | | |
| 5.8 | W24 | Direct surface runoff for silt removal through silt trap before flowing to public storm water drainage system | To remove silt in surface runoff | HyD | Whole construction site | Throughout construction phase | WPCO, EIAO-TM | ✓ |
| 5.8 | W25 | Regularly maintain the silt traps | To prevent blockage | HyD | Whole construction site | Throughout construction phase | WPCO, EIAO-TM | ✓ |
| Waste Management (Construction Phase) | | | | | | | | |
| 6.5 | WM1 | Allocate an area for waste sorting and storage of C&D materials into the following categories for reuse, recycle or disposal: - excavated material suitable for reuse - inert C&D material for disposal offsite - non-inert C&D materials for disposal at landfills - chemical waste - general refuse | To minimize waste generation | HyD's Contractor | Whole construction site | Throughout construction phase | Waste Disposal Ordinance, EIAO-TM | * |
| 6.5 | WM2 | Adopt good site practice as follows: - Provide training to workers on site cleanliness, waste management (waste | To proper handling of waste | HyD's Contractor | Whole construction site | Throughout construction phase | Waste Disposal Ordinance, EIAO-TM | ✓ |

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|-----|-----|---|---|------------------|-------------------------|-------------------------------|-----------------------------------|---|
| | | reduction, reuse and recycle) and chemical handling procedures - Provide sufficient waste collection points and regular removal - Cover waste materials with tarpaulin or in enclosure during transportation - Maintain drainage systems, sumps and oil interceptors - Sort out chemical waste for proper handling and treatment | | | | | | |
| 6.5 | WM3 | Adopt waste reduction measures as follows: - Allocate area/containers for sorting, recovering and storing waste for reuse, recycle or disposal (e.g. demolition debris and excavated materials, general refuse like aluminium cans) - Allocate area for proper storage of construction materials to prevent contamination - Minimize wastage through careful planning and avoiding over-purchase of construction materials | To minimize waste generation | HyD's Contractor | Whole construction site | Throughout construction phase | Waste Disposal Ordinance, EIAO-TM | # |
| 6.5 | WM4 | Prepare and implement a site specific Waste Management Plan (WMP) as part of Environmental Management Plan (EMP) in accordance with ETWB TCW No. 19/25. Detail waste management method in the form of avoidance, reuse, recovery, | To provide guidance to waste management | HyD's Contractor | Whole construction site | Throughout construction phase | ETWB TCW No. 19/2005, EIAO-TM | ✓ |

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| | | recycling, storage, collection, treatment and disposal according to the recommendations on the EIA and EM&A Manual. It should be approved by the ER and | | | | | | |
| 6.5 | WM5 | Store waste materials properly as follows: - Avoid contamination by proper handling and storing waste - Prevent erosion by covering waste or applying water spray - Maintain and clean storage area regularly - Sort and stockpile different materials at designated location to enhance reuse | To properly store waste | HyD's Contractor | Whole construction site | Throughout construction phase | ProPECC PN 1/94, EIAO-TM | * |
| 6.5 | WM6 | Apply for relevant waste disposal permits in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28). | To properly dispose waste | HyD's Contractor | Whole construction site | Throughout construction phase | Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28), EIAO-TM | ✓ |

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|-----|------|--|---|------------------|-------------------------|-------------------------------|---|---|
| 6.5 | WM7 | Hire licensed waste disposal contractors for waste collection and removal. Dispose waste at licensed waste disposal facilities | To properly dispose waste | HyD's Contractor | Whole construction site | Throughout construction phase | Waste Disposal Ordinance, EIAO-TM | ✓ |
| 6.5 | WM8 | Implement trip-ticket system for recording the amount of waste generated, recycled and disposed, including chemical wastes | To monitor movement of waste | HyD's Contractor | Whole construction site | Throughout construction phase | Waste Disposal (Chemical Waste) (General) Regulation, Waste Disposal Ordinance, EIAO-TM | ✓ |
| 6.5 | WM9 | Provide wheel washing bay at site exit to clean the vehicle body and wheel | To prevent dust from being brought offsite | HyD's Contractor | Whole construction site | Throughout construction phase | ProPECC PN 1/94, EIAO-TM | ✓ |
| 6.5 | WM10 | Reduce water content in wet spoil generated from piling work by mixing with dry materials. Only dispose treated spoil with less than 25% dry density to Public Fill Reception Facilities | To minimize load to reception facilities | HyD's Contractor | Whole construction site | Throughout construction phase | Waste Disposal Ordinance, EIAO-TM | ✓ |
| 6.5 | WM11 | Dispose dry waste or waste with less than 70% water content by weight to landfill | To minimize load to reception facilities | HyD's Contractor | Whole construction site | Throughout construction phase | Waste Disposal Ordinance, EIAO-TM | ✓ |
| 6.5 | WM12 | Follow the <i>Code of Practice on the Packaging, Labelling and Storage of Chemical Waste</i> as follows: - Store chemical wastes with suitable | To avoid accident in waste storage and handling | HyD's Contractor | Whole construction site | Throughout construction phase | Waste Disposal Ordinance, EIAO-TM | ✓ |

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|-----|------|---|---|------------------|-------------------------|-------------------------------|---|-----|
| | | <p>containers. Seal and maintain the container to avoid leakage or spillage during storage, handling and transport</p> <ul style="list-style-type: none"> - Label chemical waste containers in both English and Chinese with instructions in accordance to Schedule 2 of the Waste Disposal (Chemical Waste) (General) Regulation - The container capacity should be smaller than 450 litres unless agreed by the EPD | | | | | | |
| 6.5 | WM13 | <p>Comply with the requirement of the chemical storage area:</p> <ul style="list-style-type: none"> - Store only chemical waste and label clearly the chemical characters of the waste - Have at least 3 sides enclosed and protected from rainfall with cover - Provide sufficient ventilation - Have impermeable floor and has bunds to contain 110% of the capacity of the largest container or 20% of the total volume of the stored waste in the area, whichever is larger - Adequately spaced incompatible materials | To ensure proper storage of chemical waste | HyD's Contractor | Whole construction site | Throughout construction phase | Waste Disposal Ordinance, EIAO-TM | ✓ |
| 6.5 | WM14 | <p>Transfer used lubricants, waste oils and other chemicals to oil recycling companies, if possible, and empty oil drums for reuse or refill. No direct or indirect discharge is permitted</p> | To ensure proper disposal of chemical waste | HyD's Contractor | Whole construction site | Throughout construction phase | Waste Disposal (Chemical Waste) (General) Regulation, EIAO-TM | N/A |

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|-----|------|--|---|---------------------|--|-------------------------------|---|-----|
| 6.5 | WM15 | Hire licensed chemical waste disposal contractors for waste collection and removal. Dispose chemical waste at the approved CWTC at Tsing Yi or other licensed facility | To ensure proper disposal of chemical waste | HyD's Contractor | Whole construction site | Throughout construction phase | Waste Disposal (Chemical Waste) (General) Regulation, EIAO-TM | N/A |
| 6.5 | WM16 | Hire reputable waste collector to separately collect and dispose general refuse from other wastes. Cover the waste to prevent being blown away | To ensure proper disposal of general refuse | HyD's Contractor | Whole construction site | Throughout construction phase | Waste Disposal (Chemical Waste) (General) Regulation, EIAO-TM | ✓ |
| 6.5 | WM17 | Provide recycling bins for sorting out recyclables for collection by recycling companies. Non-recyclables should be removed to designated landfills every day by licensed collectors to prevent environmental and health nuisance. | To ensure proper recycling and disposal of general refuse | HyD's Contractor | Whole construction site | Throughout construction phase | Waste Disposal Ordinance, EIAO-TM | ✓ |
| 6.5 | WM18 | Organize training and reminders to site staff on waste minimization through avoidance and reduction, reusing and recycling | To ensure proper management of general refuse | HyD's Contractor | Whole construction site | Throughout construction phase | EIAO-TM | ✓ |
| 6.5 | WM19 | Carry out testing to verify sediment quantity and quality | To verify the categories of sediment to be disposed in accordance with ETWB TC(W) No. 34/2002 | HyD's GI Contractor | Drillholes CB1 to 5 as shown in Sediment Sampling and Testing Plan | Throughout construction phase | ETWB TC(W) No. 34/2002 | ✓ |

| Landscape and Visual | | | | | | | | |
|----------------------|-----|---|---|------------------|---------------------------------|-------------------------------|-------------------------|-----|
| 7.9.3 | CM1 | Shorten the construction period | To minimize duration of landscape and visual impact | HyD's Contractor | Whole construction site | Throughout construction phase | EIAO-TM | N/A |
| 7.9.3 | CM2 | Limit work within site area without encroaching into the landscape resources offsite. | To minimize landscape and visual impact | HyD's Contractor | Whole construction site | Throughout construction phase | EIAO-TM | ✓ |
| 7.9.3 | CM3 | Protect retained trees from damage during construction work according to the recommended in the detailed tree assessment report and the approval of Tree Removal Application under ETWB TCW No. 3/2006 Tree Preservation | To maintain and minimize damage to existing greenery | HyD's Contractor | Whole construction site | Throughout construction phase | ETWB TCW 3/2006, EIAOTM | ✓ |
| 7.9.3 | CM4 | Transplant unavoidably affected trees wherever possible in accordance with ETWB TCW No. 3/2006 Tree Preservation. Maintain transplanted trees to ensure healthy development during the establishment period | To minimize tree loss and ensure survival of transplanted trees | HyD's Contractor | Whole construction site | Throughout construction phase | ETWB TCW 3/2006, EIAOTM | N/A |
| 7.9.2.6 | OM1 | Carry out compensatory planting in areas proposed in the Tree Survey and Landscape and Greening Study Report in accordance to ETWB TCW 3/2006, which will be subjected to refinement in detailed design stage. Compensatory planting of a ratio no less than 1:1 in terms of quality and quantity will be provided for any potential tree | To compensate for loss greenery | HyD's Contractor | Whole construction site/Offsite | Construction phase | ETWB TCW 3/2006, EIAOTM | N/A |

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|---------|-----|--|--|------------------|-------------------------|--------------------|------------------|-----|
| | | felling within the site. Offsite planting may be required due to land constraint. 410 nos. of compensatory trees have been proposed | | | | | | |
| 7.9.2.6 | OM2 | Provide vertical greening at piers of elevated roads and shrub planting near amenity planting strips to soften the hard landscape (e.g. climber and shrub for hiding central divider and enclosures). Early comments from the ACABAS and relevant departments, implementation and maintenance agents shall be sought at the earlier stage. | To soften hard landscape | HyD's Contractor | Whole construction site | Construction phase | ETWB TCW 36/2004 | N/A |
| 7.9.2.6 | OM3 | Match the design and materials of road structure with the surrounding environment and with the schematic theme paving of the future West Kowloon Reclamation Development and the Advisory Committee on the Appearance of Bridges and Associated Structures (ACABAS) | To match with existing landscape character | HyD's Contractor | Whole construction site | Construction phase | ETWB TCW 36/2004 | N/A |

Remarks:

- ✓ Compliance of mitigation measure
- X Non-compliance of mitigation measure
- Non-compliance but rectified by the contractor
- * Recommendation was made during site audit but improved/rectified by the contractor
- # Waiting for improving/rectifying by the contractor
- N/A Not Applicable

Appendix I: Cumulative Log for Environmental Exceedance, Complaints,
Notification of Summons and Successful Prosecutions

Cumulative Log for Environmental Exceedance, Non-Compliance, Complaints, Notification of Summons and Successful Prosecution

| Reporting Month | Number of Exceedance | Number of Non-Compliance | Number of Environmental Complaints | Number of Notification of Summons | Number of Successful Prosecutions |
|-----------------|----------------------|--------------------------|------------------------------------|-----------------------------------|-----------------------------------|
| February 2016 | 0 | 0 | 0 | 0 | 0 |
| March 2016 | 0 | 0 | 0 | 0 | 0 |
| April 2016 | 0 | 0 | 2 | 0 | 0 |
| May 2016 | 7 | 0 | 0 | 0 | 0 |
| June 2016 | 11 | 0 | 0 | 0 | 0 |
| July 2016 | 6 | 0 | 0 | 0 | 0 |
| August 2016 | 6 | 0 | 0 | 0 | 0 |
| September 2016 | 5 | 0 | 0 | 0 | 0 |
| October 2016 | 6 | 1 | 0 | 0 | 0 |
| November 2016 | 5 | 0 | 0 | 0 | 0 |
| December 2016 | 5 | 0 | 0 | 0 | 0 |
| January 2017 | 5 | 0 | 0 | 0 | 0 |
| February 2017 | 5 | 0 | 0 | 0 | 0 |
| March 2017 | 6 | 0 | 0 | 0 | 0 |
| April 2017 | 6 | 0 | 1 | 0 | 0 |
| May 2017 | 5 | 0 | 0 | 0 | 0 |
| June 2017 | 6 | 0 | 0 | 0 | 0 |
| July 2017 | 5 | 0 | 0 | 0 | 0 |
| August 2017 | 5 | 0 | 0 | 0 | 0 |
| September 2017 | 6 | 0 | 0 | 0 | 0 |

| | | | | | |
|---------------|-----|---|---|---|---|
| October 2017 | 5 | 0 | 0 | 0 | 0 |
| November 2017 | 6 | 0 | 0 | 0 | 0 |
| December 2017 | 5 | 0 | 0 | 0 | 0 |
| January 2018 | 5 | 0 | 0 | 0 | 0 |
| February 2018 | 5 | 0 | 0 | 0 | 0 |
| March 2018 | 6 | 0 | 0 | 0 | 0 |
| April 2018 | 5 | 0 | 0 | 0 | 0 |
| May 2018 | 7 | 0 | 1 | 0 | 0 |
| June 2018 | 5 | 0 | 0 | 0 | 0 |
| Grand Total | 149 | 1 | 4 | 0 | 0 |

COMPLAINT / CONCERN LOG

Ref: 00035/18/KFMF0165/2B3

| Log Ref | Event Date/Location | Complainant/ Date of Contact | Details of Complaint | Investigation/Mitigation Action | File Closed |
|---|---|--|---|--|-------------|
| Ref no.: 00035/18/KF MF0165/2B3 EPD complaint ref.: (6) in EP3/K07/RE/0 0013626-18 | Canton Road the Grand Austin (Scheme Q of the Project) | A complaint received on 23 May 2018. | EPD received a complaint from Miss Wu of Grand Austin MO about heavy traffic and traffic congestion at Canton Road caused noise nuisance to residents of Grand Austin. Letter from EPD by email was received on 23 May 2018. | Investigation Result: 1. According to clause 4.4.6 of the EIA report, the road improvement works along Canton Road (Scheme Q) consists of the widening of footpaths and junction improvement of Canton road/Wui Cheung Road and Canton Road/Austin Road which would not change the nature of road, traffic capacity or traffic composition of Canton road. 2. One additional lane at short road section in close proximity to the Canton Road/Austin road junction may cause increasing in traffic noise level but not the traffic flow. 3. The potential increasing in traffic noise level was assessed. And the results indicated that the increase in traffic noise level at all NSRs due to Scheme Q is considered insignificant since the noise level difference between the with Project and without Project scenario at the design year (i.e. Year 2030) are in range of -0.4dB(A) to 0.4 dB(A) (refer to Appendix 4.4A of EIA report), which is smaller than 1.0 dB(A). 4. The increase in traffic noise level due to the improvement works is insignificant, the Scheme Q for the interim road improvement works along Canton Road is not considered within the ambits of Item A.1 of Schedule 2 of the EIAO. 5. Traffic noise impact monitoring during operational stage as well as mitigation measure for traffic noise impact are not required by the Environmental Permit (EP) and EM&A Manual of this Project. | Yes |

Filed by Environmental Team Leader: 

Date: 5 June 2018



大成環境科技拓展有限公司

ENVIRONMENTAL PIONEERS & SOLUTIONS LIMITED

Member of FSE Engineering Holdings (Stock Code: 331)

Our Ref.: 00035/18/KFMF0165/2B3

Date: June 5, 2018

Environmental Protection Department
Environmental Compliance Division
Regional Office (East)
8/F., Cheung Sha Wan Government Offices
303 Cheung Sha Wan Road, Kowloon

Attn.: Mr. Peter C P Dui

Compliant of Road Traffic Noise from Canton Road, Typhoon Shelter
[Environmental Permit (EP) (No.: EP-455/2013)]

With reference to your letter with ref. EP3/K07/RE/00013626-18 regarding the complaint from Miss Wu of Grand Austin MO about the traffic noise at Canton Road outside Grand Austin. We have reviewed the Environmental Impact Assessment (EIA) Report of the designated project "Proposed Road Improvement Works in West Kowloon Reclamation Development – Phase 1" (Project) under EP No. EP-455/2013. According to clause 4.4.6 of the EIA report, the road improvement works along Canton Road (Scheme Q) consists of the widening of footpaths and junction improvement of Canton road/Wui Cheung Road and Canton Road/Austin Road which would not change the nature of road, traffic capacity or traffic composition of Canton road. One additional lane at short road section in close proximity to the Canton Road/Austin road junction may cause increasing in traffic noise level but not the traffic flow. The potential increasing in traffic noise level was assessed. And the results indicated that the increase in traffic noise level at all NSRs due to Scheme Q is considered insignificant since the noise level difference between the with Project and without Project scenario at the design year (i.e. Year 2030) are in range of -0.4dB(A) to 0.4 dB(A) (refer to Appendix 4.4A of EIA report), which is smaller than 1.0 dB(A). Since the increase in traffic noise level due to the improvement works is insignificant, the Scheme Q for the interim road improvement works along Canton Road is not considered within the ambits of Item A.1 of Schedule 2 of the Environment Impact Assessment Ordinance (EIAO). As a result, traffic noise impact monitoring during operational stage as well as mitigation measure for traffic noise impact are not required by the Environmental Permit (EP) and Environmental Monitoring and Audit (EM&A) Manual of this Project. Furthermore, the road widening works at Green Area Site C and Green Area Site D were carried out by the developer of Grand Austin (refer to attached layout plans).

.../02

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ISO 9001:2008
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ISO 14001:2004
Certificate No.: CC 5833



OHSAS 18001:2007
Certificate No.: CC 5880





大成環境科技拓展有限公司

ENVIRONMENTAL PIONEERS & SOLUTIONS LIMITED

Member of FSE Engineering Holdings (Stock Code: 331)

Our Ref.: 00035/18/KFMF0165/2B3

Date: June 5, 2018

Based on the results and requirements of EIA report, EP and EM&A manual of this Project, the complaint from Miss Wu should not be caused by this Project. And we will continuous with the construction noise impact monitoring as per EM&A manual of this Project

Should you have any queries, please feel free to contact the undersigned at 6131 8134.

Thank you for your kind attention.

Yours Faithfully,

Environmental Pioneers & Solutions Limited

Goldie Fung

Environmental Team Leader

Encl.

| | | | |
|----|------------------------------------|---|----------------------|
| cc | Highways Department | - | Mr. F.K. Lai (w/e) |
| | WSP(Asia) Limited | - | Mr. Angus Law (w/e) |
| | ANewR Consulting Limited | - | Mr. Adi Lee (w/e) |
| | Vibro Construction Company Limited | - | Mr. John Leung (w/e) |

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<http://www.epsl.com.hk>



ISO 9001 : 2008
Certificate No.: CC 5832

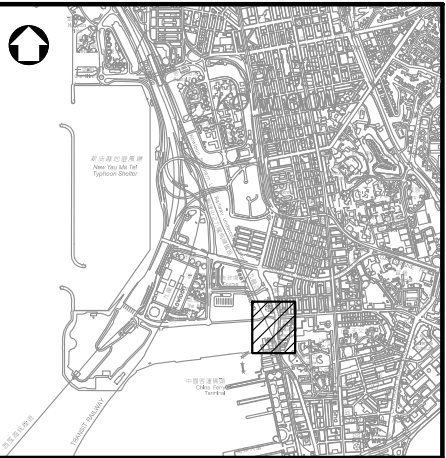
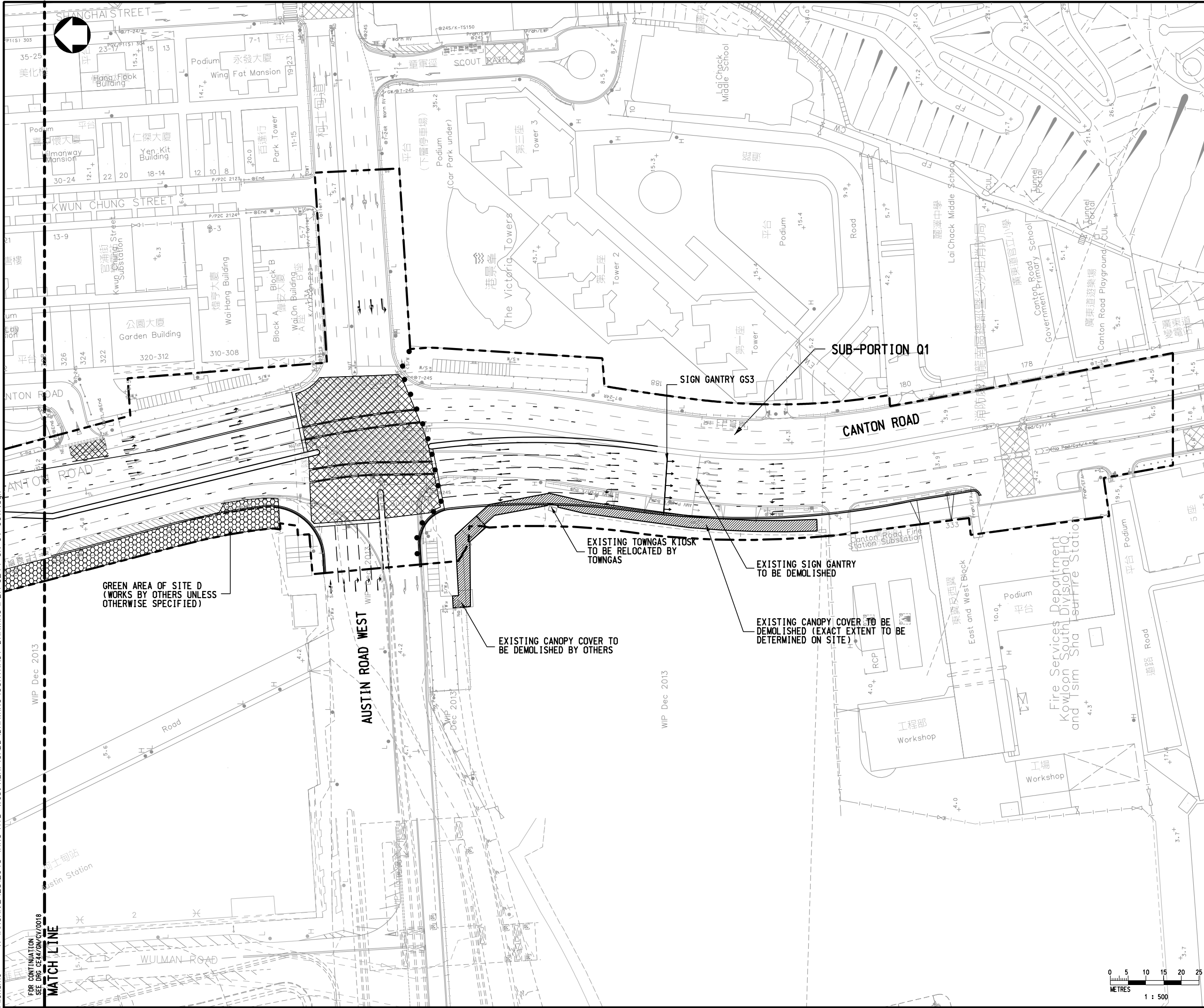


ISO 14001 : 2004
Certificate No.: CC 5833



OHSAS 18001 : 2007
Certificate No.: CC 5860





LOCATION PLAN

NOTES:

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE STATED.
2. ALL LEVELS ARE APPROXIMATE VALUES AND IN METERS ABOVE HONG KONG PRINCIPAL DATUM.

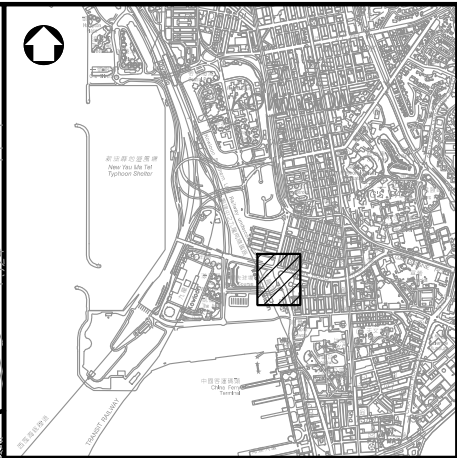
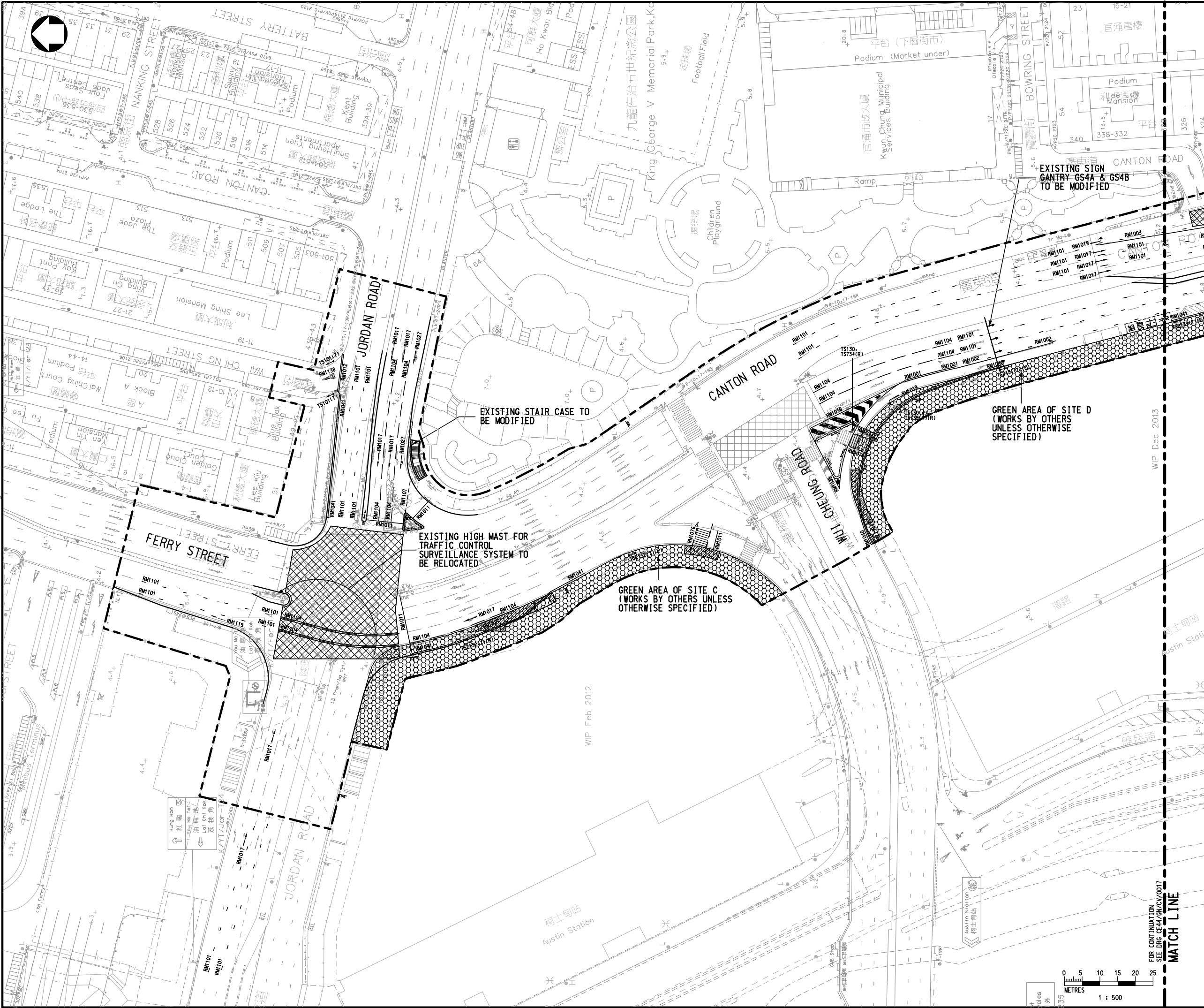
LEGEND:

- LIMIT OF THE SITE
- • • SUB-PORTION Q1 BOUNDARY
- GREEN AREA OF SITE C AND SITE D
- EXISTING CANOPY COVER TO BE DEMOLISHED

| | | | |
|------------------|---|------------|-------------|
| Rev | Description | By | Date |
| Consultant | PARSONS BRINCKERHOFF | | |
| Project title | CONTRACT NO. HY/2013/17 PROPOSED ROAD IMPROVEMENT WORKS IN WEST KOWLOON RECLAMATION DEVELOPMENT | | |
| Drawing title | GENERAL LAYOUT PLAN (SHEET 7) | | |
| Drawing no. | CE44/GN/CV/0017 | | Rev. - |
| Drawn CAD | Date - | Checked AT | Approved EW |
| Scale 1:500 (A1) | Status CONTRACT | | |

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LOCATION PLAN

- NOTES:**
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE STATED.
 2. ALL LEVELS ARE APPROXIMATE VALUES AND IN METERS ABOVE HONG KONG PRINCIPAL DATUM.
 3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING INTERIM TRAFFIC SCHEME AS SHOWN IN DRAWING NO. CE44/RW/TP/0501 TO 0502. REQUIREMENTS SHALL REFER TO PS SECTION 1.

- LEGEND:**
- LIMIT OF THE SITE
 - GREEN AREA OF SITE C AND SITE D

| | | | |
|---|-------------|--------------------|----------------|
| | | | |
| | | | |
| Rev | Description | By | Date |
| Consultant | | | |
| PARSONS BRINCKERHOFF | | | |
| Project title | | | |
| CONTRACT NO. HY/2013/17 PROPOSED ROAD IMPROVEMENT WORKS IN WEST KOWLOON RECLAMATION DEVELOPMENT | | | |
| Drawing title | | | |
| GENERAL LAYOUT PLAN (SHEET 8) | | | |
| Drawing no. | | Rev. | |
| CE44/GN/CV/0018 | | - | |
| Drawn CAD | Date | Checked AT | Approved EW |
| Scale | 1:500 (A1) | Status CONTRACT | |
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| 路政署 HIGHWAYS DEPARTMENT 主要工程管理處 MAJOR WORKS PROJECT MANAGEMENT OFFICE | | | |